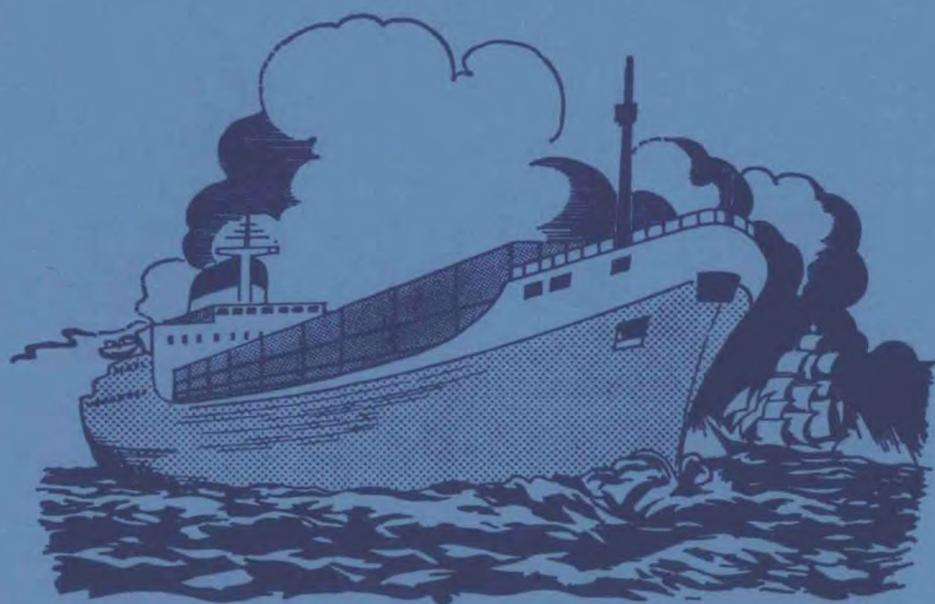


Met. O. 963

The Marine Observer

*A quarterly journal of Maritime
Meteorology*



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THE MARINE OBSERVER

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DIVISION OF THE METEOROLOGICAL OFFICE

VOL. LIV

No. 285

JULY 1984

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*Letters to the Editor, and books for review, should be sent to the Editor 'The Marine Observer',
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EXCELLENT AWARDS 1983

It is 60 years since the first Excellent Awards list was published in the July 1924 edition of *The Marine Observer*, and we have pleasure in congratulating those Masters, Principal Observing Officers and Radio Officers who have earned Excellent Awards for the year ended 31 December 1983.

Of the 1221 meteorological logbooks received at Bracknell from ships of the United Kingdom Voluntary Observing Fleet during the 12 month period, certain were assessed to be of the quality to merit receipt of an Excellent Award. Names of the Officers to receive such awards are listed in the pages following. The master mariners who perform the assessments must take into account the varying levels of difficulty and opportunity experienced in the diverse types of ship committed to this vital work in many trades; they realize that a cross-channel ferry cannot be expected to produce the same consistent standards and frequency of observation as a container ship on liner service. We must not omit to offer our commiserations to the many observers and radio operators who came near to receiving awards, and exhort them to continue their valuable voluntary efforts—reward may be theirs next year.

The following ships submitted the six logbooks assessed as being of the highest standard in the year:

1. m.v. *British Ranger* (B.P. Shipping Ltd), Captain R. Towell.
2. m.v. *Lincolnbrook* (F. T. Everard & Sons Ltd), Captain R. G. Davis.
3. m.v. *ACT 7* (Blue Star Ship Management Ltd), Captain D. M. McPhail.
4. m.v. *Benledi* (Ben Line Steamers Ltd), Captain O. Henderson.
5. m.v. *Encounter Bay* (Overseas Containers Ltd), Captain T. L. Watson.
6. m.v. *Lackenby* (Ropner Ship Management Ltd), Captain M. B. Bradley.

Photographs of the top three ships appear opposite page 108. We congratulate Captain McPhail on his personal achievement of gaining Excellent Awards for several consecutive years, and the Officers of m.v. *ACT 7* for maintaining such high standards that their ship has appeared in the short list for the third year running.

It appears relevant to mention here that high quality excerpts from 1983 meteorological logbook entries were displayed on the Marine Division's stand at the Shipcare & Safety at Sea Exhibition held at the Novotel (formerly Cunard International Hotel), Hammersmith, in March 1984 (see photographs between pages 120 and 121). Samples of Principal Observing Officers' work were reproduced at the exhibition, including additional remarks pages compiled by Mr H. J. Conlon aboard m.v. *British Ranger*, some superb seabird drawings from Mr P. G. Powell of m.v. *Lincolnbrook* and observations pages by Miss Wendy Winter when she was serving aboard m.v. *Tolaga Bay* with Captain G. C. Barrett. Miss Winter was the Principal Observing Officer of ship No. 5 listed above, and also has the distinction of being named in six meteorological logbooks assessed as Excellent in the past 2 years.

Names of Officers serving in MARID ships, which take and transmit sea temperatures only on short sea passages, who have qualified for awards, are listed on page 107.

Recipients of Awards will be individually notified by letter and requested to supply a return address. Masters and Officers who see their names listed here, or in house journals, are requested to write direct to Bracknell as soon as convenient, stating addresses to which their awards may be sent.

Philip's University Atlas is the initial Award this year, the second *Cassell's English Dictionary* and the third *To the Ends of the Earth* by Ranulph Fiennes.

J. F. T. H.

EXCELLENT AWARDS (Year ended 31 December 1983)

CAPTAIN	COMPANY	CAPTAIN	COMPANY
J. K. Allison	Bibby Line Ltd	J. P. Frewer	PAL Shipping Services Ltd
A. H. Aston	Overseas Containers Ltd	A. L. G. Gosset	Sir Wm Reardon Smith & Sons Ltd
G. C. Barrett	Overseas Containers Ltd	C. W. Gowen	Cayzer, Irvine Shipping Ltd
I. Y. Batley	P. & O. Lines Ltd	D. Graham	Ocean Fleets Ltd
F. G. Bevis	P. & O. Lines Ltd	E. H. Gregson	Furness Withy (Shipping) Ltd
R. G. Bland	Overseas Containers Ltd	I. D. Grigor	Esso Petroleum Co. Ltd
A. F. Bonehill	Townsend Car Ferries Ltd	R. S. Grono	Adventure Under Sail
M. B. Bradley	Ropner Management Ltd	J. A. Hagger	PAL Shipping Services Ltd
K. Bramley	Shell Tankers (U.K.) Ltd	D. P. Hawkins	Cardline Shipping Ltd
R. Brinkworth	Overseas Containers Ltd	O. Henderson	Ben Line Steamers Ltd
N. D. Brookes	B.P. Shipping Ltd	G. Hepple ..	P. & O. Lines Ltd
D. G. Brown	Overseas Containers Ltd	M. J. Heron	Overseas Containers Ltd
L. J. Brown	Cunard Shipping Services Ltd	R. Higgins ..	B.P. Shipping Ltd
R. Brownbill	Blue Star Management Ltd	M. A. Hill ..	P. & O. Lines Ltd
P. S. Bytheway	Bibby Line Ltd	C. M. G. Hunter	United Baltic Corp. Ltd
J. B. Caley ..	Cayzer Irvine Shipping Ltd	J. H. Hutson	Overseas Containers Ltd
W. C. Carruthers	Overseas Containers Ltd	G. D. Johnson	Ocean Fleets Ltd
A. J. Chivers	Blue Star Management Ltd	T. F. Jones	Ropner Management Ltd
J. G. Clark ..	P. & O. Lines Ltd	C. C. Jorgensen	Esso Petroleum Co. Ltd
J. O. Clark ..	London & Overseas Freighters P.L.C.	S. J. Lawrence	British Antarctic Survey
J. D. Cooper	Bolton Maritime Management Ltd	J. Lilley ..	British United Trawlers Ltd
J. Cosker ...	Overseas Containers Ltd	D. R. Llewellyn	Furness Withy (Shipping) Ltd
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D. J. Edmans	Cable & Wireless Ltd	W. A. Murison	Overseas Containers Ltd
C. R. Elliott	British Antarctic Survey	F. Myers ..	British United Trawlers Ltd
H. Evans ..	Cunard Shipping Services Ltd	T. S. Nurcombe	London & Overseas Freighters P.L.C.
A. J. Fee ..	Overseas Containers Ltd	K. J. Owen	Overseas Containers Ltd
J. L. Fram ...	Maersk Co. Ltd	A. J. Palmer	Overseas Containers Ltd
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Excellent Awards (contd)

CAPTAIN	COMPANY	CAPTAIN	COMPANY
E. M. S. Phelps	British Antarctic Survey	A. D. Terras	Cayzer, Irvine Shipping Co. Ltd
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A. A. Railton	Overseas Containers Ltd	J. S. Thorpe	Overseas Containers Ltd
J. G. Rosie	Cunard Shipping Services Ltd	D. Tobin	B.P. Shipping Ltd
R. P. Royan	Overseas Containers Ltd	R. Towell	B.P. Shipping Ltd
T. D. Scott	Bank Line Ltd	C. Walker	P. & O. Lines Ltd
R. M. Simpson	Ocean Fleets Ltd	A. J. Washbourne	Esso Petroleum Co. Ltd
J. F. Sole	Offshore Marine Ltd	T. L. Watson	Overseas Containers Ltd
E. D. Somes	Ocean Fleets Ltd	J. W. Welch	Overseas Containers Ltd
J. R. Stephens	C. M. Willie & Co (Shipping) Ltd	J. H. B. Weston	P. & O. Lines Ltd
D. Steward	Canadian Pacific Steamships Ltd	P. J. Wright	London & Overseas Freighters P.L.C.
W. R. Strevens	Furness Withy (Shipping) Ltd	G. Young	Stephenson Clarke Shipping Ltd
A. Sugden	P. & O. Lines Ltd		

PRINCIPAL OBSERVING OFFICER	COMPANY	PRINCIPAL OBSERVING OFFICER	COMPANY
M. J. Aldred	B.P. Shipping Ltd	N. A. Jardine	Overseas Containers Ltd
R. D. Anderson	Overseas Containers Ltd	P. Johnson	Overseas Containers Ltd
D. Bailey	Gardline Shipping Ltd	R. Law	Esso Petroleum Co. Ltd
S. Barraclough	Overseas Containers Ltd	R. A. A. Lees	B.P. Shipping Ltd
P. G. Bascombe	Bolton Maritime Management Ltd	A. R. Louch	Natural Environment Research Council
P. M. Bates	Ropner Management Ltd	C. McKay	Shell Tankers (U.K.) Ltd
C. J. Batty	Cayzer, Irvine Shipping Ltd	P. McNeill	Stephenson Clarke Shipping Ltd
S. B. Beal	P. & O. Lines Ltd	R. D. McNeill	Overseas Containers Ltd
D. L. Beveridge	Dept of Agriculture & Fisheries for Scotland	T. W. Mitchell	Furness Withy (Shipping) Ltd
M. C. Blake	London & Overseas Freighters P.L.C.	P. L. Morley	P. & O. Lines Ltd
P. Borley	C. M. Willie & Co (Shipping) Ltd	R. A. A. Morrison	Blue Star Management Ltd
D. N. Bridgens	P. & O. Lines Ltd	R. C. Moss	Esso Petroleum Co. Ltd
M. P. Brooks	Furness Withy (Shipping) Ltd	J. A. Norman	Maersk Co. Ltd

P. J. Brown	Blue Star Management Ltd	S. C. O'Callaghan	Townsend Car Ferries Ltd
C. G. Buckley	F. T. Everard & Sons Ltd	K. J. Odams	Overseas Containers Ltd
K. T. Cederholm	London & Overseas Freighters P.L.C.	C. J. Petty ..	Overseas Containers Ltd
I. M. Chadney	Overseas Containers Ltd.	M. J. Pinder	Salen U.K. Ship Management Ltd
I. Chadwick	Furness Withy (Shipping) Ltd	H. G. Pollard	P. & O. Lines Ltd
B. A. Chapman	Ministry of Agriculture, Fisheries & Food	P. T. Powell	F. T. Everard & Sons Ltd
C. A. Clague	Esso Petroleum Co. Ltd	S. T. A. Read	Overseas Containers Ltd
R. D. Clark	Cunard Shipping Services Ltd	J. D. Reid ..	B.P. Shipping Ltd
H. J. Conlon	B.P. Shipping Ltd	D. G. Robbie	Blue Star Management Ltd
A. G. Counsell	P. & O. Lines Ltd	R. J. Ross ..	Townsend Car Ferries Ltd
A. T. Cross	B.P. Shipping Ltd	N. Sheard ..	Offshore Marine Ltd
D. L. Culton	B.P. Shipping Ltd	I. Shillito ..	Cayzer, Irvine Shipping Ltd
M. Daniels ..	Blue Star Management Ltd	J. Y. Simpson	Shell Tankers (U.K.) Ltd
J. Davies ..	Bank Line Ltd	D. C. Slack	Overseas Containers Ltd
J. Y. Davies	James Fisher & Sons Public Ltd	K. W. Smith	Overseas Containers Ltd
R. P. Dewsnap	Furness Withy (Shipping) Ltd	R. Spall* ..	British United Trawlers Ltd
G. M. Douglas	London & Overseas Freighters P.L.C.	R. Stewart ..	Canadian Pacific Steamships Ltd
P. A. Evans	Cunard Shipping Services Ltd	G. Swallow*	British United Trawlers Ltd
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M. Forder ..	Esso Petroleum Co. Ltd	J. C. Theaker	Bolton Maritime Management Ltd
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P. R. Gray ..	PAL Shipping Services Ltd	J. M. Torkington	Overseas Containers Ltd
G. Griffiths	Ocean Fleets Ltd	D. W. Torr	United Baltic Corp. Ltd
R. M. Gunn	P. & O. Lines Ltd	R. Wade* ..	British Antarctic Survey
D. S. Hardie	Ben Line Steamers Ltd	S. L. J. Walker	Ben Line Steamers Ltd
D. L. Haynes	Overseas Containers Ltd	A. J. Wallace	Bibby Line Ltd
I. M. Hill ..	Overseas Containers Ltd	R. B. Webb	Blue Star Management Ltd
J. R. Hollamby	Furness Withy (Shipping) Ltd	M. J. West ..	Sir Wm Reardon Smith & Sons Ltd
S. J. Hollows	Ocean Fleets Ltd	C. D. Whittemore	Bank Line Ltd
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G. J. Hoodless	Bank Line Ltd	W. M. Winter	PAL Shipping Services Ltd
M. Hooson ..	Offshore Marine Ltd	P. S. D. Worrall	Overseas Containers Ltd
S. V. Horne	Overseas Containers Ltd	C. J. Yarrow	Cable & Wireless Ltd
P. E. Hughes	Blue Star Management Ltd		Blue Star Management Ltd
M. S. Hume	Bibby Line Ltd		

Excellent Awards (contd)

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D. K. Alcock	Overseas Containers Ltd	N. W. Harrison	P. & O. Lines Ltd
I. F. Alexander	London & Overseas Freighters P.L.C.	R. Hart**	F. T. Everard & Sons Ltd
N. A. Allison	PAL Shipping Services Ltd	S. C. Horne**	Townsend Car Ferries Ltd
H. P. Anderson	United Baltic Corp. Ltd	A. D. Hutchinson	Overseas Containers Ltd
R. J. Ashworth	Ocean Fleets Ltd	W. Kay	Overseas Containers Ltd
M. P. Atherton	Overseas Containers Ltd	D. A. Kelsall	Overseas Containers Ltd
G. Barnes	Furness Withy (Shipping) Ltd	G. C. Kemp	Overseas Containers Ltd
R. P. Bate	Overseas Containers Ltd	G. F. Lee	Ministry of Agriculture, Fisheries & Food
M. L. Bechley**	Townsend Car Ferries Ltd	D. Leeson	Marconi International Marine Co. Ltd
A. M. Begg	S.T. & C. International Marine Ltd	P. A. Lloyd**	Sealink (U.K.) Ltd
W. M. Blacklaws	P. & O. Lines Ltd	A. D. MacGillivray	P. & O. Lines Ltd
R. C. Boyle	P. & O. Lines Ltd	W. B. McIntosh	Overseas Containers Ltd
R. D. Bragg	B.P. Shipping Ltd	R. McSorley	Ocean Fleets Ltd
S. J. Braithwaite	Overseas Containers Ltd	M. Malkin	Salen U.K. Ship Management Ltd
J. Bridge	Overseas Containers Ltd	E. Marks	P. & O. Lines Ltd
H. Brookfield	Bibby Containers Ltd	T. J. Martel	Cayzer, Irvine Shipping Ltd
K. Brown	S.T. & C. International Marine Ltd	M. Morgan	S.T. & C. International Marine Ltd
M. Brown	Overseas Containers Ltd	B. A. Mullan	Overseas Containers Ltd
W. D. Brown	S.T. & C. International Marine Ltd	H. F. Murphy	P. & O. Lines Ltd
A. E. Burbidge	Cunard Shipping Services Ltd	C. G. Nolan	Esso Petroleum Co. Ltd
R. A. Cairns	Ropner Management Ltd	H. M. O'Gorman	British Antarctic Survey
A. Campbell	Cayzer Irvine Shipping Ltd	P. J. C. O'Neill	London & Overseas Freighters P.L.C.
C. S. Carver	Cunard Shipping Services Ltd	M. S. Odell**	Offshore Marine Ltd
D. Casey	Furness Withy (Shipping) Ltd	G. M. Pepper**	Furness Withy (Shipping) Ltd
R. D. Cause	Overseas Containers Ltd	C. J. Redman**	Furness Withy (Shipping) Ltd
A. C. Cook	Shell Tankers (U.K.) Ltd	D. E. Reilly	Radio & Electronic Services Ltd
R. L. Crook**	F. T. Everard & Sons Ltd	D. A. Rice	P. & O. Lines Ltd
V. F. Cullen	Sir Wm Reardon Smith & Sons Ltd	S. A. Ringer	S.T. & C. International Marine Ltd
B. T. Davis	P. & O. Lines Ltd	R. P. Robertson	Shell Tankers (U.K.) Ltd
C. D. Dewis	Ocean Fleets Ltd	V. Salkeld	B.P. Shipping Ltd
P. M. Dolphin	Overseas Containers Ltd	G. Shaw	S.T. & C. International Marine Ltd
J. N. Duckworth	Cayzer, Irvine Shipping Ltd	R. J. Sheldon**	Dept. of Agriculture & Fisheries for Scotland
R. S. Duff	Esso Petroleum Co. Ltd	G. J. Simpson	Bibby Line Ltd
P. W. Ferguson	P. & O. Lines Ltd	I. Smallshaw**	Furness Withy (Shipping) Ltd
D. S. Flemington	Overseas Containers Ltd	N. R. Smirk	S.T. & C. International Marine Ltd

I. R. Forster	..	Marconi International Marine Co. Ltd	T. J. Smith	..	Overseas Containers Ltd
M. R. Freeman**	..	Townsend Car Ferries Ltd	T. A. Strickland	..	B.P. Shipping Ltd
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K. J. Gaughan	..	Overseas Containers Ltd	C. K. Thornalley	..	Overseas Containers Ltd
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A. J. Gordon	..	Stephenson Clarke Shipping Ltd	R. E. Tucker	..	S. T. & C. International Marine Ltd
V. C. I. Gosling	..	Canadian Pacific Steamships Ltd	D. J. Turrill**	..	North British Shipping Ltd
O. H. W. Grimsdall	..	Kelvin Hughes Ltd	G. K. Valentine	..	Bibby Line Ltd
P. J. Grist	..	PAL Shipping Services Ltd	C. P. Ward	..	Radio & Electronic Services Ltd
R. F. Hagley**	..	Natural Environment Research Council	K. G. Watkinson	..	Electro-Nav. International Ltd
R. B. Hall	..	S. T. & C. International Marine Ltd	J. Whatrupp	..	Marconi International Marine Co. Ltd
M. R. Hannan	..	Cayzer, Irvine Shipping Ltd			

'MARID' SHIPS†

CAPTAIN	PRINCIPAL OBSERVING OFFICER	RADIO OFFICER	COMPANY
A. Bourn	L. Gibb	H. Chesters	Stephenson Clarke Shipping Ltd
G. Mount	S. Floate	P. S. J. Kelly	Rowbotham Tankships Ltd
P. O'Connor	K. Bosanquet	I. Wilson	Esso Petroleum Co. Ltd

* Also Radio Officer.

** Deck Officer

† Vessels recruited for the purpose of observing and transmitting sea temperatures with non-instrumental observations in the North Sea.



July, August, September

The Marine Observers' Log is a quarterly selection of observations of interest and value. The observations are derived from the logbooks of marine observers and from individual manuscripts. Responsibility for each observation rests with the contributor.

Observing officers are reminded that preserved samples of discoloured water, luminescent water, etc. considerably enhance the value of such an observation. Port Meteorological Officers in the UK will supply instructions on how to preserve and pack such samples on request.

PASSAGE OF TYPHOON 'WAYNE'

Taiwanese waters

m.v. *Starman Anglia*. Captain P. W. Hutchinson. At Kao-Hsiung. Observers: the Master, Mr M. Haines, Chief Officer and Mr M. Daniels, 2nd Officer.

24–25 July 1983. The development of this typhoon was monitored through weather reports received via Kao-Hsiung Radio from its origin as an area of weak low pressure on 19 July. At 0000 GMT on this day a 'low' of 1007 mb was reported in position 8°N, 146°E. At this time the vessel was anchored 1 n. mile west of the northern entrance to the port, in position 22° 37'N, 120° 14'E. In the following account, which is extracted from the deck and meteorological logs, all times are in GMT.

21/0000: Low 1007 mb reported 9°N, 142°E.

22/0000: Tropical depression reported 1005 mb, 13°N, 136°E, moving west slowly.

23/0000: Tropical storm warning: 988 mb, 16·8°N, 130·3°E, moving WNW at 11 knots, maximum winds 50 knots, gusting to 60 knots.

24/0000: Typhoon warning: 'Wayne' (8304), 950 mb, 19·3°N, 124·6°E, moving WNW at 13 knots, maximum winds 90 knots, gusting to 110 knots. Closest approach on this course anticipated at 60 n. mile.

24/0330: Vessel weighed anchor and proceeded inwards to shelter in Kao-Hsiung harbour.

24/0530: Vessel secured to No. 32 Buoy aft, port and starboard anchors each with 4 shackles in water.

24/0600: Typhoon Wayne reported 920 mb, 20·0°N, 123·0°E, moving WNW at 12 knots, maximum winds 125 knots, gusting to 150 knots.

24/0800: Wind NNW, force 3–4, barometric pressure 1005·0 mb, dry bulb 31·3 °C, wet bulb 26·6, pressure change in last 3 hours Code 6, 2·0 mb, sky 8/8 altocumulus.

24/0900: Typhoon reported (Hong Kong Radio) 922 mb, 20·3°N, 122·3°E, moving WNW at 18 knots, maximum winds 110 knots.

24/1200: Wind N'w, force 5, pressure 1003·0 mb, dry bulb 30·4 °C, wet bulb 26·4, 8/8 cloud.

24/1515: Slight rain.



British Ranger (B.P. Shipping Ltd) Captain R. Towell

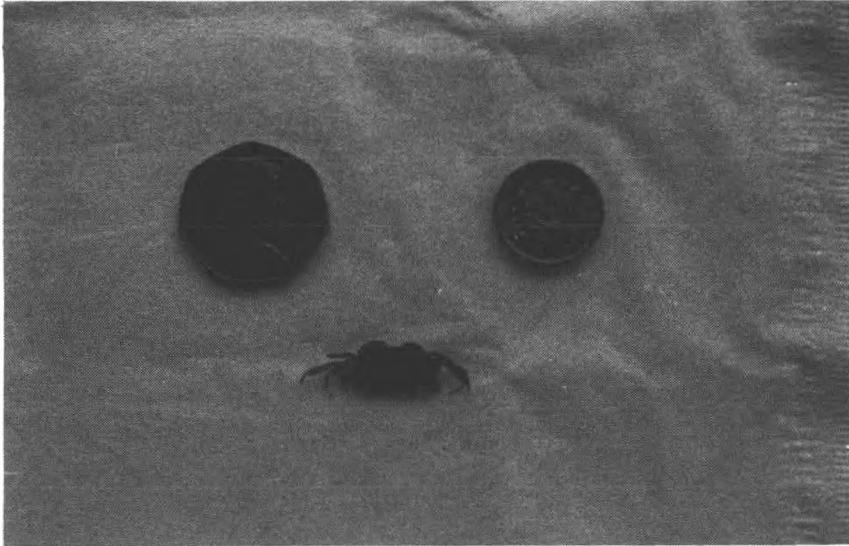


Lincolnbrook (F. T. Everard & Sons Ltd) Captain R. G. Davis

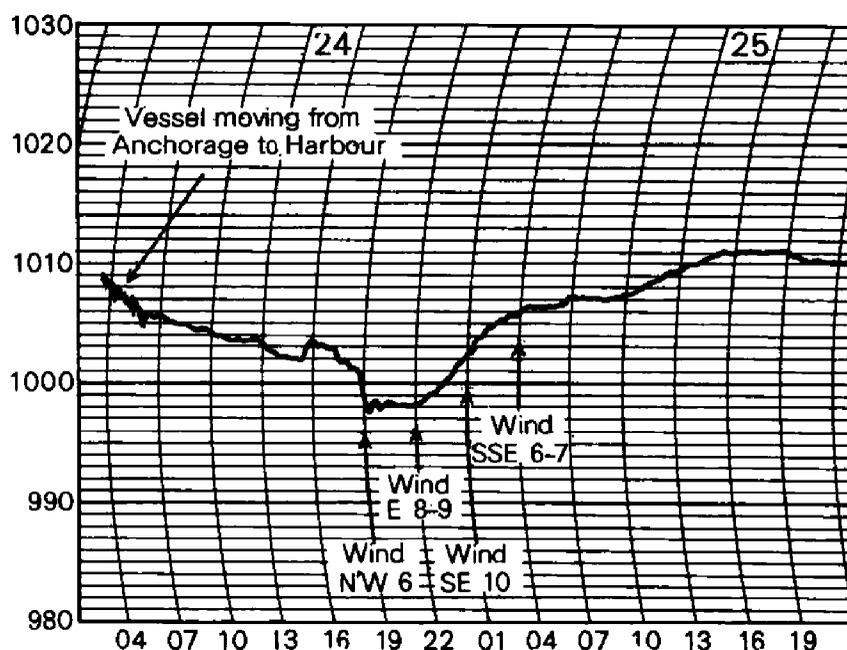


ACT7 (Blue Star Ship Management Ltd) Captain D. M. McPhail

THE THREE SHIPS WHICH GAINED THE HIGHEST MARKINGS FOR THEIR METEOROLOGICAL LOGBOOKS DURING THE YEAR 1983 (see page 102).



Crab and Butterfly found on board m.v. *Cardigan Bay* (see pages 119 and 123)



24/1600: Wind calm, pressure 1002.6 mb, dry bulb 28.0 °C, wet bulb 26.9, 8/8 cloud, pressure change in last 3 hours Code 3, 0.1 mb.

24/1600-1700: Wind variable.

24/1700: Continuous moderate rain, wind N'W, force 3.

24/1830: Intermittent slight rain, wind NNW, force 5.

24/1900: Slight-moderate rain, wind gusting to N'W, force 6.

24/2000: Wind NNE, force 4, pressure 999.1 mb, dry bulb 27.5 °C, wet bulb 25.4, pressure change in last 3 hours Code 6, 3.0 mb.

24/2100: Moderate-heavy rain, wind NE, force 6, pressure 998.5 mb, Typhoon reported (Hong Kong Radio) 945 mb, 21.8°N, 119.9°E, moving NW at 14 knots.

24/2130: Wind veered to E, force 6-7.

24/2200: Wind E, force 8-9, pressure 998.5 mb.

24/2215: Wind E, force 9-10.

24/2230: Rain ceased.

24/2245: Wind veered to SE, force 9-10.

24/2300: Wind SE, force 9-10, pressure 1000.0 mb.

25/0000: Wind SE's, force 10, pressure 1001.4 mb, dry bulb 26.0 °C, wet bulb 24.0. Typhoon now reported (Kao-Hsiung Radio) 950 mb, 22.3°N, 119.2°E, maximum winds 95 knots.

25/0100: Heavy rain, wind SE, force 10, pressure 1003.2 mb.

25/0300: Drizzle, wind SE, force 8-9, pressure 1006.0 mb.

25/0400: Slight rain, wind SSE, force 6-7, pressure 1006.9 mb.

25/0600: Wind S'E, force 5-6, pressure 1007.5 mb, dry bulb 28.4 °C, wet bulb 26.6.

By 0800 on the 25th the wind had dropped to force 3, with rain ceasing and skies clearing. By 2100 GMT on this day Typhoon Wayne had been downgraded to a tropical storm in position 25.6°N, 115.2°E. The closest approach was estimated to be 51 n. mile, bearing 218°(T), at 2200 GMT on the 24th.

Position of ship 24-25 July: 22° 36' N, 120° 16' E.

PASSAGE OF DEPRESSION

North Atlantic Ocean

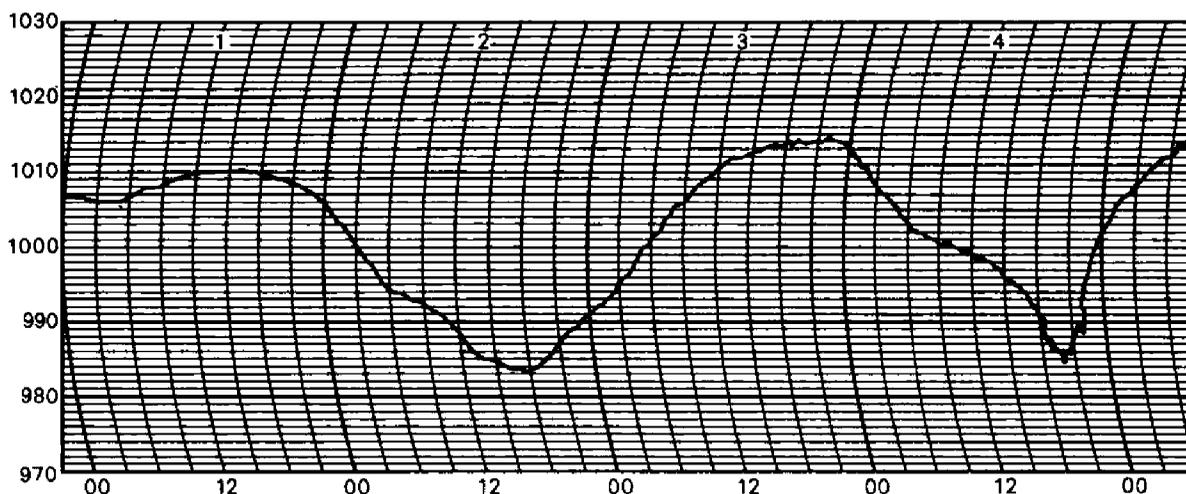
m.v. *Northia*. Captain B. Cosgrove. Tetney Terminal to Milford Haven via Fulmar Terminal. Observer: Mr M. M. Murphy, Navigating Cadet.

29 August–5 September 1983. During this period a depression developed over the North Atlantic and moved NE towards the United Kingdom. The following extracts are taken from the deck and meteorological logs:

29 August. Air temperature 15 °C, sea temperature 13°. Barometric pressure 1028 mb. Wind wsw, force 2. Cloud cover 70 per cent. Visibility 10–30 n. mile. Sea slight with low swell.

30 August. Wind speed increased to force 6. Air temperature 18 °C, sea temperature 14°. Barometric pressure 1012 mb. Wind ssw, force 6. Cloud cover 70 per cent. Visibility 10–30 n. mile. Sea rough with moderate swell.

31 August. Wind speed dropped suddenly to force 3. Air temperature 16 °C, sea temperature 13°. Cloud cover 50–60 per cent, including haze. Visibility 5–10 n. mile. Sea 0.5–2.0 ft in height, with low swell.



1 September. At Milford Haven. 8 a.m. Wind speed remains w, force 3. Air temperature 18 °C, sea temperature 16°. Cloud cover 50 per cent. Visibility 10–30 n. mile. Sea 0.5–2.0 ft in height.

2 September. At Milford Haven. Wind speed increased to w, force 6–7. (Depression centre 968 mb 180 n. mile west of UK). Overcast sky with squalls and rain. Visibility 5–7 n. mile. Sea rough, no swell. Wind increased to sw, force 8 at 1600 GMT and to sw, force 9 at 2000 GMT.

3 September. At Milford Haven. (Depression centre 978 mb centred over north-west England). Overcast sky with squalls and rain. Visibility less than 5 n. mile. Sea very rough, no swell. Wind speed and direction 0100–0300=w, force 10; 0300–0500=w, force 9; 0500–0700=w, force 8; 0700–0900=w, force 9; 0900–1000=wnw, force 8; 1000–1400=wnw, force 7; 1400–1600=w, force 6; 1600–1700=w, force 7; 1700–1800=w, force 6.

4 September. (Depression centre 984 mb 360 n. mile north of Scotland). Air temperature 15 °C, sea temperature 14°. Wind SE, force 5. 100 per cent cloud cover with mist. Visibility 5–10 n. mile. Sea moderate with low swell. (Second depression reported to be developing over North Atlantic and heading NE towards UK coast).

Position of ship at noon on 29 August: 56° 55' N, 01° 01' E.

Position of ship at noon on 30 August: 58° 28' N, 05° 44' W.

Position of ship at noon on 31 August: 53° 42' N, 05° 28' W.

Position of ship at noon on 1, 2 and 3 September: 51° 43' N, 05° 02' W.

Position of ship at noon on 4 September: 54° 42' N, 05° 13' W.

PASSAGE OF DEPRESSION

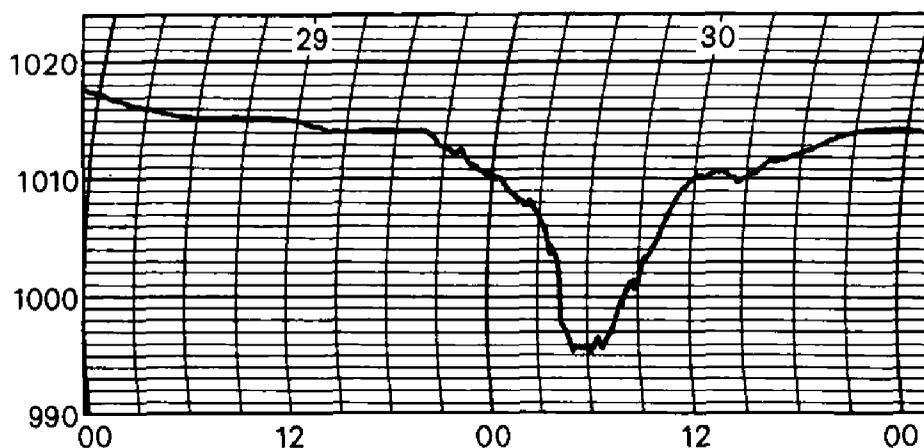
Mediterranean Sea

m.v. *British Dart*. Captain D. A. White. Fos to Rijeka via Bonifacio Strait. Observers: the Master, Mr W. J. Daniel, 2nd Officer and Cadet A. Tyson.

29–30 September 1983. At 1900 GMT on the 29th the vessel cleared Fos Departure Channel, in ballast, on a course of $116^{\circ}(T)$ and at a speed of 10 knots. The weather was fine, the wind light and variable, there was no cloud, and the sea was calm. The barometric pressure was 1014.6 mb, steady.

By 2100 GMT the pressure was starting to fall, the wind speed increasing steadily from the NE, and the sea was becoming rough. There were 5 oktas of stratus fractus cloud.

At 2300 GMT engine revolutions were reduced owing to the vessel's pounding. There was a swell from the SW, approximately 5 m in height and seas were rough to very rough. The wind was NE'E, force 8 and the pressure was falling steadily. The vessel was rolling and pitching heavily, spraying overall. Frequent rain showers were encountered until by 0300 the rain was continuous and spray was beginning to affect visibility. The pressure was 1007.4 mb, falling quickly, and the wind NE, force 8. The swell was s'ly, 5 m, and the vessel was shipping seas on deck.



At 0330 GMT the clear outline of the centre of a depression was observed on the radar Plan Position Indicator, bearing $045^{\circ}(T)$ and distance 7 n. mile. A plot established that the depression was moving SE at 10 knots and that the vessel could be expected to pass through the centre at approximately 0430 GMT. The pressure was by now falling rapidly and the wind was NNE, force 10, and backing steadily.

At 0427 GMT, with the pressure at 997.4 mb, the wind suddenly dropped to about 8 knots, direction variable, and the rain ceased. The sea was heavy and confused, and patches of clear sky were visible through the cumulus fractus cloud. The pressure continued to fall.

Suddenly, at 0500 GMT, the wind speed increased to approximately 40 knots from the east in the space of about one minute, with heavy rain. The pressure at this time was 995.5 mb, the lowest pressure recorded. The wind continued to veer and increase, until at 0700 GMT it was from the south, force 10, and rain was diminishing to showers. Pressure was beginning to rise unsteadily and stood at 997.4 mb. The outline of the depression was lost on the P.P.I. at this time, 12 n. mile to the SW.

By 1000 GMT the wind was sw'w, force 8 and the pressure 1004.6 mb, rising quickly. The sea was rough with swell sw'w and there were frequent rain showers. As the vessel entered the Bonifacio Strait the weather improved dramatically and continued to do so, being fine for the remainder of the voyage.

The weather report from Rome Radio at 0600 on the 30th gave wind SE, force 3; sea slight; visibility good for this area.

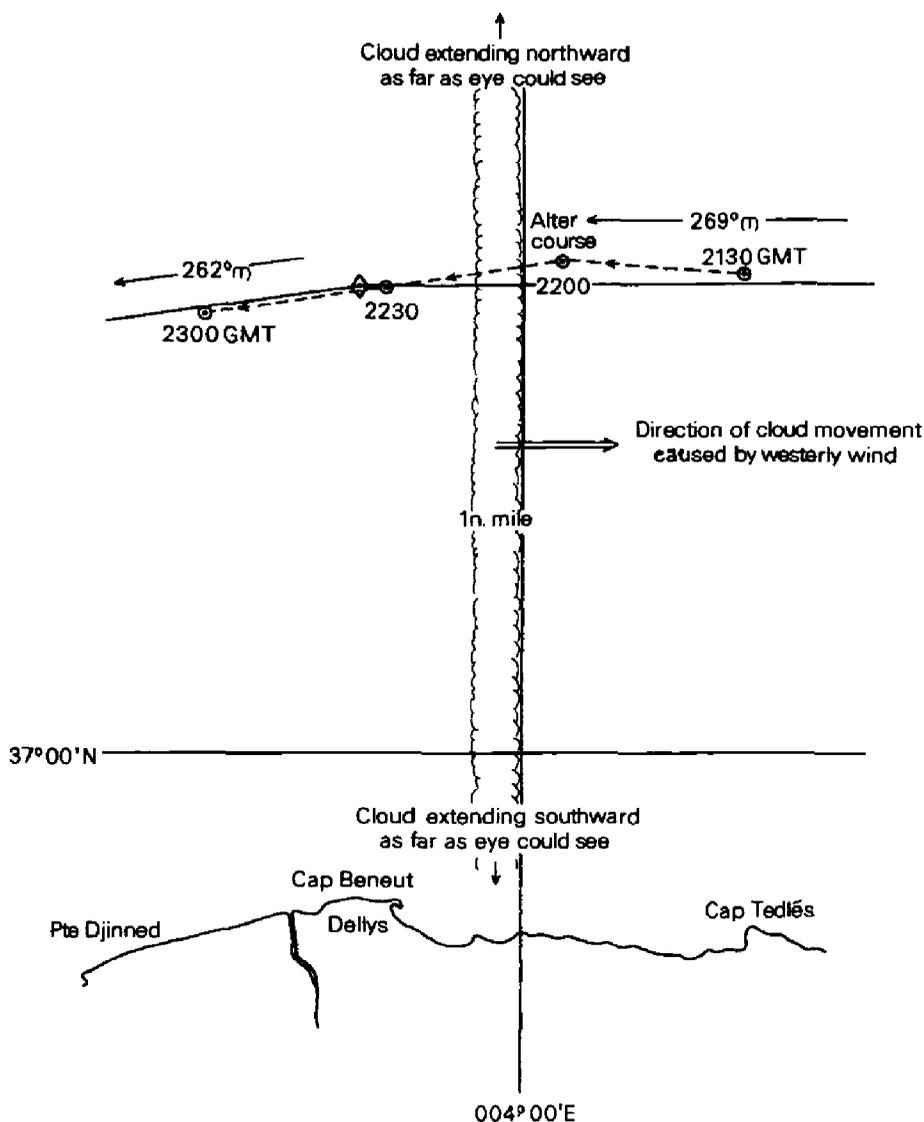
Position of ship at 0430 GMT on 30 September: 42° 07' N, 07° 19' E.

PASSAGE OF LINE-SQUALL

Western Mediterranean Sea

ss. *Pollenger*. Captain J. A. Smeeton. Skikda to Boston (Mass.). Observer: Mr T. W. Ferguson, 3rd Officer.

19 July 1983. At 2200 GMT a long line of medium type cumulus cloud was sighted ahead of the vessel as she altered course from 269°(T) to 262°(T). The cloud stretched out uninterruptedly both north and south of the vessel as far as the eye could see. The wind at the time of the alteration of course and for the preceding 4 hours had been from the east, force 2-3. At 2205 GMT the wind suddenly turned through 180° and started gusting force 5-6 from the west. This



change of wind direction lasted for only 5 minutes during which time the line of cloud had reached and passed over the ship. The wind then, just as suddenly, changed back to its original direction and strength, E'ly, force 2-3, as soon as the cloud had passed.

As the cloud passed overhead there were a very few spots of rain, but nothing more. The visibility before the passing of the cloud had been 6-7 n. mile, which was not helped by the moon shining. After the passage of the cloud the visibility improved by another 5-6 n. mile, and shore lights and ships which could not be seen visually before now became visible. No other cloud was to be seen in the sky either before or after the passage of the cloud.

The barometric pressure had been falling slowly on the 8-12 watch from 1018.3 mb at 1900 GMT to 1017.1 mb at 2200 GMT. After the passage of the cloud it suddenly rose to 1019.0 mb and stayed the same up till 2300 GMT. Screen temperatures were 27.3 °C dry bulb and 24.5 wet bulb before the cloud passage, and 26.5 and 24.5 afterwards.

Half an hour after the event the wind again changed and came from the west, force 3; this time it remained from this direction for 15 minutes. At 2255 GMT the first clouds started appearing ahead of the vessel since the cloud passage; they were small cumulus and to a lesser extent medium cumulus also. At 2300 GMT the barometric pressure again began to fall.

Position of ship: 37° 35' N, 4° 00' E.

CURRENT RIP

North Atlantic Ocean

m.v. *Jedforest*. Captain J. M. Huke. Hampton Roads to Rio de Janeiro. Observers: Mr K. Riddick, 2nd Officer, Mr N. R. Foster, 3rd Officer and Mr R. Creasey, Chief Engineer Officer.

9 September 1982, 1500 GMT. At noon, whilst steering a course of 134°(T), the vessel was suddenly set off 10 degrees to port. This appeared to be due to a current rip. Ahead of the ship, parallel rows of alternate rippled water and choppy seas with frequent white water were observed—approximately 1 n. mile apart. The direction of the rows was east-west. The wind was observed to be on the port bow at 3 points, force 2 or 3; however, when entering a stretch of disturbed water, the wind suddenly veered and was observed to be blowing along the direction of the white crests, i.e. 2 points on the starboard bow, force 4 or 5. Each time the vessel entered rough water she would be set off course by up to 10 degrees. A stern view showed the ship's S-shaped wake. The observers could only attribute this to a strong current from the River Amazon being set east by the equatorial counter-current. The sea bucket was dipped several times in the rough water and a consistent reading of 1020.5 was obtained on the hydrometer; this reading, however, did not change when samples of smooth water were obtained. Little detailed information concerning salinity is given in the *South America Pilot*. No discoloration of the sea was noted.

Position of ship: 5° 19' N, 43° 53' W.

RADAR DUCTING PHENOMENA

South China Sea

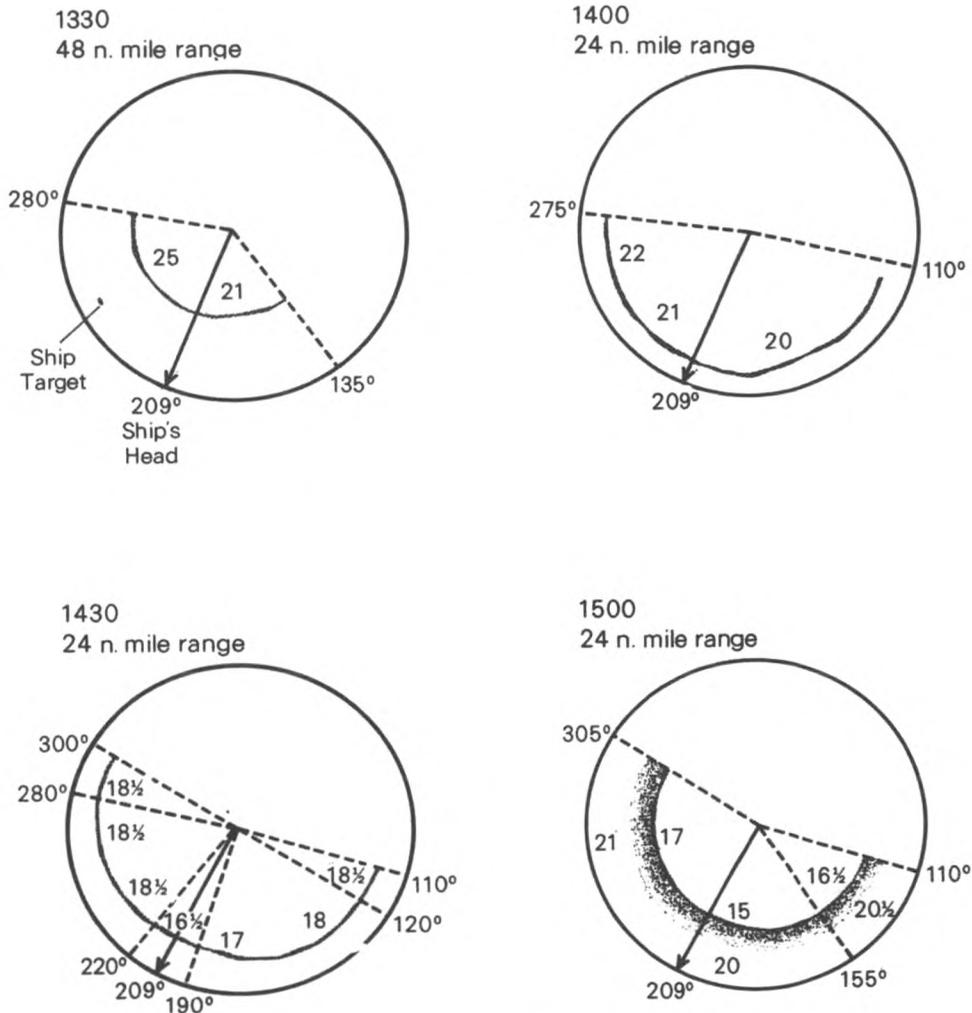
m.v. *Oceanic Crest*. Captain R. P. Bosman. Kawasaki to Port Hedland.
Observers: Mr M. Samus, 2nd Officer and Mr B. W. Watson, 3rd Officer.

23-24 September 1983. In the following account all times are in GMT and all bearings are in degrees true.

At 1330 on the 23rd an echo was observed on the radar screen on the 48 n. mile range. The echo at this time was very faint and had the appearance of a distant land or heavy rain echo. The effect was visible in an arc between 280° and 135° , with poorer definition at the extremities of the arc, and at a range of between 21 and 25 n. mile. The nearest land was approximately 180 n. mile distant.

The strength of the echo was not increased by use of anti-clutter rain control, and this, coupled with the fact that no cloud was observed throughout this period, indicated that the echo was not rain. N.B. The ship target at 40 n. mile (15 n. mile beyond echo) is clearly identified.

At 1400 the echo became stronger, giving better definition, and increased in size of arc (110° to 275°). Only a leading edge to the echo was seen and it had no depth to it. The range had now decreased to 20-22 n. mile, but the rate of decrease did not seem to be uniform throughout the arc.



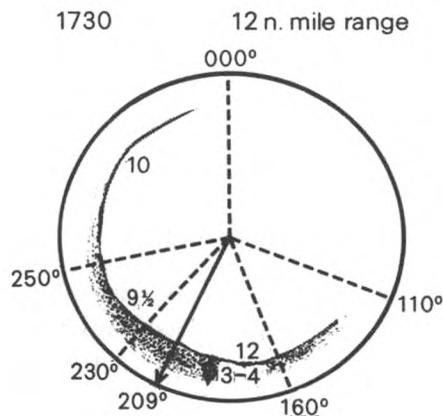
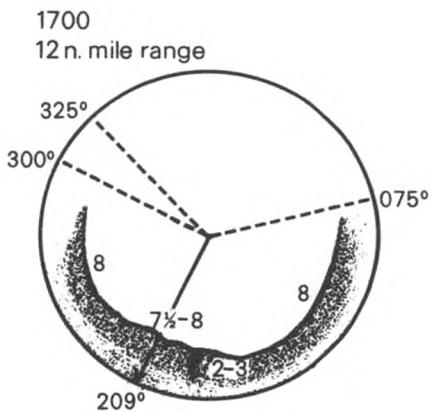
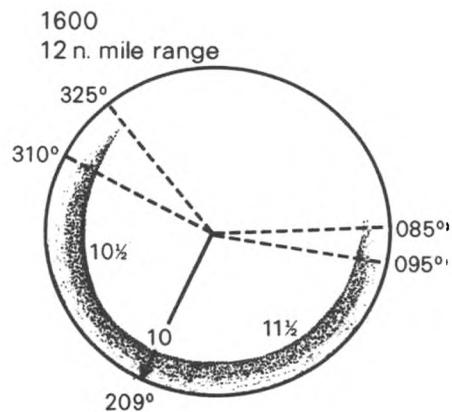
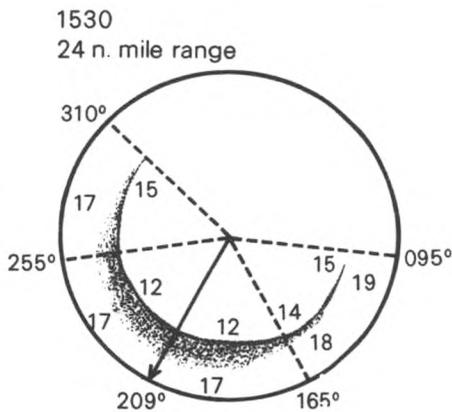
At 1430 the arc was showing a strong leading edge and the size of the arc continued to increase, although it was very faint at its extremities. The range now varied from $16\frac{1}{2}$ n. mile at ship's head to $18\frac{1}{2}$ n. mile at outer edges.

At 1500 the size of arc continued to increase from 110° to 305° , but between 110° and 155° the echo decreased in strength. For the remainder of the arc the leading edge was very strong, and behind it an echo of lesser strength could be observed which was 4 to 5 n. mile in depth. The range of the leading edge varied from 15 n. mile at ship's head to $16\frac{1}{2}$ –17 n. mile at arc extremities.

On the 48 n. mile range Cunningham Island was clearly picked up, bearing $196^\circ \times 45$ n. mile, although the Racon was not to be observed until about 36 n. mile. On previous passages Cunningham Island was not usually identified until around 20 to 24 n. mile distant. The height of scanner being 47.2 m and that of the the Island 30.5 m, the radar range was $14.1 + 12.6 = 26.7$ n. mile.

At 1530 the size of arc continued to increase from 095° to 310° . From 165° to 255° the leading edge was still a very clearly defined echo, but the remainder was fairly weak. The range varied from 12 n. mile at ship's head to 15 n. mile at arc extremities. Behind the leading edge the echo had slightly gained in strength at the ship's head (4 to 5 n. mile depth) but was very weak elsewhere (1–2 n. mile).

At 1600 the size of arc continued to increase (085° to 325°). Strong echos were observed throughout the arc except at the arc extremities, where the echo gradually faded. The range was now $10\frac{1}{2}$ – $11\frac{1}{2}$ n. mile throughout. The depth



had decreased to about 3 n. mile throughout. The shape of the echo seemed to be constantly changing from this point onward, maintaining no uniform shape as before. N.B. VHF contact was made with Port Hedland Control and reception was very clear on all channels. We were informed that no previous reports of abnormal refraction had recently been received.

At 1700 the arc continued to increase (075° to 325°). The range of the leading edge was now $7\frac{1}{2}$ – $8\frac{1}{2}$ n. mile and the depth of echo 2–3 n. mile. At this point the echo was of strongest definition throughout the observation, and at the shortest range, after which time the strength decreased and the range increased.

At 1730 the echo strength had decreased considerably, although the arc to the west had increased to 000° (but was very faint). The depth from 160° to 250° was 3–4 n. mile, the remainder having no depth and only the leading edge having been observed.

From 1730 onwards the size of arc and strength were decreasing and the range increasing; the echo no longer had any depth and only a very weak echo was observed. This continued until 2030 when the echo disappeared at a range of 45 n. mile.

The weather conditions were as follows:

	1330	1500	1700	1900
Barometric Pressure (mb)	1012.8	1012.4	1011.2	1011.5
Dry Bulb ($^{\circ}$ C)	26.3	25.6	25.5	24.5
Wet Bulb ($^{\circ}$ C)	24.8	24.0	23.5	23.5
Dew-point ($^{\circ}$ C)	24.0	23.1	22.5	23.0
Relative Humidity (%)	89	87	80	91
Sea Temperature ($^{\circ}$ C)	27	27	27	27
Wind Direction	S	S	SSW	SSW
Wind Force	3	3	3	3

The skies were clear throughout, no cloud, and visibility 15 n. mile.

The vessel's course and speed throughout: $209^{\circ} \times 13$ knots.

Radar type: Decca R.M. 1266, 3 cm.

Height of Scanner: 47.2 m.

Position of ship at 1330 on 23rd: $16^{\circ} 36' S, 119^{\circ} 12' E$.

Position of ship at 1500 on 23rd: $16^{\circ} 48' S, 119^{\circ} 09' E$.

On the following day, 24 September, the vessel was still on passage from Kawasaki to Port Hedland on a course of $186^{\circ}(T)$ and at a speed of $12\frac{1}{2}$ knots.

At 0300 GMT an echo was observed on the radar screen on the 24 n. mile range. The echo received at this time was not of a strong definition and had the appearance of a distant land echo. The echo could be seen at a range varying between 20 and 22 n. mile and through an arc of 70° (from 130° to 200°).

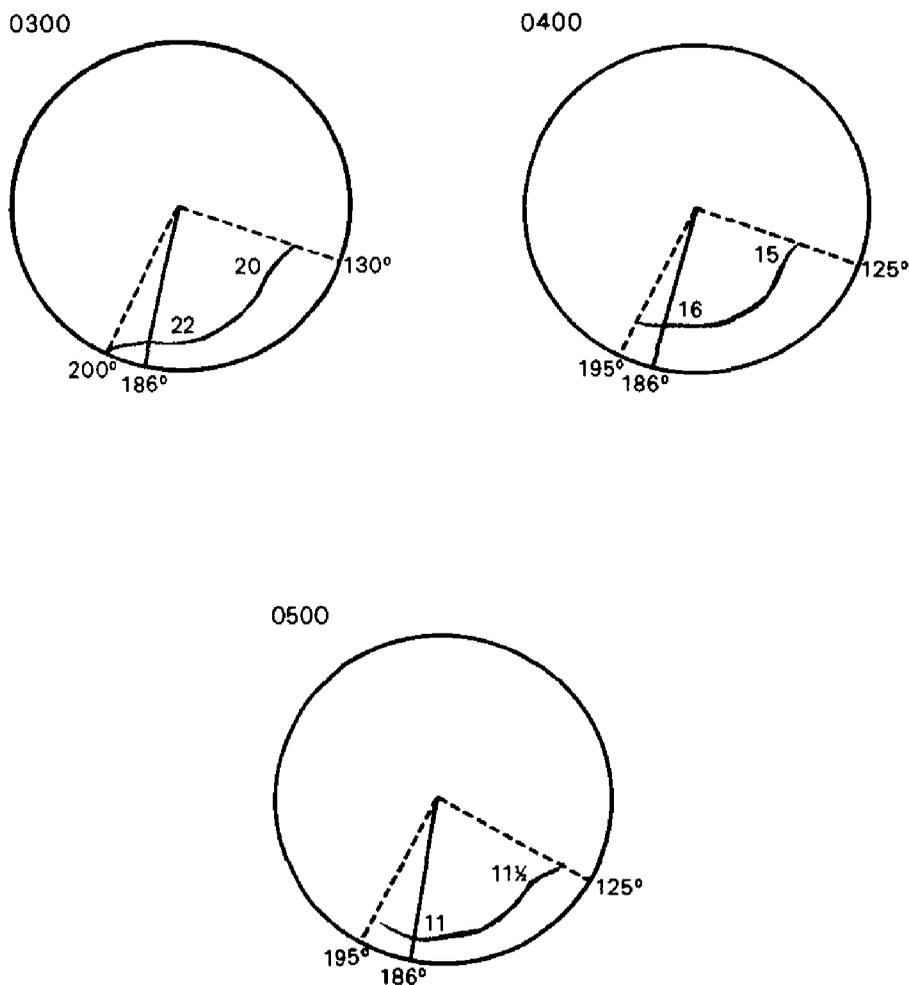
At 0400 GMT the echo became much stronger. The leading edge now had a very good definition to it, although the echo had no depth, as was the case throughout this observation. The size of arc had decreased slightly at the western extremity and increased slightly at the eastern extremity, but throughout the arc the shape of the echo remained constant, even though the range had now decreased to between 15 and 16 n. mile. At this time the echo was at its strongest, after which the echo gradually began to decrease.

By 0500 GMT the echo had weakened somewhat, although the size of arc and the shape had remained constant. The range was now 11– $11\frac{1}{2}$ n. mile. After this time the echo rapidly weakened and disappeared with a minimum range of 11 n. mile at 0530.

Upon inspection of navigational charts of the Australian North-west coast it was clear that the echo observed on the radar screen was of a similar shape to that which one would expect to receive, only on a much larger range scale (perhaps radar with 100 n. mile range). However, this vessel's radar equipment

on previous passages has not usually picked up land on approach to Port Hedland until about 20 n. mile distant, owing to the relatively low lie of the land and lack of prominent features to produce good radar returns.

At 0300 GMT the vessel was approximately 60 n. mile from the coast and it is interesting to note that at this time the range of the echo was 20 n. mile, one-third of the actual distance. This multiple of three remained constant throughout the observation until the echo disappeared at 0530, the echo's range then being 11 n. mile and the actual distance from land approximately 33 n. mile.



A true land echo was received at a distance of 22 n. mile at 0630, although definition was quite poor, and an accurate land fix was not obtained until about 18 n. mile.

The weather conditions were as follows:

	0300	0400	0500
Barometric Pressure (mb)	1011.7	1011.9	1011.8
Dry Bulb (°c)	29.0	30.0	30.0
Wet Bulb (°c)	22.0	22.0	22.0
Dew-point (°c)	18.1	17.5	17.5
Relative Humidity (%)	52	47	47
Sea Temperature (°c)	26	26	26
Wind Direction	WNW	WNW	WNW
Wind Force	3	3	3

The skies were clear throughout, no cloud, and visibility approximately 12 n. mile.

The vessel's course and speed throughout: $186^{\circ} \times 12\frac{1}{2}$ knots.

Position of ship at 0300 on 24th: $19^{\circ} 10'S, 118^{\circ} 30'E$.

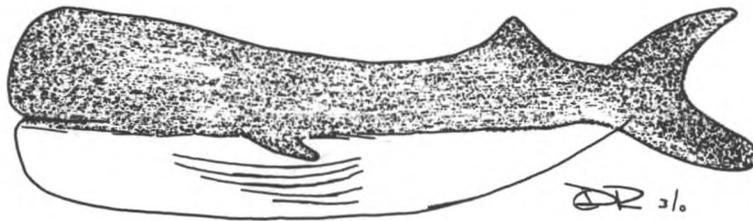
CETACEA

North Atlantic Ocean

m.v. *Dart Americana*. Captain P. Roberts. Le Havre to New York. Observers: Mr C. D. Rossell, 3rd Officer, and other members of the ship's company.

4th July 1983. At 1325 GMT the vessel was proceeding in dense fog, with visibility near zero. An unusual wake was noted around the vessel, and this, together with the slower than expected speed for the r.p.m. led to a check being made forward which revealed that a large whale was impaled on the bow, its tail being visible above the waterline.

At 1330 the vessel started to reduce speed, the animal becoming increasingly visible as the speed dropped. At 1355 with the vessel stopped in the water the engine was put half-speed astern and as the vessel moved astern the whale floated off the bow and quickly sank, apparently dead.



The whale was estimated to be 16–18m in length and had a deep gash of about 30 cm half-way along its body which was bleeding profusely, indicating perhaps that the animal was alive at the time of impact, which was estimated to have been some 8 hours previously, although no impact was felt on the ship.

The exact shape of the animal could not clearly be seen as it was wrapped across the bow, but its back was a blue/grey colour, and its belly a whitish colour with five black stripes longitudinally set back from its head. Towards the tail on its back was a small blue/grey dorsal fin. The animal's head, not clearly visible, was quite rounded in shape. On each side was another small fin, black on top and white on the underside.

Position of ship: $41^{\circ} 40' N, 66^{\circ} 24' W$.

Note. Mr D. A. McBrearty, of the Department of Anatomy, University of Cambridge, comments as follows:

'I would very much like to see a copy of the photographs taken of this animal if and when they are available. It is obviously a large rorqual as indicated by the overall size and the longitudinal "strips" or pleats on the belly. The blue/grey colour of the dorsum, small fin and rounded shape of the head point to the animal being a blue whale (*Balænoptera musculus*), the white underparts are more indicative of other rorquals, namely the fin and possibly the sei whale. However, it may be that in the poor weather conditions what was described as "white" may really have been simply 'light'. This is why a look at any photographs taken at the time could be most useful.'

R.R.S. *Challenger*. Falmouth to Oban. Captain P. H. Warne. Observers: the Master and Mr R. Chamberlain, 3rd Officer.

9 July 1983. Between 1015 and 1025 GMT a school of seven cetaceans was sighted. At first they were thought to be Albino Pilot Whales, but were subsequently identified from Lyall Watson's 'Seaguide to Whales of the World' as being Grey Dolphins (Risso's) approaching maximum size. They were swimming slowly and were on a diverging course from the ship, surfacing twice during the period and being completely submerged for about 3 minutes. The sea was calm and the swell was less than half a metre.

1 September 1983. At 1810 GMT a school of seven adult sperm whales was sighted swimming in a westerly direction and blowing every one or two minutes. The closest point of approach was about 2 cables. The sea was slight, with low swell and the vessel was on a course of $221^{\circ}(T)$ at a speed of 8.3 knots.

Position of ship on 9 July: $55^{\circ} 53' N, 09^{\circ} 13' W$.

Position of ship on 1 September: $60^{\circ} 55' N, 03^{\circ} 19' W$.

Note. Mr McBrearty confirms both these identifications and draws attention to the photograph of Risso's Dolphin which appears opposite page 80 in *The Marine Observer*, **LI**, April 1981.

CRAB

Arabian Sea

m.v. *Cardigan Bay*. Captain R. J. Bland. Busan to Port Said. Observer: Mr C. D. Mercer, L/S.

— July 1983. The crab shown in the photograph opposite page 109 was found on the forecastle close to the fair leads. Before leaving Busan on 27 June the ship had drydocked in Kobe, Japan and had anchored once outside the port after leaving the dry dock.

Approximate position of ship: $10^{\circ} N, 65^{\circ} E$.

MARINE LIFE

Red Sea

s.s. *ACT 1*. Captain J. M. Harneis. Rotterdam to Piraeus. Observers: the Master and ship's company.

4 August 1983. At 1250 GMT long parallel bands of what appeared to be a suspension of yellow-brown dust were seen lying on the sea surface in a direction of $120^{\circ}/300^{\circ}$ and approximately corresponding with the direction of swell. In some areas where the dust was disturbed by the vessel's wake the water appeared to contain an oily green form of effluent. This had probably formed a base on which the dust had settled after earlier high winds (force 6) had moderated to light airs.

Position of ship: $18^{\circ} 07' N, 39^{\circ} 57' E$.

Note. Dr F. Evans, of the Dove Marine Laboratory, University of Newcastle upon Tyne, comments as follows:

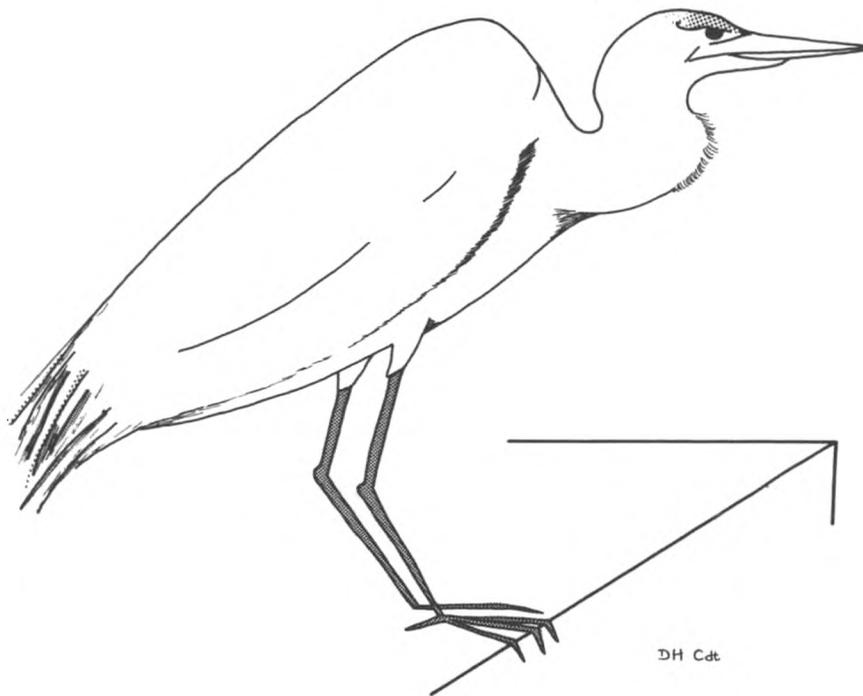
'The "dust" lying in windrows was most likely living phytoplankton. Blooms of yellow or red dinoflagellates are reported from time to time in the Red Sea (was this the origin of the sea's name?). Patches of water become saffron yellow and noticeably viscous as the bloom progresses, gradually changing with time to red or dirty green.'

BIRDS

Mona Passage

m.v. ACT 7. Captain D. M. McPhail. Auckland to Tilbury. Observers: the Master, Mr T. Jones, Chief Officer, Mr A. Wallace, 3rd Officer and Cadet D. Horsfield.

23 August 1983, 1215 GMT. While approaching Mona Passage, a medium-sized white bird was observed flying past the starboard bridge-wing in the direction of the stern of the ship, where it landed on one of the containers carried on deck.



The bird was approximately 50 cm high, with snowy-white plumage, an S-shaped neck, pointed yellow beak, and black legs and feet. Whilst it was in flight, it was noticed that the neck was curled up and the legs trailed to the rear.

Whilst standing on the containers, the bird would occasionally hunch its shoulders or extend its neck. However, at no time did it appear nervous or agitated. The bird remained on deck for approximately 20 minutes before flying off. A positive identification was not possible, but it was thought to be either a small Heron or an Egret.

Weather conditions: dry bulb 28.0 °C, wet bulb 25.6, barometric pressure 1017.8 mb, wind E's, force 4.

Position of ship: 18° 20' N, 67° 50' W.

Note. Captain A. S. Young, of the Royal Naval Birdwatching Society, comments as follows:

'Probably a Cattle Egret (*Bubulcus bis*). Quite often observed at sea in this area and frequently using ships as staging posts! On second thoughts, the black legs would tend more towards a Little Egret (*Egretta garzetta*) or Reef Heron (*Egretta cularis*). Both are very similar, though having yellowish feet and darker bills.'



THE MARINE DIVISION'S STAND AT THE SHIPCARE & SAFETY AT SEA EXHIBITION HELD AT THE NOVOTEL, HAMMERSMITH IN MARCH 1984 (see page 102).

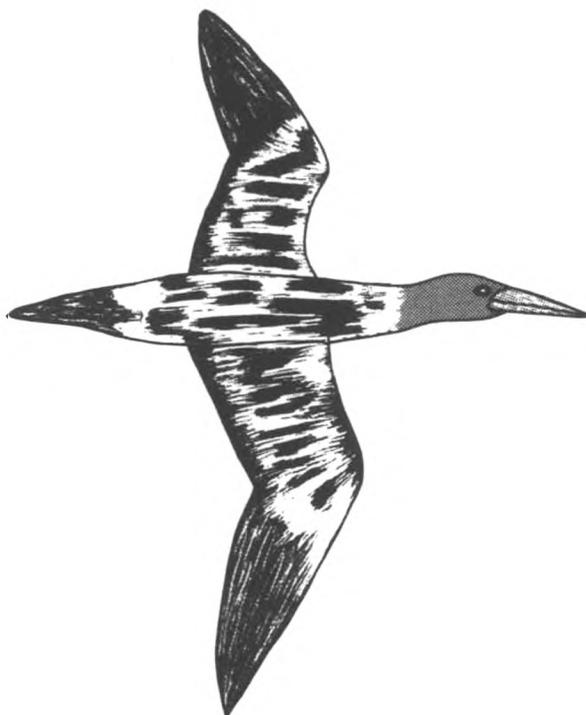


SECTION OF THE MARINE DIVISION'S STAND DEVOTED TO THE VOLUNTARY OBSERVING FLEET (see page 102).

Brazilian waters

m.v. *Devonshire*. Captain R. A. F. Edwards. At anchor off Recife. Observers; the Master and ship's company.

23 July 1983. During most of the day a gannet-type bird was observed flying around the vessel, and on occasions it was seen diving for fish. The body, both on top and underneath, was white but heavily speckled with brown. The head was brown all the way to the neck. The wings were also white with speckles and



a dark brown trailing edge; underneath the wings had a dark-brown leading and trailing edge, the rest being white. The tail was dark brown and the beak a yellowish green. The 1st Officer said that it was a young brown booby.

Position of ship: $07^{\circ} 58' \text{S}$, $34^{\circ} 38' \text{W}$.

Note. Captain Young comments as follows:

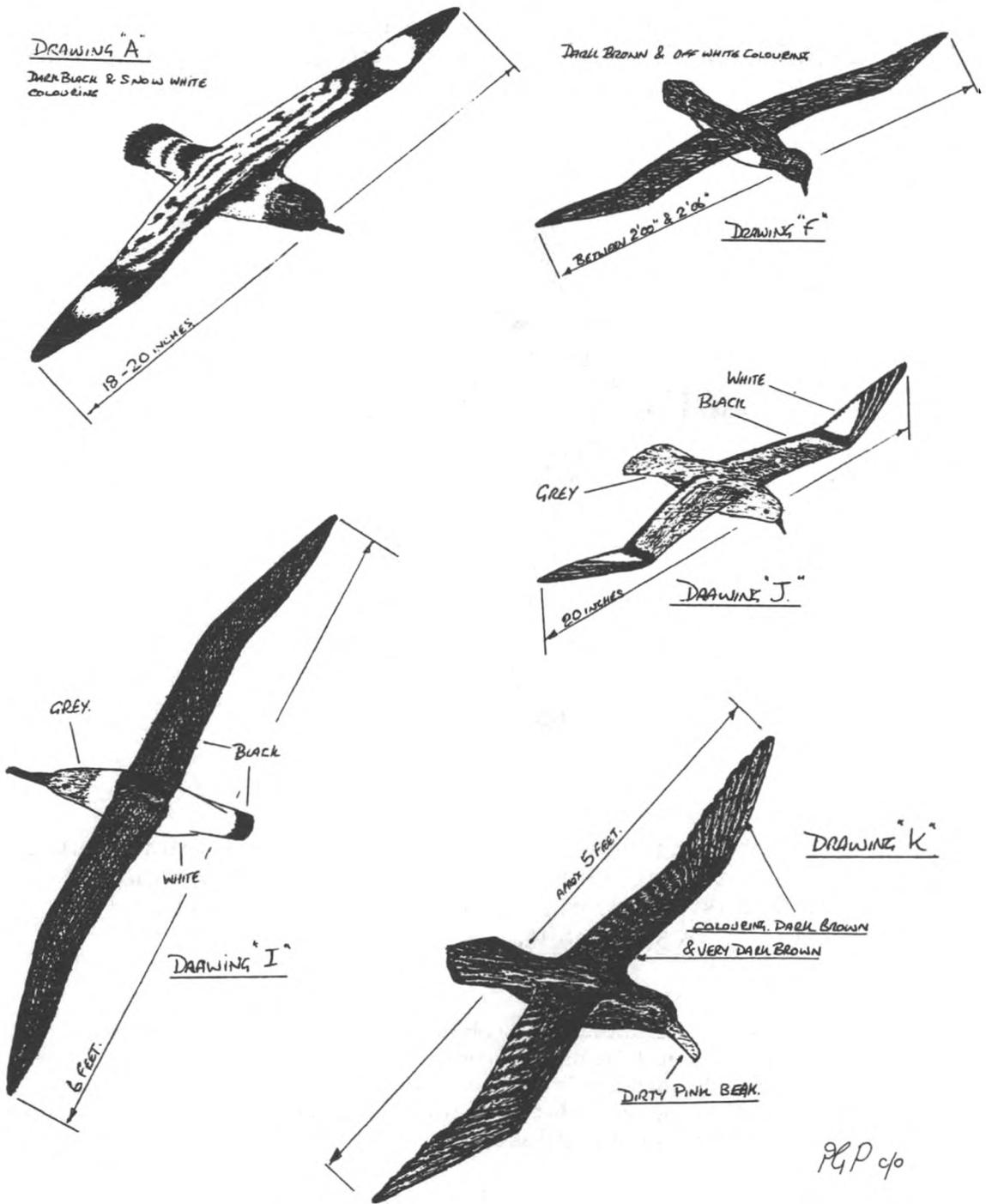
'I do not think this is an immature brown booby (*Sula leucogaster*) which are predominantly dark. It is most probably an immature masked booby (*Sula dactylatra*) which has a characteristic all-brown head and neck. The upper body and wings whiten progressively, which tends to give a mottled/streaked appearance, and somewhat more white under body and wings than the brown booby, and bill greenish/yellow to a varying degree.'

South Atlantic Ocean

m.v. *Lincolnbrook*. Captain R. Davis. Stanley to Las Palmas. Observers: Mr P. G. Powell, Chief Officer and other members of the ship's company.

22 September 1983. At 1200 GMT several birds of types shown in sketches 'A', 'F' and 'J' were seen, together with an albatross similar to that shown in sketch 'I', but with a white head, and somewhat larger, which was considered to be a Wandering Albatross.

Also during this day a bird was observed which was at first thought to be a young albatross (sketch 'K'). However, the wings seemed shorter, and the tail longer, and it flew more like a petrel, that is to say that it was more lively in



the air and swooped and turned more often than an albatross. It had a wingspan of approximately 1.7 metres and was a very dark brown colour with a dirty pink beak.

Position of ship: 48° 48's, 55° 36'w.

Note. Captain Young comments as follows:

'A very interesting report but unfortunately not enough individual detail for positive identification. Those albatrosses referred to as adolescent (immature), if Wandering (*Diomedea exulans*) have a

varying mottled brownish body with a rather distinct white 'face', the body becoming more generally white with maturity over some 4–5 years. Sooty (*Phaebetria fusca*) and Light-mantled Sooty (*P. palpedrata*) could be amongst the albatrosses seen in this area.

'The smaller (albatross-type) birds would probably be Petrel, possibly Great Winged (*Pterodroma macroptera*) and/or White-chinned (*Procellaria æquinoctialis*), both medium and large, mainly dark, petrel frequenting this area.

'I suspect that the observer may have been mistaking Giant Petrels for some of the varied albatrosses mentioned, inasmuch as they are rather similar (very large) and all great scavengers—after garbage etc. They could have been Northern Great Petrel (*Macronectes Halli*) or Southern Great Petrel (*M. giganteus*).'

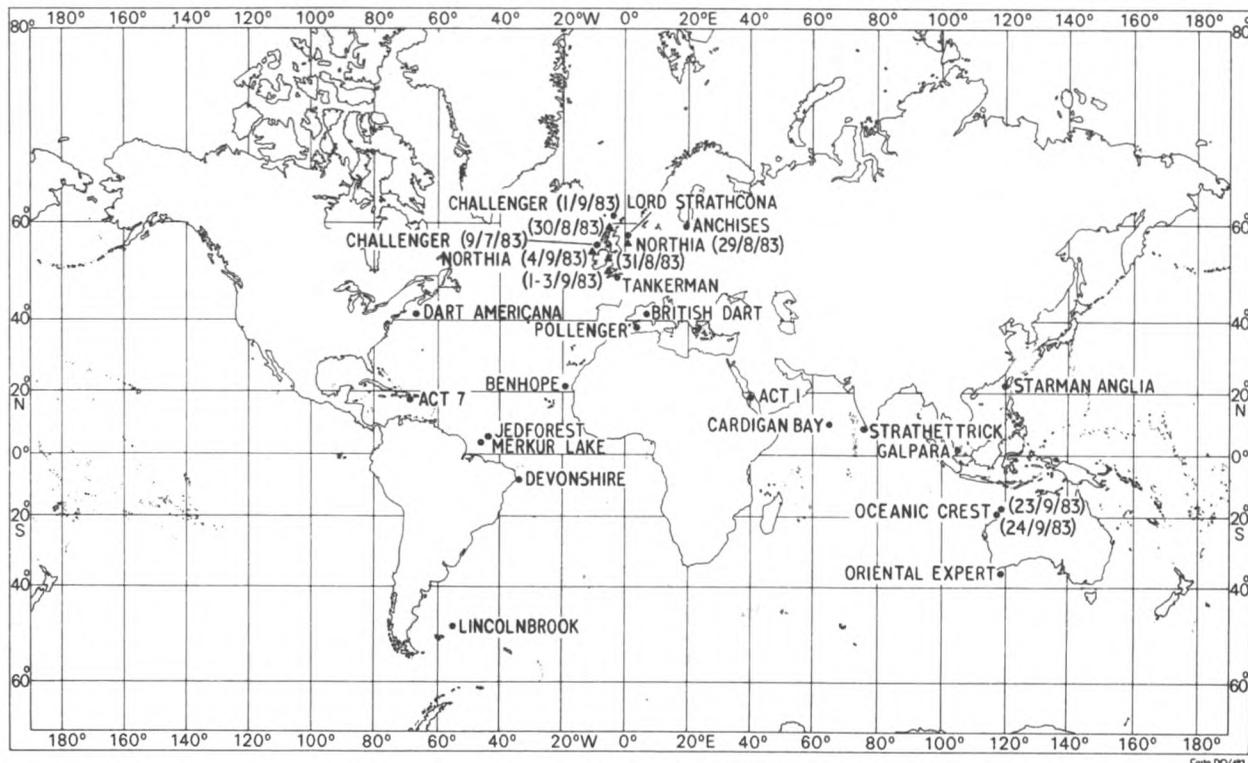
BUTTERFLY

Arabian Sea

m.v. *Cardigan Bay*. Captain R. J. Bland. Busan to Port Said. Observer: Mr C. D. Mercer, L/S.

— July 1983. The butterfly shown in the photographs opposite page 109 was found on deck in the shelter of the hatch coamings. When discovered it was fairly brittle, and so could have been there for some time. A photograph was first taken of the insect as found, for fear that the wings might break when opened, as indeed they did.

Approximate position of ship: 10°N, 65°E.



Position of ships whose reports appear in *The Marine Observers' Log'*

MOTHS

East Malayan Peninsular waters

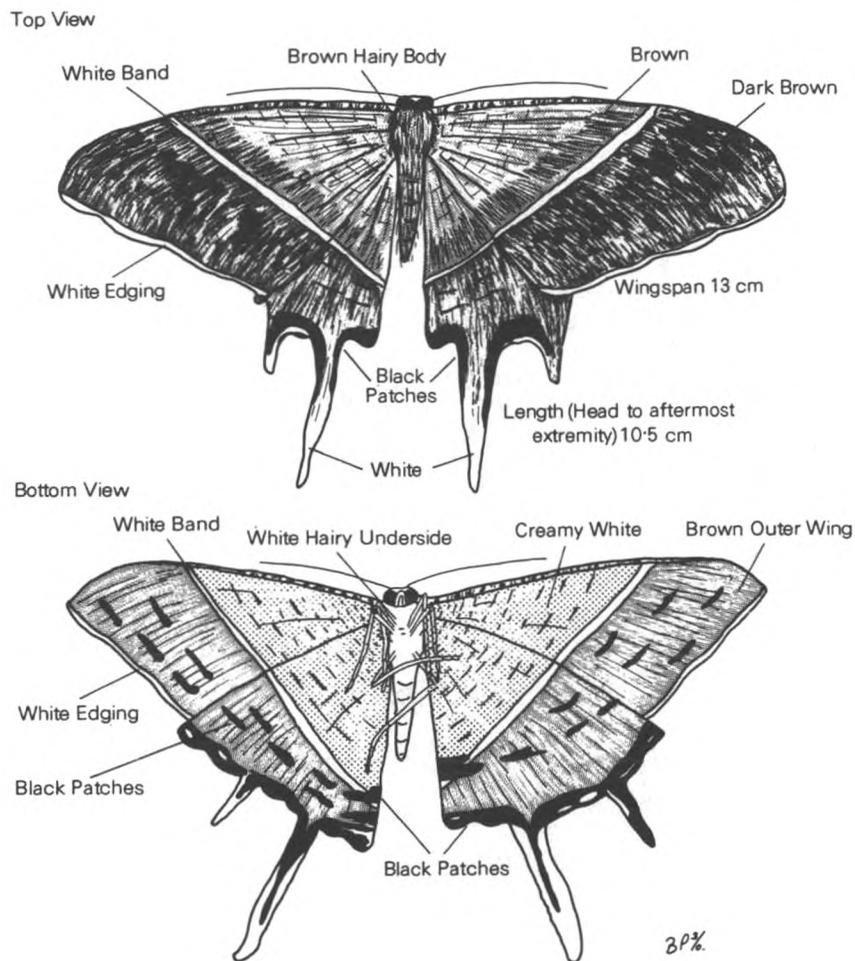
m.v. *Galpara*. Captain S. Harwood. At anchor off East Malaya Peninsula. Observers: the Master and family, Mr G. Penberthy, 2nd Officer and Mrs Penberthy, Mr S. James and Mr B. Pritchard, 3rd Officers and other members of the ship's company.

7-11 July 1983. During the 8-12 evening Anchor watch on the 7th a large gathering of moths descended around the fluorescent lights situated on the port bridge-wing. Others also landed elsewhere around the ship but none were so noticeable as the port-bridge-wing throng, which resembled a 'swarm', virtually covering the entire surface of the dodgers.

As the sun came up on the morning of the 8th, quite a number of moths were observed to fly off in ones and twos, downwind and away from the direction of land. The remainder clung to the decks and bulkheads. The few that remained gradually died off as the day wore on. They did not fly off in search of food etc., but merely sat in one place, sometimes clinging on for dear life whenever the wind picked up in strength.

On the evening of the 9th no moths invaded the ship, the wind being on-shore. However, on the evening of the 10th and 11th once again an offshore wind was experienced and a large number of moths collected on board around the lights.

The observers considered the experience to be unique, in a view of the number of moths involved, and wondered whether the moths were attracted by the



lights of the vessel, which was anchored 5 n. mile offshore, or were blown offshore as indicated by the wind direction, or owed their presence in such large numbers to a combination of these two factors.

Weather conditions on 7 July: overcast with occasional drizzle, wind sw (i.e. offshore), force 3, visibility good, slight sea running.

Position of ship: $01^{\circ} 38' N$, $104^{\circ} 21' E$.

BIOLUMINESCENCE

North Atlantic Ocean

m.v. *Benhope*. Captain I. G. Morrison. Rio Grande (Brazil) to Ghent. Observers: Mr D. J. Rennie, 3rd Officer and Mr —, Hazzard, SGIA.

11 July 1983. At 2215 GMT bioluminescence in the form of a white-coloured strip was observed about $\frac{1}{2}$ n. mile off the port side. The strip was estimated to be about 200 metres in length and 20 metres in breadth. About five minutes after the sighting of the first strip another strip was observed, appearing in about the same place as the first. As the strips came abeam their intensity reduced and finally disappeared. The ship was steering $023^{\circ} (T)$ at 11.7 knots.

Weather conditions: dry bulb $19.5^{\circ} C$, sea temperature 20.0 , barometric pressure 1016.8 mb, wind N'E, force 4, skies clear with a slight horizon haze.

Position of ship: $21^{\circ} 44' N$, $19^{\circ} 11' W$.

Note. Dr P. J. Herring, of the Institute of Oceanographical Sciences, comments as follows:

'The strips were probably derived from windrows of luminous organisms, as they appear to have been approximately parallel to each other, albeit well separated.'

m.v. *Mercur Lake*. Captain S. Schwarz. Belem to Heysham. Observer: Mr P. Howland, Chief Officer, and Mr O. Lamug, O.S.

5 September 1982. Between the hours of 2100 and 2300 GMT the vessel encountered an area of marine bioluminescence. This took the form of rapid light flashes on the sea surface, especially in the turbulence along the ship's side and bow wave, reappearing in the wake. The light flashes were approximately 30 to 60 cm in length and were either vivid green or brilliant white. Several water samples were taken but these were not luminous—whether shaken or stirred (no lemon). A strong light on the sea neither initiated nor increased the luminescence. The radar being switched on and off also had no obvious effect. Course $027^{\circ} (T)$, speed 15 knots.

Weather conditions: dry bulb $27.1^{\circ} C$, wet bulb 24.0 , sea temperature 29.5 , barometric pressure 1012.4 mb, seas slight with E'ly swell.

Position of ship: $04^{\circ} 35' N$, $45^{\circ} 06' W$.

Note. Dr Herring comments:

'The flashes were probably produced by jellyfish or comb-jellies and their appearance would have depended very much on the depth of the animals below the surface. The lack of response of the water samples to the 007 treatment indicates that smaller planktonic organisms were making little contribution to the overall luminescence.'

English Channel

m.v. *Tankerman*. Captain M. J. Charlesworth. Rosyth to Swansea. Observers: Mr J. M. Walker, 2nd Officer and Mr M. Mongan, A.B.

31 August 1983. At 0200 GMT bright luminescence occurred, lining the crest of the ship's bow wave. The wind was variable, force 1, the visibility was down

to 3-4 n. mile owing to fog, and the sea was rippled. There was a half moon which was exceptionally bright and was almost overhead. The luminescence appeared on the crest of the bow waves and subsequent waves caused by the ship. It gave the effect of white lines radiating from the bow aft. It lasted for approximately 20 minutes until thin cloud obscured the moon.

Position of ship: $50^{\circ} 10' N$, $02^{\circ} 49' W$.

Note. Dr Herring comments as follows:

'The "exceptionally bright" overhead moon suggests to me that the 'luminescence' was more likely to have been reflectance of moonlight off the wavecrests. In such bright conditions it is often very difficult to observe surface luminescence, which tends to be much less bright than reflected moonlight. The fact that the phenomenon ended when the moon was obscured is supporting evidence for this interpretation.'

Arabian Sea

m.v. *Strathetrick*. Captain J. W. Welch. Singapore to Cochin. Observers: Mr R. J. Baldock, 2nd Officer, Mr K. J. Odams, 3rd Officer, and Mr K. Cave and Mr P. Scannel, Seamen.

30 July 1983, 1730 GMT. At this time the vessel was some 20 n. mile off the west coast of India. The moon rose, giving rise to intense bioluminescence around the ship. It was observed in any white water that occurred, mainly in the ship's bow wave and wake, but also in the splashes of flying fish returning to the water and the very occasional crests of wind waves.

The effect was very bright indeed and the 'fluorescent' white was tinged a very deep turquoise blue/green colour around the edges. It seemed as though the observers were looking down into a swimming pool lit from beneath the water. The effect was observed for about three hours.

Weather conditions: dry bulb $27.7^{\circ} C$, wet bulb 25.9 , wind variable, force 2, sky clear.

Position of ship $09^{\circ} 24' N$, $76^{\circ} 06' E$.

Note. Dr Herring comments:

'I cannot identify the organisms with any certainty. Although dinoflagellates are by far the most common source of luminescence in any turbulent water, ostracods (small water-flea-like crustaceans) can produce a similar effect and are locally abundant in Indian waters. The report suggests that the moon rise was the cause of the luminescence but this may have been coincidental.'

ABNORMAL REFRACTION

South-west Australian waters

m.v. *Oriental Expert*. Captain C. J. Farren. Melbourne to Singapore. Observer: Mr J. P. Ayling, 3rd Officer.

2 July 1983. At 0100 GMT Mount Manypeak (Ht 1855 ft) was quite clearly distinguished above the horizon at a distance of 65 n. mile. As the vessel proceeded on its course more of the coastline came into view until eventually Peak Head (bearing $326^{\circ}(T)$, and distance 33 n. mile), Bald Head (height approx. 400 ft, bearing $331^{\circ}(T)$, distance 31 n. mile), Mount Gardner (height approx. 1305 ft, bearing $348^{\circ}(T)$, distance 33 n. mile), Mount Manypeak (bearing $355^{\circ}(T)$, distance 39 n. mile) and Bald Island (height approx. 1020 ft, bearing $009^{\circ}(T)$, distance 39 n. mile) could all be seen.

Each large land mass was seen to curve inwards at the position where it should have met the horizon, whereas the smaller peaks were not observed to meet the horizon at all; moreover, they had a definite blue 'wavy' band between them and the horizon.

The extremities of each land mass observed were very pointed, and in some cases joined on to the next land mass, leaving a blue 'wavy' section underneath.

Bald Island was first observed on the 10 cm radar some 1½ hours after the visual observations had begun and when the refraction became most apparent only Bald Island, Mount Manypeak and Mount Gardner were observed on radar.

Weather conditions: dry bulb 21.0 °C, wet bulb 15.0, sea temperature 18.0, barometric pressure 1026.6 mb, wind sw'ly, force 2-3, calm sea and low swell.

Course and speed 280°(T) at 14 knots.

Position of ship: 35° 33'S, 118° 18'E.

Note 1. The *Oriental Expert* is a Hong Kong Selected Ship.

Note 2. This report was accompanied by a highly detailed and informative sketch which cannot be reproduced satisfactorily within the available page width.

North-west Australian waters

m.v. *Oceanic Crest*. Captain P. Bosman. Off Port Hedland. Observers: Mr M. Sams, 2nd Officer and Mr B. W. Watson, 3rd Officer.

24 September 1983, 0630-0730 GMT. The vessel was approaching Port Hedland when at 0630 GMT and at a range of 23 n. mile the coastline was clearly visible from the vessel, refracted above the visible horizon. The land between Cooke Point and Finucane Island, larger buildings, and salt and iron stockpiles at Newman and Goldsworthy were all observed at this time. Simultaneously, a northbound vessel which had passed the *Oceanic Crest* and was about 5 n. mile astern to the north became refracted, its shape, while remaining the same laterally, becoming extended vertically (*see* first sketch).

Shortly after this a superior-image/mirage effect could be observed in the form of a narrow band above the image of the land already described in the previous paragraph. The observation was of an arc of about 30-35 degrees horizontally and about 25-30 minutes of arc vertically above the horizon.

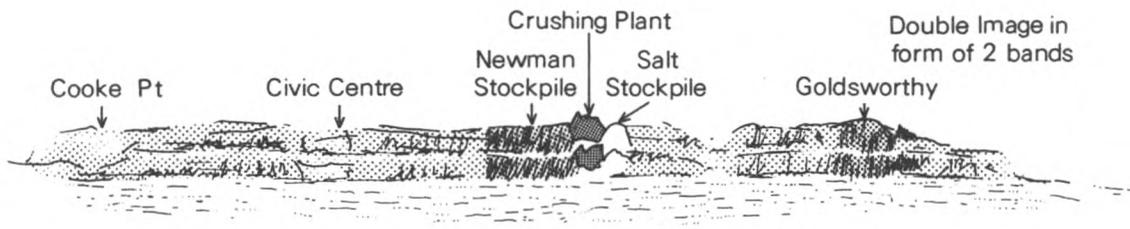
The two images of the band of land, one above the other, were often distorted, with the two layers often merging with each other and appearing to dislocate themselves from the horizon. Whilst the distinct shapes of shore-based objects could not be defined, the various colours of different landmarks could be identified, for example, the white of the salt stockpiles and more prominent buildings, the dark brown of the iron stockpiles and the sandy colour of the beach and green of the scrub bush. The horizon remained quite clear throughout (*see* second sketch).

This phenomenon lasted for nearly an hour, when at 0715 the mirage effect disappeared at a range of 16 n. mile. It is at this distance that the larger structures and higher points of land become visible above the horizon under normal conditions.

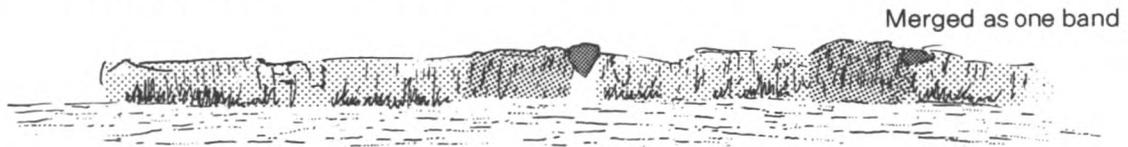
At 0730 as the vessel was about 5 n. mile south of the 'C1' buoy, three ships at the anchorage 10-11 n. mile to the south-east were seen to become refracted. They were all of small size horizontally but of great freeboard in appearance; the accommodation blocks appeared compressed in relation to the shape and size of the hull. This is best illustrated with the third sketch. This phenomenon lasted until the *Oceanic Crest* was about 5 n. mile from the anchorage before disappearing. As the vessel proceeded inwards no more refraction was observed. By this time the vessel was 5-6 n. mile off the coast.

Weather conditions at 0600 GMT: dry bulb 30 °C, wet bulb 21°, dew-point 17.8, sea temperature 26°; wind WNW, force 3; no cloud.

Weather conditions at 0730 GMT: dry bulb 31 °C, wet bulb 20.5, dew-point 17.8, sea temperature 26°; WNW, force 3; no cloud.



(Note: Vertical merging of colours similar to short vertical brush strokes on canvas)

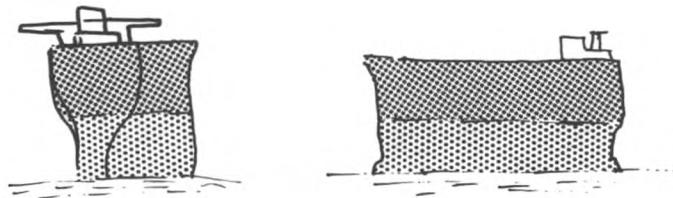


Merged as one band

(Shapes not clearly defined but colours well visible)



One band dislocated from horizon before disappearing



Ship's course 186°(T) and speed 10 knots; approach channel entered at 'C1' buoy.

Position of ship at 0630 GMT: 19° 56'S, 118° 27'E.

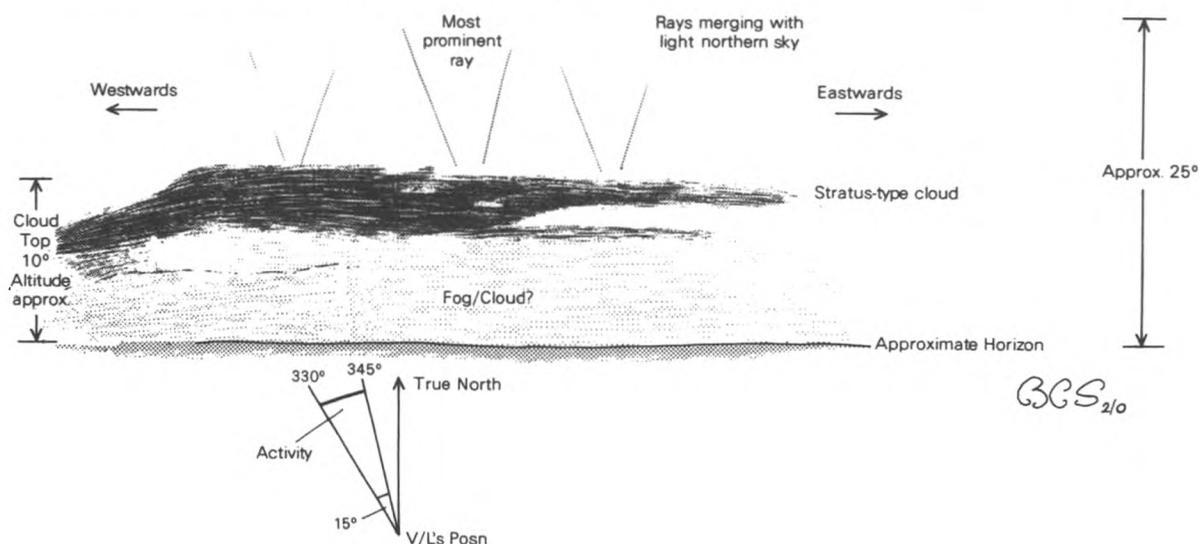
Note. The *Oceanic Crest* is an Australian Selected Ship.

AURORA BOREALIS

North Sea

m.v. *Lord Strathcona*. Captain D. Forbes. At Montrose Alpha. Observer: Mr B. C. Scott, 2nd Officer.

24 July 1983. Between 0146 and 0154 GMT auroral activity was sighted bearing $335^\circ(\text{T})$ from the vessel to the centre of activity. The activity was quiet, with weak to moderate brightness and in the form of four rays (similar to searchlight beams shone vertically upwards). The approximate elevation of the uppermost visible ray edge was 25° , the lower edge being hidden by cloud and possibly the remains of fog banks that had predominated in the area earlier. (No accurate measurements were possible as there was no sextant immediately to hand.) The colour of the rays was a pale yellow/white, the outer rays being shorter and paler. There was a full moon on a bearing of $215^\circ(\text{T})$, though this was partly obscured by stratus-type cloud and the moon's altitude was estimated to be less than 15° despite the fact that the horizon was unidentifiable owing to darkness and low cloud. The sky above 10° elevation all round the horizon was free from cloud and the sky to the north was lighter than elsewhere. Owing to shipboard operations, the report and sketches could not be completed until after the event had ceased and hence may not be completely accurate.



Position of ship: $57^\circ 26' \text{N}$, $01^\circ 21' \text{E}$.

Baltic Sea

m.v. *Anchises*. Captain E. D. Somes. Varberg (Sweden) to Yxpila (Finland). Observers: Mr M. J. Harrison, Chief Officer and Cadet J. M. F. Williams.

25 August 1983. Between the hours of 0130 and 0300 GMT a glow was observed in the sky covering an arc of 50° from the port bow, between NNW and NNE to an altitude of 15° . It resembled the glow given off by a city at night, although it was whitish-grey in colour. The cloud cover at the time was a mixture of altocumulus and altostratus. There was a full moon, but this was astern of the vessel throughout the period of observation. At the time it was approaching morning twilight and as dawn broke and the sun rose, the effect lessened.

Course and speed: $037^\circ(\text{T})$ at 15 knots.

Position of ship: $59^\circ 10' \text{N}$, $19^\circ 35' \text{E}$.

Marine Biology and Merchant Ships

BY PAUL HORSMAN, MSc

(The Marine Society, 202 Lambeth Road, London SE1 7JW)

Dolphins leap in the bow wave as flying fish scatter before the ship while jellyfish drift past; barnacles, mussels and tube worms grow on the hull and in sea-water intakes, coolers and condensers. Throughout the last 130 years seafarers have made notes on this rich variety of animals and plants. This information is valuable in adding to our knowledge of the marine world.

Plankton—meaning that which drifts

Many organisms are poor swimmers; these spend their lives drifting with the current. They are mostly small and can only be seen clearly with a magnifying lens, but some larger animals, such as jellyfish, also drift with the currents. All drifting animals and plants are **plankton**.

With the exception of Sargasso weed or Gulf-weed, *Sargassum* spp.*, the plant plankton or **phytoplankton** are minute, their size ranging from a few to several hundred microns (1 micron is one-thousandth of a millimetre; micrometre is the officially accepted term for micron).

The animals, or **zooplankton**, are usually larger, ranging from about 30 microns to a few centimetres; some jellyfish may grow to over a metre across.

The phytoplankton is the basic food of the sea, because animals must eat other animals or plants for food. Plants can make their own food from carbon dioxide and water in the process of **photosynthesis**, which requires sunlight (nutrients like nitrates and phosphates are also necessary). Living plants are found only when the sun penetrates the water; in cloudy coastal sea this may be the top 20 metres, but in clear oceanic water it may extend to 150 metres.

Coastal water is rich in nutrients swept up from the seabed by upwelling currents and poured into the sea from rivers. Here the plants grow and provide the food for the animals. The resulting concentration of plankton and the abundance of nutrients gives the coastal water the grey/green colour that is so different from the deep blue of the oceans.

Some organisms spend all their lives drifting—these are **permanent plankton**. But many seabed and shore animals use the water currents to carry their offspring to different areas. Crabs, lobsters, limpets, sea anemones and many fish are some of the animals that produce planktonic young—these are **temporary plankton**.

The amount of plankton varies with area—coastal water contains more temporary plankton than oceanic—and with the season and time of day. In temperate and cool regions during winter many organisms die, their bodies adding to the nutrients. In spring the phytoplankton grow quickly, providing the food for the zooplankton which consequently also increase. During the summer the food is used up and the numbers fall slightly; autumn follows with another burst of growth before the temperatures fall and the numbers drop to the winter low.

In tropical waters the plankton is scarce as there is no winter 'resting' period—the growing season lasts all year and uses up the nutrients. Consequently

* spp. indicates that a number of species are involved belonging to the genus *Sargassum*.

tropical fisheries are poor except near river estuaries and upwelling currents such as on the western seaboard of South America and southern Africa.

Many animals migrate from deep water to the surface and back during 24 hours. Dawn finds the animals at the surface; as the sun rises they sink and reach their deepest level by midday, but at sunset they return to the surface.

The best way to preserve samples of plankton is by using alcohol, which is not generally available. Methylated spirit or denatured alcohol is not suitable, although liquors like gin can be used in an emergency. The most practical preservative is formalin, which can be obtained from most chemists. A 9 to 1 mixture (equivalent to a 10% solution) of sea-water and formalin is sufficient. A few lumps of chalk or coral pieces are added as the formalin is slightly acidic and would otherwise dissolve any shells and skeletons, leaving some animals unrecognizable. The sample should be labelled with a pencil on good quality paper which is then put **inside** the jar—labels on the outside become detached.

It is possible, with a magnifying lens and reference books, to identify the types of organisms in the sample. Phytoplankton can be recognized by their geometrical shapes: triangles, squares, sculptured surfaces and spines; zooplankton include animals from practically every major group from minute single-celled organisms to larger shrimp-like 'krill' (Figure 1).

Red Tides

Red tides are caused by an accumulation of plankton which often occurs where two currents meet forming a downwelling. A combination of the water moving downwards and the organisms swimming to the surface causes the plankton to congregate, often in long lines or windrows. The Red Sea is so named because of the occurrence of red tides but they occur all over the world. In a red tide the water appears like rust or paint, although the colour depends on the species with varying shades of red, pink, violet, orange, blue, green or brown.

When certain species of phytoplankton are concentrated in a red tide they can be responsible for killing many animals. This happens in two ways: in the first, when the plants have used up all the nutrients, or the temperature or amount of light changes, the whole population may die simultaneously. Their rotting bodies cause the amount of oxygen in the water to fall and the animals suffocate. In 1977 a red tide off New Jersey, USA, caused an area of over 14 000 square kilometres to become deficient in oxygen and many animals were killed, especially those living on the seabed such as clams and oysters.

The second way in which these plants kill is by producing poisons. Some kill fish, while others are more harmful to warm-blooded animals. Shellfish that have accumulated certain of these organisms can be fatal to man, causing paralytic shellfish poisoning.

Bioluminescence

Bioluminescence—or phosphorescence—is probably the most strange but most commonly recorded phenomenon. It is difficult to classify as there are so many different types and the observations vary. The intensity depends on how long the observer has been in the dark, and estimates of colour vary. The best advice is to note precisely **what you see**: size, colour, extent, duration and anything else possible. There are several experiments which can be carried out to help in identifying the organisms responsible:

1. What is the effect of shining a light on the sea?
2. What is the effect of the echo sounder?

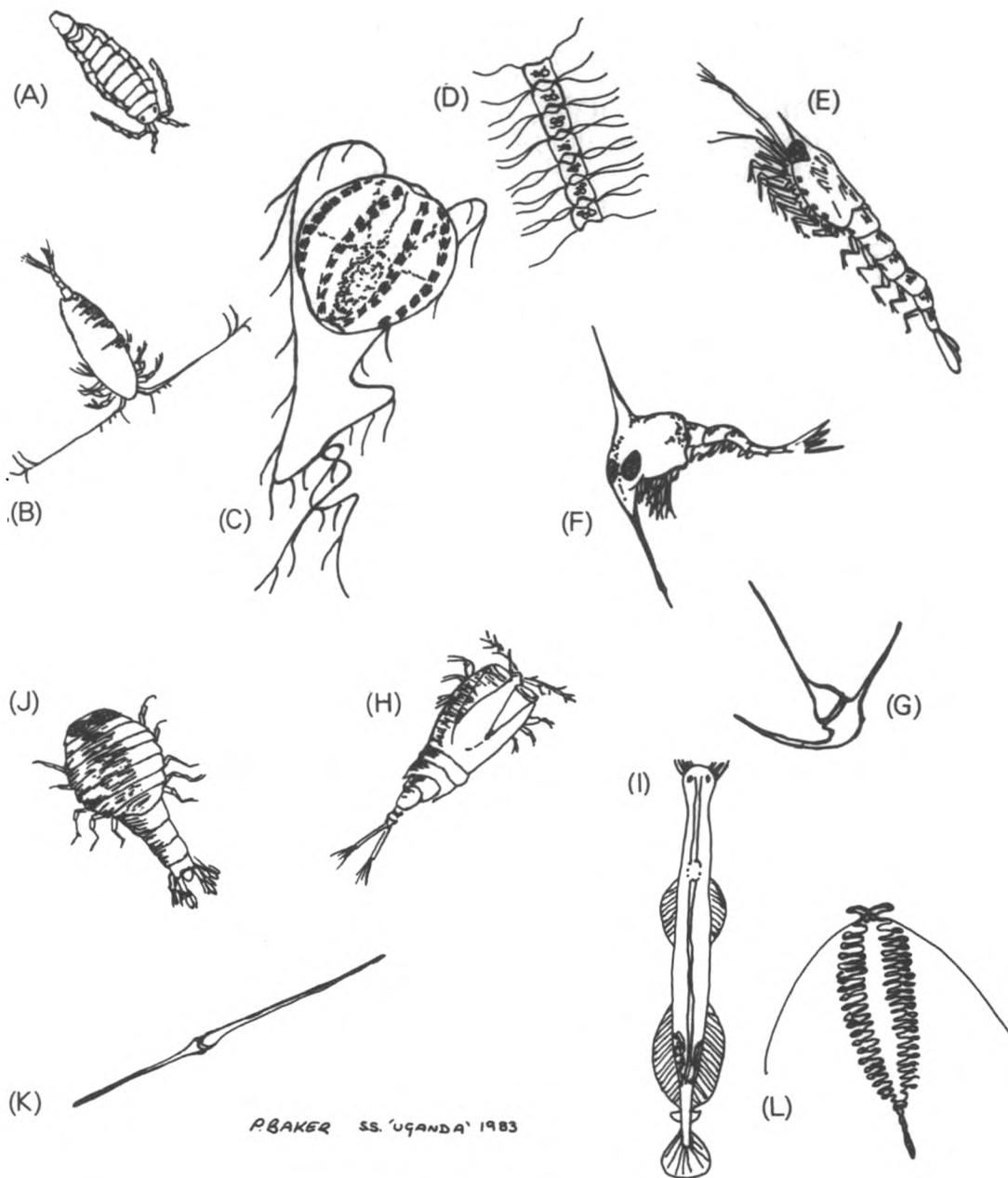


Figure 1. Some of the small planktonic organisms. All these organisms with the exception of C and L have been collected through the fire hydrant. D, G and K are plants—phytoplankton; the remainder are animals—zooplankton.

A. Woodlouse-like isopod; B. Copepod—about 7000 different species; C. The comb-jelly or ctenophore *Pleurobrachia*; D. A string of centric diatoms; E. Euphausiid—better known as 'krill'; F. A young crab at the zoea stage; G. The dinoflagellate, *Ceratium* spp.; H. Another copepod, this one belonging to the genus *Corycaeus*; I. An arrow worm or chaetognath; J. An amphipod; K. Another type of dinoflagellate; L. A planktonic worm, *Tomopteris* spp.

3. If the vessel is stopped, what happens when the engine is started—or vice versa?
4. What is the effect of switching on (or off) the radar?

Try to obtain a sample by using the sea temperature bucket, an ordinary bucket or even the fire hydrant. First keep the sample in the dark:

5. Is there any luminescence in the sample?
6. Is there luminescence if the sample is shaken?
7. What happens when a torch is shone on the sample?

Then take the sample into the light and inspect under a lens.

If you wish to see the luminescence again before preserving the sample it must be left in the dark for at least 20 minutes.

Some bioluminescent phenomena may fit into one of the following categories, but there may be other types or combinations of the categories.

1. **Milky Sea**—an even, diffuse, continuous glow in the surface waters which extends over a great distance and has no distinct shapes. Occasionally a change in sea temperature has been noted indicating that the vessel has moved into a different body of water. A 'fishy' smell has also been recorded which could be due to dead plankton.

The cause of a milky sea is not known. Bacteria are the only organisms that are known to luminesce continuously. In rich areas, such as the Arabian Sea in summer, there is an increase in the amount of surface algae which do not luminesce but may form a base on which the bacteria can grow.

2. **Phosphorescent Wheels**—waves of luminescence travelling out quickly in an expanding circle from a central hub which may also be luminescent. The formation varies from 2 metres to a mile in diameter and sometimes 'spokes' can be seen from the hub to the rim. Many patterns revolve and occasionally there may be many wheels interlocking or separate.

It is possible that this phenomenon is due to seismic disturbance stimulating large numbers of luminescent plankton but this is by no means a fully satisfactory explanation.

3. **Luminescent Bands**—sometimes associated with a large wheel. The ship may appear to be sailing over a series of parallel lines which may be moving. The bands may extend for a limited distance or to the horizon. They vary from 60 metres wide and 300 metres apart to 1.5 metres wide and 1.5 metres apart.

4. **Erupting Luminescence**—also often associated with wheels. These are luminescent balls of light which rise from deep water and spread out on the surface. The size of the ball varies from 30 centimetres to 2 or 3 metres in diameter and spreading into discs of up to 30 metres. These eruptions are distinct from 'blobs' of luminescence which rise into the disturbed water around the vessel.

It has also been suggested that luminescent bands and eruptions may be due to seismic activity.

5. **Patches and Speckles**—small pinpricks of light caused by small organisms disturbed by the ship.

6. **Miscellaneous**—luminescence in response to a searchlight beam is mostly the reflection from the eyes of fish. Occasionally it has been reported that the observer could 'write' on the water using the Aldis lamp. This is rare but some animals are known to luminesce in response to a light. Other types of luminescence have been said to be caused by switching on the radar. This is difficult to explain and many more observations are needed before coincidence can be ruled out.

It is not clear why some organisms luminesce. Most bioluminescent light is blue-green which penetrates the furthest in sea water and all bioluminescent animals have eyes so the light can be detected. Bioluminescence probably does a number of jobs:

1. **Searchlight to find food**—probably mostly used by fish feeding at night.
2. **Lure**—the angler fish has a light on the end of a 'fishing rod' extension dangling in front of its mouth which attracts small animals. Some other fish have light organs on the inside of their mouths or cheeks probably for the same reason.
3. **Warning**—a flash may be a warning to a predator not to eat a particular animal as it is poisonous or in some way 'nasty'. Some species may mimic this type of luminescence even if they are not distasteful. A flashing light may warn others that there is a predator nearby; this may not help the organism being eaten but it may benefit the whole species.
4. **Burglar Alarm**—a predator's position could be given away to its enemies by the flashing light of the food it is eating. For instance a herring may be attracted to a flashing copepod that is being eaten by a euphausiid, which then becomes food for the herring. This also is only an advantage to the shoal of copepods, not to the individual.
5. **Escape**—a flash of light may startle a predator leaving it 'blinded' while the prey escapes, or vice versa, some fish switch off their light when attacked; this also leaves their attacker temporarily 'blind'.
6. **Camouflage**—the light-producing organs or **photophores** are usually on the underside so the animals are not easily seen by predators from above. Predators beneath will be unable to distinguish the prey from the light coming down from the surface. Skin pigments, reflective surfaces, transparency and vertical migration all help to camouflage the animals.
7. **Shoaling**—some species can be distinguished by the arrangement of their photophores; it is possible that the animals can recognize the differences. Perhaps in the world of darkness light may also be used to mark territorial boundaries.
8. **Sexual Displays**—some males and females have different arrangements of photophores; a display of light may help in recognizing sexually mature individuals of the correct species.

Larger Plankton

1. The Coelenterates—corals, sea anemones and jellyfish.

Coelenterates are found all over the world but there are two classes that are seen regularly from ships.

Class 1. Hydrozoa—three members of this class live floating on the surface. They have a sail and use the wind and currents to push them along. The first two species belong to the family Velellidae:

Velella velella, by-the-wind-sailor—a blue oval raft up to 10 centimetres long with concentric rings and a translucent sail set across the top. Beneath the raft there are short tentacles surrounding the central mouth.

Porpita porpita—similar to *Velella* but the raft is circular up to 8 centimetres in diameter with club-shaped tentacles.

The third species is *Physalia physalis*, the Portuguese man-of-war, which belongs to the siphonophores. Members of this group are not simple animals

but colonies of individuals each adapted to perform different functions. *Physalia* has a large gas-filled float which resembles an inflated plastic bag with a crest that acts like a sail. The rest of the colony is suspended beneath.

In *Physalia*, like *Veleva*, the sail is set at an angle to the left or right, and the submerged part of the colony acts like a drogue—especially in *Physalia*. So the animals do not run before the wind but tack across it.

Class 2. Scyphzoa—the true jellyfish. There are approximately 250 species of jellyfish around the world; the following three are the most commonly reported:

Aurelia aurita, the moon jelly—a saucer-shaped jellyfish growing to 50 centimetres across and found in all coastal waters. It is usually pink/purple with many fine short tentacles around the margin. There are four three-quarter-round organs resembling two crossed figures-of-eight clustered around the centre—these are the reproductive organs. Family: Cyaneidae, the Lion's Mane Jellyfish. There are two species in this family: *Cyanea capillata* and *Cyanea lamarcki*. They are similar except for their size and colour. *C. capillata* is the largest jellyfish known; one caught in Massachusetts Bay measured 2 metres across. This species is dark red/brown with long tentacles and powerful stinging cells. *C. lamarcki* is smaller, rarely more than 30 centimetres, and is deep blue to purple and the sting is not so powerful.

Certain species of fish can live in close association with some coelenterates. The man-of-war fish, *Nomeus gronovi*, lives unharmed among the tentacles of *Physalia*. The fish is well camouflaged with deep blue stripes to blend with the tentacles. *Cyanea* spp. often have young whiting or other fish of the cod family sheltering among the tentacles.

2. The Molluscs—mussels, snails, squid and octopus.

Most planktonic snails have their 'foot' modified into 'wings' for 'flying' through the water. The floating bubble snail, *Janthina* spp. is one species that does not swim; this purple snail lives suspended upside down from a raft of bubbles. Its main food is the floating coelenterates. When *Janthina* collides with a *Veleva* it attaches itself and exudes a purple dye which may anaesthetize the *Veleva*. The snail digests the animal leaving behind a clear husk.

3. The Crustacea—barnacles, crabs, shrimps and lobsters. Pink swimming crabs probably belonging to the genus *Charydris* have been recorded in some tropical coastal waters. Their back legs are flattened and used like paddles.

Barnacles grow on floating debris and on hulls, in sea-water intakes, coolers and condensers. Goose barnacles have a flexible stem with calcium plates around the body. One species, *Lepas fascicularis*, lives in clusters around a float made from mucus bubbles and drifts in the surface waters. Acorn barnacles are shaped like tiny volcanoes attached to the substrate. The stalk of the goose barnacle is a popular seafood item in Spain and Portugal, where it is known as 'percebe' and 'perceve' and also in Italy where it is known as 'balani' or 'pico'. Although the stalk can be eaten raw, it is usually steamed or grilled, after which the tough outer skin may be removed easily. Dipped in melted butter, the goose barnacle stalk is said to taste somewhat like lobster.

4. Urochordates—sea squirts.

These animals are barrel-shaped with a semi-transparent skin; some have muscle bands like stripes around the animal. Water is sucked in through an opening at the front and passes through a basket network inside the animal which filters out small plankton for food. The water is then pumped out of the rear, making a jet to push the animal along. Most sea squirts are about 10 millimetres long; some live in colonies resembling strings of sausages, or connected in circles. One colony, *Pyrosoma* spp., is like a bag and may grow to a metre across.

5. *Sargassum* spp.—Gulf-weed.

Clumps of brown *Sargassum* weed are commonly seen in the area of the Sargasso Sea in the north-western to central Atlantic, but other species are found in different parts of the world. The weed has air bladders to keep itself afloat.

A community of animals lives among the weed: the *Sargassum* fish, shrimps, the *Sargassum* crab, flatworms, tube worms, snails, ragworms, small encrusted seamats or bryozoa that resemble encrusted eggs, long fine sea fans or hydroids growing from a system of root-like extensions. The community relies on the buoyant weed for its survival.

Non-planktonic Animals

1. Squid—are found world wide. During the day they are at depths of between 30 and 100 metres, but many migrate to the surface at night often giving extensive displays of bioluminescence. (Some species like the giant squid live permanently in deep waters.) After rough seas small squid may be found on deck. They swim by pumping water out through a tube or siphon which can be pointed in any direction. The jet is powerful enough to enable some species to leap out of the water—these are the 'flying squid'.

2. Fish—there is an infinite variety of fish but flying fish are perhaps the most common to be seen from ships. The two front (pectoral) fins have evolved to resemble wings which enable the animal to escape predators by gliding over the water. When the fish loses speed it dips the tail into the water and boosts itself with a few quick sculling strokes. In this way it can stay airborne for a few hundred metres.

Many species of flying fish are found throughout the world in warmer waters. Some have two 'wings'—generally oceanic; others have four 'wings' and are more coastal. They are blue on the dorsal surface as camouflage against predation by seabirds, and white underneath as camouflage against larger fish below. They are often found on deck when close inspection may reveal parasites attached to the skin, or in the gills or mouth.

Sharks are often seen when the ship has stopped. The easiest to recognize are the hammerheads, of which there are five species ranging from the true hammerheads to the bonnet-heads.

The basking shark, *Cetorhinus maximus*, is a large plankton feeder; they are usually found in shoals in cool temperate surface waters during the summer, but it is thought that they hibernate in deeper water during the winter.

The white tip shark, *Carcharhinus longimanus*, is a deep-sea species. It has a white tip on the ends of its fins.

Sometimes pilot fish, *Naucrates ductor*, which are small with black and white stripes, will be seen swimming with sharks. Occasionally the sucker fish, *Remora remora* may be attached by its large sucker.

Several species of rays often swim on or near the surface. The largest is the manta with a wing span of 3 or 4 metres; it has a dark blue/black dorsal surface and a white underside. They are often seen basking with the tips of the wings projecting above the surface. Occasionally they leap out of the water and make a loud crack when they land. The devil fish, *Mobula*, resembles the manta but is smaller. Other smaller rays are the eagle rays which also leap; they have a long thin tail and a dark brown mottled dorsal surface.

The dolphin fish or dorado, *Coryphaena* spp., is often seen chasing flying fish. It is easily recognized by its blunt forehead, shimmering silver blue skin and the dorsal fin that runs from the head to the tail. They grow to between 1 and 1.5 metres in length.

It is impossible to list all the species that may be seen, but with information on the position, date, size, colour and a quick sketch it is usually possible to identify the animals.

3. Reptiles—sea snakes and turtles.

There are about 50 species of sea snakes; they are poisonous and found in the Indo-Pacific. They are often seen swimming at or near the surface in coastal waters, especially in the area of the Arabian Gulf.

The seven species of marine turtles live in warmer waters all over the world. They all travel great distances during their lives but most information is known only about the green turtle, *Chelonia mydas*. About 100 to 120 eggs are buried in the sand above high water mark on a tropical beach. After 60 days the young hatch and push up through the sand to head for the sea. The turtles spend the next five to seven years exploring the oceans before looking for a suitable place to breed, which may be the same beach where they hatched. Mating takes place in the sea and then, each night during about 15 days, the female will come ashore to bury her eggs until she has laid about 1000. The turtles will then leave the beach and return in three years to breed. Of the 1000 eggs only one will survive the first five years to breed.

4. Mammals—whales, dolphins and seals.

There are about 80 different kinds of whales and dolphins which belong to the Cetacea. There are two sub-groups: the mysticeti are the whalebone or baleen whales including the minke whale that grows to 8 metres in length and the blue whale which can reach a length of 30 metres; the odontoceti are the toothed whales and they include the dolphins of 1.6–2.0 metres and the sperm whale which grows to about 20 metres.

Data are still needed on the distribution of Cetacea. Dolphins have disappeared from areas where they were once common; it is not known where they have gone. Any information is valuable—number, size behaviour, colour, the shape and size of blow, direction of travel and a quick sketch, no matter how rough. All this can help in identifying the species that was seen.

Seals and sea lions belong to the order Pinnipedia in which there are three families: true seals, eared seals and the walrus. The eared seals have an external ear and commonly breed on rocky shores (true seals breed on ice). There are frequent reports of the South African fur seal, *Arctocephalus pusillus*, swimming up to 750 n. mile from the South African coast. The pups stay at sea for the first two years before returning to the beaches to breed.

The information that is sent from the sea is extremely valuable. A constant stream of data can help to detect any changes in the distribution and abundance of marine life. During the next year, with the help of The Marine Society, I aim to produce a guide to marine life for seafarers.* I hope that the guide will be of interest and use to everyone at sea. Spotting animals and identifying specimens is a fascinating hobby. Seafarers are in a privileged position in being able to see animals in the wild that few marine biologists see in a life-time.

Acknowledgement: My thanks to Mr Peter Baker, 2nd Cook of P. & O., for drawing the specimens in Figure 1.

* *The Seafarer's Guide to Marine Life* will be published by Croom Helm Ltd in the spring of 1985.

AUSTRALIAN EXCELLENCE AWARDS

(from the Director of Meteorology, Bureau of Meteorology, Australia)

Ship's Excellence Awards were presented recently by the Commonwealth Bureau of Meteorology, Australia to the m.v. *Anro Australia* (Australian National Line), the m.v. *Kimberley* (West Australian State Shipping Service), the *Australia Star* (Blue Star Line) and the *Darwin Trader* (Australian National Line).

Individual awards were given to Mr David Barrett, Radio Officer of the *Anro Australia*, Mr P. J. George, 3rd Officer of the *Darwin Trader*, and to the following Masters of vessels of the West Australian Shipping Service: R. E. Marsh, D. C. Heppingstone, G. Evans, R. J. Hoyle, R. J. Stephens, G. H. Wharton, and E. T. Tomlinson.

The Bureau of Meteorology makes the awards on the recommendation of its Port Meteorological Agents in Melbourne, Sydney and Fremantle, in recognition of the provision of regular and accurate daily weather reports.

About 200 reports are received each day from the 93 ships in the Bureau's observing Fleet. With Australia surrounded by ocean areas, the reports from ships in what would otherwise be data-void areas are of great value in the preparation of weather forecasts and warnings.

AURORA NOTES JULY TO SEPTEMBER 1983

By R. J. LIVESEY

(Director of the Aurora Section of the British Astronomical Association)

In Table No. 1 are listed the observations made by ships during the period. In

Table 1—Marine Aurora Observations July to September 1983

DATE 1983	SHIP	GEOGRAPHICAL POSITION	TIME (GMT)	FORMS IN SEQUENCE
24 July ..	<i>Lord Strathcona</i> ..	57° 26' N, 01° 21' E	0146-0154	mRR
3 Aug. ..	<i>E. W. Beatty</i> ..	50° 02' N, 64° 30' W	0100-0400	RA, p ₂ RR, RA, R ₂ RA, R ₃ R, hA
8 ..	<i>Andes Discoverer</i> ..	52° 46' N, 23° 58' W	0250-0325	pRR
8 ..	<i>Cumulus</i> ..	57° 09' N, 19° 52' W	0000-0050	p ₃ RA, pm ₂ RA
9 ..	<i>Cumulus</i> ..	57° 09' N, 19° 52' W	0000-0250	p ₂ mR ₁ R, R ₁ mRR, p ₂ fR ₂ RA, p ₁ fR ₂ RA, qhG
12 ..	<i>Rubens</i> ..	47° 10' N, 86° 00' W	0100	RR, p ₂ RA
15 ..	<i>Pacific Courage</i> ..	51° 40' N, 51° 20' W	0140-0225	N, qHA, p ₄ RA, G, p ₂ RR, G
25 ..	<i>Anchises</i> ..	59° 10' N, 19° 35' E	0130-0300	N
29 ..	<i>Pacific Courage</i> ..	51° 55' N, 54° 30' W	0120-0230	hA, RA, fR ₂ R, mR ₂ R, mRR, mR ₃ R, mR,R
30 ..	<i>Pacific Courage</i> ..	50° 00' N, 62° 00' W	0200	NRR
19 Sept. ..	<i>Cumulus</i> ..	56° 54' N, 18° 12' W	2315-2340	amhR, RG, amhR ₂ RA

KEY: q=quiet, f=fragmentary, p=pulsating, p₁=rhythmic change of form, p₂=vertical flaming, p₃=flickering with rapid irregular variations, m=multiple, m₂=multiple (2 No.), m₃=multiple (3 No.), h=homogeneous, N=unspecified auroral form, G=glow, R=ray, RR=ray structures, R,R=short length rays, R₂R=medium length rays, R₃R=long length rays, A=arc, RA=rayed arc, S=surface.

Table No. 2 are given the dates of significant auroral sightings made by both land and marine observers. On several occasions sightings have been made by a single reliable observer. It should be emphasized that these reports relate to observations received and it may well be that aurora is present on certain nights when cloud cover or lack of reporting observers in suitable locations prevents detection. Artificial earth satellites can of course now monitor auroral activity from above, clear of tropospheric weather, but it is the human observer who appreciates the beauty as well as the scientific interest of the aurora in all of its forms.

Table 2—Auroral Observations July to September 1983, Summary of significant reports received (northern hemisphere)

DATE (NIGHT)	LOCATION AND NUMBER OF OBSERVERS	RANGE OF ACTIVITY	TIME (GMT)
12/13 July	Winnipeg (1)	5	0440-0516
23/24	Winnipeg, Scotland(2)	4-5	0146-0505
27/28	Nova Scotia (1)	6	0130-0300
2/3 Aug.	Newfoundland (1)	4	0100-0400
7/8	USA, Canada, Scotland, Finland, 'Lima' (9)	1-7	2340-0409
8/9	Scotland, 'Lima' (3)	1-5	0010-0250
11/12	Canada, Great Lakes (2)	4-6	0100-0713
12/13	Canada, Scotland (3)	3-5	2225-0700
14/15	Newfoundland (1)	1-5	0140-0225
28/29	Newfoundland (1)	2-4	0120-0230
29/30	Winnipeg (1)	4	0403
30/31	Winnipeg (1)	5	0317-0430
19/20 Sept.	'Lima' (1)	5	2315-2340
25/26	Winnipeg (1)	5	0443-0505

* Range of activity code: 1=glows, 2=homogeneous arcs, 3=rayed arcs, 4=ray bundles, 5=active moving storm, 6=coronal structure, 7=all sky activity.

On 15 August when m.v. *Pacific Courage* was at Lat. 51° 40'N, Long. 51° 20'W, Captain R. Dobie wrote in the weather logbook:

'Shortly before the aurora display took place, two separate spurious radar targets were observed at close range, the nearer being less than 2 miles away. These targets travelled a course of 233 degrees true at a speed of 25 knots, their courses being in the direct line for the position from which the aurora emerged. Nothing of these targets was visually sighted even although the visibility was excellent and an intense search for ships, aircraft and icebergs was carried out.'

This is likely to have been a case of a radar transmission pulse encountering the ion cloud at the base of the developing aurora and being scattered back towards the ship. Because of the range to the aurora the time for the outward and return journey for the signal pulse would be timed by the radar as if it were the next pulse returning from a close-range target.

Mariners may well have experienced spurious targets for a variety of reasons. Commander Henry Hatfield has confirmed to the writer that he has been able to detect the hills behind Bombay while steaming in the Gulf of Aden. Scottish radio operators, with suitable equipment, can intercept the echoes from the Greenland and Iceland mountains caused by HF radar transmissions emanating from the Soviet Union. Radar is used in research on the aurora with frequencies up to at least 3000 MHz. There are fixed radar stations for this purpose in north Scotland, Norway, Sweden and Finland. It is not surprising therefore if a ship's

radar picks up auroral echoes. Further, VHF and UHF signals which normally are used to travel in straight lines may be bent round the curvature of the earth, owing either to thermal layers in the lower atmosphere or to ducting along the ionosphere if the signal meets the ionosphere at a grazing angle, thus contacting targets at long ranges.

As the sunspot cycle is declining so is the aurora. Fewer big transient storms are being encountered but as the sun develops coronal 'holes' in its outer atmosphere there will be periods of magnetic disturbance accompanied by quiet aurorae. There is less evidence of reported sightings from the southern hemisphere, which is also indicative of the changing conditions. When big transient storms have taken place, reports have come in from Western Australia. The lack of Australian reports reflects the pattern of activity as seen in the Atlantic region.

The most spectacular sightings have been made in Canada and around the region of the Great Lakes. Because of the eccentricity of the magnetic field relative to the geographic axis, aurorae are directed further towards the equator in this region of the northern hemisphere, and, in summer, into the darker skies. Ships steaming into the St Lawrence Seaway and on the Great Lakes have therefore a better possibility of encountering the Aurorae having significant activity than those on the western European seaboard. Consequently, at the present time reports of significant auroral activity emanate regularly from Winnipeg, Detroit, Toronto and Halifax and from ships in the region of Newfoundland. In Table No. 3 is given a comparison of the most southerly observation of the aurora received for a number of events seen on both sides of the Atlantic.

**Table 3—Large Auroral Storms 1977–83
Most Southerly Reports Received**

STORM No.	MINIMUM GEOMAGNETIC LATITUDE IN U.K.	MINIMUM GEOMAGNETIC LATITUDE IN N. AMERICA
1	57	53
2	55	54
3	59	51
4	57	52
5	58	53
6	52	52
7	58	55
8	56	53
9	57	54
10	57	52
11	57	52
12	57	53
13	57	53
14	56	53
15	59	53
16	58	53

(Continued overleaf)

Table 3 (contd)

GEOMAGNETIC LATITUDE	Locations	
	U.K. AND EUROPE	N. AMERICA
51	Lorient	New York
52	Le Havre	Cleveland
53	Calais	Detroit
54	London	Buffalo
55	Bedford	Toronto
56	Nottingham	Halifax N.S.
57	Liverpool	Montreal
58	Carlisle	St Johns
59	Glasgow	Port Arthur

ICE CONDITIONS IN AREAS ADJACENT TO THE NORTH ATLANTIC OCEAN FROM DECEMBER 1983 TO FEBRUARY 1984

The charts on pages 146 to 148 display the actual and normal ice edges (4/10 cover), sea-surface and air temperatures and surface-pressure anomalies (departures from the mean) so that the abnormality of any month may be readily observed. (The wind anomaly bears the same relationship to lines of equal pressure anomaly as wind does to isobars. Buys Ballot's law can therefore be applied to determine the direction of the wind anomaly). Southern and eastern iceberg limits will be displayed during the iceberg season (roughly February to July). In any month when sightings have been abnormally frequent (or infrequent) this will be discussed briefly in the text.

The periods used for the normals are as follows. Ice: 1966-75 (Meteorological Office). Surface pressure: 1951-70 (Meteorological Office). Air temperature: 1951-60 (US Department of Commerce, 1965). Sea-surface temperature: area north of 68°N, 1854-1914 and 1920-50 (Meteorological Office, 1966), area south of 68°N, 1854-1958 (US Navy, 1967).

DECEMBER

Pressure continued to be lower than normal over Greenland and in the vicinity of the Kara Sea. An anomaly for westerly winds resulted in the persistence of the previous excess of ice through the Davis Strait and near the approaches to Hudson Strait. By the end of the month, ice had also extended further south-east than usual over the Labrador Sea. Pressure and temperature anomalies were less marked over the Gulf of St Lawrence, and here ice conditions were near normal. Over the Greenland Sea anomalies were rather weak, resulting in little change in the position of the ice edge, so that the previous deficit of ice continued. Over the Barents Sea, despite a well-defined anomaly for northerly winds, there was little change in ice conditions, a feature which is difficult to explain in terms of pressure and temperature anomalies. There was, however, some tendency for ice to form earlier than usual in the Baltic seas.

JANUARY

The dominant feature was for much lower pressure than normal centred near Iceland. The strong anomaly for westerly winds over the North Atlantic Ocean resulted in a continued excess of ice south of the Davis Strait and north-east of Newfoundland. Icebergs were reported much further east than usual, including one exceptional sighting near 59°N, 28°W. East of Greenland the anomaly was for southerly winds, so that the ice edge remained north of its usual position. There was, in fact, some recession of ice over the Greenland and northern Barents seas. The previous deficit of ice off East Greenland became larger in extent and deficits of ice developed over the Barents and White seas and in the Gulf of Finland, where previously ice conditions had been near normal.

FEBRUARY

Pressure continued to be lower than usual near Iceland but the significant feature was for much higher pressure than normal over north-west Russia. Over the Labrador Sea and east of

Newfoundland, the anomaly for west or north-westerly winds continued. The position of the ice edge and limit of icebergs was, again, much further east than usual. There was some anomaly for southerly winds over the Gulf of St Lawrence and an extensive open water lead developed along the western coast of Newfoundland East of Greenland, the result of the high pressure over Russia was for a change to a much stronger anomaly for south-west or westerly winds. The previous pattern for deficits of ice continued with little change over the Greenland and Baltic seas. However, over the Barents Sea there was unusual recession of ice, and extensive areas of open water developed along the western shores of the Kara Sea, which is normally ice-covered until the end of May.

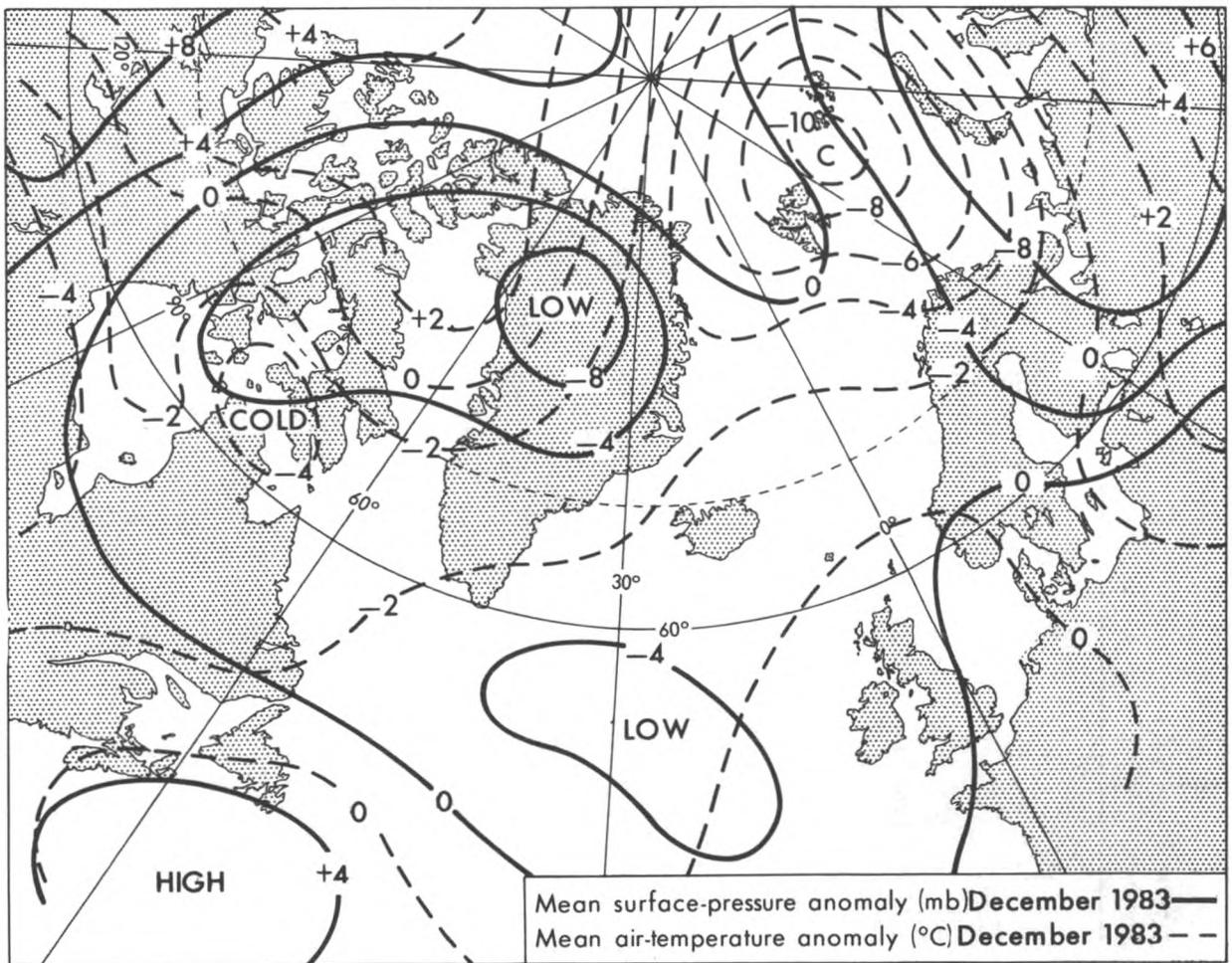
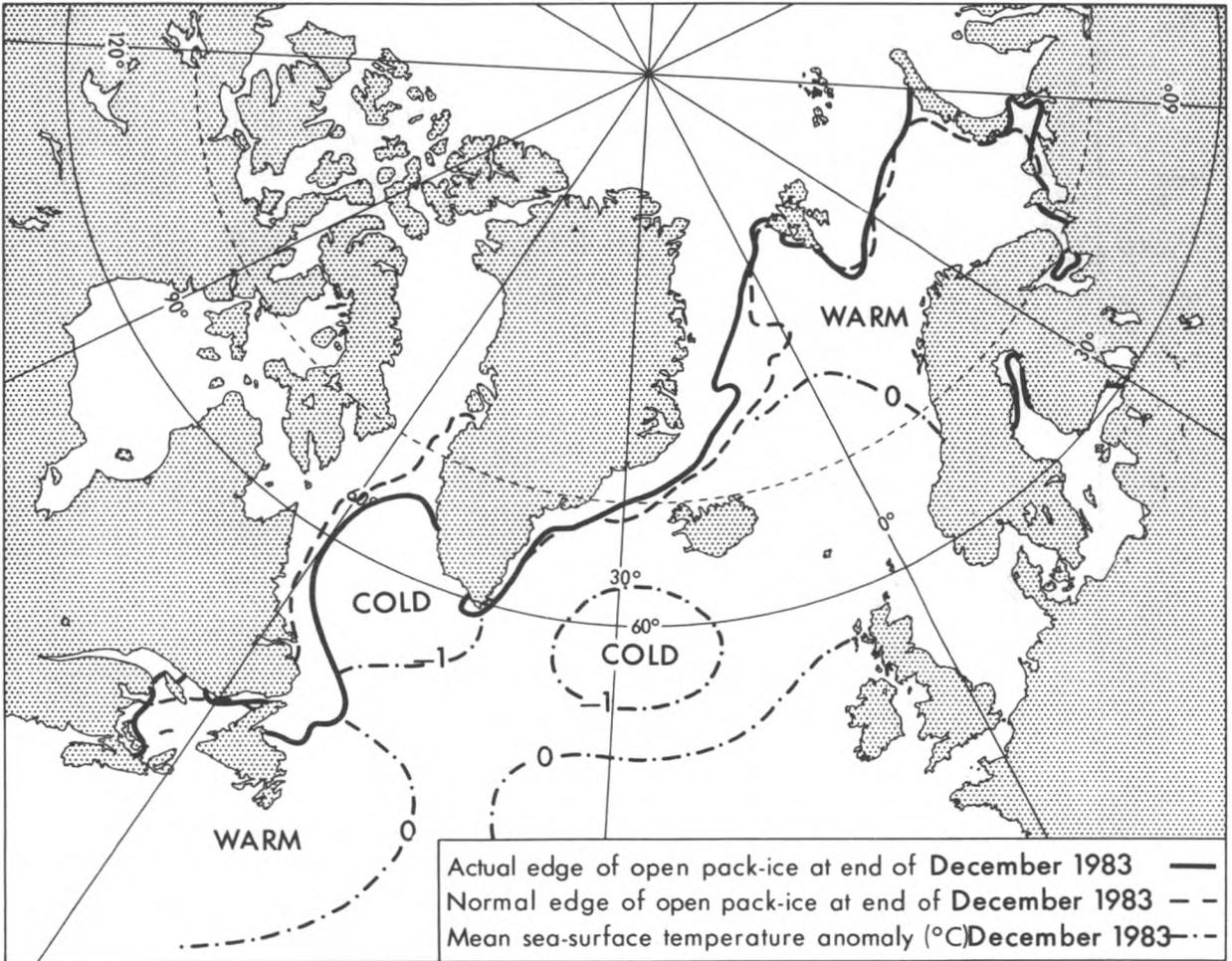
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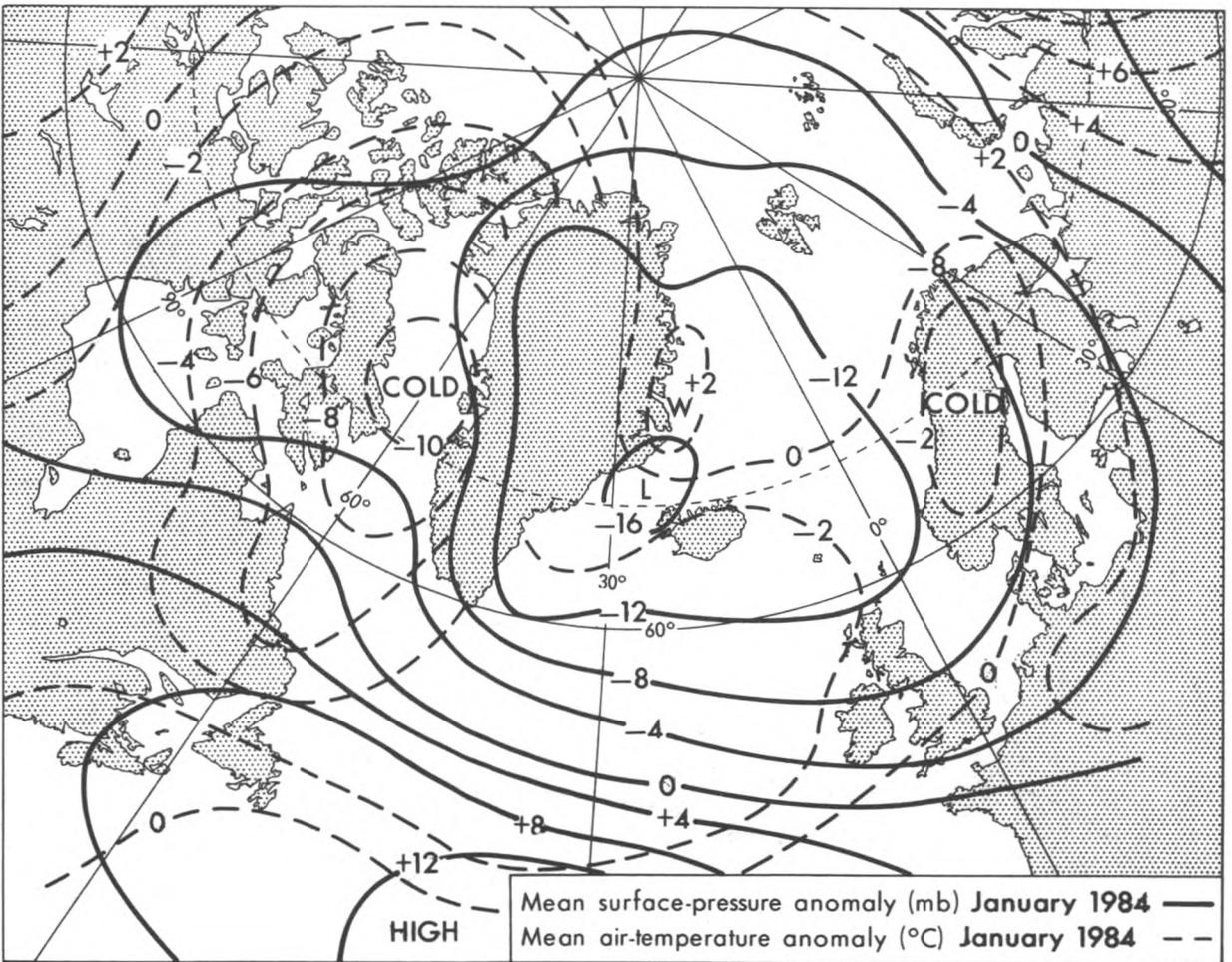
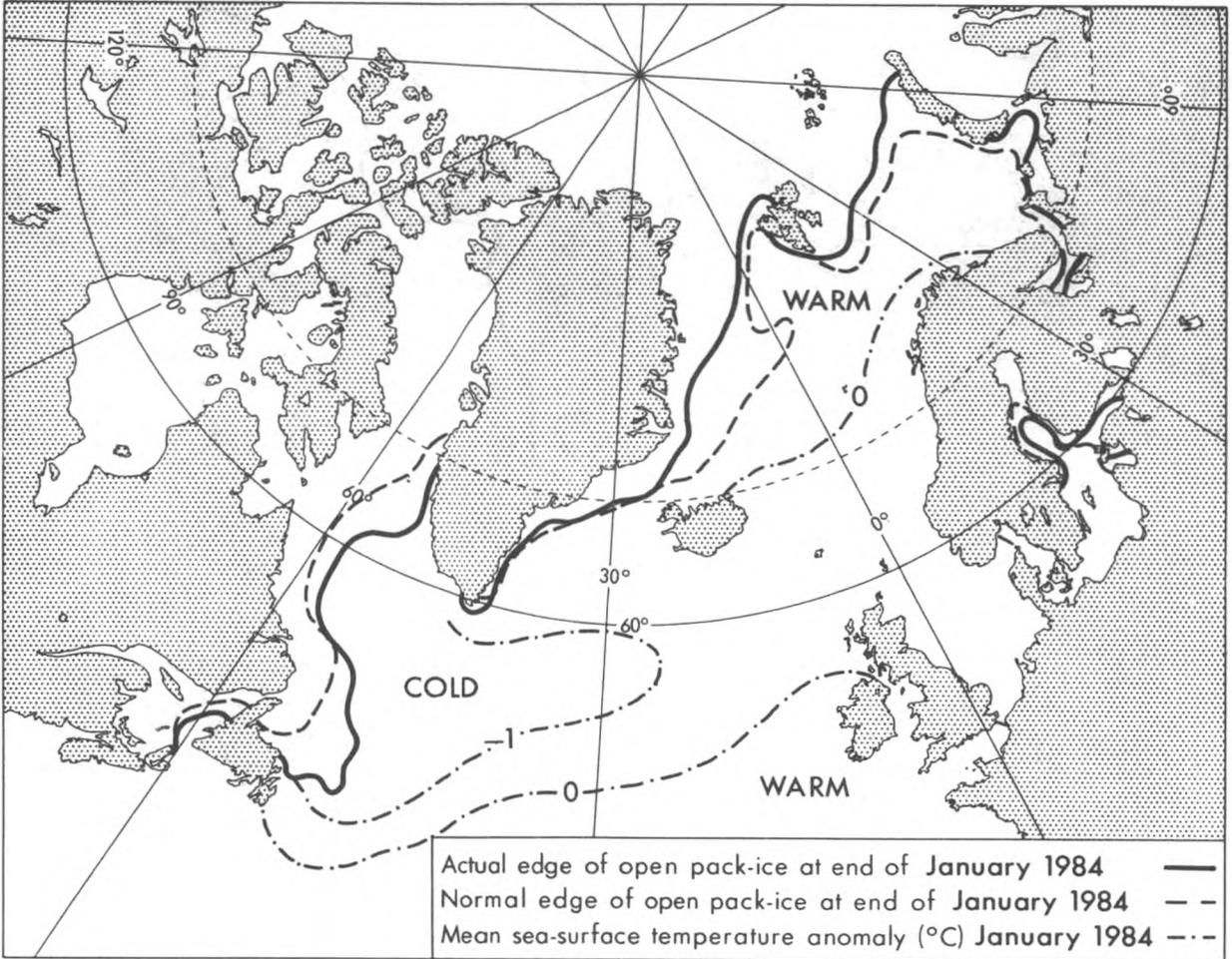
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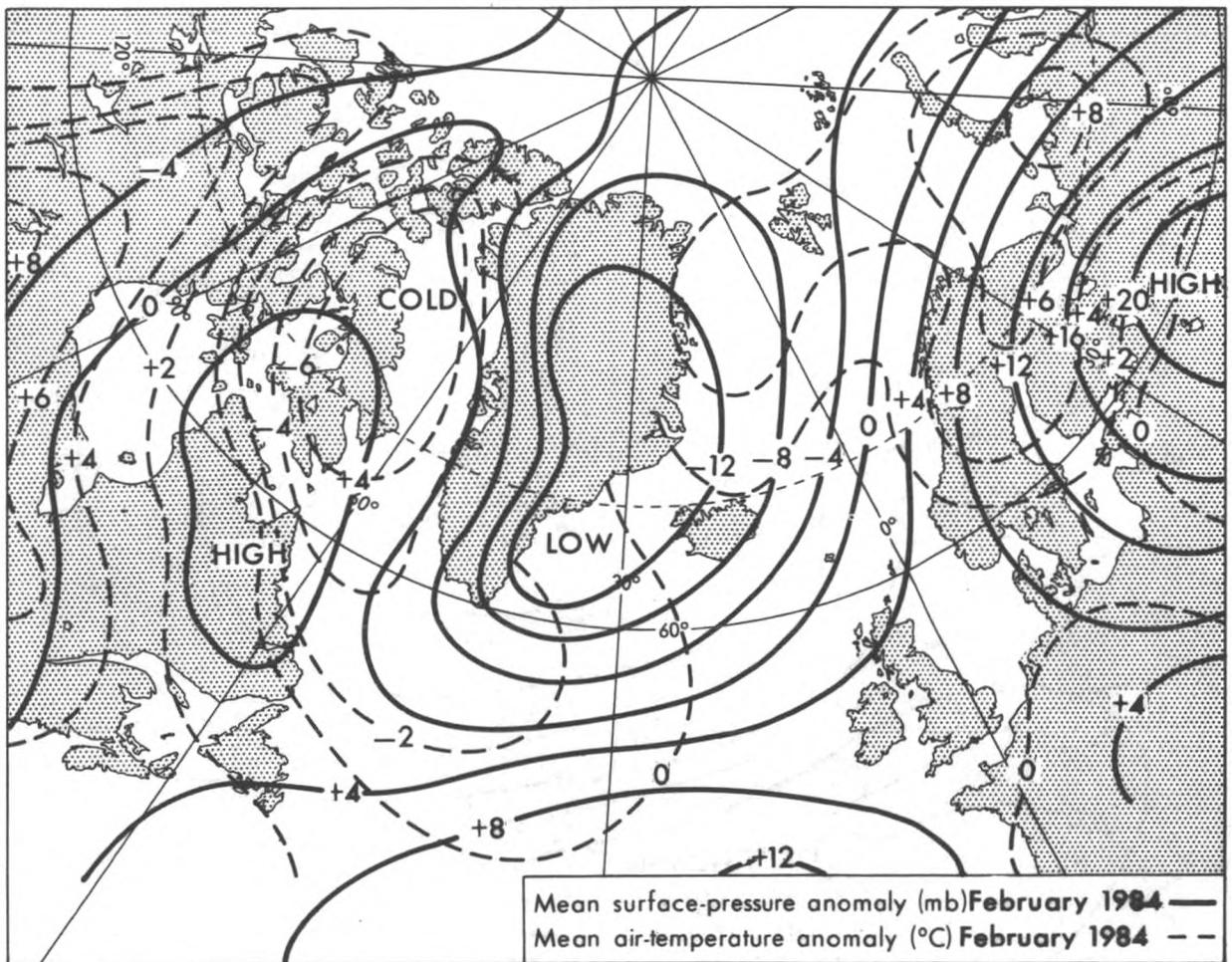
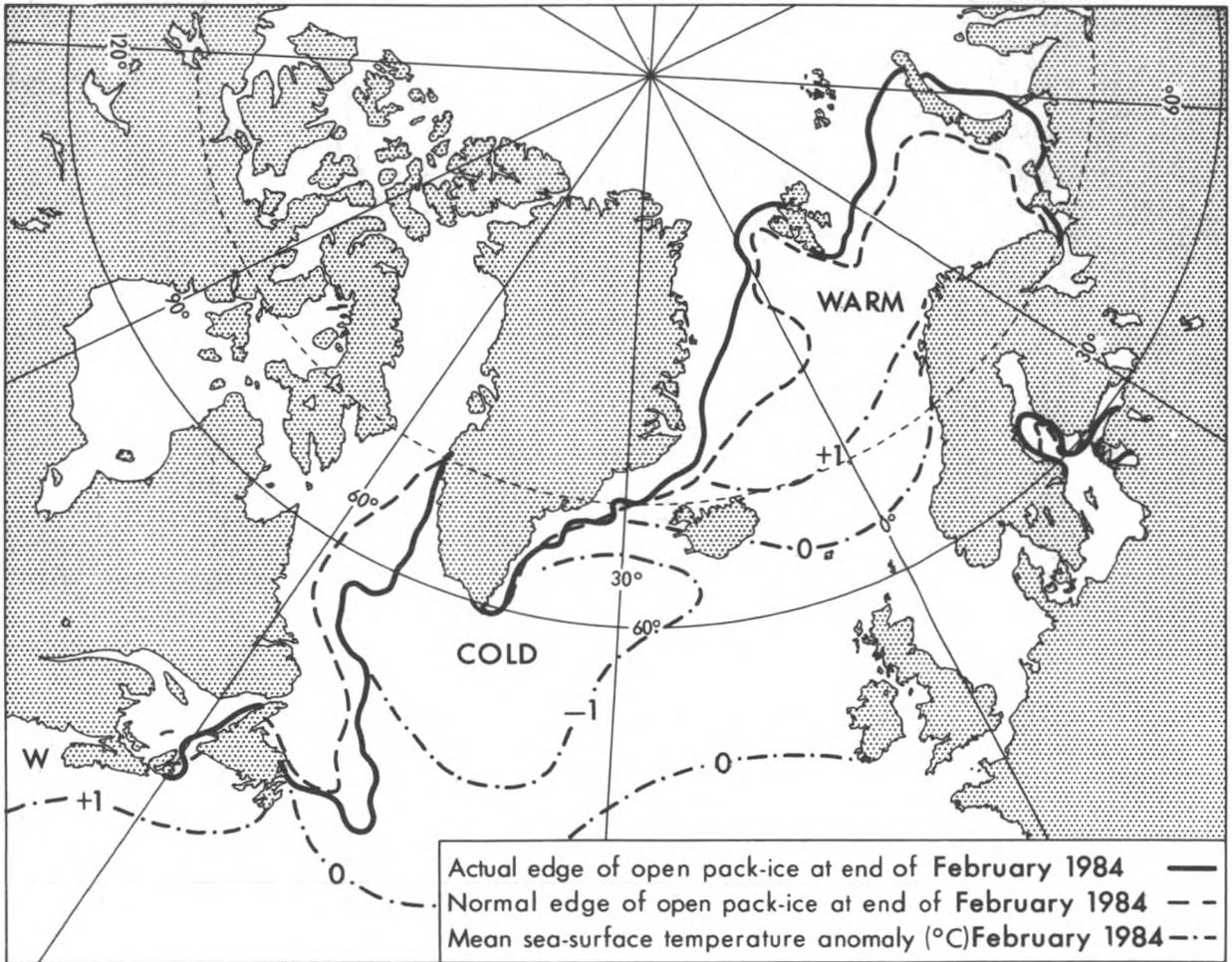
Baltic Ice Summary: December 1983—February 1984

No ice was reported at the following stations during the period: Visby, Emden, Bremerhaven, Flensburg, Kiel, Rostock, Gdansk, Aarhus, Copenhagen, Oslo, Kristiansandfjorden.

STATION	DECEMBER 1983						JANUARY 1984						FEBRUARY 1984					
	LENGTH OF SEASON		ICE DAYS		NAVIGATION CONDITIONS		ACCUMULATED DEGREE DAYS		LENGTH OF SEASON		ICE DAYS		NAVIGATION CONDITIONS		ACCUMULATED DEGREE DAYS			
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I
Luleå ..	1	31	31	31	0	31	0	0	524	1	31	31	31	0	1	30	0	919
Skellefteå ..	1	31	31	31	0	26	5	0	—	1	31	31	31	0	0	31	0	—
Bredskar (Vaktaren) ..	1	31	24	11	12	22	1	0	—	1	31	26	8	13	19	1	0	—
Sundsvall ..	1	31	29	1	2	29	0	0	—	1	31	31	1	22	24	7	0	—
Sandarne ..	2	31	27	27	0	27	27	0	—	1	31	31	31	0	21	10	0	—
Oxelösund ..	0	0	0	0	0	0	0	0	—	0	0	0	0	0	0	0	0	—
Kalmar ..	0	0	0	0	0	0	0	0	—	0	0	0	0	0	0	0	0	—
Göteborg ..	0	0	0	0	0	0	0	0	—	23	31	9	0	9	9	0	0	—
Stockholm ..	12	31	20	0	20	20	0	0	87	1	31	31	9	22	31	0	0	180
Helsinki ..	12	31	20	0	20	20	0	0	120	1	31	31	0	31	31	0	0	252
Turku ..	12	31	20	0	20	20	0	0	146	1	31	31	8	23	31	0	0	286
Mariehamn ..	0	0	0	0	0	0	0	0	—	24	31	8	0	8	3	0	0	161
Mäntyluoto ..	2	31	30	0	30	30	0	0	—	1	31	31	0	31	31	0	0	—
Vaasa ..	1	31	31	0	11	12	0	0	258	1	31	31	31	0	6	25	0	515
Norrskär ..	1	28	16	0	11	12	0	0	—	1	31	24	0	22	5	19	0	—
Oulu ..	1	31	31	31	0	0	31	0	—	1	31	31	31	0	0	19	12	—
Roytta ..	1	31	31	31	0	24	7	0	—	1	31	31	31	0	0	31	0	—
Leningrad ..	1	31	31	15	16	11	20	0	166	1	31	31	20	11	0	31	0	276
Vyborg ..	1	31	29	29	0	1	28	0	—	1	31	31	31	0	0	31	0	—
Tallin ..	0	0	0	0	0	0	0	0	—	0	0	0	0	0	0	0	0	—
Riga ..	14	19	6	0	6	6	0	0	84	24	31	7	0	7	2	0	0	150
Pärnu ..	1	31	31	22	0	30	1	0	104	1	31	31	20	11	8	3	20	186
Ventspils ..	0	0	0	0	0	0	0	0	—	0	0	0	0	0	0	0	0	—
Klaipeda ..	15	23	4	0	1	1	0	0	45	11	31	11	0	11	1	0	0	80
Hamburg (Elbe) ..	16	23	6	0	6	5	0	0	—	0	0	0	0	0	0	0	0	—







A VOTE OF THANKS TO MARINE BIRDWATCHERS

I considered it something of an impertinence to offer to take over the liaison with the Met. Office for the Royal Naval Birdwatching Society in the wake of Captain G. S. Tuck, DSO, RN, an authority on seabirds of many years' standing. However, to relieve a little of the pressure on the other, overburdened, officers of the Society I took the plunge and offer my relatively limited knowledge to fellow seafarers who very generously send in reports of bird sightings with their meteorological logs. (May I point out that I only deal with seabirds, land birds being the speciality of our Chairman, Commander M. Casement, RN.)

Though unfortunately somewhat hampered by domestic matters, I have much enjoyed the first year in this capacity and am very impressed by the interest shown by many observers, and hope that my comments are of some little interest and/or assistance, and possibly help to stimulate more enthusiasm for this enjoyable and rewarding pastime.

The reports themselves vary from the meticulous and artistic to the relatively crude and brief, although all are given the same attention and it is not always the most artistic which are the easiest to diagnose if adequate details are not given. Some of the photographs submitted are very good and are of course invaluable for identification and our records, especially of the birds which come on board. Of birds in flight, as I know only too well, it takes patience, practice and much wasted film to obtain reasonable results (the disappointment rate is very high, especially for beginners). I recommend strongly that expert advice should be obtained on gear etc.—I didn't and now regret it!

I myself was introduced to the Society, some 15 years ago, through a meteorological report; a tiny bird came aboard in mid North Atlantic and was duly sketched and reported in our meteorological log. I received a very nice letter from the then Chairman, Captain G. S. Tuck, advising that it had been a Gold Crest—in mid Atlantic! From then on I was hooked, became a member, and after quite a while ventured into logging and reporting my observations; I dropped my share of clangers in the process, nothing ventured, nothing gained. I greatly treasure my slide of that little Gold Crest, dwarfed by my binoculars; did he make it I wonder?

For anyone really interested in the subject, apart from a reasonable pair of binoculars, a good Field Guide is invaluable; initially the Seafarers Education Service helped me with a copy of 'Birds of the Ocean' by W. B. Alexander, this later being superseded by the much more comprehensive and easier 'Seabirds of Britain and the World' by Tuck and Heinzel, which is within reach of most pockets. There are also other more specialized books but these can be expensive and too bulky in these days of relieving abroad by air travel.

The R.N.B.W.S. has provided much valuable information on seabird distribution and migration patterns, and also land birds at sea, since its inception immediately after the Second World War, and is held in high regard by other ornithological institutions with whom there is a good working relationship. Originally, as the name implies, the Society was purely Royal Navy, but it was soon realized that Merchant Navy personnel would greatly widen the scope of activity to everyone's benefit and so we 'civilians' were cordially invited along and now form a good proportion of Membership; thus much reporting is done by M. N. personnel of all ranks including wives.

Being by its very nature a fairly exclusive 'Club', the present membership stands at about 440, a considerable number of whom are active in the reporting field. Birdwatching does take a little time and effort, and is both relaxing and rewarding, but we would very much like to increase membership and thus our coverage of the oceans.

From the standard of the meteorological reports that I have so far dealt with it is very apparent that there are many interested and also quite knowledgeable

observers abroad, and to these I offer a most cordial invitation and warm welcome to the 'Club' and to become involved in a scientific work of great interest and international importance.

When I look back on all the golden opportunities I let slip in my earlier seafaring days, I greatly wish that my little Gold Crest had put in a much earlier appearance.

I shall be most pleased to acquaint any interested party with further details of the Society whether directly or through the kind offices of the Met. Office (Captain M. L. McN. Coombs, with whom I correspond on the meteorological reports).

Finally, on behalf of the Royal Naval Birdwatching Society, may I indeed thank all those troubling to send in reports of sightings (no matter how crude): good sailing, a prosperous year ahead, and please carry on the good work.

Captain Anthony S. Young, MN
(Presently Deep Sea Pilot)

Book Review

The Heyday of Steam by Colin White. 245 mm×180 mm, 176 pp., *illus.* Kenneth Mason Publications Ltd, 8 North Street, Emsworth, Hampshire PO10 7DD. Price: £11.95.

At first sight the casual reader might classify this work as more of a picture book than a history—yet in an age when so much is learned or viewed in a combination of sight and sound, a similar arrangement in print seems appropriate and logical, and since many photographs and prints are fully authentic, they help the uninformed to create a much more accurate image than might otherwise be possible.

However, the penalty for providing such a splendid range of pictorial coverage of the subject is inevitably a reduction in text and perhaps a tendency to skip detail, which the more earnest student might regret. For those who seek to refresh their memory or fill gaps in knowledge of this era of naval events, there is more than enough for their purpose.

Perhaps the most intriguing message of the book is the stature of the Royal Navy in the eyes of the rest of the country. At that time, the man in the street, less well informed than now, probably accepted with little questioning the role and practice of the Navy and so more readily appreciated the worth of those afloat and their contribution to the strength of the Victorian Empire. Some resurgence of this attitude was evident during and after the recent South Atlantic conflict, but seemingly not with the depth of feeling that appeared to obtain when the affairs of the Navy were even more intermingled with the life of the Royal Family.

By contrast, and because of the transition from the age of sail, there was less pampering to the comfort of a ship's company than is enjoyed today—open bridges, with perhaps no more than a canvas dodger must have made watchkeeping a test of endurance—while in action (or during the inevitable practice firing) plenty of cotton wool, or its equivalent of the day, would have been needed for ear protection where gun and bridge were in close proximity and the size of the former was up to 16.25 inches. Below decks, again by today's standards, there was much that was rough and ready—although the officers clearly had a higher degree of comfort. The author's comment on the 'large gulf' between the two is of course correct, but was it really so very different from that which obtained in other services—or come to that—in most industries?, but this is not the time or place to discuss the ethics of such arrangements.

What is also manifest is the degree to which history repeats itself. The book spans the years from 1870 to 1910, a time of great technological change and development, and so it was as difficult then as now, for those charged with maintaining the highest possible quality of fighting force, to 'sift the chalk from the cheese' and pick warship designs that met the staff requirement in full. The need to pack in the maximum striking power and yet provide speed, endurance, seaworthiness and armoured protection from comparably sized guns was not easily resolved and resulted in a wide variety of vessels. The much reduced Royal Navy of today has the same conundrum to resolve, on a much tighter budget and with more critical scrutiny.

The author, on the staff of the Royal Naval Museum, Portsmouth, is ideally placed to provide the wide-ranging and extensive pictorial back-up to his history. The end result is original and interesting and allows a close look at Naval life as it was in the period covered. It is likely to be a welcome addition to the bookshelves of all those with an interest in such matters.

This book is the second in a series; the first *The end of the Sailing Navy* by the same author was reviewed in the July 1981 issue of *The Marine Observer*.

LT.-CDR P. F. C. SATOW, MBE, RN (RET'D), FNI, MRIN.

Notice to Marine Observers

APPOINTMENT TO THE NAUTICAL STAFF OF THE MARINE DIVISION AT BRACKNELL

Captain M. L. McN. Coombs has been appointed to the Marine Division of the Meteorological Office and posted to Headquarters in Bracknell.

Mike Coombs was apprenticed to Port Line Ltd in 1946, and served in all ranks in that Company, which is now a member of the Cunard Group, until shortly before joining the Meteorological Office. He attained command of his first ship in 1963, and has since served as Master in many vessels of the Group.

Fleet Lists

GREAT BRITAIN (Information dated 16.3.84)

The following is a list of British ships which have been equipped with instruments and which voluntarily co-operate with the Marine Division of the Meteorological Office. The names of the Masters, Observing Officers and Senior Radio Officers are given as ascertained from the last written returns received. The date of receipt of the last return is given in the second column. An asterisk indicates a new recruitment who has not yet sent in a logbook.

All returns received from observing ships will be acknowledged, direct to the ship, by the Marine Superintendent of the Meteorological Office.

The Port Meteorological Officers will make personal calls on the Masters and Observing Officers as opportunity offers, or on notification from the ship at any time when their services are desired.

Excellent Awards are made at the end of each calendar year. The names of the Masters, Principal Observing Officers and Radio Officers gaining these awards are published each July in *The Marine Observer*.

It is requested that prior notification of changes of service, probable periods of lay-up, transfer of Master or other circumstances which may prevent the continuance of voluntary meteorological service at sea, may be made to a Port Meteorological Officer or to the Marine Superintendent of the Meteorological Office at Bracknell. Masters and Officers are invited to point out any errors or omissions which may occur in the list.

Selected Ships

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
Abbey	22.11.83	T. C. Willcox	C. M. Billington, P. C. Waite, D. G. Olley	M. Gibbs	Furness Withy (Shipping) Ltd
Acaous	16.2.83	J. L. Taylor	A. M. Davies, L. Rigby, A. S. Burgess	G. G. Graham	Shell Tankers (U.K.) Ltd
ACT 1	30.11.83	J. M. Harnais	R. J. Shuttleworth, M. Power, G. Thorburn	M. Hanraads	Blue Star Management Ltd
ACT 6	13.7.83	M. H. C. Twomey	A. Staveley, S. E. Richard-Dit-Leschery, R. B. Lloyd	M. Newton	Cunard Shipping Services Ltd
ACT 7	27.1.84	D. Newlin	D. J. Horsfield, J. R. Webber, M. J. O'Keefe	D. Owen	Blue Star Management Ltd
Afric Star	31.10.83	G. D. Easton	C. J. Yarrow, K. Lumby, H. A. Roberts	N. Macaskill	Blue Star Management Ltd
Al Shamiah	23.10.78	T. Williams	P. Walley		United Arab Shipping Co. (S.A.G.)
Albright Explorer	29.11.83	D. A. Maclean	J. C. Warmingham, J. G. Nixon, D. A. Macleod	G. Cassidy	James Fisher & Sons Public Ltd
Albright Pioneer	20.2.84	M. Rossiter	T. Wright, J. Nixon, N. J. B. Fisher	J. Ryan	James Fisher & Sons Public Ltd
Alert	18.5.83	D. W. Alford	G. Chant, P. J. Footman-Williams, G. W. Weaver	A. R. Carr	British Telecom International
Almeda Star	7.2.84	T. Black	J. C. Hunter, W. R. Wright, T. P. Green	P. Davies	Blue Star Management Ltd
Almeria Star	1.3.84	G. Stubbings	P. A. Duggie, C. J. Poulter, B. P. Stockdale	J. Ramsay	Blue Star Management Ltd
Amastra	8.3.84	R. Palmer	J. Zerata, G. P. Donnelly, R. G. Stollery	A. Cook	Shell Tankers (U.K.) Ltd
Anco Charger	23.1.84	K. Lewis	J. Kennedy, P. Southcombe	B. Cridge	PAL Shipping Services Ltd
Anco Endeavour	10.2.84	J. A. Hagger	S. R. Anderson, A. W. Simonds, J. L. Wainwright	R. P. Bradsell	PAL Shipping Services Ltd
Andalucia Star	19.12.83	P. H. Daniel	N. Hibberd, B. M. E. Baggaley, P. R. Kirkman	N. E. Scott	Blue Star Management Ltd
Andes Discoverer	15.11.83	G. N. Gaunt	I. J. Butler, P. M. Bell, C. P. M. Lucas	P. Hammerman	Canadian Pacific Steamships Ltd
Andes Trader	17.10.83	J. Waling	C. T. Hentley, T. Robinson, I. R. Phillis	I. D. Hamilton	Canadian Pacific Steamships Ltd
Andes Voyageur	14.3.84	I. Macgregor	J. Goble, M. J. Conlan	H. Roberts	Canadian Pacific Steamships Ltd
Apapa Palm	8.2.84	M. Hurley		M. F. Lavan	Palm Line Ltd

Appleby	R. W. Henderson	G. W. Paterson, I. R. Wemyss, R. W. Garner	A. M. Begg	Ropner Management Ltd
Arafura Sea	M. J. Dickens	C. P. Bootman, A. Morley, D. J. Hagon, G. Collinson	D. Passmore	Denholm Ship Management Ltd
Arapaho	R. H. Jones	R. T. Lammung, I. Mathison, M. H. Farmer	P. Johnson	Silver Line Ltd
Asia Winds	I. H. Watterson	P. M. N. Marsham, M. J. Harrison, M. E. Winter	C. W. Knibb	T. & J. Harrison Ltd
Ataman	H. Vane	I. F. Scarr, M. G. Wood, H. McWilliam	A. E. H. Jones	Transocean Maritime Agencies
Atlantic Fisher	E. J. Jackson	G. M. Kay, N. J. Nash, A. Tweedie	J. Cooney	James Fisher & Sons Public Ltd
Atlantic Star	M. H. Wilson	J. D. Pinder, N. J. Blacker, T. J. Fox	E. G. Smartt	Cunard Shipping Services Ltd
Aurora	E. Maxwell	B. J. Walker, M. Farmer	C. R. Brown	P. & O. Lines Ltd.
Author	A. W. Kinghorn	P. C. Sellers, A. J. Brown, J. D. Willis-Richards	M. Bell	T. & J. Harrison Ltd
Avelona Star	R. MacDougall	G. D. S. Hope, K. W. Reynolds, R. L. Prestly	A. Camp	Blue Star Management Ltd
Avon Forest	G. A. Davies	R. A. Wilson, D. M. Lynch		Harrison (Clyde) Ltd
Avondyke	D. H. Munro	S. Jesson, P. Bowers		North British Shipping Ltd
B.P. Harrier	R. Davidson	C. G. Willis	A. Webster	B.P. Oil Ltd
Badagry Palm	G. Remyton	C. E. Devey, D. W. Sharp, M. A. Jackson	A. Vertannes	Palm Line Ltd
Balder London	R. Kreamer	B. Elworthy, D. Glass	H. P. Anderson	Ugland (U.K.) Ltd
Baltic Progress	J. Rose	R. M. Raybould, P. E. Scott, D. Sweet	B. Huzzard	United Baltic Corp. Ltd
Baltic Eagle	A. S. Hobbins	G. Proctor, R. T. Blomfield, L. A. Hudson	M. H. Breeze	United Baltic Corp. Ltd
Bamenda Palm	L. M. Hocking	C. Doris, R. D. Gernon, A. Mackie	A. Honan	Palm Line Ltd
Baron Belhaven	J. M. MacKay	R. J. Sinclair, S. A. Budd, C. R. Williamson	J. Tomlinson	Lyle Ship Management Ltd
Baron Kinnaird	J. McCully	D. C. Reed, D. W. Little, F. P. Garbutt	M. J. Mitchell	Lyle Ship Management Ltd
Bay Fisher	R. J. Sankey	K. L. Brooks, J. D. Allen, J. Monk	G. P. Watts	James Fisher & Sons Public Ltd
Beacon Grange	J. R. Milne	B. W. Wood, A. Glen, M. Wills, G. Day	S. Drinkwater	Furness Withy (Shipping) Ltd
Ben Ocean Lancer	A. C. Spencer	K. Kennedy, A. Gibson, A. V. Plant, J. H. Clark	E. O'Sullivan	Ben Line Steamers Ltd
Benalbanach	W. C. McKenzie	P. Trickey, J. Grant, D. Keillor	J. S. Hallam	Ben Line Steamers Ltd
Benalder	C. P. Browne	T. V. Roberts, A. McKee, F. Anderson	J. S. Hallam	Ben Line Steamers Ltd
Benavon	P. J. Warren	R. Sharp, A. Kemp	M. Winter	Ben Line Containers Ltd
Bendoran	P. Hurlock	E. A. White, P. A. Owen	I. M. Clarke	Ben Line Steamers Ltd
Benedict	O. Henderson	H. W. Stewart, I. M. Morrison, I. Hogg	P. Hannon	Ben Line Steamers Ltd
Benhope	I. G. Morrison	L. D. Thomson, W. A. Horsburgh, A. W. Morrison	P. J. Clery	Ben Line Steamers Ltd
Benledi	McFee			Ben Line Steamers Ltd
Benlmond	T. Fyfe	R. S. Basford, T. D. Corbett, S. Fish	W. J. M. Campbell	Atlantic Drilling Co. Ltd
Benvorlich	M. Green	A. R. Winn, R. Harris, I. Whittaker		Ben Line Steamers Ltd
Benvorackie	A. J. Montgomerie	R. Baker, I. C. Oke, M. J. Court	B. Hansen	Ben Line Steamers Ltd
Binsnes	D. W. Miller	T. J. Purse, D. A. Wedderburn	R. C. Taverner	Atlantic Drilling Co. Ltd
Bise	P. Andreassen	S. Steen, M. Gaarder, J. Andersen, L. Nedland	T. T. Kaford	Denholm Ship Management Ltd
Black Prince	T. Fleten	K. Karlsen, H. Aas	S. Robbestad	Fred Olsen Ltd
Black Watch	A. Smart	C. U. Adams, D. J. Ayling, A. Smith	P. D. Dredge	Fred Olsen Ltd
Bolnes	P. Hurlock	T. P. Gillespie, M. Moorhouse, T. P. Green	N. Maclean	Jebsens Ship Management Ltd
Boniface	T. L. Watson	S. C. Lugg, P. Davies, M. Leech	P. I. Pegg	Denholm Ship Management Ltd
Botany Bay	M. J. Cole	C. J. Holmes, A. M. T. Reading, J. B. Hawkins	H. M. O'Gorman	Fred Olsen Ltd
Bransfield	H. Hall	P. A. Harris, D. J. Podger	P. Neely	Jebsens Ship Management Ltd
Bridgeman	M. Dunning	M. Blamires, A. Chylak	P. F. Rogers	Overseas Containers Ltd
British Avon				British Antarctic Survey
				Rowbotham Tankships Ltd
				B.P. Shipping Ltd

Selected Ships (contd)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>British Beech</i>	4.10.83	E. Coates	L. Bishop, J. Gibson	A. Crocker	B. P. Shipping Ltd
<i>British Dart</i>	7.11.83	D. A. White	W. J. Daniel, T. M. Benham, A. L. C. Smith	A. Riordan	B. P. Shipping Ltd
<i>British Esk</i>	4.1.84	J. F. Hobbs	H. J. Conlon, A. J. Drew, L. E. McGrath	D. Worthy	B. P. Shipping Ltd
<i>British Forth</i>	18.10.83	P. N. Johnson	S. D. Puntun, A. K. Trotter		B. P. Shipping Ltd
<i>British Humber</i>	1.9.83	I. Oliphant	I. D. Williams, T. M. Stone, R. Crawford	P. Ruddick	B. P. Shipping Ltd
<i>British Kennet</i>	15.2.84	P. Waller	I. Pellowe, H. N. Gates, A. W. Duffin	A. Brown	B. P. Shipping Ltd
<i>British Normess</i>	26.4.83	P. N. Johnson	A. S. Kenyon, A. K. Trotter, A. Rawlinson	D. A. Tait	B. P. Shipping Ltd
<i>British Ranger</i>	16.1.84	J. W. Graves	R. C. M'aleese, C. Beaton	G. L. Smeaton	B. P. Shipping Ltd
<i>British Reliance</i>	16.3.84	J. A. M. Taylor	A. D. Haworth, M. Amos, I. L. McLean	A. J. Steven	B. P. Shipping Ltd
<i>British Resolution</i>	10.8.83	A. H. Skellern	H. N. Gates, P. A. W. McNicholl	R. G. Hall	B. P. Shipping Ltd
<i>British Resource</i>	13.1.84	M. Stephenson	I. Hodge, R. Whatmore, K. Lynch	C. Davidson	B. P. Shipping Ltd
<i>British Respect</i>	8.2.84	J. M. Ronald	A. J. Lockie, R. J. Crawford, N. J. Palmer	D. W. Bone	B. P. Shipping Ltd
<i>British Security</i>	29.11.83	F. A. Smith	D. Morrison, N. Scarratt, P. A. Terry	G. Wilson	B. P. Shipping Ltd
<i>British Skill</i>	13.1.84	R. H. Bell	J. P. Rumsby, R. Fogarty	A. J. Bellamy	B. P. Shipping Ltd
<i>British Spy</i>	25.1.84	R. Rickman	J. Fidler, A. Nicoll, D. J. Buckley	D. Walker	B. P. Shipping Ltd
<i>British Spirit</i>	27.1.84	L. A. Woodward	N. Howard, G. Haynes	P. J. Hall	B. P. Shipping Ltd
<i>British Success</i>		D. E. Mitchell			B. P. Shipping Ltd
<i>British Tamar</i>	3.11.83	C. N. B. Burley	M. Ramsbottom, N. J. Corder, A. G. Crichton	N. Richardson	B. P. Shipping Ltd
<i>British Tay</i>	17.1.84	K. V. Meacock	A. M. Feltham, R. A. Irwin, J. A. Pearce	C. J. Taylor	B. P. Shipping Ltd
<i>British Tenacity</i>	3.8.83	K. Peacock	J. C. Patterson, R. Skene, G. C. Smith	N. M. Collins	B. P. Shipping Ltd
<i>British Test</i>	10.2.84	D. N. Allan	J. D. Cawsey, M. C. Lynch, M. J. Slaven	S. R. Calvert	B. P. Shipping Ltd
<i>British Trent</i>	4.10.83	P. Harrison	D. J. Buckley, V. J. Brimble, M. J. Swords	M. G. Spencer	B. P. Shipping Ltd
<i>British Tweed</i>	1.12.83	R. Jarrett	R. E. Taylor, J. W. Gough	T. R. Holter	B. P. Shipping Ltd
<i>British Voyager</i>	1.12.80	I. Johnston	P. W. Barber, H. Watson, F. Tait	R. I'Anson	Star Offshore Services Ltd
<i>British Wye</i>	12.1.84	D. Coombes	A. Wallace, D. Jackson	N. M. Collins	B. P. Shipping Ltd
<i>Broompark</i>	6.12.83	W. McCrac	N. Horner, F. W. Brown, S. D. Gallagher	R. J. McMurtry	Denholm Ship Management Ltd
<i>Buffalo</i>					P. & O. Lines Ltd
<i>Bulknes</i>					Jebsons Ship Management Ltd
<i>C. P. Ambassador</i>	2.6.83	N. G. Price	A. Tye, I. Grainger, G. Combe	P. MacIver	Canadian Pacific Steamships Ltd
<i>Cable Venture</i>	13.1.84	T. L. Simpson	B. Thickett, G. E. Craik, P. C. H. Adair	H. McGrory	Cable & Wireless Ltd
<i>Cableman</i>	14.11.83	D. J. Edmans	P. Hare, J. A. Tollady, D. Rickards	D. Steel	Rowbotham Tankships Ltd
<i>Cairnsmore</i>	6.10.83	W. Millar	D. W. Rice, J. M. Webster, M. D. Kerr	R. A. Kirk	Matheson & Co. Ltd
<i>California Star</i>	12.1.84	A. W. Brannan	R. A. Crook, I. S. R. Bell, D. R. A. J. Briggs	J. D. Neville	Blue Star Management Ltd
<i>Canadian Explorer</i>	18.11.83	D. A. Ganderton	D. J. Dawson, N. M. Bower, J. K. Wilkinson	R. C. Knott	Furness Withy (Shipping) Ltd
<i>Canberra</i>	23.2.84	E. Buckle	J. R. Hollamby, G. M. Pepper, M. D. O'Carroll	I. Conn	P. & O. Lines Ltd
<i>Cape Arnhem</i>	5.1.84	M. Turton	S. James	G. Harding	Lyle Ship Management Ltd
<i>Cape Finistierre</i>	15.2.83	C. Maclean	A. F. Hamilton, W. J. Esler, M. N. Beeley	R. A. S. Macneikan	Lyle Ship Management Ltd
<i>Cape Rodney</i>	13.2.84	J. G. Jones	M. R. Barker, D. Haughey, R. C. Bucknall	I. MacDonald	Lyle Ship Management Ltd
<i>Cape Trafalgar</i>	26.1.84	F. M. Dalby	P. B. W. Newton, P. Smart, R. Gerton	D. F. Wilson	Lyle Ship Management Ltd
			D. M. Finlayson, N. G. Smith, G. S. Adams	C. C. Houston	Lyle Ship Management Ltd

<i>Cardigan Bay</i>	9.2.84	A. J. Palmer	S. J. Edge, A. P. Talbot	C. K. Thornalley	Overseas Containers Ltd
<i>Carinthia</i>	27.2.84	M. Thwaite	J. Sanderson, D. Moody, T. Turney	S. Myland	Cunard Shipping Services Ltd
<i>Carmania</i>	25.1.84	C. Burtinshaw	M. K. Clark, C. Denny, D. Smith	M. J. Price	Cunard Shipping Services Ltd
<i>Cast Husky</i>	22.8.83	M. Thomson	F. C. Maciver, A. C. Dunning, J. Davidson	T. D. Walton	Denholm Ship Management Ltd
<i>Cast Muskox</i>	12.1.84	R. McManus	W. T. Woods, R. Spence, A. McLean	D. J. Busveids	Denholm Ship Management Ltd
<i>Cast Otter</i>	28.2.84	R. Cotter	C. Morrison, W. Winton, J. D. C. Martin	J. P. McCarthy	Denholm Ship Management Ltd
<i>Celtic Endeavour</i>	20.6.83	M. R. Gadd	P. Borley, H. F. J. Fogarty, I. K. Rew		C. M. Willie & Co. (Shipowners) Ltd
<i>Celtic Link</i>	18.2.82	H. Gray	H. W. Stewart, S. Duncan	D. N. Barlow	Ben Line Steamers Ltd
<i>Challenger</i>	11.10.83	J. J. Moran	P. J. MacDermott, J. O. Avery		Natural Environment Research Council
<i>Charon</i>	16.1.84	P. J. Duff	C. R. Booker, P. Marsham	D. Mackay	Ocean Fleets Ltd
<i>Cirolana</i>	22.11.83	M. J. Willcock	E. T. Hall, E. W. Pearson, R. Woodhouse	R. Baty	Ministry of Agriculture, Fisheries & Food
<i>City of Durban</i>	30.11.83	K. G. Maclean	N. A. Jardine, M. Herring, G. Stewart	T. Tims	Overseas Containers Ltd
<i>City of Edinburgh</i>	31.1.84	A. Maclean	G. Wells, I. Marshall, L. D. Macleod	H. Brookfield	Ben Line Containers Ltd
<i>City of Oporto</i>	31.10.83	M. R. Eden-Smith	G. M. Pepper, I. Smallshaw, I. Chadwick		Furness Withy (Shipping) Ltd
<i>City of Plymouth</i>	8.6.83	J. W. Hodson	K. J. Steven, T. Oliver	L. Janor	Ellerman Lines Ltd
<i>City of York</i>	14.2.84	J. Macleod	J. Reategui, P. Jackson, T. Oliver	J. Little	Ellerman Lines Ltd
<i>Clerk Maxwell</i>	6.1.84	M. J. Dale	K. P. Alcock, G. R. Jackson		Furness Withy (Shipping) Ltd
<i>Clone</i>	3.2.84	J. R. French	G. R. Oliver, R. F. Graham, J. Harper		Ministry of Agriculture, Fisheries & Food
<i>Chydebank</i>	14.11.83	B. Bennett	W. E. Lewis, G. G. Mattson, P. N. Hill	R. Scobie	Bank Line Ltd
<i>Clytneus</i>	28.7.83	H. B. Gobey	K. S. Markwell, K. Peterson, M. Browning	W. C. A. Phillips	Ocean Fleets Ltd
<i>Coltair</i>	6.3.84	W. Young	I. Sloan	T. A. Strickland	B.P. Shipping Ltd
<i>Columbia Star</i>	4.10.83	A. J. Chivers	R. D. Faulkner, M. Walker, G. Henderson	S. Ringer	Blue Star Management Ltd
<i>Contender Bezanit</i>	13.9.83	B. Mavity	T. J. Oakley, A. M. Walsh, A. C. Humphreys	L. Lobo	Sea Containers (Chartering) Ltd
<i>Crestbank</i>	15.8.83	G. J. Tully	J. Munro, M. B. Hannon, N. J. G. Allen		Bank Line Ltd
<i>D. C. Coleman</i>	20.2.84	P. Moore	R. A. Young, D. R. Lloyd, J. F. Morgan	D. J. Dean	Canadian Pacific Steamships Ltd
<i>Dacebank</i>	21.10.83	I. M. Maden	K. M. Taylor, A. Beattie, C. Medicott	M. J. Janor	Bank Line Ltd
<i>Dallington</i>	30.11.83	A. M. Arkley	K. Whitaker, O. Stephenson, I. G. Baskerville	A. Campbell	Stephenson Clarke Shipping Ltd
<i>Dart Americana</i>	17.2.84	G. A. Jenkins	A. W. Whiteford, R. S. Daya, C. D. Rossell	M. L. Anderson	Canadian Pacific Steamships Ltd
<i>Dart Atlantica</i>	4.1.84	G. E. Gamblin	J. L. Dyer, D. A. Bance, E. F. Farquharson	R. Frank	Canadian Pacific Steamships Ltd
<i>Dart Britain</i>	6.12.83	M. J. Winter	P. A. Rickard, M. Price, M. Warrior	G. Barnes	Furness Withy (Shipping) Ltd
<i>Devonshire</i>	11.11.83	R. P. Askew	S. Hind, S. Jones, R. T. Nield	W. Ormrod	Bibby Line Ltd
<i>Discovery</i>	26.1.84	M. A. Harding	A. R. Louch, G. M. Long, N. A. C. Jonas	C. A. Langley	Natural Environment Research Council
<i>Discovery Bay</i>	26.1.84	J. S. Thorpe	R. B. Robinson, D. J. Robertson	D. Ray	Overseas Containers Ltd
<i>Drupa</i>	20.1.83	B. Bowtell	C. McKay, M. Ellard	M. G. Ridehalgh	Shell Tankers (U.K.) Ltd
<i>Dryso</i>	7.3.84	G. Pirie	H. S. Wright	J. F. Beavis	Van Ommen (U.K.) Ltd
<i>Durrington</i>	17.11.83	R. Headrick	S. J. Shimwell, J. R. Shaw, R. Ellsmoor	G. Dickson	Stephenson Clarke Shipping Ltd
<i>E. W. Beatty</i>	9.3.84	D. Davies	P. J. Copeland, A. J. Gurney	P. J. Rogers	Canadian Pacific Steamships Ltd
<i>Eburna</i>	16.1.84	D. R. Cummins	M. B. Styles, A. Simson, A. Kelly	G. Duffield	Shell Tankers (U.K.) Ltd
<i>Echoman</i>	19.12.83	W. N. Pritchard	G. A. McEwan, J. P. Madge, A. J. Gorrange	A. Campbell	Rowbotham Tankships Ltd
<i>Edinburgh</i>	17.10.83	M. R. Godfrey	R. W. Madden	C. L. Keeble	Cayzer, Irvine Shipping Ltd
<i>Universal</i>	21.2.84				P. & O. Lines Ltd

Selected Ships (contd)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Encounter Bay</i>	20.9.83	M. J. Heron	A. M. Hurley, R. A. Kenchington, B. L. Brierley	B. A. Mullan	Overseas Containers Ltd
<i>England</i>	•	J. Osocroft	K. Phillips, I. Ramage, A. Honeybourn, D. John	A. E. Burbidge	Cunard Shipping Services Ltd
<i>Equinox</i>	21.2.84	E. T. Lakin	D. R. Brant, R. Taylor, J. Wright	J. Stone	Souter Hamlet Ltd
<i>Esso Aberdeen</i>	16.2.84	J. Way	R. Moss, D. W. Bunker	J. Morris	Esso Petroleum Co. Ltd
<i>Esso Dalriada</i>	22.2.84	W. D. B. Boler	C. A. Lane, A. Meeds	D. Laybourn	Esso Petroleum Co. Ltd
<i>Esso Demetia</i>	12.12.83	J. M. Phillips	W. E. Hardy, A. C. Lowe, A. Hoare	R. Duff	Esso Petroleum Co. Ltd
<i>Esso Humber</i>	15.8.83	R. Walker	D. S. Thetford, R. Samson	M. L. Phillips	Esso Petroleum Co. Ltd
<i>Esso Tees</i>	•	R. W. Noakes	P. M. Beevers, N. J. Watkins, K. Lightbody	I. Morgan	Esso Petroleum Co. Ltd
<i>Esso Warwickshire</i>	14.2.84	C. C. Jorgensen	J. D. Peel, W. A. Gundry	•	Esso Petroleum Co. Ltd
<i>Ethel Everard</i>	2.2.83	G. R. Hare	P. J. E. Bird, R. C. Ross, C. S. Hiltunen	S. Suttie	F. T. Everard & Sons Ltd
<i>Etrema</i>	12.1.84	J. A. Stuart	S. Barber, G. Read, H. J. Tibbs	J. A. Main	Shell Tankers (U.K.) Ltd
<i>Explorer (F.R.S.)</i>	19.8.77	J. Gillon	A. Murray, W. Ferguson	•	Department of Agriculture & Fisheries for Scotland
<i>Eye of the Wind</i>	12.1.83	R. S. Grono	•	•	Adventure Under Sail
<i>Falmouth Bay</i>	8.2.84	P. J. R. Manson	N. E. Gardiner, S. D. Smith, K. W. Smith	B. A. Mullan	Overseas Containers Ltd
<i>Farland</i>	25.1.84	T. F. Jones	D. T. Nichol, B. F. Middleton, I. Buckley	G. Richards	Ropner Management Ltd
<i>Farnes</i>	25.10.83	A. Gatt	R. Claridge	A. de La Grense	Jebsens Ship Management Ltd
<i>Fenbank</i>	12.9.83	P. J. Elder	J. E. Davies, R. S. Brown, B. M. Bennett	T. S. Kucharski	Bank Line Ltd
<i>Fengtien</i>	26.10.82	J. Aldiss	W. M. Laverick, J. Bird, I. A. James	J. A. Phipps	J. Swire & Sons Ltd
<i>Festival</i>	•	M. Tuddenham	•	•	Gulf (Ship Owners) Ltd
<i>Finnnes</i>	•	•	•	•	Jebsens Ship Management Ltd
<i>Flanders Bay</i>	7.2.84	M. Brackenridge	M. K. R. Elliot, B. J. Coupland	R. D. Cause	Overseas Containers Ltd
<i>Fort Assiniboine</i>	9.11.83	R. Smith	P. Townsend, K. P. Connor, G. Wallace	G. Bell	Overseas Containers Ltd
<i>Fort Frontenac</i>	•	•	•	•	Canadian Pacific Steamships Ltd
<i>Fort Garry</i>	7.12.83	K. W. Elias	N. G. Bruty, A. J. Bentley, C. E. Laverack	R. Brien	Canadian Pacific Steamships Ltd
<i>Fort Hamilton</i>	17.11.83	B. G. Roberts	K. P. Doyle, A. B. W. Rugg, C. M. Goddard	G. North	Canadian Pacific Steamships Ltd
<i>Fort MacLeod</i>	•	C. Beck	A. Jones, F. E. Brown, M. C. Hadley	R. E. Haviland	Canadian Pacific Steamships Ltd
<i>Fort Providence</i>	30.1.84	W. A. McCall	T. C. Risebrow, J. Kemp, I. D. Smith	T. Smith	Canadian Pacific Steamships Ltd
<i>Fort Resolution</i>	18.1.84	K. Hyde	R. W. Morgan, C. Riches, S. D. Johnson	P. O'Hara	Canadian Pacific Steamships Ltd
<i>Fort Rouge</i>	20.9.83	J. Hume	D. A. Moss, D. A. Elliott, J. G. Small	D. Woolian	Canadian Pacific Steamships Ltd
<i>Fort Toronto</i>	16.4.82	R. Kinner	A. H. Williams, D. Carlisle, J. P. H. Simcox	S. L. Hallam	Canadian Pacific Steamships Ltd
<i>Fort Victoria</i>	10.2.84	D. G. T. Greenhalgh	W. J. Tennant, P. M. Barrington, R. L. Smith	C. Wicks	Canadian Pacific Steamships Ltd
<i>Forthbank</i>	4.1.84	E. T. Rees	S. J. Cole, A. G. Stevenson, C. J. Butters	J. M. Munroe	Canadian Pacific Steamships Ltd
<i>Fred Everard</i>	19.7.83	M. A. Chapple	B. R. F. Cox, P. J. Miller, R. Hart	•	Bank Line Ltd
<i>Frederick Russell</i>	11.10.83	P. H. Warne	M. S. Pitman, R. J. Chamberlain	•	F. T. Everard & Sons Ltd
<i>G. A. Walker</i>	•	J. B. Jones	J. Evans, R. Williams, R. Barber	•	Natural Environment Research Council
<i>Galconda</i>	4.11.83	R. Knight	S. R. Deans, R. Wanchoo, K. Newman	P. Howard	Canadian Pacific Steamships Ltd
				D. English	P. & O. Lines Ltd

Selected Ships (contd)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>La Pampa</i>	18.10.83	D. K. Smith	T. Woods, M. B. Stephenson, G. Fondis	M. Tindall	Buries Markes (Ship Management) Ltd
<i>Lackenby</i>	7.12.83	C. Tingle	N. D. Ferguson, A. Willing, R. Whyte	J. G. Aherne	Ropner Management Ltd
<i>Lagos Palm</i>	18.7.83	R. Vinton	I. N. Hafenden, P. Perry, R. Ellsmoor	J. Allen	Palm Line Ltd
<i>Lantau Trader</i>	16.3.84	J. Maddison	T. J. Metzger, P. Holloway	S. K. Cheung	Denholm Ship Management (Overseas) Ltd
<i>Larkfield</i>	*	P. T. Hodge	T. Forrest, S. Butler	T. Lowe	Buries Markes (Ship Management) Ltd
<i>Leicesterbrook</i>	19.12.83	J. J. Myles	E. J. R. Williams .. ..	.. ..	F. T. Everard & Sons Ltd
<i>Leona</i>	14.3.84	J. D. T. Price	K. J. Coleman, A. K. Comrie, J. Urquhart	D. H. O'Neill	Shell Tankers (U.K.) Ltd
<i>Lima</i>	1.6.83	B. Wilkinson	D. Hinks	A. Ridley	Shell Tankers (U.K.) Ltd
<i>Lincobrook</i>	17.1.84	W. D. Taylor	M. R. Irwin, G. A. Zimmer .. ..	.. ..	F. T. Everard & Sons Ltd
<i>Lincolnshire</i>	1.12.83	C. O. Thomas	S. L. J. Walker, C. S. Gaukroger, R. Hodgson	G. J. Simpson	Bibby Line Ltd
<i>Liverpool Bay</i>	9.2.84	J. Cosker	A. C. W. Lipscombe, B. Cushman	D. S. Flemington	Overseas Containers Ltd
<i>Lokaya Palm</i>	19.9.83	E. H. Thomson	J. M. Messanges, G. Bell, I. M. Winter .. ..	.. ..	Palm Line Ltd
<i>London Enterprise</i>	20.1.84	F. G. B. Hewlett	M. J. Webber, G. R. Hicks	R. E. Smith	London & Overseas Freighters P.L.C.
<i>London Glory</i>	6.12.83	J. O. Clark	B. Woodward, R. McGammon	K. J. Steele	London & Overseas Freighters P.L.C.
<i>London Spirit</i>	15.2.84	J. A. Attwater	F. R. Sanford, B. C. Watkins	I. Alexander	London & Overseas Freighters P.L.C.
<i>London Victory</i>	14.2.84	P. J. Wright	M. C. Littlewood, A. Fox	P. J. C. O'Neill	London & Overseas Freighters P.L.C.
<i>Lord Kelvin</i>	*	R. M. Banton	G. Blake, M. Green, S. Shaw	F. Fletcher	Furness Withy (Shipping) Ltd
<i>Lord Mount Stephen</i>	10.1.84	R. B. Jones	J. Turner, A. Evans, K. Ward	M. Corry	Canadian Pacific Steamships Ltd
<i>Lord Strathcona</i>	13.2.84	G. Watterson	W. Tennant, R. Gayton	D. J. Atkinson	Canadian Pacific Steamships Ltd
<i>Los Angeles</i>	30.1.84	M. H. C. Twomey	M. Julier, P. C. Youe, N. P. Hodgson	K. Grattan	Cunard Shipping Services Ltd
<i>Lucerna</i>	14.2.84	W. J. Flett	P. D. R. Bryan .. ..	.. ..	Cunard Shipping Services Ltd
<i>Luminence</i>	7.11.83	N. T. Alford	L. A. C. Logan	C. I. Kitchen	Crescent Shipping Co. Ltd
<i>Lycaon</i>	28.7.83	H. K. Timbrell	J. K. Ryan, M. K. Elliot	D. W. Ray	Ocean Fleets Ltd
<i>Maersk Angus</i>	24.1.84	G. Parven	B. A. Jablonski	K. Mutimear	Maersk Co. Ltd
<i>Maersk Buchan</i>	18.7.83	G. E. Daykin	P. Ward, G. W. Clark, L. Martin, T. S. Lawrence	S. Spendlove	Maersk Co. Ltd
<i>Maerangi Bay</i>	27.2.84	C. R. Short	N. M. V. Salmon, B. Graham	T. R. Clark	Overseas Containers Ltd
<i>Manchester Challenge</i>	14.3.84	J. McKay	G. R. Green, A. Niblock, D. L. Smith	A. Brogan	Furness Withy (Shipping) Ltd
<i>Manchester Crown</i>	10.1.84	E. A. Jones	I. Smallshaw, C. R. Darnley .. ..	.. ..	Furness Withy (Shipping) Ltd
<i>Mandana</i>	17.8.83	A. H. White	A. Varghese, D. P. Webb, J. Spencer	T. Mathew	Blue Star Management Ltd
<i>Marlock</i>	12.3.84	P. A. Brown	B. R. Frank, J. Chalmers, C. V. Farrant	P. E. Greer	Turnbull Scott Management Ltd
<i>Maron</i>	7.3.84	G. F. Williams	M. N. Baxter, M. N. Baldwin, B. N. Jones	L. M. Sells	Ocean Fleets Ltd

<i>Martindye</i> ..	14.2.84	J. S. Wisden	D. E. C. Stevenson, O. M. Lynch, D. Wright	S. Jones	North British Shipping Ltd
<i>Matco Avon</i> ..	15.6.83	J. M. Bell	K. J. Dye, M. H. McFarlin	R. Skuse	Mobil Shipping & Transportation Co.
<i>Matco Clyde</i> ..	19.12.83	P. Callaghan	D. Smith, N. A. Abbott, N. J. Cooke		Mobil Shipping & Transportation Co.
<i>Matco Thames</i> ..	24.1.84	B. D. Jones	D. O'Keefe, A. D. Wall, P. Thompson	D. McSweeney	Mobil Shipping & Transportation Co.
<i>Meadowbank</i> ..	17.1.84	W. H. Martin	G. Blunden, R. K. Ward, G. Warley	J. F. Bryson	Bank Line Ltd
<i>Mediterranean</i> ..	6.1.83	T. Langstaff	M. H. Morris, M. T. Hardy, A. G. Lacey	E. L. Derbyshire	James Fisher & Sons Public Ltd
<i>Shearwater</i> ..		H. R. Lawton	C. P. Benson, G. Hamilton, R. G. Daley	R. Buckles	Ocean Fleets Ltd
<i>Melampus</i> ..	31.10.83	T. Hunter	N. Cloughton, P. Donoghue	C. D. Dews	Melton Shipping Co. Ltd
<i>Melton Challenger</i> ..	8.10.82	R. M. Simpson	S. Thomson, S. Edge, I. A. Pakula		Ocean Fleets Ltd
<i>Mentor</i> ..		L. R. Bell	E. Betts, E. Baillie, D. Nolan, A. MacPherson	Mohsin Hassam	Denholm Ship Management Ltd
<i>Merchant Navigator</i> ..	29.11.83	W. Jeffrey	Syed Aazid Ali, Shakeel Babar, Pervez Maqsood	C. Robinson	Acomarit (U.K.) Ltd
<i>Montark</i> ..	20.1.84	P. H. Crist	G. D. Boyce, I. Cumming, V. P. Stevens	D. K. Alcock	Bank Line Ltd
<i>Moraybank</i> ..	13.9.83	A. H. Aston	J. M. Torkington, T. G. Whittaker, A. J. Ball	R. Stevens	Overseas Containers Ltd
<i>Moreton Bay</i> ..	16.3.83	H. McCole	B. Reilly, J. Fielden, J. Roemmele	A. Gebicki	Ocean Fleets Ltd
<i>Myrmidon</i> ..	28.11.83	C. G. Scarf	A. J. Leach, J. M. A. Urquhart, G. Wilkinson	R. Leeds	Shell Tankers (U.K.) Ltd
<i>Naitcina</i> ..		R. Wilson	D. Thurston, D. Winter, K. Scott		P. & O. Lines Ltd
<i>Newforest</i> ..	7.11.83	A. J. C. Metcalfe	I. T. Braidwood, R. J. Crickmore		North British Shipping Ltd
<i>Norbrit Faith</i> ..		R. Gale	D. E. C. Stevenson, A. Metcalf		North British Shipping Ltd
<i>Norbrit Hope</i> ..		J. Ridout	M. Holmes, P. A. Ellacott, M. J. Pinks, M. J. Johnson	L. M. Campbell	Burries Markes (Ship Management) Ltd
<i>Norman Lady</i> ..	20.2.84	W. Blackie	S. Palmer		Harrison (Clyde) Ltd
<i>Norse Marshal</i> ..	7.10.83	B. Cosgrove	C. J. Miners, M. Frampton, J. Cornwall	D. Olivant	Shell Tankers (U.K.) Ltd
<i>Norhia</i> ..	1.12.83	J. Parsloe	A. D. Dillon, A. Horsbrough, P. Newton	G. K. Emmett	Bolton Maritime Management Ltd
<i>Nosira Lin</i> ..	9.12.83	S. F. Williams	D. J. Williamson, E. Ljond, G. Jackson	P. Griffin	Bolton Maritime Management Ltd
<i>Nosira Madeleine</i> ..	18.11.83	G. C. Murray	S. J. Kimberley, J. W. Mitchell, J. J. Millar	P. M. Haslam	Bolton Maritime Management Ltd
<i>Nosira Sharon</i> ..	23.9.83	G. Wilson	R. M. J. Bonsier, R. Firth, R. L. Redding	C. M. Jackson	Bolton Maritime Management Ltd
<i>Opalia</i> ..	24.2.84	R. T. Riley	M. G. Vanstone, T. D. Pawson, M. G. Janstone	M. D. Gray	Shell Tankers (U.K.) Ltd
<i>Oropesa</i> ..	24.10.83	D. Aitchison	M. P. Brooks, I. Middleton, I. Cull	J. Davies	Furness Withy (Shipping) Ltd
<i>Oroya</i> ..	13.12.83	J. McCully	J. Sharples D. C. Reed, S. D. Pringle	J. Miller	Furness Withy (Shipping) Ltd
<i>Orwell Fisher</i> ..	5.1.84	J. K. Blackburn	R. B. Gurney, I. M. Lewis, M. D. Moore	E. B. Stephenson	James Fisher & Sons Public Ltd
<i>Osaka Bay</i> ..	21.11.83	T. S. Nurcombe	M. C. Blake, K. A. Hewlett	C. Stuart	Overseas Containers Ltd
<i>Overseas Argonaut</i> ..	3.1.84	R. M. Frederick	D. A. Duance, S. J. Ivey, R. M. Price		London & Overseas Freighters P.L.C.
<i>Pacific Challenge</i> ..	7.11.83	P. Barry	P. Ashurst, P. Cooper, N. Halliwell	K. J. Harris	Furness Withy (Shipping) Ltd
<i>Pacific Courage</i> ..	12.3.84	P. G. Hobson	M. H. Morris, I. Thompson, P. A. Booker	B. Howarth	Furness Withy (Shipping) Ltd
<i>Pacific Crane</i> ..	25.10.83	I. G. Thompson	D. Bainbridge, J. P. Allan, D. Farmer	N. Marwood	James Fisher & Sons Public Ltd
<i>Pacific Fisher</i> ..	10.2.84	H. F. Monckton	R. Moss, F. Gordon	P. A. Stocking	James Fisher & Sons Public Ltd
<i>Pacific Horizon</i> ..	1.2.84	E. Gowland	J. D. Clark, J. H. F. Taylor, R. Wooding	J. Marr & Sons Ltd	J. Marr & Sons Ltd
<i>Pacific Patriot</i> ..	31.10.83	D. M. C. Allan	P. M. Smith, D. J. Hewitt, J. Monk	S. Roberts	Furness Withy (Shipping) Ltd
<i>Pacific Peace</i> ..	20.1.84	J. J. Hurley	D. Boardman, C. D. Hall, M. Holbrook	R. Merriott	Furness Withy (Shipping) Ltd
<i>Pacific Prestige</i> ..	14.12.83	J. Miller	J. M. Petty, J. Dumazel, D. Marr	J. C. Callaghan	Furness Withy (Shipping) Ltd
<i>Pacific Swan</i> ..	17.10.83	F. P. Garbutt	P. J. Savory, D. Ilderton, A. Dumbell	G. Swainbank	James Fisher & Sons Public Ltd
<i>Pacific Teal</i> ..	6.2.84	I. Kemp	R. Hutchinson, J. Kingston, T. Mather	P. A. Evans	James Fisher & Sons Public Ltd
<i>Pacific Universal</i> ..		R. W. W. Baldwin	M. Blackburn, D. A. Mitchell, A. F. Ure	G. Rudd	Gateway Shipping Ltd
<i>Photias</i> ..	12.12.83			M. Gilliland	Coe-Mercalf Shipping Ltd

Selected Ships (contd)

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<i>Pikebank</i>	6.1.84	M. Macinnes	W. M. Esler, A. P. Maytham, S. M. Wilkie	M. S. Skinner	Bank Line Ltd
<i>Pointsmen</i>	17.1.84	J. A. Suter	N. O. Morrice, K. M. Seery, T. S. Kenney	D. W. Macintyre	Rowbotham Tankships Ltd
<i>Pole Star</i>	3.1.79	N. Morrison	W. Tullock, A. D. Welch		Northern Lighthouse Board
<i>Pollenger</i>	5.1.84	J. H. B. Weston	T. P. Flower, N. J. Adams, D. M. Sharp	M. Smith	P. & O. Lines Ltd
<i>Pomela</i>	13.2.84	J. L. Taylor	C. Bull, S. Gallaway, R. Turnbull	S. Thomas	Shell Tankers (U.K.) Ltd
<i>Port Alberni City</i>	18.11.83	A. L. G. Gosset	R. B. Webb, G. P. Eyles, J. S. Murray	V. F. Cullen	Sir Wm Reardon Smith & Sons Ltd
<i>Port Hawkesbury</i>	13.10.83	T. S. Rind	G. Moir, B. Nicholls, P. Grant	T. Graves	Canadian Pacific Steamships Ltd
<i>Port Quebec</i>	7.12.83	D. J. Campion	P. G. Cole, M. Blease, A. Williams	J. Beckett	Overseas Containers Ltd
<i>Providence Bay</i>	16.2.84	M. Lees	P. A. Trafford, D. A. Dornom, G. P. Farrell	A. D. Hutchinson	Stephenson Clarke Shipping Ltd
<i>Qarouh</i>	18.11.83	G. Young	R. Mitcheson, D. C. Selley, C. Twomey	K. T. Whytock	P. & O. Lines Ltd
<i>Queen Elizabeth 2</i>	3.10.83	R. J. S. Pearce	G. P. Cowling, A. J. Wilson, S. B. Tudor	D. M. Williams	Cunard Shipping Services Ltd
<i>Rangelock</i>	*	L. R. W. Portet	J. G. Scott, P. M. Robson, S. Trundle	A. Holmes	Turnbull Scott Management Ltd
<i>Ravenscraig</i>	3.1.84	J. H. Wehner	R. Roemmele, N. White, M. Shipley	A. Bassett	Ropner Management Ltd
<i>Reefer Ciku</i>	19.12.83	C. R. Bamford	W. K. Mutch, P. J. Hunter, I. C. Gravatt, D. Wallis	J. Fitzgerald	P. & O. Lines Ltd
<i>Reefer Duku</i>	18.8.83	A. S. Laidlaw	R. C. Bloomfield, T. Chantler, M. C. Echivere	Can Jai Heng	P. & O. Lines Ltd
<i>Reefer Manggis</i>	3.8.83	B. Austen-Smith	T. K. Hoon, M. J. Winterbottom, G. W. Bryson	J. H. Gan	P. & O. Lines Ltd
<i>Reefer Nangka</i>	*		N. N. Laurel, R. J. Smith, J. Poter	Lee Kim Seng	P. & O. Lines Ltd
<i>Remuera Bay</i>	26.8.83	W. F. McCarthy	M. Leech, D. Tracey, A. C. W. Lipscombe	T. R. Clark	Overseas Containers Ltd
<i>Resolution</i>	13.9.83	D. Howell	F. Mack		Gardline Shipping Ltd
<i>Resolution Bay</i>	13.3.84	D. V. Harradine	M. Barracough, W. Watts, C. K. Urwin	W. B. MacIntosh	Overseas Containers Ltd
<i>Retriever</i>	24.5.83	A. Venables	P. M. Swan, R. C. Phillips, J. Creagh	D. Steel	Cable & Wireless Ltd
<i>Reynolds</i>		E. H. Dillen	J. Theaker, J. J. Millar, S. Cannon	D. L. Warner	Bolton Maritime Management Ltd
<i>Ringnes</i>	7.7.81	M. J. Meyer	R. Claridge, P. Skelton, D. W. Clements	A. Hodson	Jebsens Ship Management Ltd
<i>Roachbank</i>	9.11.83	T. D. Scott	D. B. Pirie, J. C. Osman, P. G. H. Stapleton	T. Williams	Bank Line Ltd
<i>Rocknes</i>	14.3.83	T. J. Lee	C. W. Milne, G. A. Boobyer, P. Skelton	P. Dredge	Jebsens Ship Management Ltd
<i>Rallnes</i>	2.11.82	J. H. Apsey	R. Baker, S. Murray, I. C. Oke, S. Byczynski	W. Swann	Jebsens Ship Management Ltd
<i>Romney</i>	17.11.83	H. J. Taylor	D. T. Wells, S. T. Curtis, B. Stirling	G. B. Randall	Blue Star Management Ltd
<i>Rubens</i>	20.1.84	P. Weldon	D. S. Hibberd, P. Stott, P. M. Bailey	D. Iveson	Bolton Maritime Management Ltd
<i>Sachem</i>	*	M. E. Newall	W. E. L. Stevens, P. Eastwood, C. N. Macy, Z. Chodzkozatko	P. C. Nottle	Mobil Shipping & Transportation Co.
<i>Sagacity</i>	21.12.83	A. I. Morris	G. L. Lewis, R. J. Volante	J. Halliwell	F. T. Everard & Sons Ltd
<i>St Helena</i>	13.3.84	W. A. King	R. Hone, C. Hughes, J. Pearce	R. A. Wilson	Curnow Shipping Ltd
<i>St Nicholas</i>		J. E. Jennings	C. Winterton	R. Mallett	Sealink (U.K.) Ltd
<i>Salmompool</i>	8.12.83	M. Thwaite	L. P. Bridges, S. J. Honey, N. H. Cooper	I. Forster	Ropner Management Ltd
<i>Samarina</i>	12.12.83	A. J. Milmine	M. S. Bell, M. G. Jevons, S. Daniel	J. F. Worcester	Cunard Shipping Services Ltd
<i>Sapele</i>	18.7.83	I. H. Pringle	S. J. Hollows, P. C. Thorneloe, J. L. Wilson	R. McSorley	Ocean Fleets Ltd
<i>Sapphire Bounty</i>	24.2.84	C. P. Margeson	M. G. Dexter, P. R. Phibbs, J. J. Gladstone, I. Percival	R. F. Minon	Sea Containers (Chartering) Ltd
<i>Saxonia</i>	7.2.84			D. Egerton	Cunard Shipping Services Ltd

Selected Ships (contd)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Sirider Juno</i>	31.10.83	S. Bennett	R. Advincula, R. Arban, J. Nega	M. A. Asual	Sea Containers Ltd
<i>Suavity</i>	18.11.83	J. Young	R. C. Ross, S. Messruther		F. T. Everard & Sons Ltd
<i>Suitoen</i>	12.3.84	A. C. Free	A. Tavendale, N. W. Martin	I. M. Charlton	Caledonian MacBrayne Ltd
<i>Sulisker</i>	3.1.84	S. S. Lockhard	A. J. Taylor-Gray, P. R. Shenton	D. Temple	Ministry of Agriculture, Fisheries & Food
<i>Summit</i>	16.3.83	D. Spurling	P. J. Laity, C. Buckley, J. Henderson		F. T. Everard & Sons Ltd
<i>Superiority</i>	*	J. Moir	E. Froggatt, E. Varne		F. T. Everard & Sons Ltd
<i>Tacoma City</i>	30.6.83	J. C. Lee	J. M. Coleman, P. D. Codd, P. C. Coles	R. J. Preece	Sir Wm Reardon Smith & Sons Ltd
<i>Tankerman</i>	14.2.84	M. J. Charlesworth	R. A. Eveleigh, R. J. Ralling, R. Walsh	P. G. Neely	Rowbotham Tankships Ltd
<i>Tantalus</i>	4.5.82	I. Bease	A. J. Goldsmith, P. Harner, M. Harrison	K. Torr	Ocean Fleets Ltd
<i>Tectus</i>	1.9.83	B. B. Pearson	S. R. Pace, L. Wassell, M. Stickley	M. Collingwood	Shell Tankers (U.K.) Ltd
<i>Telnes</i>	*	V. Taylor	M. Bailey	J. O'Driscoll	Jebsens Ship Management Ltd
<i>Tenchbank</i>	28.11.83	B. J. Peterson	M. J. West, W. W. Davies, D. K. Bennett	J. G. Hull	Bank Line Ltd
<i>Texaco Ghent</i>	26.5.83	H. G. Duff	P. W. G. Gibson, D. Pepper, P. C. Stone	R. Ballaam	Texaco Overseas Tankships Ltd
<i>Texaco Westminster</i>	12.5.82	J. R. Walker	J. M. Small, G. S. Williams, J. B. Anderson	P. A. Flynn	Texaco Overseas Tankships Ltd
<i>Thamesfield</i>	16.3.84	D. L. Robinson	E. A. Lamb, S. Bryans, A. J. Howlett	R. J. Stevens	Hunting Stag Management Ltd
<i>Tog Mor</i>	*	J. Suddes	G. Patience		Howard Doris Marine Services Ltd
<i>Tokyo Bay</i>	27.2.84	J. M. Johnston	I. M. Chadney, A. C. McCulloch, R. T. Whelan	B. W. Matten	Overseas Containers Ltd
<i>Tolaga Bay</i>	22.2.84	J. C. Cox	L. A. Turner, D. Tracey, A. J. A. Aston	D. A. Kelball	Overseas Containers Ltd
<i>Tor Bay</i>	20.2.84	P. J. Clark	I. S. Norris, A. J. Ball, J. K. Williamson	T. Vaughan	Overseas Containers Ltd
<i>Tor Caledonia</i>	19.1.83	P. Miller	E. A. Rose, J. E. Boswell	J. Munroe	Denholm Ship Management Ltd
<i>Tribulus</i>	4.10.83	M. T. John	C. McKay, G. P. Donnelly, R. N. Richards	T. I. Kennedy	Shell Tankers (U.K.) Ltd
<i>Trinculo</i>	7.12.83	L. Y. Davis	I. Howard, J. M. Lewis, K. Bamber	D. Streeter	Newgate Shipping Co. Ltd
<i>Troll Maple</i>	16.3.84	K. C. G. G. G. G.	C. M. Meneze, M. Sharan, M. J. Nazareth	A. K. Rodrigues	Escombe McGrath & Co. Ltd
<i>Troll Viking</i>	10.1.84	A. S. M. Pagarkar	A. S. Kamboj, S. Palad, V. Madhok	A. K. Desai	Escombe McGrath & Co. Ltd
<i>Troutbank</i>	7.3.84	A. B. Osborne	A. J. Dixon, C. C. Baines, P. R. N. Maynard	M. Hanraads	Bank Line Ltd
<i>Uganda</i>	6.12.83	M. V. N. Bradford	S. P. Love	F. Murphy	P. & O. Lines Ltd
<i>Valdivia</i>	16.3.84	N. C. Kerr	A. D. Chapman, J. Kirk, M. Craig	M. Mammari	Harrison (Clyde) Ltd
<i>Vegaman</i>	19.9.78	M. Blight	S. G. Turner, M. C. Jones	L. P. Greeve	Rowbotham Tankships Ltd
<i>Vendee</i>	8.3.84	I. Macallister	R. M. Gunn, R. D. M. Hamilton, D. Lemon	D. L. Byrne	P. & O. Lines Ltd
<i>Vic Bill</i>	6.3.84	P. W. Hillier	D. J. Ridgway, A. K. Cassels, J. Moloney	E. Barrowman	B. P. Shipping Ltd
<i>Victoria Peak</i>	*	C. J. Ball	P. A. Davis, I. Smith, C. Prescott	J. M. Ferrao	Seahorse Ship Management Ltd
<i>Vigilant</i>	3.1.84	D. L. Rattray	J. Barkess, A. F. McQuade, M. C. J. Jewell		Department of Agriculture & Fisheries for Scotland
<i>Viking Venturer</i>	6.12.83	M. Edvard	R. J. Ross, D. J. Pearce, S. O'Callaghan	S. C. Horne	Townsend Car Ferries Ltd
<i>Vosges</i>	14.2.84	I. Y. Batley	S. R. Deans, N. T. S. Parkinson, C. Baker	P. C. A. Enrico	P. & O. Lines Ltd
<i>W. A. Mather</i>	23.11.83	M. T. P. McMahon	G. Knox, M. J. Heffer, P. Grant	J. Stephen	Canadian Pacific Steamships Ltd
<i>W. M. Neal</i>	17.10.83	R. G. Headrick	P. E. Jolley, M. Duce, D. Warnett	K. J. Rennison	Canadian Pacific Steamships Ltd
<i>Wellington Star</i>	22.2.84	W. J. G. Jones	K. A. Sykes, J. Barwis	G. Shaw	Blue Star Management Ltd
<i>Wellpark</i>	11.11.83	J. Corrin	D. G. Paul, S. R. Marshall, L. G. Hosick	M. Hill	Denholm Ship Management Ltd

<i>Westra</i>	6.1.83	T. Henderson	D. L. Beveridge, R. J. Sheldon	.. .. .	.. .. .	Department of Agriculture & Fisheries for Scotland
<i>White Billow</i>	6.2.84	J. R. Bell	M. L. Aranha, G. Weaver, M. Labo	.. .. .	F. Lettao	Salen (U.K.) Ship Management Ltd
<i>White Cascade</i>	25.10.83	J. F. Adams	J. White	.. .. .	H. Correa	Salen (U.K.) Ship Management Ltd
<i>Willowbank</i>	24.11.83	C. B. Davies	P. M. Frost	.. .. .	C. Schrimshaw	Bank Line Ltd
<i>Wilmington</i>	*	M. F. Berne	B. J. Wright, M. F. Poulloin	.. .. .	C. Ferris	Stephenson Clarke Shipping Ltd
<i>Yorkshire</i>	23.2.84	N. H. Malpass	D. H. Macnicol, S. J. Kitchen	.. .. .	J. Palethorpe	Bibby Line Ltd

Supplementary Ships

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Arctic Freebooter</i>	•	B. Wharan	J. A. Scannel	J. A. Scannel	Boyd Line Ltd
<i>Earl Godwin</i>	21.7.83	P. Weston	P. A. Lloyd	S. Turner	Sealink (U.K.) Ltd
<i>Earl Granville</i>	17.10.83	C. Barker	P. Goode, T. Drennan	J. Ernest	Sealink (U.K.) Ltd
<i>Free Enterprise</i>	19.9.83	D. Pearce	R. D. Poole, N. R. Vardy, E. Betts	D. A. Thomas	Townsend Car Ferries Ltd
<i>Londonbrook</i>	29.11.83	E. Lear	R. M. Thompson, R. Couch, S. Palmer	.. .. .	F. T. Everard & Sons Ltd
<i>Oil Hustler</i>	•	N. Brown	L. Elms	.. .. .	Ocean Incheape Ltd
<i>Oil Supplier</i>	•	C. Cunningham	G. J. S. Ives, M. Kirk	.. .. .	Ocean Incheape Ltd
<i>Viking Valiant</i>	30.6.83	C. E. Banks	G. Lewis, A. R. Froude, D. Knight	D. Thomas	Townsend Car Ferries Ltd

‘Marid’ Ships

The following is a list of ships recruited for the observing and reporting of sea temperatures from coastal waters of Great Britain. Masters are requested to point out any errors or omissions in the list.

NAME OF VESSEL	MASTER	OWNER/MANAGER
<i>Aldrington</i>	P. Ryder	Stephenson Clarke Shipping Ltd
<i>Arco Thames</i>	L. Webb	A. R. C. (Marine) Ltd
<i>Ashington</i>	R. Thompson	Stephenson Clarke Shipping Ltd
<i>Authenticity</i>	J. MacMillan	F. T. Everard & Sons Ltd
<i>BP Warrior</i>	S. Howlett	B.P. Oil Ltd
<i>Barra Head</i>	A. E. Alvis	Christian Salvesen (Shipping) Ltd
<i>Beacon Point</i>	L. Miles	Christian Salvesen (Shipping) Ltd
<i>Brian Boroime</i>	J. Bakewell	Sealink (U.K.) Ltd
<i>Claymore</i>	H. Sinclair	Caledonian MacBrayne Ltd
<i>Columba</i>	R. Hutcheson	Caledonian MacBrayne Ltd
<i>Crusader Point</i>	F. Davies	Hudson S.S. Co. Ltd
<i>Dolphin Point</i>	C. Wood	Christian Salvesen (Shipping) Ltd
<i>Donnington</i>	M. Rushbrook	Stephenson Clarke Shipping Ltd
<i>Dragon</i>	P. C. Woods	Southern Ferries Ltd
<i>Earl William</i>	E. M. Scott	Sealink (U.K.) Ltd
<i>Eastgate</i>	W. Alexander	Rowbotham Tankships Ltd
<i>Emerald</i>	M. Burne	Stephenson Clarke Shipping Ltd
<i>Esso Clyde</i>	D. Campbell	Esso Petroleum Co. Ltd
<i>Esso Fawley</i>	D. Tate	Esso Petroleum Co. Ltd
<i>Esso Mersey</i>	S. McCollen	Esso Petroleum Co. Ltd
<i>Esso Milford Haven</i>	K. Hebdon	Esso Petroleum Co. Ltd
<i>Fort Point</i>	J. Kerr	Christian Salvesen (Shipping) Ltd
<i>Frederick M.</i>	I. Spencer	Coe-Metcalf Shipping Ltd
<i>Garrison Point</i>	C. Lisner	Hudson S.S. Co. Ltd
<i>Harting</i>	J. M. McCuaig	Stephenson Clarke Shipping Ltd
<i>Hebrides</i>	J. M. McQueen	Caledonian MacBrayne Ltd
<i>Helmsman</i>	A. Mackinnon	Rowbotham Tankships Ltd
<i>Irishgate</i>	R. Samson	Rowbotham Tankships Ltd
<i>Jubilence</i>	M. D. Wood	Crescent Shipping Co. Ltd
<i>La Hacienda</i>	B. K. Burwood	Buries Marques (Ship Management) Ltd
<i>Landguard Point</i>	D. Sutherland	Hudson S.S. Co. Ltd
<i>Ligar Bay</i>	G. Grant	F. T. Everard & Sons Ltd
<i>Mari Everard</i>	L. Davis	F. T. Everard & Sons Ltd
<i>Malling</i>	A. Bourn	Stephenson Clarke Shipping Ltd
<i>Miltence</i>	G. Herbert	Crescent Shipping Co. Ltd
<i>Northgate</i>	R. Samson	Rowbotham Tankships Ltd
<i>Oilman</i>	N. R. Williams	Rowbotham Tankships Ltd
<i>Orionman</i>	J. Bates	Rowbotham Tankships Ltd
<i>Oswestry Grange</i>	R. Millie	Furness Withy (Shipping) Ltd
<i>Penelope Everard</i>	T. Dawson	F. T. Everard & Sons Ltd
<i>Piquence</i>	K. Stevens	Crescent Shipping Co. Ltd
<i>Rhodri Mawr</i>		Sealink (U.K.) Ltd
<i>Rogate</i>	J. L. Blanch	Stephenson Clarke Shipping Ltd
<i>Rora Head</i>	H. Mackay	Christian Salvesen (Shipping) Ltd
<i>St Clair</i>	J. Cowie	P. & O. Lines Ltd
<i>St Columba</i>	L. R. Evans	Sealink (U.K.) Ltd
<i>Shell Explorer</i>	M. J. MacLean	Shell U.K. Ltd
<i>Storrington</i>	R. Potts	Stephenson Clarke Shipping Ltd
<i>Suffolk Service</i>		Offshore Marine Ltd
<i>Sumburgh Head</i>	F. J. Keane	Christian Salvesen (Shipping) Ltd
<i>Vibrenc</i>	J. Setterfield	Crescent Shipping Co. Ltd
<i>Warden Point</i>	R. Gattis	Hudson S.S. Co. Ltd
<i>Washington</i>	P. Dyer	Stephenson Clarke Shipping Ltd.
<i>Westence</i>	T. E. Uden	Crescent Shipping Co. Ltd
<i>Wheelsman</i>	A. W. Duffin	Rowbotham Tankships Ltd

Light-vessels

NAME OF VESSEL	MASTER
<i>Channel</i>	R. J. Owen, A. Fowler
<i>Dowsing</i>	J. F. Beamish, J. Akester
<i>East Goodwin</i>	A. Everett, F. G. Edwards
<i>Falls</i>	A. H. Robinson, W. E. Jones
<i>Humber</i>	P. F. J. Hollowed, L. A. Horn
<i>Newarp</i>	W. F. Dalby, S. F. Goose
<i>Royal Sovereign (Lt. Tower)</i>	W. G. Trebilcock, V. S. Pearce
<i>St. Gowan</i>	J. J. Spencer, G. Harley
<i>Seven Stones</i>	H. Price, R. Goddard
<i>Smith's Knoll</i>	G. E. West, W. Sheaf
<i>Tongue</i>	F. Allen, B. W. Mead
<i>Varne</i>	D. M. Davies, P. L. Wilkins

BRITISH COMMONWEALTH

The following list gives the names of Selected and Supplementary Ships and the number of Auxiliary Ships where known (i.e. those which only report in 'sparse areas'), which voluntarily co-operate with meteorological services of the British Commonwealth.

Information for these lists is required by 31 March each year. Information for the January corrective lists is required by 30 September each year.

AUSTRALIA (Information dated 22.2.84)

NAME OF VESSEL	OWNER/MANAGER
<i>Al Khaleej</i>	Kuwait Shipping Co.
<i>Al Qurain</i>	Livestock Transport & Trading Co.
<i>Al Shuwaikh</i>	Livestock Transport & Trading Co.
<i>Al Yassrah</i>	Rural Exporters & Traders Pty Ltd
<i>Anro Australia</i>	Australian National Line
<i>Arafura</i>	Overseas Containers Australia Pty Ltd
<i>Ariake</i>	Overseas Containers Australia Pty Ltd
<i>Australia Star</i>	Blue Star Line
<i>Australian Emblem</i>	Australian National Line
<i>Australian Endeavour</i>	Australian National Line
<i>Australian Enterprise</i>	Australian National Line
<i>Australian Escort</i>	Australian National Line
<i>Australian Explorer</i>	Australian National Line
<i>Australian Exporter</i>	Australian National Line
<i>Australian Pioneer</i>	Australian National Line
<i>Australian Progress</i>	Australian National Line
<i>Australian Prospector</i>	Australian National Line
<i>Australian Purpose</i>	Australian National Line
<i>Australian Venture</i>	Australian National Line
<i>Bass Trader</i>	Australian National Line
<i>BP Achiever</i>	BP Australia
<i>BP Endeavour</i>	BP Tanker Co. Ltd
<i>BP Enterprise</i>	BP Tankers (Aust.) Pty Ltd
<i>Brisbane Trader</i>	Australian National Line
<i>Cape Don</i>	Department of Transport (Australia)
<i>Cape Hawke</i>	Australian National Line
<i>Cape Moreton</i>	Department of Transport (Australia)
<i>Cape Pillar</i>	Department of Transport (Australia)
<i>Coral Chief</i>	China Navigation Co. Ltd
<i>Danny 'F'</i>	Rachid Fares Enterprises Pty Ltd
<i>Dansborg</i>	Bulkships (Singapore) Pty Ltd
<i>Darwin Trader</i>	Australian National Line
<i>Dick Smith Explorer</i>	Oceanic Research Foundation
<i>Eastern Enterprise</i>	Howard Smith Ltd
<i>Eigamoiya</i>	Nauru Local Govt Council
<i>Eigu</i>	Nauru Pacific Line
<i>Ellsberg</i>	Weeke Ship (Hong Kong) Ltd
<i>Empress of Australia</i>	Australian National Line
<i>Energy Searcher</i>	Pacific Supplies Inc.
<i>Eugene McDermott</i>	World Wide Surveys Ltd
<i>Fernanda 'F'</i>	Rachid Fares Enterprises Pty Ltd
<i>Flinders Range</i>	Australian National Line
<i>Francis Bay</i>	V. B. Perkins and Co. Pty Ltd
<i>Fua Kavenga</i>	Pacific Forum Line
<i>Gerringong</i>	Howard Smith Ltd
<i>Havjo</i>	Havtor Ship Management (Norway)
<i>Holstein Express</i>	Vroon B. V. (Holland)
<i>Howard Smith</i>	Howard Smith Ltd
<i>Iron Arnhem</i>	Broken Hill Pty Ltd
<i>Iron Kirby</i>	Broken Hill Pty Ltd
<i>Iron York</i>	Broken Hill Pty Ltd
<i>Khalij Express</i>	Gulf Ship Line
<i>Kimberley</i>	State Shipping Service
<i>Koolinda</i>	State Shipping Service
<i>Lake Barrine</i>	Australian National Line
<i>Lake Eildon</i>	Australian National Line
<i>Lake Hume</i>	Australian National Line
<i>Lalandia</i>	East Asiatic Co. Ltd.
<i>Lysaght Endeavour</i>	Australian National Line
<i>Melbourne Trader</i>	Australian National Line
<i>Mobil Flinders</i>	Mobil Oil (Australia) Ltd
<i>Mukairish Althalet</i>	Al Mukairish Shipping
<i>Mukairish Althani</i>	Kuwait Shipping Co.

Australia (contd)

NAME OF VESSEL	OWNER/MANAGER
<i>Nimos</i>	China Navigation Co. Ltd
<i>Oceanic Crest</i>	Seahorse Ship Management Ltd
<i>Oriana</i>	P. & O. Lines Ltd
<i>Ormiston</i>	C.S.R. Ltd
<i>Papuan Chief</i>	China Navigation Co. Ltd
<i>Pathfinder II</i>	Pan Ore Transportation Inc
<i>Persia</i>	Rachid Fares Enterprises Pty Ltd
<i>Pilbara</i>	State Shipping Service
<i>Prospector</i>	Pan Ore Transportation Inc.
<i>Raslan</i>	Qatar Transport & Marine Services Co. Ltd
<i>Regional Endeavour</i>	Seltrust Mining Corp. Pty Ltd
<i>River Boyne</i>	Australian National Line
<i>River Embley</i>	Australian National Line
<i>Rosborg</i>	Bulkships (Singapore) Pty Ltd
<i>Selwyn Range</i>	Australian National Line
<i>Seola</i>	C.S.I.R.O
<i>Sid McGrath</i>	John Burke Shipping Pty Ltd
<i>Silver Hawk</i>	Colonial Sugar Refinery
<i>Sprightly</i>	T. Korevaar & Sons Pty Ltd
<i>Sydney Trader</i>	Australian National Line
<i>Tarago</i>	Wilh. Wilhelmsen
<i>TNT Altrans</i>	TNT Bulkships Ltd
<i>TNT Capricornia</i>	TNT Bulkships Ltd
<i>TNT Carpentaria</i>	Australian National Line
<i>Tourcoing</i>	Scan Austral Asiatic Shipping Line
<i>Townsville Trader</i>	Australian National Line
<i>Tropic Dawn</i>	Australia Mauritius Line
<i>Tropic Star</i>	Tropic Island Shipping Co.
<i>Troubridge</i>	S.A. State Government
<i>Viborg</i>	Bulkships (Singapore) Pty. Ltd.

CANADA (Information dated 1.1.84)

NAME OF VESSEL	OWNER/MANAGER
<i>Ad Astra</i>	Barber Ship Management Ltd
<i>Advent</i>	Government of Canada
<i>Alberni Dawn</i>	Man Cheung Yuen Services Ltd
<i>Alert</i>	Government of Canada
<i>Allunga</i>	Australian National Line
<i>Arctic</i>	Canarctic Shipping Co. Ltd
<i>Atlantic Wing</i>	ACT Maritime Co. Ltd
<i>Baffin</i>	Government of Canada
<i>Bayfield</i>	Government of Canada
<i>Bibi</i>	Sir William Reardon Smith & Sons Ltd
<i>Bluenose</i>	Canadian National (Marine)
<i>Bow Drill I</i>	Bow Valley Offshore Drilling Ltd
<i>Bow Drill II</i>	Bow Valley Offshore Drilling Ltd
<i>Brierfield</i>	Buries Markes (Ship Management) Ltd
<i>Camsell</i>	Government of Canada
<i>Canadian Ace</i>	Montreal Shipping Ltd
<i>Canadian Highlander</i>	Upper Lakes Shipping Co.
<i>Cape Roger</i>	Government of Canada
<i>Chebucto</i>	Government of Canada
<i>Crystal Reed</i>	Korea Shipping Corporation Ltd
<i>Cygnus</i>	Government of Canada
<i>Dawson</i>	Government of Canada
<i>Des Groseillers</i>	Government of Canada
<i>Dilkara</i>	ACTA Pty Ltd
<i>Eastern Maid</i>	Indo-China Steam Navigation Co. Ltd
<i>Eastern Moon</i>	Indo-China Steam Navigation Co. Ltd
<i>Eastern Valley</i>	Sir William Reardon Smith & Sons Ltd
<i>Egda</i>	Indo-China Steam Navigation Co. Ltd
<i>Fjord Thistle</i>	Indo-China Steam Navigation Co. Ltd

Canada (contd)

NAME OF VESSEL	OWNER/MANAGER
Fort Calgary	Canadian Pacific Steamships Ltd
Fort Kamloops	Canadian Pacific Steamships Ltd
Fort Nanaimo	Canadian Pacific Steamships Ltd
Fort Nelson	Canadian Pacific Steamships Ltd
Fort Yale	Canadian Pacific Steamships Ltd
Friendship	Mitsui O.S.K. Lines Ltd
Fuhwo Venture	Indo China Steam Navigation Co. Ltd
G. B. Reed	Government of Canada
George E. Darby	Government of Canada
Glomar Labrador I	Home Oil Co. Ltd
Grenfell	Government of Canada
Gulf Beaufort	Gulf Canada Ltd
Gulf Canada	Gulf Canada Ltd
Gulf Mackenzie	Gulf Canada Ltd
Hudson	Government of Canada
Irving Canada	Kent Line Ltd
Irving Eskimo	Kent Line Ltd
Irving Ocean	Kent Line Ltd
Island Princess	P. & O. Lines Ltd
J. E. Bernier	Government of Canada
Jackman	Government of Canada
John A. MacDonald	Government of Canada
John Cabot	Government of Canada
John Shaw	Mobil Oil (Canada) Ltd
Kemano	Jardine Shipping Ltd
Koro Sea	Yick Fung Shipping & Enterprises Co. Ltd
La Primavera	Buriers Marques (Ship Management) Ltd
Labrador	Government of Canada
Lakeshell	Shell Oil (Marine) Co. Ltd
Limnos	Government of Canada
Louis S. St-Laurent	Government of Canada
Louisbourg	Government of Canada
Malahat	Indo-China Steam Navigation Co. Ltd
Marigold I	Patt Manfield Co. Ltd
Marine Evangeline	Canadian National (Marine)
Maxwell	Government of Canada
Montcalm	Government of Canada
Nahidik	Government of Canada
Namao	Government of Canada
Neddrill II	Mobil Oil Canada Ltd
New Zealand Alliance	Wheelock Marine Services Ltd
Nordkap	Norden Steamship Co. Ltd
Nordkyn	Norden Steamship Co. Ltd
Nordpol	Norden Steamship Co. Ltd
Norman McLeod Rogers	Government of Canada
Northern Shell	Shell Oil (Marine) Co. Ltd
Pacific Princess	P. & O. Lines Ltd
Pandora II	Government of Canada
Parizeau	Government of Canada
Pierre Radisson	Government of Canada
Port Vancouver	Canadian Pacific Steamships Ltd
Princess of Acadia	Canadian National (Marine)
Queen of Prince Rupert	British Columbia Ferries
Queen of the North	British Columbia Ferries
Rimba Meranti	Malaysian International Shipping Corporation Berhad
Sealnes	Jebsens (U.K.) Ltd
Sedco 706	Bow Valley Offshore Drilling Ltd
Sedco 709	Mobil Oil (Canada) Ltd
Sedco 710	Petro Canada
Simon Fraser	Government of Canada
Sir Humphrey Gilbert	Government of Canada
Sir John Franklin	Government of Canada
Sir William Alexander	Government of Canada
keena	Sir William Reardon Smith & Sons Ltd
South Express	Eastern Shipping Co. Ltd
Star Ching	Blandford Shipping Co. Ltd
Star Everwin	Man Cheung Yuen Services Ltd
Star Magnate	World Wide Shipping Agency Ltd
Sun Princess	P. & O. Lines Ltd
T. Akasaka	Canadian Pacific Steamships Ltd
Tanu	Government of Canada
Thomas Carleton	Government of Canada
Thor I	Thor Dahl Lines

Canada (contd)

NAME OF VESSEL	OWNER/MANAGER
<i>Thorscape</i>	Thor Dahl Lines
<i>Tupper</i>	Government of Canada
<i>Vinland</i>	Petro Canada
<i>Walter E. Foster</i>	Government of Canada
<i>W. C. van Horne</i>	Canadian Pacific Steamships Ltd
<i>Western Valley</i>	Sir William Reardon Smith & Sons Ltd
<i>West Venture</i>	Mobil Oil (Canada) Ltd
<i>Wilfred Templeman</i>	Government of Canada
<i>Wolfe</i>	Government of Canada
<i>World Prize</i>	World-wide Shipping Agency Ltd
<i>Zapata Scotian</i>	Mobil Oil (Canada) Ltd
<i>Zapata Uglad</i>	Mobil Oil (Canada) Ltd

Auxiliary Ships:

Canada has 212 ocean-going Auxiliary Ships and 107 Auxiliary Ships operating on the Great Lakes and Inland Waters.

HONG KONG (Information dated 28.1.84)

NAME OF VESSEL	OWNER/MANAGER
<i>Asian Jade</i>	Swire Shipping (Agencies) Ltd
<i>Asian Pearl</i>	Swire Shipping (Agencies) Ltd
<i>Barber Perseus</i>	Barber Wilhelmsen Agencies Ltd
<i>Barber Tonsberg</i>	Barber Wilhelmsen Agencies Ltd
<i>Boonkrong II</i>	Chin Seng Hong Ltd
<i>Bunga Kantan</i>	Mak Shui Cho & Son Ltd
<i>Chengtu</i>	Swire Shipping (Agencies) Ltd
<i>Coral Princess</i>	Swire Shipping (Agencies) Ltd
<i>Eastern Muse</i>	The Indo-China S.N. Co. (H.K.) Ltd
<i>Golden Hill</i>	Mercury Shipping Co. Ltd
<i>Halldis</i>	Thoresen & Co. Ltd
<i>Hongkong Container</i>	Hongkong Export Lines Ltd
<i>Hugheverett</i>	Everett Steamship Corp. S/A
<i>Hydrolock</i>	Wheelock Marine Services Ltd
<i>Kweilin</i>	Swire Shipping (Agencies) Ltd
<i>Loi Kim</i>	Hong Kong Borneo Shipping Co. Ltd
<i>Maersk Tempo</i>	Maersk Line (H.K.) Ltd
<i>Mah II</i>	Chin Seng Hong Ltd
<i>Manloeverett</i>	Everett Steamship Corp. S/A
<i>Ngan Chau</i>	Hong Kong Islands Shipping Co. Ltd
<i>Ocean Container</i>	Hong Kong Islands Shipping Co. Ltd
<i>Oriental Ambassador</i>	Hongkong Export Lines Ltd
<i>Oriental Chief</i>	Hongkong Export Lines Ltd
<i>Oriental Expert</i>	Hongkong Export Lines Ltd
<i>Oriental Premier</i>	Hongkong Export Lines Ltd
<i>Oriental Venture</i>	Hong Kong Export Lines Ltd
<i>Pearl of Scandinavia</i>	Swire Shipping (Agencies) Ltd
<i>Ramoneverett</i>	Everett Steamship Corp. S/A
<i>Sea Architect</i>	Interocean Shipping Co. Ltd
<i>Sealock</i>	Wheelock Marine Services Ltd
<i>Seamaster I</i>	Interocean Shipping Co. Ltd
<i>Sirichai Bulakul</i>	Chin Seng Hong Ltd
<i>Strathfife</i>	Swire Shipping (Agencies) Ltd
<i>Strathfyne</i>	Swire Shipping (Agencies) Ltd
<i>Tai Shun</i>	Agriculture & Fisheries Dept., H.K. Govt.
<i>Thai Pailin</i>	Hongkong Export Lines Ltd
<i>Thai Tubtim</i>	Hongkong Export Lines Ltd
<i>Theben</i>	Barber Ship Management Ltd
<i>Thomaseverett</i>	Everett Steamship Corp. S/A
<i>Willine Taro</i>	Barber Ship Management Ltd
<i>Willine Toyo</i>	Barber Ship Management Ltd
<i>Willine Tysla</i>	Barber Ship Management Ltd

INDIA (Information dated 1.1.84)

NAME OF VESSEL	OWNER
Selected Ships:	
<i>Akbar</i>	Mogul Line Ltd
<i>Andamans</i>	Shipping Corporation of India
<i>BR Ambedkar</i>	Shipping Corporation of India
<i>Chennai Selvam</i>	South India Shipping Co.
<i>Chidambaram</i>	Shipping Corporation of India
<i>Gaveshani</i>	National Institute of Oceanography
<i>Harsha Vardhan</i>	Shipping Corporation of India
<i>Indian Security</i>	India Steamship Co.
<i>Jalagiriya</i>	Scindia Steam Navigation Co.
<i>Jalayoti</i>	Scindia Steam Navigation Co.
<i>Jalakanta</i>	Scindia Steam Navigation Co.
<i>Jalamangala</i>	Scindia Steam Navigation Co.
<i>Jalamoti</i>	Scindia Steam Navigation Co.
<i>Jalarajan</i>	Scindia Steam Navigation Co.
<i>Jalayamini</i>	Scindia Steam Navigation Co.
<i>Jalazad</i>	Scindia Steam Navigation Co.
<i>Lok Sevak</i>	Mogul Line Ltd
<i>Nancowry</i>	Shipping Corporation of India
<i>Ratna Nandini</i>	Ratnakar Shipping Co.
<i>Sagar Kanya</i>	Shipping Corporation of India
<i>Shompen</i>	Shipping Corporation of India
<i>State of Andhra Pradesh</i>	Shipping Corporation of India
<i>State of Maharashtra</i>	Shipping Corporation of India
<i>State of Mysore</i>	Shipping Corporation of India
<i>State of Nagaland</i>	Shipping Corporation of India
<i>State of Punjab</i>	Shipping Corporation of India
<i>State of Travancore-Cochin</i>	Shipping Corporation of India
<i>State of Uttar Pradesh</i>	Shipping Corporation of India
<i>State of West Bengal</i>	Shipping Corporation of India
<i>Vishnu Sagar</i>	Parekh Ocean Carriers
<i>Vishva Anurag</i>	Shipping Corporation of India
<i>Vishva Maya</i>	Shipping Corporation of India
<i>Vishva Sudha</i>	Shipping Corporation of India
Supplementary Ships:	
<i>Ayanta</i>	Shipping Corporation of India
<i>Al Gilani</i>	Allanasons Pte Ltd
<i>Annapurna</i>	Shipping Corporation of India
<i>Anupama</i>	Shipping Corporation of India
<i>Apj Ambika</i>	Surrendra Overseas Ltd
<i>Apj Anand</i>	Surrendra Overseas Ltd
<i>Apj Anjali</i>	Surrendra Overseas Ltd
<i>Apj Priya</i>	Surrendra Overseas Ltd
<i>Aradhana</i>	Shipping Corporation of India
<i>Archana</i>	Shipping Corporation of India
<i>Arunachal Pradesh</i>	Shipping Corporation of India
<i>Bailadila</i>	Shipping Corporation of India
<i>Barauni</i>	Shipping Corporation of India
<i>Bellary</i>	Shipping Corporation of India
<i>Bhagat Singh</i>	Shipping Corporation of India
<i>Bharat Seema</i>	Shipping Corporation of India
<i>Bharatendu</i>	Shipping Corporation of India
<i>Bhaskara</i>	Shipping Corporation of India
<i>Bhavabuti</i>	Shipping Corporation of India
<i>Chanakya</i>	Shipping Corporation of India
<i>Chennai Jayam</i>	South India Shipping Co.
<i>Chennai Muyarchi</i>	South India Shipping Co.
<i>Chennai Ookkam</i>	South India Shipping Co.
<i>Chennai Perumai</i>	South India Shipping Co.
<i>Chhatrapati Shivaji</i>	Shipping Corporation of India
<i>Desh Deep</i>	Shipping Corporation of India
<i>Devaraya</i>	Shipping Corporation of India
<i>Diglipur</i>	Shipping Corporation of India
<i>Faulad Sardar</i>	Faulad Lines Pte Ltd
<i>Indian Endurance</i>	India Steamship Co.
<i>Indian Explorer</i>	India Steamship Co.
<i>Indian Faith</i>	India Steamship Co.
<i>Indian Fame</i>	India Steamship Co.
<i>Indian Fraternity</i>	India Steamship Co.
<i>Indian Freedom</i>	India Steamship Co.
<i>Indian Grace</i>	India Steamship Co.

India (contd)

NAME OF VESSEL	OWNER
<i>Indian Industry</i>	India Steamship Co.
<i>Indian Progress</i>	India Steamship Co.
<i>Indian Prosperity</i>	India Steamship Co.
<i>Indian Tribune</i>	India Steamship Co.
<i>Indian Triumph</i>	India Steamship Co.
<i>Indian Trust</i>	India Steamship Co.
<i>Indian Valour</i>	India Steamship Co.
<i>Indian Venture</i>	India Steamship Co.
<i>Jag Anjali</i>	Great Eastern Shipping Co.
<i>Jag Dharma</i>	Great Eastern Shipping Co.
<i>Jag Doot</i>	Great Eastern Shipping Co.
<i>Jag Jiwan</i>	Great Eastern Shipping Co.
<i>Jag Jyoti</i>	Great Eastern Shipping Co.
<i>Jag Manek</i>	Great Eastern Shipping Co.
<i>Jag Prakash</i>	Great Eastern Shipping Co.
<i>Jag Preeti</i>	Great Eastern Shipping Co.
<i>Jag Rekha</i>	Great Eastern Shipping Co.
<i>Jag Shakti</i>	Great Eastern Shipping Co.
<i>Jag Shanti</i>	Great Eastern Shipping Co.
<i>Jagat Kirti</i>	Dempo Steamship Co.
<i>Jagat Neta</i>	Dempo Steamship Co.
<i>Jagat Samrat</i>	Dempo Steamship Co.
<i>Jagat Swamini</i>	Dempo Steamship Co.
<i>Jagat Vijeta</i>	Dempo Steamship Co.
<i>Jainarayan Vyas</i>	Shipping Corporation of India
<i>Jalabala</i>	Scindia Steam Navigation Co.
<i>Jaladurga</i>	Scindia Steam Navigation Co.
<i>Jalagodavari</i>	Scindia Steam Navigation Co.
<i>Jalagouri</i>	Scindia Steam Navigation Co.
<i>Jalagovind</i>	Scindia Steam Navigation Co.
<i>Jalakala</i>	Scindia Steam Navigation Co.
<i>Jalakendra</i>	Scindia Steam Navigation Co.
<i>Jalamani</i>	Scindia Steam Navigation Co.
<i>Jalamatsya</i>	Scindia Steam Navigation Co.
<i>Jalamayur</i>	Scindia Steam Navigation Co.
<i>Jalamohan</i>	Scindia Steam Navigation Co.
<i>Jalamokambi</i>	Scindia Steam Navigation Co.
<i>Jalamorari</i>	Scindia Steam Navigation Co.
<i>Jalamudra</i>	Scindia Steam Navigation Co.
<i>Jalamurugan</i>	Scindia Steam Navigation Co.
<i>Jalaputra</i>	Scindia Steam Navigation Co.
<i>Jalarashmi</i>	Scindia Steam Navigation Co.
<i>Jalaratna</i>	Scindia Steam Navigation Co.
<i>Jalatapi</i>	Scindia Steam Navigation Co.
<i>Jalatarang</i>	Scindia Steam Navigation Co.
<i>Jalavijaya</i>	Scindia Steam Navigation Co.
<i>Jalayamuna</i>	Scindia Steam Navigation Co.
<i>Jalavallabh</i>	Scindia Steam Navigation Co.
<i>Jameela</i>	Shipping Corporation of India
<i>Jana Priya</i>	Mogul Line Ltd
<i>Jana Vijay</i>	Mogul Line Ltd
<i>Jawaharlal Nehru</i>	Shipping Corporation of India
<i>Jay Ambika</i>	Jay Shree Tea & Industries Ltd
<i>Kabirdas</i>	Shipping Corporation of India
<i>Kalidas</i>	Shipping Corporation of India
<i>Kanchenjunga</i>	Shipping Corporation of India
<i>Kamishka</i>	Shipping Corporation of India
<i>Karnataka</i>	Mogul Line Ltd
<i>Lal Bahadur Shastri</i>	Shipping Corporation of India
<i>Laxmi</i>	Shipping Corporation of India
<i>Lok Many</i>	Mogul Line Ltd
<i>Lok Nayak</i>	Mogul Line Ltd
<i>Lok Palak</i>	Mogul Line Ltd
<i>Lok Sahayak</i>	Mogul Line Ltd
<i>Lok Vaibhav</i>	Mogul Line Ltd
<i>Lok Vihar</i>	Mogul Line Ltd
<i>Lok Vikas</i>	Mogul Line Ltd
<i>Lok Vivek</i>	Mogul Line Ltd
<i>Lok Vinay</i>	Mogul Line Ltd
<i>Lokmanya Tilak</i>	Shipping Corporation of India
<i>Maha Vijay</i>	South East Asia Shipping Co.
<i>Mahabhakti</i>	South East Asia Shipping Co.
<i>Mahabir</i>	South East Asia Shipping Co.

India (contd)

NAME OF VESSEL	OWNER
<i>Maharasmī</i>	Shipping Corporation of India
<i>Maharshi Dayanand</i>	Shipping Corporation of India
<i>Maratha Elegance</i>	Chowgule Steamships Co.
<i>Maratha Melody</i>	Chowgule Steamships Co.
<i>Maratha Progress</i>	Chowgule Steamships Co.
<i>Marjan</i>	Shipping Corporation of India
<i>Meghdoot</i>	Varun Shipping Co.
<i>Meghrab</i>	Shipping Corporation of India
<i>Mizoram</i>	Shipping Corporation of India
<i>MMP Wealth</i>	Shipping Corporation of India
<i>M.O.T. Dredge VIII</i>	Shipping Corporation of India
<i>Nand Hari</i>	Essar Bulk Carriers Ltd
<i>Nand Kala</i>	Essar Bulk Carriers Ltd
<i>Netaji Subhas Bose</i>	Shipping Corporation of India
<i>Nitya Amar</i>	Maini Shipping Pte Ltd
<i>Onge</i>	Shipping Corporation of India
<i>Prabhu Gopal</i>	Tolani Shipping Co.
<i>Prabhu Puni</i>	Tolani Shipping Co.
<i>Prabhu Satram</i>	Tolani Shipping Co.
<i>Rafi Ahmed Kidwai</i>	Tolani Shipping Co.
<i>Ramdas</i>	Tolani Shipping Co.
<i>Ratna Kirti</i>	Ratnakar Shipping Co.
<i>Ratna Shobhana</i>	Ratnakar Shipping Co.
<i>Ratna Vandana</i>	Ratnakar Shipping Co.
<i>Rishi Vishwamitra</i>	Garware Shipping Corp. Ltd
<i>Sagar Deep</i>	Shipping Corporation of India
<i>Sagar Samrat</i>	Oil & Natural Gas Commission
<i>Sahajahan</i>	Shipping Corporation of India
<i>Sai Nanak</i>	TPS Shipping Co.
<i>Samudra Jyoti</i>	Shipping Corporation of India
<i>Samudragupta</i>	Shipping Corporation of India
<i>Sanchi</i>	Shipping Corporation of India
<i>Sarojini Naidu</i>	Shipping Corporation of India
<i>Satya Kamal</i>	Seven Seas Shipping Transportation
<i>Satya Padam</i>	Seven Seas Shipping Transportation
<i>Satya Sohan</i>	Seven Seas Shipping Transportation
<i>State of Himachal Pradesh</i>	Shipping Corporation of India
<i>State of Kerala</i>	Shipping Corporation of India
<i>State of Madhya Pradesh</i>	Shipping Corporation of India
<i>State of Manipur</i>	Shipping Corporation of India
<i>State of Meghalaya</i>	Shipping Corporation of India
<i>State of Rajasthan</i>	Shipping Corporation of India
<i>Teesta</i>	MacKinnon MacKenzie & Co.
<i>Tulsidas</i>	Shipping Corporation of India
<i>Unibaksh</i>	Universal Shipping Co. Pte Ltd
<i>Vallabhbai Patel</i>	Shipping Corporation of India
<i>Varuna Yan</i>	Thakur Shipping Co. Ltd
<i>Veer Varuna</i>	Tata Chemicals Ltd
<i>Vishva Abha</i>	Shipping Corporation of India
<i>Vishva Aditya</i>	Shipping Corporation of India
<i>Vishva Ajay</i>	Shipping Corporation of India
<i>Vishva Ambar</i>	Shipping Corporation of India
<i>Vishva Amitabh</i>	Shipping Corporation of India
<i>Vishva Apurva</i>	Shipping Corporation of India
<i>Vishva Asha</i>	Shipping Corporation of India
<i>Vishva Bandhan</i>	Shipping Corporation of India
<i>Vishva Bhakti</i>	Shipping Corporation of India
<i>Vishva Bindu</i>	Shipping Corporation of India
<i>Vishva Chetana</i>	Shipping Corporation of India
<i>Vishva Dharma</i>	Shipping Corporation of India
<i>Vishva Jyoti</i>	Shipping Corporation of India
<i>Vishva Kalyan</i>	Shipping Corporation of India
<i>Vishva Karuna</i>	Shipping Corporation of India
<i>Vishva Kaumudi</i>	Shipping Corporation of India
<i>Vishva Kirti</i>	Shipping Corporation of India
<i>Vishva Madhuri</i>	Shipping Corporation of India
<i>Vishva Mahima</i>	Shipping Corporation of India
<i>Vishva Mamta</i>	Shipping Corporation of India
<i>Vishva Mohini</i>	Shipping Corporation of India
<i>Vishva Nandini</i>	Shipping Corporation of India
<i>Vishva Nayak</i>	Shipping Corporation of India
<i>Vishva Nidhi</i>	Shipping Corporation of India
<i>Vishva Pallav</i>	Shipping Corporation of India

India(contd)

NAME OF VESSEL	OWNER
<i>Vishva Pankaj</i>	Shipping Corporation of India
<i>Vishva Parag</i>	Shipping Corporation of India
<i>Vishva Parijat</i>	Shipping Corporation of India
<i>Vishva Parimal</i>	Shipping Corporation of India
<i>Vishva Prayas</i>	Shipping Corporation of India
<i>Vishva Prem</i>	Shipping Corporation of India
<i>Vishva Raksha</i>	Shipping Corporation of India
<i>Vishva Sandesh</i>	Shipping Corporation of India
<i>Vishva Seva</i>	Shipping Corporation of India
<i>Vishva Shakti</i>	Shipping Corporation of India
<i>Vishva Shobha</i>	Shipping Corporation of India
<i>Vishva Siddhi</i>	Shipping Corporation of India
<i>Vishva Tarang</i>	Shipping Corporation of India
<i>Vishva Tej</i>	Shipping Corporation of India
<i>Vishva Tirth</i>	Shipping Corporation of India
<i>Vishva Umang</i>	Shipping Corporation of India
<i>Vishva Vibhuti</i>	Shipping Corporation of India
<i>Vishva Vijay</i>	Shipping Corporation of India
<i>Vishva Vikas</i>	Shipping Corporation of India
<i>Vishva Vikram</i>	Shipping Corporation of India
<i>Vishva Yash</i>	Shipping Corporation of India
<i>Visvesvaraya</i>	Shipping Corporation of India
<i>Vivekananda</i>	Shipping Corporation of India
<i>Yereva</i>	Shipping Corporation of India
<i>Zakir Hussain</i>	Shipping Corporation of India

Auxiliary Ships:
India has 31 Auxiliary Ships.

NEW ZEALAND (Information dated 1.3.84)

NAME OF VESSEL	OWNER/MANAGER
Selected Ships:	
<i>ACT 3</i>	Blue Port ACT (N.Z.) Ltd
<i>ACT 4</i>	Blue Port ACT (N.Z.) Ltd
<i>ACT 5</i>	Blue Port ACT (N.Z.) Ltd
<i>Amokura</i>	Union S.S. Co. (N.Z.) Ltd
<i>Aotea</i>	Container Fleets (N.Z.) Ltd
<i>Arrow</i>	Sealord Fisheries Ltd
<i>Benrooch</i>	Offshore Drilling Consortium Ltd
<i>Bounty III</i>	Pacific Lines
<i>Capitaine Cook</i>	Pacific Lines
<i>Coastal Trader</i>	Shipping Corporation of N.Z.
<i>Daniel Solander</i>	Solander Fisheries Ltd
<i>Dunedin</i>	Bank and Savill Line
<i>Eagle Arrow</i>	Gearbulk Ltd
<i>Erne</i>	Union S.S. Co. Ltd
<i>Fetu Moana</i>	Shipping Corporation of N.Z.
<i>Fijian</i>	Reef Shipping Agencies
<i>Forum New Zealand</i>	Pacific Forum Line
<i>Forum Samoa</i>	Pacific Forum Line
<i>Golden Bay</i>	Tarakohe Shipping Co.
<i>Gulf Explorer</i>	Trans Tours Ltd
<i>Holmdale</i>	Union S.S. Co. (N.Z.) Ltd
<i>Ile de Lumiere</i>	Sofrana Unilines
<i>James Cook</i>	N.Z. Govt (Fisheries Research)
<i>John Wilson</i>	Tarakohe Shipping Co.
<i>Kolle D.</i>	Nauru Pacific Line
<i>Kotuku</i>	Union S.S. Co. (N.Z.) Ltd
<i>Kuaka</i>	Union S.S. Co. (N.Z.) Ltd
<i>Lake Eyre</i>	Australian National Line
<i>Marama</i>	Union S.S. Co. (N.Z.) Ltd
<i>N.Z. Caribbean</i>	Shipping Corporation of N.Z.
<i>N.Z. Pacific</i>	Shipping Corporation of N.Z.
<i>New Zealand Star</i>	Blue Port ACT (N.Z.) Ltd
<i>New Zealand Trader</i>	Shipping Corporation of N.Z.
<i>Ngahere</i>	Union S.S. Co. (N.Z.) Ltd
<i>Ngapara</i>	Union S.S. Co. (N.Z.) Ltd
<i>Otago Galliard</i>	Fletcher Fishing Ltd
<i>Spirit of Free Enterprise</i>	Pacifica Shipping Co.
<i>Stena Constructor</i>	Stena Line
<i>Tasman Enterprise</i>	Development Finance Co.
<i>Tasman Venture</i>	Development Finance Co.
<i>Tiave Moana</i>	Shipping Corporation of N.Z.
<i>Tui Cakau III</i>	Pacific Lines
<i>Union Auckland</i>	Union S.S. Co. (N.Z.) Ltd
<i>Union Dunedin</i>	Union S.S. Co. (N.Z.) Ltd
<i>Union Nelson</i>	Union S.S. Co. (N.Z.) Ltd
<i>Union Rotoiti</i>	Union S.S. Co. (N.Z.) Ltd
<i>Union Rotorua</i>	Union S.S. Co. (N.Z.) Ltd
<i>Union Sydney</i>	Union S.S. Co. (N.Z.) Ltd
<i>Waitaki</i>	Union S.S. Co. (N.Z.) Ltd
<i>Westport</i>	N.Z. Cement Holdings Ltd
Supplementary Ships:	
<i>Arahanga</i>	New Zealand Railways
<i>Arahura</i>	New Zealand Railways
<i>Aramui</i>	New Zealand Railways
<i>Aratika</i>	New Zealand Railways

Auxiliary Ships:

New Zealand also has a fleet of 13 Auxiliary Ships currently reporting.

