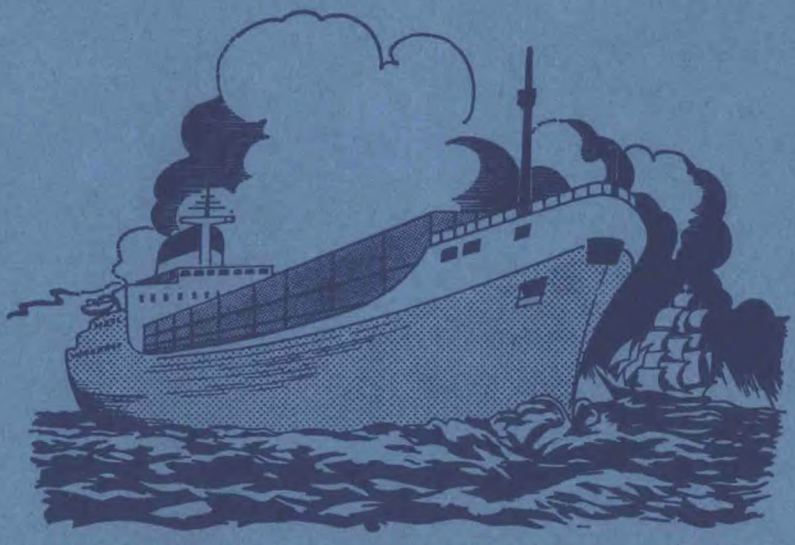
Met. O. 957

The Marine Observer

A quarterly journal of Maritime Meteorology



Volume LIII No. 281
July 1983

£2·20 net

Met. O. 957

THE MARINE OBSERVER

A QUARTERLY JOURNAL OF MARITIME METEOROLOGY PREPARED BY THE MARINE DIVISION OF THE METEOROLOGICAL OFFICE

Vol. LIII **No. 281** **JULY 1983**

CONTENTS

Letters to the Editor, and books for review, should be sent to the Editor 'The Marine Observer', Meteorological Office, Eastern Road, Bracknell, Berkshire RG12 2UR

Published for the Meteorological Office by
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To be purchased direct from HMSO at any of the following addresses: 49 High Holborn, London WC1V 6HB; 13a Castle Street, Edinburgh EH2 3AR; Brazennose Street, Manchester M60 8AS; Southey House, Wine Street, Bristol BS1 2BQ; 258 Broad Street, Birmingham B1 2HE; 80 Chichester Street, Belfast BT1 4JY, or from booksellers.

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EXCELLENT AWARDS 1982

On pages 107–111 of this issue of *The Marine Observer* appears the list of Masters, Principal Observing Officers and Radio Officers who have gained Excellent Awards for the quality of the meteorological logbooks which they have sent us during the year ending 31 December 1982 and once again we have the pleasant task of congratulating those named. However, in doing so we must commiserate with the large number of Masters and Officers whose meteorological logbooks were of Excellent quality but at the same time lacked that little extra which would have brought them into the award class.

Over 1300 meteorological logbooks were received here at Bracknell during 1982 and each one was scrutinized by a master mariner who has long experience of meteorological observing at sea and who fully realizes the difficulties involved in making these observations in certain ships on some trades.

This assessment resulted in the logbooks being placed in an order of merit and the following is a 'short list' of those ships from which we received the best meteorological logbooks during the year:

1. m.v. *Mairangi Bay* (Overseas Containers Ltd), Captain J. Cosker.
2. s.s. *British Trident* (B.P. Shipping Ltd), Captain R. F. Adams.
3. m.v. *Lackenby* (Ropner Management Ltd), Captain J. E. Jennings.
4. m.v. *ACT 7* (Blue Star Ship Management Ltd), Captain D. M. McPhail.
5. m.v. *Table Bay* (Overseas Containers Ltd), Captain R. P. Royan.
6. m.v. *Carinthia* (Cunard Shipping Services Ltd), Captain C. J. Burtinshaw.

Photographs of the first three ships appear opposite page 136. It is worthy of note that *Mairangi Bay* appeared in the 'short lists' for the years 1978 and 1979 and also that *ACT 7* appeared in last year's 'short list'. Special congratulations go to Captain J. Cosker whose name appears in the 'short list' for the third time and to Captain D. M. McPhail whose name appears for the second year running.

The names of Officers serving in 'MARID' ships (vessels in the short sea trades taking and transmitting sea temperatures only) who have gained Awards are shown on page 111. Although seldom mentioned in this journal, the work done by these Officers is an important contribution to our task of providing a meteorological service for shipping.

The recipients of the Awards will be individually notified by letter and asked for an address to which they would like the Award to be sent. As letters sometimes take a long time to reach ships, any Master or Officer who sees his name in the list in this journal, or in a similar list published in a company's house journal, is urged to write to us here in Bracknell claiming the Award and giving us an address to which it may be sent.

The initial Award this year is, once again, the *University Atlas,* the second *Cassell's English Dictionary* and the third *Continents in Collision* by Keith Miller.

C.R.D.

EXCELLENT AWARDS (Year ended 31 December 1982)

Captain	Company
R. F. Adams	B.P. Shipping Ltd
G. C. Barrett	Overseas Containers Ltd
R. K. Bilton	Blue Star Line Ltd
R. J. Bland	Overseas Containers Ltd
M. Boyd	B.P Shipping Ltd
K. Bramley	Shell Tankers (U.K.) Ltd
D. G. Brown	Ocean Transport & Trading P.L.C.
C. P. Browne	Ben Line Steamers Ltd
R. M. Burns	Blue Star Line Ltd
C. J. Burtinshaw	Cunard S.S. Co. Ltd
J. B. Caley	Cayzer Irvine Shipping Co. Ltd
R. R. Cawdery	Cayzer Irvine Shipping Co. Ltd
G. B. Charleson	Cayzer Irvine Shipping Co. Ltd
M. J. Cole	British Antarctic Survey
J. A. Corcoran	Bibby Line Ltd
J. Cosker	Overseas Containers Ltd
D. S. Craven	Furness Withy (Shipping) Ltd
G. P. Crossland	Offshore Marine Ltd
A. G. Cruickshank	Cayzer Irvine Shipping Co. Ltd.
L. W. Crump	Cunard S.S. Co. Ltd
W. A. Davidson	Blue Star Line Ltd
L. Y Davis	Bowring S.S. Co. Ltd
D. K. Dickson	Dept. of Agriculture & Fisheries for Scotland
R. Dinnie	Ocean Transport & Trading P.L.C.
J. R. Dit-Leschery	Cunard S.S. Co. Ltd
D. G. Downie	B.P. Shipping Ltd
A. J. Dyne	Ocean Transport & Trading P.L.C.
C. R. Elliott	British Antarctic Survey
I. R. Farnell	Shell Tankers (U.K.) Ltd
J. L. Frain	Maersk (U.K.) Co. Ltd
J. R. French	Ministry of Agriculture, Fisheries & Food
P. N. Gilkes	F. T. Everard & Sons Ltd
W. P. Goldie	Ocean Transport & Trading P.L.C.
J. W. Graves	B.P. Shipping Ltd
J. Hart	Cunard S.S. Co. Ltd
M. R. Hicks	P. & O. S.N. Co.
L. E. Howell	Overseas Containers Ltd
J. H. Hutson	Overseas Containers Ltd
J. E. Jennings	Sir R. Ropner and Co. Ltd
C. J. C. Johnston	Overseas Containers Ltd
W. J. G. Jones	Blue Star Line Ltd
J. T. Langstaff	James Fisher and Sons Ltd
S. J. Lawrence	British Antarctic Survey
P. Lay	P. & O. S.N. Co.
J. A. Lefevre	Scottish Ship Management Ltd
J. C. Lilley	British United Trawlers Ltd
I. C. Mackintosh	Blue Star Line Ltd
M. McCarthy	Overseas Containers Ltd
G. W. McDermott	P. & O. S.N. Co.
D. M. McPhail	Blue Star Line Ltd
P. J. R. Manson	Overseas Containers Ltd
P. Mathews	Blue Star Line Ltd
D. B. C. Morris	Overseas Containers Ltd
M. Mortimer	Furness Withy (Shipping) Ltd
W. A. Murison	Overseas Containers Ltd
F. Myers	British United Trawlers Ltd
D. Newlin	Blue Star Line Ltd
T. Nicholson	Canadian Pacific Steamships Ltd
T. S. Nurcombe	London & Overseas Freighters P.L.C.
A. J. Palmer	Overseas Containers Ltd
D. Pearce	Townsend Thoresen Car Ferries Ltd
B. M. Penman	P. & O. S.N. Co.
E. M. S. Phelps	British Antarctic Survey
R. H. Plant	Townsend Thoresen Car Ferries Ltd
A. A. Railton	Ocean Transport & Trading P.L.C.
D. L. Rattray	Dept. of Agriculture & Fisheries for Scotland
S. J. Readman	Scottish Ship Management Ltd
M. M. Reeves	Bibby Line Ltd
A. J. A. Richards	F. T. Everard & Sons Ltd
P. Robinson	Hunting Stag Management Ltd

Excellent Awards *(contd)*

Captain	Company
J. Rogers	Canadian Pacific Steamships Ltd
R. P. Royan	Overseas Containers Ltd
A. A. Rundle	Ocean Transport & Trading P.L.C.
M. S. Salsbury	F. T. Everard & Sons Ltd
J. S. Schofield	Ben Line Steamers Ltd
P. Simpson	Bank Line Ltd
G. H. Selby Smith	Natural Environment Research Council
J. Sole	Offshore Marine Ltd
D. Stewart	Bank Line Ltd
F. Stuart	Sir R. Ropner & Co. Ltd
R. B. Tarbuck	London & Overseas Freighters P.L.C.
J. R. Taylor	Bibby Line Ltd
W. D. Templeman	Esso Petroleum Co. Ltd
M. P. Tennant	Ben Line Steamers Ltd
A. D. Terras	Cayzer Irvine Shipping Co. Ltd
J. F. Thomson	B.P. Shipping Ltd
C. B. Tingle	Sir R. Ropner & Co. Ltd
M. Thwaite	Cunard S.S. Co. Ltd
C. B. Walgate	Overseas Containers Ltd
N. Walsh	Scottish Ship Management Ltd
I. Webster	Ocean Transport & Trading P.L.C.
J. W. Welch	Overseas Containers Ltd
P. Wheeldon	British United Trawlers Ltd
M. D. Whiteley	Cayzer Irvine Shipping Co. Ltd
R. R. Will	Cayzer Irvine Shipping Co. Ltd
G. Young	Stephenson Clarke Shipping Ltd
T. D. Young	Newgate Shipping Co. Ltd

Principal Observing Officer	Company
J. H. Adcock	P. & O. S.N. Co.
P. I. Anderson	Ocean Transport & Trading P.L.C.
R. D. Anderson	Overseas Containers Ltd
P. F. Armitage	B.P. Shipping Ltd
K. O. Avery	Natural Environment Research Council
C. F. Balaporia	Bowring S.S. Co. Ltd
K. G. Baldwin	F. T. Everard & Sons Ltd
S. Barraclough	Overseas Containers Ltd
P. M. Bates	Sir R. Ropner & Co. Ltd
I. K. Bourne	Cunard S.S Co. Ltd
J. H. Brechin	B.P. Shipping Ltd.
I. D. Brewell**	British United Trawlers Ltd
C. E. Broad	Sir Wm. Reardon Smith & Sons Ltd.
G. H. Buckby	Ben Line Steamers Ltd
N. D. J. Butler	Blue Star Line Ltd
K. D. Campbell	Ocean Transport & Trading P.L.C.
T. W. Carr	Ben Line Steamers Ltd
N. Carrington	B.P. Shipping Ltd
I. M. Chadney	Overseas Containers Ltd
S. J. Chapman	Furness Withy (Shipping) Ltd
J. H. Clark	Ben Line Steamers Ltd
C. F. G. Crookshank	P. & O. S.N. Co.
P. Crowe	Canadian Pacific Steamships Ltd
R. P. Daniells	Newgate Shipping Co. Ltd
C. A. Skane-Davis	Shell Tankers (U.K.) Ltd
J. J. Dibben	Cunard S.S. Co. Ltd

R. J.Ellis	Furness Withy (Shipping) Ltd
N. A. Escott	Overseas Containers Ltd
J. C. Etheridge	P. & O. S.N. Co.
S. A. Fell	Cayzer Irvine Shipping Co. Ltd.
N. D. Ferguson	Sir R. Ropner & Co. Ltd
R. J. Gill	Blue Star Line Ltd
J. J. Grace	Bibby Line Ltd
P. D. Hall	Cayzer Irvine Shipping Co. Ltd
P. Hamlin	Sir R. Ropner and Co. Ltd
A. T. Hammond	Ocean Transport & Trading P.L.C.
K. S. Hardy	Ocean Transport & Trading P.L.C.
I. M. Hill	Ocean Transport & Trading P.L.C.
A. Hillier	Blue Star Line Ltd
C. Hillier	Bibby Line Ltd
D. C. Hocking	Blue Star Line Ltd
M. Hooson	Offshore Marine Ltd
R. S. Hopkins	Ocean Transport & Trading P.L.C.
R. J. Hughes	Ocean Transport & Trading P.L.C.
M. S. Hume	Bibby Line Ltd
A. Hunt	Dept. of Agriculture & Fisheries for Scotland
N. W. Hunt	Bank Line Ltd
R. M. James	P. & O. S.N. Co.
C. Jeffrey	Scottish Ship Management Ltd
E. A. Lamb	Hunting Stag Management Ltd
G. F. Lee	Ministry of Agriculture, Fisheries & Food
L. J. Loftus	B.P. Shipping Ltd
L. E. Macintosh	Maersk (U.K.) Co. Ltd
C. J. Meredith	Cayzer Irvine Shipping Co. Ltd
J. S. Millar	Scottish Ship Management Ltd
P. Mitchell	Blue Star Line Ltd
W. J. K. Mulcahy	Ocean Transport & Trading P.L.C.
J. A. Norman	Cunard S.S. Co. Ltd
I. S. Norris	Overseas Containers Ltd
K. J. Odams	Overseas Containers Ltd
C. J. O'Donnell	Bank Line Ltd
D. A. Parsons	Townsend Thoresen Car Ferries Ltd
J. M. Petty	James Fisher and Sons Ltd
P. R. Phibbs	Cunard S.S. Co. Ltd
P. G. Powell	F. T. Everard & Sons Ltd
J. D. Price	Cayzer Irvine Shipping Co. Ltd
G. Rawlings	Townsend Thoresen Car Ferries Ltd
A. M. T. Reading	British Antarctic Survey
J. M. Rigden	Shell Tankers (U.K.) Ltd
P. R. Shenton	London & Overseas Freighters P.L.C.
N. B. H. Skinner	F. T. Everard & Sons Ltd
D. C. Slack	Overseas Containers Ltd
J. G. Small	Canadian Pacific Steamships Ltd
D. W. Smith	Ocean Transport & Trading P.L.C.
J. G. Smith	B.P. Shipping Ltd
K. W. Smith	Overseas Containers Ltd
J. O. Smyth	Scottish Ship Management Ltd
R. Spall**	British United Trawlers Ltd
I. A. Sutton	Ocean Transport & Trading P.L.C.
J. G. Sweetman	Offshore Marine Ltd
G. W. H. Tennant	Dept. of Agriculture & Fisheries for Scotland
D. M. Thornton	Blue Star Line Ltd
W. F. Todd	Blue Star Line Ltd
J. M. Torkington	Overseas Containers Ltd
M. J. Trafford	Overseas Containers Ltd
R. Wade**	British Antarctic Survey
S. L. J. Walker	Bibby Line Ltd
M. J. Webber	London & Overseas Freighters P.L.C.
J. M. Webster	Blue Star Line Ltd
M. J. West	Bank Line Ltd
A. N. Whinton	P. & O. S.N. Co.
C. G. White	Esso Petroleum Co. Ltd
S. F. Whittingham	Offshore Marine Ltd
A. R. Wilson	Cayzer Irvine Shipping Co. Ltd
W. M. Winter	Overseas Containers Ltd
A. Wormald	Stephenson Clarke Shipping Ltd
H. A. Wren	Overseas Containers Ltd

Excellent Awards *(contd)*

Radio Officer	Company
D. Alcock	Overseas Containers Ltd
R. W. Aldridge	P. & O. S.N. Co.
I. F. Alexander	London & Overseas Freighters P.L.C.
P. A. Barratt	Marconi International Marine Co. Ltd
R. P. Bate	Overseas Containers Ltd
G. Bewley*	F. T. Everard & Sons Ltd
P. Boyle	Cayzer Irvine Shipping Co. Ltd
M. K. Breeze	Marconi International Marine Co. Ltd
A. J. Brigden*	Natural Environment Research Council
H. E. Brookfield	Marconi International Marine Co. Ltd
C. R. Brooks	P. & O. S.N. Co.
M. Brown	Ocean Transport & Trading P.L.C.
W. Brown	International Marine Radio Co. Ltd
C. G. Buckley*	F. T. Everard & Sons Ltd
A. Campbell	Cayzer Irvine Shipping Co. Ltd
J. A. Cardownie	Cayzer Irvine Shipping Co. Ltd
M. J. Carroll*	Offshore Marine Ltd
R. J. Chamberlain*	Natural Environment Research Council
E. Connell	Canadian Pacific Steamships Ltd
W. H. Coventry	Ocean Transport & Trading P.L.C.
C. Curtis	International Marine Radio Co. Ltd
D. E. Dale	B.P. Shipping Ltd.
K. Davenport	International Marine Radio Co. Ltd
R. F. Davies	Cunard S.S. Co. Ltd
C. D. Dews	Ocean Transport & Trading P.L.C.
B. Dickinson	Bibby Line Ltd
P. M. Dolphin	Ocean Transport & Trading P.L.C.
J. N. Duckworth	Cayzer Irvine Shipping Co. Ltd
K. A. Ellison	International Marine Radio Co. Ltd
M. Essery	International Marine Radio Co. Ltd
P. G. Esson	International Marine Radio Co. Ltd
P. Fitzsimons	Ocean Transport & Trading P.L.C.
D. I. Fraser	Overseas Containers Ltd
M. J. Gamble	Shell Tankers (U.K.) Ltd
J. C. Gartland	Ocean Transport & Trading P.L.C.
P. A. Gooch	Ocean Transport & Trading P.L.C.
T. Hooper*	F. T. Everard & Sons Ltd
M. P. Howard	Overseas Containers Ltd
F. Huggett	International Marine Radio Co. Ltd
C. E. Hughes	Overseas Containers Ltd
D. W. Humble	Scottish Ship Management Ltd
D. Hutchinson	Furness Withy (Shipping) Ltd
J. H. Hutton	Offshore Marine Ltd
W. Kay	Overseas Containers Ltd
D. A. Kelsall	Overseas Containers Ltd
C. W. Knibb	Ocean Transport & Trading P.L.C.
T. Kucharski	Marconi International Marine Co. Ltd
W. Latus	Cayzer Irvine Shipping Co. Ltd
P. A. Lloyd	Sealink (U.K.) Ltd
A. R. Louch*	Natural Environment Research Council
A. R. Male	Marconi International Marine Co. Ltd
M. McKenny	P. & O. S.N. Co.
R. J. Middleton*	F. T. Everard & Sons Ltd
T. W. Mitchell*	Furness Withy (Shipping) Ltd
A. Monteath*	F. T. Everard & Sons Ltd
I. Morgan	Marconi International Marine Co. Ltd
P. C. Morris	Townsend Thoresen Car Ferries Ltd
B. A. Mullan	Overseas Containers Ltd
I. A. Muschamp	Kelvin Hughes Ltd
D. Neave	International Marine Radio Co. Ltd
P. M. Nee	International Marine Radio Co. Ltd
H. M. O'Gorman	British Antarctic Survey
B. Oldroyd	Ocean Transport & Trading P.L.C.
N. T. Palmer	International Marine Radio Co. Ltd
T. R. Pardoe	Radio & Electronic Services Ltd
W. C. A. Phillips	Ocean Transport & Trading P.L.C.
T. Plant	Sealink (U.K.) Ltd
P. Prophet	Blue Star Line Ltd
M. S. Putman*	Natural Environment Research Council
R. B. Redhead	Ocean Transport & Trading P.L.C.
J. D. Rennie	Marconi International Marine Co. Ltd
R. P. Robertson	Shell Tankers (U.K.) Ltd

D. Gordon*	Dept. of Agriculture & Fisheries for Scotland
V. A. Gorny	Overseas Containers Ltd
R. F. Graham*	Ministry of Agriculture, Fisheries & Food
H. O. C. Grattan	Cunard S.S. Co. Ltd
K. R. Grattan	Cunard S.S. Co. Ltd
C. P. Green*	Offshore Marine Ltd
O. H. W. Grinsdall	Kelvin Hughes Ltd
B. A. Hall*	Dept. of Agriculture & Fisheries for Scotland
P. J. Hall	B.P. Shipping Ltd
J. S. Hallam	Ben Line Steamers Ltd
P. Henderson	B.P. Shipping Ltd
D. Hobson	Furness Withy (Shipping) Ltd
L. M. Sells	Ocean Transport & Trading P.L.C.
S. Shayes	International Marine Radio Co. Ltd
G. T. Simpson	Bibby Line Ltd
I. Smallshaw*	Furness Withy (Shipping) Ltd
M. Smith	P. & O. S.N. Co.
T. J. Smith	Ocean Transport & Trading P.L.C.
I. Spiden	P. & O. S.N. Co.
C. Stuard	London & Overseas Freighters P.L.C.
R. A. Trebilcook	Stephenson Clarke Shipping Ltd
T. A. Verling	Canadian Pacific Steamships Ltd
C. A. Waddicor	Bibby Line Ltd
M. J. Walker	Ocean Transport & Trading P.L.C.
J. N. Wright	Cayzer Irvine Shipping Co. Ltd

'MARID' SHIPS†

Captain	Principal Observing Officer	Radio Officer	Company
F. W. Dogherty	E. C. Davies	G. O. Szymanski	Esso Petroleum Co. Ltd
A. C. Free	N. W. Martin	J. S. Mathers	Caledonian MacBrayne Ltd
J. Penwell	K. Edwards	D. J. Pitt	P. & O. S.N. Co.

* Deck Officer.

** Also Radio 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.

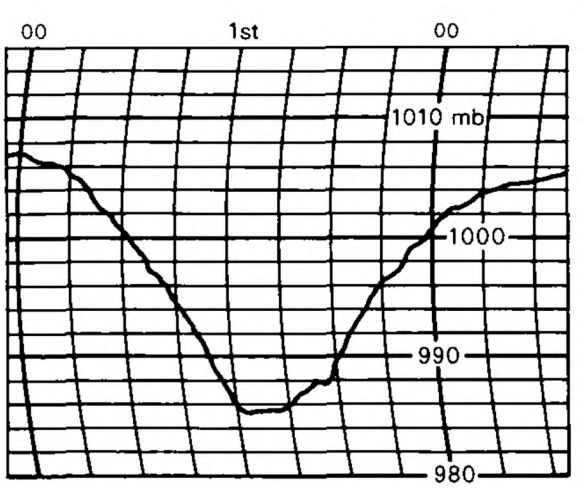
Observing officers are reminded that preserved samples of discoloured water, luminescent water, etc. considerably enhance the value of such an observation. Port Meteorological Officers in the UK will supply instructions on how to preserve and pack such samples on request.

PASSAGE OF TYPHOON 'BESS'

Japanese coastal waters

m.v. *Benledi*. Captain T. Fyfe. Osaka Bay. Observers, the Master, Mr G. Byers, Chief Officer, Mr T. J. F. Gallacher, 2nd Officer, Mr J. A. Inkster, 3rd Officer, and Cadets L. D. MacLeod, P. D. Gauld, G. M. MacDougall and P. G. Amos.

1 August 1982. At 0345 GMT the vessel received orders to leave the Port of Kobe owing to the approach of Typhoon Bess. The vessel left the Port boundary at 0540 GMT for the anchorage area in Osaka Bay. At 0700 GMT the vessel anchored in position 34° 29′N, 135° 12′E. This position was maintained throughout the duration of the typhoon. The Port was declared open at 2200 GMT.



(Barograph running 20 min. slow)

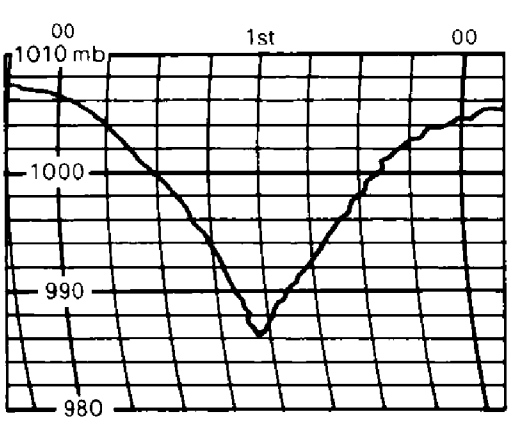
The following data were recorded:

Time GMT	Wind Dir'n	Force	Corrected barometer reading (mb)	Barograph (mb)	Temperatures Dry bulb °C	Wet bulb °C
0600	040°	3	999·9	999·1	24·0	22·7
0700	020°	5	997·9	997·1	23·2	23·0
0800	020°	5	996·8	996·2	23·5	23·0
0900	360°	6	994·5	994·3	23·0	22·5
1000	330°	8	992·2	992·0	22·0	21·6
1100	330°	9	989·2	988·6	21·9	21·5
1200	350°	9	987·0	985·3	22·4	21·7
1300	350°	9	987·5	985·5	21·3	21·1
1400	300°	10	987·3	985·4	21·0	21·0
1500	290°	10	987·9	986·3	21·1	21·1
1600	280°	9	990·5	987·9	21·1	21·1
1700	300°	8	990·3	987·9	21·7	21·0
1800	250°	7–8	993·9	991·4	22·6	21·6
1900	240°	7	995·6	993·1	23·0	21·4
2000	230°	6	998·8	995·0	24·0	21·6
2100	230°	5–6	999·7	996·3	24·4	21·5
2200	250°	5	1001·6	998·0	25·0	23·0
2300	250°	6	1002·3	1000·0	25·9	22·9

Position of ship: 34° 29′N, 135° 12′E.

m.v. *Arafura*. Captain R. M. Coates. Off Osaka, Japan. Observers, the Master and Officers.

1 August 1982. At 0600 GMT the *Arafura* sailed from the port of Osaka to avoid Typhoon No. 10 (Bess). After careful plotting over a number of days it was decided by the Meteorological Agency in Tokyo that this typhoon would pass over the eastern seaboard of Japan on the evening of the 1st (local time) and after careful consideration it was decided that the ports of Kobe and Osaka would be closed along with other major ports to the north. Although Bess was slowly decreasing in intensity, with increase in latitude, winds exceeding 60 knots were recorded and severe damage was inflicted on certain areas of the eastern coast of Japan.



The *Arafura*, through quick and decisive action, was able to escape the full force of the typhoon. Nevertheless wind velocities of 35 knots (force 8) were recorded between 1100 and 1300 GMT on the 1st, blowing from a NNW'ly direction and slowly backing to the west as the typhoon passed by at some 100 n. mile

to the east. A very large E'ly swell was predominant throughout the evening but wind velocity rapidly decreased as the typhoon moved over the island of Honshu.

The *Arafura* proceeded back to Osaka the following morning when the typhoon alert was over. The following sequence of weather was experienced by the *Arafura* as she passed by the typhoon on 1 August:

1100 GMT: dry bulb 23·0 °C, barometric pressure 990·0 mb, wind NW, force 7.
1200 GMT: dry bulb 22·0 °C, barometric pressure 987·8 mb, wind NNW, force 7–8.
1300 GMT: dry bulb 22·5 °C, barometric pressure 990·3 mb, wind NNW, force 4.
1400 GMT: dry bulb 26·5 °C, barometric pressure 993·0 mb, wind NW, force 4–5.
1500 GMT: dry bulb 26·7 °C, barometric pressure 996·2 mb, wind NW'W, force 6.

Position of ship at 0600 GMT on 1 August: 34° 41′N, 135° 28′E.

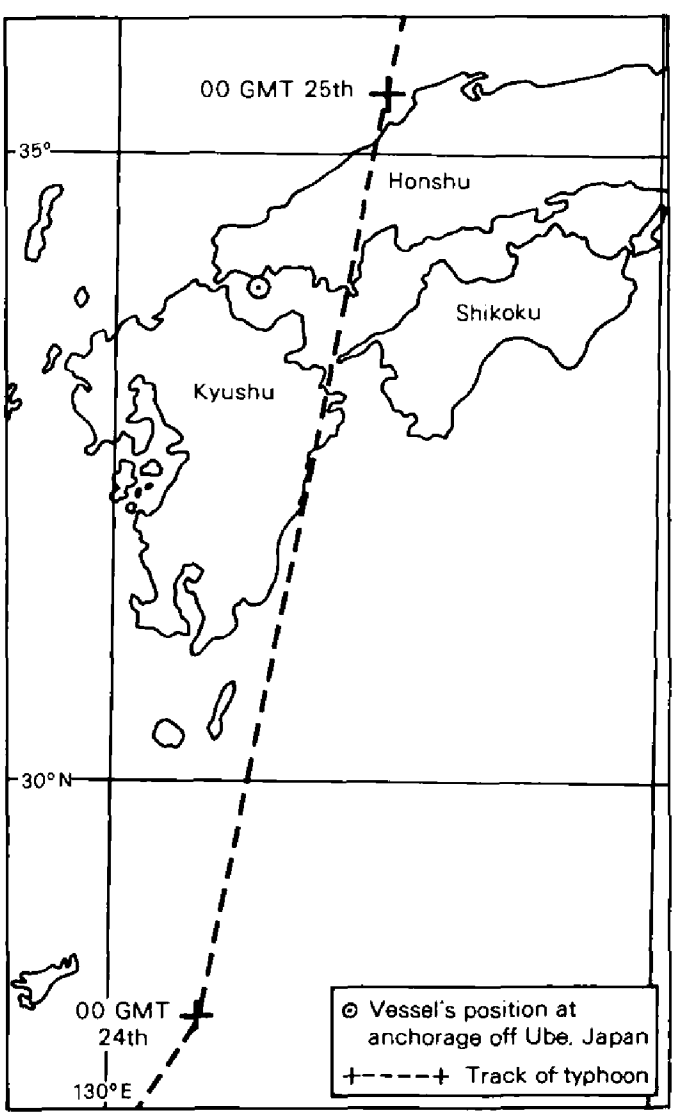
Note. The *Arafura* is an Australian Selected Ship.

PASSAGE OF TYPHOON 'KEN'

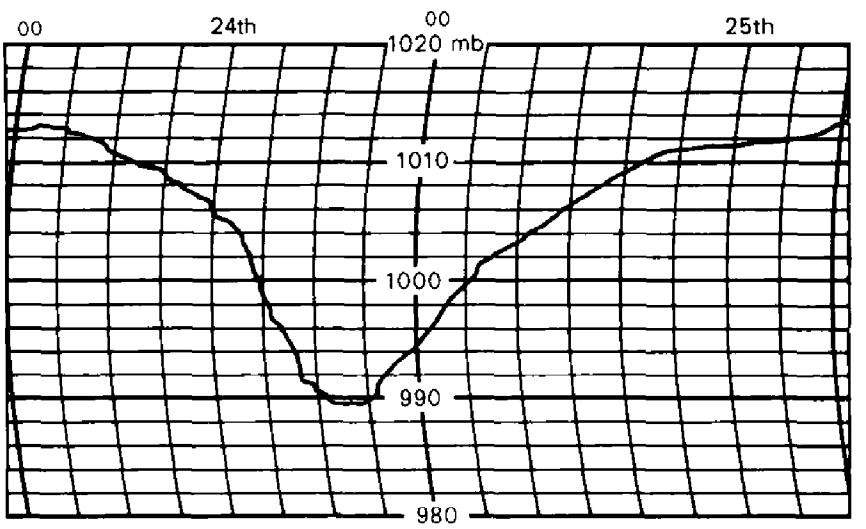
Japanese Inland Sea

m.v. *Port Alberni City*. Captain D. L. Bell. At anchor off Ube, Japan. Observers, the Master, Mr S. F. Broderick, 3rd Officer, and other Officers.

24–25 September 1982. On receiving and plotting the weather reports, it became apparent that the predicted path of the typhoon would approach to within 120 n. mile of the vessel's anchorage position. The vessel, previous to



the approach of the typhoon, was lying to 6 shackles on the port anchor in approximately 14 metres of water, with good holding ground. It was decided to increase the port anchor to 8 shackles, this being completed at 0730 GMT on 24 September. The engine was brought to stand-by on 24 September.



During the passage of the typhoon, its closest point of approach to the vessel was approximately 80 n. mile. Although the wind gusted to force 9 at times, the vessel was protected to a certain extent by the range of mountains to the north of Ube. Also, owing to the fact that the vessel was anchored in the Inland Sea of Japan, there was no noticeable swell.

The factors noted in the following table were among those considered to be the most important and they were therefore logged every hour.

Time GMT	Wind Dir'n	Force	Barometric pressure mb	Dry bulb °C	Dew-point °C	Weather at time of observation
24 September						
0300	NE	2	1012·4	19·0	17·3	Overcast with continuous moderate rain, low seas, moderate visibility.
0700	NE	3	1010·4	20·0	17·8	Overcast with continuous light rain, low seas, moderate visibility.
0800	NE	3	1009·0	19·8	17·1	Heavily overcast with continuous light rain, low seas, moderate visibility.
0900	NE	3	1007·6	19·8	17·1	Heavily overcast with continuous light rain, low seas, moderate visibility.
1000	NNE	3	1006·8	20·0	17·7	Overcast, cloud cover breaking up slightly, rain stopped, good visibility, low seas.
1100	NE	3	1006·3	19·8	18·5	Heavily overcast, cloud forming, with continuous moderate rain, low seas, moderate visibility.
1200	NE	4	1004·5	18·8	18·4	Heavily overcast with heavy continuous rain, low to moderate seas, moderate visibility, wind gusting to force 7.
1300	NNE	4	1002·6	18·7	18·5	Heavily overcast with heavy continuous rain, low to moderate seas, moderate visibility, wind gusting to force 7.
1400	N'E	5	998·8	18·7	18·5	Heavily overcast with heavy continuous rain, moderate seas, moderate to poor visibility, wind gusting to force 7.

Time GMT	Wind Dir'n	Force	Barometric pressure mb	Dry bulb °C	Dew-point °C	Weather at time of observation
1500	N'E	6	995·9	19·8	18·8	Heavily overcast with moderate continuous rain, moderate seas, moderate to good visibility, wind gusting to force 8–9.
1600	NNE	6–7	992·8	19·5	18·6	Heavily overcast with continuous light rain, moderate to rough seas, good visibility, wind gusting to force 7–8.
1700	NNE	7	990·3	20·2	18·4	Heavily overcast with occasional light rain, rough seas, good visibility, wind gusting to force 8.
1800	NNE	6	989·3	21·0	19·8	Overcast with occasional light rain, rough seas, good visibility, wind gusting to force 8.
1900	NNE	7	988·5	22·0	17·9	Overcast and clear with excellent visibility, rough seas, wind gusting to force 8.
2000	NNE	6	989·9	21·9	18·2	Overcast and clear with excellent visibility, rough seas, wind decreasing.
2100	N'W	6–5	992·0	22·1	18·7	Overcast with light rain, moderate to rough seas, good visibility, wind decreasing.
2200	NNW	3	994·2	21·2	19·3	Overcast with continuous drizzle, moderate to slight seas, moderate visibility.
2300	NW'W	4	995·3	22·0	19·8	Overcast with continuous heavy drizzle, moderate seas, moderate visibility, wind increasing.
25 September						
0000	NW'W	6–7	996·9	22·0	19·6	Heavily overcast with good visibility, rough seas, wind gusting to force 8.
0100	WNW	7	999·3	21·8	18·9	Heavily overcast with good visibility, rough seas, wind gusting to force 8–9.
0200	NW'W	7–8	1000·8	22·0	20·8	Heavily overcast, rain within 5 n. mile, very rough seas, good to moderate visibility, wind gusting to force 9.
0300	NW	7–8	1001·8	21·4	18·8	Heavily overcast with continuous light drizzle, rough seas, moderate visibility, wind gusting to force 9.
0400	NW'W	7–8	1002·2	21·6	19·0	Heavily overcast with continuous moderate rain, rough seas, moderate visibility, wind beginning to decrease.
0500	WNW	7–8	1002·8	22·0	18·1	Heavily overcast with continuous moderate rain, rough seas, moderate visibility.
0600	WNW	6–7	1003·7	22·1	18·4	Overcast with moderate rain, rough seas, moderate visibility, wind decreasing.
0700	WNW	7	1005·3	20·0	18·4	Overcast with continuous moderate rain, rough seas, moderate visibility, wind gusting and then decreasing.
0800	NW'W	5	1007·4	20·1	16·8	Overcast with continuous moderate rain, moderate seas, moderate visibility, wind decreasing.
0900	W'N	5	1008·3	19·5	17·8	Overcast and clear, moderate seas, good visibility, wind decreasing.
1000	W'N	4	1009·1	19·3	17·3	Overcast and clear, moderate to slight seas, good visibility.
1100	W	3	1010·0	19·5	17·5	Overcast and clear, cloud cover beginning to break up, slight seas, good visibility.
1500	SW	3	1011·7	19·9	17·3	Overcast with occasional light drizzle, otherwise clear, slight seas, good visibility.
1900	SE	3	1012·0	20·1	16·6	Cloudy, fine and clear, slight seas, good visibility.

The typhoon went on to cause a fair amount of damage in the coastal regions of Kyushu and Honshu, including loss of life, but quickly dissipated to a relatively small depression after it had crossed Honshu.

Position of ship: 33° 53′N, 131° 13′E.

KATABATIC WIND

Gulf of Aden

m.v. *Gas Enterprise*. Captain H. E. Brown. Ras Tannūrah to Suez Bay. Observers, the Master, Mr C. J. Coxhead, 2nd Officer and Mr G. Jackson.

1 September 1982. Before the onset of the Belat, the vessel was on a course of 251°(T) at 15 knots, the dry bulb temperature was 31·0 °C, the barometric pressure was 1003·2 mb, the wind was SSW, force 4 and the sea moderate with no swell. A long time before the onset of the Belat the sky on the western horizon had been very dark with even deeper patches of blackness which appeared to be squalls which rose about 300 m above sea level; elsewhere the visibility was excellent, with the hills to the north clearly visible at 40 n. mile.

At 1448 GMT as the vessel approached the most northerly squall the wind veered abruptly and now was coming from the NNW at over 30 knots, and at 1450 the horizon ahead disappeared and visibility was reduced to less than 1 n. mile almost instantly as the vessel became surrounded by a mass of whirling sand. At times the sun was clearly visible, through the murkiness, and away over to the west.

By 1500 the visibility had become patchy, although it was still generally not much over 1 n. mile; by 1505 it had started to improve and by 1520 had increased to such an extent that Ras Marshaq light could clearly be seen flashing at over 12 n. mile and ships could be seen at up to 7 n. mile. The wind took over an hour to die down and by 1700 GMT had backed to NW, force 3. There was no noticeable change in temperature or barometric pressure but behind, that is to say to the west of the Belat, there was a horizon haze and the visibility only improved to about 9 n. mile.

Position of ship: 12° 48′N, 45° 12′E.

Note. The following entry appears on p. 24 of the *Red Sea and Gulf of Aden Pilot:*

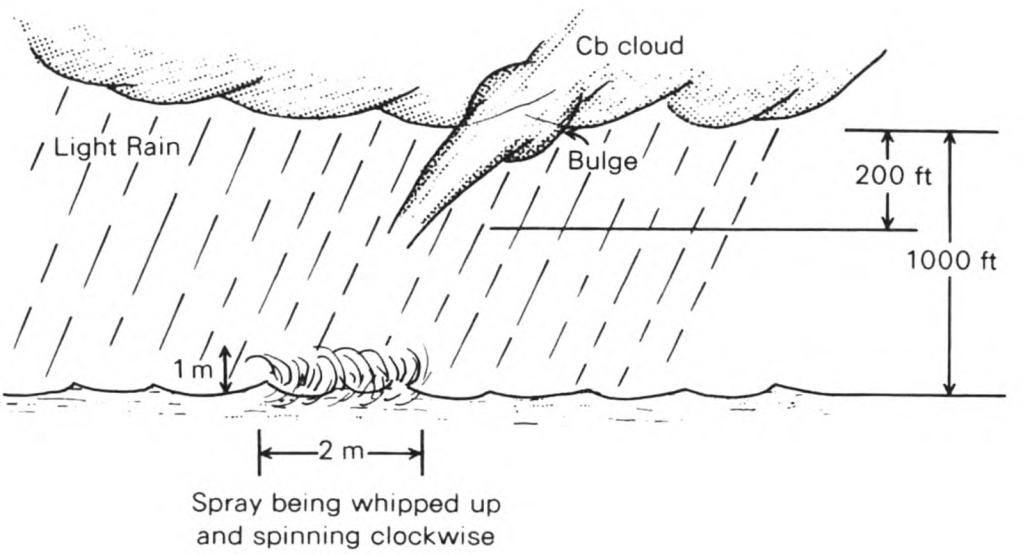
'**Belat** is a strong N to NW wind which blows off the mountains of Southern Yemen and Oman. It is strongest in Kuria Muria Bay, and may reach force 7 in the more violent squalls during the night, especially towards dawn.'

WATERSPOUT

South Pacific Ocean

m.v. *Wellington Star*. Captain W. J. G. Jones. Apia to Honolulu. Observers, Mr J. M. Webster, 3rd Officer, Mr B. Wilson, Chief Engineer, Mr A. Kemp, 2nd Engineer and Mr S. Shayes, Radio Officer.

14 August 1982, 2220–2230 GMT. At 2220 GMT there was a light rain shower at the vessel. At 2225 GMT a small sea-surface disturbance was observed about ½ n. mile distant on the starboard beam. In a circle of about 2 metres' radius spray was being whipped up to a height of about a metre and spun in a clockwise direction. At 2226 GMT a 'funnel' was observed extending about 200 ft below the base of the cumulonimbus raincloud. A slight bulge was noticed near the point where the funnel met the cloud. One minute later the spout passed approximately 200 m astern of the vessel and at 2230 GMT the spout was out of visible range and travelling rapidly westwards.



Weather conditions: dry bulb 30·0 °C, wet bulb 26·2, sea temperature 29·4, barometric pressure 1007·4 mb, falling steadily. Wind E'ly, force 4, cloud cover 3 oktas of cumulonimbus without anvil and two oktas large cumulus, cloudbase 1000 ft. Present weather: precipitation within sight reaching the surface of the sea.

Position of ship: 0° 54′S, 166° 42′W.

SEVERE ELECTRICAL STORM WITH ST ELMO'S FIRE

Mediterranean Sea

m.v. *British Ivy*. Captain M. Salmon. Sarroch (Sardinia) to Europoort. Observers, Mr D. Styles, 3rd Officer and Cadet T. Hawthorne.

15 July 1982. At about 1900 GMT lightning was observed off the port bow. It was quite distant and appeared in several places but no thunder was audible. The radars were showing some bad weather in the vicinity of the lightning and the observers anticipated a typical thunder-and-lightning storm with heavy rain. The dry-bulb temperature at this time was about 30 °C. At 2008 GMT some heavy drops of rain were experienced at the ship with a rise in temperature. All the time the lightning was becoming more intense and appearing from abeam to port and right ahead, and some of the bad weather showing on the radar was beginning to reach the vessel. At 2015 GMT the wind had backed from a steady E'ly direction to a SSW'ly direction and had risen suddenly from force 3 to force 8. The electrical phenomenon known as St Elmo's Fire could clearly be seen on one of the ship's aerials, leading from the mainmast to a stub mast on the main deck, over its entire length of about 30 metres. It appeared as a string of equally spaced beads, with a tinge of greenish/white luminescence.

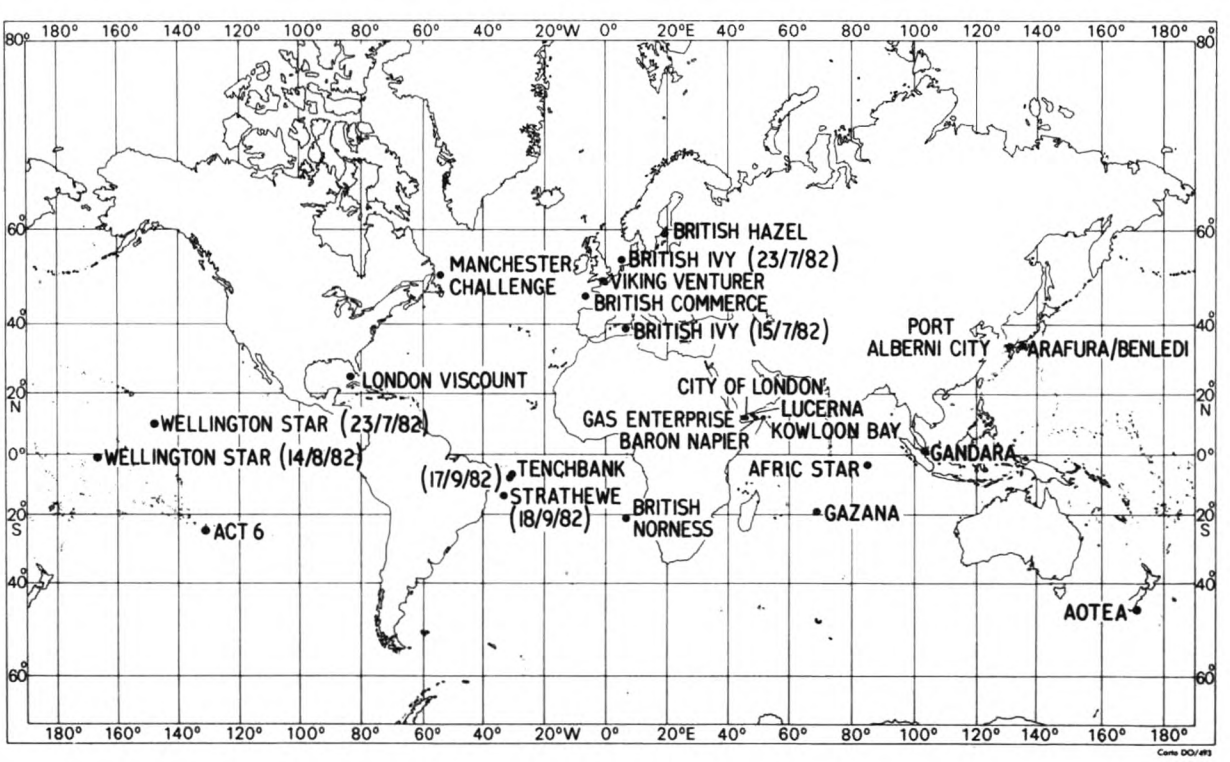
Another warm blast of air was felt at 2022 GMT, accompanied occasionally by heavy raindrops. After one minute the wind died very suddenly from a gusting force 8–9 to practically nothing. It was a very strange experience and occurred again a couple of times later, during the electrical storm. The wind slowly began to increase in strength, with heavy individual drops of rain which felt very cool. At 2027 GMT temperatures were recorded as dry bulb 33·2 °C, wet bulb 22·0 and the wind was a steady force 8. The lightning could be seen to starboard as well as all down the port side at 2030 GMT but there was still no thunder or rain. The barograph trace showed a rise and fall previous to 2030

and now it began rising very quickly. At 2033 GMT a reading of 1012·6 mb was recorded and the wind force had dropped to about a force 3. The St Elmo's Fire phenomenon had faded away but was now returning and appeared to be creeping backwards and forwards along the aerial previously mentioned.

At 2035 GMT the wind violently increased and was whipping spray off a relatively moderate sea and blowing it across the ship from port to starboard. It is believed that the wind was gusting up to gale force and possibly reaching a force 12, judging from the extent of the spray. The Radio Officer heard Niton Radio at strength 3, calling the callsign SWJW.

The following observations were noted: 2040 GMT, dry bulb 35 °C (becoming uncomfortably warm), pressure continuing to rise, wind decreased to force 3–4, no more lightning. 2044 GMT, pressure 1012·7 mb, wind picking up. 2046 GMT, dry bulb 35·8 °C, wet bulb 22·0. 2048 GMT, dry bulb 36·4 °C, occasional raindrops, wind veered to 220°(T), pressure 1011·9 mb. 2052 GMT, wind suddenly backed to port quarter. 2054 GMT, wind veered to port bow, approx. 220°(T). 2056 GMT, wind continuing to veer, now from starboard bow, approx. 280°(T), force 3, dry bulb 37·7 °C. 2058 GMT, St Elmo's Fire effect no longer observable, pressure falling, 1011·0 mb, wind picking up and veering to 130°(T), force 5. 2103 GMT, temperature falling, dry bulb 35 °C, visibility noted to be 16 n. mile. 2108 GMT, dry bulb 34·6 °C, pressure 1011·5 mb, pressure now 1011·7 mb, both radar pictures cleared up completely. 2138 GMT, dry bulb 32·6 °C, wet bulb 24·8, barometric pressure 1011·9 mb, wind steady 130°(T).

Position of ship: 38° 14′N, 6° 29′E to 38° 09′N, 5° 58′E.



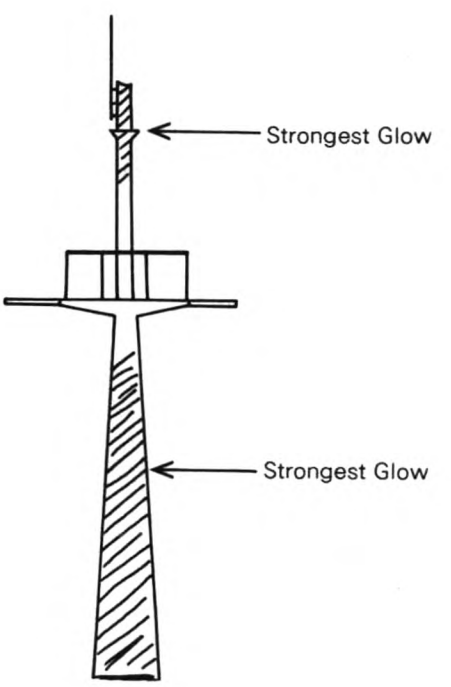
Position of ships whose reports appear in *The Marine Observers' Log*.

ST ELMO'S FIRE

Indian Ocean

m.v. *Afric Star*. Captain E. C. Smith. Bandar Abbas to Fremantle. Observers, Mr R. D. Chivers, Extra 3rd Officer and Mr B. Mather.

21 September 1982, 0100 GMT. During the evening, just after darkness had fallen, there was a period of thunder, lightning and heavy rain. It soon became apparent in the darkness that the forward mast was beginning to take on a distinct coloration or glow—a luminous green that became quite distinguishable for a quarter of an hour before dying down in colour. The luminescent glow was from the base of the mast to its upper extremity, being of strongest colour about the base and uppermost extremity. (Before darkness the A.B. on watch



had checked the decks for any obtrusive light. There were cranes on deck, so any light from aft to forward would have been reflected on them—but wasn't.)

Dry bulb 27·9 °C, wet bulb 25·2.

Position of ship: 02° 54′S, 85° 14′E.

MASSIVE CUMULONIMBUS CLOUD

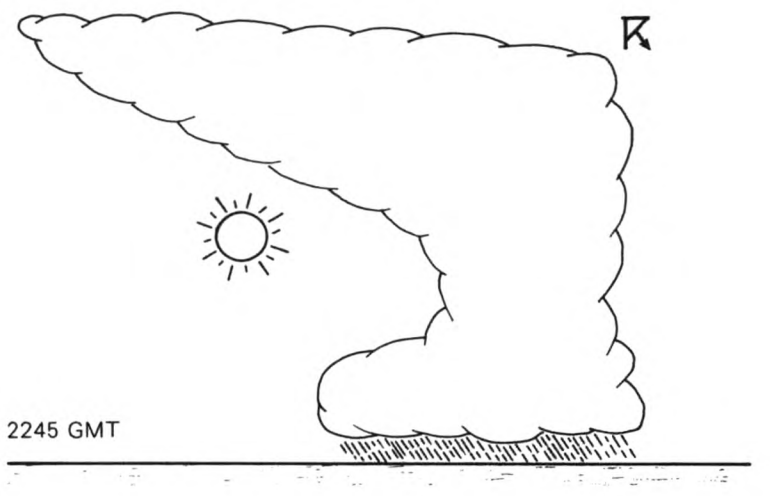
Gulf of Mexico

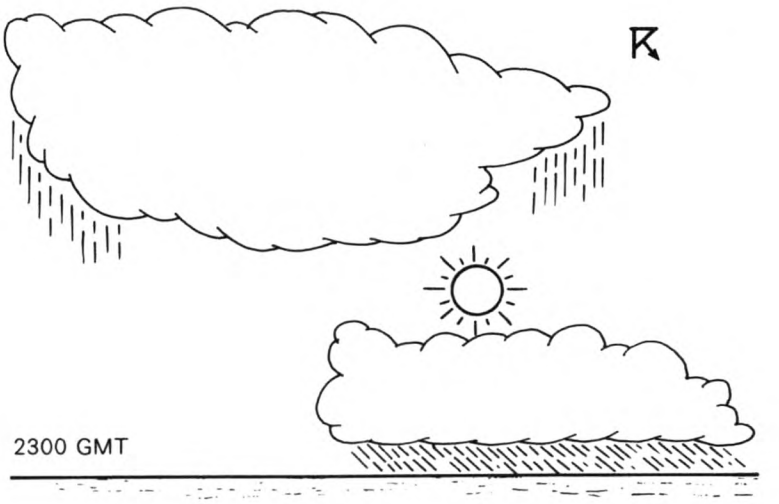
m.v. *London Viscount*. Captain D. G. Scourfield. Port Canaveral to Mississippi. Observers, Mr I. Roberts, 3rd Officer and Mr D. G. Gavin, Radio Officer.

1 September 1982, 2245 GMT. At this time, approximately 90 minutes before sunset, a huge cumulonimbus cloud was seen to have formed ahead of the vessel. No other cumulonimbus was visible, the cloud cover being 3 oktas of large cumulus (with no rain falling) and 1 okta of cirrus. From the radar it was found that the cloud was approximately 2 n. mile in diameter, oval shaped on the Plan Position Indicator, and 11 n. mile distant at the centre.

Vertical sextant angles were taken at the top and base of the cloud and through simple geometry the base was found to be 2160 ft above sea level and the height to be 40 500 ft.

The most interesting thing about the cloud was the intense forked lightning emanating from the base, easily out-brilliancing the sun. Only three separate forks of lightning, approximately 10 seconds apart, were observed. Heavy rain was falling from the base at all times.





By 2300 GMT the cloud had broken into two separate formations, an upper and a lower, the sun shining in between them. Dense rain fell from the lower formation, and virga was seen emanating from the upper formation.

Weather conditions: dry bulb 30·3 °C, wet bulb 26·2, barometric pressure steady at 1014·4 mb, wind E'ly, force 3.

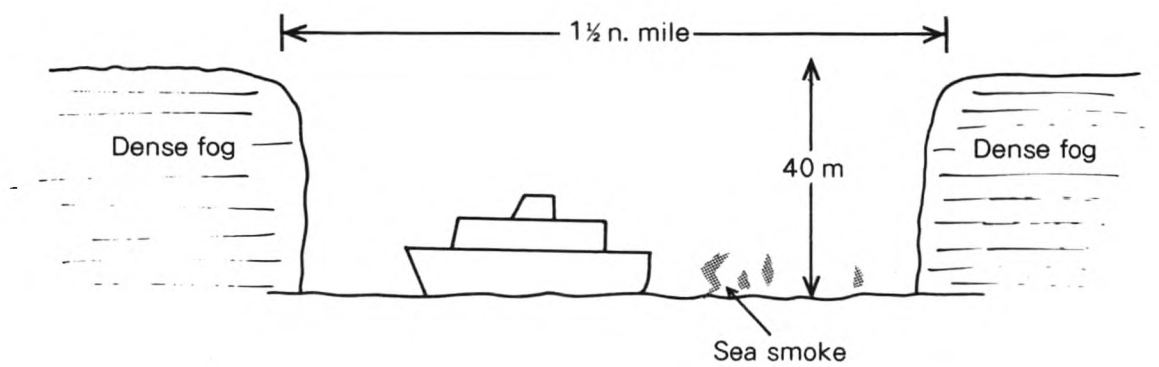
Position of ship: 24° 55′N, 83° 46′W.

FOG BANK

English Channel

m.v. *Viking Venturer*. Captain D. Pearce. Portsmouth to Cherbourg. Observers, the Master and Mr D. Gammons, 2nd Officer.

10 September 1982. During the day crossing from Portsmouth to Cherbourg the visibility varied between 1½ and 3 n. mile until 1045 GMT, when the vessel, which was then 18 n. mile north of the eastern entrance to Cherbourg Harbour, ran into a dense fog bank in which the visibility was reduced to 10 metres. The vessel remained in this fog bank, except for a brief interval, until she reached the entrance to the inner harbour, where the visibility improved to 2 n. mile.



Prior to arrival at the outer harbour of Cherbourg, in a position approximately 13 n. mile north of the eastern entrance, the vessel entered a circular area of diameter approximately 1½ n. mile which was completely clear of fog. The edges of the fog bank were clearly visible and the height of the bank was about 40 metres. A sister vessel appeared out of the wall of fog at a distance of 1 n. mile and then disappeared instantly on re-entering it. The *Viking Venturer* then re-entered the fog bank and dense fog persisted until arrival. On departure from Cherbourg the vessel encountered the same 'hollow' which was in the same position.

Weather conditions in 'hollow': air temperature 18·0 °C, barometric pressure 1022·8 mb, completely clear skies, patches of sea smoke visible on surface of sea.

Position of ship: 49° 55′N, 1° 38′W.

CETACEA

North Atlantic Ocean

m.v. *British Commerce*. Captain M. Dunning. Wilhelmshaven to Forcados. Observer, Mr A. T. McDonald, 3rd Officer.

18 September 1982, 1700 GMT. Two groups of dolphins were sighted within five minutes of each other. The first group was estimated to consist of about 50 creatures and the second of about 20. All appeared to be adult common dolphins (*Delphinus delphis*) and they were all about 1·5 m in length. Both groups appeared very lively and played and jumped around the ship. Although they seemed interested in the ship they all appeared intent on swimming rapidly due east.

Ship's course and speed 220°(T) at 13 knots. Sea slight with long swell.

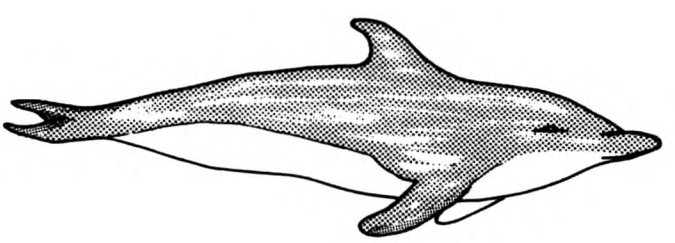
Position of ship: 47° 15′N, 7° 17′W.

South Atlantic Ocean

s.s. *British Norness*. Captain P. N. Johnson. Das Island to Wilhelmshaven. Observers, Mr J. McIntyre, 2nd Officer, Cadet K. M. Toy and Mr I. Macartney.

16 September 1982, 1700 GMT. A group of approximately 30 dolphins was sighted, consisting of both adults and juveniles. They were observed to be playing and leaping on both sides of the vessel. The largest numbers were concentrated around the bow area and they appeared to be 'riding' the bow wave.

They remained in the vicinity of the vessel for about 35 minutes before gradually dispersing in a northerly direction. The adults were about 2 metres in length while the juveniles ranged from about 1 metre upwards. The animals were of a dark grey colour along the dorsal surfaces with light grey chest and belly areas.



Weather conditions: fine and clear, 8/8 cloud, wind SSE, force 3, sea calm to slight, sea temperature 18 °C.

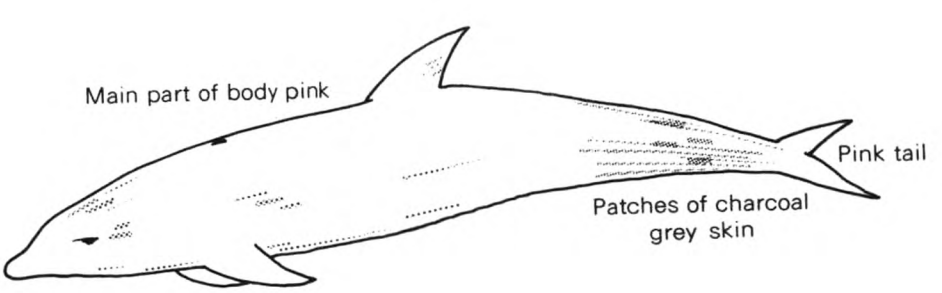
Position of ship: 20° 39′S, 6° 33′E.

Note. Mr D. A. McBrearty, of the Department of Anatomy, University of Cambridge, is of the opinion that they were certainly bottlenose dolphins.

Singaporean waters

m.v. *Gandara*. Captain T. Shield. At anchor off Singapore. Observers, The Master, Mr D. Morton, Chief Officer, Miss S. J. Miller, 3rd Officer, Mr R. Leeds, Radio Officer, and other members of the ship's company.

5 August 1982. At 0040 GMT four bottlenosed dolphins were observed alongside the ship. They were chasing, and catching, garfish and flying fish. In the five minutes or so during which they were closely observed two were seen to be normal grey bottlenose adults, one was mainly pink and one, a juvenile, was white in colour.



The 'pink' adult was a bright pink with small charcoal-grey patches, mainly towards the rear, and a few white patches. The observers sent a report of this sighting direct to Mr D. A. McBrearty of the Dolphin Watch, but felt that others might be interested in 'pink' dolphins and might be reassured that if they see them it is not necessarily the effects of the night before. They wondered whether the animals were 'albino' dolphins or if, for some reason, they were shedding their skins.

Position of ship: 01° 16′N, 103° 36′E.

Note. Mr McBrearty comments as follows:

'The photographs which accompanied this report showed a bottlenose dolphin *Tursiops* with extensive discoloration of the upper rostrum, fore part of the melon and the top of the dorsum to just behind the dorsal fin, which was itself unaffected. The top surfaces of the flukes were also pale coloured although the caudal peduncle was dark.

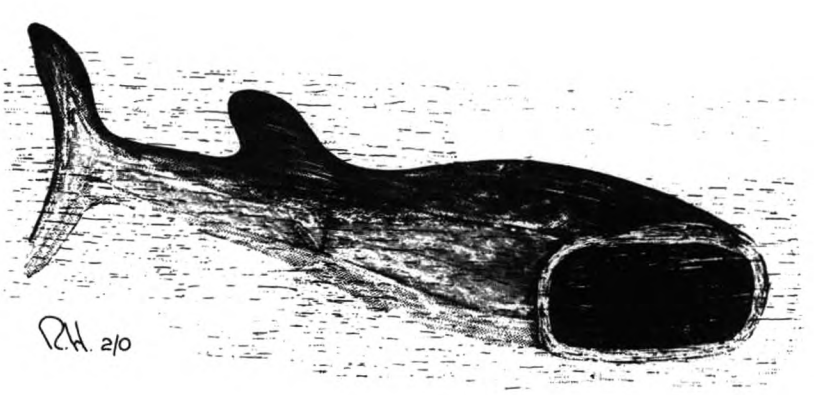
'This dolphin was not an albino, neither should it be confused with the truly cream-coloured or "pink" Indo-Pacific humpbacked dolphin, *Sousa borneensis* (=*Sousa chinensis*) which is found in coastal areas throughout south-east Asia. The large pinkish areas of skin on the animal photographed had the appearance of a fungal infection, something not uncommon in cetaceans, particularly those which live around harbours and anchorages. In the early days of "Marine Parks" using artificial sea water, such infections were common and often fatal. Treatment usually consisted of dosage with systemic antibiotics, vitamins and anti-inflammatory drugs.'

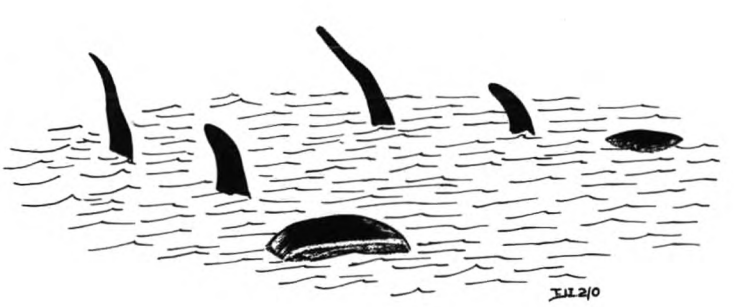
WHALE SHARKS

Gulf of Aden

m.v. *Kowloon Bay*. Captain W. P. Goldie. Port Kalang to Suez Bay. Observers, the Master, Mr T. J. Illingworth, Senior 2nd Officer, Mr R. Hopkins, 2nd Officer and Cadet G. Perez.

27 September 1982. At 1050 GMT off Cape Guardafui about 12 whales were observed. They were between 9 and 12 metres in length and appeared to be





feeding on plankton by sifting as they were swimming in random directions on the surface with their mouths agape. They had extremely large square-shaped jaws about 1·2 metres wide and very thick white lips and flat heads, with the eyes at the upper corners of the lips. The base colour of the back was dark brown with many yellow-green spots all over it. There did not appear to be any blowhole. The belly was white and the dorsal fin about a metre long and very floppy. The vertical tail fins resembled the dorsal fin but were rather longer. The proximity of the vessel did not disturb them in any way, even though it was as close as 25 metres. For several hours after the sighting large numbers of porpoises and relatively small fish were seen, presumably also in the area for the rich feeding.

Position of ship: 12° 00′N, 51° 24′E.

Note. Mr McBrearty comments as follows:

'This is not a cetacean, it is a fish—see also *The Marine Observer*, April 1981, pp. 60–61. These are excellent drawings and an accurate description of a whale shark (*Rhineodon typus*), found in tropical waters of the Atlantic, Indian and Pacific Oceans. If my memory serves me well, I believe one of Jacques Cousteau's early films showed one in the Red Sea. The shark may grow to a length of 16 m and is by far the largest fish in the sea. Unlike other well-known members of the shark family, this huge beast is not a man-eater; it lives entirely on plankton and apart from its sheer bulk, it is harmless.

'Your correspondent may be interested to hear that the first description of a whale shark was made by an army medical officer, Andrew Smith, who examined one caught in Table Bay, South Africa, in 1828. The skin was later purchased for the magnificent sum of £6 and sent to the Museum of Natural History in Paris.'

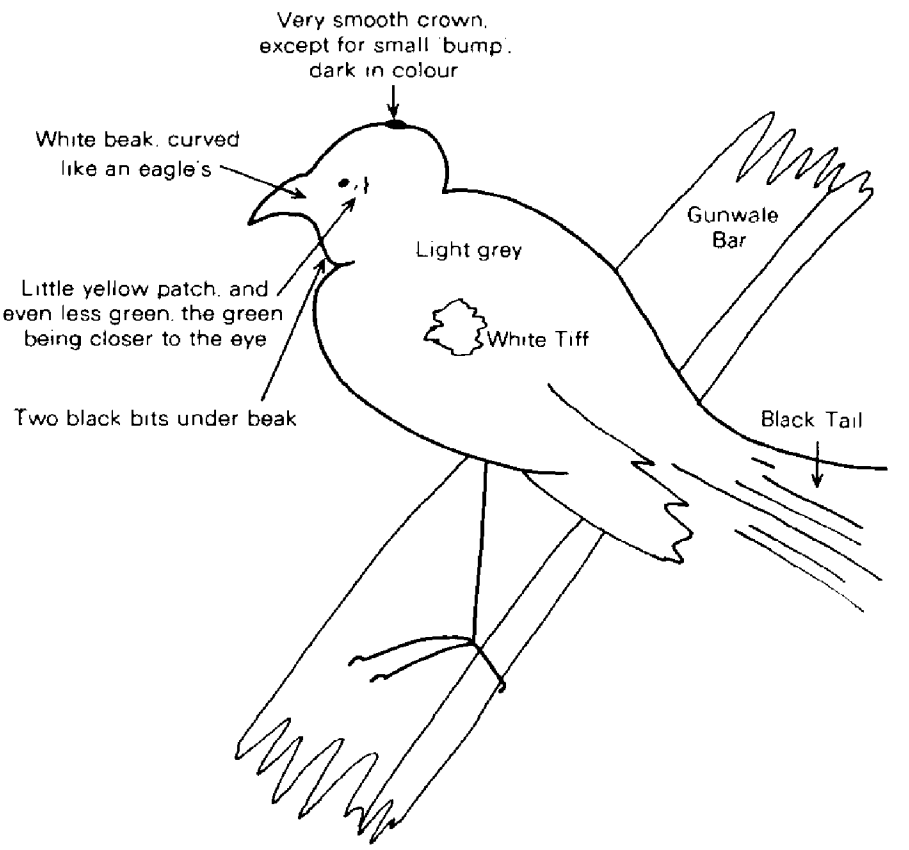
BIRD

Gulf of Aden

m.v. *Baron Napier*. Captain K. N. Dootson. Adelaide to Jeddah. Observer, Mr A. Weir, Chief Officer.

15 August 1982. At 1400 GMT the bird shown in the sketch was observed on the bridge-wing gunwale bar. At this time the vessel was 56 n. mile north of Somaliland, the closest approach to land having taken place five hours previously when the vessel was 11 n. mile off Ras Alula.

At 1420 GMT the bird jumped or fell down to the deck, but upon being offered a piece of apple it flew off in an arc and landed on the poop deck, where it was sighted at 1500 GMT. Some bread was thrown to the bird, but it is not known whether it took any. There was no sign of the bird at 1700 GMT.



Position of ship: 12° 15′N, 49° 37′E.

INSECTS

Gulf of Aden

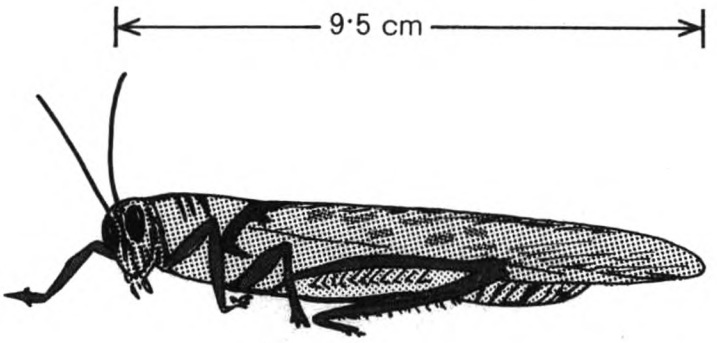
m.v. *Lucerna*. Captain W. J. S. Flett. Jeddah to Lavan Island. Observers, Mr N. Fillingham, 3rd Officer and Mr D. Donaldson, 2nd Engineer.

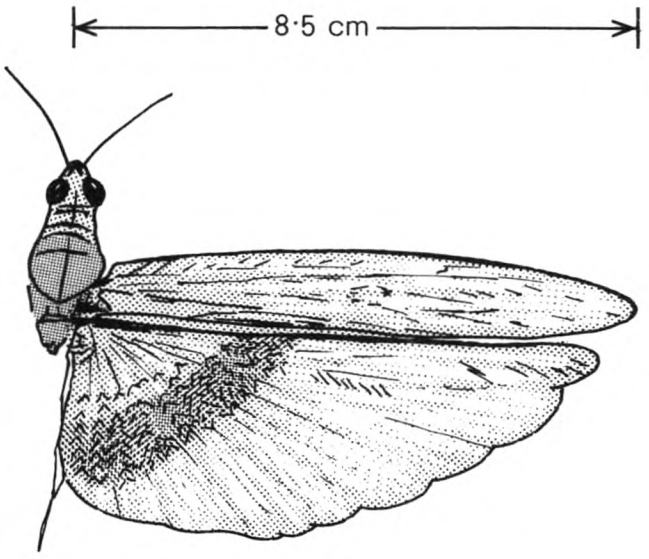
2 August 1982, 0700 GMT. A number of locusts were discovered on board. They were light brown to light grey in colour, the backs of the legs being red. The insects varied in length from head to tail between 2·5 and 12·5 cm.

Position of ship: 13° 30′N, 47° 40′E.

Note. Dr D. R. Ragge, of the British Museum (Natural History), comments as follows:

'The insect so ably drawn by Mr Donaldson was a large grasshopper, perhaps *Anacridium melanorhodon*, a common African species that is known occasionally to fly for quite long distances.'

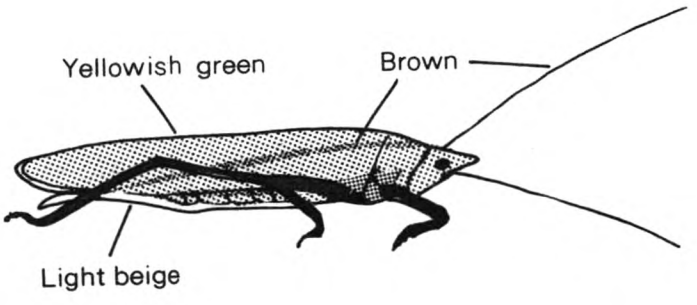




D.D. 2/E

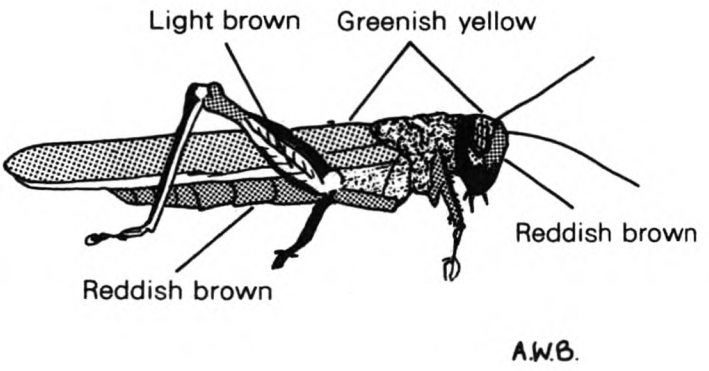
m.v. *City of London*. Captain R. M. Simpson. Suez to Karachi. Observers, Mr I. A. Pakula, 3rd Officer and Mr A. W. Britton.

9 August 1982, 0430 GMT. Approximately 1000 locusts of the type shown in the first sketch were observed when the vessel was 30 n. mile SE off Aden. A



I.A.P. 3/0

number of grasshoppers or locusts of unknown species with two pairs of wings and a strange hooked appendage under the abdomen as illustrated in the second sketch were also found on board.



Ship's course 071°(T). Wind SSW, force 3.
Position of ship: 12° 45′N, 45° 35′E.

Note. Dr Ragge has identified the two insects as a large grasshopper and a bush-cricket respectively.

BIOLUMINESCENCE

North Sea

m.v. *British Ivy*. Captain M. Salmon. Europoort to Fredericia (Denmark). Observers, Mr D. Styles, 3rd Officer and Cadet T. Hawthorne.

23 July 1982, 2155 GMT. A strip of bioluminescence about 2 n. mile long by 50 m wide running in an approximately north–south direction was encountered. When the vessel, which was steaming on a course of 031°(T), crossed this strip, the bow wave caused a bright green glow to emanate from the sea surface. The bioluminescence continued to be observed, in a less intense form, until 2215 GMT.

Weather conditions: dry bulb 17·0 °C, wet bulb 14·7, wind NE, force 3.
Position of ship: 53° 59′N, 05° 04′E.

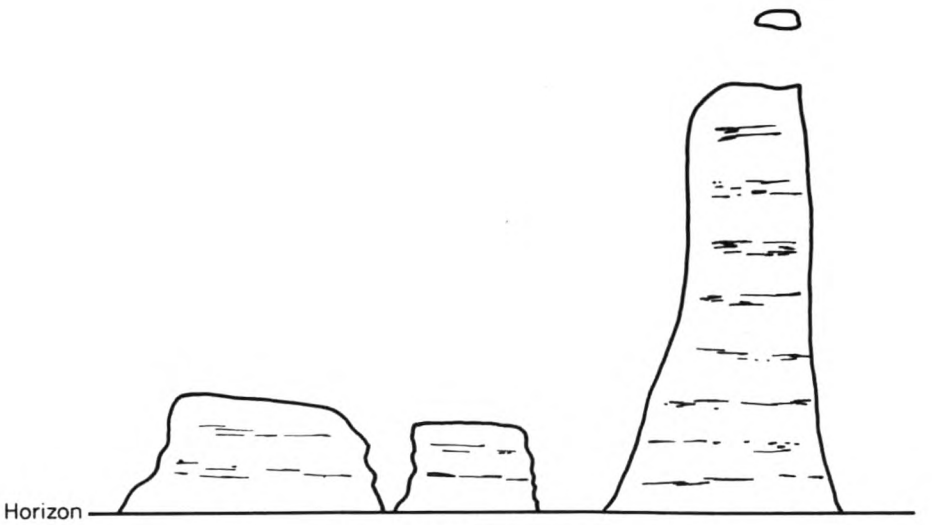
ABNORMAL REFRACTION

Strait of Belle Isle

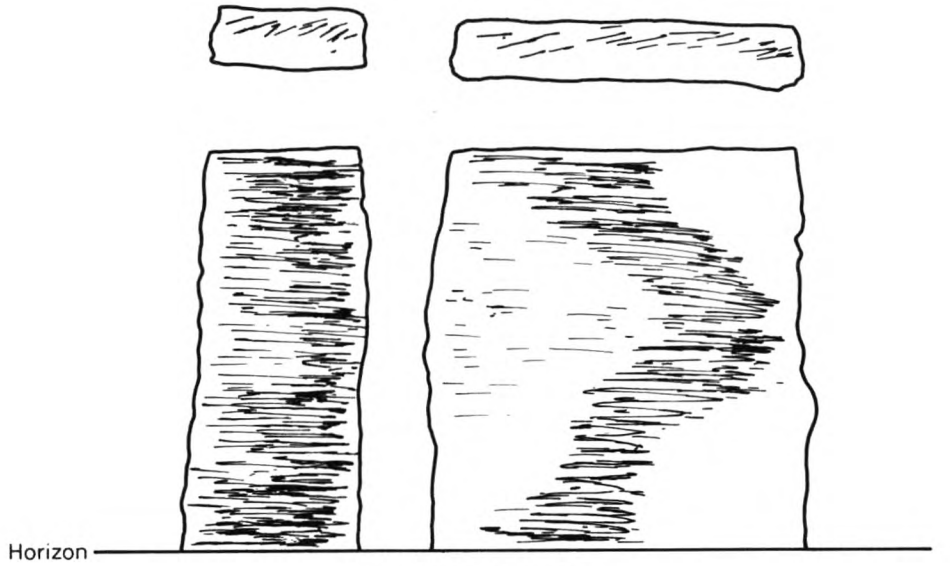
m.v. *Manchester Challenge*. Captain N. R. Pryke. Montreal to Felixstowe. Observers, the Master, Mr C. M. Billington, 3rd Officer, Mr I. Foster. Extra 3rd Officer, Mr M. O'Gorman, Radio Officer and Mr T. Rowland.

26 July 1982. The vessel was passing through the Strait of Belle Isle in poor visibility; at approximately 1500 GMT the fog cleared and the visibility was seen to be approximately 50 n. mile. This was verified by the fact that two icebergs were observed on the radar at 48 n. mile and could be seen visually with the naked eye. Apart from experiencing excellent visibility, abnormal refraction was observed. Numerous icebergs were present in the area and all the bergs observed at a distance of 18 n. mile and over were seen to be abnormally refracted. The effect the refraction had on the appearance of the bergs is shown in the accompanying sketches.

One particularly large berg was estimated to be of a size 68 metres in height and 135 metres in length (determined by taking horizontal and vertical sextant angles of the berg).



Distance: 38 n. mile



Distance: 43 n. mile

Weather conditions: dry bulb 10·4 °C, wet bulb 9·5, sea temperature 7.0, barometric pressure 1009·7 mb, wind light airs, sky cloudless.

Height of eye: 23 metres.

Position of ship: 51° 58′N, 54° 20′W.

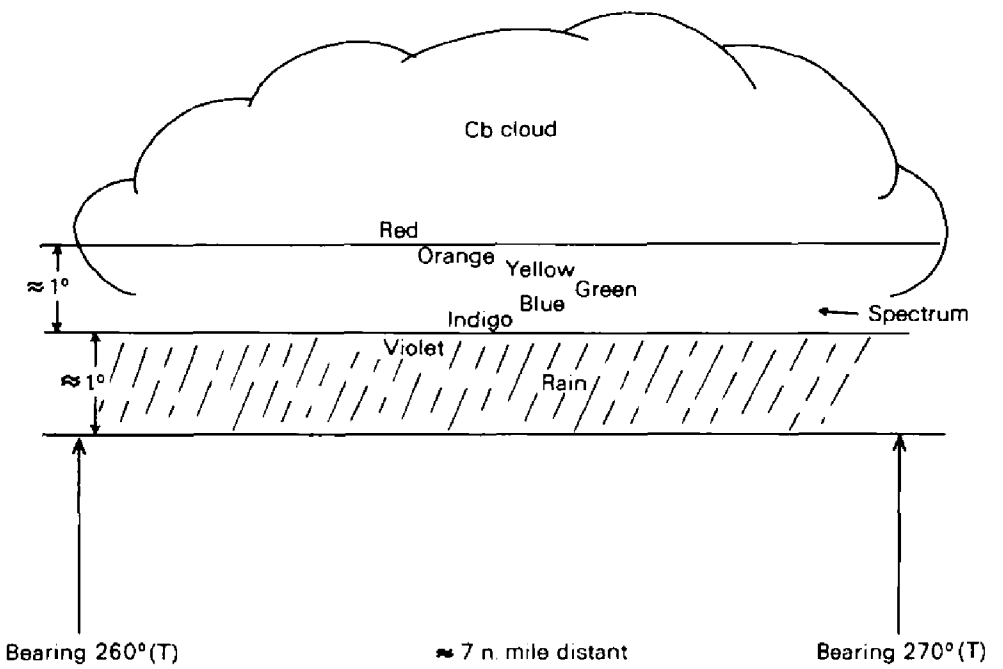
SPECTRUM

North Pacific Ocean

m.v. *Wellington Star*. Captain W. J. G. Jones. Los Angeles to Suva, Fiji. Observers, Mr J. M. Webster, 3rd Officer and Mr S. Shayes, Radio Officer.

23 July 1982. At 1830 GMT the vessel was passing through bright, but showery, weather on her way to Suva, when a horizontal layer spectrum was observed approximately 7 n. mile distant to westward at the base of a cumulonimbus cloud. The phenomenon lasted for about 3 minutes (unfortunately not enough time to grab a sextant and measure it accurately!) at an elevation of approximately

1° with an angular width of about 1° and spanning an arc of the horizon of about 10°. The arc was faint, but as far as could be determined it covered the complete colour range from red at the greatest elevation through to violet nearest the horizon.



Ship's course and speed 229°(T) at 19·5 knots. Sun bearing 072°(T), altitude 39° 12′.

Weather conditions: dry bulb 26·5 °C, wet bulb 25·5, sea temperature 27·6, barometric pressure 1012·7 mb, steady. Wind NE'E, force 3, cloud 5 oktas, mainly cumulonimbus but with ragged cumulus also present.

Position of ship: 10° 17′N, 147° 53′W.

BROCKEN SPECTRE

South Pacific Ocean

s.s. *ACT 6*. Captain D. I. Moore. Auckland to Panama. Observers, the Master, Mr. M. A. Clark, Chief Officer, Mr I. S. Ramage, 2nd Officer, and Mr M. W. Medland, 3rd Officer.

5 August 1982, 2045–2130 GMT. At 2045 GMT fog was sighted ahead of the vessel and moving towards the observers. Upon entering the fog the Chief Officer reported to the bridge from forward that a 'rainbow' was visible on the starboard side of the vessel. The arc of the rainbow was approximately 300° and the visual diameter was approximately 30 metres. At this time the sun was at its highest point in the sky, its altitude being 48° and bearing 360°(T). Though the fog was patchy, the rainbow effect was visible throughout, though varying in intensity. Also visible was a small rainbow around the shadow of the observer. Once clear of the fog at 2130 GMT the cloud cover was one okta of large cumulus.

Ship's course and speed: 087°(T) at 17·5 knots.

Weather conditions: dry bulb 22·2 °C, wet bulb 21·6, sea temperature 21·4, barometric pressure 1022·4 mb, wind NE'E, force 1.

Position of ship: 25° 08′S, 131° 10′W.

Note. The following extract is from the *Marine Observer's Handbook.*

Brocken spectre. In a foggy atmosphere an observer, standing with his back to the sun, when this is at low altitude, will sometimes see the shadow of himself, or of his head, thrown upon the fog, together with coloured rings of light surrounding the shadow. The phenomenon was first noted on the Brocken mountain in Germany but it is not confined to mountain districts and it is most common in Arctic regions, where it is seen on every occasion of simultaneous sunshine and fog.

The coloured rings are now usually known as a 'glory'. A typical series of colours seen in a well-developed one is as follows. There is a general whitish-yellow colour round the shadow, surrounded with rings of colour in order outwards: dull red, bluish-green, reddish-violet, blue, green, red, green, red. A white rainbow at a considerable distance outside the glory is sometimes also seen.

The shadow of the observer on thick fog may be seen at night if there is a bright artificial light behind him.

WHITE FLASH

Indian Ocean

m.v. *Gazana.* Captain C. G. MacKenzie. Singapore to Aratu (Brazil). Observer, Mr C. S. Stuchbury, 3rd Officer.

29 August 1982. The vessel was proceeding on a course of 249°(T) at a speed of 17 knots. At 2225 GMT a brief white flash was observed on a bearing of approximately 275°(T) and at an altitude of around 25°. The duration of the flash was $\frac{1}{3}$ second and it was bright enough to cause image retention. The flash was 4–5 times the size of the star Vega.

There had been rain showers two hours previously but no lightning of any form had been observed before, during or after these rain showers. The flash occurred in a clear part of the sky. At the time the lower limb of the moon had just touched the horizon while setting on a bearing of 248°(T).

Weather conditions at time of observation: dry bulb 22·0 °C, wet bulb 19·8, barometric pressure 1020·8 mb, 3/8 cloud, mainly small cumulus.

Position of ship: 19° 27′S, 69° 07′E.

AURORA BOREALIS

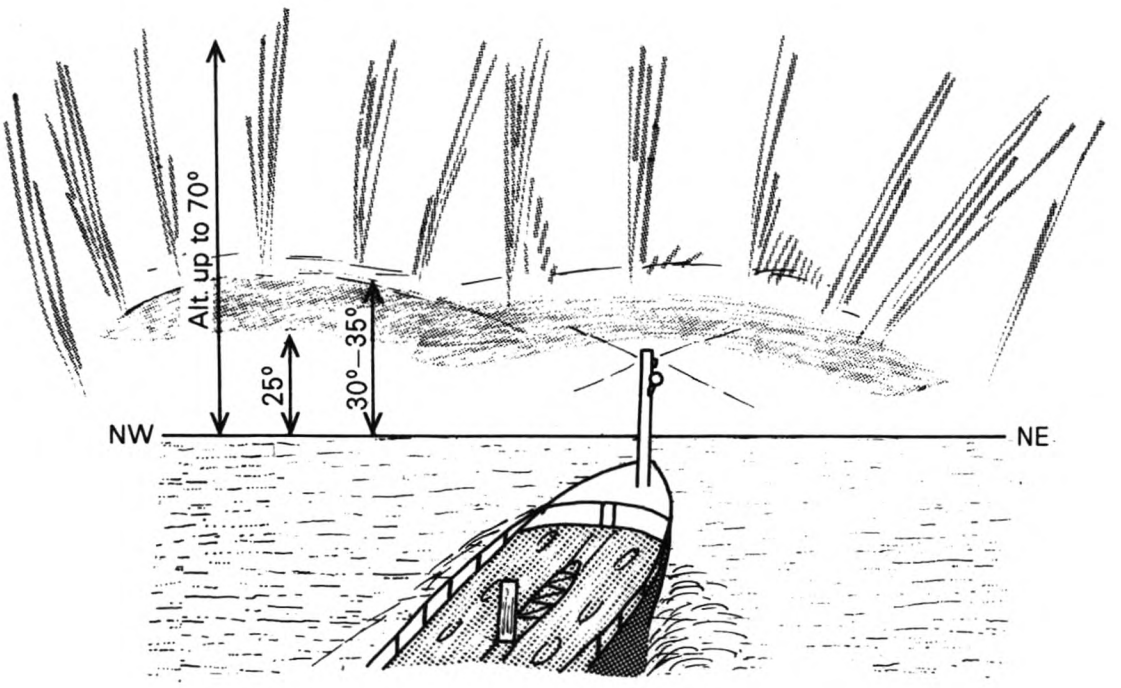
Gulf of Finland

m.v. *British Hazel.* Captain C. R. Mills. Milford Haven to Ornskoldsvik. Observers, Mr D. Hayler, 3rd Officer and Cadet J. Holmshaw.

6 September 1982, 0120–0200 GMT. Aurora was observed between approximately NW through N to NE. The phenomenon took the form of a rayed band with the actual rays being better defined than the band. At either extremity of the phenomenon a separate distinct band was observed. For a period of some 3 or 4 minutes three quite clear rays of a pale red colour were observed. During the remainder of the period the colour was grey-white with a slight incandescence present in the band.

Weather conditions: dry bulb 12·0 °C, wet bulb 9·5, sea temperature 13·8, wind NW, force 1.

Position of ship: 59° 01′N, 19° 32′E.



AURORA AUSTRALIS

New Zealand waters

m.v. *Aotea*. Captain B. V. Chipperfield. At anchor off Taiaroa Head, Port Chalmers, NZ. Observers, the Master and Mr C. C. Fisher, 3rd Officer.

6 September 1982. At 0815 GMT a very marked luminous glow was observed emanating from a SE'ly point of the horizon. This glow took the form of a cone, point down to the horizon, rising to a height of about 30° on an easterly bearing and about 50° to the south. It remained clearly visible until 0840 GMT. Later the same evening as the vessel was berthing at Port Chalmers a vivid display of the aurora was seen, this time of the classic hanging-curtain form.

Of further interest is the fact that at this time the Radio Officer, Mr T. Vaughan, reported extraordinary propagation on MF—whereas it was usual to hear stations such as Sydney VIS across the Tasman Sea, on this particular evening transpacific stations in San Francisco (KPH and KFS) were heard with clarity.

Weather conditions: dry bulb 9·5 °C, wet bulb 9·3, barometric pressure 1008·7 mb (steady), wind N'ly, force 3.

Position of ship: 45° 43′S, 170° 42′E.

Note. The *Aotea* is a New Zealand Selected Ship.

UNIDENTIFIED PHENOMENA

South Atlantic Ocean

m.v. *Strathewe*. Captain S. T. S. Household. Sheerness to Falkland Islands. Observers, Mr. W. G. Hughes, Chief Officer and Cadet D. Melville.

17 September 1982, 2103 GMT. At this time a spectacular series of events was observed in the atmosphere as detailed in the following report, which is a correlation of two eye-witness accounts. Conditions were those of a dark, clear night with many stars and a few scattered clouds.

The first thing noticed was the formation of a bright patch of white light in the general area between Rasalhague and Alphecca. Gradually a dark eye formed in the centre of the patch in which shortly afterwards a very bright object appeared like a star of magnitude −2. After one or two seconds this object appeared to undergo a tremendous explosion and become a large bright orange gaseous fireball, which appeared to be hurled earthwards directly down the observer's line of sight, growing constantly larger and larger. One witness described the fireball as resembling rolling orange smoke. The ball then ceased to increase in size, giving the impression that it had stopped. Its orange colour rapidly gave way to rainbow colours which gradually gave way to white and faded in brilliance until all that remained were several patches of luminous white light, although these were impressive in their own right. These patches held their position and continued to glow for 16 minutes after the initial fireball had disappeared.

On the following night, 18 September, at 2058 GMT a similar phenomenon, though less intense, consisting of four large explosions, was observed in a similar part of the sky. These four explosions were orange in colour. Two of them rapidly dissipated; of the remaining two, one left a blue coloured afterglow and the last one a green afterglow which persisted for 17 minutes. Being at a loss to explain these phenomena, it was decided to quiz shore stations as to whether anything had been reported elsewhere, and the following message was received from Olinda Radio:

'A meteorological rocket was launched from Barreiros (8° 50'S, 35° 15'W) at 2000Z on 18th.'

If what we saw were indeed the last moments of 'meteorological rockets', they provided an unforgettably spectacular display.

Position of ship at 2103 GMT on 17 September: 7° 34'S, 31° 30'W.

Position of ship at 2058 GMT on 18 September: 14° 00'S, 33° 36'W.

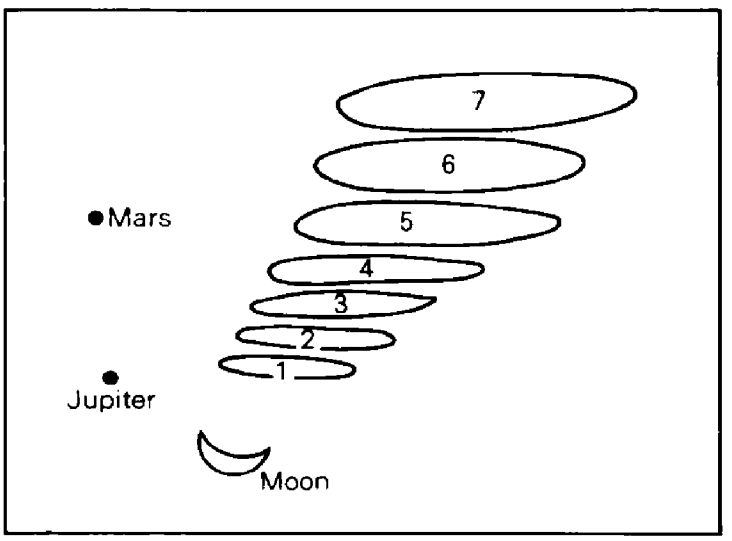
m.v. *Tenchbank*. Captain G. A. Davies. Observers, Mr R. K. Ward, Mrs N. Ward and Quartermaster Baroi for the first stages, joined by other members of the ship's company for the later stages.

18 September 1982. The altitude of the first sighting was approximately 24°, level with the planet Jupiter and offset to its right. The six subsequent bursts were above the first, and slightly to the right, leaving a fantail of purple/white lenticular clouds which leaned to the right as shown in the sketch.

Although they all kept their lenticular shape, the final burst did break up, giving the appearance of being in a gaseous state.

Each burst commenced as a pinprick of bright, white light expanding rapidly to at least 2½ times the diameter of the sun (No. 1), although No. 7 was a good deal larger than this. As the diameter of the bursts expanded a narrow green band formed round the circumference with the centre becoming a milky red colour. On one burst, the 5th or 6th, the centre was purple but the edge was still green. These bursts were very spectacular to watch, and just about all the colours of the spectrum were seen, those mentioned above being the most prominent. Each burst was perfectly spherical until it dissipated to a cloud-like lenticular shape. One of the bursts grew so large and so rapidly that it seemed to be coming straight towards the observers.

The bursts could best be described as the bursting of a very large firework, starting small and intense and expanding and fading rapidly and taking about 5 seconds to reach their largest diameter. The lenticular shape was probably the result of aspect on a circular phenomenon and the fantail effect was probably due to perspective, the first and the smallest being further away.



As the last burst started the first six bursts were still marked by white clouds of the shape and form described. After the last burst had formed its full lenticular shape it did not regain its white colour, but broke up in a gaseous manner to form a purple haze of a larger area, and only the top forms increased in size. The seven cloud-like forms disappeared suddenly at 2120 GMT, apparently drifting higher and thinning out to white dust-like particles.

At 2145 GMT shortly after the phenomenon had faded the 2nd Officer spoke to a NE-bound ship to ask if the crew had also observed this strange sight. They replied that they had not seen it on the night of the 18th, but that they had seen it the previous night!

This vessel was called *Bocsa*, Call Sign YQDY, en route from Brazil to the Black Sea. Two bursts had been seen at altitude 20°, bearing north, followed 5 minutes later by a further three bursts. The time of this observation was 2100 GMT on 17 September 1982. The description given of this sighting tallied exactly with what had been seen on the 18th from the *Tenchbank*.

Course and speed of ship: 301°(T) at 15 knots.

Position of ship: 6° 35′S, 30° 43′W.

Note. A similar phenomenon was reported in the same area on 17 and 18 September by m.v. *Strathewe*. This was identified as having been attributable to meteorological rockets launched from Brazil (Barreiros, 8° 50′S, 35° 15′W).

551.509.5:551.465.755

The Forecasting of State of Sea

By P. E. Francis
(Meteorological Office, Bracknell)

(This article is an updated version of one with the same title which appeared in the *Meteorological Magazine* dated August 1982)

Summary

The requirement for, and history of, state-of-sea forecasting in the Meteorological Office are briefly described, together with a summary of the present operational forecasting system. The various forms of output from the system are discussed and some examples are given of the applications to which they are put. The results of some verification exercises are also examined.

1. Introduction

A firm need for a state-of-sea forecasting service has been established over the last 10 years, principally because of the growing offshore industry in the North Sea, but also as a result of economic pressures on shipping lines and an increasing general requirement for greater safety margins in all aspects of marine activity.

The Meteorological Office is currently satisfying the need for such state-of-sea forecasts because of a unique coincidence of necessary skills, information and facilities. The wind fields that are forecast by the numerical weather prediction models provide the necessary forcing functions that enable a state-of-sea forecast to be made for a wide area and a long forecast period. The wide experience of numerical modelling of physical systems that is found in the Office has been fruitfully turned to designing an operational state-of-sea forecasting model which incorporates the known physical processes which govern the behaviour of the sea surface. The combination of powerful computing resources and a centralized telecommunication system provides an environment where the necessary complex mathematical modelling can be efficiently carried out and the required products and information can be quickly distributed to the users.

Before the advent of powerful computer technology the accepted means of state-of-sea forecasting was by way of empirical wave-growth curves, deducing the wave height in terms of wind speed, duration and fetch. The numerical model in use by the Office incorporates in more stringent formulations the essential physical principles which underlie such empirical techniques. Details of the physical basis of the current models are to be found in the Appendix; it is sufficient here to summarize the basic processes which are modelled. Recent theoretical and experimental work by oceanographers in many countries has greatly increased the degree of knowledge of the processes involved in wind-wave generation and dissipation. The model in use incorporates such processes as wave growth, interaction and dissipation, the advection of swell energy and, in the higher-resolution version, such depth-dependent processes as refraction and bottom friction.

2. The operational system

The current operational state-of-sea forecasting services are based on the products of three numerical models which are run on the CDC CYBER 205 computer following the twice-daily integrations of the atmospheric prediction models. Like the atmospheric models the state-of-sea models consist of

coarse-mesh and fine-mesh versions, using winds from the appropriate atmospheric model. The coarse-mesh version covers the North Atlantic and North Pacific oceans down to 18°N with an approximate grid resolution of 150 km in mid-latitudes (Figure 1). The fine-mesh models have more limited areas, the

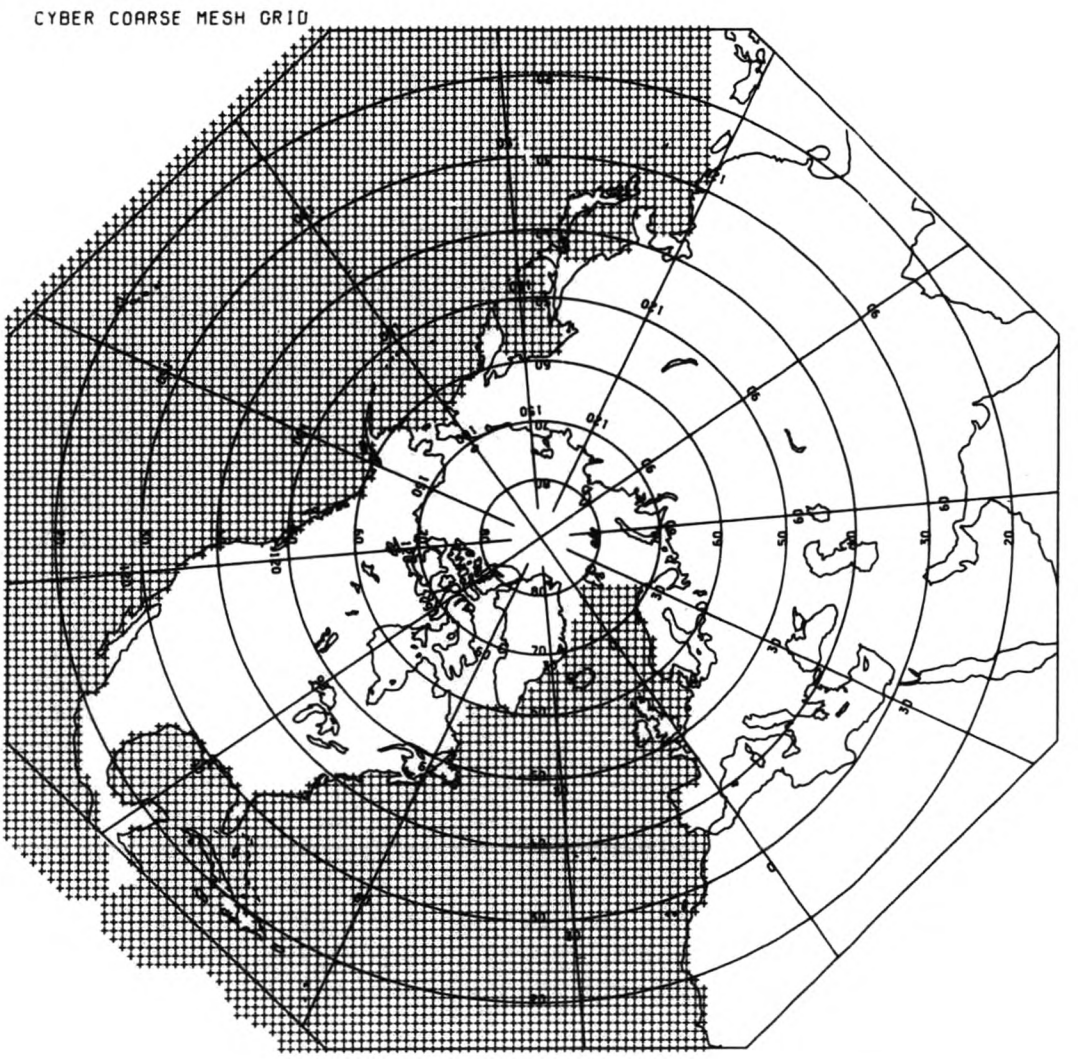


Figure 1. Grid points of the coarse-mesh wave area.

continental shelf and north-eastern Atlantic, with a resolution of 25 km (Figure 2) and the Mediterranean Sea with a resolution of 50 km (Figure 3). The winds for these models are interpolated from data on the fine-mesh atmospheric model grid. The coarse-mesh model is run for a forecast period of 48 hours and provides boundary values for the fine-mesh continental shelf model; i.e. swell forming in the Atlantic is passed into the continental shelf model and advected onward. The shelf model runs for a 36-hour forecast period, as does that for the Mediterranean Sea.

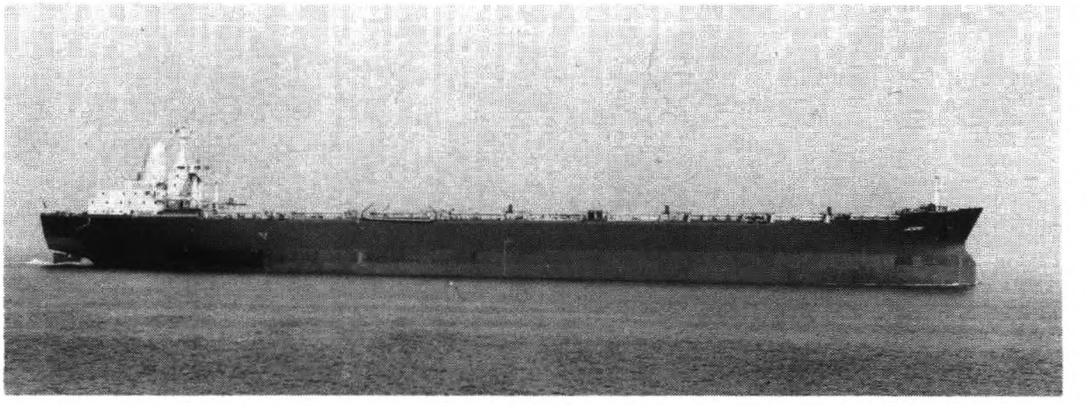
Output from the models is usually in chart format, showing significant wave-height contours for either swell or total seas (Figures 4, 5 and 6). Information is also available on wave periods. Some products are in the form of grid-point data, either assembled into WMO grid code for many points for onward transmission or listed in tabular form as a printout (Figure 7).

Before running each forecast a 12-hour 'hindcast' is performed. This is essentially a repeat of the first 12 hours of the previous integration but this time

Opposite page 1

Mairangi Bay (Overseas Containers Ltd) Captain J. Cosker

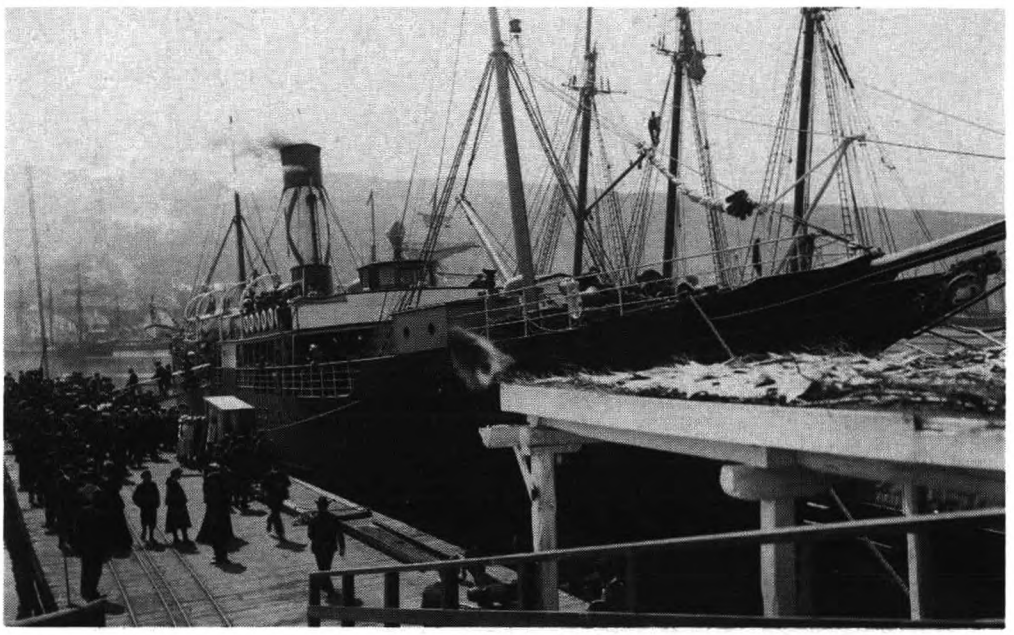
British Trident (B.P. Shipping Ltd) Captain R. F. Adams



Lackenby (Ropner Management Ltd) Captain J. E. Jennings

THE THREE SHIPS WHICH GAINED THE HIGHEST MARKINGS FOR THEIR METEOROLOGICAL LOGBOOKS DURING THE YEAR 1982 (*see* page 106).

Opposite page 137



Portia (the fourth of her name) at St John's, Newfoundland in the early 1900s.

Terra Nova in the Antarctic ice on 16 January 1911.

Benjamin Bowring in London (Transglobe Expedition 1980–82).

VESSELS OF C. T. BOWRING & CO. LTD (*see* page 145).

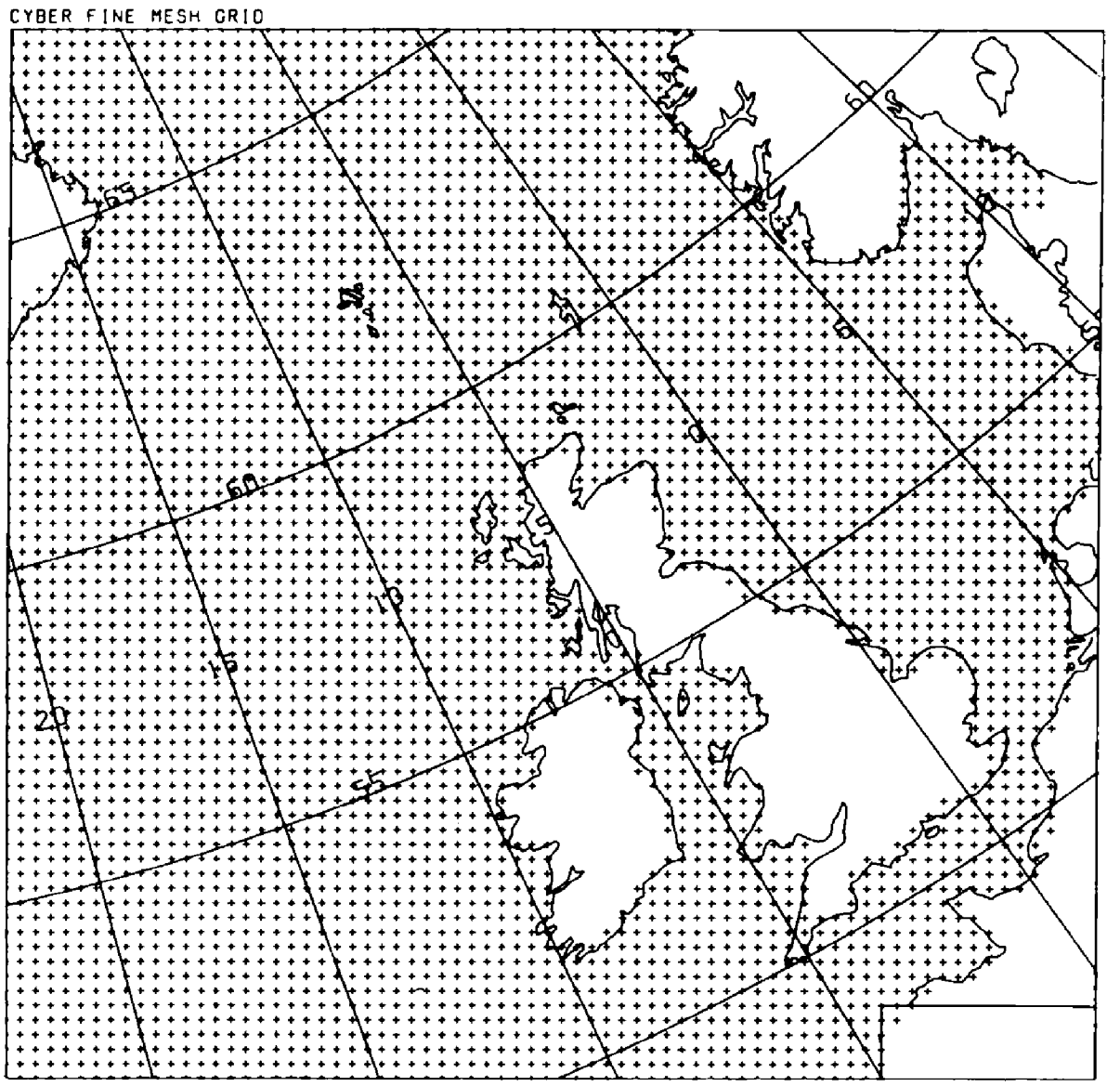


Figure 2. Grid points of the fine-mesh wave area.

using wind fields that are updated either with observations or with analysed products from the atmospheric models. This process ensures that the starting point of each state-of-sea forecast is the best possible description within the limits of the numerical simulation technique. These hindcast fields are kept in an archive, currently containing four years of acceptable data. At present no wave observations go into the models as data during the hindcast run.

The use of observed wave data, whether as visual estimates or as measured values, is confined to the area of validation. Some detailed figures are given in Table 1. A data set of forecast values for a greatly reduced number of grid points is retained during operational runs, so that at the end of each month a validation exercise can be carried out. Included in Table 1 are the corresponding errors of the forecast wind field at the same locations. Not surprisingly there is a good correlation between higher forecast wind errors and higher errors in forecast significant wave height. The scatter in the relationship is due to the differing proportions of 'local wind sea' and 'advected swell' components of the total significant wave height at different locations. The lowest root-mean-square errors of wave height for given wind errors are found at Penzoil, at the southern

Table 1. Forecast errors of fine-mesh wind speed and significant wave height.

Station	Forecast time (hours)	Wind speed ($m\ s^{-1}$)			Wave height (m)		
		n	Mean	RMS	*n*	Mean	RMS
OWS 'M'	+12	1234	−2·0	3·8	1228	0	1·1
64·8°N, 3·2°E	+24	1233	−2·3	4·2	1227	0	1·2
	+36	1230	−2·5	4·7	1224	−0·1	1·3
OWS 'L'	+12	1229	−1·0	3·8	1218	0	1·4
57·1°N, 19·7°W	+24	1228	−1·3	4·2	1216	−0·1	1·5
	+36	1225	−1·5	4·7	1212	−0·2	1·5
Penzoil	+12	1091	0	2·7	1022	0	0·5
53·2°N, 3·2°E	+24	1088	0·1	2·9	1022	0	0·6
	+36	1086	0	3·3	1020	0	0·6
Statfjord	+12	1051	0·1	2·7	880	−0·2	0·8
61·2°N, 1·8°E	+24	1052	−0·1	3·6	879	−0·2	1·0
	+36	1049	−0·2	3·9	877	−0·2	1·1
Data Buoy 1	+12	1045	0·2	2·9	988	0·1	0·9
48·7°N, 9·0°W	+24	1043	0·1	3·1	985	0·1	1·0
	+36	1044	−0·2	3·4	985	0	1·0

Data from June 1980 to February 1982.
n = number of occasions. RMS = root-mean-square.

end of the North Sea, where incoming swell is a minor constituent. The worst errors are found at Ocean Weather Station 'L' where incoming Atlantic swell is very important and perhaps not simulated well enough by the coarse-mesh model which provides the boundary values.

3. Applications

The different resolutions of the three models, together with the depth-dependent effects found only in the very-fine-mesh version, reflect the potential uses for the model products. The use of the coarser-mesh products is confined to shipping activities, hence a chart format is the most suitable output medium. A forecaster in the Central Forecasting Office (CFO) has the responsibility of preparing 24-hour and 48-hour forecast charts of total significant wave height for the North Atlantic. These charts are produced by modifying the products of the coarse-mesh wave model in the light of the expected differences in wind-field evolution from the forecast values given by the coarse-mesh numerical weather prediction model, using the forecaster's experience of the relationship between broad-scale wind fields and the associated wave developments in the model. The final product is hand drawn and then broadcast by means of radio-facsimile. The Ship Routeing Service also uses the amended North Atlantic chart and, following discussions with CFO forecasting staff, makes use of forecast wave products for the North Pacific or the Mediterranean Sea. For conventional vessels the object of the service is to select the best route for the ship to follow in order to reach her destination in the shortest possible time, with the most economical fuel consumption, commensurate with least damage to ship and cargo. Wave conditions as well as wind are an important consideration is such an exercise since average speed over the route as well as stability is a

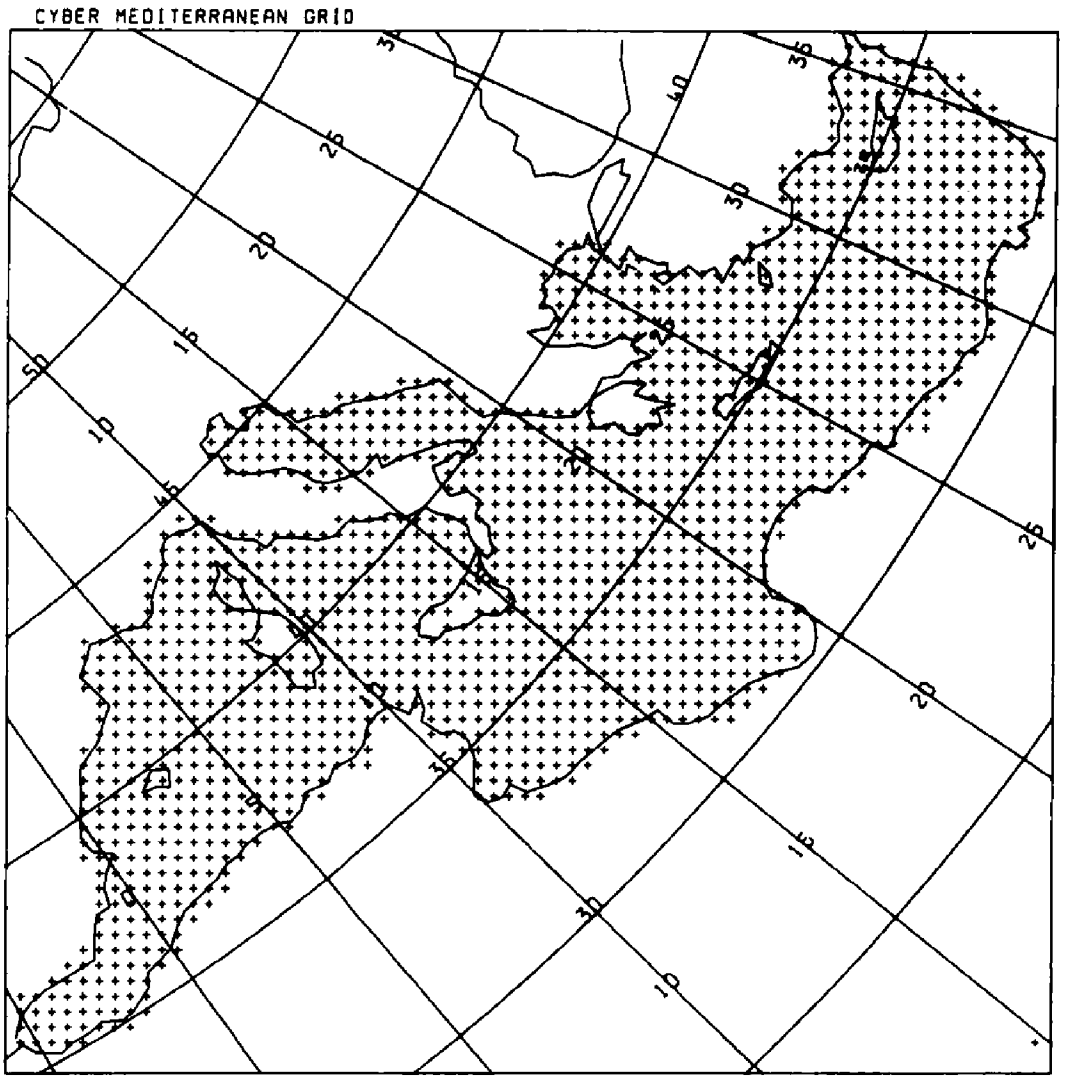


Figure 3. Grid points of the Mediterranean model.

function of state of sea. Non-conventional requests, such as for tows, may have more restrictive state-of-sea limitations and advice can be given on weather and state-of-sea 'windows' during which movements are possible.

Products of the finer-mesh continental shelf are used for a wider variety of purposes. The forecast products are used extensively by staff at London Weather Centre where the greater part of the forecasting service for the offshore gas and oil industries takes place. Both charts (Figure 5) and grid-point digital data go to London Weather Centre where, by a judicious synthesis of up-to-date analyses, numerical forecasts and empirical techniques, forecasts of state of sea are derived for transmission to users. Some basic forecast data are also sent direct to staff at Aberdeen, Kirkwall and Lerwick. The staple product for the offshore industry is significant wave height but some operations, such as the placings of large modules, are also sensitive to particular wave periods. The formulation of the forecast models enables primary energy-containing periods in the frequency spectrum to be identified, thus allowing forecasters to give an informed opinion of whether such sensitive operations should be planned during the forecast period. The expansion of forecasting services to the offshore industry is, however, hampered by difficulties in telecommunication, a restraint which at present severely affects forecasters deployed offshore at the sites of operations.

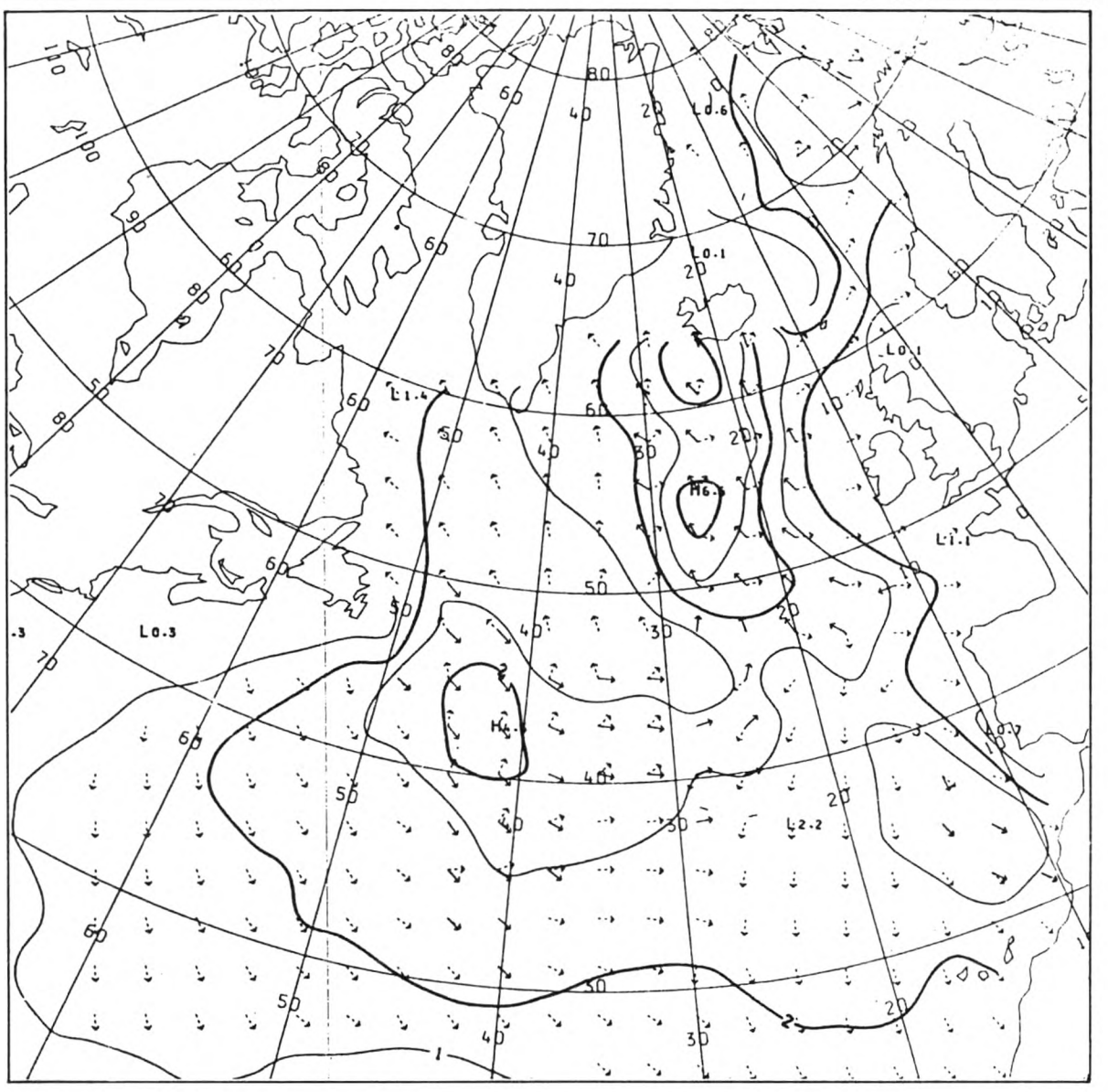


Figure 4. Example of output from the Atlantic state-of-sea model in chart format.
Sea and swell contours for 12 GMT on 4 November 1980. Arrows indicate wind direction. Dotted arrows indicate swell direction.

A tailored service in terms of wave height, period and direction could be supplied, given adequate communications. Other users of forecast state-of-sea data from the finer-mesh model are those water authorities with responsibility for some aspects of coastal defence. At present four such authorities receive forecast state-of-sea information, once or twice a day, for locations along their coastline. The data are usually in tabular form (Figure 7) giving forecast information at 3-hour intervals. This service was initiated following the Portland flooding of February 1979 and usually runs from September to April. A comparison between hindcast wave heights and measured data in Lyme Bay is given in Figure 8. The correlation is quite acceptable, bearing in mind that the hindcast model data are available only at 12-hour intervals, i.e. that absent maxima are not necessarily unpredicted, and also that the wave-rider buoy concerned was only 100 m or so from the beach. The model purports to represent open-sea situations.

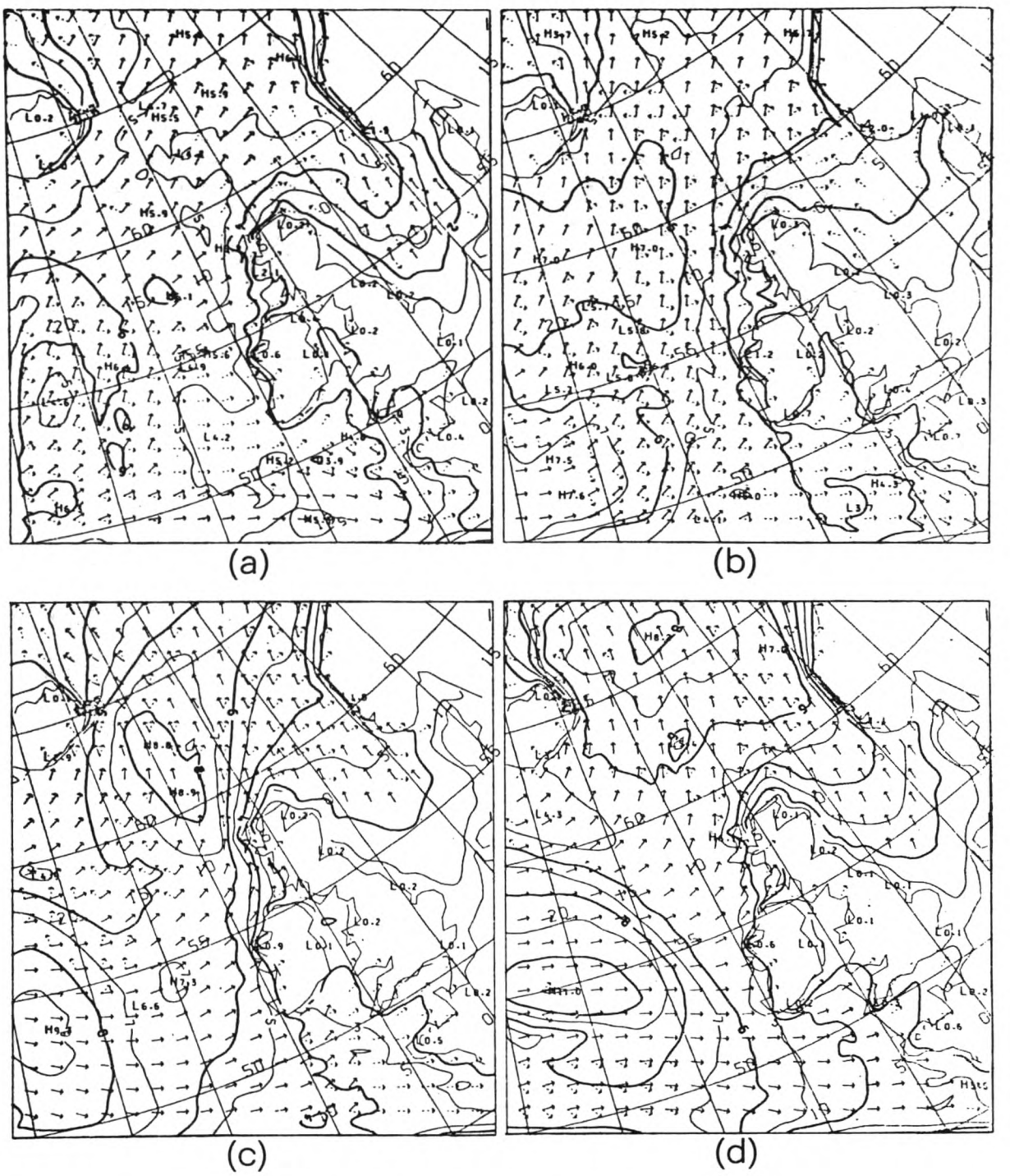


Figure 5. Example of output from the continental shelf state-of-sea model in chart format, showing sea and swell contours, wind direction (arrows) and swell direction (dotted arrows).

(a) Starting point of forecast at 00 GMT on 7 March 1982. (b) 12-hour forecast.
(c) 24-hour forecast. (d) 36-hour forecast.

The archive of hindcast states, or diagnoses, has been used quite extensively in a variety of ways. The major application has been as an aid to the Wave Energy Steering Committee of the Energy Technology Support Unit. The archive has been interrogated to give an additional estimate of the long-term average wave-energy resource, both off the Hebrides and in the Western Approaches. The agreement between short-period averages given by the model and by wave-rider-buoy measurements was extremely close. Other applications

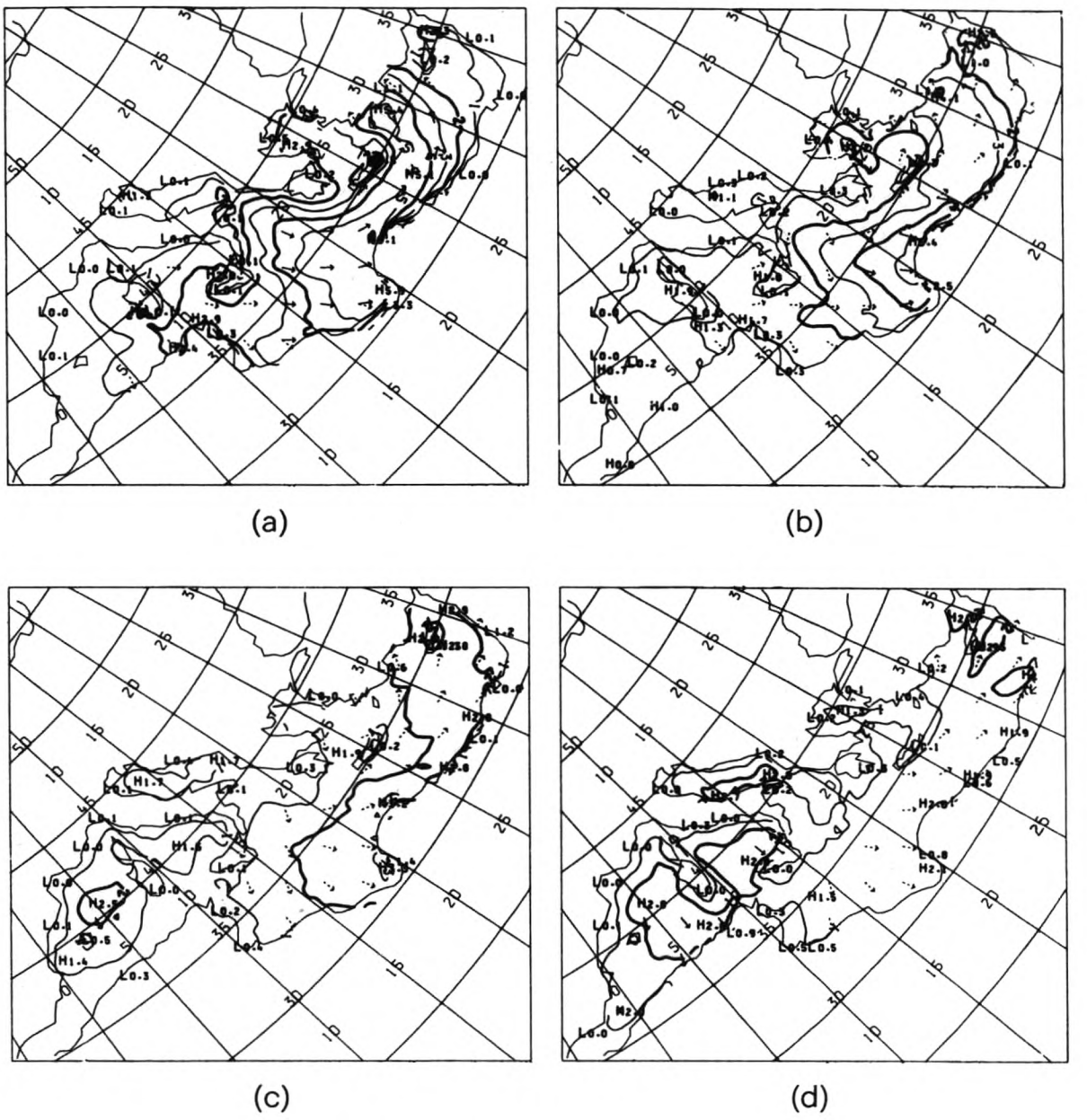


Figure 6. Example of output from Mediterranean model, showing sea and swell contours, wind direction (arrows) and swell direction (dotted arrows).

(a) Starting point of forecast at 12 GMT on 1 February 1983. (b) 12-hour forecast.
(c) 24-hour forecast. (d) 36-hour forecast.

of the diagnostic archive have also been mainly climatological in nature, principally for the Hydraulics Research Station, but there have been interesting oddities like the ecology of East Yorkshire beaches and the estimated state of sea in which a ship was abandoned by its crew!

4. Future developments

The acquisition of the CYBER 205 computer provided the opportunity for the state-of-sea forecasting service to be re-examined and assessed with respect to known requirements and possible expansion. The models themselves have already been improved, both by means of better forecast wind fields (products of the new numerical weather prediction models) and by higher resolution in

FOR TRANSMISSION TO SOUTH WEST WATER AUTHORITY VIA MET.O.5 PAGE 1

INITIAL DATA TIME 122 7/ 2/82

LOCATION 50.3N 3.6W

HOURS AFTER DATA TIME	WIND SPEED KTS	WIND DIRECTION DEG(FROM)	TOTAL WAVES HEIGHT M	TOTAL WAVES PERIOD SECS	WIND SEA HEIGHT M	WIND SEA PERIOD SECS	SWELL HEIGHT M	SWELL PERIOD SECS	SWELL DIRECTION DEG(FROM)
0.0	6.8	205.	1.7	6.6	0.3	0.1	1.6	7.1	233.
3.0	12.2	227.	1.6	6.6	0.6	3.6	1.5	7.9	235.
6.0	17.9	236.	1.6	6.2	0.9	3.9	1.3	8.8	236.
9.0	20.6	254.	1.5	6.2	0.9	4.1	1.2	8.4	231.
12.0	24.0	262.	1.4	6.2	0.8	3.9	1.2	8.1	231.
15.0	20.7	264.	1.4	6.2	0.8	4.0	1.2	8.0	232.
18.0	18.5	277.	1.4	6.2	0.6	3.7	1.2	7.4	230.
21.0	13.2	239.	1.4	6.5	0.4	3.1	1.4	7.1	231.
24.0	19.9	223.	1.6	6.3	0.8	4.0	1.3	8.1	231.
27.0	26.6	227.	2.0	6.2	1.6	4.8	1.2	9.0	224.
30.0	26.0	224.	2.5	6.3	2.3	5.5	0.9	10.0	220.
33.0	27.6	228.	2.8	6.5	2.5	5.8	1.2	9.9	216.
36.0	26.7	221.	3.1	6.7	2.6	6.2	1.7	9.8	215.

LOCATION 49.8N 4.8W

HOURS AFTER DATA TIME	WIND SPEED KTS	WIND DIRECTION DEG(FROM)	TOTAL WAVES HEIGHT M	TOTAL WAVES PERIOD SECS	WIND SEA HEIGHT M	WIND SEA PERIOD SECS	SWELL HEIGHT M	SWELL PERIOD SECS	SWELL DIRECTION DEG(FROM)
0.0	8.8	222.	3.1	8.2	0.5	2.8	3.1	8.7	260.
3.0	14.2	244.	3.0	8.1	0.7	3.6	2.9	8.9	261.
6.0	17.8	243.	2.9	7.4	1.8	5.6	2.2	10.7	266.
9.0	20.3	256.	2.8	7.0	1.7	5.0	2.2	10.1	263.
12.0	24.1	261.	2.8	6.8	2.2	5.6	1.8	10.8	264.
15.0	21.4	261.	2.8	6.8	2.6	6.6	1.2	11.8	269.
18.0	19.3	272.	2.7	6.7	2.2	6.0	1.6	10.4	259.
21.0	15.4	242.	2.7	6.9	1.7	4.8	2.1	9.2	256.
24.0	20.8	226.	2.7	7.0	2.5	6.5	1.1	11.9	265.
27.0	25.6	227.	3.0	6.6	2.6	6.2	1.5	10.5	253.
30.0	25.6	222.	3.3	6.8	3.2	6.9	1.1	11.9	262.
33.0	26.6	223.	3.6	6.9	3.4	7.1	1.1	12.0	257.
36.0	26.6	221.	3.9	7.2	3.9	8.0	0.5	13.7	269.

Figure 7. Example of output from state-of-sea model in tabular form.

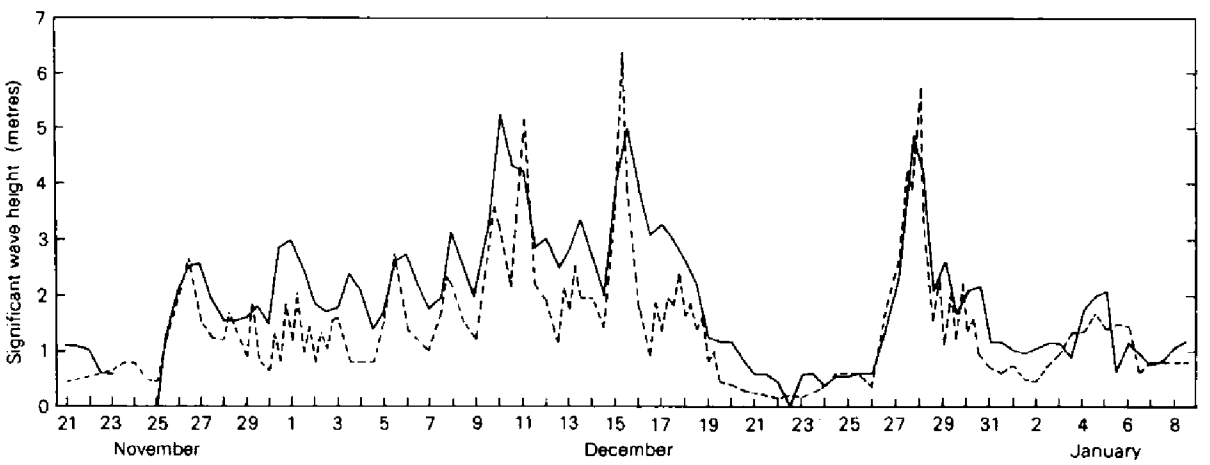


Figure 8. Comparison between hindcast wave heights and measured data in Lyme Bay (50·5°N, 2·6°W) for the period from 00 GMT on 21 November 1979 to 12 GMT on 8 January 1980.
—— Hindcast data. – – – – Measured data.

space, spectral frequency and direction. The incorporation of improvements to the simulation of some of the physical processes represented in the models will be the aim of future research work.

The increased processing power of the CYBER has allowed the resolution improvements referred to above to be implemented, but it will also make possible an expansion of geographical coverage. This increase in area covered by the models will overcome existing deficiencies as well as lending extra promotional

weight to the Ship Routeing Service. Specifically, a tropical ocean model will provide trade-wind swell input to the northern ocean areas, a feature notably lacking in the current models.

Wider coverage introduces the problematic question of validation of forecasts against reliable data. To cover this need the Office is maintaining an interest in state-of-sea measurement by means of high-frequency radar from land stations and by remote sensing from satellites. Such measurements also lead to estimates of wind speed and direction over the sea surface, another very promising source of information in areas of sparse data.

Appendix: Brief description of wave model

The basis of the operational state-of-sea forecast models is a statistical representation of the wave field, rather than an array of discrete values representing individual waves. The spectrum as represented is a function of the variance distribution of the surface elevation; hence such features as significant wave height and a representative wave period can be arrived at by means of the ratio of the appropriate moments of the spectrum at a point.

As from autumn 1983, the point representation will be made up of 16 directions (i.e. at 22·5° intervals) and 14 spectral frequencies ranging from 0·04 to 0·324 Hz (i.e. from 25 to 3·09 seconds period). Thus a sum of very short to very long waves can be assembled for each direction totalling 224 values for each grid point. The models function by considering the evolution of each spectral component through the forecast period, an evolution controlled by physical processes which have varying degrees of effect depending on the specified frequency and direction.

The rate of change of the magnitude of each component during a model time-step can be split into the contribution of individual processes:

(*a*) Propagation. Energy is moved from one part of the wave field to another. In deep water this process occurs without change of direction or speed. Speed of advection is inversely proportional to the frequency of the component.

(*b*) Refraction. As water shallows, the direction and speed of propagation change, following Snell's Law. This is an important effect in the finer-mesh model.

(*c*) Growth and decay. In response to wind forcing, wave initiation and growth take place. Initial wave growth is linear but this stage is rapidly succeeded by an exponential growth stage up to a limit dependent on local wind speed. As waves become too steep they break, resulting in an energy loss; this process is also modelled. Initial growth, and decay through 'white capping', are essentially higher-frequency effects.

(*d*) Non-linear interaction. An internal redistribution of energy between neighbouring frequency components. Observations show that wave energy tends to migrate to lower frequencies than those which are fed in by the wind; i.e. waves become longer.

(*e*) Bottom friction. Owing to the roughness of the sea bed, long-wave components begin to lose energy. Again this is an important effect in the finer-mesh model.

The net result of these processes in physical reality is to shape the spectrum into a form that has been extensively reported in scientific literature. The operational model is to a large degree forced into that representative spectral shape, thus preserving the correct orders of magnitude for the individual physical processes being modelled.

Note. 'Significant wave height' is the mean height of the highest third of the observed waves.

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Long Association with Shipowners—C. T. Bowring and Company Limited

By Captain C. T. Pitt, o.b.e.

The firm of C. T. Bowring & Co. Ltd had its origins in St John's, Newfoundland when the founder of the company Benjamin Bowring, a West Country clockmaker, set up business in St John's in 1815 as a General Dealer.

As this business developed it became necessary to acquire ships to import goods to Newfoundland and to export local produce such as seal oil, sealskins and salt cod, and with this in view in 1823 Benjamin Bowring purchased the schooner *Charlotte* of 44 tons and the larger schooners *Eagle* and *Dove* of 91 tons. In 1835 Benjamin Bowring set up an office in Liverpool and purchased the brig *Velocity* of 143 tons. She made her first voyage to Newfoundland in March 1835 with 200 tons of cargo and some passengers.

During the 1840s Bowring entered the seal trade and eventually had a fleet of some half dozen sealers. This trade went into a decline between the wars and the last vessel to operate was s.s. *Eagle* of 677 tons, which made her last voyage in 1950.

The Bowring fleet continued to expand from 1840 with the first steamship s.s. *Titania* of 2350 tons being delivered in 1880. The 1860s saw the advent of full rigged ships under the Bowring house flag such as *Juliet* of 1300 tons in 1868 and *Othello* and *Desdemona* of like tonnage. Between 1820 and the end of the century Bowring had owned or managed 62 sailing ships varying from the 44 ton *Charlotte* to the 2149 ton *Glenorchy*.

In the 1860s Bowring had developed a foothold in the petroleum industry in the United Kingdom and commenced importing kerosene contained in wooden drums in their sailing ships. This trade continued until 1890 when along with the Mellon Corporation they established the Bearcreek Oil & Shipping Company Ltd, who took delivery of their first tanker, s.s. *Bearcreek* of 3500 dwt, in 1890.

The *Bearcreek* had a rather short life, being lost whilst in ballast from Amsterdam to Philadelphia in 1892. She was replaced in 1893 by s.s. *Snowflake* of a similar size. At the end of the 1890s Bowring had acquired a further four tankers. Incidentally, the *Snowflake* was still trading in 1950, but not under the Bowring flag.

In 1884 Bowring had registered the New York, Newfoundland & Halifax Steamship Company and the ships were well known as the Red Cross Line. *Portia, Miranda* and *Romeo* were the first of a long line of passenger and cargo vessels which traded between New York, Halifax and St John's, Newfoundland. They each carried about 60 passengers and 1000 tons of cargo. They were followed by the larger *Sylvia, Rosalind, Florizel* and *Stephano*. The Red Cross Line ships had now established the tradition of naming ships after Shakespearian characters.

With the advent of steam in the late 1880s the English and American Shipping Company was incorporated and by the end of the nineteenth century it had acquired a fleet of some 15 vessels of around 2500 tons each. These ships were mainly engaged in tramping. Usually voyages were from the U.K. to the Mediterranean with coal and thence to Huelva to load ore for the U.S.A. From the U.S.A. grain and general cargo were loaded, mainly for discharge in the U.K.

In 1910 Lobitos Oilfields entrusted the management of their fleet to Bowrings. It consisted of *El Lobo*, *El Toro* and *El Zoro*, each of about 9000 tons. The *El Toro* and *El Zoro* were lost by enemy action in the first world war. These were replaced post-war by *El Grillo*, *El Aleto*, *El Cieruo* and *El Mirlo*.

During the First World War the Bowring fleet suffered considerable casualties, a total of more than 20 ships being lost by enemy action. The English and American fleet was reduced to 2 ships and in 1919 it was decided to place the company in voluntary liquidation and set up a new company, the Bowring Steamship Company Ltd, which acquired the two remaining ships *Tafna* and *Adra*.

The Bearcreek Oil & Shipping Company Ltd and the Oil Tank Steamship Company Ltd continued to operate with five tankers which were all on long-term charter to major oil companies.

The Red Cross Line continued to operate its regular service from New York to St John's until 1929, having made good its war-time losses. In late 1929 the Red Cross Line was sold to a subsidiary of Furness Withy, thus terminating the long association of Bowring ships trading regularly to St John's.

In the depressed 1920s and early 1930s the company was forced to lay up many of its ships and it was not until the mid-1930s that with the lifting of the world-wide depression things became brighter and further expansion could be planned.

Three new 15 000 ton tankers were contracted for, to be employed on long-term charter to Trinidad Leaseholds Ltd; they were m.v. *Regent Lion*, m.v. *Regent Panther* and m.v. *Regent Tiger*, and additionally a 9000 ton single-deck tramp steamer *Cape Breton* came into service.

At the outbreak of the Second World War the Bowring Fleet consisted of 16 ships and a further seven ships were managed for the Ministry of War Transport; of these 23 ships, 15 were lost by enemy action.

After the war the Bowring Steamship Company ordered four new ships for charter to Trinidad Leaseholds and purchased two more from the Ministry. With the 'take-over' of Trinidad Leaseholds by Texaco in 1956, as the ships' charters ended they were disposed of and by the early sixties Bowring had ended their tanker-owning epoch.

In 1956 Bowring managed three large bulk carriers for the M.A. Hana Corporation of Cleveland, Ohio and had ordered a 15 000 ton ore carrier m.v. *Trinculo* for charter to the British Iron and Steel Corporation. This ship was replaced by a larger vessel of the same name in 1978.

During the 1960s four more bulk carriers were delivered, m.v. *Stephano*, m.v. *London Bridge*, m.v. *Forth Bridge* and m.v. *Sydney Bridge*, the latter three ships to participate in the Seabridge Shipping Consortium.

In the 1970s m.v. *Capulet*, m.v. *Trinculo* (2) and m.v. *Desdemona*, all handy-sized bulk carriers, were delivered to participate in the Atlantic Bulker Consortium.

It is worth recalling that Bowring have had a notable association with polar exploration. *Terra Nova* was chartered to the Admiralty for use as Captain Scott's supply and base ship for his ill-fated expedition to the South Pole from 1909 to 1912. *Aurora* was the supply and base ship for Sir Douglas Mawson's Australian Antarctic Expedition from 1912 to 1914 when the Expedition did valuable surveying and other scientific work. Indeed the master, Captain Davis of the *Terra Nova*, had the honour of having the Davis Strait named after him.

In 1979 Bowring purchased the *Martin Karlsen*, ex-*Kista Dan*, a well-known polar vessel, renamed her *Benjamin Bowring* and donated the service of the ship to the Transglobe Expedition led by Sir Ranulph Fiennes who successfully accomplished the first trans-polar circumnavigation of the globe. Much scientific, oceanographic and meteorological work was achieved during the three years of the expedition.

Benjamin Bowring landed the polar party at Sanae in January 1980 and picked them up at McMurdo after their successful polar crossing in January 1981. She then took the party to the mouth of the Yukon River for their transit through the North West Passage to Alert and recovered them in Latitude 80° 30′N from an ice floe in August 1981. Incidentally, this is the most northerly latitude ever achieved by a British ship. Sir Ranulph and his party were then brought back in triumph to Greenwich at the end of August.

Following the acquisition in 1980 of C. T. Bowring & Co. Ltd by the New York insurance brokers Marsh & MacLennan Companies, Inc., the Bowring Steamship Company Ltd was subsequently sold to another British company in July 1981.

With the completion of the Transglobe Expedition in September 1982 *Benjamin Bowring* was sold and a hundred and sixty years of ship-owning tradition by the Bowring Group came to an end.

Editorial Note

The first Bowring ship to be equipped with Meteorological Office instruments was the *Viola* in April 1883. She was an iron barque of 595 net tons built by T. Royden and Sons of Liverpool in 1868. The first meteorological logbook received from the *Viola* covered the period from 4 May 1883 to 6 February 1884 when she was under the command of Captain John H. Price on a voyage from Liverpool to Valparaiso and back to Queenstown. The top of the first page of the meteorological logbook is devoted to a description of the siting and mounting of the instruments as follows:

'The Barometer is kept in the cabin where in very cold weather a fire is kept. It is not possible to hang it higher than 2 feet above the sea (the cistern end). Dry and damp bulbs are in the case supplied for them and which is fixed before the companion in the half poop screened from sun and rain etc. by a small awning stretched from rigging to rigging and fully four feet above the screen allowing for plenty of air and always in the shade except in very bad weather when heavy water is shipped on the poop. The taking down of said screen is mentioned in the remarks column on the days necessary to do so.'

The first entries in the remarks column are:

for 2 May 1883	'8 p.m. discharged Pilot off the Bar Light Ship and proceeded on a W by ½N course with the wind from the Northward.'
for 3 May 1883	'4 p.m. South Stack bore NE 15 miles. Wind ENE 5.'
for 4 May 1883	'3 a.m. The Tuskar Light bore N by W 15 miles from which I take my departure.'

Meteorological observations were commenced at Noon on 4 May 1883.

From the meteorological logbook it would appear that the voyage was uneventful with relatively fine weather except for a few short-lived gales whilst rounding Cape Horn outward bound and again just before arriving at Queenstown. Among the entries made in the remarks column were the following:

30 January 1884	'8 a.m. to Noon. Wind very unsteady flying about into all points. Number of sea gulls seen. 2 p.m. Wind gusty and looking bad to North: took down the deck instrument case. 6 p.m. Blowing a whole gale with thick black rain. Put the ship under fore and main lower topsails.'

For the remainder of that day, the whole of the 31st of January and the greater part of the 1st of February, the wind was North-westerly force 9 to 10 and selections from the remarks column are as follows:

31 January 1884	'8 a.m. No possibility of keeping the deck instruments in their place, no part of the vessel safe from the seas.'
1 February 1884	'Noon. An impossibility to use the deck instruments or get the gravity of sea water. A great number of sea gulls about.'
2 February 1884	'8 a.m. Set full sail and put up the case containing the deck instruments.'

Captain Price was obviously interested in sea birds for there is frequent mention of them, or of their sparsity, in the remarks column throughout the voyage.

The last Bowring ship to be equipped with Meteorological Office instruments was, of course, the *Benjamin Bowring*. Her final meteorological logbook covered the period from 30 April 1982 to 24 August 1982, when, under the command of Captain L. Y. Davis, and as part of the Transglobe Expedition, led by Sir Ranulph Fiennes, she sailed from Southampton to the Arctic ice cap to recover the Expedition party and returned it to Greenwich. Much fog was encountered during the voyage and the vessel was beset in the pack ice. In contrast to the frequent mention of birds in the *Viola*'s remarks column, there is none in that of the *Benjamin Bowring*. There is, however, frequent mention of polar bears observed close to the ship whilst in the pack ice.

PRESENTATION OF BAROGRAPHS

As announced in our January edition, four shipmasters were selected to receive the Special Long-service Awards for meritorious voluntary service to the Meteorological Office up to and including the year ending 31 December 1982.

Presentation of the Barograph Awards was introduced in 1948 by Sir Nelson K. Johnson, K.C.B., who, as the then Director of the Meteorological Office, inaugurated the presentation of four annual awards to ship's Officers who had rendered long service of a high standard in the Voluntary Observing Fleet.

On Wednesday, 9 March 1983, the presentation ceremony was held at the Meteorological Office H.Q., Bracknell, though unfortunately only three of the selected Masters could be present. Captain F. S. Angus, P. & O. Deep Sea Cargo Division, now lives in Auckland, New Zealand and arrangements have been made for his barograph to be shipped out and presented to him at a special ceremony to be arranged by the Director of the New Zealand Meteorological Service.

We were pleased to welcome to Bracknell Captain J. W. Waldie, formerly of Bibby Line Ltd, and Mrs Waldie, Captain H. C. Hynard, P. & O. Deep Sea Cargo Division, and Mrs Hynard, and Captain R. J. Bland of Overseas Containers Ltd, together with Mr P. H. Milburn, Fleet Manager Cargo Division, P. & O. S. N. Co. Ltd.

In making the presentations of individually inscribed barographs to the recipients, Sir John Mason, F.R.S., Director-General of the Meteorological Office, expressed his appreciation of their outstanding and consistent voluntary service over many years. He stressed the continuing importance of surface observations in weather forecasting, particularly merchant ship observations, which were also vital in historical climatology. Their value was not lessened by the increasing volume of weather satellite data received and owing to the unfortunate decline in the British merchant fleet, to a degree reflected in the size of the Voluntary Observing Fleet, their contributions were all the more valuable and vital.

Sir John continued by describing how the Meteorological Office H.Q. had now been committed to its role as a world-wide centre for weather forecasting for some considerable time and would shortly become the world centre for the provision of global aviation forecasts, an increasingly necessary service. The new CYBER 205 computer was capable of performing 400 million calculations a second, and, as the largest unit of its kind in the world, would be vital in the production of automatic weather data and the collation of marine climatological records.

The Masters and other guests were shown the very first ship's meteorological logbooks that they had helped to compile, together with their record cards summarizing all their service in the ships of the Voluntary Observing Fleet.

Presentation of barographs on 9 March 1983 at Bracknell. Left to right: Captain R. J. Bland; Captain and Mrs H. C. Hynard; Sir John Mason; Captain and Mrs J. W. Waldie. (*See* facing page.)

Opposite page 148

Captain G. A. White
Marine Superintendent of the Meteorological Office, 1969–82.

Captain G. V. Mackie
The new Marine Superintendent of the Meteorological Office.

Opposite page 149

The visiting party was entertained to luncheon by Sir John Mason and senior staff of the Meteorological Office, followed by a guided visit to the Central Forecasting Office and Ship Routeing Service.

J.F.T.H.

AURORA NOTES JULY TO SEPTEMBER 1982

By R. J. Livesey

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

There were some very active auroral and magnetic storms during this period. Summer twilight conditions further north notwithstanding, a massive auroral storm developed late in the night of 13/14 July and stretched down across Europe to Malta. Coronal structures were well seen along the northern coasts of the American Great Lakes. Concurrently the Aurora Australis was also reported from Western Australia. A smaller storm at higher geomagnetic latitudes occurred on the night of 16/17 July. Associated radio aurora events were reported on 11, 12, 13 and 24 July. Strong disturbances of the earth's magnetic field were recorded on 11, 13, 16 and 30 July with generally unsettled conditions from the 11th through to the 20th.

In August, things were quieter and isolated auroral reports were made on the nights of the 10th/11th, 12th/13th, 16th/17th, 21st/22nd, 23rd/24th and 28th/29th, together with more widely seen events at lower latitudes at Edinburgh and in southern Finland on the 26th/27th and 29th/30th. Radio events were heard on the 7th and 11th. Magnetically disturbed conditions were noted frequently between the 6th and 12th and between the 22nd and 30th.

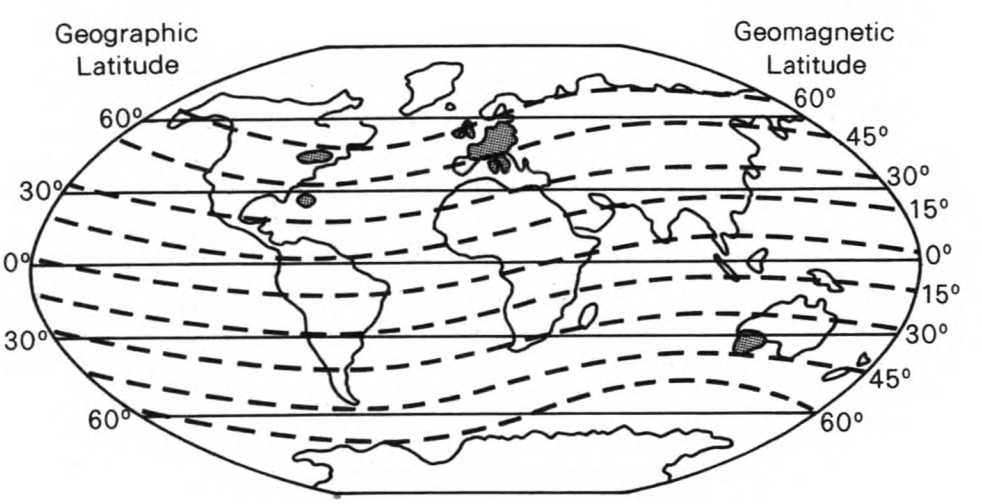
September again saw the onset of considerable activity, commencing with isolated high latitude reports on the 1st/2nd and 2nd/3rd. From the nights of the 5th/6th through to the 8th/9th there were widespread reports of visual activity including coronal ray structures along the USA–Canadian border, and rays in Western Australia, New Zealand and central Scotland. There were further isolated reports from the 15th/16th through to the 19th/20th, mainly in higher latitudes. Another widespread storm occurred on the night of the 21st/22nd, with active rayed structures seen all over the United Kingdom with additional reports from Ocean Weather Station 'Lima' and the Dutch Ferry *Koningin Juliana*. A further storm manifested itself on the 26th/27th with reports coming in of active rayed forms seen from Scotland and Ocean Weather Station 'Lima', together with all-sky aurora in southern Finland. The month terminated with light activity on the 29th/30th and 30th/31st. Radio aurorae were heard on the 6th, 7th, 22nd and 26th but that of the 6th was by far one of the biggest events reported by amateur radio operators and was recorded all over Europe. Magnetically disturbed conditions were recorded on the 6th, 7th, 9th, 21st and 25th.

A most interesting report came from Mr R. O. Yorath Williams, 3rd Officer of the RFA *Green Rover,* reporting auroral rays and glows on the night of 13/14 July some 480 n. mile SW of Bermuda. In fact, the copy of the report sent to the writer was marked in red querying the existence of auroral activity at such low geographic latitudes. A quick look at the geomagnetic chart shows that the RFA *Green Rover* was lying at the same geomagnetic latitude as Sardinia where the aurora was also being reported. The writer in the past has received auroral reports from the Bahamas, so there is nothing unusual about aurorae at this

Marine Aurora Observations July to September 1982

Date 1982	Ship	Geographical Position	Time (GMT)	Forms in Sequence
14 July	*Green Rover*	28° 00′N 72° 40′W	0210–0300	RR, N, RR, N
10 Aug.	*Abbey*	52° 25′N 51° 51′W	2300	RA
16/17	*Starella*	56° 50′N 19° 54′W	2245–0350	qN
20	*Benjamin Bowring*	65° 23′N 01° 57′E	2300–2320	mhA, RhA, QRB
23	*Starella*	55° 20′N 15° 25′W	0045–0245	qN
6 Sept.	*Coastal Trader*	43° 53′S 173° 07′E	0800–1200	RR, RR, hA, RR, amRB
6	*Aotea*	45° 43′S 170° 42′E	0815–0840	N
6	*British Hazel*	59° 01′N 19° 32′E	0120–0140	m_2RB, mRR
9	*Baltic Enterprise*	56° 17″N 11° 05′E	0055	qfRB
9	*Baltic Progress*	58° 30′N 21° 00′E	2000–2025	amRR
18	*Cumulus*	56° 55′N 19° 20′W	2200–2300	qfhG
22	*Koningin Juliana*	51° 51′N 01° 47′E	0325–0340	mRR, amRR
22	*Cumulus*	49° 50′N 04° 30′W	0015–0200	p_2mR_2R, p_2mRA
22	*Starella*	56° 48′N 20° 38′W	2142–2210	a_2R_2B
22	*Benvorlich*	57° 26′N 13° 44′W	0100–1035	RB,G
26	*Starella*	56° 52′N 20° 32′W	0347	qhB
26	*Starella*	56° 39′N 20° 32′W	2305	qmRB
28	*Naticina*	52° 20′N 05° 37′W	0000–0020	qm$_2$A
29/30	*Cumulus*	57° 04′N 19° 27′W	2330–0300	qfhG, qfS, qfP

KEY: A=arc, a=active, a_2=rapid change of lower form, B=band, f=fragmentary, G=glow, h=homogeneous, m=multiple, N= unspecified form, P=patch, p_2=flowing upwards, q=quiet, RR=ray bundles, R_2=medium length rays, S=surface.



Auroral Storm of 13/14 July 1982—Location of Observations received.

latitude on the western side of the Atlantic other than that the frequency of occurrence is low. Mr Yorath Williams is to be congratulated for having recognized the aurora and having contributed to the reporting of what was a rather massive event.

All marine observers are to be congratulated upon their reports, whether they be couched in aurora code, descriptive narrative or sketches. It is relatively easy to turn a report into code form for the purpose of scientific and statistical analysis. What does come through in the narratives and sketches is the beauty of the aurora and the impression that it has upon the observers. It is true that the inhabitants of lands beneath the auroral zone who see it nightly become blasé and unexcited, but which of us, watching the sun rise and set daily cannot become moved by the magnificence of a particularly beautiful dawn or sunset?

The British Astronomical Association has reorganized its auroral work and the Aurora Section was re-created in July 1982. This Section monitors visual and radio auroral activity together with geomagnetic storms as a department separate from the Solar Section. In addition, the Section is undertaking the collection and analysis of observations of the noctilucent clouds.

The noctilucent clouds are normally seen in northern latitudes 50 to 70 degrees from late May till early August, peaking at midsummer. The frequency of occurrence varies. They are found at a mean height of about 83 km above the earth's surface and most probably consist of ice-coated meteoric or other dusts. The clouds appear when the sun is between 6 and 16 degrees below the horizon and are seen by means of sunlight reflected by them from below the horizon. The clouds are pearly-white or blue, often having a marked wave or ripple structure, with veils, bands, billows or whirls. Their occurrence and structure are measured by the same methods as are used for the aurora and they are suitable objects for study during the 'close season for aurorae' during the summer twilight at appropriate latitudes. The Aurora Section would be very grateful for any observation made of the noctilucent clouds, which should be entered in the meteorological log in the usual manner. There are still many unanswered questions relating to the nature and occurrence of these striking clouds. Good sailing and good observing!

ICE CONDITIONS IN AREAS ADJACENT TO THE NORTH ATLANTIC OCEAN FROM DECEMBER 1982 TO FEBRUARY 1983

The charts on pages 154 to 156 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 east of Greenland and over the Barents Sea. The anomaly for cold north-westerly winds west of Greenland resulted in a continuing excess of ice off eastern Canada. Ice conditions through Denmark Strait were near normal. Over the Greenland and Barents seas the tendency was for deficits of ice alternating with smaller areas of excess ice to occur. Temperatures continued to be above average over the White Sea and here ice was slow to form.

January

The significant feature was the persistence of much lower pressure than normal over the Greenland and Barents seas. The anomaly for cold north-westerly winds west of Greenland continued. South of Davis Strait and north-east of Newfoundland, ice formed much further east than usual. These large areas of excess ice contrasted with ice conditions in the Gulf of St Lawrence, where the anomaly for milder southerly winds resulted in deficits of ice. Off east Greenland ice was near normal (there was recession of ice west of Spitsbergen on account of the anomaly for easterly winds).

Over the Barents Sea the change to the anomaly for south-easterly winds also resulted in recession so that by the end of the month the ice edge was about 80 n. mile further north than usual. Over the Baltic seas there was a marked anomaly for westerly winds and ice conditions were unusually light for the time of the year.

February

Pressure was much higher than usual west of Ireland and the previous pattern for lower pressure than usual east of Greenland was less marked. However, there was still some anomaly for cold north-westerly winds west of Greenland and excess ice persisted south of Davis Strait. The change to the anomaly for easterly winds reduced the previous excess of ice off Newfoundland to near normal and in the Gulf of St Lawrence the ice edge remained further west than usual. Off east Greenland ice conditions were again near normal. In the higher latitudes east of the Greenwich meridian the pressure and temperature anomalies were rather weak. The previous deficits of ice were reduced so that by the end of the month ice in the Barents Sea had reverted to near normal and there was some excess of ice west of Spitsbergen. The anomaly for north-westerly winds resulted in more rapid ice formation over the Baltic seas. However, by the end of February the ice edge was still north of its usual position.

References

Meteorological Office, London. 1966. Monthly meteorological charts and sea surface current charts of the Greenland and Barents Seas.

— Sea ice normals (unpublished) and various publications.

US Department of Commerce Weather Bureau, Washington, D.C. 1965. World weather records, 1951–60. North America.

US Naval Oceanographic Office, Washington, D.C. 1967. Oceanographic atlas of the North Atlantic Ocean, Section II: Physical properties.

Baltic Ice Summary: December 1982–February 1983

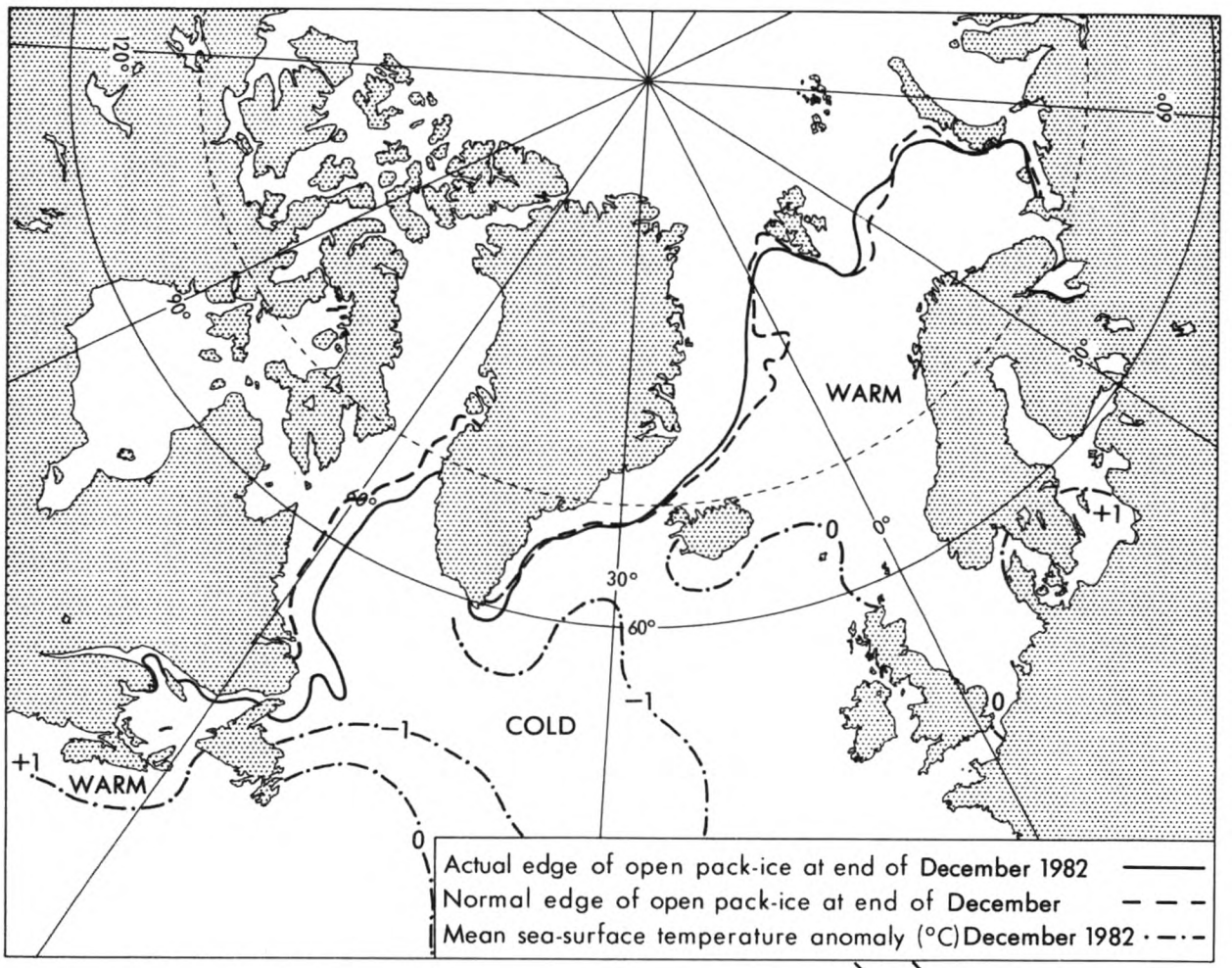
No ice was reported at the following stations during the period: Oxelösund, Visby, Ventspils, Emden, Bremerhaven, Hamburg (Elbe), Flensburg, Kiel, Lübeck, Rostock, Stralsund, Stettin, Gdansk, Aarhus, Copenhagen, Oslo, Kristiansandsfjorden.

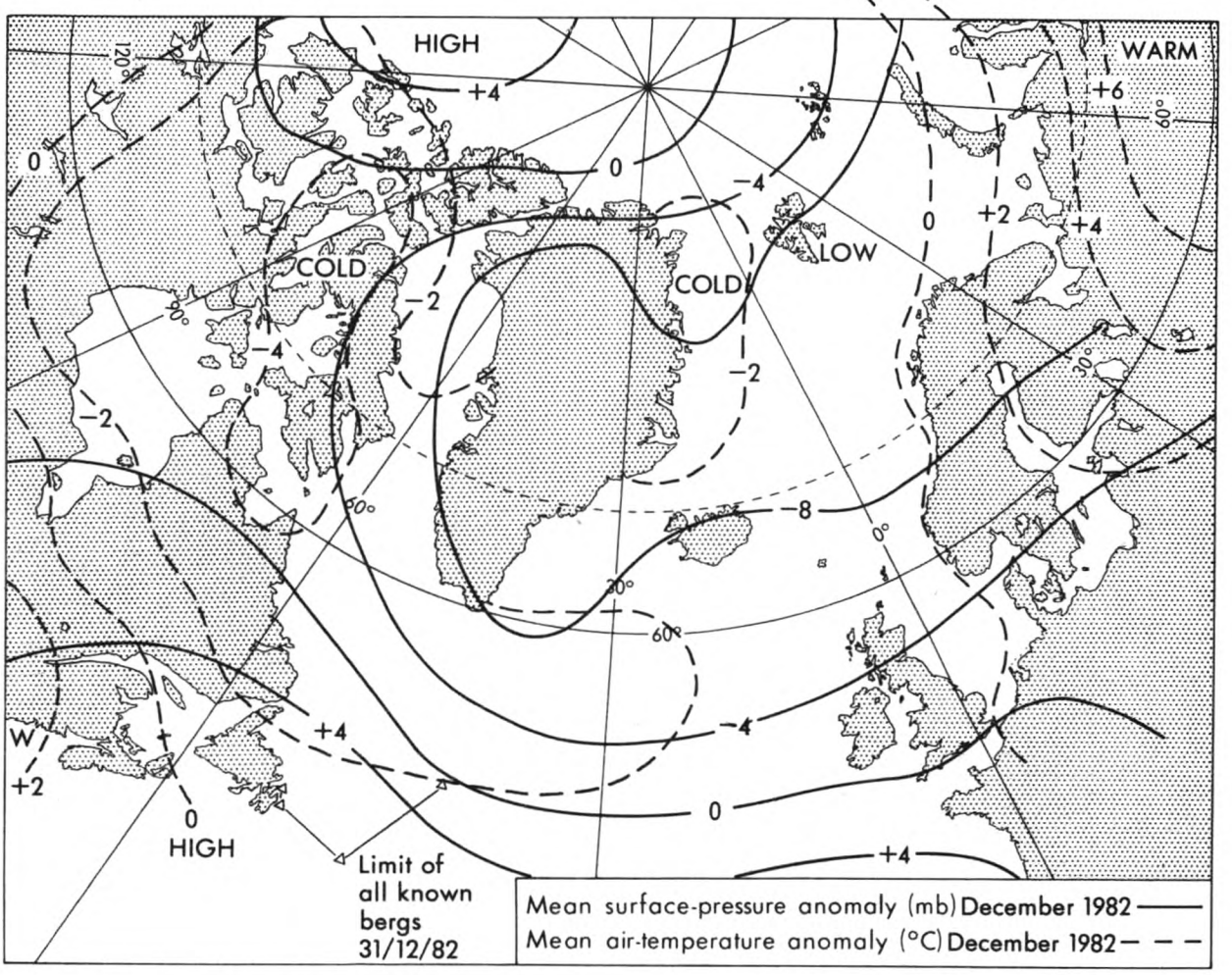
Station	December 1982									January 1983									February 1983								
	Length of Season		Ice Days			Navigation Conditions			Accumulated Degree Days	Length of Season		Ice Days			Navigation Conditions			Accumulated Degree Days	Length of Season		Ice Days			Navigation Conditions			Accumulated Degree Days
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I
Luleå ..	31	31	19	17	2	4	15	0	—	1	31	31	31	0	0	31	0	—	1	28	28	28	0	0	26	2	—
Skellefteå ..	15	31	14	2	12	14	0	0	—	1	31	18	15	3	17	1	0	—	1	28	28	28	0	4	24	0	—
Bredskar (Vaktaren) ..	0	0	0	0	0	0	0	0	—	18	31	7	3	1	5	0	0	—	1	28	20	13	6	15	4	0	—
Sundsvall ..	0	0	0	0	0	0	0	0	—	0	0	0	0	0	0	0	0	—	1	28	28	28	0	28	0	0	—
Sandarne ..	0	0	0	0	0	0	0	0	—	0	0	0	0	0	0	0	0	—	5	28	23	11	12	8	15	0	—
Kalmar ..	0	0	0	0	0	0	0	0	—	0	0	0	0	0	0	0	0	—	25	28	4	1	3	2	0	0	—
Göteborg ..	0	0	0	0	0	0	0	0	—	29	31	3	0	3	3	0	0	—	1	28	28	0	28	28	0	0	—
Stockholm ..	0	0	0	0	0	0	0	0	—	0	0	0	0	0	0	0	0	—	4	28	25	25	0	25	0	0	—
Helsinki ..	0	0	0	0	0	0	0	0	—	18	31	5	0	5	3	0	0	—	1	28	28	15	13	16	10	0	—
Turku ..	0	0	0	0	0	0	0	0	—	30	31	2	0	2	2	0	0	—	1	28	28	27	1	26	0	0	—
Mariehamn	0	0	0	0	0	0	0	0	—	0	0	0	0	0	0	0	0	—	6	28	21	0	14	14	0	0	—
Mäntyluoto	0	0	0	0	0	0	0	0	—	31	31	1	0	1	1	0	0	—	1	28	28	0	28	17	11	0	—
Vaasa ..	31	31	1	0	1	1	0	0	—	8	31	24	22	0	14	10	0	—	1	28	28	28	0	4	24	0	—
Norrskär ..	0	0	0	0	0	0	0	0	—	18	31	5	0	3	2	3	0	—	1	28	28	0	28	4	24	0	—
Oulu ..	15	31	17	17	0	17	0	0	—	5	31	17	17	0	0	17	0	—	1	28	28	28	0	0	28	0	—
Roytta ..	14	31	18	18	0	18	0	0	—	5	31	17	17	0	5	11	1	—	1	28	28	28	0	0	28	0	—
Leningrad ..	11	31	16	10	0	16	0	0	—	4	31	28	1	25	28	0	0	—	1	28	28	28	0	9	19	0	—
Vyborg ..	11	31	21	17	4	21	0	0	—	1	31	31	28	3	31	0	0	—	1	28	28	28	0	8	20	0	—
Tallin ..	0	0	0	0	0	0	0	0	—	0	0	0	0	0	0	0	0	—	15	28	14	0	14	14	0	0	—
Riga ..	0	0	0	0	0	0	0	0	—	0	0	0	0	0	0	0	0	—	7	28	16	0	16	9	0	0	—
Pärnu ..	0	0	0	0	0	0	0	0	—	23	31	9	0	9	9	0	0	—	1	28	28	23	5	9	19	0	—
Klaipeda ..	0	0	0	0	0	0	0	0	—	0	0	0	0	0	0	0	0	—	8	23	1	0	11	7	0	0	—

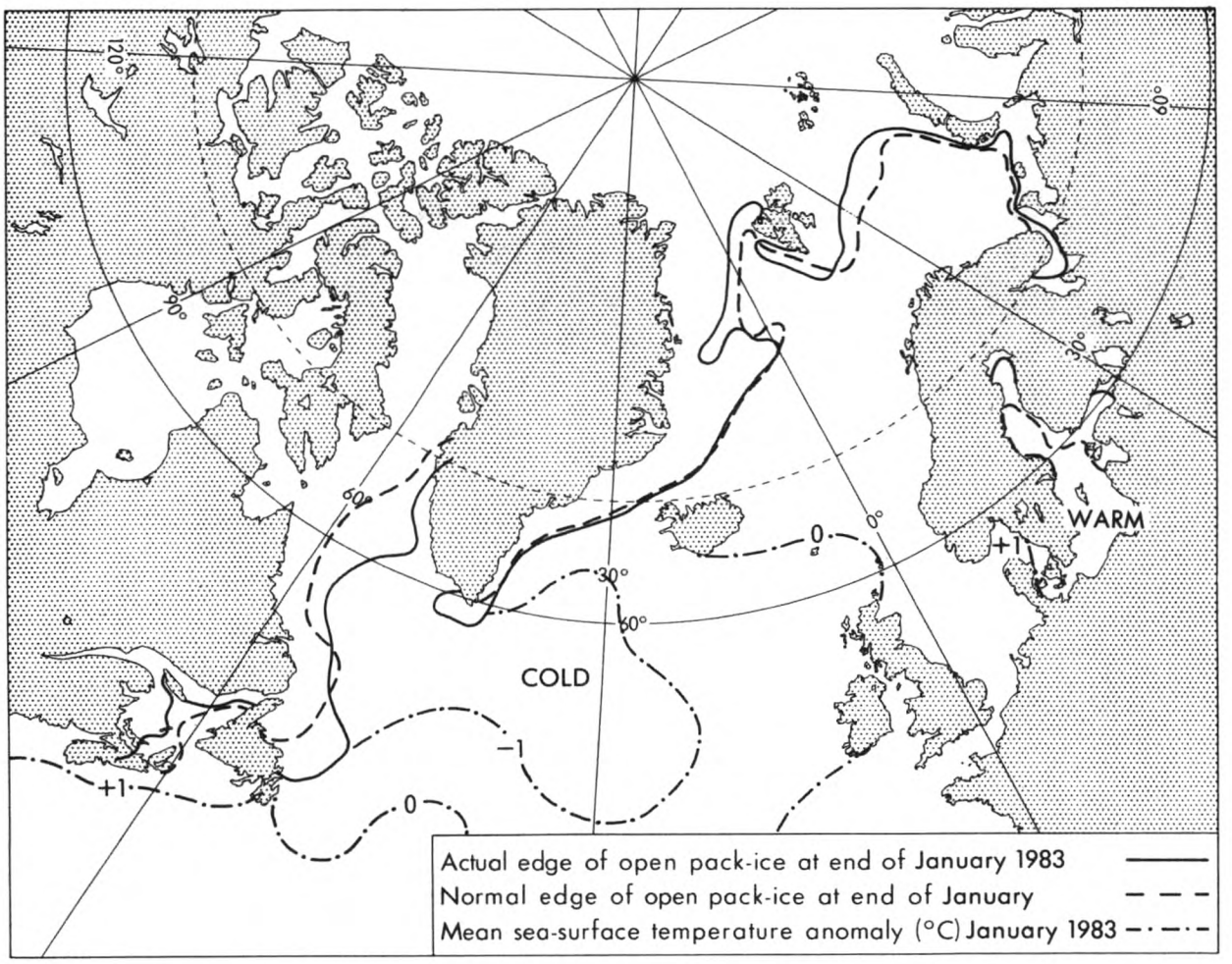
CODE

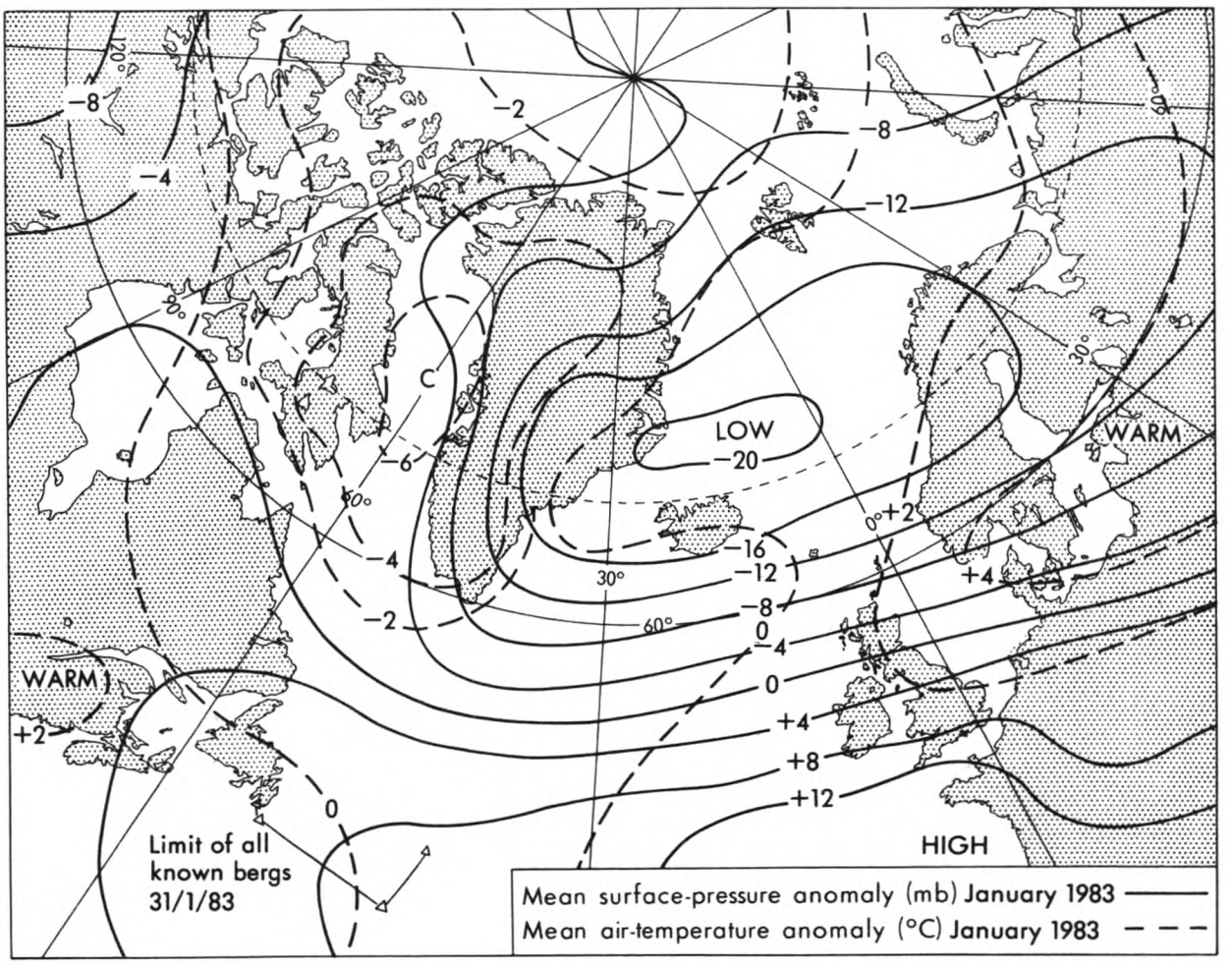
A First day ice reported.
B Last day ice reported.
C No. of days when ice was reported.
D No. of days continuous land-fast ice.
E No. of days of pack ice.
F No. of days dangerous to navigation, but assistance not required.
G No. of days assistance required.
H No. of days closed to navigation.
I Accumulated degree-days of air temperature (°C) where known.*

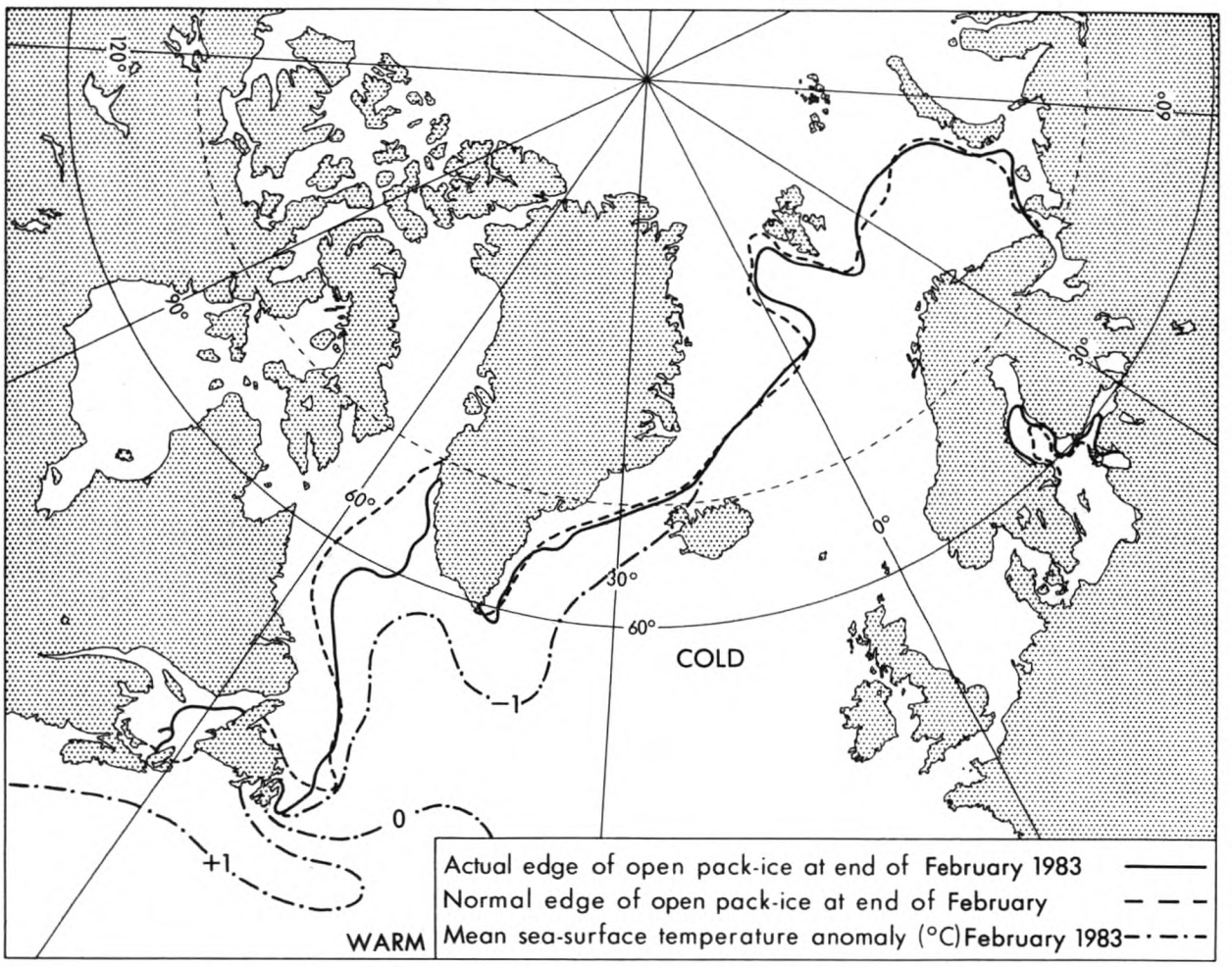
* These figures give a rough measure of the first probability of the formation of sea ice, and later the progress of the growth and its thickness. They are derived from daily averages of temperature (00+06+12+18 GMT) and are the sum of the number of the degrees Celsius below zero experienced each day during the period of sustained frost.

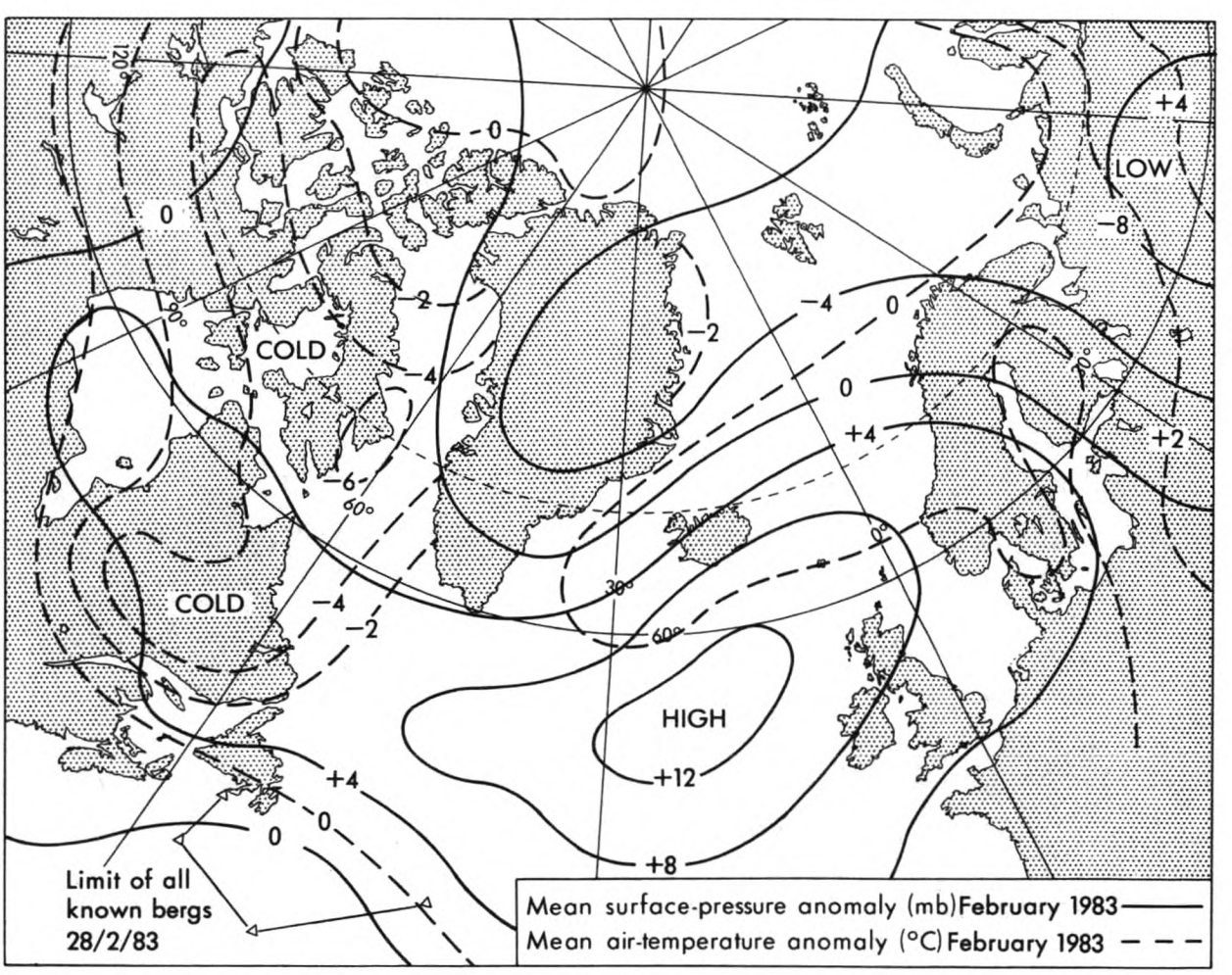

120°
60°
0°
30°
60°
WARM
COLD
WARM
+1
0
−1
−1
0
+1
0
Actual edge of open pack-ice at end of December 1982
Normal edge of open pack-ice at end of December
Mean sea-surface temperature anomaly (°C) December 1982


HIGH
WARM
+4
+6
120°
60°
0
0
−4
0
+2
+4
COLD
COLD
LOW
−2
−4
−2
−2
−8
0°
30°
60°
W
+2
+4
0
HIGH
0
+4
Limit of all known bergs 31/12/82
Mean surface-pressure anomaly (mb) December 1982
Mean air-temperature anomaly (°C) December 1982


120°
60°
30°
0°
WARM
+1
0
COLD
−1
+1
0
Actual edge of open pack-ice at end of January 1983
Normal edge of open pack-ice at end of January
Mean sea-surface temperature anomaly (°C) January 1983


120°
60°
30°
0°
−8
−4
−2
−8
−12
C
LOW
−20
−6
−16
−12
−8
−4
0
WARM
+2
+4
WARM
+2
0
+4
+8
+12
Limit of all
known bergs
31/1/83
HIGH
Mean surface-pressure anomaly (mb) January 1983
Mean air-temperature anomaly (°C) January 1983


120°
90°
0°
30°
60°
60°
0°
30°
60°
COLD
−1
0
+1
WARM
Actual edge of open pack-ice at end of February 1983
Normal edge of open pack-ice at end of February
Mean sea-surface temperature anomaly (°C) February 1983


120°
90°
0°
30°
60°
60°
0°
30°
60°
0
0
−2
−4
−6
COLD
COLD
−4
−2
+4
0
0
+4
LOW
−8
+2
1
HIGH
+12
+8
Limit of all known bergs 28/2/83
Mean surface-pressure anomaly (mb) February 1983
Mean air-temperature anomaly (°C) February 1983

APPOINTMENT OF THE NEW MARINE SUPERINTENDENT, METEOROLOGICAL OFFICE

Captain G. V. Mackie, M.N.I., has been appointed as the new Marine Superintendent of the Meteorological Office in succession to Captain G. A. White, who retired last December.

Gordon Vincent Mackie commenced his sea-going career as an Apprentice with the Lyle Shipping Company of Glasgow. He remained with that Company until after obtaining his 2nd Mate's Certificate but later transferred to Elder and Fyffes where, after obtaining his Mate's Certificate, he rose to become Chief Officer. He then transferred to the Canadian Pacific Steamship Company and served in their passenger ships on the North Atlantic. For a short period he was a cargo surveyor in the Clyde area before joining the Ocean Weather Service of the Meteorological Office in 1963. In March 1968, after having been in command of the *Weather Surveyor,* he was brought ashore to establish the Ship Routeing Service of the Meteorological Office. He was appointed Deputy Marine Superintendent of the Meteorological Office in 1973.

Photographs of Captain G. A. White and Captain G. V. Mackie appear opposite page 149.

Personalities

RETIREMENT—Captain F. S. Angus, R.D.,* R.N.R., retired in June 1982 after serving nearly 41 years at sea.

Frederick Simon Angus was born in Inverness in 1924 and was educated at the Dumfries Academy. In October 1941 he joined Ellerman Lines as a Cadet and was appointed to the *City of Christiania.* He remained with Ellerman Lines until 1949 and then transferred to the New Zealand Shipping Company which was later absorbed into the P. & O. group. Captain Angus obtained his Master's Certificate in December 1951. He was promoted to Master in October 1959 and appointed to command of the *Pipiriki.* Thereafter he commanded many New Zealand Shipping Company and P. & O. Deep Sea Cargo Division vessels including the cadet training ships *Rakaia* and *Otaio.*

He saw war service in Singapore and Burma, the North Atlantic, and the North African, Mediterranean and Pacific areas. He was commissioned into the Royal Naval Reserve in 1951 and served in all ranks to Captain in 1970. He was appointed Naval A.D.C. to H.M. the Queen in 1977 and retired from the R.N.R. in 1979.

Captain Angus is a member of the Chartered Institute of Transport, the Royal Institute of Navigation, the Honourable Company of Master Mariners and a Younger Brother of Trinity House.

On his retirement he settled in Pakuranga near Auckland in New Zealand where—as he puts it—'with my wife Ruth we can pursue our yachting interests and enjoy our retirement and grandchildren'.

We received the first meteorological logbook bearing Captain Angus's name from the *City of Khartoum* in 1947. Since then he has sent us a further 49 logbooks of which 28 were classed as Excellent. He received Excellent Awards in 1961, 1965, 1966, 1970, 1972, 1975 and 1978. He was recently selected for a long-service award in the form of a barograph to be presented to him by the New Zealand Meteorological Service on behalf of the Director-General of this Office.

We wish him a long, happy and healthy retirement.

Fleet Lists

GREAT BRITAIN (Information dated 17.3.83)

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	24.8.82	R. B. Leach	R. J. Ellis, A. F. Wood	D. Hutchinson	Furness Withy (Shipping) Ltd
Acavus	16.2.83	J. L. Taylor	A. M. Davies, L. Rigby, A. S. Burgess	G. G. Graham	Shell Tankers (U.K.) Ltd
Act 1	3.3.83	J. M. Harneis	P. Dawson	F. Huggett	Blue Star Line Ltd
Act 2	22.2.83	L. J. Brown	M. W. Medland, A. L. LeGoubin	P. Lavery	Cunard S.S. Co. Ltd
Act 6	11.3.83	M. H. C. Twomey	K. M. Phillips, M. C. Julier, M. A. Clark	S. Cockburn	Cunard S.S. Co. Ltd
Act 7	11.3.83	F. P. McGuckin	P. E. Hughes, H. A. Roberts, S. J. Davies	N. T. Palmer	Blue Star Line Ltd
Afric Star	17.3.83	G. D. Easton	A. Hillier, E. Lyon, R. D. Chivers, A. L. Hurrell	A. Steel	Blue Star Line Ltd
Ajax	15.12.82	J. B. Hughes	M. St. J. Finn, C. M. Thomas, A. P. Maclean	M. P. Atherton	Ocean Transport & Trading P.L.C.
Al Shamiah	23.10.78	T. Williams	P. Walley		United Arab Shipping Co. Ltd
Albright Explorer	6.12.82	M. Rossiter	R. Barnes, D. Maclean, J. Nixon	D. E. Brown	James Fisher & Sons Ltd
Albright Pioneer	5.1.83	P. E. Booker	J. C. Warmingham, N. J. B. Fisher, W. J. Hutchings	J. Thompson	James Fisher & Sons Ltd
Alert	18.10.82	A. Chalmers	S. I. Lewin, P. Mole, G. Weaver	J. Scott	British Telecom International
Almeda Star	15.2.83	A. J. Cheshire	F. K. Robertson, N. P. Colling, J. D. Pykett	R. B. Hall	Blue Star Line Ltd
Almeria Star	17.12.82	J. A. Gray	R. J. Shuttleworth, R. J. Tucker, A. L. Hurrell	B. Puzey	Blue Star Line Ltd
Amastra	25.2.83	R. Firth	M. M. MacDonald, C. J. Doe, P. A. Marshall	D. H. Parkes	Shell Tankers (U.K.) Ltd
Anchises	13.10.82	A. A. Railton	P. I. Anderson, J. P. H. Fisher, S. C. Westrip	P. Fitzsimons	Ocean Transport & Trading P.L.C.
Anco Challenger	23.7.82	A. F. Ainscough	J. K. Husain, A. P. Scott-Blore, S. W. Bowles	R. Humby	PAL Shipping Services Ltd
Anco Champion	5.10.82	K. Richmond	A. W. Simonds, R. C. Turrell, S. T. Johnson	B. W. Matten	PAL Shipping Services Ltd
Anco Charger	6.1.83	K. V. Lewis	A. G. Hebb, T. J. Sexton, N. A. P. Badger	R. P. Billett	PAL Shipping Services Ltd
Anco Chaser	3.3.83	J. P. Frewer	I. Wilkinson, C. Kristensen	N. A. Allison	PAL Shipping Services Ltd

Anco Endeavour	7.6.82	P. A. Messinger	M. J. Walker, K. R. Denney, F. H. Heath	M. S. L. Aldridge	PAL Shipping Services Ltd
Anco Enterprise	3.3.83	B. Hoare	D. W. Pritchard, R. J. Murray	D. Banks	PAL Shipping Services Ltd
Anco Sceptre	9.8.82	K. Richmond	M. W. Bridger, M. W. S. Royall, S. Johnson	M. J. Emery	PAL Shipping Services Ltd
Anco Stane	16.10.81	E. V. Kennard	T. W. Morgan, K. McKernan	T. P. Bunce	PAL Shipping Services Ltd
Anco Templar	3.11.82	D. G. Billing	A. G. Marits, A. Shale, C. Dixon, R. M. Gilmour	M. Cowie	PAL Shipping Services Ltd
Andalucia Star	20.12.82	I. C. Mackintosh	W. F. Todd, W. J. Barclay, C. J. Grayson	J. M. Shand	Blue Star Line Ltd
Apapa Palm	22.10.82	D. J. C. Brand	I. Hillier, J. C. Goble, C. G. Willis	W. T. Heaslip	Palm Line Ltd
Appleby	11.2.83	M. B. Bradley	N. D. Ferguson, C. R. Bamford, S. J. Honey	G. Shaw	Sir R. Ropner & Co. Ltd
Asia Winds	6.12.82	B. W. Jones	D. G. Jones, J. B. Gething	C. Brown	T. & J. Harrison Ltd
Astronomer	22.7.82	H. S. Bladon	A. Atkin, B. Jones, W. W. Gibson	M. J. Sheldon	T. & J. Harrison Ltd
Ataman	9.2.83	J. H. Watterson	P. M. N. Marsham, M. J. Harrison, M. E. Winter	C. W. Knibb	Transocean Maritime Agencies
Atlantic Fisher	21.9.82	H. Vane	I. F. Scarr, M. G. Wood, H. McWilliam	A. E. H. Jones	James Fisher & Sons Ltd
Aurora	29.10.82	W. E. N. Dwelly	S. James, C. J. Tilley, D. A. Dornom	R. Boyle	P. & O. S.N. Co.
Author	27.1.83	E. Maxwell	B. J. Walker, M. Farmer	C. R. Brown	T. & J. Harrison Ltd
Avelona Star	3.12.82	A. W. Kinghorn	S. A. Fawcett, C. E. Elms, C. J. Robilliard	P. A. Curtis	Blue Star Line Ltd
Avon Forest	10.1.83	A. L. Mitchell	P. Rouke, G. Szule, R. Lindsay, J. Dickinson	G. Auld	Harrisons (Clyde) Ltd
B.P. Harrier	20.10.82	D. Monro	S. Jesson	S. Jesson	B.P. Oil Ltd
Badagary Palm	27.7.82	E. Thomson	G. Morgan, A. J. Rowley	A. Webster	Palm Line Ltd
Balder London	19.1.83	K. J. Wallace	M. J. Browne, R. Hood, D. Sharp	J. Griffin	Ugland (U.K.) Ltd
Baltic Eagle	2.9.82	J. Rose	R. M. Raybould, P. Scott, M. Payne, D. C. Glass	D. I. Griffiths	United Baltic Corp. Ltd
Baltic Progress	26.1.83	P. Hyde	J. W. Carmichael, P. N. Kelly, R. H. Barker	D. I. Griffiths	United Baltic Corp. Ltd
Bamenda Palm	3.8.82	G. A. Holeyman	P. V. N. Perry, J. Fressanges, A. Peden	D. Simon	Palm Line Ltd
Baron Belhaven	16.3.83	F. M. Dalby	R. D. Gernon, G. Adams, M. Beeley	D. Poole	Scottish Ship Management Ltd
Baron Kinnaird	1.11.82	J. G. Jones	R. G. Wiggins, C. Jeffrey, A. Logan, I. Macleod	C. C. Houston	Scottish Ship Management Ltd
Baron Napier	8.10.82	K. Dootson	A. Weir, D. L. Coe, R. J. Sinclair	D. P. Roche	Scottish Ship Management Ltd
Bay Fisher	19.10.81	J. McCully	D. C. Reed, D. W. Little, F. P. Garbutt	M. J. Mitchell	James Fisher & Sons Ltd
Beacon Grange	7.1.83	S. Gibson	P. Marshall, P. Quayle, J. Monk	T. Phillips	Furness Withy (Shipping) Ltd
Ben Ocean Lancer	13.10.81	J. R. Milne	B. W. Wood, A. Glen, M. Wills, G. Day	S. Drinkwater	Ben Line Steamers Ltd
Benalbanach	3.2.83	J. S. Schofield	A. C. Bendelow, J. R. Doughty, D. A. Thow	W. J. M. Campbell	Ben Line Steamers Ltd
Benalder	7.1.83	A. McKenzie	J. H. Gibson, J. M. Groat	R. Milner	Ben Line Steamers Ltd
Benavon	17.3.83	W. D. Cowie	R. F. Sherwood, F. Anderson, L. D. Thomson	F. J. Curran	Ben Line Containers Ltd
Bendoran	•	P. J. Warren	R. Sharp, A. Kemp	M. Winter	Atlantic Drilling Co. Ltd
Benedict	24.8.82	J. C. Harris	P. J. Brown, A. J. Brown, P. C. Sarjeant	R. Speare	Blue Star Line Ltd
Benhope	21.12.81	R. E. Cowie	L. D. Thomson, C. J. A. Cladingbowl, J. I. Brown	F. J. Curran	Ben Line Steamers Ltd
Benledi	9.2.83	T. Fyfe	J. A. Inkster, T. J. F. Gallacher, G. Byers	P. S. G. Hannon	Ben Line Steamers Ltd
Benvorlich	17.11.82	W. C. Spencer	G. W. Blakey, G. Rutherford, I. F. Gibson	C. Dillon	Ben Line Steamers Ltd
Benvrackie	16.4.82	M. Green	C. Harris, J. Whittaker		Atlantic Drilling Co. Ltd
Berkshire	20.1.83	J. R. Woodfield	A. J. Malpass, D. C. Farquhar, D. C. Morgan	C. Wade	Bibby Line Ltd
Bolnes	•	A. Smart	C. V. Adams, D. Ayling, D. Clement	P. Dredge	Jebsens (U.K.) Ltd
Boniface	17.1.83	P. Hurlock	T. P. Gillespie, M. Moorhouse, T. P. Green	N. Maclean	Blue Star Line Ltd
Boston Sea Lance	4.8.82	D. T. Pingel	M. T. Phillips, I. H. Blyth		North British Shipping Ltd
Botany Bay	17.3.83	J. M. Brackenridge	M. J. Chapman, D. Tracey, A. J. Ball	D. A. Kelsall	Overseas Containers Ltd
Bransfield	20.5.82	S. J. Lawrence	A. M. T. Reading, R. C. Plumley, M. P. Stevens	H. M. O'Gorman	British Antarctic Survey
Bridgeman	24.11.82	R. D. Andrews	A. C. Jacobsen, P. A. Marris, E. M. Jenkins, M. Taylor	S. Moss	Rowbotham Tankships Ltd
British Avon	13.1.83	D. G. Roberts	J. Fidler, A. K. Cassels, J. C. Crooks, W. Young	M. Grant	B.P. Shipping Ltd
British Beech	28.2.83	R. Longhorn	A. Wallace	C. J. Ellery	B.P. Shipping Ltd
British Dart	20.12.82	J. A. M. Taylor	T. L. Cullen, A. M. Plows	A. Sadler	B.P. Shipping Ltd

Selected Ships (*contd*)

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
British Esk	18.2.83	J. Hobbs	A. P. Yates, G. Carr-Smith, M. Fisher	A. F. Holmes	B.P. Shipping Ltd
British Forth	16.3.83	M. D. Salmon	A. Haworth, S. Chadwick	P. Davies	B.P. Shipping Ltd
British Humber	10.5.82	R. G. McConnach	D. J. Taylor, G. McGill	P. Clemence	B.P. Shipping Ltd
British Kennet	24.12.82	D. G. Downie	J. H. Brechin, R. M. Halstead, J. P. Q. Waller	I. M. Jenson	B.P. Shipping Ltd
British Norness	21.2.83	D. E. Mitchell	A. S. Kenyon, O. Pointon	D. Pheasey	B.P. Shipping Ltd
British Ranger	20.12.82	R. Towell	H. Conlon, M. J. McGlone, G. Belson	P. F. Rogers	B.P. Shipping Ltd
British Reliance	11.3.83	J. Smith	R. McGuire	N. Stephens	B.P. Shipping Ltd
British Resolution	26.1.83	A. H. Skellern	C. Pettey, P. Walter	P. K. Kielthy	B.P. Shipping Ltd
British Resource	16.11.82	M. C. Stephenson	P. F. Armitage, M. Birchall, J. A. Hofton	P. J. Hall	B.P. Shipping Ltd
British Respect	1.2.83	J. B. Wharrie	R. D. Mead, N. J. Collins, D. J. Pengelly, E. C. Smith	L. A. Hatley	B.P. Shipping Ltd
British Security	13.12.82	H. J. Shields	R. Denyer, R. Standing, M. Berry	G. R. Wilson	B.P. Shipping Ltd
British Spey	3.2.83	R. Rickman	S. T. MacDonald, A. J. Torry	A. Redford	B.P. Shipping Ltd
British Spirit	•	L. A. Woodward			B.P. Shipping Ltd
British Tamar	30.7.82	D. O. W. Jones	J. M. White, J. A. Carrick, C. Mitchell	P. Davies	B.P. Shipping Ltd
British Tay	27.1.83	P. T. Morris	G. R. Proud, S. P. Weston, J. G. Holland	N. Richardson	B.P. Shipping Ltd
British Tenacity	21.12.82	D. Faulkner	C. S. Adams, I. G. Chadwick, S. W. Burton	N. M. Collins	B.P. Shipping Ltd
British Test	18.11.82	D. Allan	P. V. Goddard, S. Bryant, W. A. J. Cameron	T. Holter	B. P. Shipping Ltd
British Trent	25.2.83	L. McGeoch	M. K. Gregg, M. J. Lindsley		B.P. Shipping Ltd
British Trident	22.9.82	H. Phillips	C. R. Shoolbraid, P. J. Holcroft, V. Radley	P. Clemence	B.P. Shipping Ltd
British Voyager	1.12.80	I. Johnston	P. W. Barber, H. Watson, F. Tait	R. I'Anson	Star Offshore Services Ltd
British Wye	7.2.83	R. G. Holmes	I. D. Williams, J. R. Gipson	D. Cooper	B.P. Shipping Ltd
Broompark	13.12.82	H. W. McDonald	S. Thompson, R. Stewart, P. Kilvington, C. Wilson	P. Johnson	J. & J. Denholm Ltd
Browning	20.1.83	W. Sparks	A. H. Morbey, P. Readman, P. Duggie	R. F. Collins	Blue Star Line Ltd
C. P. Ambassador	16.9.82	T. L. Simpson	P. Crowe, R. I. Shepherd	D. J. Dean	Canadian Pacific Steamships Ltd
C. P. Discoverer	28.4.82	J. Wyllie	B. Nicholls, A. B. W. Rugg, P. M. Bell	T. O'Connell	Canadian Pacific Steamships Ltd
C. P. Trader	26.5.81	J. Waling	B. G. Alexander, P. Bland, N. C. W. Barham	S. A. Richards	Canadian Pacific Steamships Ltd
C. P. Voyageur	24.1.83	G. N. Gaunt	D. J. Faulkner, G. P. Ansell, J. Dickie	G. Monkman	Canadian Pacific Steamships Ltd
Cable Venture	14.9.82	D. E. Rickards	P. R. Woodward, P. S. D. Worrall		Cable & Wireless Ltd
Cableman	22.12.82	M. P. O'Brien	D. W. Rice, E. M. Jenkins, C. Pearce	R. A. Kirk	Rowbotham Tankships Ltd
Cairnsmore	•	M. Bishop	I. Bell, T. Grace, M. Fisher	Cheung Kwong-Wing	Matheson Ship Management Ltd
California Star	23.2.83	J. R. Howorth	R. Betts, A. Milligan, P. Lewis	S. Ringer	Blue Star Line Ltd
Canadian Explorer	11.3.83	E. Buckle	C. D. Eke, R. W. Mitchell, K. I. Jones	I. Conn	Furness Withy (Shipping) Ltd
Canberra	10.9.82	D. J. Scott-Masson	I. Hayward, M. Glendhill, P. Braid	J. H. Morrison	P. & O. S.N. Co.
Cape Arnhem	21.9.82	S. W. Wright	R. C. Johnson, D. C. C. Bryce, A. C. Henderson	C. Ritchie	Scottish Ship Management Ltd
Cape Finisterre	15.2.83	C. Maclean	M. R. Barker, D. Haughey, R. C. Bucknall	I. MacDonald	Scottish Ship Management Ltd
Cape Rodney	7.2.83	I. Tyrrell	I. W. Warner, R. C. Johnston	R. A. S. MacMeikan	Scottish Ship Management Ltd
Cape Trafalgar	14.3.83	D. White	R. A. Warner, I. Wemyss, R. Lauder, A. F. Hamilton	A. Mackinnon	Scottish Ship Management Ltd
Cardigan Bay	28.2.83	R. J. Bland	R. D. Anderson, L. Nelson, D. Roberton	B. A. Mullan	Overseas Containers Ltd

Carinthia	7.1.83	C. P. Margeson	J. J. Dibben, M. S. Hughes, P. Burgess	R. F. Davies	Cunard S.S. Co. Ltd
Carmania	18.1.83	C. Burtinshaw	P. R. Lawrence, D. W. Unsworth, W. Headon	T. R. Pardoe	Cunard S.S. Co. Ltd
Cast Caribou	*	R. Cotter	R. Millar, R. Collet, W. Wood	D. Busveids	J. & J. Denholm Ltd
Cast Fulmar	2.9.82	T. F. Morgan	K. Hunter, M. A. W. Brown	G. Smith	J. & J. Denholm Ltd
Cast Husky	*	M. Thompson	S. Dunnet, C. J. Miller	F. McKinley	J. & J. Denholm Ltd
Cast Kittiwake	20.1.83	L. R. Bell	D. M. Russell, J. Vincent, A. C. Dunnings	J. D. Walsh	J. & J. Denholm Ltd
Cast Petrel	8.10.82	D. W. Miller	C. C. Rowdon, A. Chestnut, B. Speirs	F. McQuillan	J. & J. Denholm Ltd
Cast Polarbear	*	E. Williams	–. Craig, S. Bracewell, R. Spence	P. Laycock	J. & J. Denholm Ltd
Cedarbank	27.9.82	R. F. Whitehead	P. A. Lanaghan, N. W. Hunt, E. F. S. Harrison	S. Price	Bank Line Ltd
Celtic Crusader	28.2.83	D. Sully	R. A. Walters, S. P. Johnson		F. T. Everard & Sons Ltd
Celtic Endeavour	7.2.82	F. Mottram	R. A. Walters, S. P. Johnson		Willie & Co. (Shipowners) Ltd
Celtic Link	18.2.82	H. Gray	H. W. Stewart, S. Duncan	D. N. Barlow	Ben Line Steamers Ltd
Centaur	7.2.83	G. Coupar	K. Gopala, R. Arsiwala, S. Bhatia	S. R. Bharucha	Curnow Shipping Ltd
Challenger	14.9.82	P. J. MacDermott	A. R. Louch, K. O. Avery, B. Richardson		Natural Environment Research Council
Charon	6.1.83	J. O. Jones	W. Kirrane, M. Grant	J. Carr	Ocean Transport & Trading P.L.C.
Cheshire	17.12.82	J. R. Taylor	S. Harvey, J. J. Grace, S. W. Harris	P. E. Thomas	Bibby Line Ltd
Cirolana	2.11.82	M. J. Willcock	E. W. Pearson, E. T. Hall, B. D. Stokes	R. Baty	Ministry of Agriculture, Fisheries & Food
City of Edinburgh	9.2.83	J. E. Pritchard	I. F. Gibson, A. Airey, S. Fish	H. Brookfield	Ben Line Containers Ltd
City of Plymouth	1.3.83	E. G. George			Ellerman Lines Ltd
City of York	24.1.83	D. D. Jamieson	S. J. Windle, R. Nightingale, S. Martin, B. Morris	J. Ramsay	Ellerman Lines Ltd
Clerk Maxwell	*	M. J. Dale	P. Burrows, M. Greene, H. Bowden	J. Williams	Furness Withy (Shipping) Ltd
Clione	8.3.83	J. R. French	G. F. Lee, R. J. Hunt, B. A. Chapman		Ministry of Agriculture, Fisheries & Food
Clydebank	9.3.83	H. Barber	A. D. Watson, B. F. Dewhurst, P. B. Moulds	R. C. Elkins	Bank Line Ltd
Clytoneus	7.1.83	J. K. Winn	M. R. Davies, R. A. C. Smelt	L. M Sells	Ocean Transport & Trading P.L.C.
Coltair	11.2.83	G. Coulson	M. J. Aldred, D. J. Taylor, R. N. A. Lees	T. Strickland	B.P. Shipping Ltd
Columbia Star	18.1.83	A. J. Chivers	A. Tibbott, D. G. Robbie, J. D. Gregory	R. Knott	Blue Star Line Ltd
Contender Bezant	2.3.83	Q. J. Murphy	A. C. Humphreys, J. A. Baker	L. Lobo	Sea Containers (Chartering) Ltd
Corabank	15.11.82	A. McGregor	S. T. Curtis, R. C. Allen, M. Cawson	R. C. Taverner	Bank Line Ltd
Crest Hill	23.2.83	H. D. Windle	R. G. Harris, J. Hunter, N. A. Ianson, B. P. Stockdale	T. Gilmour	Blue Star Line Ltd
Crestbank	19.7.82	T. D. Scott	A. Stangroom, G. G. Mattson, G. A. Foster	R. G. Schaefer	Bank Line Ltd
Crown Prince	14.2.82	H. Nixon	R. N. Palmer, T. W. Mitchell, C. R. Darnley		Furness Withy (Shipping) Ltd
D. C. Coleman	12.1.83	R. P. Stanage	P. A. Chalmers, R. G. Wall, C. Burtenshaw	T. P. O'Connell	Canadian Pacific Steamships Ltd
Dacebank	8.3.83	B. J. Peterson	J. Davies, G. G. Mattson, V. L. Mitchell	M. Hanraads	Bank Line Ltd
Darina	6.1.83	B. Pearson	J. Cripps, G. J. Barber	J. Thompson	Shell Tankers (U.K.) Ltd
Dart Americana	7.3.83	P. Roberts	N. Hibberd, A. Williams, J. C. Leach	G. Burras	Canadian Pacific Steamships Ltd
Dart Atlantica	25.1.83	P. Denham	I. A. Smith, B. Alexander, C. Harding	W. W. Bonner	Canadian Pacific Steamships Ltd
Dart Britain	27.9.82	M. J. Winter	A. C. A. Butcher, M. R. Eden Smith, P. Springett	I. Conn	Furness Withy (Shipping) Ltd
Devonshire	*	N. H. Malpass	P. Kelly	P. R. Breivik	Bibby Line Ltd
Discovery	1.2.83	S. D. Mayl	P. Pepler, S. Jackson, E. M. Bowden	C. Currie	Natural Environment Research Council
Discovery Bay	7.3.83	J. H. Hutson	C. J. Petty, P. D. Davies, K. Worthington, P. M. Fox	W. B. Macintosh	Overseas Containers Ltd
Drupa	20.1.83	B. Bowtell	C. McKay, M. Ellard	M. G. Ridgehalgh	Shell Tankers (U.K.) Ltd
Dryso	15.11.82	K. Birkeland	H. Aashildrod, T. Rapp, C. Arbstedt	R. Schmidt	Van Ommeren (U.K.) Ltd

Selected Ships (*contd*)

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Durrington	•	A. M. Arkly	P. Robson, D. Stephenson	M. Williams	Stephenson Clarke Shipping Ltd
E. W. Beatty	29.3.82	A. G. Moat	M. H. Kneen, J. R. Onslow, M. R. Baggaley	D. Dean	Canadian Pacific Steamships Ltd
Eburna	•	A. B. Pereir			Shell Tankers (U.K.) Ltd
Echoman	•	F. Craske	C. Gregory, I. Plummer, A. Gibbons	C. Williams	Rowbotham Tankships Ltd
Edinburgh Universal	23.12.82	G. B. Charleson	D. C. Williams, I. Cuthbertson, P. M. Simpson	W. Latus	Cayzer Irvine Shipping Co. Ltd
Elk	19.1.83	B. Luke	R. Madden, E. Thwaites, P. Brookes	R. Stewart	P. & O. S.N. Co.
Encounter Bay	14.1.83	W. C. Carruthers	J. M. Torkington, C. J. A. Hughes, R. D. Dally	D. K. Alcock	Overseas Containers Ltd
Esso Aberdeen	5.1.83	J. P. W. Way	D. R. A. Diggory, M. McCabe	R. Ballaam	Esso Petroleum Co. Ltd
Esso Dalriada	14.3.83	W. Boler	P. Beevers, D. J. Fox	L. W. Weeks	Esso Petroleum Co. Ltd
Esso Demetia	17.3.83	A. J. Washbourne	R. Law, C. G. Starr, H. W. Webb	R. S. Duff	Esso Petroleum Co. Ltd
Esso Hibernia	10.5.82	K. Hebdon	T. Potts, M. Wise	R. D. Campbell	Esso Petroleum Co. Ltd
Esso Humber	•	R. B. Walker	E. Calder, J. Weeden, W. Hardy	G. Kelly	Esso Petroleum Co. Ltd
Esso Tyne	•	H. M. McQuaid	P. Rees, D. Slade, J. Donaldson	D. Leeson	Esso Petroleum Co. Ltd
Esso Ulidia	4.3.83	I. Grigor	R. C. Moss, P. Grounds	J. McDonnell	Esso Petroleum Co. Ltd
Esso Warwickshire	7.2.83	C. C. Jorgensen	T. Potts, A. Meeds, C. D. Clark	C. G. Nolan	Esso Petroleum Co. Ltd
Ethel Everard	2.2.83	G. R. Hare	P. J. E. Bird, R. C. Ross, C. S. Hiltunen		F. T. Everard & Sons Ltd
Etrima	•	J. Rafferty	W. Parker, C. Upton, M. Nicholson, J. Sharp	M. Collingwood	Shell Tankers (U.K.) Ltd
Explorer	19.8.77	J. Gillon	A. Murray, W. Ferguson	J. A. Main	Department of Agriculture & Fisheries for Scotland
Eye of the Wind	12.1.83	R. S. Grond			
Falmouth Bay	6.12.82	J. K. Blackburn	M. Copeman, J. N. Keileher, J. C. Hoy	A. D. Hutchinson	Overseas Containers Ltd
Farnes	2.2.83	J. Isbester	C. W. Milne, S. Heggie, R. Baker	M. Arscott	Jebsens (U.K.) Ltd
Fenbank	21.2.83	G. D. Scott	J. Peggs, A. M. Weale, R. L. McEwan	B. P. Clarke	Bank Line Ltd
Fengtien	26.10.82	J. Aldiss	W. M. Laverick, J. Bird, I. A. James	J. A. Phipps	J. Swire & Sons Ltd
Firbank	22.11.82	P. J. Elder	M. A. Ranson, A. G. Stevenson, R. Armson	E. Barnes	Bank Line Ltd
Flinders Bay	22.11.82	R. Brinkworth	M. J. Trafford, M. Watts, D. L. Haynes	D. Fraser	Overseas Containers Ltd
Fort Assiniboine	7.12.82	A. Myles	P. R. Kirkman, L. N. Paul, P. Townsend	R. J. Higgs	Canadian Pacific Steamships Ltd
Fort Garry	•	T. Hill	J. Brothers, J. Lock, C. Harris	T. Graves	Canadian Pacific Steamships Ltd
Fort Hamilton	15.12.82	J. R. Brooks	W. R. Smith, G. Mills, R. M. Ellismoor	D. R. Jelley	Canadian Pacific Steamships Ltd
Fort Norman	20.10.82	B. Sanderson	N. J. Dance, B. G. Hardy, W. Fleming	A. C. Bell	Canadian Pacific Steamships Ltd
Fort Providence	•	W. A. McCall	M. Weir, C. Riches, P. Jolley	M. Cook	Canadian Pacific Steamships Ltd
Fort Rouge	1.2.83	R. Smith	M. A. Jones, M. P. Oswin, G. P. Ansell, G. Chapman	T. Rogers	Canadian Pacific Steamships Ltd
Fort Toronto	16.4.82	R. Kinner	A. H. Williams, D. Carlisle, J. P. H. Simcox	S. L. Hallam	Canadian Pacific Steamships Ltd
Fort Victoria	30.7.82	G. Gamblin	S. Dancer, S. A. Syed, J. R. Gray	C. A. Hall	Canadian Pacific Steamships Ltd
Forthbank	25.2.83	B. F. C. Bennett	A. N. Kantaris, N. Long, R. Morton	D. Kelly	Bank Line Ltd
Fred Everard	•	W. Sheriff	M. R. Irwin, P. Miller		F. T. Everard & Sons Ltd
Frederick Russell	13.10.82	P. H. Warne	M. S. Putman, P. T. Oldfield, E. Dowell	A. J. Brigden	Natural Environment Research Council

G. A. Walker	•	J. B. Jones	J. Evans, R. Williams, R. Barber	P. Howard	Canadian Pacific Steamships Ltd
G. A. Chau	21.2.83	F. Keddie	M. A. Burford, C. J. Noonan, J. Hanney	P. Dewes	J. & J. Denholm Ltd
Galconda	17.12.82	D. A. Lambell	P. J. Jenner, C. G. Trappe, S. D. Bradley	J. A. Carroll	P. & O. S.N. Co.
Galpara	•	S. Harwood	M. Searle, I. Bruce, J. N. Balkwill	A. Watt	P. & O. S,N. Co.
Gambada	28.1.83	R. T. Turney	G. J. Crosby, H. A. Smith	M. D. Bull	P. & O. S.N. Co.
Gandara	7.2.83	G. Hepple	A. G. Counsell, D. P. Morton, T. H. Goldsmith	D. Rice	P. & O. S.N. Co.
Garala	7.1.83	R. Reid	S. W. C. Hyde, G. D. Owen	G. Basnett	P. & O. S.N. Co.
Garbeta	26.11.82	C. Hunt	M. G. Charnley, D. J. Tomkiss, D. M. Springett	D. Williams	P. & O. S.N. Co.
Gardline Locater	7.2.83	H. Morrell	R. S. James		Gardline Shipping Ltd
Gardline Tracker	7.3.83	A. J. D. Coxon	D. Bailey		Gardline Shipping Ltd
Garinda	18.2.83	J. O. Spence	G. Phillips, N. Fuller, N. Vause	A. Watson	P. & O. S.N. Co.
Gas Enterprise	26.1.83	R. J. Higgins	C. R. Shoolbraid, J. N. Greeson	P. F. Davies	B.P. Tanker Ltd
Gazana	26.1.83	C. A. Hatcher	S. P. Scott, A. C. Wilson	M. G. Welsh	P. & O. S.N. Co.
Geestbay	21.2.83	O. Springett	I. Luff, T. Evans, A. J. Gladman	M. Toogood	Geest Line Ltd
Geestland	15.12.82	M. Wilks	G. M. Coles, H. C. MacKenzie, W. A. Boddington	M. I. McGregor	Geest Line Ltd
Geestport	24.8.82	G. de Ferry Foster	C. M. Morgan, M. Davies, T. Evans	R. Byng	Geest Line Ltd
Geest Star	4.1.83	K. M. R. Skinner	K. P. Breedon, J. H. Worwood, G. M. Coles, W. A. Boddington	D. A. Ward	Geest Line Ltd
Gold Varda	17.10.78	M. J. Wharf	D. J. Smith, G. C. Rautraya, J. J. Neill	G. W. Cunnane	Haverton Shipping Ltd
Goth	17.11.82	F. Myers	R. Spall		British United Trawlers Ltd
Grey Hunter	21.8.81	T. Fyfe	J. M. Smith, J. D. Simpson, F. J. Rossiter	P. A. Barratt	Ben Line Steamers Ltd
Gulf Hawk	16.2.83	S. K. Bishnoi	A. R. Mukadam, T. P. Chugtai	B. S. Hedge	Gulf (Shipowners) Ltd
Halifax Star	1.11.82	D. Newlin	I. M. Dawson, N. B. Meek, L. M. Colam	A. R. Theophilus	Blue Star Line Ltd
Hampshire	3.12.82	D. J. Creamer	S. J. Kembery, G. N. Penry, B. Holcombe	B. J. Foley	Bibby Line Ltd
Helenus	19.1.83	E. Woosey	C. M. Leather, M. Brown, J. Braddock	K. R. Overson	Ocean Transport & Trading P.L.C.
Hornchurch	•	C. G. Summerfield	M. Shelverton, Tang Chiu Hung, J. Kelly	Pun Kwok Yu	Taiship Co. Ltd
I. D. Sinclair	9.3.83	F. K. Gordon	G. A. Thomas, P. K. Dobson, A. W. Pratt	D. Lever	Canadian Pacific Steamships Ltd
Ibn Abdoun	31.1.83	R. F. Wilkinson	S. Rogers, B. J. Kidwill, J. Woolley	J. G. McCahey	United Arab Shipping Co. Ltd
Ibn Majid	22.12.82	P. D. Cullen	A. M. Lee, R. A. Brown, A. W. Jones	T. A. Stalker	Furness Withy (Shipping) Ltd
Ibn Rushd	9.9.82	R. I. Philip	A. E. Towlan, I. D. Hebborn, M. I. Noureddin	S. Yim	United Arab Shipping Co. Ltd
Iolair	5.1.83	T. Nixon	M. Tomkins, B. Millar, K. E. Peacock, P. D. Dalby	B. Cameron	B.P. Shipping Ltd
Isocardia	•	–. Wilkie	–. Southworth		Shell Tankers (U.K.) Ltd
Isomeria	•	D. Nicol	–. Scott, –. McKay, J. Grisdale		Shell Tankers (U.K.) Ltd
Ivybank	5.1.83	J. Steel	A. H. Pronk, E. R. Mainland	A. J. Lafond	Bank Line Ltd
Jack Wharton	8.3.83	M. A. Chapple	R. H. Middleton		F. T. Everard & Sons Ltd
Jedforest	28.1.83	J. M. Huke	A. C. Peace, N. E. Hartley, T. Collins	P. W. Ferguson	P. & O. S.N. Co.
Jervis Bay	7.2.83	C. J. C. Johnston	L. A. Turner, C. C. Young, M. J. Power	C. Thornalley	Overseas Containers Ltd
John Biscoe	15.3.83	C. R. E. Elliott	R. Wade, R. C. Plumley	R. Wade	British Antarctic Survey
Jura	29.10.82	A. Hunt	P. A. Ellis, D. W. Temple		Department of Agriculture & Fisheries for Scotland
Kilmun	16.11.82	S. J. Readman	C. Jeffrey, I. J. Waters	D. W. Humble	Scottish Ship Management Ltd
Kindrence	•	J. A. Stapleford	G. Watkins, P. Derham, R. Brummett		Crescent Shipping Co. Ltd
King Alfred	8.9.82	R. M. Bessant	H. Edwards, C. Neave, N. Saunders	J. Walker	Cayzer Irvine Shipping Co. Ltd
King Charles	20.7.82	R. E. Todd	A. Dawson, A. Flenley, D. Rae	J. Blackwell	Cayzer Irvine Shipping Co. Ltd
Kingsnorth Fisher	2.7.82	J. J. Smith	H. McWilliam	D. R. Woods	James Fisher & Sons Ltd
Kowloon Bay	7.3.83	D. G. Brown	D. J. Baily, A. E. Spencer	M. Brown	Overseas Containers Ltd
Kubbar	14.3.83	J. K. Leverton	N. L. Davis, N. Blacker, A. R. Lindsay	C. Brooks	P. & O. S.N. Co.
La Chacra	•	J. R. Pinteau	B. K. Beisly, A. Adamson, A. Scarrat	M. J. Tindall	Buries Markes Ltd

Selected Ships (*contd*)

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
La Costa	4.6.82	P. D. Hull	P. A. Yates, P. J. Weston, D. Harris	N. Cawthorne	Buries Markes Ltd
La Pampa	31.8.82	M. J. Brennan	S. R. Butler, J. W. Gurton	B. Riley	Buries Markes Ltd
Lackenby	3.9.82	J. E. Jennings	P. Bates, B. Middleton, D. Lewington	A. R. Male	Sir R. Ropner & Co. Ltd
Lagos Palm	•	R. Vinton	A. Peden, I. Haffenden, R. Ellesmoor	L. Holt	Palm Line Ltd
Lantau Trader	22.9.82	S. Marlowe	R. K. Dutta, P. Chan Ping Hung, K. A. Appiah	A. P. Pinto	Denholm Ship Management (Overseas) Ltd
Lima	•	B. Wilkinson	A. D. Lowery, D. R. Wood, G. Cable	A. B. Stewart	Shell Tankers (U.K.) Ltd
Lincolnbrook	15.11.82	R. G. Davis	E. J. R. Williams, J. K. Gray		F. T. Everard & Sons Ltd
Lincolnshire	16.12.82	K. Allison	I. D. Gordon, R. Hodgson, S. J. Kitchen	C. L. Bolton-Heaton	Bibby Line Ltd
Liverpool Bay	25.1.83	W. A. Fitzgerald	P. V. Moore, R. J. Edmonds, R. Moxon	E. B. Stephenson	Overseas Containers Ltd
London Enterprise	22.2.83	A. D. Gillie	P. N. Thompson, K. T. Cederholm, G. Skinner	C. Stuart	London & Overseas Freighters P.L.C.
London Glory	20.1.83	P. J. Wright	D. W. Lloyd, K. J. McClymont	K. J. Steel	London & Overseas Freighters P.L.C.
London Pride	13.3.81	E. G. Kemp	A. R. Follett, I. Roberts	R. F. Smith	London & Overseas Freighters P.L.C.
London Spirit	14.3.83	J. A. Attwater	R. Fullagar, M. C. Blake, W. Howarth, P. Hobbs	D. Lawrence	London & Overseas Freighters P.L.C.
London Victory	2.3.83	E. G. Humby	C. A. Cornish, P. N. W. Smith	D. Jakobaufderstroht	London & Overseas Freighters P.L.C.
Lord Mount Stephen	2.3.83	J. Wyllie	J. A. Turner, H. Mansell, P. Fitzgerald, A. C. Day	T. A. Verling	Canadian Pacific Steamships Ltd
Lord Strathcona	1.2.83	B. P. Philip	P. R. Robinson, M. Scanlon	D. Atkinson	Canadian Pacific Steamships Ltd
Lucerna	22.10.82	W. J. S. Flett	N. Fillingham, J. Holloway, H. R. Shuttleworth	M. J. Shearer	Cunard S.S. Co. Ltd
Luminence	•	B. Fern	P. McAliden, K. Logan		Crescent Shipping Co. Ltd
Maersk Cadet	24.2.83	J. L. Frain	J. A. Norman, N. C. L. Alcazar, J. S. Anderson	O. Grimsdall	Maersk (U.K.) Co. Ltd
Magdalena	6.9.82	P. G. Pinkerton	M. Boylin, S. J. Colclough, C. Bunt	J. Kelly	Fyffes Group Ltd
Mahsuri	1.3.83	R. G. Murch	G. Varghese, J. D. Willis-Richards, P. J. Muras	A. Mascarenhas	Blue Star Line Ltd
Mairangi Bay	15.2.83	C. R. Short	S. C. Lugg, D. K. MacCorquodale, D. R. Peel	P. A. Mathews	Overseas Containers Ltd
Makkah	21.6.82	G. H. Smith	D. S. Sadler, P. C. Morrison, M. T. Hutton	C. Nolan	Texaco Overseas Tankships (U.K.) Ltd
Manaar	6.5.82	M. Coombs	D. R. Moody, D. W. Lax, S. J. Daniel	N. Matthews	Cunard S.S.Co. Ltd
Manchester Challenge	26.1.83	N. Pryke	C. M. Billington, D. Kennedy, R. J. Owen	P. G. Corkin	Furness Withy (Shipping) Ltd
Mandama	9.11.82	W. A. Wilson	D. P. Fotheringham, A. J. Delaney, G. J. Rawding, P. J. Carroll	J. V. Darooji	Blue Star Line Ltd
Marilock	•	J. H. Wehner	R. Lingard, N. White, M. Rawson	A. Cheshire	Turnbull Scott Management Ltd
Maron	7.2.83	R. M. Simpson	L. M. Ramsay, G. Griffiths, D. J. H. Custance	C. D. Dews	Ocean Transport & Trading P.L.C.
Matco Avon	28.1.83	K. J. Beverley	D. J. Brock	G. McDanielson	Mobil Shipping Co. Ltd
Matco Clyde	20.10.82	P. Callaghan	N. J. Cooke, N. A. Abbott, J. Ramage	M. R. W. Sheehy	Mobil Shipping Co. Ltd

Matco Thames	10.3.83	B. D. Jones	B. Douglas, R. A. Strutt, D. J. O'Keefe	E. Harle	Mobil Shipping Co. Ltd
Meadowbank	9.3.83	E. T. Rees	A. Halsall, B. Bennett, D. E. Ginder	P. C. Shanahan	Bank Line Ltd
Mediterranean Shearwater	6.1.83	T. Langstaff	M. H. Morris, M. T. Hardy, A. G. Lacey	E. L. Derbyshire	James Fisher & Sons Ltd
Melampus	31.8.82	D. Howe	U. J. Todd, A. G. French, R. J. Pike	P. M. Dolphin	Ocean Transport & Trading P.L.C.
Menton	8.10.82	R. M. Simpson	S. Thomson, S. Edge, I. A. Pakula	C. D. Dews	Ocean Transport & Trading P.L.C.
Merzario Grecia	2.3.83	J. E. Boswell	D. Barclay, R. J. Hibling, M. Scollay	R. J. Clayton	Denholm Maclay Co. Ltd
Merzario Hispania	25.2.81	J. B. Clemenson	G. Miller, T. Turvey, J. Rogers	S. Myland	Denholm Maclay Co. Ltd
Meynell	7.2.83	T. E. Kelso	E. O. Morris, D. Warren, W. Harwood	D. Dalton	P. & O. S.N. Co.
Montarik	•	W. F. Jeffrey			Acomarit U.K. Ltd
Moraybank	25.1.83	M. Thompson	K. M. Taylor, M. A. MacKenzie, A. Beattie	A. Camp	Bank Line Ltd
Moreton Bay	4.3.83	J. W. Welch	S. Barraclough, R. J. McLarty, A. C. W. Lipscombe	M. P. Atherton	Overseas Containers Ltd
Myrmidon	16.3.83	H. McCole	B. Reilly, J. Fielden, J. Roemmele	R. Stevens	Ocean Transport & Trading P.L.C.
Naticina	17.3.83	I. R. Farnell	J. D. Cranston, E. A. Walsh	M. E. Collins	Shell Tankers (U.K.) Ltd
New Westminster City	6.12.82	S. Pearsall	S. D. Bateman, R. W. Davies, B. R. Hopper	R. H. Smith	Sir Wm. Reardon Smith & Sons Ltd
Norbrit Faith	•	J. Gray	D. E. C. Stevenson, D. Wright		North British Shipping Ltd
Nordic Commander	2.4.82	S. H. Baker	R. M. Stoakes, S. Cairns, J. Morrison	D. Owens	J. & J. Denholm Ltd
Norman Lady	28.2.83	J. W. Murray	H. J. Norton, M. J. Pinks, J. D. Hogg	N. J. Cawthorne	Buries Markes Ltd
Norse Marshal	1.11.82	R. D. M. Watson	J. Coyle, R. Lindsay, J. Cripps	W. Donaldson	Harrisons (Clyde) Ltd
Northia	•	C. G. Scarf	M. J. Honey, M. J. H. Crorie, P. M. Hudson, L. J. Twynholm	G. K. Emmett	Shell Tankers (U.K.) Ltd
Nosira Lin	18.1.83	J. Parsloe	J. C. Theaker, C. Cook, E. Lyons	K. G. Watkinson	Bolton Maritime Management Ltd
Nosira Madeleine	•	J. D. Cooper	P. Bascombe, J. Mitchell, C. A. Sheffield	K. Brown	Bolton Maritime Management Ltd
Nosira Sharon	•	S. F. Williams	A. D. Dillon, B. Tucker, J. Miller	M. Jackson	Bolton Maritime Management Ltd
Opalia	15.12.82	D. G. Nicol	N. D. Megson	C. Duggan	Shell Tankers (U.K.) Ltd
Oropesa	2.7.82	E. H. Gregson	P. M. Smith, A. M. Roberts, P. J. Green	W. D. Mullan	Furness Withy (Shipping) Ltd
Oroya	15.2.83	E. H. Gregson	M. P. Brooks, I. Cull	W. D. Mullan	Furness Withy (Shipping) Ltd
Orwell Fisher	•	J. McCully	D. C. Reed, J. Sharples		James Fisher & Sons Ltd
Osaka Bay	4.3.83	A. A. Rundle	N. M. V. Salmon, A. J. Leslie, A. V. P. Williams	M. R. Palmer	Overseas Containers Ltd
Overseas Argonaut	17.3.83	T. C. Nurcombe	P. J. Wade, T. C. Swatton, J. R. Warton	F. R. Gerstner	London & Overseas Freighters P.L.C.
Pacific Challenge	3.3.83	D. W. Luff	I. Bowler, A. R. Pullan, I. R. Linke	P. Hodge	Furness Withy (Shipping) Ltd
Pacific Courage	5.1.83	J. J. Hurley	D. Boardman, P. Galea, R. M. Price	P. J. Dyer	Furness Withy (Shipping) Ltd
Pacific Crane	27.1.83	J. L. Lundberg	M. H. Morris, I. Thompson, P. A. Booker	W. D. Scott	James Fisher & Sons Ltd
Pacific Fisher	31.1.83	W. H. Eggert	K. M. MacDonald, D. Ilderton, A. Dumbell	C. S. Schrimshaw	James Fisher & Sons Ltd
Pacific Patriot	•	E. Gowland	R. Ellis, D. Spurrell, D. Olly	I. Weatherill	Furness Withy (Shipping) Ltd
Pacific Peace	6.1.83	E. W. Foxworthy	S. E. Smith, G. C. Leggett, D. G. Lyon	D. Wylam	Furness Withy (Shipping) Ltd
Pacific Prestige	17.3.83	P. Barry	P. Ashurst, S. J. Ivey, M. O'Dougherty	N. Clark	Furness Withy (Shipping) Ltd
Pacific Swan	29.9.82	P. G. Hobson	P. J. Savory, D. Marr, M. Grimshaw	N. Markwood	James Fisher & Sons Ltd
Pacific Teal	•	J. Cairns	J. Dumazel, R. Bourton, P. McParlans	M. Hoyes	James Fisher & Sons Ltd
Pholas	21.12.82	R. Baldwin	A. Appleby, A. F. Ure, N. Bevan	P. Mangleshot	Coe-Metcalf Shipping Ltd
Pikebank	17.3.83	T. D. Scott	G. J. Hoodless, R. Snape	R. E. Tucker	Bank Line Ltd
Pole Star	3.1.79	N. Morrison	W. Tullock, A. D. Welch		Northern Lighthouse Board
Pollenger	21.2.83	R. B. Reid	D. J. Thurston, A. S. Tennant	T. Searle	P. & O. S.N. Co.
Pomella	20.1.82	B. G. Calderwood	K. Watson, R. Whing, J. Redman	P. K. C. Spear	Shell Tankers (U.K.) Ltd
Port Alberni City	20.1.83	D. L. Bell	S. F. Broderick, D. P. Kirley, J. S. Murray	N. C. Sanders	Sir Wm. Reardon Smith & Sons Ltd

Selected Ships (*contd*)

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Port Hawkesbury	•	G. Wright	M. Heiffer, D. Westwatson, M. Kneen	H. McGrory	Canadian Pacific Steamships Ltd
Portland Bay	•				Overseas Containers Ltd
Providence Bay	•	M. Lees	M. Trafford, J. Dodworthy, D. L. Haynes	C. E. Hughes	Overseas Containers Ltd
Pulborough	9.2.82	R. S. Francis	A. Wormald, H. Gunton, N. B. Wilson	S. Whitehead	Stephensen Clarke Shipping Ltd
Qarouh	5.1.83	R. J. S. Pearce	G. P. Cowling, R. F. Harris	M. Padginton	P. & O. S.N. Co.
Queen Elizabeth 2	7.12.82	P. Jackson	C. Haughton, S. Trundle, J. Dunford	A. Holmes	Cunard S.S. Co. Ltd
Rangatira	•	P. Liddell	R. Paterson, R. Venables, P. Brown	A. Steel	Blue Star Line Ltd
Ravenscraig	21.9.82	C. B. Tingle	N. D. Ferguson, N. H. Cooper, A. Willing	J. J. Seymour	Sir R. Ropner & Co. Ltd
Remuera Bay	2.3.83	W. F. McCarthy	D. C. Slack, B. Graham, L. Johnson	W. Kay	Overseas Containers Ltd
Resolution	9.11.82	D. Howell	H. Ellis, J. W. Graham, F. Mack		Gardline Shipping Ltd
Resolution Bay	9.2.83	W. A. Murison	M. P. Willis, K. H. Davie, R. Walker	K. J. Gaughan	Overseas Containers Ltd
Retriever	9.5.79	J. H. Killick	P. S. D. Worrall, D. S. MacFarlane	D. Steel	Cable & Wireless Ltd
Ringnes	7.7.81	M. J. Meyer	R. Claridge, P. Skelton, D. W. Clements	A. Hodson	Jebsens (U.K.) Ltd
Roachbank	29.11.82	J. F. Beckett	J. C. Osman, P. H. Drinkwater, P. Maynard, A. Halsall	H. G. Moran	Bank Line Ltd
Rocknes	14.3.83	T. J. Lee	C. W. Milne, G. A. Boobyer, P. Skelton	P. Dredge	Jebsens (U.K.) Ltd
Rollnes	2.11.82	J. H. Apsey	R. Baker, S. Murray, I. C. Oke, S. Byczynski	W. Swann	Jebsens (U.K.) Ltd
Royal Prince	7.3.83	W. R. Stevens	M. Broadhead, I. Chadwick		Furness Withy (Shipping) Ltd
Rubens	7.3.83	G. Murray	D. J. Williamson, D. S. Hibberd, S. Cannon, E. Miles	D. MacRae	Bolton Maritime Management Ltd
Ruddbank	23.2.83	C. B. Davies	M. J. West, D. T. Wells, C. C. Baines	J. G. Hull	Bank Line Ltd
Sagacity	•	J. A. Chapman	C. Brown, R. Valente		F. T. Everard & Sons Ltd
St Edmund	8.9.82	M. Stockman	A. M. Moir, W. G. Stephen, L. O. Roskell	M. Powell	Sealink (U.K.) Ltd
St George	10.11.82	M. Morton	M. J. Collins, H. W. Ramsey, K. Leech	M. C. Powell	Sealink (U.K.) Ltd
St Helena	11.2.83	C. J. Hughes	C. Balls, W. F. Hughes, J. Smith	R. A. Wilson	Curnow Shipping Ltd
Samaria	4.1.83	J. R. Dit-Leschery	E. Gander, P. M. Robson, G. A. McPhee, C. Kingston	D. Kerslake	Cunard S.S. Co. Ltd
Sapele	15.11.82	A. J. Milmine	P. A. Cripps, J. M. MacKenzie, I. D. MacPherson	R. J. Ashworth	Ocean Transport & Trading P.L.C.
Sapphire Bounty	11.6.81	M. R. Rutter	U. P. Singh Baveja, R. A. P. Hunt, Yip Siu Keung	Chan Shu Hong	Sea Containers (Chartering) Ltd
Saxonia	2.11.82	A. P. Briggs	S. R. Dit-Leschery, C. I. Kitchen	S. Myland	Cunard S.S. Co. Ltd
Scotia	3.3.82	G. M. Coull	J. E. Bannister, W. H. Laws, D. Dixon	J. Steven	Department of Agriculture & Fisheries for Scotland
Scottish Eagle	3.11.82	A. D. Terras	R. Collins, A. R. McCulloch, P. L. White	M. Zarattini	Gayzer Irvine Shipping Co. Ltd
Scottish Lion	11.2.83	J. B. Caley	C. J. Batty, C. M. Turner, R. Smith	J. Duckworth	Cayzer Irvine Shipping Co. Ltd
Scythia	11.1.83	G. F. Kay	P. A. Evans, A. A. M. Staveley, P. N. Burgess	M. Rossiter	Cunard S.S. Co. Ltd
Seaforth Clansman	3.12.80	J. Ritchie	J. Sabourn, G. Henderson	W. Hammerton	Seaforth Maritime Ltd
Seagair	16.2.83	J. B. Gorrie	G. Gardner, D. J. Williamson	I. M. Macleod	B.P. Shipping Ltd
Security	21.12.82	I. Anderson	K. Archer, J. Dymock, M. S. Bean	P. G. Powell	F. T. Everard & Sons Ltd
Sekondi	22.12.82	S. A. McInnes	I. A. Sutton, D. W. Bunyan, A. Brown	R. F. Seward	Ocean Transport & Trading P.L.C.

Selbydyke	3.2.83	G. D. Goulding	R. A. Wilson, D. J. Turrill, W. Tebbutt	North British Shipping Ltd
Semac 1	28.8.80	J. Dobeson		Semac Services
Serenia	25.2.83	K. Whiting	C. Skane-Davis, J. Cripps	J. A. Phelan — Shell Tankers (U.K.) Ltd
Serenity	•	L. A. S. Cooper	S. M. Messruther, Pl J. Dominey	F. T. Everard & Sons Ltd
Servia	16.3.83	E. L. Jackson	C. J. Parvin, D. A. Smith	D. E. Reilly — Cunard S.S. Co. Ltd
Shabonee	16.3.83	P. Crabtree	K. Gill, A. D. Lott, R. P. Frankland, A. Knight	Mobil Shipping Co. Ltd
Shackleton	27.1.83	G. M. Long		W. T. Ashley — Natural Environment Research Council
Shetland Service	26.10.82	J. Sole	M. Hooson, C. P. Green, A. Henwood	J. Sole — Offshore Marine Ltd
Shonga	3.2.83	J. Banna	J. James, T. J. Bayley, J. Woods	J. Crotty — Ocean Transport & Trading P.L.C.
Sherbro	16.12.82	G. D. Warren	P. J. Rowe	D. A. Pugh — Ocean Transport & Trading P.L.C.
Sincerity	4.2.82	J. Heavy	W. J. Strafford, J. MacDonald	F. T. Everard & Sons Ltd
Singularity	11.1.83	J. Young	C. G. Buckley, R. Hart	F. T. Everard & Sons Ltd
Sir Winston Churchill	•	M. Kemmis Betty	G. Dippie, M. Stephens	Sail Training Association
Sivand	17.3.83	G. K. Waite	H. Alinia, J. Parry, R. Irwin	A. M. Midgley — Irano British Ship Service Co. Ltd
Snow Hill	15.2.83	G. Hogg	M. J. Pinder, S. Smith, J. Clamp	M. Malkin — Salen (U.K.) Ship Management Ltd
Sokoto	22.2.83	J. McGechen	R. Flint, M. G. Garside	D. A. Pugh — Ocean Transport & Trading P.L.C.
Southland Star	18.11.82	R. K. Bilton	H. H. Trompert, D. Leech, B. Truran	C. Curtis — Blue Star Line Ltd
Speciality	3.2.83	P. Gilks	K. G. Baldwin, A. Monteath, N. J. Bennett	F. T. Everard & Sons Ltd
Spey Bridge	21.9.82	D. Allen	D. W. Saunders, G. Bamford, M. L. Miller, I. Finlayson	R. Faulds — Silver Line Ltd
Stability	3.3.83	J. Twisleton	S. D. Clarke, M. S. Bean	F. T. Everard & Sons Ltd
Staffordshire	10.9.82	R. Middleton	D. H. MacNicol, A. Set, J. S. Gunn	G. J. Simpson — Bibby Line Ltd
Star Ming	26.1.83	R. Beswick	J. M. Evans, M. Donnelly	J. D. Wilson — Blandford Shipping Co. Ltd
Star Sung	8.9.82	D. Smethurst	Hung Chuen Ricky, J. Melrose, K. Capes	R. Brien — Fred Olsen Ltd
Star World	17.3.83	E. Sherwood	P. Kumar, T. W. Hawkey, T. Barrett	S. G. Vaswaney — Marine Navigation Co. Ltd
Starman Anglia	24.9.82	R. G. Murch	A. W. Reader, G. M. Clark, A. M. Jenkins	M. King — Blue Star Line Ltd
Stena Oceanica	22.12.81	F. R. M. Best	D. Cuthill, S. Lee, R. T. C. Sneddon	E. Buggy — Denholm Maclay Co. Ltd
Stirling Universal	11.3.83	C. W. Gowans	I. Shillito, P. Hickmott, G. Mobbs	A. Campbell — Cayzer Irvine Shipping Co. Ltd
Streambank	27.5.82	J. F. Beckett	A. S. Ross, T. N. Wilkinson, A. L. Jeffrey	S. Murphy — Bank Line Ltd
Strider Juno	16.11.82	E. S. Fowler	R. De La Cruz	D. Quijada — Sea Containers Ltd
Sulisker	26.4.82	N. E. McInnes	D. T. Bain, W. A. Brown, J. P. Laycock	Ministry of Agriculture, Fisheries & Food
Summity	16.3.83	D. Spurling	P. J. Laity, C. Buckley, J. Henderson	F. T. Everard & Sons Ltd
Swiftnes	•	C. Thompson	M. Monday, S. Comfort, M. Court	S. Smith — Jebsens (U.K.) Ltd
Tacoma City	18.1.83	W. G. Wood	A. M. Russell, I. M. Stewart, P. Good	C. Macey — Sir Wm. Reardon Smith & Sons Ltd
Tanjong Tokong	•	D. T. White	K. Y. Young, Y. W. Leong, A. Shukor Admad	R. Napitupulu — Scottish Ship Management Ltd
Tanjong Utara	18.1.82	J. Wood	R. J. Sinclair, C. G. M. Dale, R. Keig	C. Ritchie — Scottish Ship Management Ltd
Tankerman	•	R. D. Andrews	P. A. McAnaily	Rowbotham Tankships Ltd
Tantalus	4.5.82	I. Bease	A. J. Goldsmith, P. Hamer, M. Harrison	K. Torr — Ocean Transport & Trading P.L.C.
Tectus	23.12.82	P. W. G. Chilman	L. J. Hill, J. M. Rigden	J. D. Dechant — Shell Tankers (U.K.) Ltd
Tenchbank	5.1.83	G. A. Davies	D. K. Bennett, A. I. Spencer, H. N. V. Cole, P. N. Hill	D. K. Iveson — Bank Line Ltd
Texaco Brussels	22.1.82	T. A. Page	N. E. S. Smith, D. J. Warner, G. J. Stevens	K. F. Kippen — Texaco Overseas Tankship (U.K.) Ltd

Selected Ships (*contd*)

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Texaco Ghent	24.11.82	H. G. Duff	C. M. Utley, K. Robertson, C. D. Elvidge	I. Brooks	Texaco Overseas Tankship (U.K.) Ltd
Texaco Westminster	12.5.82	J. R. Walker	J. M. Small, G. S. Williams, J. B. Anderson	P. A. Flynn	Texaco Overseas Tankship (U.K.) Ltd
Thamesfield	12.8.82	P. Robinson	E. A. Lamb, S. D. Ranson, N. S. Patterson	P. White	Hunting Stag Management Ltd
Tog Mor	•	J. Suddes	G. Patience		Howard Doris Marine Services Ltd
Tokyo Bay	17.3.83	J. C. Cox	D. R. Lewis, R. J. Hughes, H. J. Buchanan	V. A. Gorny	Overseas Containers Ltd
Tolaga Bay	7.2.83	R. P. Royan	W. M. Winter, D. Batchelor, P. S. Chase	S. J. Braithwaite	Overseas Containers Ltd
Tor Bay	6.1.83	J. Thomson	N. A. Escott, D. P. Crowley, L. J. Fletcher, R. J. Baldock	D. S. Flemington	Overseas Containers Ltd
Tor Caledonia	19.1.83	P. Miller	E. A. Rose, J. E. Boswell	J. Munroe	J. & J. Denholm Ltd
Trinculo	18.1.83	R. Knowles	R. J. A. Weston, N. A. J. Bacon, P. Black	M. Lavan	Newgate Shipping Co. Ltd
Troll Maple	15.3.83	H. K. Hande	C. Meneze, J. S. Randhawa, M. Sharan	S. L. Silveira	J. & J. Denholm Ltd
Troll Park	4.2.82	R. W. Cotter	C. J. Noonan, J. W. Holgate		J. & J. Denholm Ltd
Troll Viking	16.12.82	V. K. Khurana	K. Nagarkatti, D. Miranda, K. Ponnappa	G. B. Rodrigo	J. & J. Denholm Ltd
Trongate	8.9.82	T. Price			Turnbull Scott Management Ltd
Troutbank	17.8.82	P. Treland	M. R. Lynam, M. Waight, N. J. Harvey	M. Handraads	Bank Line Ltd
Uganda	18.1.83	M. V. N. Bradford	K. A. Parsons, G. E. Wintle	K. Gibson	P. & O. S.N. Co.
Valdivia	28.2.83	E. A. Muir	J. Kirk, G. Hope	P. Wong	Harrisons (Clyde) Ltd
Vendee	24.1.83	M. A. Hill	J. C. Etheridge, D. J. Perry	W. Grant	P. & O. S.N. Co.
Vegaman	19.9.78	M. Blight	S. G. Turner, M. C. Jones	L. P. Greeve	Rowbotham Tankships Ltd
Vic Bilh	6.1.83	S. R. Garratt	I. C. Massey, D. Thomas, N. T. Lee	G. A. Dickson	B.P. Shipping Ltd
Vigilant	•	D. Rattery	N. E. McInnes, J. Barton, J. Jewel		Department of Agriculture & Fisheries for Scotland
Viking Valiant	13.9.82	R. A. Shopland	D. E. Knight, G. Lewis, C. I. Griffiths	G. I. Petrie	Townsend Thoresen Car Ferries Ltd
Viking Venturer	16.12.82	D. Pearce	R. J. Ross, D. A. Parsons, J. R. Adams	S. Horne	Townsend Thoresen Car Ferries Ltd
Voreda	•	M. Lindsay			Harrisons (Clyde) Ltd
Vosges	13.1.83	I. Y. Batley	S. N. Horne, D. A. Lemon, R. Woods	W. Blacklaws	P. & O. S.N. Co.
W. A. Mather	14.1.83	J. Simcox	D. Collyer, T. Fisher, D. Little, J. L. White	E. Connell	Canadian Pacific Steamships Ltd
W. M. Neal	24.1.83	A. McGrail	J. R. Williams, D. R. F. Earley, P. M. Bell, D. A. Hall	K. Kwasniewski	Canadian Pacific Steamships Ltd
Wamera	•	G. A. Holeyman	G. Bell, P. Perry, J. Goble	L. Holt	Palm Line Ltd
Wellington Star	19.10.82	W. J. G. Jones	J. M. Webster, R. A. Somerville	S. Shayes	Blue Star Line Ltd
Wellpark	18.1.82	D. Dickson	I. Watson, D. J. Kelley	T. J. C. Stevenson	J. & J. Denholm Ltd
Westra	6.1.83	T. Henderson	D. L. Beveridge, R. J. Sheldon		Department of Agriculture & Fisheries for Scotland
Wild Flamingo	25.1.83	H. C. Hynard	J. A. McCullough, T. Chantler, K. K. Sood	M. J. A. McKenny	P. & O. S.N. Co.
Wild Fulmar	9.3.83	J. S. Laidlaw	M. Young, N. C. Davidson, C. F. Campbell	A. MacGillivray	P. & O. S.N. Co.
Wild Gannet	24.1.83	B. Austen-Smith	C. J. Duncan, J. L. Spurdle, W. J. Woodward	C. Gamwell	P. & O. S.N. Co.

Wild Grebe	19.4.82	A. J. Hughes	J. MacKenzie, R. Lorains, M. Pellet	C. A. Anderson	P. & O. S.N. Co.
Willowbank	15.2.83	D. Stewart	C. W. Hardy, M. Armstrong, M. A. Copeland	D. MacGillivray	Bank Line Ltd
Wiltshire	7.1.83	J. A. Corcoran	M. S. Hume, R. W. A. Brough, C. Gaukroger	K. Smith	Bibby Line Ltd

Supplementary Ships

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Ardmore	24.11.82	R. C. Lister	T. A. Chantler, M. R. Gould, R. T. Flemington	J. L. Spanner	P. & O. S.N. Co.
Dane	3.8.82	J. Lilley	I. D. Brewell		British United Trawlers Ltd
Earl Godwin	4.3.82	–. Millward	P. A. Lloyd		Sealink (U.K.) Ltd
Earl Granville	8.10.82	P. R. Craythorn	J. Leonard, B. J. Nayball	J. Bradley	P. & O. S.N. Co.
Londonbrook	•	B. Tarn	E. Avery, R. M. Thompson		F. T. Everard & Sons Ltd
Oil Hustler	•	N. Brown	L. Elms		Ocean Inchcape Ltd
Oil Supplier	•	C. Cunningham	G. J. S. Ives, M. Kirk		Ocean Inchcape 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
Aldrington	G. B. Panes	Stephenson Clarke Shipping Ltd
Arco Thames	P. H. Phillipss	A. R. C. (Marine) Ltd
Ashington	W. Gibson	Stephenson Clarke Shipping Ltd
Barra Head	H. C. Mackay	Christian Salvesen (Shipping) Ltd
Beacon Point	G. Cubbon	Christian Salvesen (Shipping) Ltd
Benvenue	E. Gibbs	Ben Line Steamers Ltd
Brian Boroime		Sealink (U.K.) Ltd
Clansman	–. McLean	Caledonian MacBrayne Ltd
Claymore	C. W. Billimore	Caledonian MacBrayne Ltd
Columba	–. Gray	Caledonian MacBrayne Ltd
Crusader Point	W. M. Horsley	Hudson S.S. Co. Ltd
Cymbeline	B. R. Smith	Furness Withy (Shipping) Ltd
Dallington	–. McNaughton	Stephenson Clarke Shipping Ltd
Dolphin Point	A. E. Alvis	Christian Salvesen (Shipping) Ltd
Donnington	R. W. Atkinson	Stephenson Clarke Shipping Ltd
Dragon	I. H. Leggatt	Southern Ferries Ltd
Earl William	J. Davies	Sealink (U.K.) Ltd
Emerald	M. Burne	Stephenson Clarke Shipping Ltd
Esso Clyde	R. H. Rendell	Esso Petroleum Co. Ltd
Esso Fawley	F. Cook	Esso Petroleum Co. Ltd
Esso Mersey	–. Hope-Smith	Esso Petroleum Co. Ltd
Esso Milford Haven	P. O'Connor	Esso Petroleum Co. Ltd
Fort Point	C. F. Irvine	Christian Salvesen (Shipping) Ltd
Free Enterprise V	M. Edwards	Townsend Thoresen Car Ferries Ltd
Garrison Point	L. G. Relton	Hudson S.S. Co. Ltd
Harting	B. Reid	Stephenson Clarke Shipping Ltd
Hebrides		Caledonian MacBrayne Ltd
Landguard Point	D. Sutherland	Hudson S.S. Co. Ltd
Main Everard	P. McKay	F. T. Everard & Sons Ltd
Martindyke	E. Sinclair	North British Shipping Ltd
Oilman	N. R. Williams	Rowbotham Tankships Ltd
Orionman	A. G. Mount	Rowbotham Tankships Ltd
Oswestry Grange	A. W. Millie	Furness Withy (Shipping) Ltd
Penelope Everard	M. P. Parker	F. T. Everard & Sons Ltd
Rhodri Mawr		Sealink (U.K.) Ltd
Rora Head	P. Keene	Christian Salvesen (Shipping) Ltd
St Clair	D. C. Grey	P. & O. S.N. Co.
St Columba	L. R. Evans	Sealink (U.K.) Ltd
Suffolk Service		Offshore Marine Ltd
Suilven	A. C. Free	Caledonian MacBrayne Ltd
Sumburgh Head	D. M. McDonald	Christian Salvesen (Shipping) Ltd
Vibrence	G. Getterfield	Crescent Shipping Ltd.
Warden Point	D. Sutherland	Hudson S.S. Co. Ltd.
Washington	W. Sutherland	Stephenson Clarke Shipping Ltd.
Wilmington	E. Gaffney	Stephenson Clarke Shipping Ltd.

Light-vessels

Name of Vessel	Master
Channel	R. J. Owen, A. Fowler
Dowsing	J. F. Beamish, W. R. James
East Goodwin	W. Sheaf, A. Everett
Falls	A. H. Robinson, A. C. Catchpole
Humber	P. F. J. Hollowed, L. A. Horn
Newarp	W. F. Dalby, S. F. Goose
Royal Sovereign (Lt. Tower)	W. G. Trebilcock, V. S. Pearce
St. Gowan	J. J. Spencer, G. Harley
Seven Stones	C. R. Lawrence, R. Goddard
Smith's Knoll	F. Harrison, G. E. West
Tongue	B. W. Mead, F. Allen
Varne	D. Davies, K. Lazenby

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 3.3.83)

Name of Vessel	Owner/Manager
Advara	Jumbo Line
Al-Khaleej	Kuwait Shipping Co.
Al Qurain	Livestock Transport & Trading Co.
Al-Yassrah	Rural Exporters & Traders Pty
Andros	Hoi Loong Nav. Ltd
Anro Australia	Australian National Line
Arafura	Overseas Containers Australia Pty Ltd
Ariake	Overseas Containers Australia Pty Ltd
Australia Star	Blue Star Line
Australian Emblem	Australian National Line
Australian Endeavour	Australian National Line
Australian Enterprise	Australian National Line
Australian Escort	Australian National Line
Australian Explorer	Australian National Line
Australian Exporter	Australian National Line
Australian Pioneer	Australian National Line
Australian Progress	Australian National Line
Australian Prospector	Australian National Line
Australian Purpose	Australian National Line
Australian Venture	Australian National Line
Baron Maclay	Scottish Ship Management Ltd
Baron Pentland	Scottish Ship Management Ltd
Bass Trader	Australian National Line
BP Endeavour	BP Tanker Co. Ltd
BP Enterprise	BP Tankers (Aust.) Pty Ltd
Brisbane Trader	Australian National Line
Cambridgeshire	Bibby Line
Cape Don	Department of Transport (Australia)
Cape Hawke	Australian National Line
Cape Moreton	Department of Transport (Australia)
Cape Pillar	Department of Transport (Australia)
Clearwater Bay	Weeke Ship (Hong Kong) Ltd
Coral Chief	China Navigation Co. Ltd
Curtis Oceanic	Port Curtis Bulk Carriers Pty Ltd
Danny 'F'	Rachid Fares Enterprises Pty Ltd
Dansborg	Bulkships (Singapore) Pty Ltd
Darwin Trader	Australian National Line
Dick Smith Explorer	Oceanic Research Foundation
Doha	Patridis Agencies Pty Ltd
Eigamoiya	Nauru Local Govt Council
Ellsborg	Weeke Ship (Hong Kong) Ltd
Empress of Australia	Australian National Line
Energy Searcher	Pacific Supplies Inc.
Eugene McDermott	World Wide Surveys Ltd
Fernanda 'F'	Rachid Fares Enterprises Pty Ltd
Flinders Range	Australian National Line
Francis Bay	V. B. Perkins and Co. Pty Ltd
Fua Kavenga	Pacific Forum Line
Gerringong	State Shipping Service
Howard Smith	Howard Smith Ltd
Iron Arnhem	Broken Hill Pty Ltd
Iron Kerry	Broken Hill Pty Ltd
Iron York	Broken Hill Pty Ltd
Khalij Express	Gulf Ship Line
Kimberley	State Shipping Service
Koolinda	State Shipping Service
Lalandia	East Asiatic Co.
Lake Barrine	Australian National Line
Lake Hume	Australian National Line
Lysaght Endeavour	Australian National Line
Melbourne Trader	Australian National Line
Mobil Flinders	Mobil Oil (Australasia) Ltd
Mukairish Althaleth	Al Mukairish Shipping

Australia (*contd*)

Name of Vessel	Owner/Manager
Mukairish Althani	Kuwait Shipping Co.
Nimos	China Navigation Co. Ltd
Ocean Prospector	Ocean Nihon Drilling S.A.
Oriana	P. & O. Lines Ltd
Ormiston	C.S.R. Ltd
Papuan Chief	China Navigation Co. Ltd
Persia	Rachid Fares Enterprises Pty Ltd
Pilbara	State Shipping Service
Prospector	Panere Shipping Co.
Regional Endeavour	Seltrust Mining Corp. Pty Ltd
River Boyne	Australian National Line
Rosborg	Bulkships (Singapore) Pty Ltd
Sea Princess	P. & O. (Australia) Ltd
Selwyn Range	Australian National Line
Sid McGrath	John Burke Shipping Pty Ltd
Sydney Trader	Australian National Line
Tanjong Pasir	Tanjong Shipping Line
Tarago	Wilh. Wilhelmsen
Tombarra	Wilh. Wilhelmsen
Tourcoing	Scan Austral Asiatic Shipping Line
Tropic Dawn	Australia Mauritius Line
Tropic Star	Tropic Island Shipping Co.
Troubridge	S.A. State Government
Viborg	Bulkships (Singapore) Pty. Ltd.

CANADA (Information dated 1.1.83)

Name of Vessel	Owner/Manager
Selected Ships:	
Ad Astra	Barber Ship Management Ltd
Advent	Government of Canada
Alberni Dawn	Man Cheung Yven Services Ltd
Alert	Government of Canada
Allunga	Australian National Line
Arctic	Canarctic Shipping Co. Ltd
Atlantic Wing	ACT Maritime Co. Ltd
Baffin	Government of Canada
Bayfield	Government of Canada
Bibi	Sir William Reardon Smith & Sons
Borgnes	Jebsens (U.K.) Ltd
Bow Drill 1	Bow Valley Offshore Drilling Ltd
Camsell	Government of Canada
Canadian Ace	Montreal Shipping Ltd
Canadian Highlander	Upper Lakes Shipping Co.
Cape Breton Miner	Upper Lakes Shipping Co.
Cape Roger	Government of Canada
Cardiff City	Sir William Reardon Smith & Sons
Chebucto	Government of Canada
Des Groseillers	Government of Canada
Devon City	Sir William Reardon Smith & Sons
Dilkara	ACTA Pty Ltd
Eastern Maid	Indo China S.N. Co. Ltd
Eastern Moon	Indo China S.N. Co. Ltd
Fjord Thistle	Indo China S.N. Co. Ltd
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 OSK Lines Ltd
Fuhwo Venture	Indo China S.N. Co. Ltd
G. B. Reed	Government of Canada
George E. Darby	Government of Canada
Grenfell	Government of Canada
Gulf Canada	Gulf Canada Ltd

Canada (*contd*)

Name of Vessel	Owner/Manager
Gulf Mackenzie	Gulf Canada Ltd
Gypsum Empress	Fundy Gypsum Co.
Hudson	Government of Canada
Irving Canada	Kent Lines Ltd
Irving Eskimo	Kent Lines Ltd
Irving Ocean	Kent Lines Ltd
Island Princess	Princess Cruises
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)
Kemano	Jardine Shipping Ltd
Koro Sea	Yick Fung Shipping & Enterprises
Labrador	Government of Canada
La Primavera	Buries Markes (Ship Management) Ltd
La Sierra	Buries Markes (Ship Management) Ltd
Limnos	Government of Canada
Lord Selkirk II	Sub-Arctic Expeditions Inc.
Louisburg	Government of Canada
Louis S. St. Laurent	Government of Canada
Malahat	Indo China S.N. Co.
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
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 (Canada) Ltd
Oriana	P. & O. S.N. Co.
Pacific Princess	P. & O. S.N. Co.
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 Maranti	Malaysian International Shipping Corp.
Rowan Juneau	Mobil Oil (Canada) Ltd
Sealnes	Jebsens (U.K.) Ltd
Sedco 706	Mobil Oil (Canada) Ltd
Sedco 709	Mobil Oil (Canada) Ltd
Simon Fraser	Government of Canada
Sir Humphrey Gilbert	Government of Canada
Sir John Franklin	Government of Canada
Sir William Alexander	Government of Canada
South Express	Eastern Shipping Co. Ltd
Star Ching	Blandford Shipping Co. Ltd
Star Magnate	World Wide Shipping Agency Ltd
Sun Princess	P. & O. S.N. Co.
T. Akasaka	Canadian Pacific Steamships Ltd
Thomas Carleton	Government of Canada
Thor I	Thor Dahl Lines
Thorscape	Thor Dahl Lines
Tupper	Government of Canada
Universal Wing	ACT Maritime Co. Ltd
Vinland	Petro Canada
Walter E. Foster	Government of Canada
W. C. van Horne	Canadian Pacific Steamships Ltd
Wilfred Templeman	Government of Canada
Wolfe	Government of Canada
Zapata Scotian	Mobil Oil (Canada) Ltd
Zapata Ugland	Mobil Oil (Canada) Ltd

Auxiliary Ships:

Canada has 103 ocean-going Auxiliary Ships and 109 Auxiliary Ships operating on the Great Lakes and Inland Waters.

HONG KONG (Information dated 1.2.83)

Name of Vessel	Owner/Manager
Asian Jade	Swire Shipping (Agencies) Ltd
Asian Pearl	Swire Shipping (Agencies) Ltd
Barber Memnon	Barber Wilhelmsen Agencies Ltd
Barber Menelaus	Barber Wilhelmsen Agencies Ltd
Barber Perseus	Barber Wilhelmsen Agencies Ltd
Barber Tonsberg	Barber Wilhelmsen Agencies Ltd
Boonkrong II	Chin Seng Hong Ltd
Bunga Kantan	Mak Shui Cho & Son Ltd
Charlotte Maersk	Maersk Line (H.K.) Ltd
Cheongwind	Shun Cheong S.N. Co. Ltd
Chengtu	Swire Shipping (Agencies) Ltd
Coral Princess	Swire Shipping (Agencies) Ltd
Eastern Muse	The Indo-China S.N. (H.K.) Ltd
Emma Maersk	Maersk Line (H.K.) Ltd
Golden Hill	Mercury Shipping Co. Ltd
Halldis	Thoresen & Co. Ltd
Hongkong Container	Hongkong Export Lines Ltd
Hugheverett	Everett Steamship Corp. S/A
Kweilin	Swire Shipping (Agencies) Ltd
Lamma Island	Hong Kong Islands Shipping Co. Ltd
Maersk Tempo	Maersk Line (H.K.) Ltd
Mah II	Chin Seng Hong Ltd
Manoloeverett	Everett Steamship Corp. S/A
Mui Kim	Hong Kong Borneo Shipping Co. Ltd
Oriental Ambassador	Hongkong Export Lines Ltd
Oriental Chief	Hongkong Export Lines Ltd
Oriental Expert	Hongkong Export Lines Ltd
Pabloeverett	Everett Steamship Corp. S/A
Pearl of Scandinavia	Swire Shipping (Agencies) Ltd
Ramoneverett	Everett Steamship Corp. S/A
Rhein Express	Jebsen & Co. Ltd
Singwind	Shun Cheong S.N. Co. Ltd
Sirichai Bulakul	Chin Seng Hong Ltd
Strathfife	Swire Shipping (Agencies) Ltd
Strathfyne	Swire Shipping (Agencies) Ltd
Tai Shun	Agriculture & Fisheries Dept., H.K. Govt.
Thomaseverett	Everett Steamship Corp. S/A
Torrens	Barber Ship Management Ltd
Victoria 1	Magallanes Investment Inc.
Willine Taro	Barber Ship Management Ltd
Willine Toyo	Barber Ship Management Ltd
Willine Tysla	Barber Ship Management Ltd

INDIA (Information dated 1.1.83)

Name of Vessel	Owner
Selected Ships:	
Akbar	Mogul Line Ltd
Andamans	Shipping Corporation of India
Chidambaran	Shipping Corporation of India
Gaveshani	National Institute of Oceanography, Goa
Harshavardhan	Shipping Corporation of India
Indian Security	India Steamship Co.
Jalagirija	Scindia Steam Navigation Co.
Jalajyoti	Scindia Steam Navigation Co.
Jalakanta	Scindia Steam Navigation Co.
Jalakirti	Scindia Steam Navigation Co.
Jalakrishna	Scindia Steam Navigation Co.
Jalamangala	Scindia Steam Navigation Co.
Jalamoti	Scindia Steam Navigation Co.
Jalarajan	Scindia Steam Navigation Co.
Jalayamini	Scindia Steam Navigation Co.
Jalazad	Scindia Steam Navigation Co.
Lok Sevak	Mogul Line Ltd
Nancowry	Shipping Corporation of India
Ratna Nandini	Ratnakar Shipping Co.
Shompen	Shipping Corporation of India
State of Assam	Shipping Corporation of India
State of Andhra Pradesh	Shipping Corporation of India
State of Maharashtra	Shipping Corporation of India
State of Nagaland	Shipping Corporation of India
State of Punjab	Shipping Corporation of India
State of Tamil Nadu	Shipping Corporation of India
State of Tr. Cochin	Shipping Corporation of India
State of Uttar Pradesh	Shipping Corporation of India
Vishnu Sagar	Parekh Ocean Carriers
Vishva Anurag	Shipping Corporation of India
Vishva Maya	Shipping Corporation of India
Vishva Sudha	Shipping Corporation of India
Supplementary Ships:	
Ajanta	Shipping Corporation of India
Al Gilani	Allanna Line Ltd
Annapoorna	Shipping Corporation of India
Anupama	Shipping Corporation of India
Apj Anand	Apeejay Lines Ltd
Apj Ambika	Apeejay Lines Ltd
Apj Priya	Apeejay Lines Ltd
Aradhana	Shipping Corporation of India
Archana	Shipping Corporation of India
Arunachala Pradesh	Shipping Corporation of India
Bailadila	Shipping Corporation of India
Barauni	Shipping Corporation of India
Bellary	Shipping Corporation of India
Bhagat Singh	Shipping Corporation of India
Bhaskar	Shipping Corporation of India
Bharatendu	Shipping Corporation of India
Bhavabhuti	Shipping Corporation of India
B.R. Ambedkar	Shipping Corporation of India
Chanakya	Shipping Corporation of India
Chhatrapati Shivaji	Shipping Corporation of India
Chennai Jayam	South India Shipping Corporation
Chennai Muyarchi	South India Shipping Corporation
Chennai Perumai	South India Shipping Corporation
Chennai Ookkam	South India Shipping Corporation
Chennai Selvam	South India Shipping Corporation
Desh Bandhu	Shipping Corporation of India
Desh Deep	Shipping Corporation of India
Devaraya	Shipping Corporation of India
Diglipur	Shipping Corporation of India
Faulad Sardar	Faulad Lines Ltd
Indian Endurance	India Steamship Co.
Indian Explorer	India Steamship Co.
Indian Faith	India Steamship Co.
Indian Fame	India Steamship Co.
Indian Fraternity	India Steamship Co.
Indian Freedom	India Steamship Co.
Indian Grace	India Steamship Co.

India (*contd*)

Name of Vessel	Owner
Indian Progress	India Steamship Co.
Indian Prosperity	India Steamship Co.
Indian Triumph	India Steamship Co.
Indian Tribune	India Steamship Co.
Indian Trust	India Steamship Co.
Indian Valour	India Steamship Co.
Indian Venture	India Steamship Co.
Jag Anjali	Great Eastern Shipping Co.
Jag Dev	Great Eastern Shipping Co.
Jag Dharma	Great Eastern Shipping Co.
Jag Doot	Great Eastern Shipping Co.
Jag Jiwan	Great Eastern Shipping Co.
Jag Jyoti	Great Eastern Shipping Co.
Jag Manek	Great Eastern Shipping Co.
Jag Prakash	Great Eastern Shipping Co.
Jag Rekha	Great Eastern Shipping Co.
Jag Shakti	Great Eastern Shipping Co.
Jag Shanti	Great Eastern Shipping Co.
Jagat Kirti	Dempo Steamships Ltd
Jagat Neta	Dempo Steamships Ltd
Jagat Swamini	Dempo Steamships Ltd
Jagat Samrat	Dempo Steamships Ltd
Jagat Vijeta	Dempo Steamships Ltd
Jalabala	Scindia Steam Navigation Co.
Jaladurga	Scindia Steam Navigation Co.
Jaladharati	Scindia Steam Navigation Co.
Jaladuta	Scindia Steam Navigation Co.
Jalagodavari	Scindia Steam Navigation Co.
Jalagomati	Scindia Steam Navigation Co.
Jalagovind	Scindia Steam Navigation Co.
Jalajaya	Scindia Steam Navigation Co.
Jalakala	Scindia Steam Navigation Co.
Jalakendra	Scindia Steam Navigation Co.
Jalamatsya	Scindia Steam Navigation Co.
Jalamayur	Scindia Steam Navigation Co.
Jalamohan	Scindia Steam Navigation Co.
Jalamokambi	Scindia Steam Navigation Co.
Jalamorari	Scindia Steam Navigation Co.
Jalamudra	Scindia Steam Navigation Co.
Jalapankhi	Scindia Steam Navigation Co.
Jalarashmi	Scindia Steam Navigation Co.
Jalaratna	Scindia Steam Navigation Co.
Jalatapi	Scindia Steam Navigation Co.
Jalatarang	Scindia Steam Navigation Co.
Jalavalabh	Scindia Steam Navigation Co.
Jalavijaya	Scindia Steam Navigation Co.
Jameela	Kerala Lines Ltd
Jana Vijaya	Mogul Line Ltd
Janapriya	Mogul Line Ltd
Jawaharlal Nehru	Shipping Corporation of India
Jay Ambika	Jayashree Shipping Co.
Jayanarayan Vyas	Shipping Corporation of India
Kalidas	Shipping Corporation of India
Kanchan Junga	Shipping Corporation of India
Kanishka	Shipping Corporation of India
Karnataka	Karnataka Shipping Co.
Lal Bahadur Shastri	Shipping Corporation of India
Laxmi	Shipping Corporation of India
Lok Manya	Mogul Line Ltd
Lok Nayak	Mogul Line Ltd
Lok Palak	Mogul Line Ltd
Lok Sahayyak	Mogul Line Ltd
Lok Vaibhav	Mogul Line Ltd
Lok Vihar	Mogul Line Ltd
Lok Vinay	Mogul Line Ltd
Lok Vivek	Mogul Line Ltd
Lokmanya Tilak	Shipping Corporation of India
Mahabhakti	South East Asia Shipping Co.
Mahabir	South East Asia Shipping Co.
Maharashmi	South East Asia Shipping Co.
Maharshi Dayanand	Shipping Corporation of India
Mahavijay	Shipping Corporation of India
Maratha Elegance	Chowgule Steamships Ltd

India (*contd*)

Name of Vessel	Owner
Maratha Melody	Chowgule Steamships Ltd
Maratha Progress	Chowgule Steamships Ltd
Marjan	Indoceanic Shipping Co.
Meghdoot	Varun Shipping Co.
Meghrab	Indoceanic Shipping Co.
Mizoram	Shipping Corporation of India
M.O.T. Dredge	Shipping Corporation of India
Nand Kala	Essar Construction and Carriers Ltd
Netaji Subhas Bose	Shipping Corporation of India
Nitya Amar	Maini Shipping Pte Ltd
Onge	Shipping Corporation of India
Prabhu Gopal	Tolani Shipping Co.
Prabhu Satram	Tolani Shipping Co.
Rafi Ahmed Kidwai	Shipping Corporation of India
Ramdas	Shipping Corporation of India
Ratna Kirti	Ratnakar Shipping Co.
Ratna Shobhana	Ratnakar Shipping Co.
Ratna Vandana	Ratnakar Shipping Co.
Rishi Vishwamitra	Garware Shipping Corporation
Sagar Samrat	Oil & Natural Gas Commission of India
Sagardeep	Government of the Republic of India
Sahajahan	Shipping Corporation of India
Sai Nanak	TPS Shipping Co.
Samudra Jyoti	Pent-Ocean Steamships Pvt. Ltd
Samudragupta	Shipping Corporation of India
Sanchi	Shipping Corporation of India
Sarojini Naidu	Shipping Corporation of India
Satya Kamal	Seven Seas Transportation Ltd
Satya Padam	Seven Seas Transportation Ltd
Satya Sohan	Seven Seas Transportation Ltd
Satyamurti	Shipping Corporation of India
State of Himachal Pradesh	Shipping Corporation of India
State of Madhya Pradesh	Shipping Corporation of India
State of Manipur	Shipping Corporation of India
State of Meghalaya	Shipping Corporation of India
State of Mysore	Shipping Corporation of India
State of Rajasthan	Shipping Corporation of India
State of West Bengal	Shipping Corporation of India
Teesta	MacKinnon MacKenzie & Co.
Tulsidas	Shipping Corporation of India
Unibaksh	Universal Shipping Co.
Vallabhbhai Patel	Shipping Corporation of India
Varuna Adhar	Government of the Republic of India
Varuna Yan	Thakur Shipping Co.
Vishva Abha	Shipping Corporation of India
Vishva Aditya	Shipping Corporation of India
Vishva Ajay	Shipping Corporation of India
Vishva Asha	Shipping Corporation of India
Vishva Bandhan	Shipping Corporation of India
Vishva Bhakti	Shipping Corporation of India
Vishva Bindu	Shipping Corporation of India
Vishva Chetana	Shipping Corporation of India
Vishva Dharma	Shipping Corporation of India
Vishva Jyoti	Shipping Corporation of India
Vishva Kalyan	Shipping Corporation of India
Vishva Karuna	Shipping Corporation of India
Vishva Kaumudi	Shipping Corporation of India
Vishva Kaushal	Shipping Corporation of India
Vishva Kirti	Shipping Corporation of India
Vishva Madhuri	Shipping Corporation of India
Vishva Mahima	Shipping Corporation of India
Vishva Mamta	Shipping Corporation of India
Vishva Mangal	Shipping Corporation of India
Vishva Mohini	Shipping Corporation of India
Vishva Nandini	Shipping Corporation of India
Vishva Nayak	Shipping Corporation of India
Vishva Nidhi	Shipping Corporation of India
Vishva Pallav	Shipping Corporation of India
Vishva Pankaj	Shipping Corporation of India
Vishva Parag	Shipping Corporation of India
Vishva Parijat	Shipping Corporation of India
Vishva Parimal	Shipping Corporation of India
Vishva Pratibha	Shipping Corporation of India

India (*contd*)

Name of Vessel	Owner
Vishva Prayas	Shipping Corporation of India
Vishva Prem	Shipping Corporation of India
Vishva Raksha	Shipping Corporation of India
Vishva Sandesh	Shipping Corporation of India
Vishva Seva	Shipping Corporation of India
Vishva Shakti	Shipping Corporation of India
Vishva Shobha	Shipping Corporation of Iindia
Vishva Siddhi	Shipping Corporation of India
Vishva Tarang	Shipping Corporation of India
Vishva Tej	Shipping Corporation of India
Vishva Tirth	Shipping Corporation of India
Vishva Umang	Shipping Corporation of India
Vishva Vibhuti	Shipping Corporation of India
Vishva Vijay	Shipping Corporation of India
Vishva Vikas	Shipping Corporation of India
Vishva Vikram	Shipping Corporation of India
Vishva Vivek	Shipping Corporation of India
Vishva Yash	Shipping Corporation of India
Visvesvarayya	Shipping Corporation of India
Yerewa	Shipping Corporation of India
Zakir Hussain	Shipping Corporation of India

Auxiliary Ships:
India has 31 Auxiliary Ships.

NEW ZEALAND (Information dated 1.2.83)

Name of Vessel	Owner/Manager
Selected Ships:	
ACT 3	Blue Port ACT (N.Z.) Ltd
ACT 4	Blue Port ACT (N.Z.) Ltd
ACT 5	Blue Port ACT (N.Z.) Ltd
Adi Viti	Reef Shipping Agencies
Amokura	Union S.S. Co. (N.Z.) Ltd
Aotea	Container Fleets (N.Z.) Ltd
Bounty III	Pacific Lines
Bulkness	Shipping Corporation of N.Z.
Capitaine Cook	Pacific Lines
Coastal Trader	Shipping Corporation of N.Z.
Daniel Solander	Solander Fisheries Ltd
Dunedin	Bank and Savill Line
Eagle Arrow	Gearbulk Ltd
Erne	Union S.S. Co. (N.Z.) Ltd
Fetu Moana	Shipping Corporation of N.Z.
Fijian	Reef Shipping Agencies
Forum New Zealand	Pacific Forum Line
Forum Samoa	Pacific Forum Line
Golden Bay	Tarakohe Shipping Co.
Holmdale	Union S.S. Co. (N.Z.) Ltd
Ile de Lumiere	Sofrana Unilines
James Cook	N.Z. Govt (Fisheries Research)
John Wilson	Tarakohe Shipping Co.
Kolle D.	Nauru Pacific Line
Kotoku	Union S.S. Co. (N.Z.) Ltd
Kuaka	Union S.S. Co. (N.Z.) Ltd
Lake Eyre	Australian National Line
Marama	Union S.S. Co. (N.Z.) Ltd
N.Z. Caribbean	Shipping Corporation of N.Z.
N.Z. Pacific	Shipping Corporation of N.Z.
New Zealand Star	Blue Port Act (N.Z.) Ltd
Ngahara	Union S.S. Co. (N.Z.) Ltd
Ngahere	Union S.S. Co. (N.Z.) Ltd
Stena Constructor	Stena Line
Tangaroa	N.Z. Govt (Oceanographic Research)
Tasman Enterprise	Tasman Pulp & Paper Co. Ltd
Tasman Venture	Development Finance Co.
Tiare Moana	Shipping Corporation of N.Z.
Totara	Union S.S. (N.Z.) Ltd
Tui Cakau II	Pacific Lines
Union Auckland	Union S.S. Co. (N.Z.) Ltd
Union Hobart	Union S.S. Co. (N.Z.) Ltd
Union Lyttelton	Union S.S. Co. (N.Z.) Ltd
Union Nelson	Union S.S. Co. (N.Z.) Ltd
Union Rotoiti	Union S.S. Co. (N.Z.) Ltd
Union Rotorua	Union S.S. Co. (N.Z.) Ltd
Waitaki	Union S.S. Co. (N.Z.) Ltd
Westport	N.Z. Cement Holdings Ltd
Supplementary Ships:	
Arahanga	New Zealand Railways
Aramoana	New Zealand Railways
Aranui	New Zealand Railways
Aratika	New Zealand Railways

Auxiliary Ships:
New Zealand also has a fleet of 15 Auxiliary Ships currently reporting.

Printed by HMSO, Edinburgh Press
Dd 736048 C20 6/83 (208503)

ISBN 0 11 726 928 X
ISSN 0025–3251