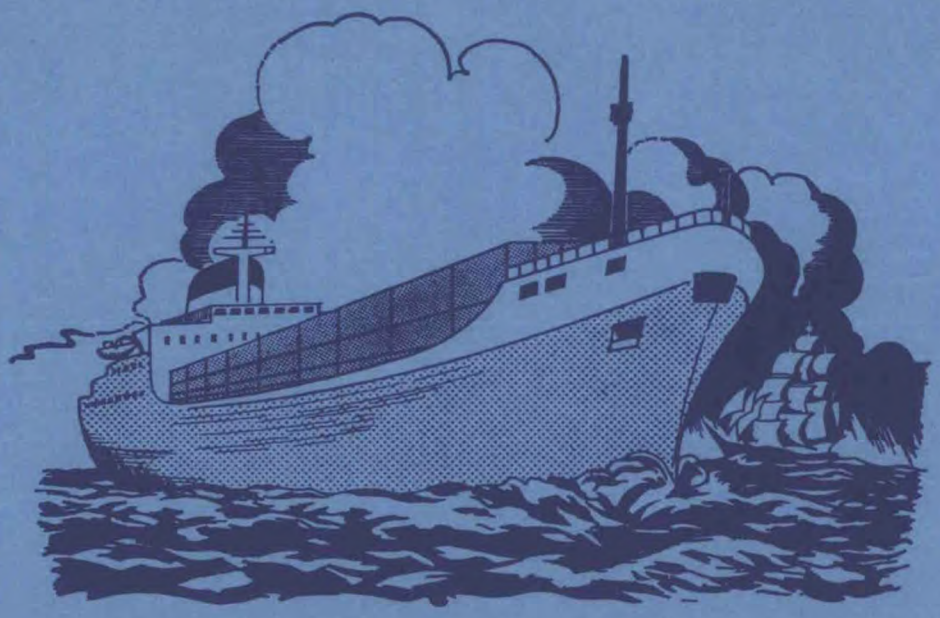
Met. O. 966

The Marine Observer

A quarterly journal of Maritime Meteorology



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THE MARINE OBSERVER

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

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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

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EXCELLENT AWARDS 1984

During the 12 months of 1984 we received a total of 1198 meteorological logbooks compiled by the 450 units which comprise the UK Voluntary Observing Fleet.

It is now our pleasure to offer congratulations to the Masters, Principal Observing Officers and Radio Officers whose proficient and opportune observations and transmissions have earned them Excellent Awards. Details of the Officers concerned are published in the lists following.

In assessing each meteorological logbook individually, the master mariners of the Marine Division must take into account a number of factors before arriving at a fair index for the log.

When considering the many variables that apply to operating conditions on board, it is appreciated that there is far more opportunity for keeping voluminous and meticulous records on a UK–Australia container ship each and every voyage, than on a humble North Sea tanker where the Officers may make the maximum observing effort but have much less to show for it. A fair-minded attitude is taken towards busy short-sea ships and suitable allowances made in the marking of their logs so that they have an equal chance of earning an Excellent Award if they have made the effort. A study of the list will demonstrate that we at least aim for justice for all. Although it is inevitable that Officers on container liners which form part of large fleets appear extensively among the lucky recipients, there is nevertheless a most encouraging response from many other classes of ship on various trades.

The following ships submitted the six logbooks judged to be best of the year:

1. m.v. *ACT 7* (Blue Star Ship Management Ltd), Captains D. Newlin and D. M. McPhail.
2. m.v. *Devonshire* (Bibby Line Ltd), Captains R. A. F. Edwards and J. A. Corcoran.
3. m.v. *Appleby* (Ropner Management Ltd), Captain T. Armstrong.
4. m.v. *Tolaga Bay* (Overseas Containers Ltd), Captain J. C. Cox.
5. m.v. *Garala* (P & O Bulk Shipping), Captain J. O. Spence.
6. m.v. *Columbia Star* (Blue Star Ship Management Ltd), Captains W. A. Davidson and A. J. Chivers.

Photographs of the first three ships named are shown opposite page 104.

Names of Officers serving in MARID ships, which collect and transmit sea temperatures only on short sea passages, and who will receive awards, are shown on page 103.

Those due to receive awards will be individually notified by letter and asked to supply an address for supply of their award. Masters and Officers who see their names in the list may write direct to Bracknell as soon as convenient with the required details.

This year the awards consist of *Philip's University Atlas, Chamber's Twentieth Century Dictionary* and *Great Rivers of the World* edited by Alexander Frater.

J. F. T. H.

EXCELLENT AWARDS (Year ended 31 December 1984)

Captain	Company
D. J. Alder	Hunting Stag Management Ltd
D. M. C. Allan	Furness Withy (Shipping) Ltd
P. M. Anthony	Bank Line Ltd
T. Armstrong	Ropner Management Ltd
C. R. Bamford	Ropner Management Ltd
H. Barber	Bank Line Ltd
O. Barnsley	Cayzer, Irvine Shipping Ltd
I. D. Bease	Ocean Fleets Ltd
G. C. Belson	B.P. Shipping Ltd
J. K. Blackburn	Overseas Containers Ltd
R. J. Bland	Overseas Containers Ltd
R. Brinkworth	Overseas Containers Ltd
L. J. Brown	Cunard Shipping Services Ltd
C. P. Browne	Ben Line Steamers Ltd
C. N. B. Burley	B.P. Shipping Ltd
A. J. Chivers	Blue Star Ship Management Ltd
P. J. Clark	Overseas Containers Ltd
M. J. Cole	British Antarctic Survey
J. A. Corcoran	Bibby Line Ltd
J. Cosker	Overseas Containers Ltd
J. C. Cox	Overseas Containers Ltd
W. A. Davidson	Blue Star Ship Management Ltd
F. A. Davies	Hudson S.S. Co. Ltd
R. G. Davis	F. T. Everard & Sons Ltd
D. Dickson	Marine Navigation Co. Ltd
E. H. Dillen	Bolton Maritime Management Ltd
R. D. Dinnie	Overseas Containers Ltd
R. W. H. Dole	Jebsens Ship Management Ltd
P. J. Duff	Ocean Fleets Ltd
P. N. Duffield	B.P. Shipping Ltd
D. J. Edmans	Cable & Wireless Ltd
R. A. F. Edwards	Bibby Line Ltd
P. J. Elder	Bank Line Ltd
A. J. Fee	Overseas Containers Ltd
R. J. C. Foale	London & Overseas Freighters P.L.C.
A. D. Gillie	London & Overseas Freighters P.L.C.
J. W. Graves	B.P. Shipping Ltd
E. H. Gregson	Furness Withy (Shipping) Ltd
J. A. Hagger	PAL Shipping Services Ltd
M. A. Harding	Natural Environment Research Council
D. V. Harradine	Overseas Containers Ltd
O. Henderson	Ben Line Steamers Ltd
P. G. Hobson	James Fisher & Sons P.L.C.
L. E. Howell	Overseas Containers Ltd
D. S. Hughan	Cunard Shipping Services Ltd
E. G. Humby	London & Overseas Freighters P.L.C.
P. Hurlock	Blue Star Ship Management Ltd
J. H. Hutson	Overseas Containers Ltd
W. F. Jeffrey	Acomarit (U.K.) Ltd.
J. E. Jennings	Ropner Management Ltd
G. D. Johnson	Ocean Fleets Ltd
J. M. Johnson	Overseas Containers Ltd
C. S. Kingston	Cunard Shipping Services Ltd
D. Lambell	P. & O. Lines Ltd
R. Lanz	B.P. Shipping Ltd
A. T. MacGregor	Bank Line Ltd
C. I. MacKillop	Blue Star Ship Management Ltd
D. T. MacLachlan	Ocean Fleets Ltd
J. MacLeod	Ellerman Lines Ltd
N. H. Malpass	Bibby Line Ltd
P. J. R. Manson	Overseas Containers Ltd
W. F. McCarthy	Overseas Containers Ltd
D. M. McPhail	Blue Star Management Ltd
D. I. Moore	Cunard Shipping Services Ltd
R. C. Mortimer	London & Overseas Freighters P.L.C.
W. A. Murison	Overseas Containers Ltd
D. Newlin	Blue Star Ship Management Ltd
T. S. Nurcombe	London & Overseas Freighters P.L.C.
W. N. Pritchard	Cayzer, Irvine Shipping Ltd
A. A. Railton	Overseas Containers Ltd

Excellent Awards *(contd)*

Captain	Company
P. R. R. Ramsay	Cunard Shipping Services Ltd
D. L. Rattray	Dept of Agriculture & Fisheries for Scotland
M. M. Reeves	Bibby Line Ltd
A. J. A. Richards	F. T. Everard & Sons Ltd
J. M. Ronald	B.P. Shipping Ltd
C. R. Short	Overseas Containers Ltd
J. O. Spence	P. & O. Lines Ltd
D. Stewart	Bank Line Ltd
A. D. Terras	Cayzer, Irvine Shipping Ltd
C. O. Thomas	Bibby Line Ltd
I. G. Thompson	James Fisher & Sons P.L.C.
M. Thwaite	Cunard Shipping Services Ltd
G. J. Tulley	Bank Line Ltd
J. A. Twiselton	F. T. Everard & Sons Ltd
M. H. C. Twomey	Cunard Shipping Services Ltd
G. Waite	B.P. Shipping Ltd
C. B. Walgate	Overseas Containers Ltd
J. V. Wallace	P. & O. Lines Ltd
C. J. Watson	B.P. Shipping Ltd
H. Watson	PAL Shipping Services Ltd
G. F. Williams	Ocean Fleets Ltd
M. H. Wilson	P. & O. Lines Ltd
W. A. Wilson	Blue Star Ship Management Ltd
H. D. Windle	Blue Star Ship Management Ltd
M. J. Winter	Furness Withy (Shipping) Ltd
D. M. Woolfenden	Cunard Shipping Services Ltd
W. Young	B.P. Shipping Ltd

Principal Observing Officer	Company
K. K. Ahmed	Acomarit (U.K.) Ltd
S. R. Allaker	Ellerman Lines Ltd
D. Bainbridge	James Fisher & Sons P.L.C.
A. J. Ball	Overseas Containers Ltd
J. Barkess	Dept of Agriculture & Fisheries for Scotland
M. Barraclough	Overseas Containers Ltd
C. J. Batty	Cayzer, Irvine Shipping Ltd
M. N. Baxter	Ocean Fleets Ltd
M. S. Bell	Cunard Shipping Services Ltd
W. K. Brackenridge	Jebsens Ship Management Ltd
L. P. Bridges	Ropner Management Ltd
K. L. Brooks	Furness Withy (Shipping) Ltd
C. Brown	F. T. Everard & Sons Ltd
H. J. Le Cornu	Blue Star Ship Management Ltd
D. R. Lewis	Overseas Containers Ltd
A. C. W. Lipscombe	Overseas Containers Ltd
M. C. Littlewood	London & Overseas Freighters P.L.C.
A. J. Lockie	B.P. Shipping Ltd
A. R. Louch	Natural Environment Research Council
R. M'Aleese	B.P. Shipping Ltd
I. P. MacCormac	Bank Line Ltd
K. S. Markwell	Ocean Fleets Ltd
P. R. May	P. & O. Lines Ltd
W. J. McFadyen	Bank Line Ltd
S. J. McNeill	Cunard Shipping Services Ltd
S. J. Miller	P. & O. Lines Ltd

W. Carmody	London & Overseas Freighters P.L.C.
I. M. Chadney	Overseas Containers Ltd.
M. M. Cokes	Marine Navigation Co. Ltd
J. A. Condie	B.P. Shipping Ltd
P. M. Crowley	Cunard Shipping Services Ltd
N. J. Dance	Hudson S.S. Co. Ltd
B. L. Davies	Ocean Fleets Ltd
J. Davies	Bank Line Ltd
J. J. Dibben	Cunard Shipping Services Ltd
G. M. Douglas	London & Overseas Freighters P.L.C.
S. J. Fair	Bank Line Ltd
S. A. Fawcett	Blue Star Ship Management Ltd
N. D. Ferguson	Ropner Management Ltd
N. E. Gardiner	Overseas Containers Ltd
D. E. Ginder	Bank Line Ltd
I. D. Gordon	Bibby Line Ltd
C. N. Hallam	Cunard Shipping Services Ltd
C. N. Hardy	Bank Line Ltd
K. S. Hardy	Overseas Containers Ltd
P. H. Hare	Cable & Wireless P.L.C.
A. R. Hembury	Cunard Shipping Services Ltd
D. S. Hibberd	Bolton Maritime Management Ltd
C. J. Holmes	British Antarctic Survey
J. C. Holmes	P. & O. Lines Ltd
D. J. Horsfield	Blue Star Ship Management Ltd
P. E. Hughes	Blue Star Ship Management Ltd
G. P. Hunt	B.P. Shipping Ltd
P. J. Hunter	Ropner Management Ltd
M. R. Irwin	F. T. Everard & Sons Ltd
R. M. James	P. & O. Lines Ltd
P. Johnson	Overseas Containers Ltd
J. N. Kelleher	Overseas Containers Ltd
M. C. King	PAL Shipping Services Ltd
A. Kirkham	Overseas Containers Ltd
E. A. Lamb	Hunting Stag Management Ltd
G. Laversuch	Ocean Fleets Ltd
N. D. R. Copeman-Mitchell	Overseas Containers Ltd
V. S. Moran	Blue Star Ship Management Ltd
A. H. Morbey	Blue Star Ship Management Ltd
N. J. Nash	Cunard Shipping Services Ltd
R. E. Niven	Ellerman Lines Ltd
K. J. Odams	Overseas Containers Ltd
P. R. Ostick	James Fisher & Sons P.L.C.
C. J. Petty	Overseas Containers Ltd
J. D. Pinder	P. & O. Lines Ltd
J. D. Reid	B.P. Shipping Ltd
P. A. Rickard	Furness Withy (Shipping) Ltd
D. G. Robbie	Blue Star Ship Management Ltd
T. V. Roberts	Ben Line Steamers Ltd
B. L. Rolf	Overseas Containers Ltd
F. J. Routledge	B.P. Shipping Ltd
J. D. Sanderson	Cunard Shipping Services Ltd
D. L. Shields	B.P. Shipping Ltd
I. Shillito	Cayzer, Irvine Shipping Ltd
A. W. Simonds	PAL Shipping Services Ltd
P. M. Smith	Furness Withy (Shipping) Ltd
H. W. Stewart	Ben Line Steamers Ltd
R. C. Stewart	Canadian Pacific Steamships Ltd
W. J. Stoker	Overseas Containers Ltd
G. W. Thomas	Cunard Shipping Services Ltd
J. M. Torkington	Overseas Containers Ltd
D. M. Thornton	Blue Star Ship Management Ltd
L. A. Turner	Overseas Containers Ltd
C. K. Urwin	Overseas Containers Ltd
S. L. J. Walker	Bibby Line Ltd
M. J. Webber	London & Overseas Freighters P.L.C.
E. A. White	Blue Star Ship Management Ltd
S. M. Whitting	Bank Line Ltd
K. P. Widdowson	Ocean Fleets Ltd
A. R. Wilson	Cayzer, Irvine Shipping Ltd
G. W. Wostenholme	F. T. Everard & Sons Ltd

Excellent Awards *(contd)*

Radio Officer	Company
D. K. Alcock	Overseas Containers Ltd
M. S. Bean*	F. T. Everard & Sons Ltd
A. M. Begg	S.T. & C. International Marine Ltd
A. J. Bellamy	B.P. Shipping Ltd
D. W. Bone	B.P. Shipping Ltd
R. P. Bradsell	PAL Shipping Services Ltd
D. M. Bradshaw	British Antarctic Survey
S. J. Braithwaite	Overseas Containers Ltd
J. Bridge	Overseas Containers Ltd
S. O. J. Broady	Marconi International Marine Co. Ltd
M. Brown	Ocean Fleets Ltd
R. A. Browne	Ocean Fleets Ltd
A. E. Burbridge	Cunard Shipping Services Ltd
L. G. Burks	E. B. Communications (Great Britain) Ltd
A. Burns	Shell Tankers (U.K.) Ltd
D. J. Busveids	Quadrant Marine Services Ltd
A. Campbell	Cayzer, Irvine Shipping Ltd
W. J. M. Campbell	Marconi International Marine Co. Ltd
G. Carmichael	Furness Withy (Shipping) Ltd
R. D. Cause	Overseas Containers Ltd
P. Clemence	B.P. Shipping Ltd
D. Colclough	Cayzer Irvine Shipping Ltd
D. Colwill	Silver Line Ltd
J. R. Cowan	S.T. & C. International Marine Ltd
D. Dalton	P. & O. Lines Ltd
P. A. Dews	Bibby Line Ltd
P. M. Dolphin	Overseas Containers Ltd
J. P. D. Fitzgerald	Marconi International Marine Co. Ltd
D. S. Flemington	Overseas Containers Ltd
R. E. Garnham	S.T. & C. International Marine Ltd
F. R. Gerstner	London & Overseas Freighters P.L.C.
T. Gilmour	S.T. & C. International Marine Ltd
V. A. Gorny	Overseas Containers Ltd
W. Grant	Overseas Containers Ltd
H. O. Grattan	Radio & Electronic Services Ltd
K. R. Grattan	Cunard Shipping Services Ltd
J. M. Little	Furness Withy (Shipping) Ltd
R. Lodge	B.P. Shipping Ltd
N. J. Lovell	Marconi International Marine Co. Ltd
W. B. MacIntosh	Overseas Containers Ltd
D. Mackay	Ocean Fleets Ltd
I. M. Macleod	B.P. Shipping Ltd
D. A. MacRae	S.T. & C. International Marine Ltd
N. E. McInnes*	Dept of Agriculture & Fisheries for Scotland
P. A. Mathews	Overseas Containers Ltd
M. F. Morgan	S.T. & C. International Marine Ltd
R. Morley	P. & O. Lines Ltd
J. M. Muirhead*	B.P. Shipping Ltd
B. A. Mullan	Overeas Containers Ltd
S. Myland	Radio & Electronic Services Ltd
M. P. O'Gorman	Furness Withy (Shipping) Ltd
P. J. C. O'Neill	London & Overseas Freighters P.L.C.
D. Owen	S.T. & C. International Marine Ltd
M. J. Price	Radio & Electronic Services Ltd
S. Price	Marconi International Marine Co. Ltd
M. Ridehalgh	Shell Tankers (U.K.) Ltd
G. H. Roe	B.P. Shipping Ltd
P. F. Rogers	B.P. Shipping Ltd
M. Rossiter	Radio & Electronic Services Ltd
M. Sadiq	Waveney Marine Services Ltd
V. Salkeld	B.P. Shipping Ltd
L. M. Sells	Ocean Fleets Ltd
G. N. Shaw	S.T. & C. International Marine Ltd
S. Shayes	S.T. & C. International Marine Ltd
G. E. Shirt	P. & O. Lines Ltd
G. J. Simpson	Bibby Line Ltd
G. L. Smeaton	B.P. Shipping Ltd
N. R. Smirk	S.T. & C. International Marine Ltd
N. Stephens	B.P. Shipping Ltd
A. F. Stoupe	Radio & Electronic Services Ltd
T. A. Strickland*	B.P. Shipping Ltd
J. Styles	Furness Withy (Shipping) Ltd

M. D. Gray	Shell Tankers (U.K.) Ltd
P. J. Grist	PAL Shipping Services Ltd
A. P. Gurney	B.P. Shipping Ltd
M. Hannan	Cayzer, Irvine Shipping Ltd
P. S. G. Hannon	Marconi International Marine Co. Ltd
N. P. Hill-Heaton	B.P. Shipping Ltd
A. D. Hutchinson	Overseas Containers Ltd
D. Jakobaufderstroht	London & Overseas Freighters P.L.C.
P. M. James	Cunard Shipping Services Ltd
D. A. Kelsall	Overseas Containers Ltd
R. C. Knott	Blue Star Ship Management Ltd
T. S. Kucharski	Marconi International Marine Ltd
C. A. Langley	Marconi International Marine Co. Ltd
G. L. Swainbank	James Fisher & Sons P.L.C.
J. C. Thompson	Overseas Containers Ltd
A. Titley	Overseas Containers Ltd
C. Wade	Bibby Line Ltd
D. E. Wallace	London & Overseas Freighters P.L.C.
R. A. Walters*	C. M. Willie & Co. (Shipowners) Ltd
E. A. Wareing	S.T. & C. International Marine Ltd
M. G. Welsh	P. & O. Lines Ltd
K. T. Whytock	Stephenson Clarke Shipping Ltd
K. S. Woodley	Marconi International Marine Co. Ltd
J. C. Yates	S.T. & C. International Marine Ltd
G. Zimmer*	F.T. Everard & Sons Ltd

'MARID' SHIPS†

Captain	Principal Observing Officer	Radio Officer	Company
J. Cowie	H. Mouat	G. Duncan	P. & O. Ferries Ltd (Aberdeen)
D. J. G. Kain	J. M. G. Arthur	R. D. Seymour	Shell U.K. Oil Ltd
I. H. Leggatt	P. N. Hambleton	D. J. Pitt	P. & O. Ferries Ltd (Southampton)

* Deck Officer.

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

July, August, September

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

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

PASSAGE OF TYPHOON 'ALEX'

Balintang Passage

m.v. *City of Edinburgh*. Captain J. E. Pritchard. Kobe to Hamburg. Observers: the Master and ship's company.

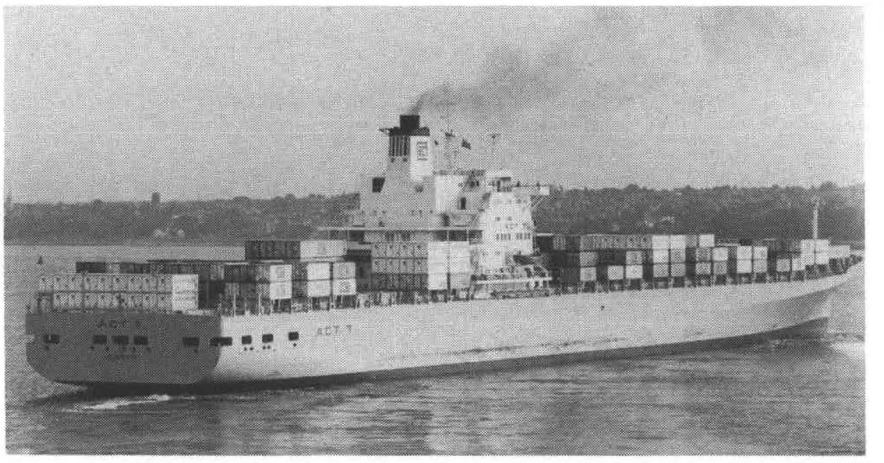
2 July 1984. The vessel passed through the 'eye' of Typhoon Alex at 1640 GMT. Between 1130 and 1800 GMT her average speed was 20 knots. The following details are extracted from the ship's logbook.

Time (GMT)	Wind Dir'n	Force	Baro. pressure	Dry Bulb °C	Wet Bulb °C	Course	Remarks
1130	E'S	5	1005·8	28·1	25·6	224°	
1230	E	5–6	1005·5	28·2	26·0	224°	
1330	E	6	1005·5	28·4	26·3	224°	
1430	E'N	6–7	1003·8	26·3	25·1	224°	Max. wind speed experienced approx 60+ knots to the E of the eye, i.e. prior to 1630 GMT, and 65+ knots to the W after 1640 GMT.
1530	E'N	6–7	998·5	25·4	25·2	215°	
1630	E	8–9	974·1	26·0	26·0	215°	
1730	W'S	8	993·0	25·2	25·2	215/255°	
1800	WSW	7	1002·9	24·7	24·7	—	

When passing through the eye a ring of approximate radius 4·5 n. mile was observed on the radar. The following warning was received from Hong Kong Radio at 1428 GMT:

'Tropical cyclone warning at 021200Z=severe tropical storm Alex (8403) with central pressure 980 mb was centred within 60 n. mile of 18·5 N, 122·8 E and is forecast to move northwest at about 5 knots for the next 24 hours. Max. winds near the centre are estimated to be 55 knots. Radius of over 33 knot winds 150 n. mile. Radius of over 47 knot winds 80 n. mile. Radius of over 2 metre waves 200 n. mile. Forecast position at 031200 GMT 20·3 N, 121·1 E. Forecast position at 041200 GMT 22·4 N, 119·1 E.'

Opposite page 104



ACT 7 (Blue Star Ship Management Ltd) Captains D. Newlin and D. M. McPhail

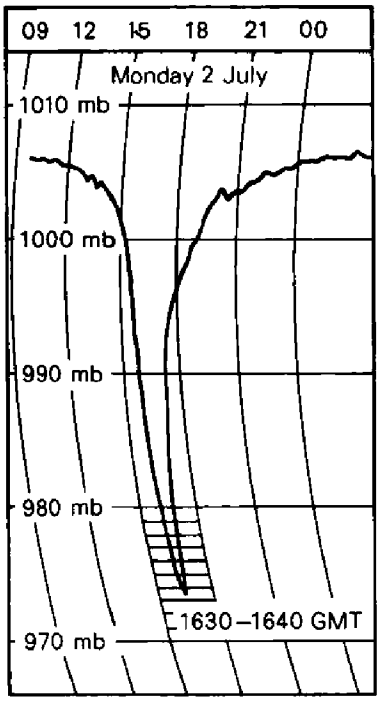
Devonshire (Bibby Line Ltd) Captains R. A. F. Edwards and J. A. Corcoran

Appleby (Ropner Management Ltd) Captain T. Armstrong

THE THREE SHIPS WHICH GAINED THE HIGHEST MARKS FOR THEIR METEOROLOGICAL LOGBOOKS DURING THE YEAR 1984 (*see* page 98)

Opposite page 105

Dolphins observed from m.v. *Corabank* (*see* page 112)



Position of ship at 0600 GMT on 2nd: 23° 06′N, 125° 06′E.
Position of ship at 1800 GMT on 2nd: 20° 01′N, 121° 54′E.

PASSAGE OF TYPHOON 'HOLLY'

Yellow Sea

m.v. *Staffordshire*. Captain M. Nisbet. Yeosu (S. Korea) to Singapore Roads. Observers: the Master, Mr M. Southby, Chief Officer, Mr G. Lang, 2nd Officer and Mr A. Clifton, 3rd Officer.

20–21 August 1984. At 0500 GMT on the 20th the vessel completed discharging LPG at Yeosu with shore warnings of an imminent typhoon, falling pressure and an increasing wind. The vessel unberthed at 0516 GMT and as she left the port area large numbers of coastal vessels and fishing boats could be seen entering the area to seek anchorage. The decision was made to set sail in view of the fact that the typhoon was forecast to pass over the restricted anchorage.

The vessel made departure at 0830 and headed towards Singapore for orders. At this time the wind was ENE, force 8 and the barometric pressure (corrected) was 995·6 mb. Typhoon Holly was some 300 n. mile due south of the vessel and moving north at 8 knots with wind speeds of up to 70 knots.

The vessel set a course to pass to the north of Quelpart Island in order to obtain following winds and a brief comparative lee behind the island and possibly to heave to if necessary.

By 1200 GMT the pressure had fallen to 993·1 mb, continuing a downward gradient of approximately 2 mb/h. The wind was ENE, force 9 beginning to veer slowly to the east. The swell was southerly with a wave height of over 6 metres. The vessel's course at this time was south-south-westerly and she was beginning to roll violently with rolls in excess of 20°. The sky was totally covered with stratus fractus of bad weather which produced continuous light to moderate rain, and the horizontal visibility was less then 4 n. mile.

At 1500 GMT the barometer was reading 987·4 mb and the wind was N'E, force 9. The vessel's rolling was now at its most violent. By 1700 the vessel was in the lee of Quelpart Island and rolling only moderately. The barometer was reading 981·5 mb and the wind was E'N, force 9–10. The latest weather report gave the typhoon centre as only 100 n. mile to the SSE, moving NNE at 10 knots. At 2000 GMT the vessel came out of the lee from Quelpart Island.

At 2100 the barometric pressure reached its lowest reading of 977·1 mb and then began to increase. The wind dramatically changed to N'ly, force 9 and continuous light rain was still being experienced at this time. By use of 'Buys Ballot' it was obvious that the typhoon centre was no longer to the south of the vessel, but rather to the east-north-east, moving just to the east of north. This was the closest point of approach of the vessel to the typhoon; by 2300, however, despite the rising pressure, the vessel was still experiencing N'ly winds of force 10 accompanied by a heavy SE'ly swell. The barometer was reading 982·9 mb and the air temperature was 26·0 °C. The vessel was steering a S–SW'ly course throughout and making good about 13 knots.

At 0100 GMT on the 21st there was a dramatic improvement in the weather. The skies cleared, the wind began to decrease and the visibility improved remarkably. The vessel was now clear of the major effects of the typhoon as Holly began to drop further astern of the vessel to make a landfall over South Korea and become downgraded to a tropical depression in the Sea of Japan on 22 August. The pressure continued to rise over the rest of the day and although a moderate to heavy swell remained the wind speed had dropped to force 2 by 1100 GMT.

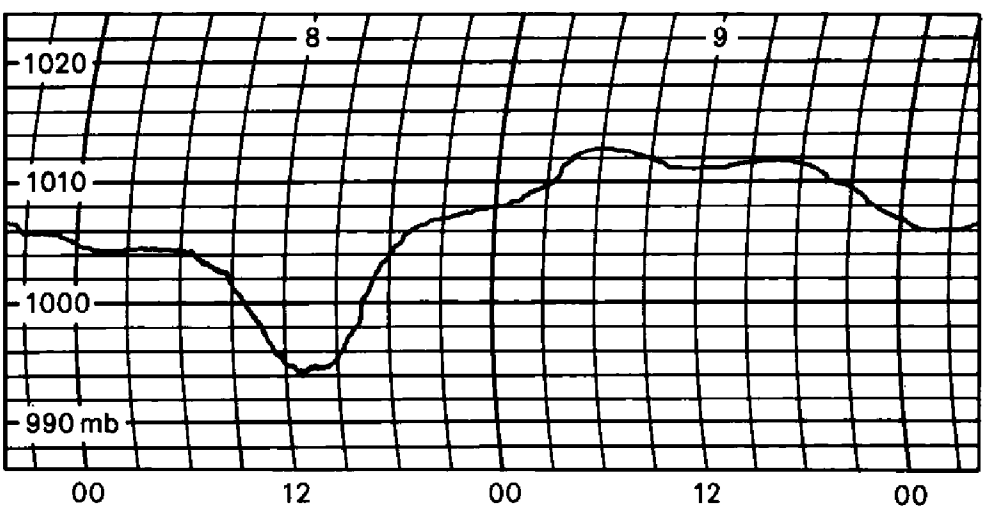
Position of ship at CPA: 33° 18'N, 125° 54'E.

PASSAGE OF HURRICANE 'MARIE'

North Pacific Ocean

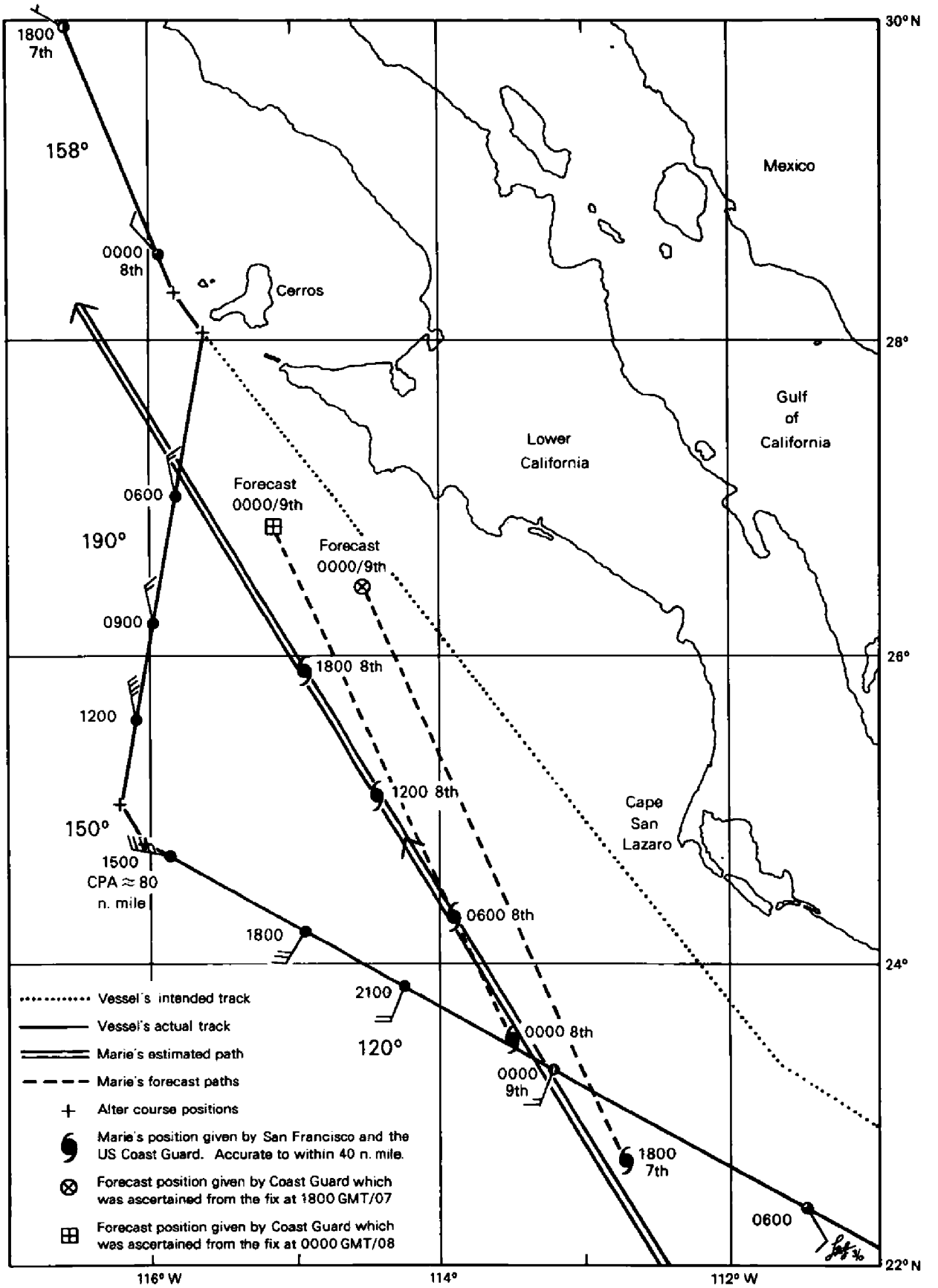
m.v. *Columbia Star*. Captain W. A. Davidson. Los Angeles to Lazaro Cardenas (Mexico). Observers: Mr P. H. Harding, 2nd Officer, Mr C. M. Nicholson and Mr L. St J. Campbell, 3rd Officers and Cadet M. Ellis.

6–8 September 1984. During the evening of the 6th the vessel departed Los Angeles on a southerly course bound for the Mexican port of Lazaro Cardenas. Weather bulletins were received from the NOAA National Weather Service in San Francisco.



At 0600 GMT on the 7th Hurricane Marie was in position 20° 54'N, 111° 42'W, moving NW at 13 knots. Maximum winds were said to be 75 knots near the centre, with gales extending outwards over a radius of 250 n. mile. The hurricane's progress was constantly monitored over the following 36-hour period in an attempt to predict its probable path. Positions received for 07/1800 and 08/0000 indicated it was maintaining a steady north-westerly course, although forecast positions given by both San Francisco and the US Coast Guard emphasized a possible drift to the north into Lower California.

At 08/0400 an alteration of course was made from 158° to 190°; this, it was hoped, would keep us well to the west of the hurricane. Weather conditions at this time were distinctly calm, considering the presence of the nearby storm.



Apart from a relatively low barometer reading for the time of year, only the steady development of thick cloud along with an ever-increasing SE'ly swell indicated its subsequent onset.

At 08/1000 the vessel was experiencing continuous heavy rain and the barometric pressure was starting to fall, but there were still only moderate prevailing winds. A sudden increase of wind speed occurred at 08/1100 and the pressure was then falling rapidly. By 08/1200 winds of force 8 were being experienced, backing slightly. Maximum wind speeds of force 10 occurred at 08/1500 and by this time the winds had backed through almost 90°.

The hurricane's centre was determined to be to the north-east of the vessel, maintaining its NW'ly track and an alteration of course was therefore made to 120° for Lazaro Cardenas. The wind continued to back and at 08/2100 slack and almost southerly winds were being experienced. The rain, which had been heavy, started to decrease in intensity soon after 08/1500 and ceased completely by 08/1200. The vessel's closest position of approach to Marie was estimated to have been 80 n. mile, bearing NE.

Position of ship at 1200 GMT on 7 September: 31° 24'N, 117° 12'W.

Position of ship at 1200 GMT on 8 September: 24° 12'N, 115° 06'W.

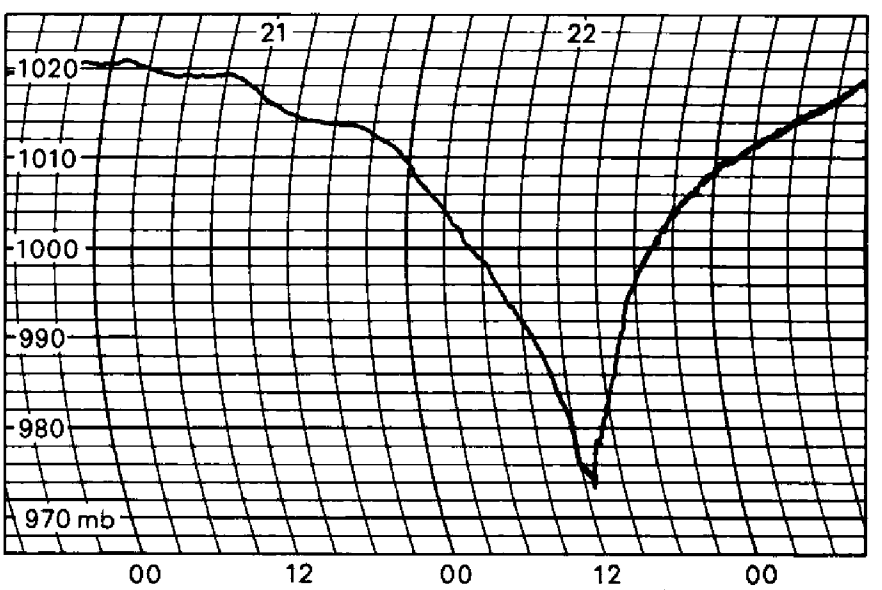
HEAVY WEATHER

Southern Ocean

s.s. *Uganda*. Captain M. D. Rushan. Ascension to the Falkland Islands. Observers: Mr S. Greenfield, 2nd Officer, and Mr A. K. Tilbury and Mr A. Hayward, 3rd Officers.

22–23 July 1984. During this period the barograph trace shown in the sketch was recorded. The amplifying details which follow are taken from the deck and meteorological logs.

22nd, 0000 GMT. The weather was fine, with no cloud. The wind was N'ly, force 5 and the sea state moderate with moderate SSW'ly swell. The barometric pressure was 1013·4 mb, falling rapidly. Course 217°, speed 16·5 knots.



At 0030 GMT stratocumulus cloud invaded the sky from the SW and by 0045 the sky was completely overcast.

At 0600 GMT the weather was overcast and the wind N, force 5 with sea state moderate to rough with average moderate confused swell. The pressure was

1003·9 mb, falling rapidly. Two hours later the pressure had fallen to 999·9 mb and the wind had increased to N, force 8.

At 1000 GMT the vessel was on a course of 218° at a speed of 14 knots. The weather was overcast with stratus fractus cloud and continuous moderate rain. The wind was N'W, force 9 and the sea state very rough with moderate short NNW'ly swell. The pressure was 994·9 mb, falling rapidly. At 1200 GMT the wind had increased to N'W, force 10 and the pressure was 991·1 mb, falling rapidly.

At 1400 the course was 240° and the speed 11 knots. The weather was overcast with continuous rain, the wind N'W, force 11 and the sea state was high with average heavy NNW'ly swell. The pressure was 981·6 mb, falling sharply. The vessel was taking heavy sea on the starboard side. The maximum roll was 27° to port and 20° to starboard. The anemometer was gusting to 80 knots; shortly afterwards it was blown off the mast!

At 1500 the wind was NNW, force 12, beginning to back, and the pressure 980·8 mb, starting to rise. An hour later the wind was unchanged and the pressure 981·4 mb, rising rapidly.

At 1800 the course was 218° and the speed unchanged at 11 knots. The weather was overcast with occasional rain, the wind SW, force 12 and the sea state was high with average heavy SW'ly swell. The barometric pressure was 988·8 mb, rising rapidly.

At 2200 with course and speed unchanged the weather was overcast with continuous rain and the sea state was high with average heavy SW'ly swell.

At 000 GMT on the 23rd the wind was S'W, force 9 and the pressure 1007·4 mb, rising. The wind stayed from the south in direction and moderated to force 5 by 0600 GMT.

Position of ship at 0000 GMT on 22nd: 30° 30'S, 30° 36'W.

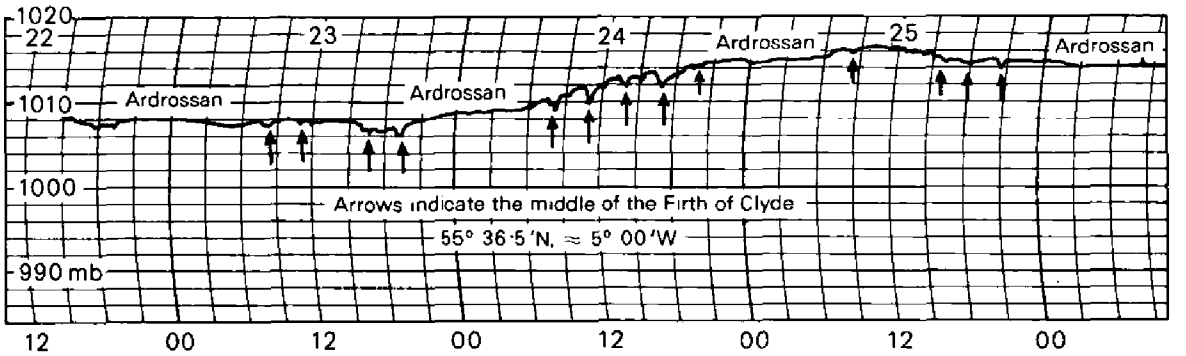
Position of ship at 2200 GMT on 22nd: 33° 54'S, 34° 03'W.

'MINI-LOW'

Firth of Clyde

m.v. *Isle of Arran*. Captain H. Campbell. Ardrossan–Brodick shuttle. Observers: the Master, Captain J. Peacock, Acting Chief Officer, and Mr M. Smith, 2nd Officer.

23–25 August 1984. This vessel steams between Ardrossan on the mainland of Scotland and Brodick on the Isle of Arran, completing five return crossings daily. The interesting barograph trace shows a 'mini-low' which appeared to be



centred consistently over the middle of the Firth of Clyde. The wind was E'ly in direction and mainly force 4 in strength, and it was observed that on the eastern side of the low the wind was stronger than that on the west, although still blowing from the east.

Position of ship: 55° 37'N, 05° 00'W.

Note. Mr David Ireland, of the Marine Climatology Branch of the Meteorological Office, comments as follows:

'An interesting trace! First inspection of the hourly synoptic charts indicates that on the 23rd, E'ly winds probably prevailed north of Troon, but that south of Ayr, w'ly sea-breezes were possible, inducing a cyclonic circulation east of Arran. On the 24th, a steady E'ly flow was likely, with no sea-breeze.

'On the 25th winds were generally slack, and sea-breezes were likely everywhere. These slightly different wind regimes seem to militate against a common meteorological cause such as a lee low, a standing wave, or differential sea-breezes. It seems more likely that the cause could have been a venturi effect past the doors on each side of the wheelhouse, if both were open.

'The day with the most marked wind, the 24th, was also the day with the most marked dips in the pressure trace. The wind was blowing along the route; the vessel's speed of 11 knots when heading for Ardrossan would have doubled the ambient wind speed, and would have cancelled it out when heading for Brodick. The width of the dips seems to be about one hour, the duration of one leg of the journey, and if the times are correct on the barogram, they coincide with the easterly legs; (there are also signs of minor dips in the w'ly legs).

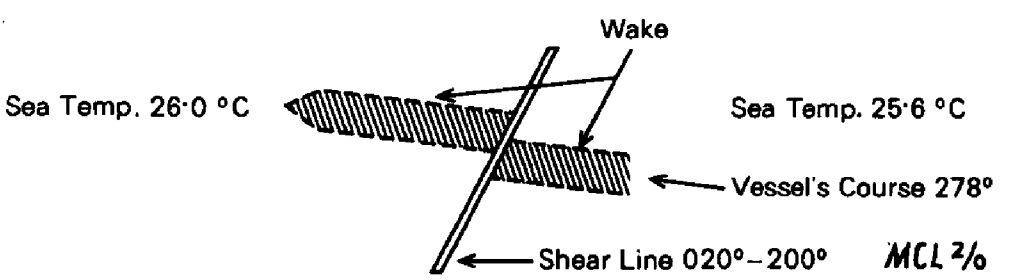
'It is curious that the phenomenon did not show up on other days. It may require a hot day (in order to have the doors open) and the wind direction lying along the route, not a common occurrence.'

CURRENT SHEAR

Equatorial Eastern Atlantic

m.v. *Overseas Argonaut.* Captain T. S. Nurcombe, Djeno to St Croix (Virgin Islands). Observers: Mr T. C. Swatton and Mr M. C. Littlewood, 2nd Officers.

23 September 1984. At 0655 GMT a current shear was observed on the sea surface, running in a straight line from 020° to 200° and stretching as far as the eye could see in both directions. There was a marked area of disturbed water



about 3 metres wide which formed the boundary between two water masses which were subsequently found to differ in temperature.

Also observed flying along the line and close to the vessel were about 20 terns, possibly Arctic or Common, which may well have been fishing.

As shown in the diagram, there was a very clear change in the wake of the vessel as it passed over the shear, and sea temperatures were taken on each side of the line.

Weather conditions unchanged from those observed at 0600 GMT, which were: dry bulb 24·2° C, wet bulb 23·5, wind S'W, force 4.

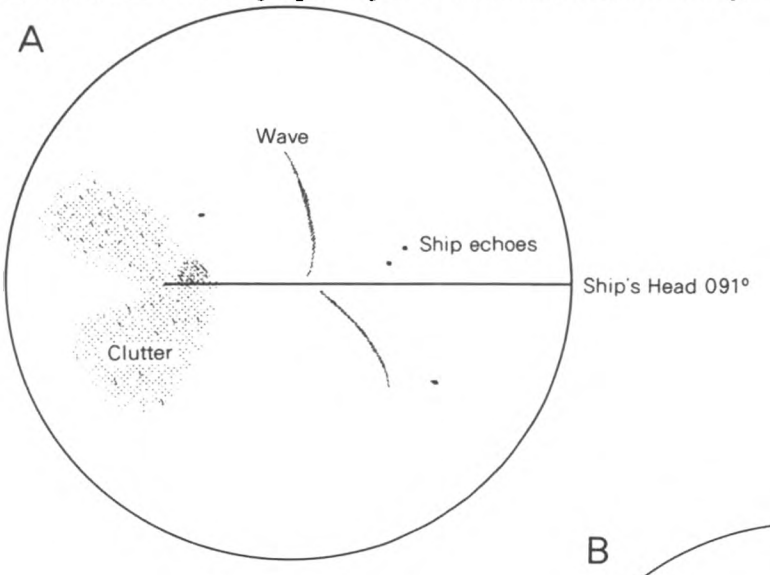
Position of ship: 04° 28′S, 09° 48′E.

UNUSUAL WAVE AND SHOAL OF FISH

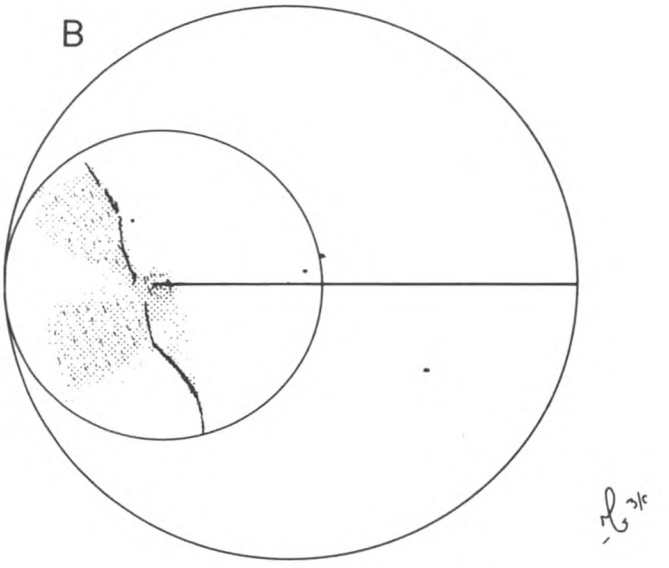
Bay of Bengal

m.v. *Tor Bay*. Captain A. J. Palmer. Mina Qaboos to Singapore. Observers: the Master, Mr N. E. Gardiner, 3rd Officer and Mr C. Browne, Leading Seaman.

12 September 1984. At 1400 GMT the vessel was steaming towards the Strait of Malacca and the 'picture' on the 3-cm radar was similar to that shown in sketch 'A'. This showed an unusual wave form ahead of the vessel, but nothing could be seen visually, partly because the moon had just risen right ahead.



12 n. mile range



12 n. mile range (VRM @ 6·9 n. mile)

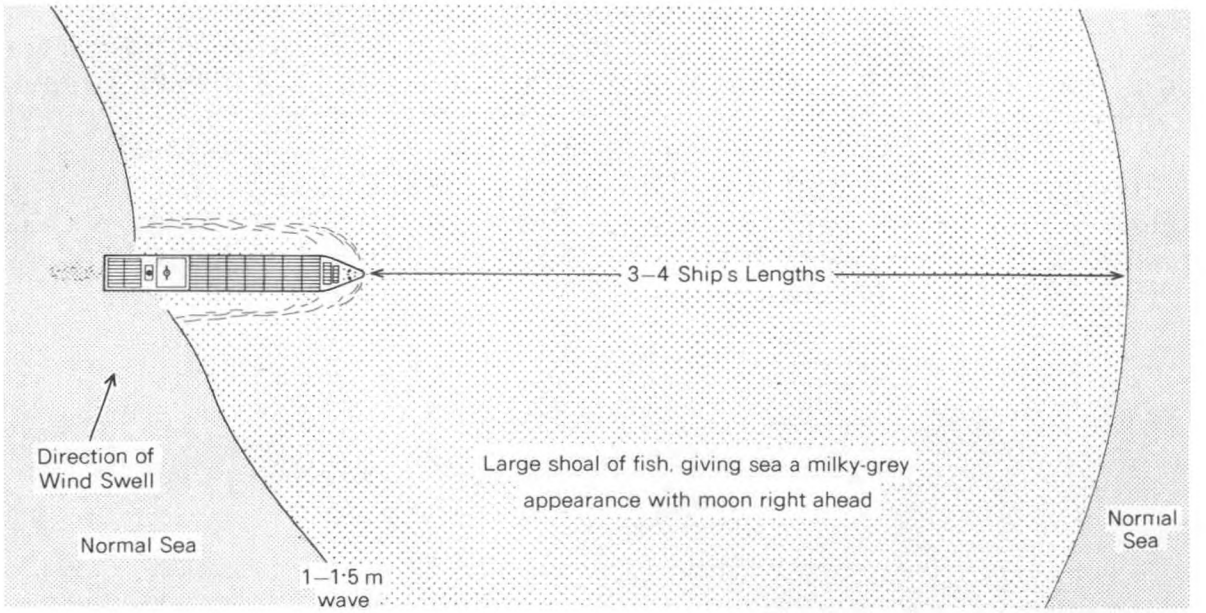
At 1418 GMT the ship approached the 'wave'. The ship's head was seen to rise as the wave was passed over and to dip afterwards. The wave was estimated to be 1–1·5 metres high as it passed down the ship's side. It was noted that no shipping in the vicinity could have made such a wave.

Once the vessel was clear of the wave the sea itself had changed colour; it had turned from a crystalline black to a milky grey. When the searchlight beam was directed on to the water it was discovered that the sea was swarming with bright twin-pinpoints of orange light—fishes' eyes. The milky-grey sea was almost circular with a radius of approximately 4 ship's lengths.

While in the milky sea the radar picture (3 cm) was similar to sketch 'B' and showed the wave extending out to 6·9 n. mile south of the vessel and apparently moving slowly westwards.

At all times throughout the observation good ship and heavy-cloud echoes

were obtained. The milky sea did not appear in any form on the radar picture (the dark area at the vessel in both sketches being the area of maximum clutter).



The observers were satisfied that the moon's shining on the fishes' backs was the reason for the milky-grey sea, as when a sample was taken using the sea bucket the water was still 'crystalline black' (for want of a better description).

But the wave—we can only guess that it was caused by the shoal of fish moving just under the surface of the water in a westward direction (similar to a bow wave). Any other suggestions would be welcome.

Position of ship: 05° 46′N, 83° 25′E.

DOLPHINS

Equatorial Western Pacific

m.v. *Corabank*. Captain H. Barber. Lake Charles (Louisiana) to Djakarta. Observer: Mr I. P. MacCormac, 3rd Officer.

30 July 1983. At 0040 GMT approximately 100 bottlenose dolphins were observed all in a fairly tight group in an area 200 metres × 100 metres of disturbed water that resembled a shoal of fish. The dolphins, which were light grey in colour, and about 3–4 metres in length, were riding in and out of the water at the south-east edge of this area, in long lines. Some photographs were taken of the dolphins, which were mostly coming out of the water in two distinct lines simultaneously. (*See* upper photograph opposite page 105.)

Position of ship: 01° 07′S, 157° 35′E.

Note 1. Mr D. A. McBrearty, of the Department of Anatomy, University of Cambridge, comments as follows:

'I think this is one of the most interesting observations we have had in a very long time. It is a pity that only one of the four black-and-white prints is in focus and the dolphins appear quite small and some distance off. However, at least two of the groups shown (in the centre and at the right) seem to show dolphins with a robust body, relatively small dorsal fin, small fore-flippers and a broad, dark stripe along the flanks. If my suspicions of these animals are correct then this is a most important photograph. In my opinion these are not bottlenose dolphins (*Tursiops truncatus*) as the observers suggest, but I believe them to be Fraser's dolphins (*Lagenodelphis hosei*). Very few pictures of this dolphin have been published and I am pretty sure it hasn't appeared in *The Marine Observer* before. The animal was only recognized from a single skull in 1956 and photographed with flesh on in January 1971.'

Note 2. This report was received too late for inclusion in the July 1984 issue of *The Marine Observer*.

WHITE DOLPHINS

Barbadian waters

m.v. *Geestland*. Captain D. N. Boon. Barry to Port Castries. Observers: the Master and Mr M. Tomlinson, Chief Officer.

25 August 1984. At 0545 LMT a small school of dolphins was seen off the port bow about 50 metres distant as the vessel was slowly approaching the Pilot Station off the breakwater at Bridgetown, Barbados. Amongst this school of what appeared to be bottlenose dolphins was a most distinctly white or light-grey specimen which was clearly seen when submerged and altogether was a rare sight. The observers were reminded of the legendary 'Polaris Jack' which guided ships into Sydney Harbour. The length of this dolphin was about 2 metres.

Position of ship; 13° 05′N, 59° 36′W.

Note. Mr McBrearty comments as follows:

'These dolphins most probably were, as the observers say, bottlenose dolphins (*Tursiops truncatus*). There are occasionally colour anomalies and even albino specimens among cetaceans just as there are within the rest of the animal kingdom; however, the bottlenose dolphins of the Caribbean do tend to be much lighter in colour than are those of any other area. The dolphins from Florida (which incidentally provided almost all the early "marineland" specimens) are just about the lightest of all in colour.

'I think the observers are somewhat adrift in their reference to "Polaris Jack" and Sydney Harbour. What they are referring to is surely "Pelorus Jack", a dolphin which rode the bow waves of steamships crossing the outside of Pelorus Sound, Marlborough, NZ between 1888 and 1912. This animal was a Risso's dolphin (*Grampus griseus*) and a great attraction to all who saw it. Unfortunately, the animal disappeared without trace in April 1912. It was actually the subject of an Order in Council, signed by the then Governor of the Colony of New Zealand in September 1904 for the purpose of preventing the dolphin from being shot, harpooned or harmed in any way; this was renewed twice subsequently before the eventual disappearance of the beast. Much has been written about "Pelorus Jack" and photographs have appeared in a number of books and newspapers.

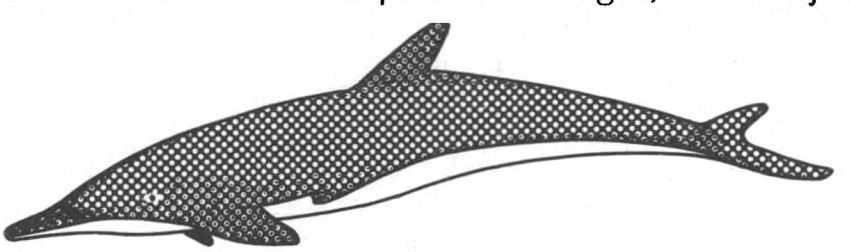
'The Order in Council made to protect "Pelorus Jack" was the first such order published to protect any individual cetacean. There was in the early years, and even up until 1971, some controversy over whether the animal was a *Grampus* or a *Tursiops*. The evidence which proves beyond doubt that it was a *Grampus griseus* is in Baker, A. N. (1974) Risso's dolphin in NZ waters and the identity of Pelorus Jack. *Rec. Dom. Mus.*, **8**, No. 16, pp. 267–276, Wellington, NZ.'

DOLPHINS AND PILOT WHALES

Eastern North Atlantic

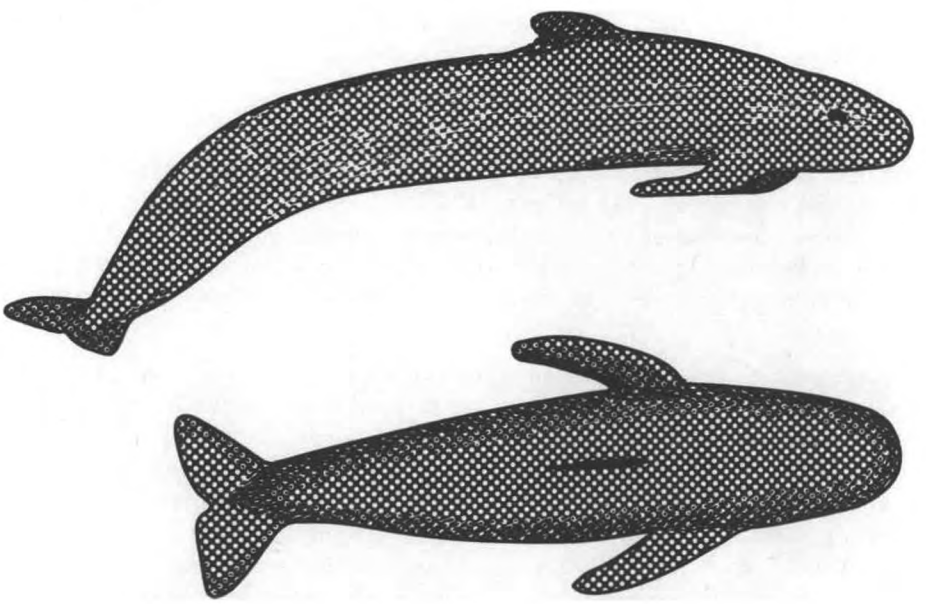
m.v. *Tolaga Bay*. Captain G. C. Barrett. Rotterdam to Melbourne. Observers: Mr M. J. Godbehear, Chief Officer, Mr D. R. Peel, 2nd Officer, Mr R. J. Curry, 3rd Officer, Mr M. R. Hannan, Radio Officer, Cadet N. D. Peters, Mr M. Byrne, A.B., and Doctors A. Swires and H. Black.

29–30 August 1984. At 0700 GMT on the 29th a large school of dolphins was observed swimming in a southerly direction. The group, which consisted of some 70–80 adult and juvenile dolphins, soon closed with the vessel on either bow and began riding on the bow wave. The adult dolphins, as shown in the first sketch, were between 1·8 and 2·4 metres in length, with the juveniles only

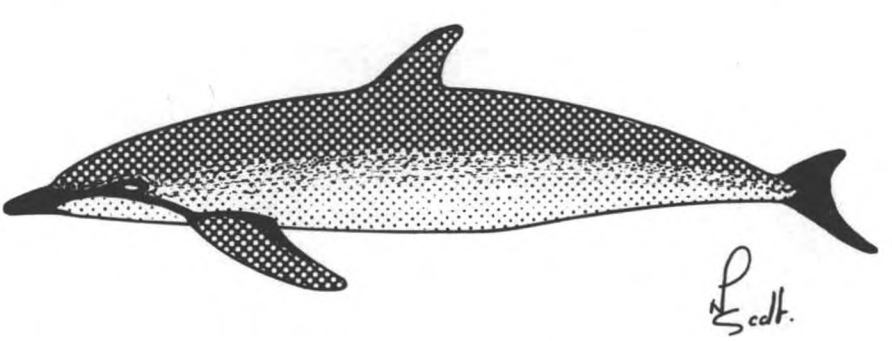


a third of this size. All the dolphins, which were thought to be of the bottlenose variety, were dark grey in colour, with light grey undersides.

At 1500 GMT, seven slow-moving creatures were observed lazing in the water off the port bow. As the vessel closed, the whales were observed quite clearly through clear water to be swimming slowly away from the ship in a south-easterly direction. Later identified as pilot whales, they appeared to be undisturbed by their close proximity to the ship, and passed down the port side of the ship at a distance of about 100 metres. The school consisted of five adults, two views of one of which are shown in the sketch, and two juveniles. The adults were about 5 metres in length and the younger ones about 2 metres.



At 1800 GMT on the 30th, some 36 spinner dolphins were observed astern of the vessel. They were between 1·8 and 2·4 metres in length, with grey topsides and creamy white underbellies as shown in the final sketch. The school was playing in the vessel's wake when first observed, and this they continued to do for 10–15 minutes before swimming off.



Weather conditions at 0700 GMT on the 29th: air temperature 20·7 °C, sea temperature 22·1, wind N'ly, force 2–3, sea state rippled sea and low, N'ly swell.

Weather conditions at 1500 GMT on the 29th: air temperature 27·5 °C, sea temperature 27·0, wind W'S, force 2–3, sea state unchanged.

Weather conditions at 1800 GMT on the 30th: air temperature 28·2 °C, sea temperature 27·0, wind SW'ly, force 3, sea state rippled sea and low S'ly swell.

Position of ship at 0700 GMT on 29 August: 19° 46′N, 17° 50′W.

Position of ship at 1800 GMT on 30 August: 08° 22′N, 16° 00′W.

Note. Mr McBrearty, comments as follows:

'The first group observed may have been, as suggested, bottlenose dolphins (*Tursiops truncatus*), but the drawing accompanying the description shows a dolphin with a longish beak and a very sloping "forehead" without a clear demarcation at the base. This may be a slip or just "artistic licence", but if the head was truly this shape, it wasn't a bottlenose dolphin; it was more probably a so-called rough-toothed dolphin (*Steno bredanensis*).

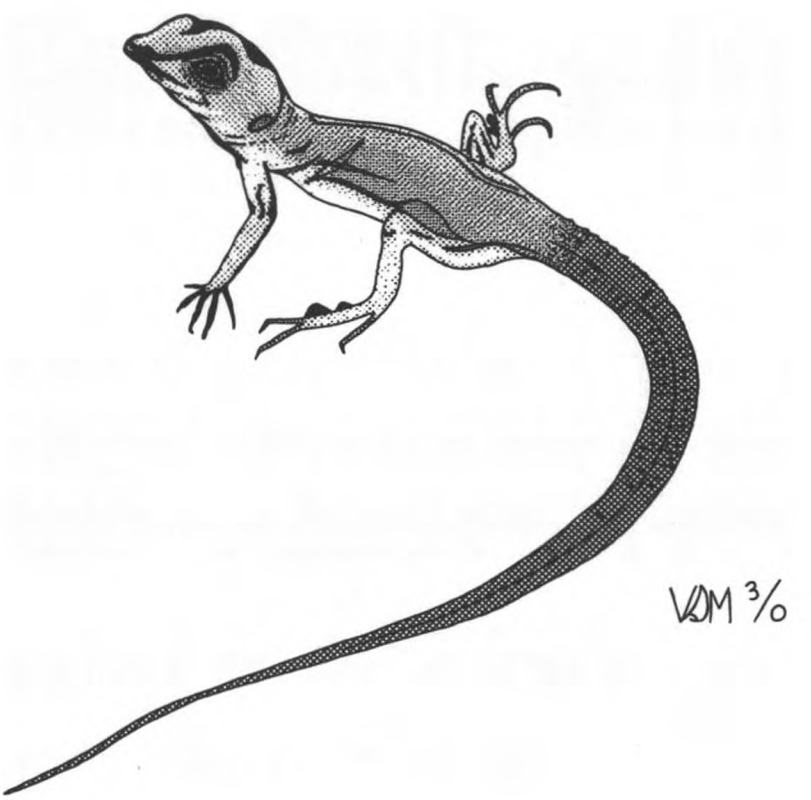
'The whales are short-finned or tropical pilot whales (*Grampus macrorhynchus*) and I concur with the identification of the spinner dolphins.'

LIZARD

Mexican coastal waters

m.v. *Columbia Star.* Captain A. J. Chivers. Lazaro Cardenas (Mexico) to Balboa (Panama Canal). Observers: the Master, Mr M. Power, Chief Officer and Mr V. S. Moran, 3rd Officer.

11 July 1984. The vessel departed Lazaro Cardenas in the early hours of the morning. Cargo had been worked all through the night in heavy rain. The weather brightened up, and later that day in the mid-afternoon the Chief Officer found the lizard shown in the sketch dozing in the sun on the fo'c'sle deck.



Eventually, after an hour's frustrating struggle, the lizard was caught and brought to the bridge for further examination. It was deduced that it had sought shelter from the night's downpour, in an empty container on the quay and had hence been brought on with the cargo.

The colour of the lizard's body and skin was olive green, except for its brown tail, which darkened progressively towards the tip. The eyes had large black pupils, with chestnut-brown surrounds. The overall length of the lizard was 18 cm (body 7 cm and tail 11 cm).

Position of ship: 17° 55′ N, 102° 11′ W.

Note. Mr A. F. Stimson, of the Department of Zoology, British Museum (Natural History), comments as follows:

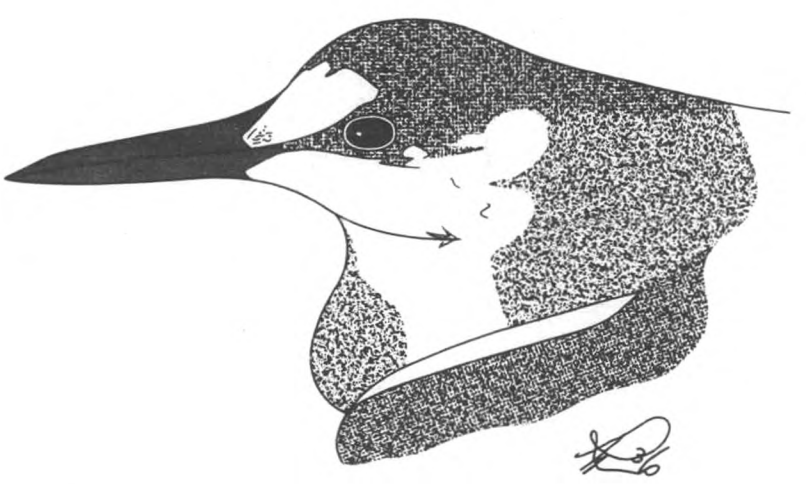
'The green lizard is a baby spiny-tailed iguana, *Ctensaura pectinata*. This species reaches a length of 75 cm. The juvenile green coloration is lost quite early in life, adults being brownish with yellow markings. The species is primarily vegetarian and harmless to man. A Mexican endemic, it has recently turned up, having presumably been introduced, in Costa Rica.'

BIRDS

Panama Canal and South Pacific Ocean

m.v. *Corabank*. Captain H. Barber. Lake Charles (Louisiana) to Djakarta via Panama Canal. Observers the Master, Mr M. A. Mackenzie, Chief Officer and Mrs Mackenzie, Mr E. F. S. Harrison, 2nd Officer, Mr I. P. MacCormac, 3rd Officer, Mr K. S. Woodley, Radio Officer and Mrs J. Murry, wife of the Chief Engineer Officer.

17–28 July 1983. At 1830 GMT on the 17th the Mate's wife brought a Sooty Tern up to the bridge after finding it in the windward alleyway. The bird, which had been heard screeching during the previous night, was placed in the shade and provided with water and then left to recover. It was thought to be exhausted. A sketch was made and notes were taken during the half-hour or so which elapsed before the bird recovered and flew off.



Size from tip of beak to end of tail was 33 cm; it was not found possible to measure the wingspan. The neck was mottled white and both sides of the underbody were either oily or a sooty-brown colour to the tips of the feathers, possibly the latter as it was thought to be an immature bird in view of its size.

Each night from the 19th to the 23rd some birds were heard 'chattering' to one another throughout the hours of darkness. They were only seen in glimpses against a moonlit underside of a cloud except on one occasion when the Chief Officer saw them very early by daylight. He identified them as 'Tropic Birds' with the help of Captain Tuck's 'Seabirds' book.

Early on the morning of the 22nd a Brown Noddy hovered by the outstretched hand of the Chief Engineer's wife and various other seabirds were seen during the days, mainly terns and boobies.

At 1015 GMT on the 27th a Sooty Tern was caught in an uplift eddy and came tumbling over the bridge dodger, recovered, and flew back on deck where it was observed eating something white, about 10 to 15 cm long. It stayed on deck for about 30 minutes before flying off astern. No trace of white food was found the next morning.

At 0000 GMT on the 28th a White-tailed Tropic Bird was observed flying from south to north. It circled the ship, seemingly warily.

Position of ship at 1830 GMT on the 17th: 01° 39′S, 133° 10′W.

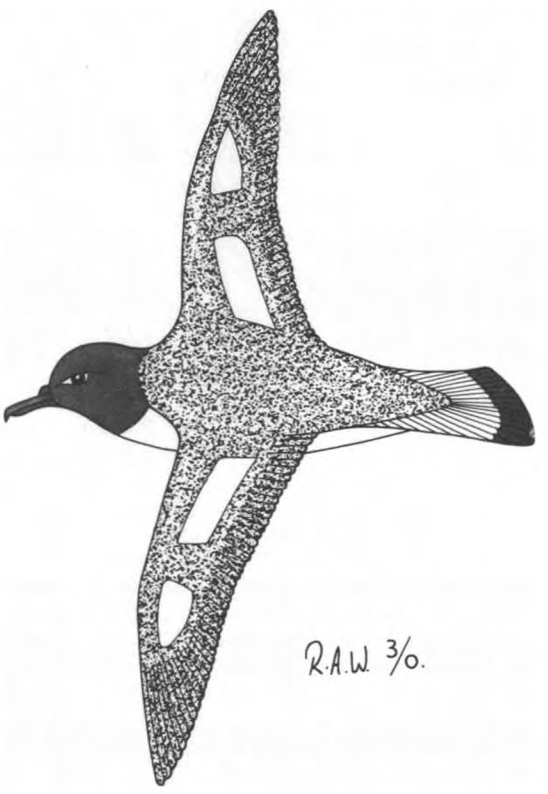
Position of ship at 0000 GMT on the 28th: 01° 42′S, 169° 00′E.

Note. These detailed reports were received too late for inclusion in the July 1984 issue of *The Marine Observer.*

Tasman Sea

m.v. *Arafura.* Captain P. D. Sheppard. Melbourne to Brisbane. Observers: Mr G. N. Hill, 2nd Officer, Mr R. A. Westwood, 3rd Officer and Cadet S. Gravenall.

26 September 1984. At 0000 GMT some 30 or so petrel-like birds were observed following the vessel. They were approximately 50 cm in length, with a wingspan of approximately 80 cm. As shown in the sketch, the birds had black heads,



bills, wingtips and tail ends. The upper parts of their bodies were dark grey and the lower parts were white. The birds also had two white patches on each wing.

Position of ship: 33° 35′S, 152° 07′E.

Note 1. The *Arafura* is an Australian Selected Ship.

Note 2. Captain Young comments as follows:

'These would certainly be Pintado Petrels (Cape Pigeons), *Daption capensis.* A very pretty and distinctive bird, though usually somewhat more mottled than the very good sketch would suggest. They are circumpolar in the southern oceans and frequently follow ships.'

South China Sea

m.v. *Crestbank.* Captain A. B. Osborne. Singapore to Aden. Observers: the Master and ship's company.

18 September 1984. At dawn, following a night-time departure from Keelung, Taiwan, on the 17th, a flock of small birds, estimated to be at least a dozen,

were noticed to be flying around the decks in very close formation. They would frequently land on the hatch tops where they would peck along the seams, presumably picking out insects. At times they would also land on some of the vessel's higher structures. They were continuously on the move and very rarely stood still when landed.

When passing up the Lamma Channel at the approach to Hong Kong at dawn on the 19th these birds were noticed to be grouped together on one of the mast outreaches chattering away in what was assumed to be excitement upon arrival in the Colony. With arrival and berthing duties then taking precedence over 'birdwatching' their further movements went unnoticed. However, upon departure from Hong Kong during the afternoon of 21 September the group was noticed to be still present and so remained until the vessel arrived in Singapore during the afternoon of the 25th.

Because they were continuously on the move and extremely timid, it was not possible to photograph them. They were very similar in size to a British Hedge Sparrow, being if anything slightly smaller, and very much of the same markings as the male of that species. They had a faint show of white above each eye and a more distinct white flash on top of each wing. Their beaks were fairly short and squat, being almost black in colour. When viewed from beneath in flight they presented a faint yellow/green colour.

One of the most noticeable things about them, apart from always remaining in a group when landing and in flight, was their tendency to hop to the edge of a flat surface and when there to lower their heads and stare intently over the edge. They appeared to prefer flat surfaces and at night roosted on the bottom boards in the No. 1 lifeboat.

The weather was calm, with very little breeze, throughout.

Position of ship on 20 September: 22° 18′N, 114° 10′E.

Note. Commander M. B. Casement, Chairman of the Royal Naval Birdwatching Society, comments as follows:

'The birds observed on the 19th were definitely Finches or Buntings, possibly the Yellow-breasted Bunting (*Emberiza aureola*): This migrant species ranges from Eurasia to East India, China, Taiwan and the Philippines.'

INSECTS

Romanian waters

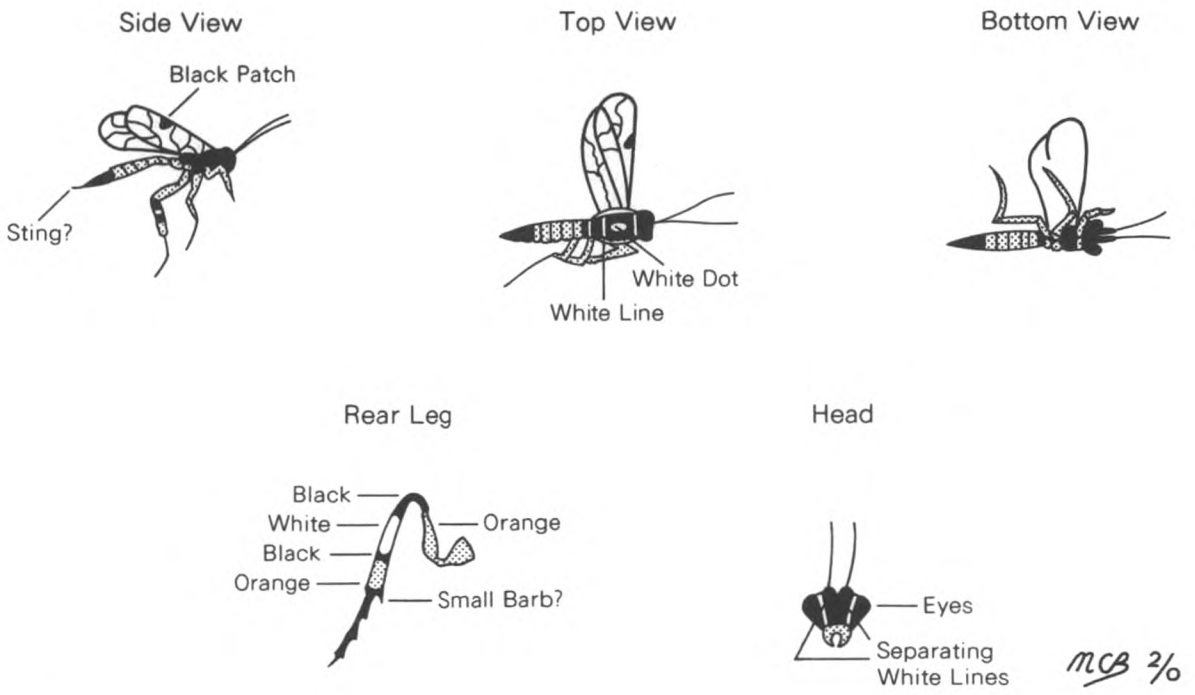
m.v. *London Victory*. Captain E. G. Kemp. At anchor off Constanza. Observer: Mr M. C. Blake, 2nd Officer.

11–12 July 1984. During this period the vessel, while at anchor, was inundated with various flying insects ranging from moths, ladybirds (mating) and flies to the insect depicted in the sketches.

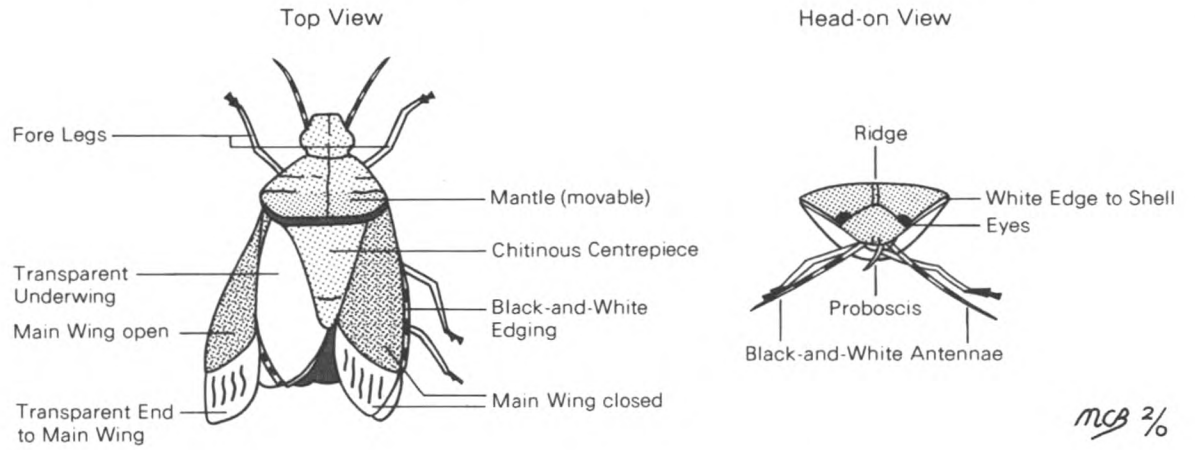
This type of insect was one of the most common. The particular specimen (about average size) had a body length of 6 mm with 4–mm antennae. The wingspan was approximately 12 mm, each wing being about 5 mm from root to tip. The rear legs—the most powerful of the three sets—were 6 mm long.

The insect had an ant-like head with two streaks of white clearly separating the eyes from the rest of the head. The jaws and mandibles were an off-white/orange colour. The black body was relieved by a white dot and line on top and transparent patches around the wings. The wings were transparent, with thin veins and a distinct patch of black on each set, as shown. Most of the legs were orange in colour overall, except the rear set, the coloration of which was as indicated in the sketch.

None of the various insects were seen to attack one another. Obviously, this is a common insect in the area, but no-one on board was quite sure of its identity.



Also seen whilst the vessel was at anchor at Constanza was the beetle shown in the lower sketch. It was approximately 13 mm in length with 5-mm antennae. Coloration was generally a mauve on the back, with a mottled brown centre and a pepper-coloured underside. There was a black-and-white edging round the



back, and the antennae and bottom segments of the legs were of the same pattern. Tucked underneath there was a large proboscis.

The two sets of rear legs were located together about half-way down the body. The forelegs were situated just behind the head. Generally only the rear legs were used for movement, and the insect proved to be a very quick and agile climber, though it was not so keen on descending.

The wings were the most fascinating feature. The outer wings were hinged, the pivot being on the outside. Underneath was another set of transparent wings, though it was not possible to see their pivoting point. To move the outer wings, the mantle moved forward. When closed, the appearance was that of a reasonably hard shell—an obvious defence mechanism as flying did not seem

to be its favourite pastime. This was the only specimen seen at the time despite the presence of a considerable amount of insects, although their number was dwindling from that of the preceding days.

Weather during period: dry bulb 16·0 °C (night) to 28° (day), wind NW, force 3, cloudy with occasional rain showers on the 11th. (Note that the NW'ly wind is an offshore wind.)

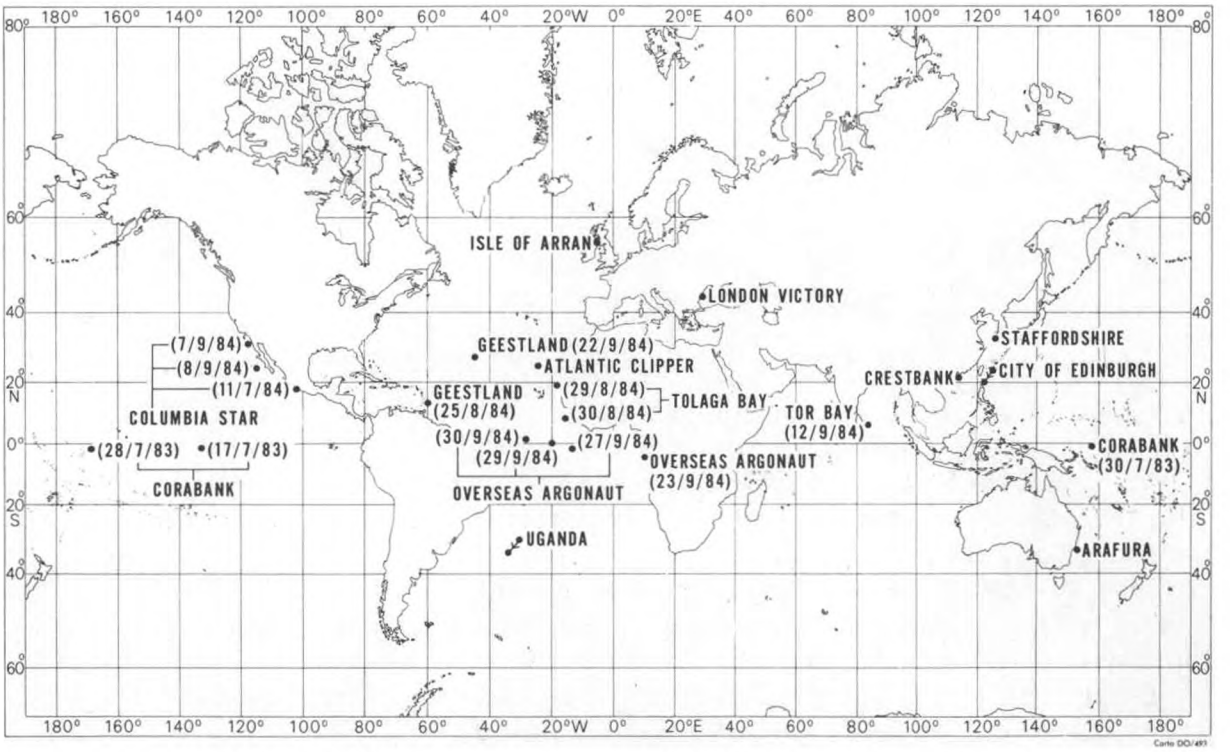
Position of ship: 44° 09′N, 28° 49′E.

Note 1. Dr M. G. Fitton, of the Department of Entomology, British Museum (Natural History), comments as follows:

'The insect described and illustrated is almost certainly an ichneumon-fly of the tribe Pimplini. Although the description is full and accurate I have not been able to tie up all the details with any of the species I know from this area.

'Ichneumon-flies (family Ichneumonidae) are a large group (there are more than 2000 species in Britain) related to ants, bees and wasps. Members of the tribe Pimplini are parasitic in the pupae of moths and butterflies. The "sting" is the ovipositor, used to pierce and lay an egg in the host. The adults are relatively strong fliers and have sometimes been taken on ships many miles from land.'

Note 2. Dr W. J. Knight, Head of the Hemiptera B Section of the Department of Entomology, British Museum (Natural History), states that the beetle was a shield-bug, probably *Dolycoris baccarum* (L.).



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

BIOLUMINESCENCE

North Atlantic Ocean

s.v. *Atlantic Clipper*. Captain A. N. Whinton. West Indies to Plymouth. Observers: Mr J. Allen, Sailing Master and Mr T. W. Leary, 2nd Officer.

17 September 1984, 2300 GMT. Large (15–20 cm diameter) lumps of circular, pale-green bioluminescence of very bright intensity where seen over the transom stern of the vessel. Some 'lumps', being caught in the turbulence of the wake, would stay with the ship for periods lasting up to 10 seconds. The brighter lumps would light up an area of diameter 1·2 m. The actual lump at the nucleus would not disintegrate, pointing to the fact of its being one organism only. Secondary bioluminescence of a more common type, of the same colour but only a couple of millimetres across, was observed at the same time. The vessel had no engines, generators, radar, echo sounder or VHF in operation at the time. The large lumps would not fade until they were 30–40 metres astern of the vessel. The half-moon was low on the horizon.

Position of ship: 24° 36′N, 25° 00′W.

Note. Dr Peter J. Herring, of the Institute of Oceanographic Sciences, comments as follows:

'The impressive display could have been large jellyfish but I suspect that small Pyrosoma were more likely to have been responsible. These colonial sea-squirts produce just such a long glow when disturbed in the wake and, although they are really cylindrical in shape, would appear as circular patches of light if they were below the surface. Reports from sailing vessels are always of particular interest because the observations are not induced by engine vibrations etc.'

STELLAR SCINTILLATION

Equatorial Eastern Atlantic

m.v. *Overseas Argonaut*. Captain T. S. Nurcombe. Djeno to St Croix (Virgin Islands). Observers: Mr M. C. Littlewood, 2nd Officer and Mr R. F. Smith, Radio Officer.

27–29 September 1984. Between 1950 and 2015 GMT on the 27th, both Arcturus and Venus were observed to be scintillating. The former (altitude 27°, azimuth 290°), was showing the colours red, green, blue, yellow, and white at about half-second intervals and a magnitude of 0·2. Venus (altitude 17°, azimuth 200°), was giving a steady yellowish light. The magnitude of the planet was −3·3.

Between 2000 and 2100 GMT on the 28th, all stars up to the altitude of approximately 48° were observed to be scintillating, generally blue/white, but the brighter stars exhibited the same colours as in the previous day's report and flashed at the same rate. Most of the stars were visible to the naked eye but very faint ones were viewed through a sextant with six-fold magnification. The colours were most apparent at lower altitudes, the maximum effect being in a band of altitude 25–15°, after which they tended to fade into a dark red/brown, and the rate decreased to about once per second. Mars and Jupiter did not show any signs of scintillation but were at an altitude of 50°. Venus, however, started to scintillate at an altitude of about 4°, being yellow and flashing at the rate of about once per second. As it continued to set, the planet became red, yellow and then orange, the most noticeable effect being at 2° altitude, and then became pale brown, eventually disappearing from view at 0·1° altitude.

From 0500 to 0600 GMT on the 29th, stars were visible all round the horizon at an altitude above 8°, and all were scintillating. They were mostly blue/white but the brighter stars below about 27° altitude were coloured. All the major stars

in the constellations of Orion, Taurus and Canis Major (of which Orion was at the zenith), scintillated blue/white at a rate of about once a second.

Position of ship on the 27th: 01° 00'S, 12° 34'W.

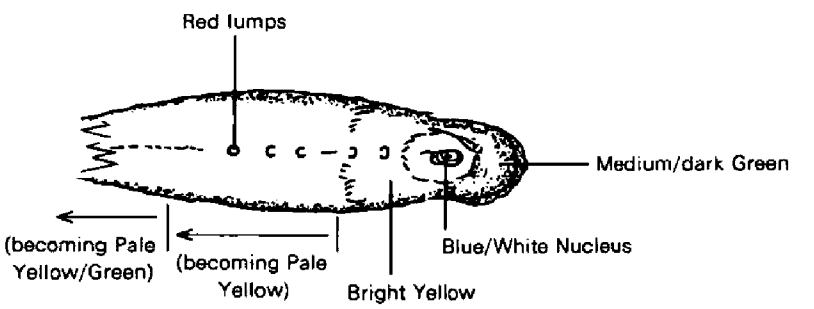
Position of ship on the 29th: 00° 01'N, 19° 36'W.

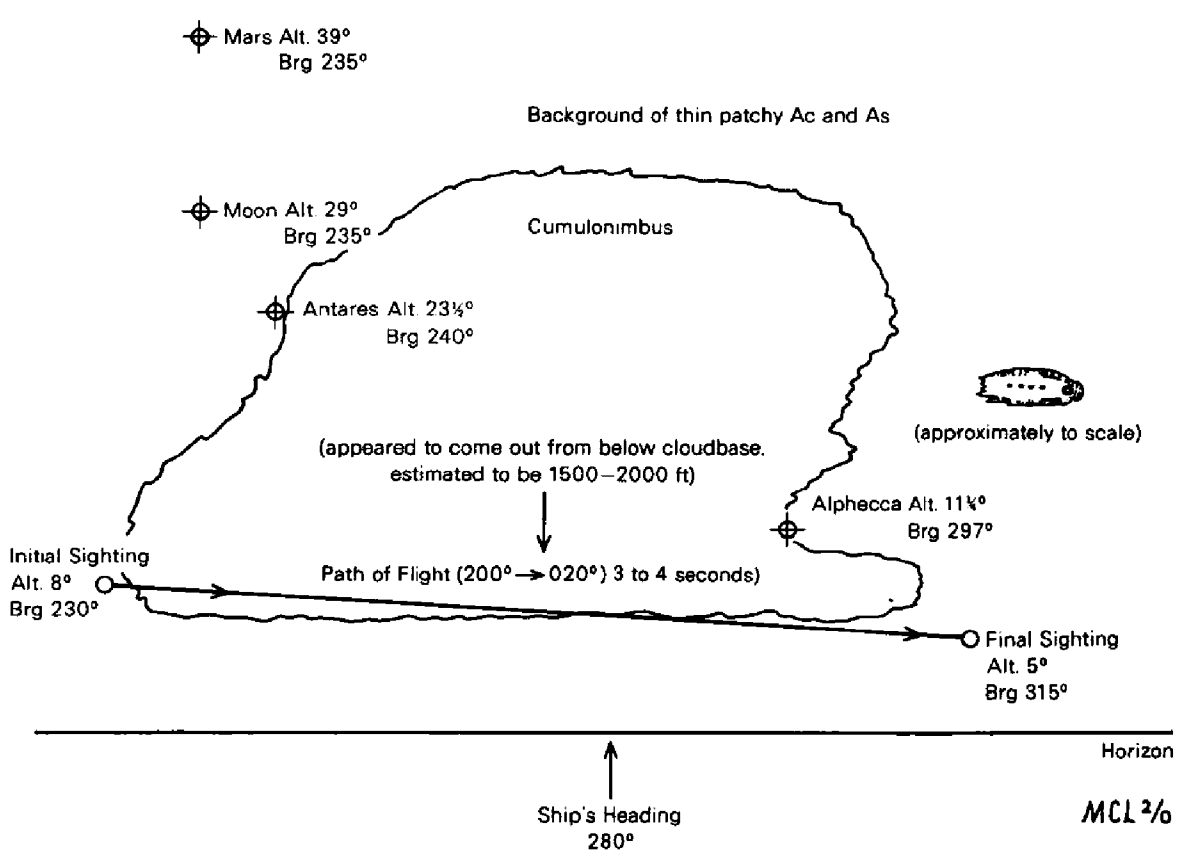
METEOR

Equatorial Eastern Atlantic

m.v. *Overseas Argonaut*. Captain T. S. Nurcombe. Djeno to St Croix (Virgin Islands). Observers: Mr M. C. Littlewood, 2nd Officer and Mr W. Carmody, 3rd Officer.

30 September 1984. At 2203 GMT, a meteor was sighted close to the vessel. It first became visible at an altitude of about 8°, bearing 230°, passed through the cumulonimbus and then appeared to break through the cloudbase, which was estimated to be at 1500–2000 ft, on a bearing of 275°. The meteor finally disappeared from view quite suddenly at an altitude of 5°, bearing 315°. The





cumulonimbus was 5–8 n. mile away from the ship; during the first stage, the light emitted appeared to be occulted slightly but after the reappearance at the bottom of the cloud it was much steadier.

A bright bluish white nucleus consisting of several lumps of material (as seen through binoculars), was observed; its size was comparable to that of an eliptical shape one-quarter the size of the full moon. It was much brighter than Venus, which on that evening had a brightness of $-3{\cdot}4$, but was less bright than the half-moon. The sketch shows that the nucleus consisted of a medium-green head, which was glowing, as was the whole bolide. Behind the nucleus, it was yellow, gradually becoming pale yellow and then pale green towards the end of the tail. From the nucleus, there was a trail of red lumps that lost speed rather rapidly and fell in a parabolic arc, but disappeared before leaving the yellowish green glow, (this was similar to the debris ejected from a Guy Fawkes rocket near the end of its powered flight).

There was no afterglow or trail visible after the event, nor were any sounds heard, and the whole sighting lasted about 3–4 seconds.

Weather conditions: wind SE'ly, force 3–4, cloud 3 oktas cumulonimbus and 1 okta thin patchy altocumulus.

Course of ship 280°, speed 12 knots.

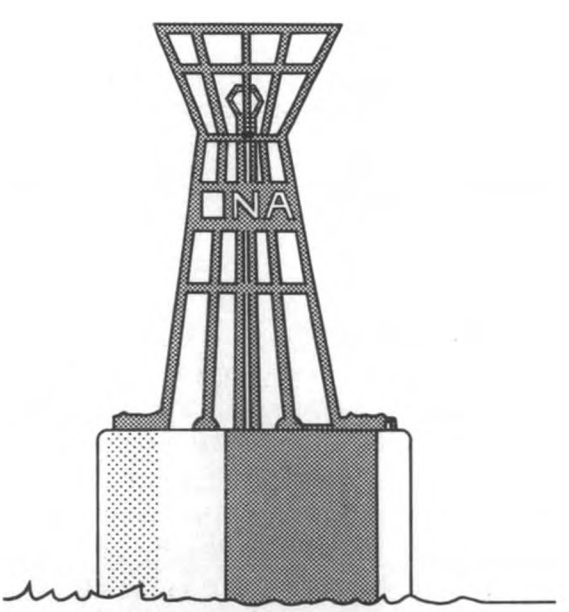
Position of ship: 01° 15'N, 28° 23'W.

CHANNEL BUOY ADRIFT

North Atlantic Ocean

m.v. *Geestland*. Captain D. N. Boon. Barry to Port Castries. Observers: the Master and Mr M. Tomlinson, Chief Officer.

22 August 1984. At 1057 GMT an unlit black-and-white can buoy with lattice upper structure was sighted. The identification letters NA preceded by a white



square appeared on the lattice and a fog horn was sounding. A warning was broadcast to all ships. If the origin of the buoy could be discovered this would throw some light on the prevailing ocean current.

Position of ship: 27° 41'N, 45° 10'W.

551.509.5

Short-range Weather Forecasting—a Current Assessment*

By A. Woodroffe
(Meteorological Office, Bracknell)

The origins of the Meteorological Office stemmed from a need to provide a storm-warning service for shipping (Burton 1983, 1984). Nowadays the work of the Office embraces a wide variety of activities, ranging from basic scientific research into the physics and dynamics of the atmosphere to the provision of specialized advice or information to individual customers. Despite this broad spectrum of interests, it is still the short-range weather forecast for 24 hours or so ahead that is of chief interest to the majority of people; indeed the accuracy of the forecasts provided on television, radio and in the newspapers is the main criterion by which the majority of the public judge the performance and value of the Office.

As with most predictions, weather forecasts can and occasionally do go astray and one of the purposes of this article is to examine some of the reasons for these errors. At the same time, it must be recognized that in recent years there have been significant advances in the tools and information available to the forecaster. Besides the improvements in the quantity and quality of data from satellites and radar, the most notable advance has been the development of more sophisticated and accurate numerical modes of the atmosphere. In particular, the introduction of a global 15-level model of the atmosphere in September 1982 has undoubtedly had a beneficial effect and some aspects of its performance are covered below.

The forecasting process

The forecasting of the weather for 24 hours or so ahead involves three operations on the part of the forecaster:

(i) The analysis of the existing weather situation.
(ii) Forecasting the surface pressure pattern and frontal positions (the 'prebaratic').
(iii) Interpreting the prebaratic in terms of weather.

Because of the dynamical interactions between different weather systems, and their rapid movement on some occasions, it is necessary to take account of conditions over a wide area, even when forecasting for the United Kingdom just 24 hours ahead. In the Central Forecasting Office (CFO) at Bracknell, the main surface analysis is drawn every six hours for an area covering much of the North Atlantic, Europe, North America and Arctic regions. Corresponding charts for selected levels in the upper atmosphere are constructed every 12 hours. A wholly successful weather forecast will depend on the accuracy of each of the three stages in the forecasting process, although the relationship is by no means a simple one. Relatively small errors in the prebaratic can sometimes have a catastrophic effect on the forecast, whilst in other situations significant errors may have little or no impact. Numerical models now play an important role in the construction of the prebaratic and, more selectively, in forecasting the distribution and intensity of precipitation.

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The general forecast guidance for the whole of the United Kingdom is contained within the so-called 'Synoptic Reviews' which are normally issued by CFO four times a day. These provide the framework for the local forecasts which are prepared by the various outstations scattered throughout the country and also form the basis for the national forecasts presented on television and radio. The Synoptic Reviews are routinely checked to determine those occasions when the guidance has been seriously in error and a summary of the main types of error for the period 1981–83 is given in Table 1.

Table 1—Causes of major errors in Synoptic Reviews 1981–83

TYPE OF ERROR	NUMBER OF CASES	PERCENTAGE OF OCCASIONS
Rain—timing error 6 hours or more	109	5·0
Rain—seriously underestimated	76	3·5
Widespread showers/thunderstorms underestimated	50	2·3
Temperature—major error	27	1·2
Widespread showers/thunderstorms overestimated	18	0·8
Rain—seriously overestimated	17	0·8
Snow—seriously underestimated	17	0·8
Severe gales underestimated	12	0·5

N.B. Table 1 only lists types of error which occurred 10 times or more.

Table 1 shows that the most important single cause of major errors was a failure to forecast correctly the timing of onset or cessation of rain, despite the fact that a six-hour timing error represents a fairly generous tolerance (many members of the public would regard an error of three or four hours as a bad forecast if it meant the difference between a dry afternoon and a wet one). This result is probably in accord with the experience of most forecasters who know only too well the difficulty of accurate timing 24 hours ahead, even when the overall sequence of weather may be relatively straightforward. This is, however, just one of a whole range of problems that the forecaster has to solve and these will be considered in more detail below.

The forecasting problem

The three main steps in the preparation of a forecast were identified above and it is interesting to consider the effect that each stage may have on the accuracy of the forecast and the impact of recent advances in areas such as numerical modelling and satellite technology.

(i) The analysis

One of the main problems facing the forecaster in the British Isles is that most of our weather originates over the vast expanse of the North Atlantic Ocean. On occasions there can be considerable uncertainty over the correct surface analysis, depending on the number, distribution and reliability of observations from ships. There may be a total absence of reports from an area where a depression is located, making its depth—or possibly even its existence—uncertain, with obvious repercussions on the confidence that can be placed in any forecast. Nowadays with good quality satellite pictures, it is often possible to deduce the position of a depression centre fairly reliably from the cloud patterns and even to gain a qualitative idea of its intensity.

There are still, however, many occasions when serious doubt exists over the details of the analysis, the classic example being the case of the Fastnet storm

in 1979 (Woodroffe 1981). At midnight GMT on 13 August 1979, 24 hours before the storm reached its peak, there were no observations at all in the crucial area of the central North Atlantic where the depression was located. The nearest ship was about 350 n. mile from the estimated position of the low centre, giving little clue to its depth or likely behaviour. These uncertainties over the correct analysis persisted throughout the following day, culminating in the problems encountered in the analysis of the depression at 1800 GMT when it was approaching southwest Ireland. Figure 1 shows the observations which were available to the forecaster when he first came to draw the chart. The three ships nearest the low centre with call-signs D5M1, KGCW and UITO reported coded pressure values 985, 992, and 038 respectively. These numbers should represent pressures of 998·5, 999·2 and 1003·8 mb. Unfortunately, the coded pressures all appear to have been in error, the first two suggesting that the low was still a relatively modest feature with central pressure only a little below 1000 mb. Although the chart was subsequently re-analysed along the lines of Figure 1, there is little

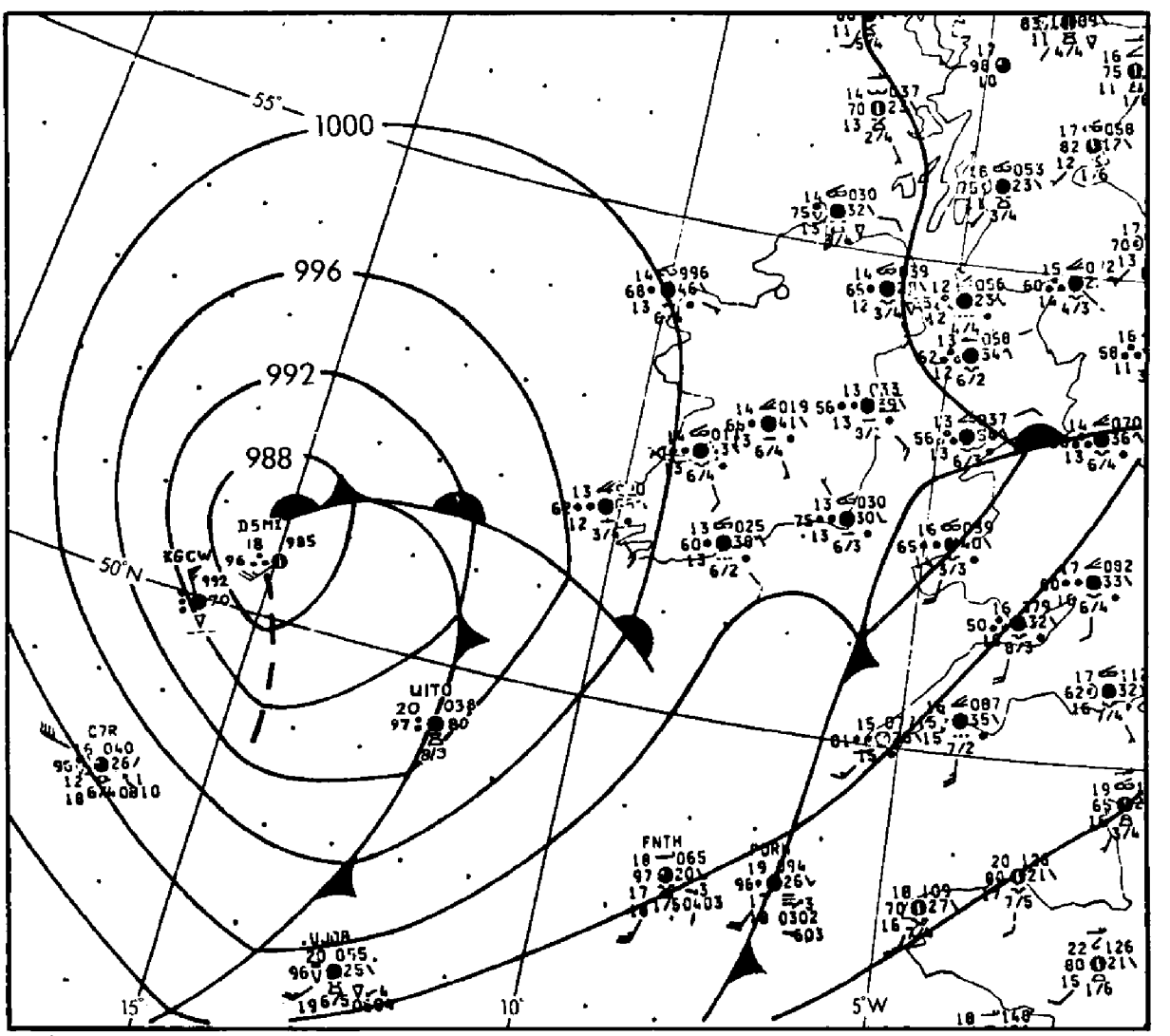


Figure 1. Final surface analysis for 18 GMT on 13 August 1979

doubt that these analysis problems delayed the recognition of this exceptional case of cyclonic development.

Similar uncertainties often exist in the detail of the upper-air patterns and also in the definitions of fronts and precipitation areas. Even satellite pictures do not provide a complete answer; for example, all forecasters are aware of the difficulty of trying to locate a warm front (or its associated rain area) with much precision when relying on infra-red imagery at night, since the pictures are dominated by the mass of thin, high cloud rather than the thick, medium-level

rain-bearing clouds. This element of uncertainty in an analysed frontal position or in the extent of a precipitation area may lead to a poor forecast as far as the user is concerned. Consider, for example, a simple situation where development is negligible and we are primarily concerned with the movement of the weather systems. An error of 100 n. mile in defining the initial state (not unlikely in areas where observations are sparse) could result in a four hour timing error for a front moving at a typical speed of 25 knots, or may make all the difference between an area of snow just skirting the south coast of England or enveloping much of southern Britain. The numerical models are subject to the same constraints; in fact human intervention is still needed to achieve the best possible analyses for the model, using the skill and experience of the forecaster to recognize deficiencies in the machine analysis, identify erroneous observations and to take account of qualitative information (e.g. from satellite pictures).

(ii) The prebaratic

The accuracy of the prebaratic will reflect both the uncertainties in the analysis discussed above, together with the errors in forecasting the movement and development of the weather systems. There has been a significant improvement in recent years in the accuracy of the forecasts of the surface pressure pattern, largely through the use of improved numerical models. The numerical guidance forms the basis of the prebaratic but the forecaster may make amendments, for example to counteract deficiencies in the analysis or to accommodate developments which do not appear to have been handled correctly by the model. For many years the accuracy of the CFO 24-hour prebaratics in the vicinity of the British Isles has been routinely checked by comparing the forecast heights of the 1000 mb pressure surface with the verifying analysis over a 6×8 grid of points. The geostrophic wind can also be easily deduced from the pressure distribution and in Figure 2 the root mean square (RMS) height and vector wind errors are

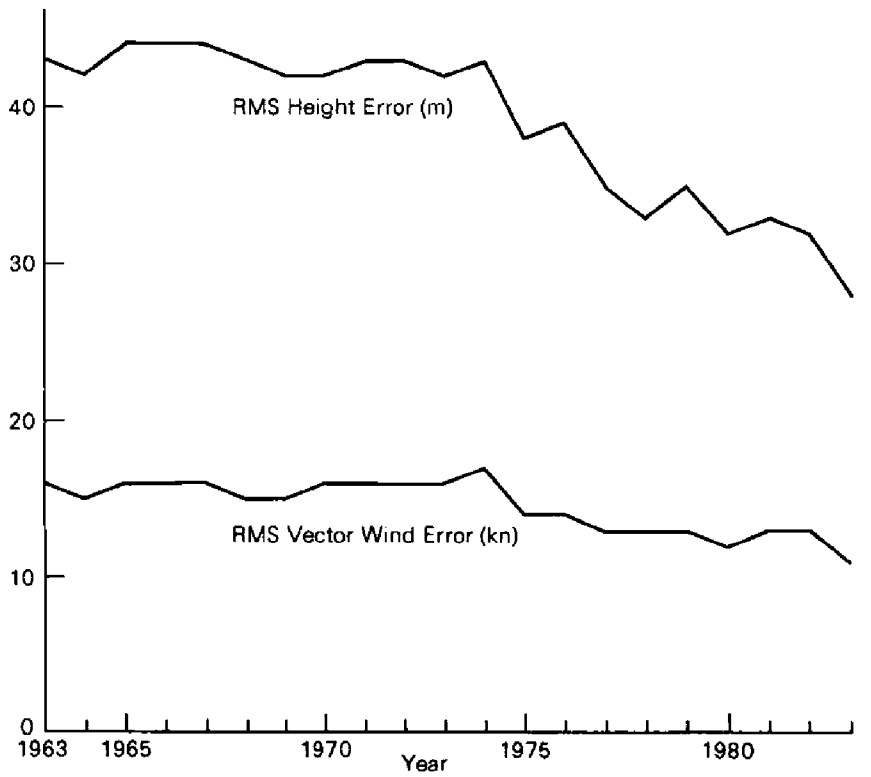


Figure 2. Verification of CFO 24-hour prebaratics for 00 GMT, 1963–83

summarized on an annual basis for the period 1963–83. It is clear from the graphs that there has been a significant improvement in accuracy over the years.

Indeed it is rare these days for the model to indicate a totally wrong development over 24 hours—usually we are concerned with errors of detail in the timing or intensity of features.

As far as the all-important fronts are concerned, these are not forecast explicitly by the model but have to be inferred from the thermal patterns. At one time the numerically predicted thickness between the 1000 and 500 mb levels (a measure of the mean temperature of the layer) was the standard tool for determining the location and likely activity on fronts. In recent years the emphasis has changed to use of the 850 mb wet-bulb potential temperature, which has proved a more sensitive and reliable indicator. As with the pressure patterns, the numerical guidance may be modified by the forecaster in the light of the more traditional forecasting methods (e.g. based on pressure gradients) and by extrapolation of current trends.

Table 2 summarizes the errors in the forecast positions of fronts near the British Isles, inferred directly from the model output, during the period November 1983 to February 1984. The results are encouraging, showing that

Table 2—Error distribution in 24-hour forecast position of fronts (inferred from model) November 1983–February 1984

Error in position of front (n mile)		Type of front			
		Warm	Cold	Occlusion	All
	200 or more	0	0	0	0
forecast	150 to 200	1	1	0	2
too	100 to 150	2	3	3	8
fast	50 to 100	4	11	8	23
	Error 50 n. mile or less	27	38	23	88
forecast	50 to 100	1	3	0	4
too	100 to 150	1	1	1	3
slow	150 to 200	0	0	0	0
	200 or more	0	0	1	1
Indeterminate—overall development mishandled					4

approximately two-thirds of all fronts were forecast to an accuracy of 50 n. mile or better, with a slight bias towards too rapid movement. Indeed such accuracy may sometimes appear difficult to reconcile with the uncertainties at the analysis stage but must reflect the three-dimensional detail that can be extracted and preserved in the continuous analysis-forecast cycle of the model (which also makes use of data from intermediate synoptic hours, asynopic observations from aircraft and satellites and the forecaster's intervention to correct any obvious deficiencies in the analysis).

A notable aspect of the new 15-level model has been its excellent handling of developing depressions, particularly the explosive deepening sometimes observed. An example is shown in Figure 3. At midnight GMT on 2 January 1984, the depression was situated in mid-Atlantic with an estimated central pressure of 994 mb. The model consistently indicated dramatic deepening of the system as it moved north-eastwards, and the CFO surface forecast (Figure 3a) followed this guidance closely (but deepening the low even more than the model by 6 mb!). As a result excellent warning was given of the severe gales which swept most parts of the British Isles (giving blizzard conditions in some northern areas). It will be noticed that both the main depression centre and the

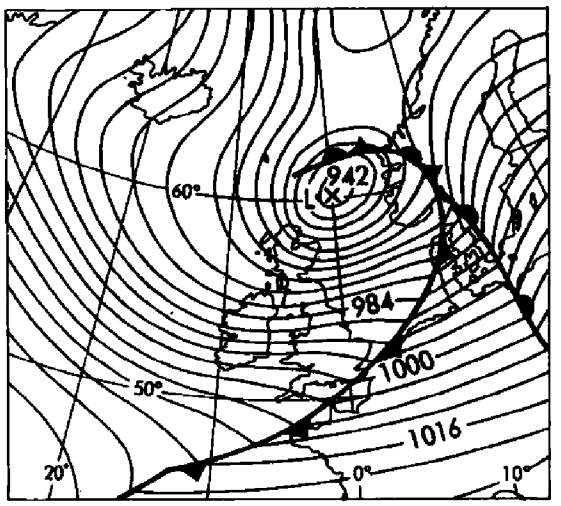


Figure 3a. CFO 24-hour surface forecast, verifying time (vt) 00 GMT, 3 January 1984

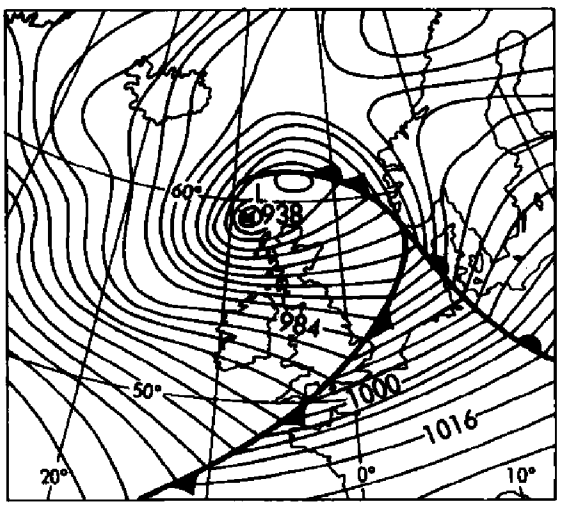


Figure 3b. CFO surface analysis for 00 GMT, 3 January 1984

fronts were brought eastwards a little too quickly, but in a fast-moving situation this had little impact on the accuracy of the forecast. The forecasters in CFO now have considerable confidence in the overall guidance from the model when major developments of this type are predicted, thereby facilitating the issue of gale and storm warnings for longer periods ahead.

Slow-moving fronts, especially when there is wave development, can prove one of the most difficult situations that the forecaster has to deal with. A typical example (13 October 1983) is shown in Figure 4. At first glance the prebaratic appears very good with the general flow pattern over the British Isles well represented with a reasonable attempt at positioning the waving cold front. In

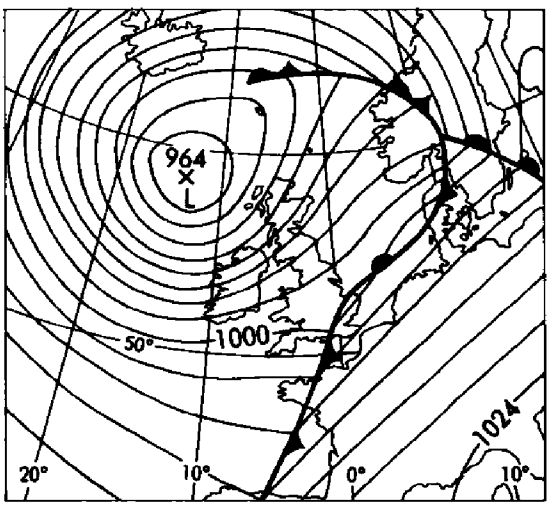


Figure 4a. CFO 24-hour surface forecast, vt 12 GMT, 13 October 1983

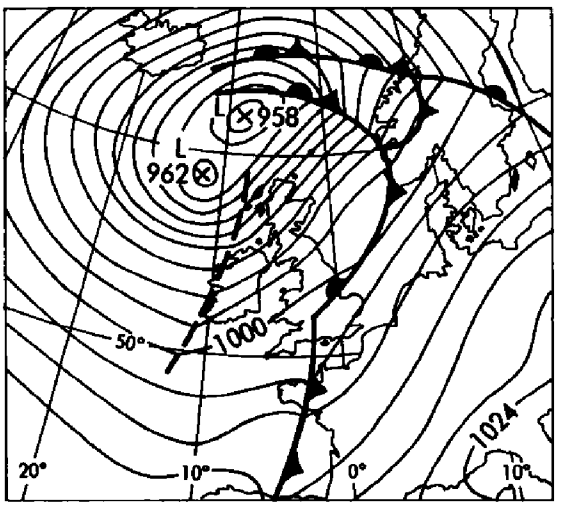


Figure 4b. CFO surface analysis for 12 GMT, 13 October 1983

fact nowhere did the error in the frontal position exceed 60 n. mile, a satisfactory estimate when one remembers that the front had travelled over 600 n. mile during the preceding 24 hours before slowing down. Likewise, the wave had originated over 1000 n. mile away in the region of the Azores on the previous day, so that the error of 100 n. mile in the forecast represents only a small percentage error in its movement. Yet these minor discrepancies were sufficient to spoil the forecast for much of East Anglia and south-east England. The slightly slower frontal movement meant that many of these south-eastern areas enjoyed a dry, bright morning on the 13th followed by a wet afternoon, although the rain did not reach the east coast until quite late in the day. In comparison,

the forecast had been for cloudy weather with outbreaks of rain followed by brighter weather with some showers spreading slowly eastwards during the afternoon, reaching the east coast towards evening. In other words the weather for the morning and afternoon had been largely transposed—rightly regarded as a poor forecast in the eyes of the general public.

Relatively minor errors in handling synoptic features can be crucial when there is the threat of snow. Figure 5 shows and example from the severe winter of 1981–82 when the outlook for two or three days had indicated the likelihood of heavy snowfall over southern Britain. The 24-hour forecast (Figure 5a)

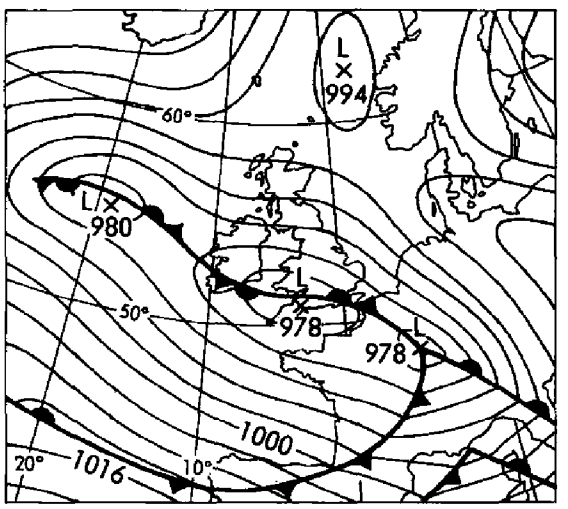


Figure 5a. CFO 24-hour surface forecast, vt 00 GMT, 14 December 1981

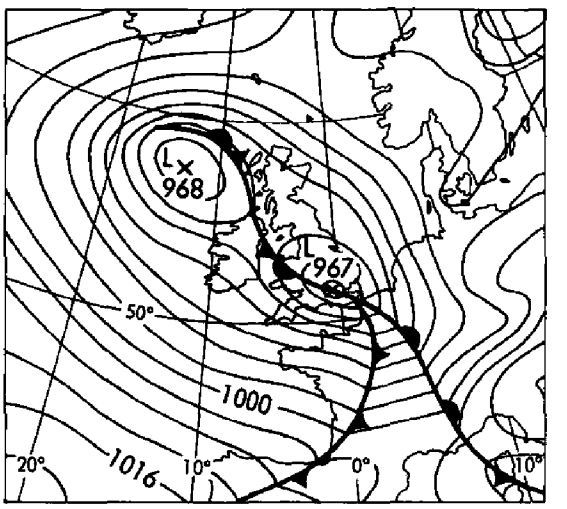
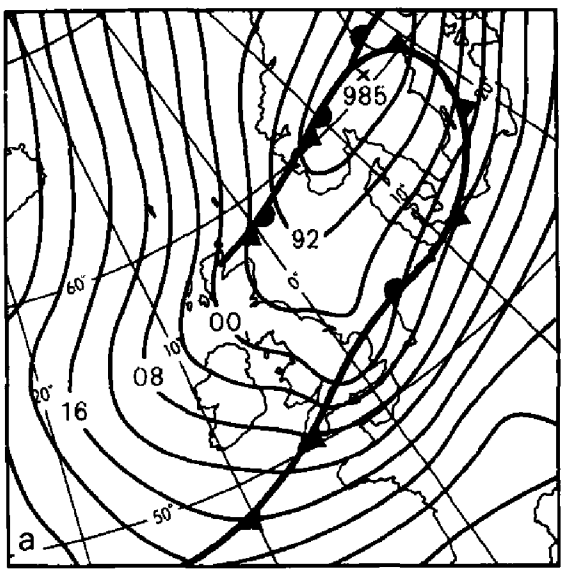


Figure 5b. CFO surface analysis for 00 GMT, 14 December 1981

followed the same lines, indicating blizzard conditions spreading to many southern and central parts of Britain, turning to rain in parts of south-west England and other sothernmost counties. For much of the day this forecast was justified but during the evening it began to go astray in the south. It can be seen from Figure 5b that the low west of Ireland remained a deeper feature than had been expected and the resultant 'dumb-belling' effect pushed the centre over southern England, and the associated occlusion, slightly further north than forecast. The resultant incursion of milder air and the change of precipitation to rain across most southern areas immediately prompted queries from some of the London newspapers as to what had gone wrong. In this case it was not difficult to persuade them of the close proximity of severe weather when Her Majesty The Queen became stranded at an hotel in the Cotswolds! On such occasions, when weather is dependent on detail of this scale, it is difficult to see how errors could be completely eliminated, particularly within the limitations of the existing observational network.

In those instances when the model fails to reflect the changes in the weather pattern adequately, the forecaster may be able to make significant improvements to the numerical product, as demonstrated by the example in Figure 6. Here the forecaster concluded that the extending upper trough would result in more pronounced development of the flat wave depression than suggested by the model in Figure 6a. Comparison of Figures 6b and 6c shows that the extra deepening and slower movement of the depression on the CFO forecast indeed resulted in a worthwhile improvement to the numerical guidance. Of course the forecaster is not always able to anticipate such deficiencies, particularly on those relatively rare occasions when the model gets the overall development wrong. Figure 7 shows a case where a major cyclonic development was mishandled. The CFO prebaratic (Figure 7a) followed the general lines of the numercial guidance and moved the deepening wave depression quickly east-north-east, bringing a showery northerly airstream over the British Isles. In the event the



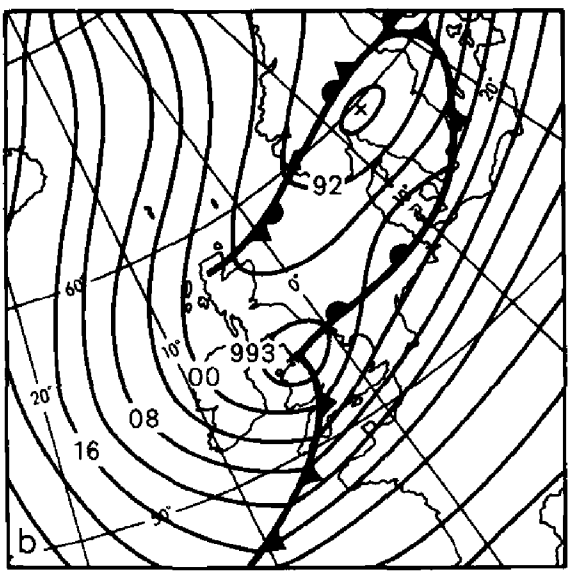
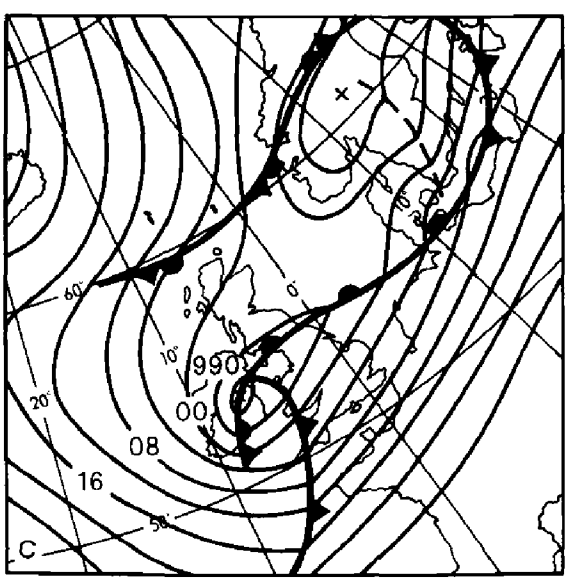


Figure 6. (a) Fine-mesh model 24-hour surface forecast, vt 00 GMT, 9 December 1983.
(b) CFO 24-hour surface forecast, vt 00 GMT, 9 December 1983.
(c) CFO surface analysis for 00 GMT, 9 December 1983



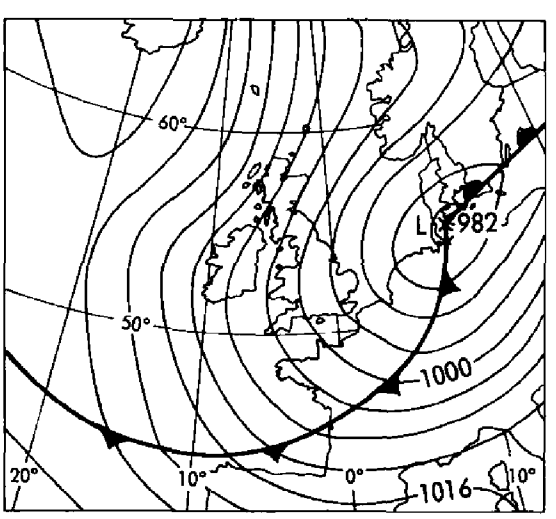


Figure 7a. CFO 24-hour surface forecast, vt 12 GMT, 9 December 1983

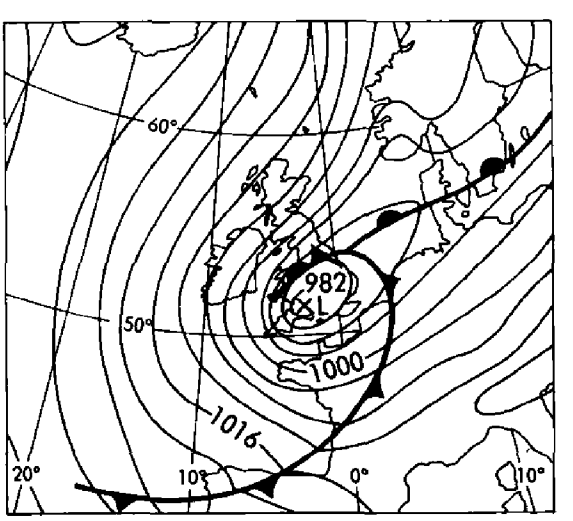


Figure 7b. CFO surface analysis for 12 GMT, 9 December 1983

main low centre deepened and moved more slowly, being held back in the cold air in association with the upper vortex (and giving England and Wales a much wetter and stormier day than had been expected). The frequency of major synoptic-scale errors of this type has been steadily decreasing over the years as the quality of the numerical guidance has improved and there seems every hope that this trend will continue.

(iii) Interpretation of the prebaratic

The interpretation of the prebaratic in terms of weather is often the most difficult part of the forecasting process. Satellite and radar displays show well the complexity of the cloud and precipitation patterns, the inhomogeneity being enhanced by local effects due to topography, land–sea differences, etc. The variations are often most pronounced in convectively unstable situations where marked differences in the weather can occur over small distances—for instance, the development of showers inland on a summer afternoon whilst the upwind coastal strip enjoys unbroken sunshine. It is not just showery situations where problems arise; during the summer months, in particular, a surprisingly high proportion of fronts are associated with a distinctly patchy and variable distribution of precipitation, influenced by factors such as local instability, topography, convergence, heating effects and the like. It is not easy to describe this sort of weather satisfactorily in a short general forecast. One resorts to the use of expressions like 'outbreaks of rain, locally heavy' or 'rain in places' but it is often difficult to achieve the right balance between expressing too certain an impression of rain at a particular location and an unhelpful forecast that sounds excessively hedged. In this sort of situation, although the overall tone of a forecast may be quite satisfactory, individual experience may differ considerably from the norm.

Despite these difficulties, the numerical model can be a useful aid in assessing the general distribution and amounts of rain. It must be remembered, however, that even the fine-mesh version of the current operational model has a grid-length of about 40 n. mile, limiting the detail that can be resolved to this scale. Whilst the model rainfall predictions are often helpful, they can sometimes prove misleading for a particular area and the forecaster must exercise considerable judgement in deciding how closely to follow them. An objective measure of the

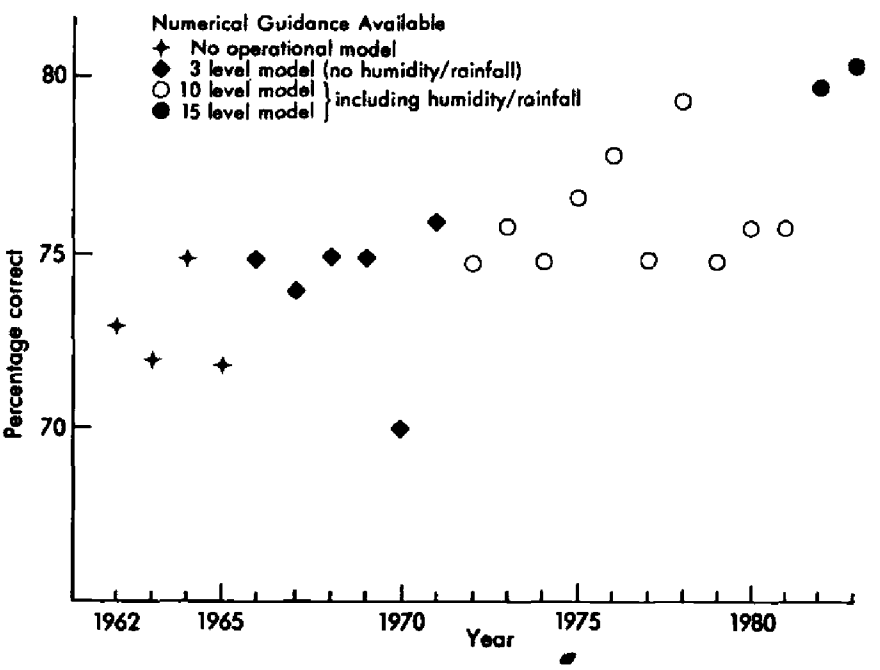


Figure 8. London precipitation forecast—verification statistics

improvement in rainfall prediction can be obtained from an analysis of the categorical forecast which the Senior Forecaster in CFO has to make each day as to whether rain will fall in the London area on the following day (as verified by the rainfall measured at Heathrow and Gatwick between 0600 and 1800 GMT). Figure 8 shows the success rate that has been achieved over the years. Such a verification scheme is open to all kinds of anomaly, especially in showery situations—for instance, the positive forecast of precipitation for 14 August 1975 was marked wrong, no rain being observed at either of the verifying stations. Yet this was the day of the so-called Hampstead storm (Keers and Westcott 1976) which produced the second highest two-hour rainfall total recorded anywhere in the British Isles, and resulted in severe flooding in north-west London. Nevertheless, the method has the merit of being objective and since the element of chance should cancel out in the long term, the encouraging trend shown in Figure 8 is thought to be real and indicative of an overall improvement in forecasting standards.

An accurate prebaratic provides no guarantee of a reliable forecast, as illustrated by the example in Figure 9. At 1200 GMT on 23 September 1983 a southerly airstream covered the British Isles (Figure 9a) but the model indicated

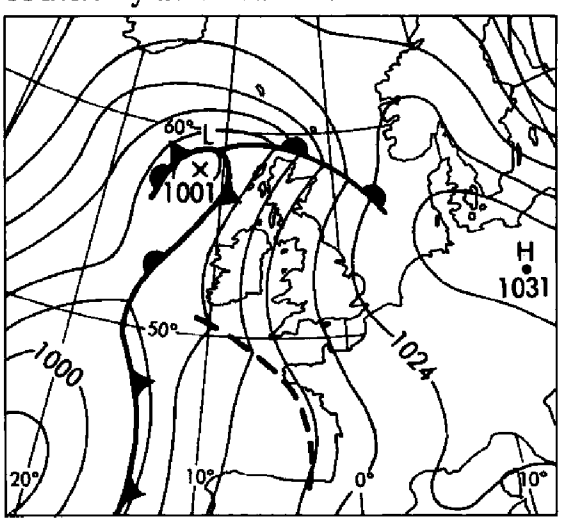


Figure 9a. CFO surface analysis for 12 GMT, 23 September 1983

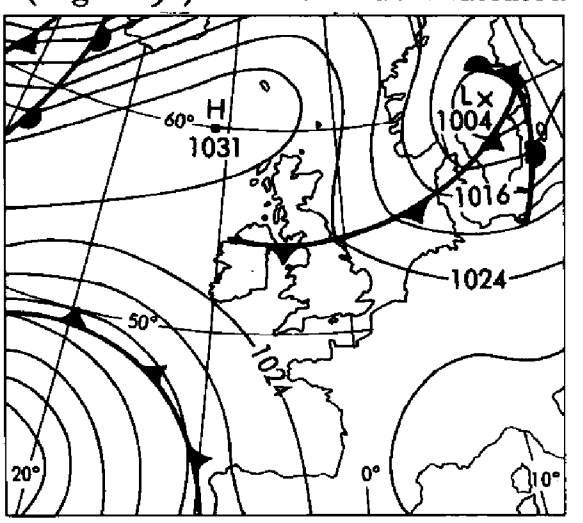


Figure 9b. CFO 24-hour surface forecast, vt 12 GMT, 24 September 1983

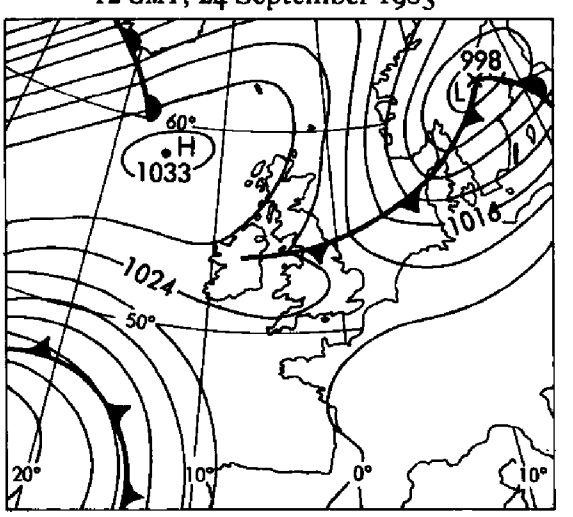


Figure 9c. CFO surface analysis for 12 GMT, 24 September 1983

a dramatic change over the ensuing 24 hours as the upper trough to the west of Ireland disrupted. The depression centre near north-west Scotland was forecast to move towards southern Scandinavia, bringing the associated cold front southwards across northern Britain as a weakening feature. Comparison of the prebaratic (Figure 9b) with the certifying analysis (Figure 9c) shows that

these changes were predicted very well. The front also weakened as expected with no more than a little rain or drizzle along it by the time it reached northern England. Over southern Britain the 24th was forecast to be dry and, although an area of instability had been noticed over Biscay, the upper flow was expected to back sufficiently to take this away to the south of Ireland. In the event, there was also sufficient advection of moisture and mid-level instability over southern Britain ahead of the upper trough to give quite widespread showers and thunderstorms, spoiling any pretensions of a good forecast for this area.

An important aspect of any forecast in cold weather is the form of precipitation, and here the model has already shown that it can provide useful guidance on the probability of snow. These probabilities are based on Boyden's method (Boyden 1964), using the forecast values of the thickness of the 1000–850 mb layer from the model, and have so far proved extremely useful. Indeed, it is almost certainly the best tool at our disposal for forecasting snow 24 hours or so ahead. At the same time it must always be remembered that conditions in the British Isles are often finely balanced and a relatively minor error in the vertical temperature profile can make all the difference between a heavy snowfall and the precipitation staying as rain. Boyden's figures show that decreasing the

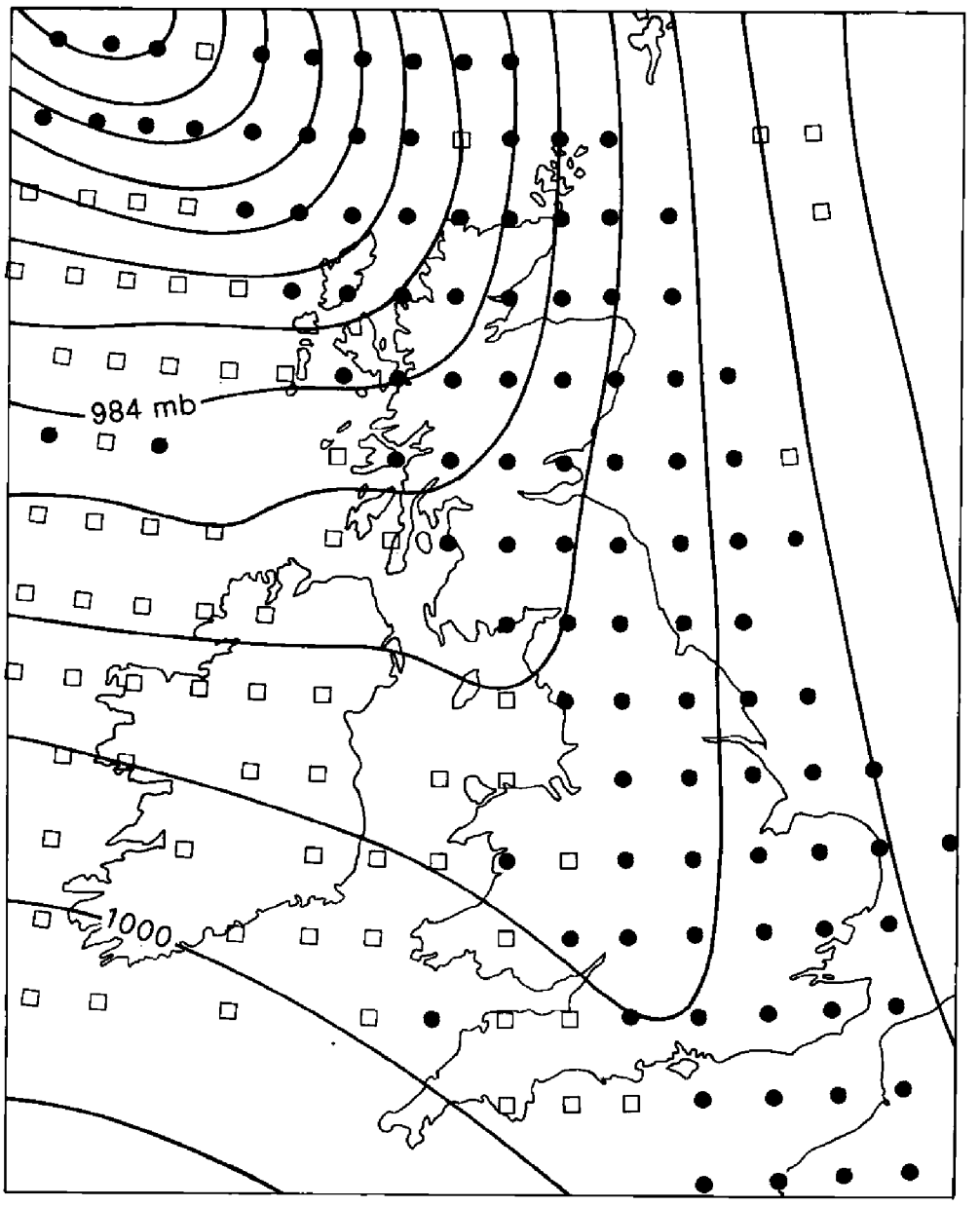


Figure 10a. Fine-mesh model 18-hour forecast, vt 06 GMT, 23 January 1984. The isobars are at 4 mb intervals. ● dynamical (frontal) precipitation, □ convective precipitation.

1000–850 mb thickness from 1303 to 1293 metres increases the probability of precipitation falling as snow from 10 per cent to 50 per cent (at MSL with pressure 1000 mb). This corresponds to a change in the mean temperature of the layer of only just over 2 C°, well within the range of errors that might be expected in a 24-hour forecast. Apart from the normal adiabatic in the atmosphere, other effects equally difficult to estimate can play an important role—for example, radiation, and cooling of the air by the precipitation itself (in turn dependent on the humidity of the air and the intensity of the precipitation). It is almost impossible for the forecaster by himself to judge quantitatively the net effect of all these complex physical processes over a 24-hour period. Therein lies the value of the model which includes these processes in its calculations: although the parametrization is relatively simple, experience shows that the results are usually fairly realistic.

As an example of the usefulness of the model, Figure 10a shows the fine-mesh model 18-hour forecast of surface pressure and precipitation verifying at 06 GMT, 23 January 1984. There was very cold air over much of the British Isles and as the trough moved eastwards it was expected that precipitation would fall as snow in some areas, particularly over northern Britain. Figure 10b shows the corresponding isopleths of snow probability (at MSL) forecast by the model, together with the observed weather. It can be seen that where the forecast probability of snow exceeded 50 per cent virtually all the precipitation was in

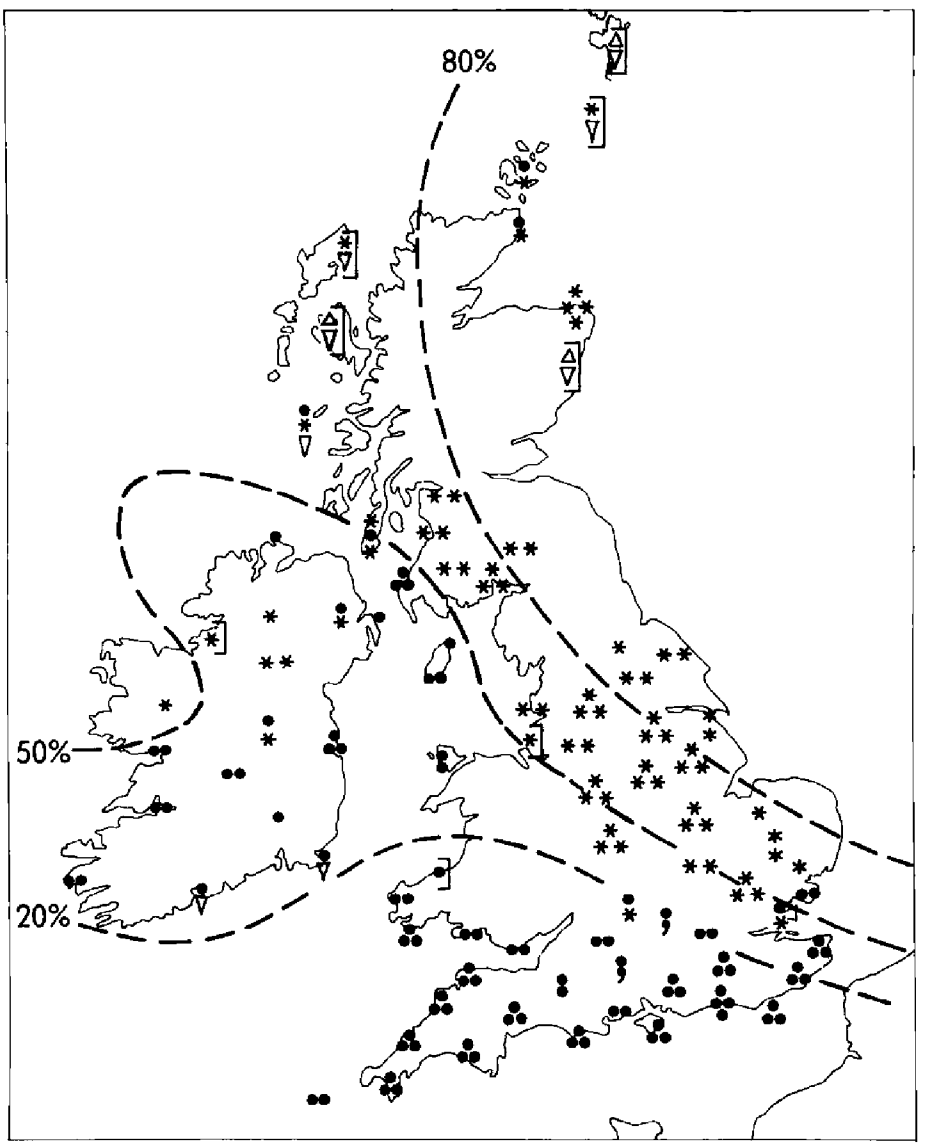


Figure 10b. Significant weather at 06 GMT on 23 January 1984, with model forecast snow probability lines.

the form of snow with a transition to rain as the probability decreased towards 20 per cent (in this transition zone most of the snow occurred well away from windward coasts). Therefore, despite the fact that the model subsequently moved the trough and associated precipitation area away too quickly eastwards, the guidance proved very helpful to the forecaster in delineating those areas likely to have significant snowfall. However, the forecaster must always bear in mind the sensitivity of snow probability to small errors in the basic parameters, and where necessary modify the numerical guidance or express an appropriate element of doubt in the forecast.

Other aspects of the weather can be equally finely balanced. Radiation fog, for example, can form quickly when the wind is light and the temperature has fallen to a critical value. If the temperature remains a degree or so higher or the wind increases by a few knots, there may be no fog at all, or just stratus.

I have attempted to give the reader a feel for the day-to-day problems which the forecaster has to face, as well as some of the advances that have undoubtedly been made in recent years. It is rare these days for the 24-hour forecast to get the overall developments completely wrong, thanks largely to the improvements in numerical weather prediction. However, the forecaster is still frequently faced with the difficult problem of making decisions on the detailed behaviour of weather systems. On occasions this is close to the limits of our predictive ability and, since the fine detail is often important for users of the forecast, probably explains why in some respects the 24-hour forecast has apparently not shown as noticeable an improvement as the two and three day products. As the Editor pointed out in the January 1984 edition of *Weather*, in the case of medium-range weather forecasting, this level of detail is neither attempted nor generally expected and the forecasts still meet the needs of the majority of users.

Further marked improvements in short-range forecasts probably await the introduction into operational use of yet finer-resolution numerical models as well as more detailed and accurate information to define the initial state of the atmosphere, particularly in areas where data are currently so sparse. Work is already in hand to meet these demands. A meso-scale model with grid-length only a little over 5 n. mile is already under development within the Meteorological Office whilst at the same time a greatly increased density of atmospheric temperature sounding data is now available from polar-orbiting satellites using HERMES (*H*igh-resolution *e*valuation of *r*adiances from *m*eteorological *s*atellites). The FRONTIERS project (Browning 1979, 1980) will provide a method of integrating data from satellites and radar to give more accurate and detailed very short period forecasts up to six hours or so ahead. There seems every reason, therefore, to be optimistic for the future!

Acknowledgements

I am grateful to my colleagues in CFO for their assistance, in particular to Mr C. R. Flood and Mr K. S. Groves who supplied Figures 8 and 6 respectively.

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Shark Tagging aboard British Weather Ships

By D. C. Rudge

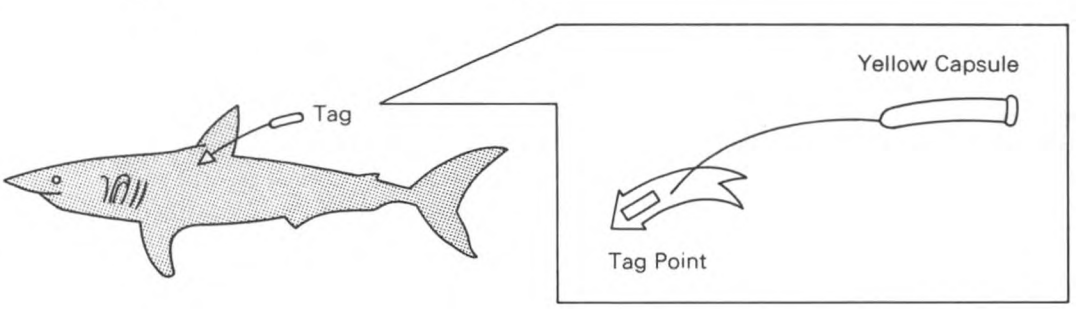
(Member of the meteorological staff aboard OWS *Starella*)

Since the mid-1970s the British weather service has run a North Atlantic weather station with various ships at a nominal position of 57° N, 20° W. The station is known as Station 'Lima' and is approximately 410 n. mile from the nearest land lying to the southeast, Eagle Island off the coast of Eire. Although the nominal position is 57° N, 20° W the station has a grid area of some 4800 square miles and a water depth which varies from 500 m to 2000 m.

Various types of fishing have been tried by the keener members of the different crews, and there have been some very good results. Squid caught by net make up the largest catches, along with saury pike and lantern fish; small blue whiting and garfish are also taken.* However, the largest fish by far to be caught are blue sharks (*Prionace glauca*). Generally these are caught on a strong handline but the author has also caught a couple on rod and line and once a 12 lb baby in a net made from an onion bag fastened to a bamboo pole.

The shark season usually starts during the third week in July and ends in late September or early October depending on the time of arrival of the autumn gales. It seems that a water temperature of 12 °C is critical as no sharks have been caught below that temperature, and the higher the sea temperature goes the more chance of catching large numbers of sharks, good weather and small swells permitting. The sizes of sharks around Lima vary from 10 lb to 200+ lb with the largest to date being 180 lb. They are accurately measured but as weighing can be difficult a formula is used to obtain a fairly accurate weight: multiplying the length in inches by the girth squared divided by 800 with slight adjustments for the condition of the shark, a reasonable weight is obtained.

Once caught the sharks are tagged as quickly as possible and then released by cutting the trace a short length from its mouth. The tag consists of a metal dart and a length of strong monofilament to which is attached a sealed capsule that contains the address to which details of the shark should be sent in the case of its recapture. The tag is placed to the side of the shark's dorsal fin with the capsule trailing free as shown in the diagram.



The tagging is part of the NOAA marine research program carried out both in the USA and also along the western European coasts as well as aboard the *Starella* and previously the *Admiral FitzRoy*.

Readers of *The Marine Observer* who catch a shark that has a tag attached should remove the capsule and read the enclosed instructions. These ask for catch details, i.e. length, weight, sex, where and when caught etc., to be sent

* See *The Marine Observer*, **XLV**, No. 249, July 1975, p.105.

to the address on the capsule. Note that NOAA tag returns with details of catch result in a reward being given, so watch out when fishing—who knows, you may be lucky.

The author's thanks are extended to Marine Superintendents past and present for their permission to take part in the program, to J. Marr and Son Ltd, Hull for allowing tagging to take place aboard the *Starella* and to all weather ship staff over the years for their help. Thanks are also due to the Ocean Weather Ship Officer for his help and to NOAA Marine Research Tagging Program for tags, traces and general assistance.

AURORA NOTES JULY TO SEPTEMBER 1984

By R. J. Livesey

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

In Table No. 1 are summarized the observations of the aurora received from mariners to date for the period concerned. I am very pleased to receive so many reports and to have such good support from the ships concerned. Many thanks for observing and recording the data for posterity. Photocopies of every ship log entry are kept by the BAA Aurora Section and are destined for storage in

Table 1—Marine Aurora Observations July to September 1984

Date	Ship	Geographical Position		Time (GMT)	Forms in Sequence
16 July ..	*Canadian Explorer*	50° 30′N,	58° 30′W	0246–0315	N, phA, pm$_2$hA, phA
27 ..	*Starella*	56° 00′N,	20° 00′W	2350–0245	qN
2 Aug. ..	*Avondyke*	54° 00′N,	33° 30′W	0140–0400	hA, RA, RA, RB, G
2 ..	*Starella*	56° 44′N,	20° 42′W	0145–0345	qN, qNA, qN
3 ..	*Starella*	56° 48′N,	20° 42′W	0145–0330	qN
3 ..	*Starella*	56° 53′N,	20° 45′W	2345–0330	qN
6 ..	*Starella*	56° 47′N,	20° 20′W	0331–0350	qN
6 ..	*Avondyke*	50° 08′N,	59° 18′W	0315–0610	G, qA, qG
12 ..	*Canadian Explorer*	50° 00′N,	60° 00′W	0104–0130	asV
12 ..	*Starella*	56° 56′N,	19° 45′W	0315–0345	qN, qpN
19 ..	*Starella*	57° 12′N,	20° 29′W	0340	qN
20 ..	*Avondyke*	45° 00′N,	65° 30′W	0300–0700	qG, G+hA, RA, qG
20 ..	*Starella*	57° 19′N,	20° 18′W	0348	qN
25 ..	*British Tamar* ..	62° 22′N,	01° 48′W	2220–0145	hA, hB, aN, aRA, aRB, pN, aN, R$_2$RA, R$_1$RA
27 ..	*Avondyke*	45° 15′N,	57° 30′W	0530–0730	qG, qhA, qRR, qG, qN
27 ..	*Avondyke*	46° 25′N,	53° 30′W	2330–0300	qG
29 ..	*Avondyke*	52° 00′N,	42° 07′W	2200–0500	qG, qhA, qV, qhA, qG
30 ..	*Cumulus*	57° 00′N,	20° 00′W	2300–0015	qhA
3 Sept. ..	*Avondyke*	58° 10′N,	14° 35′W	0001–0400	qG, RG
3 ..	*Cumulus*	57° 00′N,	20° 00′W	0045–0205	qfhG, a$_3$R$_2$R
5 ..	*Cumulus*	57° 00′N,	20° 00′W	2305–0010	hG, a$_3$R$_3$R, a$_3$m, sRA
8 ..	*Cumulus*	66° 00′N,	02° 00′E	2230–0245	a$_4$fRR, p$_2$fsR$_2$RA, qfh
17 ..	*Montarik*	68° 00′N,	07°00′E	0100–0120	ahA+hB+pN
22 ..	*Starella*	57° 00′N,	20° 00′W	2245–0447	qN, a$_3$R$_2$B, qhA, qN
23 ..	*Starella*	57° 00′N,	20° 00′W	2230–0315	a$_4$R$_2$B, qhA
23 ..	*Montarik*	72° 00′N,	11° 36′E	2000	qhA+CRR
27 ..	*Starella*	57° 00′N,	20° 00′W	2048–0128	qN, a$_4$mR$_3$B, qhA, qN
27 ..	*Cast Muskox* ..	47° 00′N,	10° 00′W	2300–0020	qRB, R$_1$R
28 ..	*Montarik*	67° 24′N,	11° 30′E	1920–2115	qHA+RR, qhA, ahB, qC
29 ..	*Starella*	57° 00′N,	20° 00′W	0445–0542	qN
29 ..	*Starella*	57° 00′N,	20° 00′W	2200–2350	qhA, qN, qhA

KEY: a=active, A=Arc, B=Band, C=Corona, f=fragmentary, G=Glow, h=homogeneous, m=multiple, N=unspecified form, p=pulsating, q=quiet, R=rayed, RR=Ray Bundle, s=striated, V=Veil.

the national aurora archives currently held by Aberdeen University. You never know when some researcher may wish to see the original record as you wrote or sketched it, so please keep on logging what you observe.

In Table No. 2 is given the distribution of aurora observations received from land and marine observers across the Atlantic from Fort McMurray in Alberta in Canada to Helsinki in Finland. The marine contribution to these records is substantial. It will be noted that the more westerly observers see the aurora later in GMT. This is because the axis of the auroral oval lies stationary in space, aligned to the sun and the magnetic pole, while the rotating earth carries the observers progressively under the oval from west to east.

Table 2—Auroral Activity reported July to September 1984

Date (Night)	Location and Number of Observers	Geomagnetic Latitude Lowest	Highest	At Storm Peak	Maximum Storm Activity Code*	Time (GMT)
15/16 July	Atlantic (1)	61	—	—	5	0246–0315
24/25	Winnipeg (1)	59	—	—	1	0426–0504
27/28	Winnipeg 'Lima' (2)	59	63	59	5	2350–0750
1/2 Aug.	Atlantic (2)	63	63	63	3	0140–0400
2/3	'Lima' (1)	63	—	—	1	0145–0330
3/4	'Lima' (1)	63	—	—	1	2345–0330
5/6	Atlantic (2)	61	63	61	2	0315–0610
10/11	Winnipeg (1)	59	—	—	1	0702–0750
11/12	Alberta, Atlantic (3)	61	64	64	6	0104–0812
14/15	Alberta (1)	64	—	—	5	0700–0900
15/16	Alberta, Winnipeg (2)	59	64	59	5	0321–0411
16/17	Alberta (1)	64	—	—	5	0500–0700
18/19	'Lima' (1)	63	—	—	1	0340
19/20	Atlantic (2)	56	63	56	3	0300–0730
23/24	Winnipeg (1)	59	—	—	1	0404–0413
24/25	Winnipeg (1)	59	—	—	5	0341–0405
25/26	Atlantic (1)	64	—	—	5	2220–0145
26/27	Atlantic, Alberta, Winnipeg (3)	56	64	59	5	0359–0730
27/28	Atlantic, Scotland, Alberta (3)	57	64	64	2	2330–0640
28/29	Scotland (1)	59	—	—	1	2215–2230
29/30	Atlantic (1)	61	—	—	2	2200–0500
30/31	'Lima' (1)	63	—	—	2	2300–0015
31 Aug./ 1 Sept.	Alberta (1)	64	—	—	6	0550–0610
2/3 Sept.	Atlantic (2)	63	63	63	5	0001–0400
3/4	Winnipeg (1)	59	—	—	5	0508–0515
4/5	Winnipeg (1)	59	—	—	5	0520–0525
5/6	'Lima' (1)	63	—	—	5	2305–0010
8/9	'Lima' (1)	63	—	—	5	2230–0245
10/11	Winnipeg (1)	59	—	—	1	0415–0430
15/16	N. Norway (1)	66	—	—	4	2125
16/17	Atlantic (1)	68	—	—	5	0100–0120
18/19	N. Norway, Winnipeg (2)	59	66	59	5	2115–0338

Table 2—(*continued*)

Date (Night)	Location and Number of Observers	Geomagnetic Latitude Lowest	Highest	At Storm Peak	Maximum Storm Activity Code*	Time (GMT)
19/20	England, Winnipeg, Alberta (3)	57	64	59	5	2030–0530
20/21	Norway (1)	60	—	—	2	1910–1925
22/23	'Lima' (1)	63	—	—	4	2245–0447
23/24	Atlantic, Alberta (3)	63	70	70	6	2000–0500
24/25	Alberta, Shetland (2)	62	64	64	2	2100–0505
25/26	Alberta (1)	64	—	—	6	0430–0445
26/27	Alberta, Winnipeg (2)	59	64	59	5	0151–0450
27/28	Alberta, Atlantic (3)	51	63	63	5	2048–0020
28/29	N. Norway, Atlantic (4)	63	66	63	5	1910–0542
29/30	N. Norway, Atlantic, Alberta (3)	63	66	64	6	2110–0600

* Storm Activity Code: 1=Glow or unspecified form, 2=Homogeneous arc or band; 3=Rayed arc or rayed band; 4=Ray bundles; 5=Active storm—moving forms, pulsations or flaming, 6=Corona structure.

In Table No. 3 is given the scoreboard in recent years for the frequency with which ships have made auroral entries in their logs as received at Bracknell. The frequency bears little relation to the actual frequency of the presence of auroral storms. It is the actual individual observations and their locations taken in conjunction with the whole range of land and marine observations integrated with magnetic, radio and solar data, which together form the basis upon which the pattern of auroral activity may be determined. To this end the marine observations are a significant contribution. To acknowledge this fact typical examples of marine observations are displayed annually at the Exhibition Meeting of the British Astronomical Association, every May.

During the period a fine example of the effects of a coronal hole developed. The sun's magnetic field is much more complex than that of the earth. The magnetic field controls the behaviour of the sun's outer atmosphere called the corona. During periods of sunspot minimum coronal holes, which tend to exist at the solar poles, may also develop in mid-solar latitudes. A coronal hole is in

Table 3—Number of Marine Auroral Observations received

	Jan.–Mar.	Apr.–June	July–Sept.	Oct.–Dec.	Annual Totals
1975	—	9	10	16	—
1976	34	10	10	17	71
1977	15	1	6	8	30
1978	9	12	10	8	39
1979	24	2	7	8	41
1980	9	9	14	7	39
1981	13	13	17	30	73
1982	16	16	19	11	62
1983	8	2	11	17	38
1984	16	7	26	—	—

reality a region of the corona in which the solar magnetic field is diminished, as a consequence of which, electrified atomic particles can escape from the sun from that region. In the normal way these particles are guided by the magnetic field and do not escape in the numbers that they do from the hole. As the sun rotates, so long as the hole remains, a stream of particles is sprayed out from the hole. If this spray encounters the earth, then it triggers off auroral and magnetic activity. Each time the sun rotates, the spray may again encounter the earth, so that the aurora repeats itself every 27 days or thereabouts. This is shown in Figure No. 1.

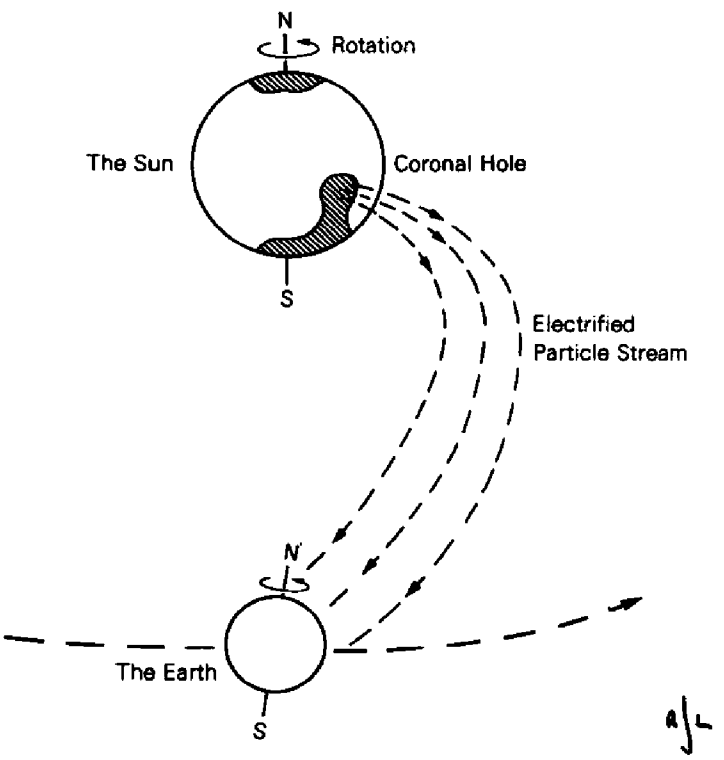


Figure 1. Coronal Hole Particle Stream (not to scale).

In August 1984 a coronal hole on the sun's southern hemisphere developed which persisted till the turn of the year. Every time the sun rotated, magnetic storms and the quiet aurorae consisting of glows and arcs, associated with this type of recurrent particle stream, were identified. In Figure No. 2 the data obtained from auroral, magnetic and radio observers have been plotted on a Bartels Diagram which sets out the information in horizontal rows of 27 days. Consequently any recurrences related to the rotation of the sun appear one below the other. Although other events of a recurrent nature were also taking place the reader will note the significant set of events which began on 31 July and recurred right down the diagram into January 1985, through at least six rotations of the sun. Even though all possible information relating to the period October–December 1984 has not yet been received, by putting together the data from many individual observers, the pattern of events has revealed itself. This is a good example of the value of co-operation obtained between ships and land observers.

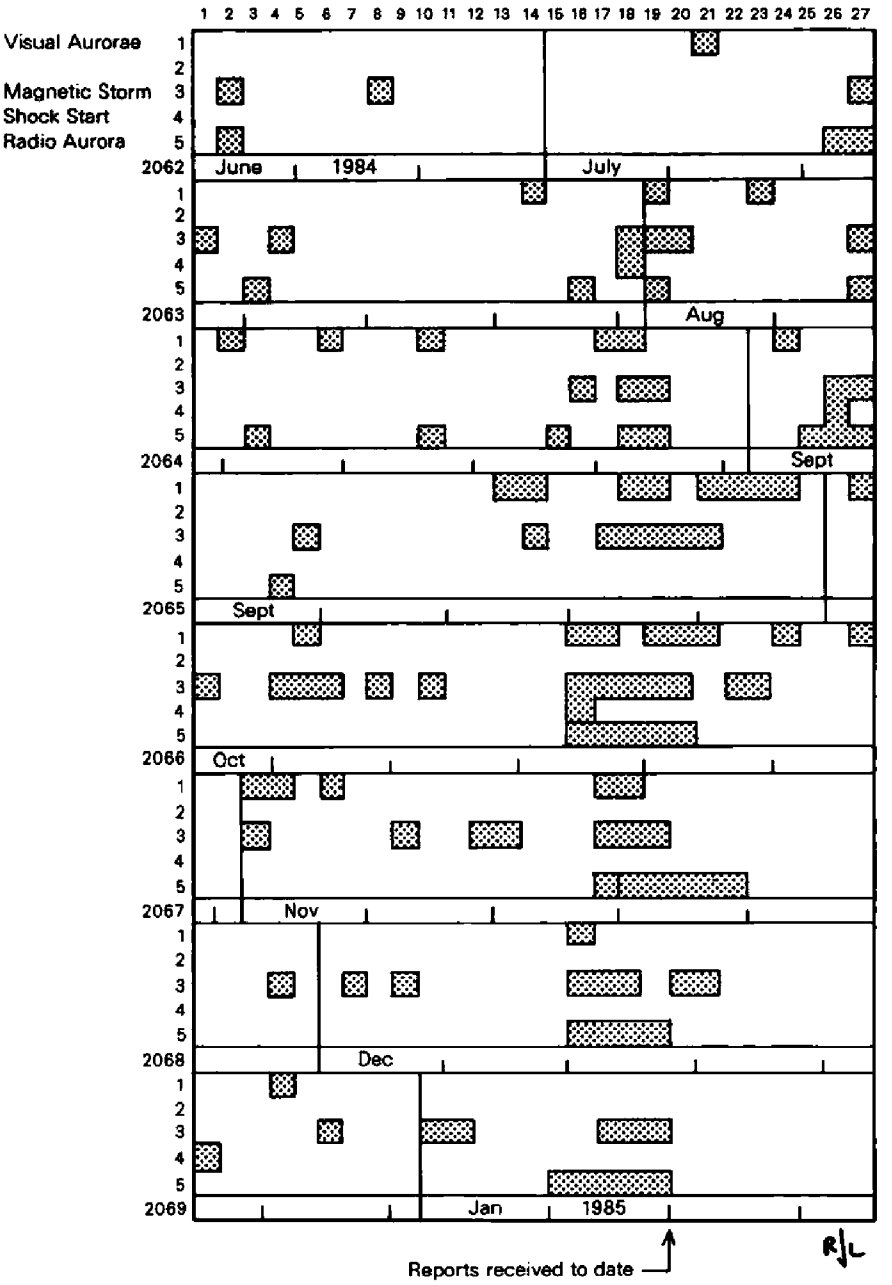


Figure 2. Bartels Diagram of Activity to show recurrent Magnetic and Auroral Storms associated with Coronal Holes.

75 Years of Maritime History

The oldest and most famous organization in the world concerned with maritime history and nautical heritage, the Society for Nautical Research, celebrated its 75th anniversary this year.

The hard core of the world's most dedicated maritime historians and antiquarians of the sea gathered in the Banqueting House in Whitehall on 14 June, with their Royal Patron, The Duke of Edinburgh, to celebrate three-quarters of a century of endeavour which led to the founding of a National Maritime Museum at Greenwich and the preservation for the nation of Nelson's flagship HMS *Victory*.

The Society for Nautical Research, which comprises men and women from all walks of life and all nations, whose qualification for membership is a profound interest and concern for the history of ships and the sea, was established in 1910 to encourage research into nautical antiquities, into seafaring and shipbuilding in all ages and among all nations, and into matters of general maritime interest.

The Society is best known through its quarterly journal, *The Mariner's Mirror* 'wherein may be discovered his Art, Craft and Mystery after the manner of their use in all ages and among all nations'. It enjoys an international reputation and the variety of its articles reflects the wide spectrum of its international membership; for example, the architectural history of Chatham Dockyard, Majorcan Privateers, the design of Crusader transport ships, portraits of Sir Francis Drake, and surgeons of the *Mary Rose*.

The outstanding achievements of the Society in its first 75 years have been its leading role in the establishment of the National Maritime Museum at Greenwich and the preservation, through the 'Save the *Victory* Fund', of Nelson's famous flagship at Portsmouth. Members meet every year on board and hold their annual luncheon on the lower gun deck. To mark its 75th year, the Society has established a fund of £10 000 to encourage international maritime research.

The Society, which has enjoyed Royal Patronage for most of its life, may look forward with confidence to its centenary in 2010. Readers who have a deep interest in maritime history are invited to communicate with the Society's Honorary Secretary, Lieutenant Commander Lawrence Phillips, RNR, the Command PR Officer, Office of the Commander-in-Chief, Naval Home Command, HM Naval Base, Portsmouth PO1 3LR.

Book Reviews

The Antarctic Circumpolar Ocean by George Deacon. 230 mm×160 mm, vii + 180 pp., *illus.* Cambridge University Press, The Pitt Building, Trumpington Street, Cambridge CB2 1RP (1984). Price £15.00.

This is the first volume in a series entitled *Studies in Polar Research,* which will include aspects of all the biological, physical and social sciences. The series of publications is designed to reflect the growth of research activity in and about the polar regions and to provide a means of disseminating the results.

Coverage is international and interdisciplinary: the books are relatively short but fully illustrated. The book reviewed here is mainly intended for students moving into oceanography or polar studies from other scientific backgrounds, but would also be suitable for a wider readership.

Sir George Deacon, former Director of the Institute of Oceanographic Sciences, deals firstly with the early ideas and evidence of a great southern continent, the pioneering observations of the early explorers and of the sealers who profited from the new discoveries and the systematic studies of oceanographic expeditions. In the second part he summarizes present knowledge of the water movements and their probable effects on temperature and salinity distributions, biological productivity, distributions of marine plants and animals, climate and ice cover. He attempts to show how present knowledge has grown from earlier findings, and to indicate its relevance to economic problems, such as the conservation of marine living resources.

There is commendable attention to historical and scientific detail throughout the book but this detail has been kept to a level of moderation which will render the text suitable for the general reader. The section on twentieth century whaling is a particularly interesting historical account. Antarctic whaling was started by

C. A. Larsen, who had captained the *Jason* in 1893–94, and the *Antarctic* for the Swedish South Polar Expedition in 1901–03. In 1903, after the *Antarctic* had been crushed in the ice and the crew rescued by the Argentine ship *Uruguay,* Larsen was able to promote Argentine interest in whaling, and the Compañía Argentina de Pesca was formed. Following regulation of the number of stations and catchers that could operate in the Falklands Dependencies, the number of whales caught there each year rose to 12 000 by 1911–12, but the proportion of Humpback Whales in the catch was declining sharply, leaving no doubt that too many were being killed. This fact led to the realization of the need for a study of the whale's reproductive habits, growth rates, migrations and physiology which subsequently produced the movement for protection of the species.

Much of the second half of the book contains details of scientific and oceanographic research, including a well documented discourse on the characteristics of the ice coverage. The section on icebergs, besides drawing interesting comparisons between the Arctic variety of ice island derived from ice shelves in northern Ellesmere Island and the great tabular bergs of the southern hemisphere, contains several superb photographs of icebergs.

The text is brought to a satisfactory ending by a paragraph on the conservation aspects of the Antarctic Treaty signed by 12 countries in 1959, and the Convention on the Conservation of Antarctic Marine Living Resources signed by 15 countries. The latter's objects include the principle of rational use, implying that the living resources must not be harvested beyond levels that are sufficient to maintain maximum productivity, and ensure no damage to dependent or related species. Let us hope that those implications bode lesser problems for the fauna of the Antarctic than man has managed to wreak on some of the other, less well protected, creatures of the globe.

J. F. T. H.

The Island of South Georgia by Robert Headland. 255 mm×195 mm, xvi + 293 pp., *illus*. The Press Syndicate of the University of Cambridge, The Pitt Building, Trumpington Street, Cambridge CB2 1RP (Cambridge University Press). Price £14·95.

For the majority of readers of this review the title of the book may conjure up only distant memories of the South Atlantic island where the 1982 Falklands campaign began. Even the book's length may seem to indicate the presence of much redundant technical material. Such a reaction would be far from the true state of the contents, for Mr Headland's topical account of a multitude of different aspects of this fascinating island and its satellites will appeal to many shades of literary taste.

For those interested in voyages of discovery, the chapter which includes an account of Captain Cook's exploration of South Georgia makes edifying reading, and there follow other historical details including a narrative on the sealing industry of the 18th and 19th centuries. Further descriptions follow of many different expeditions by illustrious explorers and scientists, ranging from the International Polar Year Expedition of 1882–83 up to the Joint Services Expedition of a century later.

Other subjects covered in several chapters will interest the traveller, scientist, biologist and philatelist. The topics include whaling, travel and communications, geology, meteorology and oceanography, physical sciences and natural history. The treatment if the native fauna and flora is particularly sympathetic with the inclusion of many fine photographs in black and white of indigenous plants, animals and birds. It is in this section that the absence of colour photographs is particularly noticeable, and many of the more recent illustrations would have

benefited from colour display. However, the book's ultimate price probably dictated that colour plates were excluded in preference for a greater amount of text and black and white photographs.

Robert Headland's involvement in the recent crisis in his role as deputy postmaster of South Georgia has attracted much attention. He therefore justifiably includes a personal account of the invasion of the island by Argentinian forces in April 1982, not the least of which was his surrender of the civilian population and 3 weeks of imprisonment under the invaders. Philatelists will be especially interested in the South Georgian stamps issued for the Falkland Islands Dependencies, described in detail in the chapter on travel and communications. Headland himself smuggled the last post out of South Georgia after the Argentinian invasion.

J. F. T. H.

The Seafarer's Guide to Marine Life by Paul V. Horsman. 240 mm×160 mm, xiv+256pp., *illus*. Croom Helm Ltd, Provident House, Burrell Row, Beckenham, Kent BR3 1AT, in association with The Marine Society, 202 Lambeth Road, London SE1 7JW. Price £12·95.

To many of the readers of Paul Horsman's article *Marine Biology and Merchant Ships* in the July 1984 edition of *The Marine Observer,* who wrote expressing a desire for the complete book on the subject, it can confidently be said that this is the work they have been waiting for.

In his foreward to the book, Dr Ronald Hope, Director of The Marine Society, says that it is manifestly intended for use both by amateurs and professionals as a means of indentifying the plants and animals in the sea. A highly qualified reader of the book when it was in manuscript commented, 'I like this book. Some of the descriptions of the animals are exceptionally clear, bearing witness to direct observations. Indeed, the author is at his best with an exciting, first-hand account of bioluminescence, for example. Parts have the genuine excitement of a living early nineteenth-century explorer, a novel occurence these days'.

The Seafarer's Guide to Marine Life is at once a handbook of the animals and plants that anyone may see from a ship, trawler or sailing vessel, and a definitive guide for the more serious student of scientific aspects of marine biology. A general introduction to the marine world in the first chapter is followed by a detailed description of the miniature world of small organisms likely to be seen through a magnifying lens or simple microscope, and tells exactly how such organisms can be collected, preserved and studied aboard vessels at sea. Chapter three looks at the strange phenomenon of bioluminescence, otherwise known as phosphorescence, including that most spectacular of displays, the luminescent wheel. Subsequent chapters are devoted to particular groups of species, ranging from jellyfish and molluscs through crustacea to fish, reptiles and mammals. There is also a useful guide to the sea life that can be found as fouling on ships' hulls and on harbour walls, pier piles and the like.

Considerable effort has gone into the preparation of 160 distribution maps that will greatly help in identification of the numerous species described.

The 64 colour plates, many of them produced from Paul Horsman's own photographs, are a delightful adjunct to the text and to the many drawings, tables and black and white plates which proliferate throughout the book. Much of the artwork, which is of a high order, is by David Henderson and Stephen Devane, who was employed by the Marine Society when the book was in preparation.

Paul Horsman himself was employed by The Marine Society as a tutor at sea for five years during which time he conducted much of his practical research on voyages made aboard the ships *Vancouver Forest*, *Seatrain Saratoga*, *Troll Park*, *Wellpark*, *Manistee*, *British Trident*, *British Norness*, *Uganda* (on various occasions), *Author*, *Wellington Star* and *Pacific Princess*. The writer of this review had the pleasure of welcoming the author aboard the first of those ships in 1980, finding him full of youthful enthusiasm for his new project and surrounded by a bewildering array of preserving bottles, nets and other marine biology paraphernalia amongst his baggage. Paul Horsman confessed five years after his maiden voyage to have been petrified at the prospect of this introduction to an alien world, being further subdued by the sceptical reception of the ship's bo'sun from the Outer Hebrides, who was asked to help him stow his gear. By the end of his first voyage, that same bo'sun had become one of his chief disciples, and this was a frequent reaction he received to his enthusiastic introduction to his novel discipline, on almost every ship in which he sailed.

As well as having open access to the archives at the Meteorological Office in his researches, the author acknowledges the help given to him by many of the scientists who regularly correspond with this office regarding ships' phenomena reports, notably Dr Frank Evans of the Dove Marine Laboratory who recommended the author to The Marine Society in the first place, Dr Peter Herring (Institute of Oceanographic Sciences) and Mr Denis McBrearty of International Dolphin Watch, Department of Anatomy at Cambridge University. Many of the black and white drawings have been stylishly drawn by Peter Baker, Ship's Cook with P. & O. Cruises.

With all the above to recommend it, together with Paul Horsman's effervescent text showing his spontaneous enthusiasm for his subject, one can only end by highly recommending this invaluable guide to all aspects of the marine world.

J. F. T. H.

Personalities

OBITUARY.—Captain J. H. Jones, Port Meteorological Officer, Bristol Channel area, died at his home from natural causes on 18 February 1985.

John Holland Jones (Jack to all his friends and colleagues) was born in May 1920 and was due to take retirement only a few months after his untimely demise at the age of 65. He had been appointed Port Meteorological Officer at Cardiff in July 1976 and he elected to continue in the position beyond the optional retirement age of 60.

Jack Jones began his seagoing career as an apprentice indentured to the British Tanker Company in 1937 aboard the *British Engineer* and on obtaining his Second Mate's Certificate in 1941 he was promoted to Third Officer; he then remained with the BP Tanker Company, as it became known, throughout his seagoing career up to 1975 when he retired from the sea as Master of the *British Confidence*. He was promoted to command in 1956 when he became Master of the *British Diligence*.

During his years as Master he sent us a total of 12 meteorological logbooks of which 4 were assessed as Excellent. He received Excellent Awards in 1961, 1970 and 1971.

Highlights of Captain Jones's career included the award of the Coronation Medal and the honour of being selected to lay the Remembrance Sunday wreath at the Cenotaph in Whitehall in November 1973, on behalf of the Merchant Navy and Fishing Fleets.

He was a Warden of the Swansea and South Wales Company of Mariners and a well known and respected member of the local community in his home town of Swansea as well as amongst his many professional contacts in the Cardiff area. He was always the most cheerful and courteous person to talk to, whether it was by telephone with Bracknell or across the table at a conference. When last seen at Headquarters in September 1984 his radiant good humour and obvious vitality would have made it unbelievable that he would leave us so soon after, and we send our sincerest sympathy to his wife and two daughters and their families in their sad loss.

OBITUARY.—Captain J. R. Milne died on 20 September 1984 whilst at home on leave, aged 49 years.

James Milne was born in Aberdeen and joined Ben Line Steamers Ltd as Efficient Deck Hand in September 1956. After serving as AB on cargo liners, he became a Deck Officer, eventually obtaining his Master's certificate in July 1963. About two years after this, in June 1965, we received his first meteorological logbook, compiled aboard the *Benlawers*. He was promoted to Master in 1975 when appointed to command the chemical tanker *Benvenue*. For 5 years from June 1977 he served as Master of the drillship *Ben Ocean Lancer* as well as his final 9 months, and it was during this period that we had the benefit of most of his 15 books of observations, one of which was assessed as of Excellent standard.

Captain Milne also served with Atlantic Drilling Company Ltd, a wholly owned subsidiary of Ben Line, on board drilling rigs *Bendoran* and *Benvrackie* from June 1982 to January 1984 as Barge Engineer and Offshore Installation Manager.

He is survived by his widow, Mrs Aileen Milne and two sons whose ages are 18 and 20 approximately, to all of whom we send our heartfelt sympathy at the unfortunate loss of their man at such a comparatively early age.

RETIREMENT.—Captain J. A. M. Taylor retired from the sea on 1 November 1984 after serving the whole of his 35 years on the oceans in the tankers of BP Shipping Ltd.

John Albert Martin Taylor was born at Lowestoft on 10 February 1932 and, following a grammar school education, attended HMS *Conway* for pre-sea training from 1947 to 1949. He joined his first ship, *British Confidence,* at Falmouth in September 1949, and then sailed in many ships of the British Tanker fleet, gaining his Master's Certificate in June 1961.

Captain Taylor was given his first command, *British Ensign,* in April 1971, having already sent us the first of 24 meteorological logbooks to contain his name as a voluntary observer, when Chief Officer of the *British Chivalry* in 1968. Two of those logs were rated excellent, and he qualified for an Excellent Award in 1982.

At the outbreak of the Falklands Campaign, Captain Taylor was in command of the *British Dart,* sailing from Portsmouth for the South Atlantic on Easter Sunday 1982 and returning to Plymouth on 2 July. For his part in the Falklands hostilities he received the Combat Medal.

We offer thanks and best wishes for a long and happy retirement to Captain Taylor.

Fleet Lists

Fleet Lists

GREAT BRITAIN (Information dated 15.3.85)

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	8.2.85	R. Whistler	J. R. Monk, G. R. Green, D. G. Olley	P. Rowbottom	Furness Withy (Shipping) Ltd
ACT 1	28.12.84	H. D. Windle	J. D. Pegler, M. R. Atkinson, J. K. Wilkinson	A. E. Wareing	Blue Star Ship Management Ltd
ACT 2	7.1.85	J. A. Oscroft	P. M. Crowley, D. A. Smith, J. H. Peaston	K. R. Grattan	Cunard Shipping Services Ltd
ACT 6	31.12.84	P. R. R. Ramsay	A. R. Hembury, M. C. Julier, P. R. Phibbs	D. Beech	Cunard Shipping Services Ltd
ACT 7	7.2.85	W. A. Davidson	D. G. Robbie, S. M. Ross	N. R. Smirk	Blue Star Ship Management Ltd
Adviser	23.7.84	R. H. Jones	I. Caig, R. J. Dobson, N. G. Rebeiro	F. Farthing	T. & J. Harrison Ltd
Afric Star	12.12.84	D. Eckworth	D. M. Thornton, N. J. Barr, J. H. Barwis	W. T. Ashley	Blue Star Ship Management Ltd
Al Shamiah	23.10.78	T. Williams	P. Walley		United Arab Shipping Co. (S.A.G.)
Aladdin	15.1.85	E. Taylor	N. C. Dobson, D. Reynolds, K. Barrett, D. McIsaac		Jebsens Offshore Drilling Ltd
Albright Explorer	21.8.84	D. A. Maclean	J. C. Wright, M. Early, J. Nixon	R. Clayton	James Fisher & Sons P.L.C.
Albright Pioneer	10.9.84	J. H. Kitching	J. V. Davies, W. J. Hutchings, D. J. Thomas	F. McQuillan	James Fisher & Sons P.L.C.
Alcor	9.2.83	J. H. Watterson	P. M. N. Marsham, M. J. Harrison, M. E. Winter	C. W. Knibb	Transocean Maritime Agencies
Alert	3.1.85	A. Chalmers	P. Footman Williams, C. J. Miners, D. M. Shepherd	J. Vaughan	British Telecom International
Ali Baba	15.1.85	H. A. Scott	W. Sinclair	B. Dodd	Jebsens Offshore Drilling Ltd
Amastra	26.6.84	G. B. Porter	G. W. Thomas, G. P. Donnelly, D. J. Conway	J. Cully	Shell Tankers (U.K.) Ltd
Andes	29.1.85	B. Walmsley	K. Brooks, G. Claye, M. Green	D. Hobson	Furness Withy (Shipping) Ltd
Andes Trader	17.10.83	J. Waling	I. J. Butler, P. M. Bell, C. P. M. Lucas	I. D. Hamilton	Canadian Pacific Steamships Ltd
Apapa Palm	3.4.84	G. Davidson	C. G. Willis, H. Raynor, K. Caldwell	P. Reagan	Palm Line Ltd
Appleby	20.2.85	C. B. Tingle	P. Wylie, N. D. Ferguson, N. H. Cooper	P. B. Davies	Ropner Management Ltd
Aquamaster	18.10.84	A. M. Stobbs	P. R. Anderson, A. H. Roberts, D. Bell	P. Winning	PAL Shipping Services Ltd

Arafura Sea	23.10.84	J. Rogers	R. K. Dutta, H. Tew Siew Ling, Lee Oon Lai	Yee Ching Biu	Denholm Ship Management Ltd
Arapaho	11.3.85	M. Dickens	D. C. Bartlett, M. Hancock, B. W. Firth	D. Colwell	Silver Line Ltd
Atlantic Clipper	4.2.85	M. A. Smith	T. W. Leary, J. W. Vahey, A. J. Williams	.. ..	Clipper Cargoes (U.K.) Ltd
Atlantic Conveyor	*	J. K. Cooper	A. Legoubin, V. DesLandes, J. K. Brocklehurst	D. Edgerton	Cunard Shipping Services Ltd
Atlantic Fisher	21.9.82	H. Vane	I. F. Scarr, M. G. Wood, H. McWilliam	A. E. H. Jones	James Fisher & Sons P.L.C.
Atlantic Star	17.9.84	J. K. Cooper	M. Binnie, M. S. Bell, L. P. V. DesLandes, S. G. Millar	G. Deane	Cunard Shipping Services Ltd
Atlantic Universal	5.7.84	C. Ramsden	J. M. Collis, I. Ligertwood, B. P. Giles	D. T. Pyatt	Gateway Shipping Ltd
Aurora	4.2.85	J. V. Wallace	P. J. Jenner, R. T. Flemington, J. N. Balkwill	M. J. A. McKenny	P. & O. Lines Ltd.
Author	12.12.84	E. J. Maxwell	N. Humphreys, A. J. Patterson, B. H. Birch, I. J. Lowry	C. Hawkridge	T. & J. Harrison Ltd
Avondyke	16.1.85	P. Kilvington	M. Lynch, T. W. White	.. ..	North British Shipping Ltd
B.P. Harrier	31.1.84	D. H. Munro	S. Jesson, P. Bowers	.. ..	B.P. Oil Ltd
Badagry Palm	21.11.84	G. Davidson	J. M. Moore	E. Barnes	Palm Line Ltd
Baltic Eagle	30.7.84	A. W. Wilford	T. Ghest, T. J. Macquire	J. D. Walsh	United Baltic Corp. Ltd
Baltic Progress	11.2.85	P. Hyde	M. Kearney, D. Glass, R. H. Barker	J. D. Walsh	United Baltic Corp. Ltd
Baron Belhaven	27.2.85	L. M. Hocking	P. B. W. Newton, M. Gardner, D. Farrington	B. Breslin	Lyle Ship Management Ltd
Baron Kinnaird	9.1.85	D. White	A. F. Hamilton, D. L. Coe, S. W. Wright	J. Macneil	Lyle Ship Management Ltd
Ben Ocean Lancer	31.1.85	R. Shaw	T. V. Roberts, R. L. Sutherland, P. Anelli	J. A. Borrett	Ben Line Steamers Ltd
Benalder	12.3.85	A. McKenzie	D. S. Hardie, D. Keillor, D. C. Morris	J. S. Hallam	Ben Line Steamers Ltd
Benavon	30.1.85	C. P. Browne	S. Fish, I. A. Marshall, J. M. Groat	H. Brookfield	Ben Line Containers Ltd
Bencruachan	5.3.85	R. E. Cowie	A. W. Marshall, M. J. Simpson, C. T. Smith	D. Stewart	Ben Line Steamers Ltd
Bendoran	*	P. J. Warren	R. Sharp, A. Kemp	M. Winter	Atlantic Drilling Co. Ltd
Benedict	6.9.84	P. Hurlock	J. Owens, R. I. Townend, M. Walker	P. Webster	Blue Star Ship Management Ltd
Benhope	6.9.84	A. S. Hamilton	D. Gilmour, T. D. Corbett, C. C. Ross	A. R. McCormick	Ben Line Steamers Ltd
Benlomond	*	–. McFee	.. ..	.. ..	Atlantic Drilling Co. Ltd
Benvrackie	6.2.85	D. Walker	R. Dooley, R. Thomson	B. Godfrey	Atlantic Drilling Co. Ltd
Bideford Dolphin	25.2.85	M. Tune	P. Christopher, P. Wallace	T. Smith	Blandford Shipping Co. Ltd
Binsnes	22.8.84	A. Montgomery	G. A. Combe, S. Murray, M. J. C. Court	A. Hodson	Jebsens Ship Management Ltd
Bise	18.10.84	M. M. Kennedy	C. Snape, I. B. Forrest, R. L. Dewick	D. W. B. Kellas	Denholm Ship Management Ltd
Black Prince	*	P. Andreassen	S. Steen, M. Gaarder, J. Andersen, L. Nedland	T. T. Kaford	Fred Olsen Ltd
Black Watch	14.5.84	T. Fleten	K. Karlsen, H. Ass, Y. Eneyold	B. Foss	Fred Olsen Ltd
Bluestream	19.10.84	B. Hodges	S. Chopra, C. Bunt, S. G. Kulkarni	A. Carneiro	Fyffes Group Ltd
Bolnes	3.12.84	R. W. H. Dole	J. B. Hickey, W. Brackenridge, S. G. Clark	P. Orpwood	Jebsens Ship Management Ltd
Boniface	12.12.84	J. Rowe	J. L. Clarke, A. J. Delaney, P. C. French	M. Hanraads	Blue Star Ship Management Ltd
Botany Bay	20.2.85	T. L. Watson	D. C. Slack, D. Worsnop, M. Leech	P. M. Dolphin	Overseas Containers Ltd
Bransfield	23.5.84	S. Lawrence	C. J. Holmes, J. R. Wisden, J. B. Hawkins	H. M. O'Gorman	British Antarctic Survey
Bridgeman	5.11.84	M. O'Brien	H. Williams, D. J. Podger, M. W. S. Royall	R. A. Kirk	Rowbotham Tankships Ltd
British Avon	9.1.85	M. Dunning	I. T. Wake, M. F. Orchard, J. Mellish	J. Sutherland	B.P. Shipping Ltd
British Beech	5.7.84	R. W. Blyth	M. Ramsbottom, A. G. Crichton	A. N. McInnes	B.P. Shipping Ltd
British Dart	2.10.84	G. Coulson	A. D. L. Gillam, A. W. Duffin, A. M. Smith	A. D. Wilkes	B.P. Shipping Ltd
British Esk	25.1.85	L. V. McGeogh	C. S. Adams, M. P. Sexton	R. Wray	B.P. Shipping Ltd
British Forth	6.2.85	H. Brown	H. J. Conlon, T. M. Stone, N. Mills, D. W. Tierney	P. Davies	B.P. Shipping Ltd
British Humber	31.12.84	B. Wardman	P. F. Armitage, S. Mitchell, C. Mackey	N. Flather	B.P. Shipping Ltd
British Kennet	24.4.84	I. A. Oliphant	H. Gates, J. P. Rogers	A. Brown	B.P. Shipping Ltd
British Ranger	12.2.85	M. C. Stephenson	P. D. Walker, H. J. Stribblehill, S. Oliver	M. D. Smyth	B.P. Shipping Ltd
British Reliance	22.11.84	R. A. W. Jarrett	G. R. Snow, S. J. Viney	G. R. Wilson	B.P. Shipping Ltd

Selected Ships (*contd*)

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
British Renown	*	G. Luff	M. K. Paradowski, M. S. Vidgeon, I. L. Sutherland	C. Roberts	B.P. Shipping Ltd
British Resolution	16.10.84	G. Waite	J. A. Condie, I. Campbell, T. M. Stones	N. Stephens	B.P. Shipping Ltd
British Resource	13.1.84	M. Stephenson	I. Hodge, R. Whatmore, K. Lynch	C. Davidson	B.P. Shipping Ltd
British Respect	15.10.84	J. Ronald	D. W. Smith, N. Palmer, C. Grannell	P. Ruddick	B.P. Shipping Ltd
British Security	14.11.84	A. Lockwood	H. N. Gates, J. Robertson, M. S. Vidgeon	A. Harris	B.P. Shipping Ltd
British Skill	13.11.84	M. C. Stephenson	R. McGuire, R. C. Stevens, S. W. Burton	A. J. Bellamy	B.P. Shipping Ltd
British Spey	6.3.85	J. W. Graves	S. Allibone, R. L. Horne, A. L. Beswick	E. Barrowman	B.P. Shipping Ltd
British Spirit	4.1.85	L. A. Woodward	M. J. Aldred, K. R. Howie, J. Bovaird	P. H. Wales	B.P. Shipping Ltd
British Steel	1.2.85	G. V. Spong	S. W. Douglas, M. Warrior, J. Taylor	J. Hetherington	Furness Withy (Shipping) Ltd
British Success	31.8.84	J. O. Bailey	D. Blake, S. Allibone, R. M. Kempson, V. Radley	D. W. Bone	B.P. Shipping Ltd
British Tamar	23.1.85	J. F. Hobbs	C. Soanes, J. L. Rashleigh, J. P. R. Fogarty, P. F. St Lawrence	S. Broughall	B.P. Shipping Ltd
British Tay	18.10.84	K. Meacock	P. Walker, A. P. Cook, N. J. Pengelly	I. Smith	B.P. Shipping Ltd
British Tenacity	24.1.85	A. R. Wilkinson	J. A. Carrick, J. Robertson, D. S. Styles, M. J. Swords	A. R. MacPherson	B.P. Shipping Ltd
British Test	15.10.84	J. Smith	C. P. Mullett, R. S. Byrne	P. Hurst	B.P. Shipping Ltd
British Trent	1.10.84	R. Higgins	R. D. Mead, D. J. Hayler	K. R. Jones	B.P. Shipping Ltd
British Tweed	23.11.84	K. E. Peacock	S. D. Punton, R. A. W. McNicholl, A. A. Brown	M. V. Holmes	B.P. Shipping Ltd
British Wye	4.3.85	J. F. Thomson	T. L. Cullen, C. Winterbottom	J. W. N. Morphew	B.P. Shipping Ltd
Broompark	5.7.84	W. McCrae	R. Spence, F. Keddie, M. Burford	P. S. Melton	Denholm Ship Management Ltd
Buffalo	14.3.85	R. H. Saunders	M. E. Ingham, J. S. Biglands, S. Hanson, D. Holme	C. S. O'Sullivan	P. & O. Lines Ltd
C. P. Ambassador	6.11.84	G. N. Gaunt	P. G. Cole, R. J. Stewart, D. R. Lloyd	G. Monkman	Canadian Pacific Steamships Ltd
Cable Venture	6.3.85	O. L. Harrison	D. Wilson, D. Foster, P. Hare	D. Steel	Cable & Wireless P.L.C.
Cableman	24.4.84	J. Westley	M. E. Lendon, C. R. Ford, N. W. McLean	M. Kinsella	Rowbotham Tankships Ltd
Cairnsmore	20.12.84	E. M. McDonnell	M. R. Johnson, C. L. Rees, R. Engineer	R. L. Chesterman	Indo-China S.N. Co. (Hong Kong) Ltd
California Star	29.1.85	R. Brownbill	A. J. Wallace, N. Ianson, A. Tibbot	S. Hollingsworth	Blue Star Ship Management Ltd
Canadian Explorer	4.3.85	F. Shepherd	J. D. Clark, D. Mackenzie, K. Jones	M. P. Greene	Furness Withy (Shipping) Ltd
Canberra	1.10.84	R. Ellingham	I. B. Hutley, P. M. Haddon	F. Lloyd	P. & O. Lines Ltd
Cape Arnhem	17.9.84	I. Tyrrell	R. J. Sinclair, S. W. Wright, C. R. Williams, P. C. Mackay	B. G. Breslin	Lyle Ship Management Ltd
Cape Finisterre	24.9.84	J. M. MacKay	S. A. Henderson, I. D. MacLeod	D. Roche	Lyle Ship Management Ltd
Cardigan Bay	26.2.85	P. J. Clark	I. M. Chadney, A. C. McCulloch, I. M. Hill	D. A. Kelsall	Overseas Containers Ltd
Carinthia	29.8.84	D. M. Kissane	A. Clements, M. Julier, J. Gladstone	R. Davies	Cunard Shipping Services Ltd
Carmania	5.4.84	D. M. Kissane	M. K. Clark, C. H. Denny, D. A. Smith	F. Tordoff	Cunard Shipping Services Ltd
Caspian Universal	4.9.84	W. N. Pritchard	C. J. Batty, D. J. Innes, J. Dingle	A. Campbell	Cayzer, Irvine Shipping Ltd
Cast Husky	3.1.85	E. Williams	A. D. McLean, J. Martlew, R. Spence	D. S. Watson	Denholm Ship Management Ltd
Cast Muskox	6.12.84	B. McManus	R. F. Gribben, R. J. Westwater, W. T. Wood	R. S. Henderson	Denholm Ship Management Ltd
Cast Otter	1.3.85	R. W. Cotter	R. F. Gribben, J. Martin, R. Huyshe	R. A. S. Macmeikan	Denholm Ship Management Ltd

Celtic Endeavour ..	6.11.84	J. M. Hockey ..	N. Barnaby, I. R. Rew	.. ..	C. M. Willie & Co. (Shipowners) Ltd
Celtic Mariner ..	*	E. Gannon	N. A. Voss, C. J. Slade	.. ..	C. M. Willie & Co. (Shipowners) Ltd
Celtic Voyager ..	*	A. C. Wehner ..	N. A. Voss, B. Bedworth	.. ..	C. M. Willie & Co. (Shipowners) Ltd
Celtic Link	18.2.82	H. Gray	H. W. Stewart, S. Duncan	D. N. Barlow ..	Ben Line Steamers Ltd
Challenger	2.1.85	P. H. Warne	S. Jackson, B. M. Richardson, R. Chamberlain ..	.. ..	Natural Environment Research Council
Charles Darwin ..	*	P. H. Warne	G. Long, J. Seymour, R. Hagley	J. G. L. Baker ..	Natural Environment Research Council
Charles Rowan ..	1.3.85	.. ..	P. R. Berridge, C. I. Pemberton, P. Grundy, R. J. Roberton	.. ..	Rowan Drilling U.K. Ltd
Cirolana	27.11.84	J. R. French	E. W. Pearson, R. F. Graham	G. R. Amick	Ministry of Agriculture, Fisheries & Food
City of Durban ..	3.1.85	R. J. Smith	J. Murray, P. Jackson, N. Jardine	C. S. Carver	Overseas Containers Ltd
City of Edinburgh ..	9.1.85	A. Maclean	G. W. Blakey, J. I. Brown, A. Yeaman	N. D. Barlow ..	Ben Line Containers Ltd
City of Plymouth ..	14.3.85	A. J. Evans	.. ..	.. ..	Ellerman Lines Ltd
City of York ..	30.1.85	E. G. George ..	P. J. Wilkes, R. Nightingale, S. R. Allaker	M. Bushnell	Ellerman Lines Ltd
Clerk Maxwell ..	9.1.85	M. J. Dale	P. M. Newman, D. G. Miller, B. T. R. Hayes ..	M. A. Bratton ..	Furness Withy (Shipping) Ltd
Clione	31.12.84	J. R. French	B. A. Chapman, R. Newrick	.. ..	Ministry of Agriculture, Fisheries & Food
Clydebank	30.1.85	G. J. Tully	M. R. Pullen, G. A. Foster, P. B. Moulds	M. S. Price	Bank Line Ltd
Coastal Pioneer ..	*	M. M. MacInnes ..	J. Young, D. Jennings	.. ..	Fortoser Ltd
Coltair	29.1.85	G. Belson	W. C. McFadzean	P. Clemence	B.P. Shipping Ltd
Columbia Star ..	3.12.84	A. J. Chivers	C. M. A. Nicholson, P. Harding	S. Shayes	Blue Star Ship Management Ltd
Crestbank	19.12.84	A. B. Osborne ..	A. J. Dixon, R. S. Brown, R. Hanraads	E. A. Rogers	Bank Line Ltd
Dacebank	31.12.84	B. J. Peterson ..	S. J. Fair, M. A. Ranson, A. I. Spencer	M. H. Stalker ..	Bank Line Ltd
Dallington	27.11.84	J. N. Ramsay ..	D. C. Selley, I. R. Whitehead, D. W. McCluskey ..	K. Whytock	Stephenson Clarke Shipping Ltd
Dart Americana ..	29.1.85	J. W. Hooley	A. W. Whiteford, R. S. Daya, S. E. Westcott	M. Anderson	Canadian Pacific Steamships Ltd
Dart Atlantica ..	7.2.85	G. Gamblin	P. Crowe, C. Harding, D. Lloyd, C. Rossell	.. ..	Canadian Pacific Steamships Ltd
Dart Britain ..	11.2.85	M. J. Winter	S. J. Chapman, M. Price, K. Alcock	I. H. Thomas ..	Furness Withy (Shipping) Ltd
Devonshire	3.10.84	R. A. F. Edwards ..	A. Pailing, R. Hodgson, R. B. Gillett	J. G. Palethorpe ..	Bibby Line Ltd
Discovery	11.2.85	M. A. Harding ..	A. Brigden, M. S. Putman	M. Taperell	Natural Environment Research Council
Discovery Bay ..	29.1.85	B. V. Chipperfield ..	M. R. Chudley, D. Bailey, R. Anderson	K. J. Gaughan ..	Overseas Containers Ltd
Dixilyn Field 96 ..	3.7.84	.. ..	.. ..	.. ..	Wood Offshore Ltd
Dixilyn Field 97 ..	15.3.85	.. ..	.. ..	.. ..	Wood Offshore Ltd
Donovania	13.2.85	A. B. Reynolds ..	J. P. Foster, D. Freeman	G. Clarke	Shell Tankers (U.K.) Ltd
Drupa	29.1.85	J. Hullock	K. W. Nelson, R. M. Linley-Munro, K. M. McGregor	M. Pearson	Shell Tankers (U.K.) Ltd
Dryso	21.1.85	.. ..	G. Kristiansen, T. A. Rapp, J. Heimdal	.. ..	Van Ommeren (U.K.) Ltd
Durrington	14.12.84	A. M. Arkley	D. D. Matheson, O. Stephenson	M. R. Williams ..	Stephenson Clarke Shipping Ltd
Dyvi Omega ..	17.1.85	R. Kingston	J. P. Edwards, A. Saleh	.. ..	Dyvi Offshore
E. W. Beatty ..	12.11.84	P. T. Slatter	D. R. Shipley, A. P. Sharp, C. M. Goddard	J. Beckett	Canadian Pacific Steamships Ltd
Eburna	18.2.85	J. P. M. Cusson ..	I. Reed, J. Weir	J. Cully	Shell Tankers (U.K.) Ltd
Echoman	12.3.85	R. D. Andrews ..	M. B. Styles, G. J. Leask, D. A. Eagles	R. R. Hughes ..	Rowbotham Tankships Ltd
Elk	21.11.84	M. R. Godfrey ..	J. T. Jamieson, R. W. Madden, P. Brookes	J. Phipp	P. & O. Lines Ltd

Selected Ships (*contd*)

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Encounter Bay	14.1.85	M. Heron	A. M. Woods, K. H. Davie	T. Vaughan	Overseas Containers Ltd
England	7.2.85	D. M. Woolfenden	T. Couill, T. Honeybourne	R. Holmes	Cunard Shipping Services Ltd
Enterprise	*	R. Carr	J. R. James, I. G. Roberts, K. A. MacLeod	C. A. Dillon	Souter Hamlet Ltd.
Equinox	17.1.85	K. E. Greest	J. M. Towler, C. Bland, K. Henderson	A. Knight	Souter Hamlet Ltd
Esplanade	*	.. .. ..	.. ..	.. .. ..	Souter Hamlet Ltd
Esso Aberdeen	23.10.84	J. P. Way	T. D. Lester	J. Rennie	Esso Petroleum Co. Ltd
Esso Demetia	12.12.83	J. M. Phillips	W. E. Hardy, A. C. Lowe, A. Hoare	R. Duff	Esso Petroleum Co. Ltd
Esso Humber	9.4.84	R. B. Walker	D. R. A. Diggory, R. Moss, R. Samson	G. M. Kelly	Esso Petroleum Co. Ltd
Esso Tees	9.10.84	R. Noakes	K. C. Gardiner, K. Lightbody	D. Laybourn	Esso Petroleum Co. Ltd
Esso Warwickshire	1.2.85	C. C. Jorgensen	W. Gundry	D. M. Sugden	Esso Petroleum Co. Ltd
Etrema	6.2.85	I. Farnell	C. N. Lovett, S. J. Sumner, J. M. Urquhart, H. Marshall	A.Bellamy	Shell Tankers (U.K.) Ltd
Eulima	23.1.85	C. G. Pogue	A. G. Cable	T. Kennedy	Shell Tankers (U.K.) Ltd
Eulota	30.1.85	K. M. Whiting	J. D. Corson, D. R. Salmon, P. J. Razey	D. H. Parkes	Shell Tankers (U.K.) Ltd
Europa Point	2.10.84	P. D. Guerrier	Pervez Akhter Brohi, N. H. Bukhari, Zarar Ul Islam	Muzafferuddin Ahmed	Acomarit U.K. Ltd
Eye of the Wind	12.1.83	R. S. Grono	.. ..	.. .. ..	Adventure Under Sail
Farland	5.3.85	C. R. Bamford	L. P. Bridges, B. F. Middleton, G. Adams	R. Ryan	Ropner Management Ltd
Farnes	19.2.85	D. P. Platt	B. W. Townsend, R. Claridge, R. Cubbage	G. A. Bird	Jebsens Ship Management Ltd
Fengtien	21.11.84	F. Cunningham	T. J. Metzger, A. Davison, B. Hambleton	C. J. Kellman	J. Swire & Sons Ltd
Festival	2.11.84	D. Ashworth	D. M. Hopkin, S. N. H. Naqui, S. N. Panicker	M. Sadiq	Gulf (Shipowners) Ltd
Firmnes	14.1.85	P. B. Bagley	I. J. H. Grainger, K. M. Griffiths, C. Milne	W. Laing	Jebsens Ship Management Ltd
Fleet Wave	*	R. Cumbers	S. Hooper, C. Bunt, D. Brown	A. Grant	Fyffes Group Ltd
Flinders Bay	13.11.84	D. A. Dornom	P. A. Trafford, K. W. S. Macmillan, A. J. A. Aston	E. Mackenzie	Overseas Containers Ltd
Fort Assiniboine	16.1.85	K. Elias	E. E. Nelson, J. Grannon, G. Begley	D. Lever	Canadian Pacific Steamships Ltd
Fort Dufferin	11.3.85	A. Williams	M. R. Dacombe, A. B. W. Rugg, T. Fisher	F. Kilpatrick	Canadian Pacific Steamships Ltd
Fort Frontenac	1.10.84	G. B. Ivens	P. N. Ratcliffe, M. Jordan, S. Coles	D. I'anson	Canadian Pacific Steamships Ltd
Fort Garry	21.2.85	M. Allen	M. Barrass, K. P. Doyle, C. P. Howard	T. Graves	Canadian Pacific Steamships Ltd
Fort Hamilton	27.11.84	M Caine	G. M. Moir, A. M. P. Henderson, D. R. F. Earley	R. V. Duhig	Canadian Pacific Steamships Ltd
Fort MacLeod	23.10.84	G. S. Oakley	M. Benson, C. P. M. Lucas	R. E. Haviland	Canadian Pacific Steamships Ltd
Fort Providence	8.11.84	K. Hyde	S. J. Cadman, D. Collyer, S. G. Mortlock	G. Smith	Canadian Pacific Steamships Ltd
Fort Resolution	21.2.85	B. M. Duncan	N. J. Goghlan, M. J. Clark, I. A. Hamilton	R. Moody	Canadian Pacific Steamships Ltd
Fort Rouge	12.3.85	J. Rogers	S. Barker, J. G. Small, K. Jackson	T. J. Bousfield	Canadian Pacific Steamships Ltd
Fort Toronto	13.4.84	R. Kinnear	J. P. Simcox, K. Brothers	S. Hallam	Canadian Pacific Steamships Ltd
Fort Victoria	15.2.85	M. T. P. McMahon	R. S. Tremlett, J. A. Fletcher, M. Kneen	J. Stephen	Canadian Pacific Steamships Ltd
Forthbank	27.2.85	D. L. Jones	P. M. Frost, S. T. Curtis	R. J. Ware	Bank Line Ltd
Fred Everard	19.7.83	M. A. Chapple	B. R. F. Cox, P. J. Miller, R. Hart	.. .. ..	F. T. Everard & Sons Ltd
Frederick Russell	11.10.83	P. H. Warne	M. S. Pitman, R. J. Chamberlain	.. .. ..	Natural Environment Research Council
Freezer Prince	22.1.85	R. G. Asplet	M. J. P. Lalouette, C. Bryson, S. Ding	J. H. Williams	Denholm Ship Management Ltd

Freezer Queen	15.2.85	P. J. Brooks	T. D. Mason, A. Turner, C. Spurling	D. F. S. Moorhouse	Denholm Ship Management Ltd
G. A. Walker	13.9.84	J. B. Jones	B. G. Alexander, H. Lloyd		Canadian Pacific Steamships Ltd
Galconda	14.1.85	R. Turney	T. H. Patterson, D. Simpson, L. Hesketh	A. D. Macgillivaray	P. & O. Lines Ltd
Galpara	24.1.85	R. B. Reid	C. Stuchbury, M. F. Tibbles, M. Chalk	W. Boyle	P. & O. Lines Ltd
Gambada	24.1.85	V. Cook	G. D. Owen, R. M. Deyes	M. G. Welsh	P. & O. Lines Ltd
Gandara	17.1.85	C. McKenzie	N. R. Foster, D. M. Springett, J. Adcock, H. G. Pollard	P. C. A. Enrico	P. & O. Lines Ltd
Garala	29.1.85	S. J. Lintott	P. J. Curtis, N. Vause, R. G. Bull	N. W. Harrison	P. & O. Lines Ltd
Garbeta	21.2.85	C. S. Robinson	B. C. Pritchard, T. Wiltshire, E. Bruce	J. Ellis	P. & O. Lines Ltd
Gardline Locater	7.2.83	H. Morrell	R. S. James		Gardline Shipping Ltd
Gardline Tracker	11.10.84	D. Hawkins	J. Smart, P. W. Bennett, R. S. James		Gardline Shipping Ltd
Garinda	4.1.85	J. H. B. Weston	T. H. Goldsmith, G. Woolnough, M. Hammond	T. Searle	P. & O. Lines Ltd
Gas Enterprise	12.12.84	M. D. Salmon	D. J. Ridgway, W. J. Dempsey, O. Davies, C. N. Thomson	A. E. Shute	B.P. Shipping Ltd
Gazana	8.3.85	S. Harwood	T. P. Flower, C. S. Card, I. T. Blackley	P. A. Whyley	P. & O. Lines Ltd
Geestbay	5.3.85	O. Springett	J. H. Worwood, S. D. Allen, A. J. Gladman	G. Randall	Geest Line Ltd
Geestland	18.10.84	D. Boon	A. J. Gladman, R. Coombs, N. R. Barnaby, M. F. Tomlinson	M. McGregor	Geest Line Ltd
Geestport	20.2.85	G. de Ferry Foster	S. Allen, G. Coles, D. Buckingham	R. Byng	Geest Line Ltd
Geeststar	14.3.85	D. N. Boon	C. M. Davies, C. J. Flanagan	R. T. Jolliffe	Geest Line Ltd
Glomar Biscay II	19.2.85	–. Oyen	–. Haugen, –. Langvold, –. Sandborg, –. Wetteland	–. Taylor	Shell (U.K.) Exploration & Production
Gold Varda	25.2.85	R. M. Mitchell	D. J. Smith, D. W. Mathews, T. A. Andrews	D. H. Logie	Haverton Shipping Ltd
Gothic Wasa	17.1.83	A. I. Scott	J. Enderby, B. Hall, J. Watson	C. Currie	Denholm Ship Management 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	14.12.83	B. Badoo	R. Kaushal, M. A. Javed	B. S. Hedge	Gulf (Shipowners) Ltd
Halia	19.9.84	J. W. Hullock	K. W. Nelson, G. P. Akehurst, L. Douglas	M. Croft	Shell Tankers (U.K.) Ltd
Hampshire	20.12.84	P. Bytheway	L. J. MacDonald, A. Stephens, N. Michael	J. G. Palethorpe	Bibby Line Ltd
Harold La Borde	27.2.85	M. M. Reeves	P. S. Ratcliffe, S. K. Jones, W. J. M. Hargreaves	P. N. Pouchet	Bibby Line Ltd
Hoegh Duke	25.2.85	W. A. Wilson	P. E. Hughes, P. B. Dixon, P. Holtby	T. Baxter	Blue Star Ship Management Ltd
Hornchurch	13.3.84	A. L. McLeod	M. R. Shelverton, S. W. Yuen, D. K. Ontko	Y. M. Leung	Taiship Co. Ltd
Hupeh	25.9.84	O. A. Overland	M. E. Caunce, R. C. Dundas, N. G. Yiukuen	P. A. Swire	China Nav. Co. Ltd
I. D. Sinclair	26.1.84	B. P. Philip	P. Crowe, J. N. Draper, N. P. Bradshaw	J. Blaylock	Canadian Pacific Steamships Ltd
I.T.M. Venturer	*	S. Ross	D. Mills		I.T.M. Offshore Ltd
Ibn Abdoun	31.1.83	R. F. Wilkinson	S. Rogers, B. J. Kidwell, J. Woolley	J. G. McCahey	United Arab Shipping Co (S.A.G.)
Ibn Rushd	3.10.84	T. L. Norris	H. F. Taha, A. Salem, D. Oliver	P. J. Macrory	United Arab Shipping Co (S.A.G.)
Iolair	9.1.85	D. Tobin	M. P. Fawke, I. C. Massey, M. C. Porter	B. Cameron	B.P. Shipping Ltd
Isle of Arran	15.3.85	H. Campbell	N. L. Smith, W. H. Ross		Caledonian MacBrayne Ltd
Isocardia	31.1.85	D. M. C. Renton	C. W. Seagrave, M. Stickley, N. Wilson	K. Scargill	Shell Tankers (U.K.) Ltd
Isomeria	15.10.84	B. Wilkinson	J. M. Galbraith, A. R. Wynne, J. G. Peace	D. Fry	Shell Tankers (U.K.) Ltd
Iver Champion	31.10.84	T. T. Luke	A. G. Hebb, R. B. Cox, J. Kennedy	M. J. Furlong	PAL Shipping Services Ltd
Ivybank	31.12.84	D. Stewart	S. M. Whitting, P. T. Thompson, P. J. D. Gates	J. A. Hynes	Bank Line Ltd
Jack Wharton	16.1.85	J. A. Chapman	R. L. Crook		F. T. Everard & Sons Ltd
Jade Bounty	*	L. Soederberg	R. Manantan, G. Balasa, E. Torreflores	T. Vargas	Denholm Ship Management Ltd
Jedforest	6.2.85	R. Lister	P. D. Steen, S. C. Clinch, J. Ebdy	D. B. Millar	P. & O. Lines Ltd
John Biscoe	20.3.84	C. R. Elliott	J. M. Jenkins, P. Kerry, M. J. S. Burgan	D. M. Bradshaw	British Antarctic Survey
Jostelle	*				Souter Hamlet Ltd

Selected Ships (*contd*)

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Jura	27.2.85	S. S. Lockhart	B. A. Hall, N Maciver		Department of Agriculture & Fisheries for Scotland
Keren	17.1.85	A. W. Kinghorn	S. Rathbone, B. Elston, J. Willis-Richards	T. Gilmour	Blue Star Ship Management Ltd
Kildare	30.1.85	A. B. Stalker	N. G. Barratt, I. W. Crane, T. J. Fox	A. C. Fraser	P. & O. Lines Ltd
Kilmun	9.11.84	J. G. Houston	D. P. Fotheringham, W. Dawson, R. Bentley	P. Price	Lyle Ship Management Ltd
Kingsnorth Fisher	27.4.84	L. Fant	G. Stonehouse, K. Lockhart, A. Hood	D. R. Woods	James Fisher & Sons P.L.C.
Kona	19.2.85	C. Simpson	M. Byrom, J. H. Sparkhall, P. K. Paterson	I. Forster	Denholm Ship Management Ltd
Kotta Violet	25.2.81	J. B. Clemenson	G. Miller, T. Turvey, J. Rogers	S. Myland	Swedish Caledonian Management Ltd.
Kowloon Bay	16.1.85	A. A. Railton	S. C. Lugg, N. D. Crockett, L. Nelson	G. Scullion	Overseas Containers Ltd
Kowloon Peak	23.11.84	P. J. Burden	J. MacDonald, D. R. Beattie, E. T. Hawkins	F. Seabourne	Seahorse Ship Management Ltd
La Chacra	24.1.85	J. W. Murray	S. Woodhouse, R. Dockett, T. L. Parry	W. Guinan	Buries Markes (Ship Management) Ltd
La Pampa	10.1.85	E. R. T. Little	M. W. Bingham	W. T. Guinan	Buries Markes (Ship Management) Ltd
Lackenby	25.2.85	J. E. Jennings	P. A. Carmichael, A. Reed, I. C. Gravatt	D. Warner	Ropner Management Ltd
Lakenes	9.11.84	N. G. Price	R. Baker, J. F. Cotton, T. J. Tye	B. Hansen	Jebsens Ship Management Ltd
Lantau Trader	29.1.85	F. Martin	Tsang Hin Kwan, Chow Sai Ming, P. G. Wood	Cheung Hon Hung	Denholm Ship Management (Overseas) Ltd
Larkfield	*	P. T. Hodge	T. Forrest, S. Butler	T. Lowe	Buries Markes (Ship Management) Ltd
Laurentian Forest	*	N. C. Kerr	R. Pymm		Harrisons (Clyde) Ltd
Leicesterbrook	19.12.84	J. Myles	C. G. Buckley, R. A. Parsons		F. T. Everard & Sons Ltd
Leonia	20.2.85	D. Leppard	A. D. Urwin, R. Gupta, R. J. Boudier	M. Adams	Shell Tankers (U.K.) Ltd
Leslie Gault	*	R. Williams	C. Campbell, D. Cowell		Denholm Ship Management Ltd
Lima	1.6.83	B. Wilkinson	D. Hinks	A. Ridley	Shell Tankers (U.K.) Ltd
Lincolnbrook	25.2.85	I. Anderson	M. R. Irwin, J. N. Toogood		F. T. Everard & Sons Ltd
Lincolnshire	21.11.84	J. K. Allison	G. Macleod	B. J. Foley	Bibby Line Ltd
Liverpool Bay	12.3.85	J. Cosker	A. Kirkham, J. G. W. Dixon, K. Campbell	S. R. Cloutte	Overseas Containers Ltd
Lloyd Australia	1.3.85	R. Vinton	I. Haffenden, I. McLean, A. Storrie	D. Forster	Palm Line Ltd
Lloyd Rio	5.3.85	G. A. J. Holeyman	P. J. Hancock, D. Wincup, H. Raynor	R. A. M. Lynn	Palm Line Ltd
Lloyd Texas	15.2.85	M. Hurley	D. J. Vickery, R. T. Blomfield, J. M. Moore	D. C. Smith	Palm Line Ltd
London Enterprise	4.1.85	R. C. Mortimer	W. Howarth, K. Horsley, K. A. Hewlett, R. McGannan	D. Wallace	London & Overseas Freighters P.L.C.
London Glory	7.1.85	P. J. Wright	G. M. Douglas, P. N. Thompson	D. Jakobaufderstroht	London & Overseas Freighters P.L.C.
London Spirit	22.1.85	R. P. Tarbuck	S. C. Walpole, D. L. Thomas, M. A. Pearce, J. A. Atkins	D. Lawrence	London & Overseas Freighters P.L.C.

London Victory ..	4.2.85	A. D. Gillie	K. J. McClymont, G. R. Hicks	D. Gavin	London & Overseas Freighters P.L.C.
Londonbrook ..	19.9.84	J. A. Twiselton ..	A. F. Brown, R. M. Thompson, K. Cotter, R. Couch	.. ..	F. T. Everard & Sons Ltd
Lord Kelvin ..	7.8.84	R. Banton	G. Woodall, C. P. Fazackerley, S. Shaw	I. H. Thomas ..	Furness Withy (Shipping) Ltd
Louisiane	1.11.84	P. G. Williams ..	S. H. Barker, R. Ellsmoor, A. Gravesson	A. Pampling	Canadian Pacific Steamships Ltd
Lucerna	23.1.85	D. Hughan	G. W. Thomas, C. J. Shill, J. Dibben	P. James	Cunard Shipping Services Ltd
Luminence	7.11.83	N. T. Alford	L. A. C. Logan	C. I. Kitchen ..	Crescent Shipping Co. Ltd
Luminetta	*	J. B. Watson	M. Green, P. Moxon, H. Shuttleworth	M. Newton	Cunard Shipping Services Ltd
M. G. Hulme Jnr ..	15.1.85	B. Harper	T. Dornan, M. Kay, I. Dall	.. ..	Reading & Bates
Maersk Angus ..	2.10.84	C. W. Parven ..	P. J. Ward, D. L. Thompson, S. M. Wills	P. Hornby	Maersk Co. Ltd
Maersk Buchan ..	24.4.84	D. Wilson	P. Ward, M. J. Hislop, J. A. Norman	R. L. Hollows ..	Maersk Co. Ltd
Mairangi Bay ..	6.11.84	R. Brinkworth ..	I. M. Chadney, D. Robertson	A. Hutchinson ..	Overseas Containers Ltd
Mairi Everard ..	16.1.85	J. A. Twiselton ..	T. Harrison, P. Bayliss, D. Gilbert, F. McCorlick ..	.. ..	F. T. Everard & Sons Ltd
Manchester Challenge ..	25.10.84	P. Cullen	G. Green, G. Jackson, R. Owen	I. Hay	Furness Withy (Shipping) Ltd
Marilock	5.2.85	K. H. Thorne ..	P. M. Lovett, J. Hanney	P. V. G. Lintzgy ..	Turnbull Scott Management Ltd
Marina Sea ..	*	R. K. Bansal	V. Kumar, B. S. Chatha, P. C. Malhotra	S. Ghose	Silver Line Ltd
Marina Sky ..	*	H. K. Chopra ..	R. Machado, S. Bhasin, V. K. Gupta	D. O. Mirajkar ..	Silver Line Ltd
Maron	12.3.85	P. G. Young	A. F. Goldsmith, J. J. F. Bradock, J. L. Fielden ..	R. McSorley	Ocean Fleets Ltd
Martindyke	31.12.84	J. J. McTigue ..	G. Duncan, T. W. Wilson	.. ..	North British Shipping Ltd
Matco Avon ..	3.1.85	K. J. Beverley ..	P. M. Owen, D. Edwards	M. V. Lambert ..	Mobil Shipping & Transportation Co.
Matco Clyde ..	12.11.84	P. Chambers	C. Kelly, K. Gill, A. D. Lott	R. Skuse	Mobil Shipping & Transportation Co.
Matco Thames ..	20.2.85	J. C. Watt	J. R. Fox, J. W. Haughey, T. W. King, P. L. O'Sullivan	D. McSweeney ..	Mobil Shipping & Transportation Co.
Meadowbank ..	5.11.84	P. Simpson	H. N. V. Cole, B. D. Miller, N. F. Sharpe	B. Neary	Bank Line Ltd
Mediterranean Shearwater ..	4.6.84	A. G. Lacey	K. M. MacDonald, D. Ilderton, A. Dumbell, P. J. Savory	D. Scott	James Fisher & Sons P.L.C.
Melampus	14.1.85	H. R. Lawton ..	J. W. Tandy, B. N. Jones, M. G. Garside	T. F. Scott	Ocean Fleets Ltd
Melton Challenger	11.12.84	T. Hunter	M. T. Aung, J. Beck, M. Blaney	.. ..	Melton Shipping Co. Ltd
Menelaus	*	.. ..	.. ..	.. ..	Ocean Fleets Ltd
Merchant Navigator	*	L. R. Bell	E. Betts, E. Baillie, D. Nolan, A. MacPherson ..	.. ..	Denholm Ship Management Ltd
Merchant Pioneer ..	13.12.84	E. J. O'Keeffe ..	A. J. Gillies, I. A. Craig, D. Jenkinson	H. Jefferson	Denholm Ship Management Ltd
Merchant Principal	*	J. Coren	J. Burgess, G. Johnston, E. Betts	T. Brennan	Denholm Ship Management Ltd
Mississippi	3.10.84	D. Tourell	P. Evans, C. Harding, S. J. Allen	T. Smith	Canadian Pacific Steamships Ltd
Montank	19.12.84	W. F. Jeffrey	Khan Khalid Ahmed, J. Haider, Hamdani Jawad Ali	M. Mohsin Zaidi ..	Acomarit (U.K.) Ltd
Moreton Bay ..	18.2.85	A. H. Aston	R. K. Q. Butler, G. Dockerty, O. L. Dodsworth ..	W. H. Coventry ..	Overseas Containers Ltd
Mosel Express ..	21.2.85	M. J. Godbehear ..	M. A. Armitage, C. C. Young, D. C. Thomson ..	J. Thompson	Overseas Containers Ltd
Myrmidon	27.6.84	A. J. Milmine ..	M. S. Middlebrook, J. Fielden, R. F. Taylor	M. R. Palmer ..	Ocean Fleets Ltd
Naticina	20.2.85	B. Bowtell	S. J. Hailwood, A. N. Anderson, J. Burgess	M. Philpott	Shell Tankers (U.K.) Ltd
Neptune Jasper ..	*	T. J. Bearder ..	Tan Boon Hwa, F. A. D. Mello, Heng Leng Suah ..	Maung Aung Thein	Neptune Orient Lines Ltd
Newforest	29.11.84	S. T. S. Household	D. Thurston, C. Langford, N. Davidson	E. Smartt	P. & O. Lines Ltd
Norbrit Faith ..	7.11.83	A. J. C. Metcalfe ..	I. T. Braidwood, R. J. Crickmore	.. ..	North British Shipping Ltd
Norbrit Hope ..	16.4.84	R. Gale	D. Stevenson, T. Wilson	.. ..	North British Shipping Ltd
Norse Marshal ..	10.8.84	R. Watson	G. D. S. Hope, J. D. Dickinson, A. W. Stevens ..	D. K. Iveson	Harrison (Clyde) Ltd
Northern Valley ..	28.12.84	J. Pearsall	R. A. Hall, A. Thomson, N. Jerrum	R. Masters	Sir Wm Reardon Smith & Sons Ltd

Selected Ships (*contd*)

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Northia	12.11.84	D. Davidson	D. W. Dredge, C. Scott, D. Lake	M. J. Gamble	Shell Tankers (U.K.) Ltd
Nosira Lin	18.2.85	P. Weldon	A. P. Rosinger, N. Howarth, B. Tucker	H. Anderson	Bolton Maritime Management Ltd
Nosira Madeleine	15.3.85	I. Woodier	S. Totten, N. A. J. Bacon, P. M. Bailey		Bolton Maritime Management Ltd
Nosira Sharon	29.1.85	J. Milner	A. Rosinger, D. J. Williamson, G. R. Jackman, A. A. Watkins	C. M. Jackson	Bolton Maritime Management Ltd
Oroya	14.11.84	T. J. Sax	S. D. Thair, J. R. Kelly	J. Styles	Furness Withy (Shipping) Ltd
Orwell Fisher	22.10.84	I. J. Groundwater	S. D. Pringle, H. C. McWilliam		James Fisher & Sons P.L.C.
Osaka Bay	27.2.85	I. W. Collister	P. M. Beggs, D. K. MacCorquodale	P. I. Begg	Overseas Containers Ltd
Overseas Argonaut	22.2.85	E. G. Kemp	M. J. Webber, R. Fullager, W. Carmody	F. R. Gerstner	London & Overseas Freighters P.L.C.
Pacific Challenge	21.2.85	R. M. Frederick	R. G. Carnelley, M. P. Jellicoe, W. S. Enright	A. R. King	Furness Withy (Shipping) Ltd
Pacific Courage	28.1.85	R. Dobie	H. N. Snaith, C. D. Spencer-Payne, W. R. Howell	S. J. Singleton	Furness Withy (Shipping) Ltd
Pacific Crane	20.12.84	P. G. Hobson	P. R. Ostick, J. M. Stafford, D. Ilderton	G. Swainbank	James Fisher & Sons P.L.C.
Pacific Fisher	1.3.85	F. P. Garbutt	G. Himsworth, K. Young, M. Grimshaw	P. Golson	James Fisher & Sons P.L.C.
Pacific Guardian	*	P. Shaw	W. Marr, J. Tollaby, I. Bosworth	S. Haslett	Cable & Wireless P.L.C.
Pacific Patriot	31.10.84	E. Gowland	A. Henderson, D. G. Lyon, K. B. Thorpe	R. K. Merriott	Furness Withy (Shipping) Ltd
Pacific Peace	22.10.84	J. B. Fowler	P. M. Smith, P. C. Waiton, R. Gibbons	S. Roberts	Furness Withy (Shipping) Ltd
Pacific Prestige	21.2.85	A. Jones	J. P. Archer, R. M. Price, M. J. Holbrook	T. E. Browne	Furness Withy (Shipping) Ltd
Pacific Swan	6.6.84	J. Cairns	J. A. Strathearn, P. A. Marcon, J. Petty	N. Marwood	James Fisher & Sons P.L.C.
Pacific Teal	31.7.84	A. G. Lacey	C. G. Atkinson, G. Dodsworth, P. A. Booker	S. J. Thewlis	James Fisher & Sons P.L.C.
Pacific Universal	5.3.85	W. J. Milne	I. Simpson, I. Ligertwood, A. Barata	D. Maidment	Gateway Shipping Ltd
Perth	*	K. A. Pardiwala	J. S. Dennis, A. Khan, R. Khetrapal	S. Noronha	Blue Star Ship Management Ltd
Pholas	12.12.83	R. W. W. Baldwin	M. Blackburn, D. A. Mitchell, A. F. Ure	M. Gilliland	Coe-Metcalf Shipping Ltd
Pikebank	31.7.84	H. J. Taylor	D. B. Pirie, P. N. Hill, W. Davis	J. Lawrie	Bank Line Ltd
Pointsman	19.12.84	P. Jameson	T. S. Kenney, D. Robertson, H. J. Pearce	G. Duffield	Rowbotham Tankships Ltd
Pole Star	3.1.79	N. Morrison	W. Tullock, A. D. Welch		Northern Lighthouse Board
Pollenger	5.1.84	J. H. B. Weston	T. P. Flower, N. J. Adams, D. M. Sharp	M. Smith	P. & O. Lines Ltd
Pomella	19.11.84	D. J. Sloan	J. G. Tarling, I. R. Jack, A. Rees	J. Mercer	Shell Tankers (U.K.) Ltd
Port Hawkesbury	25.2.85	P. A. Woods	P. Crowe, D. F. Shepherd, A. H. Williams	H. McGrory	Canadian Pacific Steamships Ltd
Port Quebec	4.3.85	P. Atkinson	S. W. Turner, A. F. L. Evans, J. L. White	N. Kell	Canadian Pacific Steamships Ltd
Profile	*				Gardline Shipping Ltd
Providence Bay	25.2.85	J. D. Thomson	C. J. Petty, S. H. Pearce, A. J. Bairstow	W. H. Coventry	Overseas Containers Ltd
Pulborough	20.3.84	G. Young	M. F. Poulloin, C. Goddard, M. Allison	K. T. Whytock	Stephenson Clarke Shipping Ltd
Puma	*				P. & O. Lines Ltd
Queen Elizabeth 2	20.12.84	L. Portet	A. Murphy, P. M. Robson	A. Holmes	Cunard Shipping Services Ltd
Rangelock	27.2.85	H. K. Timbrell	P. J. West, L. Aye-Maung, B. R. Frank	M. G. Finn	Turnbull Scott Management Ltd
Ravenscraig	30.1.85	F. Stuart	P. A. Wibberley, S. Honey, R. Whyte	J. Fitzgerald	Ropner Management Ltd
Rebeka Oma	4.3.85	J. F. Holmes	C. Taylor, R. A. Haigh	N. Smith	Lyle Ship Management Ltd

Reefer Ciku	22.6.84	H. C. Hynard	T. G. Aridido, A. J. Wilson, A. Dockery	Gan Teong Ping	Sembawang Johnson Shipmanagement (Pte) Ltd
Reefer Duku	18.8.83	A. J. Hughes	T. K. Hoon, M. J. Winterbottom, G. W. Bryson	J. H. Gan	Sembawang Johnson Shipmanagement (Pte) Ltd
Reefer Manggis	30.1.85	R. H. Fisher	T. C. Miguel, M. J. Winterbottom, Chan Kok Choong	Koh Poh Huat	Sembawang Johnson Shipmanagement (Pte) Ltd
Reefer Nangka	29.10.84	J. S. Laidlaw	See Hong Soo, Chong Chee Meng, G. W. Bryson	Lim Soo Hock	Sembawang Johnson Shipmanagement (Pte) Ltd
Remuera Bay	8.3.85	W. F. McCarthy	A. M. Leech, L. J. Fletcher, K. Worthington	A. Titley	Overseas Containers Ltd
Resolution	13.9.83	D. Howell	F. Mack		Gardline Shipping Ltd
Resolution Bay	25.2.85	D. V. Harradine	M. C. P. Sutcliffe, R. A. Kenchington, R. Walker	M. R. T. Hannon	Overseas Containers Ltd
Retriever	24.5.83	A. Venables	P. M. Swan, R. C. Phillips, J. Creagh	D. Steel	Cable & Wireless P.L.C.
Reynolds	8.1.85	J. Parsloe	P. Cobain, A. Cobain, P. Scott, C. Cooke	G. A. Evans	Bolton Maritime Management Ltd
Richfield	*	M. D. Cummins	M. Manekshaw, S. Singh, N. Vaswani	D. X. Sabastian	Buries Markes Ltd
Roachbank	17.10.84	P. J. Elder	A. Haynes, C. C. Baines, N. J. G. Allen	P. M. Haslam	Bank Line Ltd
Rocknes	14.3.83	T. J. Lee	C. W. Milne, G. A. Boobyer, P. Skelton	P. Dredge	Jebsens Ship Management Ltd
Rollnes	2.11.82	J. H. Apsey	R. Baker, S. Murray, I. C. Oke, S. Byczynski	W. Swann	Jebsens Ship Management Ltd
Romney	11.12.84	G. Stubbings	R. Fullwood, G. Rawding, H. Roberts	R. F. Collins	Blue Star Ship Management Ltd
Royal Princess	25.2.85	J. R. Young	N. P. Jenkins, J. A. Smith, J. A. Croft	W. J. Smith	P. & O. Lines Ltd
Rubens	5.2.85	J. Parsloe	A. W. Lewington, C. Cooke, C. Ledsam	T. Williams	Bolton Maritime Management Ltd
St. Helena	24.1.85	M. Underwood	R. Hone, S. Quinn, J. N. H. Case	R. A. Wilson	Curnow Shipping Ltd
St. Nicholas	*	W. A. King	C. Winterton	R. Mallett	Sealink (U.K.) Ltd
Sachem	27.2.85	L. D. Coppack	R. J. Kelly, G. D. Hayward, S. Woodward, M. J. Haxby	R. Skuse	Mobil Shipping & Transportation Co.
Sagacity	23.11.84	W. M. Shirreff	H. R. Beisly, R. Volante		F. T. Everard & Sons Ltd
Salmonpool	14.3.85	R. J. Copeland	D. R. Elt, D. Lewington, R. W. Garner	P. White	Ropner Management Ltd
Samaria	5.10.84	C. S. Kingston	P. D. R. Bryan, J. Lewis, D. Moody	J. F. Worcester	Cunard Shipping Services Ltd
Sapele	25.2.85	G. D. Johnson	B. M. Reilly, M. G. Brown, P. Carlisle	J. Crotty	Ocean Fleets Ltd
Sapphire Bounty	24.2.84	I. H. Pringle		R. F. Minon	Denholm Ship Management Ltd
Saxonia	31.7.84	J. G. Rosie	M. J. Turner, P. C. Youé, P. Burgess	R. Holmes	Cunard Shipping Services Ltd
Scamper Universal	10.7.84	M. I. Turner	I. V. Hughes, A. Hardman, D. P. Neaves	I. Johnston	Gateway Shipping Ltd
Scandia Team	10.1.85	R. Mackenzie	R. W. Caie, E. Smith, T. Tait	K. Ellison	Denholm Ship Management 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	19.2.85	M. D. Whiteley	P. D. Hall, C. Turner	J. N. Duckworth	Cayzer, Irvine Shipping Ltd
Scottish Lion	1.3.85	O. Barnsley	C. J. Batty, A. J. Gorringe	T. J. Martel	Cayzer, Irvine Shipping Ltd
Scythia	4.1.85	A. Pritchard	N. R. Broomhall, I. S. Ramage, M. Green	D. E. Reilly	Cunard Shipping Services Ltd
Sea Princess	16.1.85	J. Chester	B. Benzie, S. Horne	J. Gorley	P. & O. Lines Ltd
Seaboard Illustrious	6.11.84	J. Gillies	R. Crawford, A. F. Vincent, A. G. Maclean	C. Thompson	Seaboard Offshore Ltd
Seaboard Implacable	*	A. G. Axup	R. Page		Seaboard Offshore Ltd
Seaboard Invincible	20.12.84	P. Kenny	A. F. Vincent, A. G. Maclean		Seaboard Offshore Ltd
Seaforth Clansman	9.8.83	J. Ritchie		W. Hammerton	Seaforth Maritime Ltd
Seagair	11.3.85	M. Easton	F. Routledge, M. Ramsbottom, D. L. Culton	I. Macleod	B.P. Shipping Ltd
Security	19.12.83	W. G. Kingwood	M. S. Cable, N. E. Gordon, R. J. Middleton		F.T. Everard & Sons Ltd
Sekondi	25.10.84	G. D. Johnson	R. Holness, J. E. McGregor, G. W. Williams	M. Brown	Ocean Fleets Ltd
Selbydyke	29.1.85	A. W. Watson	R. Wilson, A. W. Tebbutt, J. Sullivan		North British Shipping Ltd

Selected Ships (*contd*)

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Semac 1	28.8.80	J. Dobeson			Semac Services
Serenia	19.9.84	B. Bowtell	K. J. Coleman, P. Jameson, E. J. Cripps	A. Ridley	Shell Tankers (U.K.) Ltd
Serenity	12.9.84	R. Hart	H. R. Beisly, M. M. Boyle		F. T. Everard & Sons Ltd
Servia	18.5.84	G. F. Kay	P. D. R. Bryan, B. F. Hawkins, P. Lawrence	D. Callicott	Cunard Shipping Services Ltd
Shetland Service	31.1.85	J. Sole	N. Sheard, S. F. Whittingham		Offshore Marine Ltd
Sinbad Saxon	15.1.85	M. Wilson	G. Nicol, B. Dobson, W. McLean, B. Lieper	E. Maitland	Jebsens Ship Management Ltd
Sincerity	12.12.84	B. Mumby	K. Hodson		F. T. Everard & Sons Ltd
Singularity	13.12.84	W. D. Taylor	S. J. Messruther, M. Arden		F. T. Everard & Sons Ltd
Sir Alexander Glen	29.1.85	D. Willey	C. W. Blacker, C. Grahame, A. F. Whitehead	C. P. Brockbank	Hudson S.S. Co. Ltd
Sir Walter Raleigh	*	M. Kitchenside	C. Mahoney, D. Cross, B. Wood	D. Legge	J. Marr & Son Ltd
Sir Winston Churchill	*	M. Kemmis Betty	G. Dippie, M. Stephens		Sail Training Association
Sky Clipper	*				Fyffes Group Ltd
Sokoto	5.2.85	D. J. A. Johnston	R. J. Harbourne, G. J. Griffiths, J. M. Wood	D. Griffith	Ocean Fleets Ltd
South View	*	D. Robinson	J. Clamp, S. Furness, C. Pursey	H. Segrane	Salen U.K. Ship Management Ltd
Southern Quest	*	G. V. Phippen	P. Malcolm, E. C. Davidson		Antarctic Expedition Ltd
Southland Star	6.3.85	P. W. Hutchinson	J. G. Ewart, S. J. F. Cutler, M. J. McGilvray	M. J. Janor	Blue Star Ship Management Ltd
Speciality	27.2.85	C. T. Marchant	K. Lindsay, S. K. Campbell, S. Richardson		F. T. Everard & Sons Ltd
Speedstar Universal	5.9.84	O. Barnsley	A. R. Wilson, J. P. Madge, A. J. Welcome	D. Colclough	Cayzer, Irvine Shipping Ltd
Stability	8.8.84	W. M. Shirreff	C. Brown, R. J. Middleton		F. T. Everard & Sons Ltd
Staffordshire	12.3.85	M. R. Nisbett	F. J. C. Kelly, R. Hodgson, B. King	G. K. Valentine	Bibby Line Ltd
Star Everace	19.2.85	I. C. Graham	J. K. Robson, A. D. Spence, B. S. Raper	N. Smith	Bromyard Co. Ltd
Star World	8.11.84	G. T. Parker	G. A. McPhee, A. K. Babbar, R. M. Patmore	G. O. D'Souza	Marine Navigation Co. Ltd
Stena Carrier	*	B. Le Pine Williams	C. Atterton, G. Gardiner, J. Dyson	R. Clayton	Swedish Caledonian Management Ltd
Stena Grecia	18.9.84	J. E. Boswell	W. B. Sclater, I. F. Stewart, R. J. Hibling	P. H. Skidmore	Swedish Caledonian Management Ltd
Stena Ionia	16.1.85	C. J. Harker	H. N. P. Aplin, P. G. Larkin, P. D. Meyerhoff, J. S. Latto	L. R. Allen	Swedish Caledonian Management Ltd
Stena Oceanica	25.2.85	T. Rowat	P. S. Manchester, S. W. Simpson, D. V. Lloyd	J. Laughland	Swedish Caledonian Management Ltd
Stolt Sceptre	5.11.84	K. V. Lewis	A. W. Simonds, G. R. Jones, D. J. Williams	R. C. Humby	PAL Shipping Services Ltd
Stolt Stane	31.1.85	G. Maciver	A. J. Hepworth, W. R. Austin, M. P. Sanders	M. S. Aldridge	PAL Shipping Services Ltd
Stolt Templar	4.3.85	K. Richmond	G. W. Babbage, G. W. H. Bowles	N. A. Allison	PAL Shipping Services Ltd
Strider Juno	31.10.83	S. Bennett	R. Advincula, R. Arban, J. Nega	M. A. Asual	Sea Containers Chartering Ltd
Suilven	9.1.85	J. N. MacDonald	A. Morrison, D. Malcolm	J. J. Macleod	Caledonian MacBrayne Ltd
Sulisker	27.6.84	D. K. Dickson	P. Shenton, D. Temple, J. Ross		Ministry of Agriculture, Fisheries & Food

Summity	16.3.83	D. Spurling	P. J. Laity, C. Buckley, J. Henderson		F. T. Everard & Sons Ltd
Superiority	28.6.84	M. A. Chapple	E. J. Froggatt, E. Varne, R. J. Bialoszewski, A. S. Lanucha		F. T. Everard & Sons Ltd
Tacoma City	6.2.85	J. C. Lee	R. W. Eacott, J. S. Murray, C. Swindells	R. G. Chugg	Sir Wm Reardon Smith & Sons Ltd
Tankerman	22.10.84	M. J. Charlesworth	M. G. Banks, J. M. Walker, R. J. Ralling	A. E. De La Grense	Rowbotham Tankships Ltd
Tectus	31.1.85	W. Brierley	P. J. Sutcliffe, R. N. Richards, D. Freeman, P. Gibson	W. Carty	Shell Tankers (U.K.) Ltd
Telnes	*	V. Taylor	M. Bailey	J. O'Driscoll	Jebsens Ship Management Ltd
Tenchbank	2.1.85	P. M. Anthony	J. Davies, E. F. Stewart, E. M. Pallister, N. J. Harvey	R. B. Fuller	Bank Line Ltd
Texaco Westminster	12.5.82	J. R. Walker	J. M. Small, G. S. Williams, J. B. Anderson	P. A. Flynn	Texaco Overseas Tankships Ltd
Thamesfield	21.11.84	P. Hansen	N. S. Patterson, S. Bryans, A. J. Howlett	P. Shanahan	Hunting Stag Management Ltd
Toana Papua	12.11.84	D. MacPhail	C. N. Hardy, M. Causon, I. D. Cumming	K. S. Woodley	Bank Line Ltd
Tog Mor	*	J. Suddes	G. Patience		Howard Doris Marine Services Ltd
Tokyo Bay	8.1.85	R. P. Royan	K. C. Riddick, P. D. Davies	T. J. Smith	Overseas Containers Ltd
Tolaga Bay	15.2.85	J. C. Cox	R. J. Buckley, C. J. A. Hughes, D. R. Peel	E. B. Stephenson	Overseas Containers Ltd
Tor Bay	1.2.85	W. C. Carruthers	M. K. R. Elliot, B. Cushman, W. J. Stoker	J. McKay	Overseas Containers Ltd
Tribulus	31.1.85	R. Hayward Wills	J. G. R. Williams, J. Cripps, K. Biggs	M. Harrison	Shell Tankers (U.K.) Ltd
Trinidad and Tobago	14.1.85	N. H. Malpass	A. Pailing, A. G. Smith, S. N. Harris	C. Wade	Bibby Line Ltd
Troll Lake	*	E. D. Somes	G. Laversuch, S. Brown, R. Hopkins	D. R. Davies	Ocean Fleets Ltd
Troll Maple	5.2.85	K. K. Mishra	J. D. Parakh, D. K. Manral, U. B. Palsule	A. V. M. Nair	Escombe McGrath & Co. Ltd
Troll Viking	2.10.84	L. J. J. de Figueiredo	A. S. Kamboj, S. Palat, V. Madhok	F. J. Irani	Escombe McGrath & Co. Ltd
Troutbank	10.8.84	T. D. Scott	W. E. Lewis, A. G. Stevenson, B. Stirling	E. L. Derbyshire	Bank Line Ltd
Uganda	13.2.85	D. J. Scott-Masson	D. M. Turner, R. A. Bowler, D. Hepburn	F. Murphy	P. & O. Lines Ltd
Valdivia	12.11.84	A. L. Mitchell	A. D. Chapman, J. Kirk, N. Dilkes	G. Watterson	Harrison (Clyde) Ltd
Vegaman	31.12.84	J. H. Suter	S. A. C. Jones, J. P. Evanson, L. P. Cragg	D. Johnston	Rowbotham Tankships Ltd
Vendee	11.3.85	D. J. Perry	D. P. Symons, S. B. Tudor, S. Monks	D. Williams	P. & O. Lines Ltd
Venturous	*	D. B. Davies	N. Davies, S. McDonald		Swansea University
Vic Bilh	4.1.85	P. W. Hillier	P. Hebden, W. A. J. Cameron, P. M. Cross	S. W. Taylor	B.P. Shipping Ltd
Victoria Peak	18.2.85	M. E. Guy	S. Armstrong, J. Turner, P. Blackwell-Smyth	A. W. Dixon	Seahorse Ship Management Ltd
Vigilant	4.3.85	D. L. Rattray	J. Barkess, N. E. McInnes, C. G. M. Dalew, I. McKendrick		Department of Agriculture & Fisheries for Scotland
Viking Venturer	10.1.85	R. H. Plant	R. J. Ross, L. T. Simpson, D. A. Parsons	S. C. Horne	Thoresen Car Ferries Ltd
Vivien M	*	P. G. Pinkerton	G. P. D. Coleridge, R. Mathur, R. Avesthy	Iu King Fung	Fyffes Group Ltd
Vosges	21.2.85	H. C. Hynard	P. Tarrant, C. A. Baker, J. D. Pinder	G. C. England	P. & O. Lines Ltd
W. A. Mather	15.2.85	C. G. Webster	H. K. Lloyd, D. A. Bance, R. Hawley	S. J. Mee	Canadian Pacific Steamships Ltd
W. M. Neal	19.4.84	A. R. Whyte	D. Moss, R. Gillespie, D. N. B. Nutman	D. W. Lever	Canadian Pacific Steamships Ltd
Washington	28.8.84	A. R. McKay	K. Whittaker, M. Allison, D. Lees	R. Thompson	Stephenson Clarke Shipping Ltd
Wellington Star	12.2.85	G. D. Easton	M. Hardy, D. Hocking	G. N. Shaw	Blue Star Ship Management Ltd
Wellpark	11.10.84	J. R. Corrin	M. S. MacCall, W. Winton, F. Miller	R. S. Henderson	Denholm Ship Management Ltd
Western Pacesetter IV	11.3.85	J. Touchet	J. Hodges, P. Fairbrass, P. Scott	A. Kennedy	Western Oceanics (U.K.) Ltd
Westra	6.1.83	T. Henderson	D. L. Beveridge, R. J. Sheldon		Department of Agriculture & Fisheries for Scotland
Wheelsman	8.3.85	J. Bates	S. A. C. Jones, M. D. Kerr	D. A. Russell	Rowbotham Tankships Ltd
Willowbank	24.1.85	H. J. Taylor	J. C. Osman, M. B. Hannon, M. P. Armstrong	F. Huggett	Bank Line Ltd
Wilmington	14.3.85	D. Macleod	M. B. Wdowikowski, D. D. Matheson	H. Chesters	Stephenson Clarke Shipping Ltd

Supplementary Ships

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Earl Godwin	20.12.84	J. Attwood		P. A. Lloyd	Sealink (U.K.) Ltd
Earl Granville	30.10.84	M. G. Mills	B. Hayball, P. Goode, P. Harris	P. Jordan	Sealink (U.K.) Ltd
Oil Hustler	*	N. Brown	L. Elms		Ocean Inchcape Ltd
Oil Supplier	*	C. Cunningham	G. J. S. Ives, M. Kirk		Ocean Inchcape Ltd
Viking Trader	25.2.85	K. W. Gordon	A. K. Rowley, J. Leaver, D. E. Beresford	C. D. Arnold	Thoresen Car Ferries Ltd
Viking Valiant	2.1.85	C. E. Banks	D. E. Knight, A. R. Froude, A. P. Stapley	G. I. Petrie	Thoresen Car Ferries Ltd

'Marid' Ships

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

Name of Vessel	Master	Owner/Manager
Aldrington	P. Ryder	Stephenson Clarke Shipping Ltd
Arco Thames	P. H. Phillips	A. R. C. (Marine) Ltd
Ashington	J. Reay	Stephenson Clarke Shipping Ltd
Authenticity	B. J. Gillett	F. T. Everard & Sons Ltd
BP Warrior	R. Rait	B.P. Oil Ltd
Barra Head	L. Buchanan	Christian Salvesen (Shipping) Ltd
Beacon Point	R. Rice-Hughes	Christian Salvesen (Shipping) Ltd
Claymore	M. Kennedy	Caledonian MacBrayne Ltd
Columba	R. Hutcheson	Caledonian MacBrayne Ltd
Crusader Point	D. J. Sutherland	Hudson S.S. Co. Ltd
Dolphin Point	C. Wood	Christian Salvesen (Shipping) Ltd
Donnington	G Arkley	Stephenson Clarke Shipping Ltd
Dragon	I. H. Leggatt	Thoresen Ferries Ltd
Earl William	J. Macmillan	Sealink (U.K.) Ltd
Eastgate	A. Shenton	Rowbotham Tankships Ltd
Emerald	A. Bourn	Stephenson Clarke Shipping Ltd
Esso Clyde	H. W. McQuaid	Esso Petroleum Co. Ltd
Esso Fawley	F. Cook	Esso Petroleum Co. Ltd
Esso Mersey	S. J. McCollen	Esso Petroleum Co. Ltd
Esso Milford Haven	P. O'Connor	Esso Petroleum Co. Ltd
Fort Point	R. B. Dixon	Christian Salvesen (Shipping) Ltd
Frederick M.	R. Vine	Coe-Metcalf Shipping Ltd
Garrison Point	H. Hawsley	Hudson S.S. Co. Ltd
Harting	J. M. McCuaig	Stephenson Clarke Shipping Ltd
Helmsman	A. Mackinnon	Rowbotham Tankships Ltd
Irishgate	R. Samson	Rowbotham Tankships Ltd
Jubilence	G. Brown	Crescent Shipping Co. Ltd
La Colina	D. Jones	Buries Markes (Ship Management) Ltd
La Hacienda	J. Frisby	Buries Markes (Ship Management) Ltd
Landguard Point	D. Sutherland	Hudson S.S. Co. Ltd
Ligar Bay	G. Gant	F. T. Everard & Sons Ltd
Malling	C. Dyre	Stephenson Clarke Shipping Ltd
Marinestone	G. B. Farmer	A. P. C. (Marine) Ltd
Militence	R. Hawkes	Crescent Shipping Co. Ltd
Norna	I. Pollock	Department of Agriculture & Fisheries for Scotland
Northgate	D. Bee	Rowbotham Tankships Ltd
Oilman	N. R. Williams	Rowbotham Tankships Ltd
Orionman	D. R. Cummings	Rowbotham Tankships Ltd
Oswestry Grange	A. N. Millie	Furness Withy (Shipping) Ltd
Piquence	A. Afflek	Crescent Shipping Co. Ltd
Rogate	J. L. Blanch	Stephenson Clarke Shipping Ltd
Rora Head	P. Keene	Christian Salvesen (Shipping) Ltd
St Clair	D. C. Grey	P. & O. Lines Ltd
St Columba	L. R. Evans	Sealink (U.K.) Ltd
Shell Craftsman	R. M. Astridge	Shell U.K. Oil Ltd
Shell Explorer	D. Kain	Shell U.K. Oil Ltd
Shell Trader	M. Fraser	Shell U.K. Oil Ltd
Storrington	J. Ramsey	Stephenson Clarke Shipping Ltd
Sumburgh Head	C. Wood	Christian Salvesen (Shipping) Ltd
Vibrence	J. Setterfield	Crescent Shipping Co. Ltd
Warden Point	R. Gettis	Hudson S.S. Co. Ltd
Westerence	T. G. Uden	Crescent Shipping Co. Ltd

Light-vessels

Name of Vessel	Master
Channel	A. Fowler, G. Harley
Dowsing	J. Akester, J. F. Beamish
East Goodwin	A. E. Everett, F. G. Edwards
Falls	A. H. Robinson, W. E. Jones
Humber	L. A. Horn, B. Mercer
Newarp	W. F. Dalby, S. F. Goose
Royal Sovereign (Lt. Tower)	G. Harthill, V. S. Pearce
St. Gowan	H. Price, R. Owen
Seven Stones	F. D. Gayton, R. Goddard
Smith's Knoll	W. Sheaf, G. E. West
Tongue	B. W. Mead, F. Allen
Varne	P. L. Wilkins, W. Woodward

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 1.3.85)

Name of Vessel	Owner/Manager
Al Khaleej	Kuwait Shipping Co.
Al Qurain	Livestock Transport & Trading Co.
Al Shuwaikh	Livestock Transport & Trading Co.
Al Yassrah	Rural Exporters & Traders Pty Ltd
Anna Bakke	Knutsen Line
Anro Australia	Australian National Line
Arafura	Overseas Containers Australia Pty Ltd
Ariake	Overseas Containers Australia Pty Ltd
Atrevida	World Star Shipping, Cyprus
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 Progress	Australian National Line
Australian Prospector	Australian National Line
Australian Purpose	Australian National Line
Australian Venture	Australian National Line
Bass Trader	Australian National Line
BP Achiever	BP Australia
BP Endeavour	BP Tanker Co. Ltd
BP Enterprise	BP Tankers (Aust.) Pty Ltd
Brisbane Trader	Australian National Line
Buffalo Express	Vroon VB (Breskens)
Cape Don	Department of Transport
Cape Hawke	Australian National Line
Cape Moreton	Department of Transport
Cape Pillar	Department of Transport
Coral Chief	China Navigation Co. Ltd
Danny F.	Rachid Fares Enterprises Pty Ltd
Dick Smith Explorer	Oceanic Research Foundation, Sydney
Eastern Enterprise	Howard Smith Ltd
Eigamoiya	Nauru Local Govt Council
Eigigu	Nauru Pacific Line
Ellsborg	Weeke Ship Hong Kong Ltd
El Redil	Livestock Carriers S.p.A., Bari
Empress of Australia	Australian National Line
Energy Searcher	Pacific Supplies Inc.
Eugene McDermott II	Geophysical Services Inc.
Fernanda F.	Rachid Fares Enterprises Pty Ltd
Flinders Range	Australian National Line
Fua Kavenga	Pacific Forum Line
Gerringong	Howard Smith Industries Pty Ltd
Howard Smith	Howard Smith Ltd
Icebird	Gunther Schulz
Irene Greenwood	State Shipping Service
Iron Arnhem	Broken Hill Pty Ltd
Iron Capricorn	Broken Hill Pty Ltd
Iron Kestrel	Broken Hill Pty Ltd
Iron Kirby	Broken Hill Pty Ltd
Koolinda	State Shipping Service
Kowulka	Colonial Sugar Reginery Ltd
Lake Barrine	Australian National Line
Lalandia	East Asiatic Co. Ltd.
Lysaght Endeavour	Australian National Line
Mawashi Al-Gasseem	Livestock Transport & Trading Co.
Melbourne Trader	Australian National Line
Mobil Flinders	Mobil Oil Australia Ltd
Mukairish Alawal	Nasser Al Mohamed Almukairish
Mukairish Althani	Kuwait Shipping Co.
Neptune Seginus	Hetherington Westfarmers

Australia (*contd*)

Name of Vessel	Owner/Manager
Nimos	China Navigation Co. Ltd
Nivosa	Shell Company of Australia Ltd
Norleb	Rachid Fares, Fremantle
Oceanic Crest	Seahorse Ship Management
Oriana	P. & O. Lines Ltd
Ormiston	Colonial Sugar Refinery Ltd
Papuan Chief	China Navigation Co. Ltd
Pathfinder II	Panore Shipping Co.
Pilbara	State Shipping Service
Prospector	Panore Shipping Co.
Ragna Bakke	Knutsen Line
Regional Endeavour	Seltrust Mining Corp. Pty Ltd
Rig Seismic	Bureau of Mineral Resources
River Boyne	Australian National Line
River Embley	Australian National Line
Selwyn Range	Australian National Line
Seola	C.S.I.R.O
Siba Queen	Italcattle S.p.A., Bari
Sid McGrath	John Burke Shipping Pty Ltd
Tarago	Wilh. Wilhelmsen
TNT Altrans	Bulkfridge Pty Ltd
TNT Capricornia	TNT Bulkships Ltd
TNT Carpentaria	TNT Bulkships Ltd
Tourcoing	Wllh. Wilhelmsen
Troubridge	S.A. State Government
Uniceb	Livestock Carriers S.p.A., Bari
Viborg	Livestock Carriers Pte Ltd

CANADA (Information dated 1.1.85)

Name of Vessel	Owner/Manager
Ad Astra	Barber Ship Management Ltd
Advent	Government of Canada
Alberni Dawn	Man Cheung Yuen Services Ltd
Alert	Government of Canada
Arctic	Canarctic Shipping Co. Ltd
Arion	Arion Navigation Co.
Atlantic Wing	ACT Maritime Co. Ltd
Baffin	Government of Canada
Bayfield	Government of Canada
Beau Bois	Government of Canada
Bibi	Sir Wm Reardon Smith & Sons Ltd
Bluenose	Canadian National (Marine)
Bow Drill I	Husky/Bow Valley Offshore Drilling Ltd
Bow Drill II	Husky/Bow Valley Offshore Drilling Ltd
Bow Drill III	Husky/Bow Valley Offshore Drilling Ltd
Brierfield	Buries Markes (Ship Management) Ltd
Camsell	Government of Canada
Canadian Ace	Montreal Shipping Ltd
Canadian Highlander	Upper Lakes Shipping Co.
Cape Roger	Government of Canada
Chebucto	Government of Canada
Chennai Nermai	South India Shipping Corp. Ltd
Crystal Reed	Korea Shipping Corporation
Cygnus	Government of Canada
Dawson	Government of Canada
Des Groseillers	Government of Canada
Dilkara	ACTA Pty Ltd
Eastern Maid	Indo-China S.N. Co. Ltd
Eastern Moon	Indo-China S.N. Co. Ltd
Eastern Valley	Sir Wm Reardon Smith & Sons Ltd
Egda	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

Canada (*contd*)

Name of Vessel	Owner/Manager
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
Glomar Labrador I	Home Oil Co. Ltd
Grena	Indo-China S.N. Co. Ltd
Grenfell	Government of Canada
Gulf Beaufort	Gulf Canada Co. Ltd
Gulf Canada	Gulf Canada Co. Ltd
Gulf Mackenzie	Gulf Canada Co. Ltd
Hudson	Government of Canada
Irving Canada	Kent Line Ltd
Irving Eskimo	Kent Line Ltd
Irving Forest	Kent Line Ltd
Irving Ocean	Kent Line Ltd
Island Princess	P. & O. Lines Ltd
J. E. Bernier	Government of Canada
Jackman	Government of Canada
John A. MacDonald	Government of Canada
John Cabot	Government of Canada
John Shaw	Mobil Oil (Canada) Ltd
Kemano	Jardine Shipping Ltd
La Primavera	Buries Markes (Ship Management) Ltd
Labrador	Government of Canada
Lakeshell	Shell Oil (Marine) Co. Ltd
Limnos	Government of Canada
Louis S. St-Laurent	Government of Canada
Louisbourg	Government of Canada
Malahat	Indo-China S.N. Co. Ltd
Marigold I	Patt Manfield Co. Ltd
Maxwell	Government of Canada
Mesange	Boreal Navigation Co.
Montcalm	Government of Canada
Nahidik	Government of Canada
Namao	Government of Canada
Nandu Arrow	Indo-China S.N. Co. Ltd
Neddrill II	Mobil Oil (Canada) Ltd
New Zealand Alliance	Wheelock Marine Services Ltd
Nordkap	Norden Steamship Co. Ltd
Nordkyn	Norden Steamship Co. Ltd
Nordpol	Norden Steamship Co. Ltd
Norman McLeod Rogers	Government of Canada
Northern Shell	Shell Oil (Canada) Ltd
Pacific Princess	P. & O. Lines Ltd
Pandora II	Government of Canada
Parizeau	Government of Canada
Pierre Radisson	Government of Canada
Polaris V	Carino Co. Ltd
Port Vancouver	Canadian Pacific Steamships Ltd
Princess of Acadia	Canadian National (Marine)
Queen of Prince Rupert	British Columbia Ferries
Queen of the North	British Columbia Ferries
Rimba Meranti	Malaysian International Shipping Corp.
Rowan Gorilla I	Husky/Bow Valley Offshore Drilling Ltd
Rowan Juneau	Mobil Oil (Canada) Ltd
Sedco 706	Husky/Bow Valley Offshore Drilling Ltd
Sedco 709	Mobil Oil (Canada) Ltd
Sedco 710	Petro Canada
Simon Fraser	Government of Canada
Sir Humphrey Gilbert	Government of Canada
Sir James Douglas	Government of Canada
Sir John Franklin	Government of Canada
Sir William Alexander	Government of Canada
Skeena	Sir Wm Reardon Smith & Sons Ltd
South Express	Eastern Shipping Co. Ltd
Star Everwin	Man Cheung Yuen Services Ltd
Star Magnate	World-wide Shipping Agency Ltd
Star Sulu	Vinta Maritime Co. Ltd
Sun Princess	P. & O. Lines Ltd
Sun Rokko	Gearbulk Shipping Agency Ltd

Canada (*contd*)

Name of Vessel	Owner/Manager
T. Akasaka	Canadian Pacific Steamships Ltd
Tanu	Government of Canada
Thomas Carleton	Government of Canada
Thor I	Thor Dahl Lines
Thorscape	Thor Dahl Lines
Tupper	Government of Canada
United Drive	International United Shipping Agency Ltd
Vinland	Petro Canada
W.C. van Horne	Canadian Pacific Steamships Ltd
Walter E. Foster	Government of Canada
West Venture	Mobil Oil (Canada) Ltd
Western Valley	Sir Wm Reardon Smith & Sons Ltd
Wilfred Templeman	Government of Canada
Wolfe	Government of Canada
World Jade	World-wide Shipping Agency Ltd
World Pearl	World-wide Shipping Agency Ltd
World Prize	World-wide Shipping Agency Ltd
Zapata Scotian	Mobil Oil (Canada) Ltd

Auxiliary Ships:
Canada has 261 ocean-going Auxiliary Ships and 107 Auxiliary Ships operating on the Great Lakes and Inland Waters.

HONG KONG (Information dated 5.2.85)

Name of Vessel	Owner/Manager
Selected Ships:	
Asian Jade	Swire Shipping (Agencies) Ltd
Asian Pearl	Swire Shipping (Agencies) Ltd
Australia	Denholm Ship Management Ltd
Barber Perseus	Barber Wilhelmsen Agencies Ltd
Barber Tonsberg	Barber Wilhelmsen Agencies Ltd
Boonkrong II	Chin Seng Hong Ltd
Chengtu	Swire Shipping (Agencies) Ltd
Coral Princess	Swire Shipping (Agencies) Ltd
Eastern Muse	The Indo-China S.N. Co. (H.K.) Ltd
Halldor	Thoresen & Co. Ltd
Hongkong Container	Hongkong Export Lines Ltd
Kweilin	Swire Shipping (Agencies) Ltd
Maersk Tempo	Maersk Line (H.K.) Ltd
Neptune Jasper	H.K. Trident Shipping Agency Ltd
Oriental Ambassador	Hongkong Export Lines Ltd
Oriental Chief	Hongkong Export Lines Ltd
Oriental Expert	Hongkong Export Lines Ltd
Oriental Prince	Hongkong Export Lines Ltd
Sirichai Bulakul	Chin Seng Hong Ltd
Strathconon	Swire Shipping (Agencies) Ltd
Strathfife	Swire Shipping (Agencies) Ltd
Thai Pailin	Hongkong Export Lines Ltd
Thai Tubtim	Hongkong Export Lines Ltd
Willine Taro	Barber Ship Management Ltd

Hong Kong (*contd*)

Name of Vessel	Owner/Manager
Supplementary Ships:	
Arrow Queen	Mercury Shipping Co. Ltd
Asian Thistle	The Indo-China S.N. Co. (H.K.) Ltd
Barber Tampa	Barber Wilhelmsen Agencies Ltd
Bunga Kantan	Mak Shui Cho & Son Ltd
C.R. Abidjan	Wallem Shipping Co. Ltd
C.R. Douala	Wallem Shipping Co. Ltd
Castle Peak	Wallem Shipping Co. Ltd
Hugheverett	Everett Steamship Corp. S/A
Manila Honour	Barber Wilhelmsen Agencies Ltd
Manoloeverett	Everett Steamship Corp. S/A
Ngan Chau	Hong Kong Islands Shipping Co. Ltd
Ocean Container	Hong Kong Islands Shipping Co. Ltd
Pearl Kim	Hong Kong Borneo Shipping Co. Ltd
Pearl of Scandinavia	Scanasia Shipping Ltd
Ramoneverett	Everett Steamship Corp. S/A
Sea Architect	Interocean Shipping Co. Ltd
Sealock	Wheelock Marine Services Ltd
Seamaster I	Interocean Shipping Co. Ltd
Tachibana	Barber Ship Management Ltd
Takasago	Barber Ship Management Ltd
Theben	Barber Ship Management Ltd
Thermopylae	Barber Ship Management Ltd
Thomaseverett	Everett Steamship Corp. S/A
Willine Toyo	Barber Ship Management Ltd
Willine Tysla	Hong Kong Islands Shipping Co. Ltd
Yuen Chau	Hong Kong Islands Shipping Co. Ltd

INDIA (Information dated 1.1.84)

Name of Vessel	Owner
Selected Ships:	
Akbar	Mogul Line Ltd
Andamans	Shipping Corporation of India
BR Ambedkar	Shipping Corporation of India
Chennai Selvam	South India Shipping Co.
Chidambaran	Shipping Corporation of India
Gaveshani	National Institute of Oceanography
Harsha Vardhan	Shipping Corporation of India
Jalagirija	Scindia Steam Navigation Co.
Jalajyoti	Scindia Steam Navigation Co.
Jalakanta	Scindia Steam Navigation Co.
Jalamoti	Scindia Steam Navigation Co.
Jalarajan	Scindia Steam Navigation Co.
Jalayamini	Scindia Steam Navigation Co.
Jalazad	Scindia Steam Navigation Co.
Lokmanya Tilak	Shipping Corporation of India
Nancowry	Shipping Corporation of India
Ratna Nandini	Ratnakar Shipping Co.
Sagar Kanya	Shipping Corporation of India
Shompen	Shipping Corporation of India
State of Andhra Pradesh	Shipping Corporation of India
State of Maharashtra	Shipping Corporation of India
State of Mysore	Shipping Corporation of India
State of Nagaland	Shipping Corporation of India
State of Travancore Cochin	Shipping Corporation of India
State of Uttar Pradesh	Shipping Corporation of India
State of West Bengal	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

India (*contd*)

Name of Vessel	Owner
Supplementary Ships:	
Ajanta	Shipping Corporation of India
Algilani	Allanasons Pte Ltd
Annapurna	Shipping Corporation of India
Anupama	Shipping Corporation of India
Apj Ambika	Surrendra Overseas Ltd
Apj Anand	Surrendra Overseas Ltd
Apj Anjali	Surrendra Overseas Ltd
Apj Priya	Surrendra Overseas Ltd
Aradhana	Shipping Corporation of India
Archana	Shipping Corporation of India
Arunachal Pradesh	Shipping Corporation of India
Bailadila	Shipping Corporation of India
Ballary	Shipping Corporation of India
Barauni	Shipping Corporation of India
Bhagat Singh	Shipping Corporation of India
Bharat Seema	Shipping Corporation of India
Bharatendu	Shipping Corporation of India
Bhaskara	Shipping Corporation of India
Bhavabuti	Shipping Corporation of India
Chanakya	Shipping Corporation of India
Chandidas	Shipping Corporation of India
Chennai Jayam	South India Shipping Corporation
Chennai Muyarchi	South India Shipping Corporation
Chennai Ookkam	South India Shipping Corporation
Chennai Perumai	South India Shipping Corporation
Chennai Sadhanai	South India Shipping Corporation
Chennai Veeram	South India Shipping Corporation
Chhatrapati Shivaji	Shipping Corporation of India
Desh Deep	Shipping Corporation of India
Devaraya	Shipping Corporation of India
Diglipur	Shipping Corporation of India
Homi Bhabha	Shipping Corporation of India
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.
Indian Goodwill	India Steamship Co.
Indian Industry	India Steamship Co.
Indian Progress	India Steamship Co.
Indian Prosperity	India Steamship Co.
Indian Triumph	India Steamship Co.
Indian Valour	India Steamship Co.
Indian Venture	India Steamship Co.
Jag Anjali	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 Preeti	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 Co.
Jagat Samrat	Dempo Steamships Co.
Jagat Swamini	Dempo Steamships Co.
Jagat Vijeta	Dempo Steamships Co.
Jalabala	Scindia Steam Navigation Co.
Jaladurga	Scindia Steam Navigation Co.
Jalagouri	Scindia Steam Navigation Co.
Jalagodavari	Scindia Steam Navigation Co.
Jalagovind	Scindia Steam Navigation Co.
Jalajaya	Scindia Steam Navigation Co.
Jalakala	Scindia Steam Navigation Co.
Jalakendra	Scindia Steam Navigation Co.
Jalamani	Scindia Steam Navigation Co.
Jalamatsya	Scindia Steam Navigation Co.
Jalamayur	Scindia Steam Navigation Co.

India (*contd*)

Name of Vessel	Owner
Jalamohan	Scindia Steam Navigation Co.
Jalamokambi	Scindia Steam Navigation Co.
Jalamudra	Scindia Steam Navigation Co.
Jalamurugan	Scindia Steam Navigation Co.
Jalaputra	Scindia Steam Navigation Co.
Jalarashmi	Scindia Steam Navigation Co.
Jalaratna	Scindia Steam Navigation Co.
Jalatapi	Scindia Steam Navigation Co.
Jalatarang	Scindia Steam Navigation Co.
Jalavallabh	Scindia Steam Navigation Co.
Jalavijaya	Scindia Steam Navigation Co.
Jalayamuna	Scindia Steam Navigation Co.
Jameela	Shipping Corporation of India
Jana Priya	Mogul Line Ltd
Jawaharlal Nehru	Shipping Corporation of India
Jay Ambika	Jay Shree Tea & Industries Ltd
Jayanarayan Vyas	Shipping Corporation of India
Kabirdas	Shipping Corporation of India
Kalidas	Shipping Corporation of India
Kanchenjunga	Shipping Corporation of India
Kanishka	Shipping Corporation of India
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 Priti	Mogul Line Ltd
Lok Sahayak	Mogul Line Ltd
Lok Vihar	Mogul Line Ltd
Lok Vikas	Mogul Line Ltd
Lok Vinay	Mogul Line Ltd
Lok Vivek	Mogul Line Ltd
Mahabhakti	South East Asia Shipping Co.
Mahabir	South East Asia Shipping Co.
Maharasmi	South East Asia Shipping Co
Maharshi Dayanand	Shipping Corporation of India
Maharshi Karve	Shipping Corporation of India
Mahavijay	South East Asia Shipping Co.
Maratha Elegance	Chowgule Steamships Ltd.
Maratha Melody	Chowgule Steamships Ltd.
Maratha Progress	Chowgule Steamships Ltd.
Meghdoot	Varun Shipping Co.
Meghrab	Shipping Corporation of India
Mizoram	Shipping Corporation of India
MMP Wealth	M.M.P. Lines Ltd
M.O.T. Dredge	Govt of the Republic of India
Nand Hari	Essar Bulk Carriers Ltd
Nand Kala	Essar Construction and Carriers Ltd
Nanda Rati	Essar Construction and Carriers Ltd
Netaji Subhas Bose	Shipping Corporation of India
Nitya Amar	Maini Shipping Pte Ltd
Nirvan Vishnu	Nirvan Shipping Ltd
Onge	Shipping Corporation of India
Prabhu Gopal	Tolani Shipping Co.
Prabhu Puni	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 Co.
Sagar Samrat	Oil & Natural Gas Commission of India
Sagardeep	Shipping Corporation 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

India (*contd*)

Name of Vessel	Owner
Satyamurti	Shipping Corporation of India
State of Haryana	Shipping Corporation of India
State of Himachal Pradesh	Shipping Corporation of India
State of Kerala	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 Rajasthan	Shipping Corporation of India
Teesta	MacKinnon MacKenzie & Co. Ltd
Tulsidas	Shipping Corporation of India
Unibaksh	Universal Shipping Co. (Pvt.) Ltd
Vallabhbhad Patel	Shipping Corporation of India
Varuna Adhar	Govt of the Republic of India
Varuna Yan	Thakur Shipping Co. Ltd
Veer Varuna	Tata Chemicals Ltd
Vishva Abha	Shipping Corporation of India
Vishva Aditya	Shipping Corporation of India
Vishva Ajay	Shipping Corporation of India
Vishva Ambar	Shipping Corporation of India
Vishva Amitabh	Shipping Corporation of India
Vishva Apurva	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 Karuna	Shipping Corporation of India
Vishva Kaumudi	Shipping Corporation of India
Vishva Madhuri	Shipping Corporation of India
Vishva Mamta	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 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 India
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 Vijay	Shipping Corporation of India
Vishva Vikas	Shipping Corporation of India
Vishva Vikram	Shipping Corporation of India
Vishva Yash	Shipping Corporation of India
Visvesvarya	Shipping Corporation of India
Vivekananda	Shipping Corporation of India
Yerewa	Shipping Corporation of India
Zakir Hussain	Shipping Corporation of India

Auxiliary Ships:
India has 38 Auxiliary Ships.

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