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THE MARINE OBSERVER

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

VOL. 66 **No. 334** **OCTOBER 1996**

CONTENTS

COVER PHOTOGRAPH: Common Crepuscular rays at dawn converging at the antisolar point (opposite the sun). Coincidentally, the setting moon is seen in approximately the same direction resulting in this surrealistic scene which was photographed by the Master of the *Avelona Star*, Captain J.F. Dobson, on 9 October 1995 when in position 09° 31'N, 127° 20'E.

Letters to the Editor, and books for review should be addressed to the Editor, *The Marine Observer*, Met. Office (OM), Scott Building, Eastern Road, Bracknell, Berks RG12 2PW.

LONDON: HMSO

EXCELLENT AWARDS 1995

All of the meteorological logbooks received at Bracknell during 1995 have now been appraised and assessed on their merits for consideration for the annual Excellent Awards. Taken into account are the quality and quantity of observations together with the opportunity for making regular weather observations and the availability of staff to transmit the coded reports.

The following ships from which meteorological logbooks were received between 1 January and 31 December 1995, have achieved markings which place them in the top 'bracket' for Excellent Awards.

1. m.v. *Pacific Crane*, owned by Pacific Nuclear Transport plc and managed by James Fisher & Sons plc. Captain G. Dodsworth; Principal Observing Officer J.I.N. Marsham; Radio Officer T. Bannister.
   m.v. *Kukawa*, Acomarit (U.K.) Ltd. Captain B.N. Jones; Principal Observing Officer M. Manuel; Radio Officer D. Arcegono.

2. m.v. *Lepeta*. Shell International Trading & Shipping Co. Ltd. Captain D. Freeman; Principal Observing Officer A.K. Gladstone; Navigating Officer rewarded for transmission Z.U. Islam.
   m.v. *Lincoln Universal*. London Ship Managers Ltd. Captain R.M. Hutchinson; Principal Observing Officer M.B. Simogan; Radio Officer A.A. Adolfo.
   m.v. *Leonia*. Shell International Trading & Shipping Co. Ltd. Captain A.F. DeVanney; Principal Observing Officer R.E. Parker; Radio Officer R.A. Lane.

3. m.v. *Taunton*. P&O Bulk Shipping Ltd. Captain J.A. Smeeton; Principal Observing Officer S. Gupta; Radio Officer R. Aurora.
   m.v. *York*. P&O Bulk Shipping Ltd. Captain L.J. Hesketh; Principal Observing Officer P. Dasgupta; Radio Officer M.D. D'Silva.
   m.v. *Appleby*. Ropner Shipping Services Ltd. Captain I.C. Gravatt; Principal Observing Officer G. Terriza; Radio Officer A. French.
   m.v. *British Skill*. BP Shipping Ltd. Captain G.M. Hallett; Principal Observing Officer T.T. Latto.

The number of Navigating Officers involved in both reporting and transmitting observations continues to increase as the number of dedicated Radio Officers declines and our historical practice of listing each category of officer separately is fast becoming outdated; therefore, in an attempt to simplify the format, the lists commencing on page 168 differ from previous years in that the names of Radio Officers and Navigating Officers are combined. This arrangement is for the purposes of the Excellent Awards only and by no means denigrates the work of any officer or lessens our appreciation of the time and effort given to observing the weather or to the subsequent message transmission.

The three books selected for the awards are *Natural Wonders of the World: 100 Spectacular Wonders of the Natural World*, the *TIMES Atlas of the World, Reference Edition* and *Chambers Concise Dictionary*.

Nominees for Excellent Awards should already have received their letters of official notification but any officer seeing his name in the following lists but who is not in receipt of such a letter is invited to contact the Observations (Marine)

department of The Met. Office directly or through a United Kingdom Port Met. Officer, giving full name, Discharge Book or Seaman's Book Number and an address to which the book may be sent.

Kukawa

Lincoln Universal *FotoFlite*

Pacific Crane

Three of the top ships for meteorological logbooks in 1995.
(From the top: *Photographs by courtesy of Acomarit (U.K.) Ltd; London Ship Managers Ltd; British Nuclear Fuels plc.*)

The names of those officers who have yet to claim their awards for 1994 are given on page 173 and they too are invited to contact us in a similar way if they are still at sea. In the event that a named officer has left the sea or changed his employment, his erstwhile colleagues are also invited to contact us with news of his whereabouts, if known.

Excellent Awards (Year ended 31 December 1995)

Captain	Company
P.R. Anderson	BP Shipping Ltd
B.J. Argent	P&O Containers Ltd
C.R. Bamford	Ropner Shipping Services Ltd
D.L. Beveridge	Scottish Fisheries Protection Agency
J.E. Boswell	POETS Fleet Management Ltd
M.W. Brown	J.H. Whitaker (Tankers) Ltd
M.A. Bull	Logbridge Ltd
J.R. Burton-Hall	Cunard Line Ltd
W. Campbell	Andrew Weir Shipping Ltd
B.A. Chapman	Ministry of Agriculture, Fisheries & Food
A.J. Clarke	Tidewater Marine (U.K.) Ltd
L.M. Colam	Blue Star Ship Management Ltd
M.J. Cole	British Antarctic Survey
P.H. Corbett	Boston Putford Offshore Safety Ltd
P.J. Creber	Furness Withy (Shipping) Ltd
A.F. DeVanney	Shell International Trading & Shipping Co. Ltd
P.R. Dew	Bergesen d.y. ASA
J.G.W. Dixon	P&O Containers Ltd
G. Dodsworth	James Fisher & Sons plc
C.R. Elliott	British Antarctic Survey
H. Elliott	J.H. Whitaker (Tankers) Ltd
A.J. Fee	P&O Containers Ltd
T.N. Ferguson	Bergesen d.y. ASA
D. Freeman	Shell International Trading & Shipping Co. Ltd
P.A. Furneaux	P&O Containers Ltd
D.E. Ginder	Andrew Weir Shipping Ltd
B. Graham	P&O Containers Ltd
I.C. Gravatt	Ropner Shipping Services Ltd
G.M. Gray	Logbridge Ltd
B.A. Hall	Scottish Fisheries Protection Agency
G.M. Hallett	BP Shipping Ltd
K.S. Hardy	P&O Containers Ltd
W.J. Harwood	Logbridge Ltd
B.F. Hawkins	Logbridge Ltd
G. Hepple	P&O Containers Ltd
R.M. Herring	P&O Containers Ltd
L.J. Hesketh	P&O Bulk Shipping Ltd
M.A. Hill	P&O Containers Ltd
M. Hooson	Tidewater Marine (U.K.) Ltd
C.P. Howard	Kuwait Oil Tanker Co.
R.M. Hutchinson	London Ship Managers Ltd
J.H. Hutson	P&O Containers Ltd
P.W. Jackson	Denholm Ship Management (U.K.) Ltd
T.L. Jeffery	F.T. Everard & Sons Ltd
B.N. Jones	Acomarit (U.K.) Ltd
I. Kaye	Kuwait Oil Tanker Co.
J.N. Kelleher	P&O Containers Ltd
R.A. Kenchington	P&O Containers Ltd
A.G. Lacey	James Fisher & Sons plc
S.J. Lawrence	British Antarctic Survey
A.J. Leslie	P&O Containers Ltd
E.C. Lyon	Union Kuhl-Schiffahrt GmbH
P.J.R. Manson	P&O Containers Ltd
D.K. McCorquodale	P&O Containers Ltd
N.E. McInnes	Scottish Fisheries Protection Agency
D. McIntyre	Tidewater Marine (U.K.) Ltd

Excellent Awards *(contd)*

Captain	Company
H.A. Mackenzie	Scottish Fisheries Protection Agency
R.J. McLarty	P&O Containers Ltd
S.G. Millar	P&O Containers Ltd
C.R. Mundy	Blue Star Ship Management Ltd
D.P. Neaves	London Ship Managers Ltd
G. Nicholls	P&O Bulk Shipping Ltd
H.J. Norton	C.M. Willie & Co. (Shipping) Ltd
B.W. Nuttall	P&O Containers Ltd
D.G. Olley	Furness Withy (Shipping) Ltd
J.A. Oscroft	P&O Containers Ltd
G.J. Pearson	Bergesen d.y. ASA
G.J.H. Peaston	P&O Containers Ltd
D.A. Peden	Marine Management Services Ltd
J.L. Peterson	P&O Containers Ltd
P.G. Pinkerton	Logbridge Ltd
T.C.A. Ramsey	Petroleum Shipping Ltd
D.L. Rattray	Scottish Fisheries Protection Agency
M.C. Roberts	BP Shipping Ltd
T. Robinson	Souter Shipping Ltd
J.E. Sinnott	P&O Bulk Shipping Ltd
J.A. Smeeton	P&O Bulk Shipping Ltd
J. Smith	BP Shipping Ltd
S.D. Smith	P&O Containers Ltd
W.A.E. Smith	Boston Putford Offshore Safety Ltd
L.R. Staines	Cardiff Ship Management & Services Ltd
M.J. Stares	James Fisher & Sons plc
R.A. Stockley	Boston Putford Offshore Safety Ltd
D.W. Temple	Scottish Fisheries Protection Agency
D.C. Thomson	P&O Containers Ltd
A. Tibbott	Blue Star Ship Management Ltd
S.B. Tudor	P&O Bulk Shipping Ltd
A.M. Tweedie	P&O Containers Ltd
A.W. Walker	Boyd Line Management Services Ltd
P.J. Ward	Kuwait Oil Tanker Co.
B. Wardman	BP Shipping Ltd
J.W. Welch	P&O Containers Ltd
P.L. Whitehouse	F.T. Everard & Sons Ltd
T.G. Whittaker	P&O Containers Ltd
H.A. Williams	J.H. Whitaker (Tankers) Ltd
B. Yelland	Holy House Shipping AB
K.N. Young	James Fisher & Sons plc

Principal Observing Officer and Radio Officer	Company
A.A. Adolfo	London Ship Managers Ltd
M. Allison	Boyd Line Management Services Ltd
F.H. Alrai	P&O Containers Ltd
D. Arcegono	Acomarit (U.K.) Ltd
R. Arenal	Holy House Shipping AB
R.B. Arenal	Union Kuhl-Schiffahrt GmbH
R. Aurora	P&O Bulk Shipping Ltd
M.J. Baker	P&O Containers Ltd

Excellent Awards *(contd)*

Principal Observing Officer and Radio Officer	Company
E. Andoh-Wilson	F.T. Everard & Sons Ltd
B.G. Ball	P&O Containers Ltd
T. Bannister	James Fisher & Sons plc
J. Barkess	Scottish Fisheries Protection Agency
N.P. Barrington	P&O Containers Ltd
D.I. Bell	James Fisher & Sons plc
J.k. Bhadra	P&O Bulk Shipping Ltd
P.D. Bidmead	Cardiff Ship Management & Services Ltd
C.W. Blacker	Mobil Shipping Co. Ltd
J. Bose	BT Shipping (London) Ltd
N. Bridgeman	Ropner Shipping Services Ltd
S. Bryans	P&O Containers Ltd
G.R. Butler	BP Shipping Ltd
L.A. Cal	Holy House Shipping AB
F.P. Cayabyab	Kuwait Oil Tanker Co.
V. Cayjayon	Bergesen d.y. ASA
L.J. Cheesebrough	P&O Containers Ltd
J.S. Clark	Denholm Ship Management (U.K.) Ltd
A.P. Clarke	MMOL Hong Kong
G. Clarkson	Boston Putford Offshore Safety Ltd
P.J. Clemence	BP Shipping Ltd
D. Coelho	P&O Bulk Shipping Ltd
C.Y. Constantinou	P&O Containers Ltd
N. Coombs	F.T. Everard & Sons Ltd
J.J. Coyle	Scottish Fisheries Protection Agency
D.S.J. Craig	Scottish Fisheries Protection Agency
I.A. Craig	Scottish Fisheries Protection Agency
P. Dasgupta	P&O Bulk Shipping Ltd
H.J. Davey	P&O Containers Ltd
A.R. Davidson	Scottish Fisheries Protection Agency
V. D'Cruz	P&O Bulk Shipping Ltd
M.D. D'Silva	P&O Bulk Shipping Ltd
A. Deans	P&O Containers Ltd
A.L. Derla	Logbridge Ltd
K.A. Desai	P&O Bulk Shipping Ltd
D.L. Dodsworth	P&O Containers Ltd
B. Donaldson	Natural Environment Reseach Council
K.S. Dowden	P&O Containers Ltd
A.C. Dudley	Pacifica Ship Management Pte. Ltd
J. Dunsdon	Boston Putford Offshore Safety Ltd
L.C. Durante	Logbridge Ltd
R.M. Eaton	P&O Containers Ltd
J.Ebdy	Scottish Fisheries Protection Agency
R.H. Ellison	P&O Containers Ltd
D.B. Fagan	P&O Containers Ltd
A. Farmery	Boston Putford Offshore Safety Ltd
I.G.C. Ferguson	Tidewater Marine (U.K.) Ltd
V.S. Fernandez	P&O Bulk Shipping Ltd
D.B. Flood	Denholm Ship Management (U.K.) Ltd
J.A. Forbes-Simpson	J.H. Whitaker (Tankers) Ltd
S.C. Formstone	POETS Fleet Management Ltd
A.G. French	Ropner Shipping Services Ltd
N.C. French	P&O Containers Ltd
J.C. Geddes	P&O Containers Ltd
A.K. Gladstone	Shell International Trading & Shipping Co. Ltd

Excellent Awards *(contd)*

Principal Observing Officer and Radio Officer	Company
M.E.P. Gloistein	British Antarctic Survey
H.C. Gomes	Furness Withy (Shipping) Ltd
D.E. Grief	Tidewater Marine (U.K.) Ltd
S. Gupta	P&O Bulk Shipping Ltd
C.L. Guy	P&O Containers Ltd
J.C. Hague	Denholm Ship Management (U.K.) Ltd
A.H. Hamdy	Kuwait Oil Tanker Co.
N.L. Hampao	Bergesen d.y. ASA
R.G. Hanlon	P&O Containers Ltd
M.R.T. Hannan	P&O Containers Ltd
J.T. Harper	Boston Putford Offshore Safety Ltd
G.C. Harwood	F.T. Everard & Sons Ltd
R. Hawthorne	P&O Containers Ltd
M.A. Hayes	P&O Containers Ltd
C. Henderson	P&O Containers Ltd
G. Henderson	Denholm Ship Management (U.K.) Ltd
J. Holmshaw	P&O Containers Ltd
M. Horridge	C.M. Willie & Co. (Shipping) Ltd
S. Horsburgh	Scottish Fisheries Protection Agency
B.G.J. Hughes	P&O Containers Ltd
A.D. Hutchinson	P&O Containers Ltd
Z.U. Islam	Shell International Trading & Shipping Co. Ltd
R.Z. Jacela	Logbridge Ltd
M. Jarecki	Andrew Weir Shipping Ltd
V.A. Javier	Marine Management Services Ltd
M.C.J. Jewell	Scottish Fisheries Protection Agency
M. Jones	Tidewater Marine (U.K.) Ltd
M.W. Jubb	Petroleum Shipping Ltd
A. Khela	Kuwait Oil Tanker Co.
P. Lagrada	Kuwait Oil Tanker Co.
R.A. Lane	Shell International Trading & Shipping Co. Ltd
M. Langrick	Boyd Line Management Services Ltd
R.B. Lapinio	Logbridge Ltd
T.T. Latto	BP Shipping Ltd
J.D. Lay	P&O Containers Ltd
A.D. Leach	Tidewater Marine (U.K.) Ltd
J. Lee	Boston Putford Offshore Safety Ltd
M.S. Leyesa	Logbridge Ltd
M. Light	Union Kuhl-Schiffahrt GmbH
C.G. Lontoc	Logbridge Ltd
A. MacCallum	Scottish Fisheries Protection Agency
J.D. McCann	POETS Fleet Management Ltd
P.G. McCardle	Boston Putford Offshore Safety Ltd
D.A. McCracken	Bergesen d.y. ASA
K.F. Macdonald	P&O Containers Ltd
M. Macdonald	Hornbeck Offshore Ltd
A.D. MacPherson	Andrew Weir Shipping Ltd
M.P. McShane	Ropner Shipping Services Ltd
A. Mamaparo	P&O Bulk Shipping Ltd
M.E.A. Manuel	Acomarit (U.K.) Ltd
J.I.N. Marsham	James Fisher & Sons plc
I.A. Marson	F.T. Everard & Sons Ltd
P. Mathews	P&O Containers Ltd
N. Matthews	P&O Containers Ltd
S.J. Mee	British Antarctic Survey

Excellent Awards *(contd)*

Principal Observing Officer and Radio Officer	Company
S. Mehta	P&O Containers Ltd
M.N. Messenger	P&O Containers Ltd
R. Millar	BP Shipping Ltd
M.V. Miranda	P&O Bulk Shipping Ltd
R.P.C. Mitcheson	James Fisher & Sons plc
L. Moakes	P&O Containers Ltd
M. Monk	Souter Shipping Ltd
A.D. Moore	BP Shipping Ltd
J.D. Moore	Shell International Trading & Shipping Co. Ltd
J.T. Mores	Logbridge Ltd
M.L. Mullins	P&O Containers Ltd
B. Murnin	Bergesen d.y. ASA
R.J.C. Neale	P&O Containers Ltd
D. Newens	P&O Containers Ltd
J. Nicolson	Hornbeck Offshore Ltd
I.C. Oke	Marine Management Services Ltd
J.S. Orr	P&O Containers Ltd
J.S. Parhar	P&O Bulk Shipping Ltd
R.E. Parker	Shell International Trading & Shipping Co. Ltd
J. Parkin	Ropner Shipping Services Ltd
J.E. Parnaby	P&O Containers Ltd
S.C. Parsad	P&O Containers Ltd
F.R. Patel	P&O Bulk Shipping Ltd
D.A.Peden	Cunard Line Ltd
A. Peerless	P&O Containers Ltd
P.I. Pegg	P&O Containers Ltd
S. Pendon	Holy House Shipping AB
K.C. Penny	British Antarctic Survey
L.D. Pettitt	C.M Willie & Co. (Shipping) Ltd
C.F. Phillips	P&O Containers Ltd
F.C. Potestades	Logbridge Ltd
O.M. Power	Furness Withy (Shipping) Ltd
H. Quddus	Shell International Trading & Shipping Co. Ltd
J.O. Ramos	MOL Tankship Management Ltd
N.H. Read	James Fisher & Sons plc
S.J. Reed	Petroleum Shipping Ltd
H. Reese	Boston Putford Offshore Safety Ltd
C.D.A. Reynolds	Cardiff Ship Management & Services Ltd
C.P.J. Robins	P&O Containers Ltd
M.A. Saifie	Kuwait Oil Tanker Co.
H.I. Salarzon	Logbridge Ltd
F. Sargent	Maersk Co. (I.O.M.) Ltd
S. Sharan	Wallem Shipmanagement (H.K.) Ltd
N. Sheard	Tidewater Marine (U.K.) Ltd
R.J. Sheldon	Scottish Fisheries Protection Agency
P.J. Sherriff	F.T. Everard & Sons Ltd
M.B. Simogan	London Ship Managers Ltd
G.J. Simpson	Denholm Ship Management (U.K.) Ltd
P.S. Sinclair	Denholm Ship Management (U.K.) Ltd
G. Smith	Boston Putford Offshore Safety Ltd
S.S.M. Smith	Cunard Line Ltd
B. Standerline	Stephenson Clarke Shipping Ltd
D. Stevens	P&O Containers Ltd
A. Suarez	Bergesen d.y. ASA
J.G. Swindlehurst	P&O Containers Ltd

Excellent Awards *(contd)*

Principal Observing Officer and Radio Officer	Company
J.S. Tamayo	Logbridge Ltd
E.D. Tan	Logbridge Ltd
G. Terriza	Ropner Shipping Services Ltd
V.J. Thayil	P&O Bulk Shipping Ltd
P.M. Thompson	BP Shipping Ltd
C. Tolentino	Bergesen d.y. ASA
J.W.S. Tolman	P&O Containers Ltd
R. Tomasz	Andrew Weir Shipping Ltd
D.A. Trivedi	P&O Bulk Shipping Ltd
A.Y. Villarubia	Logbridge Ltd
S.I. Wallace	British Antarctic Survey
A. Weintrit	Stephenson Clarke Shipping Ltd
M. Westcott	Ropner Shipping Services Ltd
K. Whittaker	F.T. Everard & Sons Ltd
D.J. Williams	J.H. Whitaker (Tankers) Ltd
M. Williamson	P&O Containers Ltd
C. Winterbottom	BP Shipping Ltd
M.C. Wise	P&O Containers Ltd
P.H. Woodcock	Furness Withy (Shipping) Ltd
D. Woollan	Harrisons (Clyde) Ltd
D.R. Young	James Fisher & Sons plc

'MARID' SHIPS†

Observers	Company
Captain R. Jones; Deck Officers C. Thomas and S. Wood	Stena Line Ltd
Captain J. Quale; Deck Officers P. Harvey and M. Herbert	ARC Marine Ltd
Deck Officers L. Devereux; A. Dunlop and M. Hellicar	Petroleum Shipping Co. Ltd

† Vessels recruited primarily to observe and transmit sea temperatures with non-instrumental observations from the North Sea and coastal waters.

Unclaimed Excellent Awards for 1994

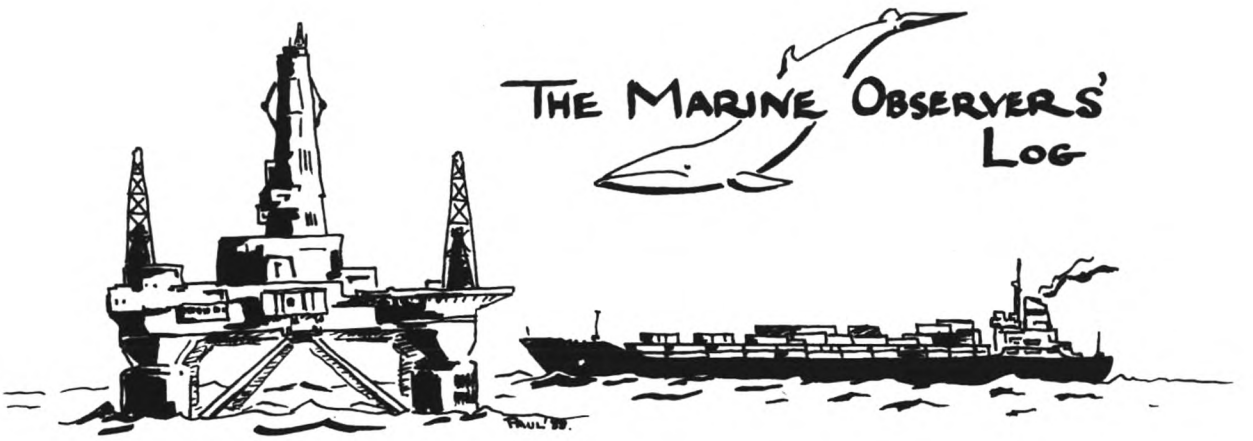
Our records show that the following officers have not claimed their Excellent Awards for 1994. We would be pleased to hear from them.

Captain

C.A. Cleverley; I.D. MacKenzie; R. Monkman; R. Phillips; R.O. Robinson; A. Ruszczynski; T. Schofield; N.E. Sierks; M. Smith; A. Wormald.

Principal Observing Officer and Radio Officer

J.H. Ansari; A.D. Atkins; J. Bagoo; R.M. Banzon; A. Baria; C. Beaton; R.C. Bernal; A.K. Birley; N. Campbell; E.S. Cass; M.D. Caulian; P.J. Clery; N.P.F. D'Souza; M.M. de Leon; P.A. de Rama; G.J. Davies; B.E. Diana; W.R. Durrans; M. Fabrero; J.T. Gamas; F. Gemudiano; A.N. Grant; N.C. Horner; H.J. Jalos; B. James; C. Knights; R. Lao; T.J. Leonen; L.P. Lim; N.R. Lingo; G. Mangubat; P.L. Michael; R. Miller; R.C. Mitra; P. Moraes; J. Paiwas; J.L. Raymundo; J.V.S. Sedonio; F.S. Servento; D.A. Simcox; J.G. Smith; K. Sridhar; L.P. Tipo; L.L. Ubaldo; I.J. Wardhaugh; R.M. McK. Watt; A.M. Webb; I.R. Williams; D. Worthy.



October, November, December

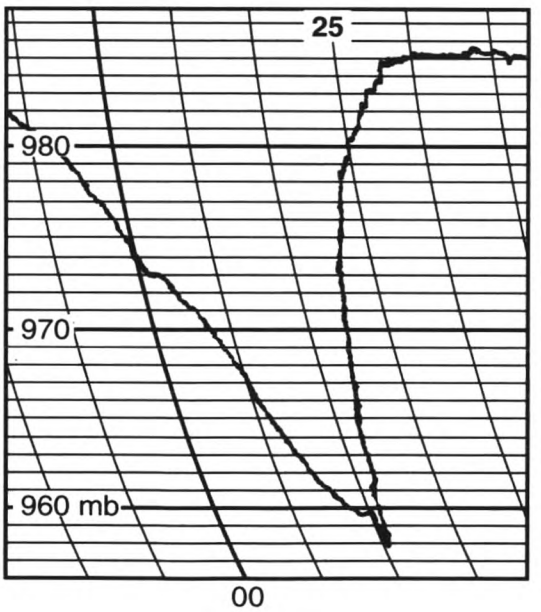
The Marine Observers' Log is a quarterly selection of observations of interest and value. The observations are derived from the logbooks of marine observers and from individual manuscripts. Responsibility for each observation rests with the contributor. All temperatures are Celsius unless otherwise stated. The standard international unit for barometric pressure is the hectopascal (hPa) which is numerically equivalent to the millibar (mb).

PASSAGE OF DEPRESSION

North Atlantic Ocean

m.v. *Iolair*. Captain M. Ramsbottom. On station, Foinaven Oil Field. Observers: the Master, Mr A.J. Milne, 2nd Officer and members of ship's company.

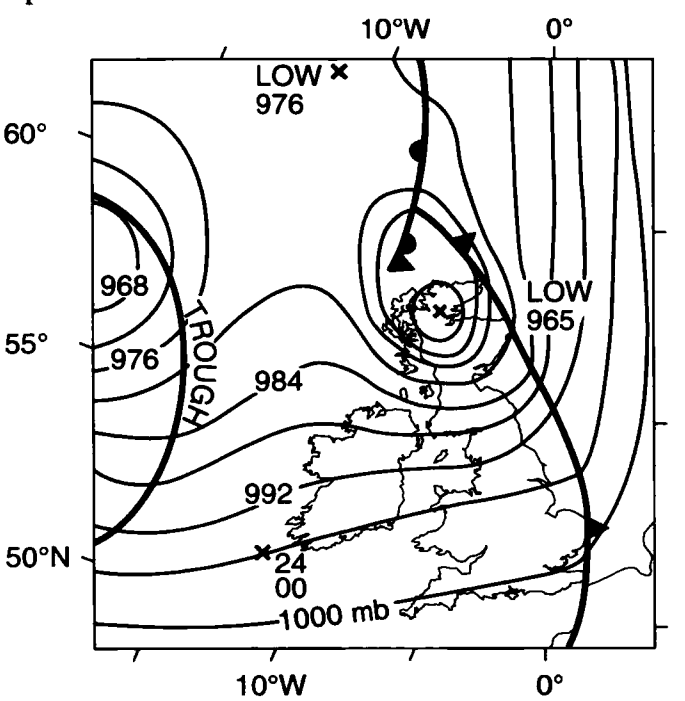
25 October 1995. The wind had been backing steadily throughout the night and had fallen in strength to approximately force 7. At 0550 UTC on the 25th the wind veered quickly by about 40°–50° and increased in speed to reach over 85 knots, taking only one or two minutes to do so whilst the pressure which had been falling steadily throughout the night began to rise sharply, see barograph trace.



The synoptic situation at 1800 on the 24th was that a low was centred about 300 n.mile south of Iceland and an associated frontal wave depression was moving north through Ireland and beginning to deepen. By 0100 on the 25th the centre [of the associated system] was close to the Outer Hebrides, still deepening and continuing northwards.

Position of ship: 60° 18′N, 04° 20′W.

Editor's note. As the observers have said, the weather conditions experienced resulted from the rapid development and passage of a low which originated from a wave on the cold front of an occluding depression.



Synoptic situation at 0000 UTC on 25 October, 1995. The location of the low 24 hours earlier was to the south-west of Ireland.

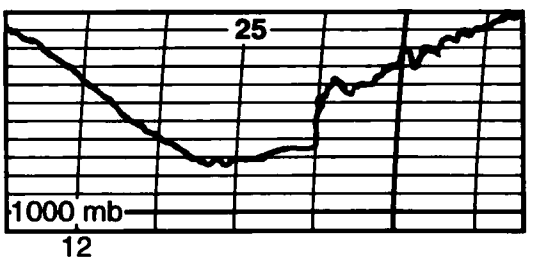
LINE SQUALL

Indian Ocean

m.v. *Lampas*. Captain J.P. Briand. Juaymah to Antifer. Observers: the Master, Mr G.M. Watson, 3rd Officer and members of ship's company.

12 October 1995. At 1840 UTC a line squall with very heavy rain showers (solid echoes on the 3-cm radar which could not be suppressed) passed east to west 18 n.mile ahead of the ship. Lightning was visible at this time, both sheet and forked, the forked lightning extending to the sea.

At 1940 the wind suddenly changed direction from NW'ly to SW'ly, force 7, the rain having disappeared from the radar screen by this time while at 1950, gusts to 75 knots were met. At this time the dry-bulb reading showed an increase from 26° to 32° while the wet-bulb temperature dropped slightly from 24.4° to 24.0°. The change in temperature and humidity was felt as the wind blasted across the ship. On checking the barograph, an instantaneous rise in pressure was noted, see



trace. After two more strong gusts the wind moderated to SW'ly, force 8 and the temperature dropped to 29°.

During the observation the sky was overcast with high opaque cloud forms and a three-quarter moon was visible as a dull orange glow in the sky. Small flea-like insects were found in the wheel-house after the event, obviously blown in with the gusts.

Position of ship: 27° 38′S, 33° 46′E.

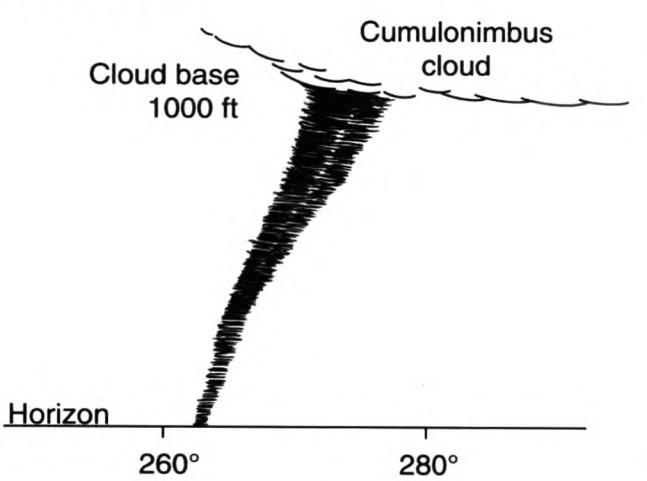
Editor's note. The phenomenon described above is a feature of the weather on the coast of South Africa and is the subject of the article beginning on page 191 of this issue.

WATERSPOUT

Mediterranean Sea

m.v. *Magnolia.* Captain K.J. Beverley. Malta to Sidi Kerir. Observers: the Master, Mr C.W. Blacker, Chief Officer, Mr I. Jamieson, Cadet and members of ship's company.

20 December 1995. At 1518 UTC a waterspout was seen to develop below a cumulonimbus cloud, the base of which was at approximately 1000 feet. Its development was observed over a period of 10 minutes while it changed from a 'funnel-like' form hanging under the cloud to a fully developed spout briefly reaching the sea surface about 500 m from the vessel. The sketch shows its appearance at full development.



Only minor disturbance of the sea surface was noted in an already moderate to rough sea and moderate westerly swell. The waterspout seemed to move in a north-easterly direction and was noticeably raked accordingly but its direction of rotation could not be determined. After reaching the surface the spout quickly retracted to the cloud base and disappeared.

Weather conditions were: air temperature 17.4°, wet bulb 15.2°, pressure 1016.5 mb, wind W'ly, force 5. A brief rain shower was experienced prior to the spout's passing.

Position of ship: 33° 20′N, 25° 34′E.

Editor's note. Waterspouts have also been reported by the *Exemplar* whilst on passage between Marmagoa and Singapore on 13 October, and by the *Staffordshire* on 17 November when in position 05° 43′N, 80° 27′E.

HAIL

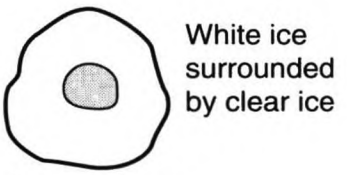
Eastern North Atlantic

m.v. *Seki Cedar*. Captain P.W. Jackson. River Tyne to Barcelona. Observers: the Master and Mr C. Bristowe, Chief Engineer Officer.

12 November 1995. Whilst starting to record the 1200 UTC weather for transmission and wondering whether the approaching and passing localised showers would actually occur 'at ship', the observers heard hailstones starting to fall on the vessel. Initially they were white and of 'normal' size but after a few minutes a loud drumming was heard and immediately evident was an increase in the size of the hailstones.

Of course, at such a time, no ruler could be found in the newly tidied chart-room area but examples of the hail were rapidly carried to the chart table and their outlines drawn on paper, see sketches.

'Normal' hail



Larger stone

The 'normal' hail was about 5 mm in diameter and was white in colour while the larger stones were up to 15 mm in diameter and consisted of white ice in the centre surrounded by clear ice. The fall lasted for five minutes in all. An hour later the anticipated shift of wind to WSW'ly occurred as a trough passed over the ship.

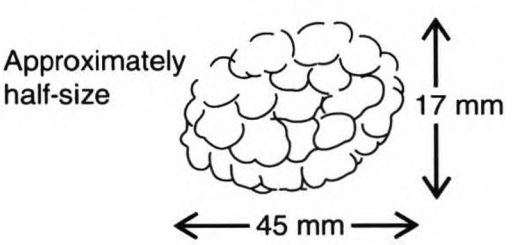
Weather conditions at the time of observation were: air temperature 14.1°, wet bulb 12.5°, pressure 999.0 mb, wind S×W'ly, force 7.

Position of ship: 45° 47′N, 08° 10′W.

South Atlantic Ocean

m.v. *Toisa Sentinel*. Captain R.T. Blackman. On station in the Campos Oil Field, offshore Brazil. Observer: Mr I.C. Strachan, Chief Officer.

18 November 1995. Whilst going out to record the temperatures for the 0600 UTC observation the observer was hit by a roughly circular hailstone measuring 45 mm in diameter and about 17 mm high, see sketch.



It was not an isolated hailstone as the hailstorm in which it fell lasted for seven minutes. The hailstones were made of solid ice which was opaque and they were flattened but roughly circular in shape.

Position of ship: 22° 39′S, 40° 34′W.

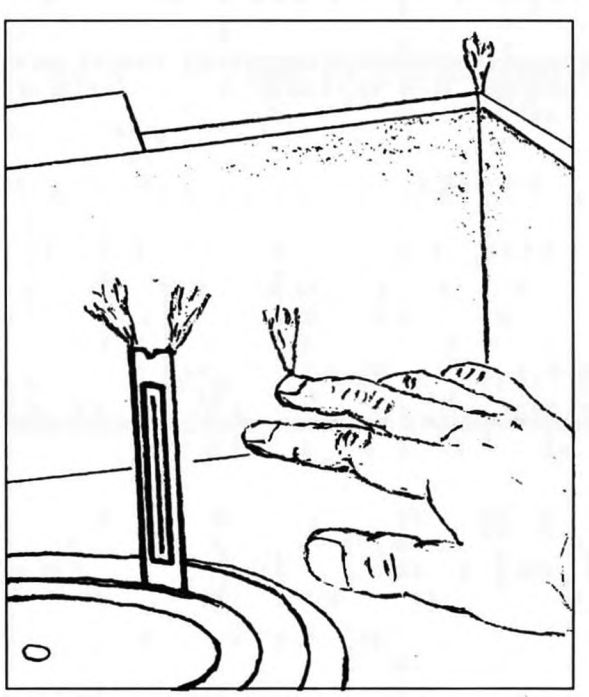
Editor's note. Intense convection is responsible for the formation of cumulonimbus clouds and the updraughts within a cloud can be extremely vigorous. Hailstones can start to fall through the cloud and then be carried aloft by the updraughts over and over again, each time passing through regions of the cloud where the liquid water content varies. Collisions with supercooled water droplets produce clear ice which is quickly formed with few trapped air bubbles whereas in the coldest parts of the cloud which are drier, the hail will acquire a layer of opaque rime which is formed more slowly and contains more air bubbles. Hailstones eventually fall from the cloud when the updraughts can no longer support them. Apart from individual pellets, hail can also form from clusters of smaller pellets frozen together or as liquid-filled ice shells or as irregular lumps of ice formed from the shattering of large hailstones.

CORPOSANTS

Singapore Strait

m.v. *Jervis Bay*. Captain J.L. Peterson. Singapore to Hong Kong. Observers: Mr R.M. Eaton, 2nd Officer and Mr D. McLennan, SM1.

9 October 1995. At 1840 UTC the vessel was on a course of 029° at a speed of 21 knots when corposants were observed on both bridge wings simultaneously as a single plume on the extreme outboard forward corners of the bridge front while two plumes from the top of each azimuth ring were seen. On approaching each area, single plumes formed on the observers' fingers although no sensation was felt or noise heard, see sketch. Each plume was steady and extended for 2.5 cm over an arc of 45°. The colour started as a point of bright white light and then reduced to a pale blue at the outer edges.



The observers were wearing composition soled shoes and standing on 2-cm thick rubber/composition matting while the azimuth rings were on repeaters mounted on fibreglass stands. The phenomenon lasted for 10 minutes after which the weather conditions did not appear to have changed appreciably; the weather was overcast with light rain, forked lightning was visible and occasionally distant thunder was heard.

Position of ship: 02° 03′N, 104° 52′E.

Editor's note. We have also received a report of corposants (or St Elmo's Fire) from Mr P.J.S. Turner, 3rd Officer on the *Singapore Bay*, after transit of the Suez Canal on 12 December. In slight drizzle, a crackling sound was heard and the phenomenon was seen on the tips of the azimuth mirror and the corner of the bridge wing. A blue aura from each of the observer's fingers was noted when he placed his hand over the steel work.

CETACEA

South Pacific Ocean

m.v. *Chitral.* Captain J.N. Edwards. Hong Kong to Auckland. Observer: Mr M. Dean, 3rd Officer.

3 December 1995. At 2305 UTC whilst 70 n.mile north of Cape Reinga, a solitary whale was sighted crossing approximately 500 m ahead of the bow, fine to port. It was travelling quite quickly and had crossed the bow in the minute or so during which the observation took place. During this time, the whale only just broke the surface every 10 seconds or so until reaching abeam of the vessel, some 100 m off. At this stage the whale arched its back and exposed three distinctive ridges on top of its flat head followed by its slender back and small fin which was surrounded by small light-coloured speckling. Although the speckling did not appear to be a barnacle covering it is possible that it may have been so. The flukes were not exposed upon diving. The general colour of the whale was dark brown, its length was approximately 10-15 m and no blow was seen during the sighting.

With reference to *Whales of the World* by Lyall Watson, the observer concluded that this was a Bryde's Whale. At the time of observation the wind was E'ly, force 2 and the visibility was excellent.

Position of ship: 33° 18'S, 172° 48'E.

Note. The *Chitral* is a Selected Ship observing for the New Zealand VOF.

North Atlantic Ocean

m.v. *British Ranger.* Captain K.E. Peacock. Cap Lopez to Fos. Observer: Mr T.T. Latto, 2nd Officer.

26 December 1995. At 1716 UTC a total of ten Sperm whales were observed to the west of the vessel. The distinctive blow at 45° and the large bulbous head identified them. Two juveniles were noted amongst the group which was spread out over a large area although all the whales were heading in the same south-westerly direction. Only one whale showed its flukes as it dived, the remainder continued to move on the surface.

The water depth in the region was 960 m and the weather conditions were: dry-bulb temperature 24.5°, sea 24.0°, wind NNE'ly, force 4. There was also a long moderate swell of approximately 4 m.

Position of ship: 19° 50'N, 17° 42'W.

South Pacific Ocean

m.v. *Forthbank.* Captain M.A. Mackenzie. Balboa to Papeete. Observers: the Master, Mr J. Bartoszek, 3rd Officer, Mrs Mackenzie, Mrs Bartoszek and members of ship's company.

7 December 1995. At 0630 UTC the ship had stopped for ERP and after

30 minutes whales were spotted a mile away on the port bow. On closer inspection, because of their flat forehead and dorsal fin they were thought to be pilot whales.

A group of six or seven approached the vessel at the surface but it was interesting to see several groups of two or three following the line of the ship about 2 m below the surface. Some of these were observed to have distinctive white marks, approximately 0.3 m by 1.0 m, on their backs around the dorsal fin. In total, about 15 whales were seen, ranging in length between 4.2 m and 4.8 m but with a few smaller ones too. Only two were observed to exhibit their flukes as the others continued to "nose" above the water, and at one time three pairs were seen to move out of the water in unison. At all times the whales at the surface came no closer than 0.25 n.mile to the ship.

The observers concluded that the whales were curious and came to see what was happening, staying around the ship for 30 minutes before heading north.

Position of ship: 02° 05.4'S, 106° 20.1'W.

BIRDS

Indian Ocean

m.v. *Botany Bay*. Captain L.J. Fletcher. Fremantle to Singapore. Observer: Mr L.M. Butler, 3rd Officer.

13 December 1995. At 0015 UTC whilst the observer was trying to identify several boobies circling around the foremast, a single bird was seen flying on a direct south-south-westerly path. It had a thin body, a very long tail and it was generally yellow in colour although it was too far away to see any further markings. Its wing beats were strong and regular and it flew at a constant height above the water, at about 75 m. On consulting *A Field Guide to the Seabirds of Britain and the World*, the bird was identified as a Christmas Tropicbird.

Five minutes later, two frigatebirds were observed flying towards the vessel, again on a south-south-westerly course; these passed about 30 m overhead then soared into the sky and circled before being lost from view. Both appeared to have mostly black plumage with a white breast, the throat and foreneck being black as well. The seabird 'bible' was again consulted and it was thought that the birds may have been Christmas Frigatebirds because of the colouration on the underside. The presence of a red pouch on either bird was impossible to note owing to the fleeting glimpse allowed of their undersides, nor were any other distinct markings seen.

Going back to the boobies; they were thought to be Masked boobies (sic.) and the group appeared to consist of two adults and two juveniles, and it was noted that one of the adults had particularly orange-coloured legs. The birds continued to circle the foremast for most of the morning.

Position of ship: 09° 50'S, 105° 53'E.

Gulf of Papua

m.v. *Siratus*. Captain G.P. Donnelly. Kumul Terminal anchorage. Observers: the Master, Mr C. Thorneloe, Chief Officer, Mr S. Dunn, Chief Engineer Officer and members of ship's company.

22–31 October 1995. Just prior to dawn on the 22nd, the *Siratus* anchored to await berth availability. During the morning a large number of birds landed on the

ship staying throughout the day and night. They were black or a very dark and dull brown colour, many of them having white heads. The wing-span of the majority of the birds was in the region of 50–60 cm. The Chief Officer estimated that during the morning watch of the 23rd, his conservative calculation of five birds per metre of pipe-line or rail indicated that over 10,000 birds were resting on board. The Chief Officer found seven birds fouled with bunker oil in a drip tray during the morning of the 23rd. With help from the Master he first bathed each bird in a very mild mix of detergent and water, and then in fresh water; the 'cleaners' were delighted to find that, after a long drying-off period, all seven birds were able to take flight. (Photographs of one of the birds before and during cleaning appear on page 189.) It was necessary to wear rubber gloves during the bathing exercise to protect the hands from the 38-mm beak of each bird. The local agent said that the birds were due to migrate north shortly and that they would move from the ship only when a new one arrived in the anchorage.

During the evening of the 24th the birds began to land on the deck in greater numbers than before. When some of the complement walked along the deck as part of their evening stroll, the birds became quite aggressive and flew very close to the heads of the strollers who then beat a hasty retreat. It was estimated that there were more than 20,000 birds on the deck during this particular night. The possibility of going into the guano export trade was considered!

Until the vessel's departure from Kumul on the evening of the 31st the birds followed the same pattern of circling the ship at about 1730 UTC and then landing on the fore part from 1800, by about 2000 the deck would be covered by large numbers of them.

Position of ship: 08° 08′S, 144° 33′E.

Andaman Sea

m.v. *Moreton Bay*. Captain G.J.H. Peaston. Singapore to Jeddah. Observers: the Master, Mr M. Messenger, 2nd Officer, Mr C.P.J. Robins, 3rd Officer and ship's company.

31 October 1995. At 0245 UTC after rounding Rondo Island, a brightly-coloured bird was seen on deck. On closer inspection it was seen to be a member of the kingfisher/kookaburra family; it was also noted with some concern that the bird had what looked like oil on its feathers and bill. We thought that if we could catch and clean the bird its chances of survival would increase. After several attempts the bird was finally captured and placed in a cardboard box to calm down as it was determined to stab the Third Officer's hand with its bill.

The bird did have oil on its feathers but it was not known from where. It was decided that we should try and clean the bird, so after taking precautions to prevent damage to ourselves from the bill by putting a rubber band around it, the cleaning process began. Luke-warm water and washing-up liquid was used in the slow process but perseverance paid off with only slight traces of oil remaining after 2.5 hours of gentle cleaning. It was noted that once the bird was used to being handled and cleaned it was completely relaxed and at some instances we thought it had died but if the cleaning was stopped it definitely wanted to know why.

The bird was then lightly dried with a towel and placed near a warm blower to dry its feathers. 'He' was then returned to his box with some towels and a hot-water bottle underneath so he could calm down and fully dry off. After spending the night recuperating the bird was offered and happily accepted water from a

pipette, seeming to be much better for its bath. Its plumage was a bright iridescent purple on its head, wings and back with a yellow-brown underside. Its feet and bill were bright-red and the bird measured about 17 cm in length. Photographs were taken before and after cleaning (see page 189).

It was thought that the bird could be released near Dondra Head (Sri Lanka) as it was a land species but unfortunately it made a bid to escape before then, and won, it was not seen again. We hoped it got a lift back to Rondo Island on another ship.

Position of ship: 06° 10.1′N, 95° 01.4′E.

Note. Commander M.B. Casement O.B.E., of the Royal Naval Birdwatching Society, comments:

'The bird was a Ruddy Kingfisher (*Halcyon coromanda*). The photograph taken prior to "washing" shows it heavily discoloured by oil but the silvery-blue rump patch is just visible. (The rubber band around the bill seems a sensible seamanlike precaution!) It is fairly widely distributed from India to Japan, eastern China, the Philippines, Malaya and throughout south-east Asia, normally frequenting forested streams and mangroves. A partial migrant, it has not been recorded at sea before by the RNBWS.'

HALO

Arabian Sea

m.v. *Singapore Bay*. Captain P.A. Furneaux. Singapore to Suez. Observers: the Master, Mr R. Clunas, 2nd Officer and Mr J. Noonan, SM1.

4 October 1995. At 1645 UTC a low patch of cumulus cloud cleared above the vessel and a complete halo was seen around the moon. Although there were cumulonimbus and altocumulus clouds in the vicinity (lightning being observed earlier) the area directly above the vessel was covered only by a moderately thin layer of cirrostratus.

The moon was at an altitude of 65° above the horizon and on a bearing from the vessel of 245°. The halo itself was of a 'fuzzy' appearance, having an inner diameter of roughly 45° of azimuth. The halo remained unobscured for 95 minutes before being blotted out by the thicker altocumulus clouds, although further glimpses were seen through gaps in the cloud for another 30 minutes.

Position of ship: 08° 31′N, 70° 58′E.

BIOLUMINESCENCE

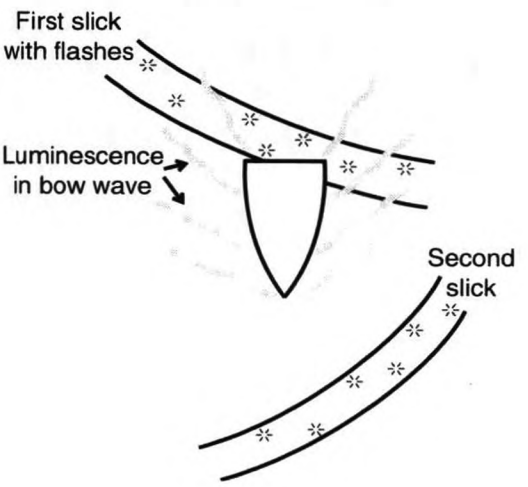
Gulf of Aden

m.v. *Table Bay*. Captain K.S. Hardy. Colombo to Jeddah. Observers: Mr C. Guy, 3rd Officer, Mr P. Mathews, Radio Officer and members of ship's company.

6 December 1995. At 1651 UTC whilst passing through the Gulf of Aden, a strip of water which looked like an oil slick, was observed by the light of a full moon on the starboard beam about 0.5 n.mile distant. It was then noticed that there appeared to be flashes coming from the 'slick' and a closer inspection from the bridge wing revealed bioluminescence in the ship's bow wave while the hull seemed to be glowing. As the vessel started to pass through the slick it was illuminated by bioluminescence. The slick appeared to be red in colour and gave off a strong fishy smell; a red tide had been observed earlier in daylight hours so it was assumed that this was the same thing.

As soon as the vessel had passed through the slick, or red tide, another one appeared on the port side and produced the same effect when passed through, see

sketch. The Radio Officer and his wife proceeded to the focsle at this time and reported that the bulbous bow had the appearance of a light bulb, being very brightly lit.



Immediately after the ship had passed through the second 'tide' the bioluminescence simply vanished, leaving no trace. The whole phenomenon occurred over a period of 15 minutes with the hull and bow waves being illuminated throughout. The wind at the time was ENE'ly, force 3, the sea was calm and the sea temperature was 25.5°.

Position of ship: approximately 12° 00′N, 46° 00′E.

Strait of Hormuz

m.v. *Chilham Castle*. Captain P.J. Griffiths. Karachi to Kuwait. Observers: the Master, Mr Z. Siddiqui, 2nd Officer and Mr R.M. Patel, GP1.

3 October 1995. At about 2240 UTC the observers saw a strange effect in the sea on both sides of the vessel extending from right forward to both quarters, stretching for approximately 100 m from the parallel body. It was a soft white light, almost strobe-like in character that pulsated irregularly. The light was bright enough to illuminate the wheel-house deckhead and seemed to emanate from below the water, almost as if something was shining a spotlight upwards, shimmering and twirling; psychedelic wall projections of the 1960s were brought to mind. Curiously, the wash from the bow was not illuminated and appeared normal, likewise the wake.

After six or seven minutes the effect faded, reappeared briefly and then disappeared. There was never any extreme in weather conditions and no electric charge or pulse was noted. At the time of the event the ship was in ballast on a course of 253° at 14.75 knots. The night was clear with no moon and the visibility was excellent.

Position of ship: 26° 36′N, 56° 21′E.

Note. Dr P.J. Herring, of the Southampton Oceanography Centre, comments:

'This account is typical of the early stages of a phenomenon known as a "phosphorescent wheel". These usually start as moving parallel bands of light which then break into one or more apparently revolving wheels. The Strait of Hormuz is one of the areas from which they are best known, and they always occur in shallow regions (less than a depth of 200 m). The cause is not known but seismic activity has been suggested, as well as some effect of the ships' engine vibrations. A more detailed account is to be found in *The Marine Observer*, 1985, pp. 194–201.'

RAINBOW

North Atlantic Ocean

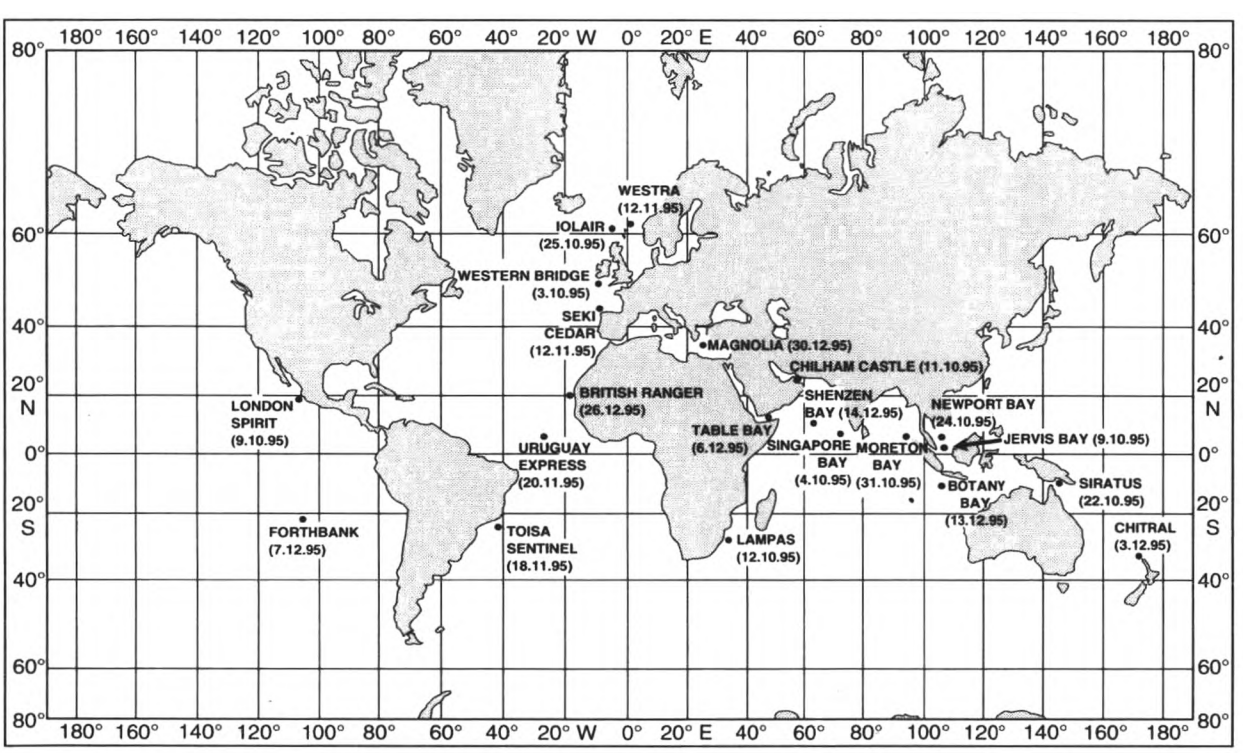
m.v. *Western Bridge*. Captain R.B. Wade. Newport News to Port Talbot. Observers: the Master, Mr J. Williams, 2nd Officer and Mr D. Bridgeman, 3rd Officer.

3 October 1995. After several hours of overcast skies comprising mainly cumulus and cumulus fractus clouds giving intermittent light rain showers, the sky on the starboard quarter began to clear rapidly at 2050 UTC and revealed a three-quarter moon. The cloud reduced to 2 oktas of cumulus with strong vertical development and at 2056 a lunar rainbow, bearing 345° to 037°, was sighted in a rain shower at the edge of the cloud bank at a range (by radar) of 2.5 n.mile. It was during the observation of the primary bow that a second but very much fainter rainbow was observed about 10° outside the first one. Indeed, the primary bow had distinct shades of grey in its colouration as opposed to the secondary bow which was a very faint, almost white image of its smaller brother. At 2106 the rainbow began to fade with only half of the arc being visible and by 2110 it had disappeared. The ship was on a course of 068° at 13.2 knots.

Position of ship: 50° 04.5′N, 10° 34′W.

Note. Dr White, of the Institute for Research in Meteorological Optics, comments:

'This was a fairly well developed lunar rainbow complex, the lack of colour being due to the lack of sensitivity of the eye to the colour of faint light. The sketch [not shown] suggests a possible development of supernumerary bows on the primary, and it is possible that the mention of "distinct shades of grey" may also refer to such.'



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

AURORA BOREALIS

North Sea

f.p.v. *Westra*. Captain N.E. McInnes. Fishery patrol duties. Observers: the Master and members of ship's company.

12/13 November 1995. At 1750 UTC an auroral display commenced with a homogeneous arc which was quiet, weak and grey in colour; the arc lay from 330° to 020° with its highest point being at 360°, while the maximum altitude of its lower edge was 10°. The following developments were then noted:

At 1900 the arc became 'harder' and rose to 15° while developing a white patch under the dark lower edge, bearing 355°. Five minutes later the arc became diffuse and rose to 30° while expanding to lie between 310° and 040°. A moderate to weak rayed band formed at altitude 10° between 340° and 010°, and a white wave progressed from left to right, taking four minutes to do so. Isolated grey-green rays reaching to an altitude of 30° were also seen bearing 355° and 005°.

At 1920 the arc rose further to 35°, lying between 305° and 050°; its condition was quiet and it was grey in colour. The rayed band weakened to a glow. By 1950 the arc had weakened and disappeared as the glow at altitude 5° also weakened.

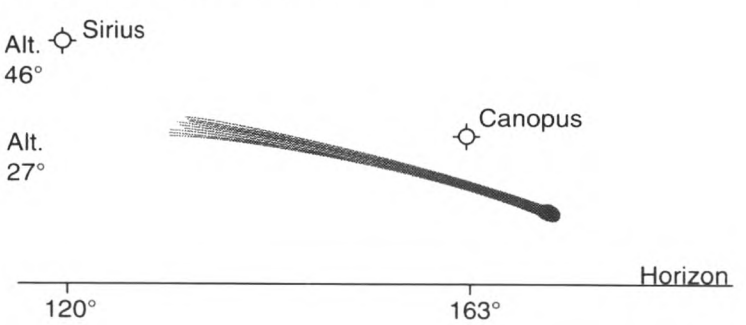
Position of ship: 61° 00′N, 00° 50′E.

METEORS

Arabian Sea

m.v. *Shenzhen Bay*. Captain D. Baily. Singapore to Suez. Observers: the Master and members of ship's company.

14 December 1995. Many meteors were sighted during the night, averaging one 'shooting star' every two or three minutes. Many of these were bright white in colour and had tails; several had bright white tails and one, observed at 1822 UTC, was particularly impressive, see sketch.



It passed from starboard to port (north to south) and was extremely bright, brighter than any other star in the sky, and had a long white tail. The meteor was spotted directly above the ship and disappeared at about 10° above the horizon; the tail was about 35° across the arc and its length suggested to those watching that the meteor could not have been at too great an altitude.

Position of ship: 09° 42′N, 63° 36′E.

Note. Mr H. Miles, Director of the Artificial Satellite Section of the British Astronomical Association, comments:

'Although the report does not give any indication of whether or not the meteors seemed to originate from a particular part of the sky, it is possible that they belonged to the Geminid meteor stream. The description given falls in line with the general characteristics of the Geminids although the percentage

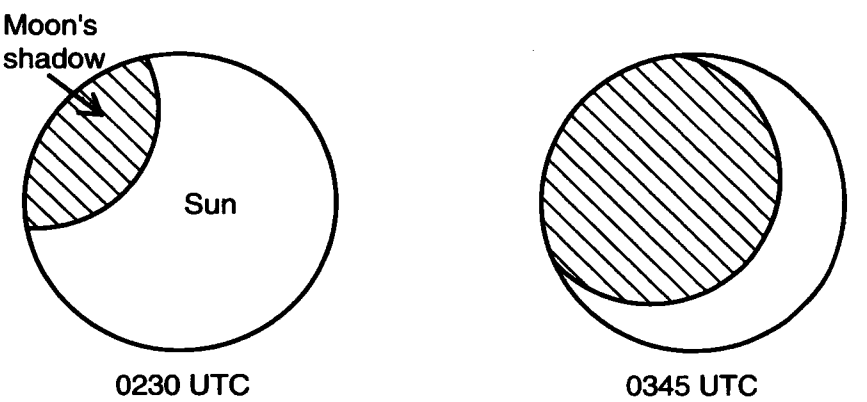
producing tails was possibly higher than usual. The suggestion that the very bright one seen was not very high in the atmosphere arises due to optical illusions, where brightness is linked directly with distance.'

ECLIPSE

South China Sea

m.v. *Newport Bay*. Captain J.A. Oscroft. Singapore to Hong Kong. Observers: the Master, Mr M.D. Moore, Chief Officer, Mr L.S. Mahdi, 2nd Officer, Mr P.C.T. Reynolds, 3rd Officer, Mr P. Bell, SM1, Mr P. Smith, SM1 and ship's company.

24 October 1995. It was noted from the nautical almanac that an eclipse of the sun would occur, commencing at 0200 UTC and ending at 0600. At first there was little optimism among the observers about being able to see anything as the sky was overcast but at 0130 the sky cleared and, observing the sun using sextants, the moon was visible towards the top left part of the sun's disc. As time passed, the moon slowly began to partially eclipse the sun, reaching what would be its maximum extent at about 0345, see sketch.



By this time it was noticeably darker but further monitoring of the eclipse was hampered by the untimely arrival of yet more clouds.

Position of ship: 04° 07.3'N, 106° 03.9'E.

Note. Dr White comments:

'Perhaps the most interesting feature here is that the moon was visible before the eclipse started, I presume that this was the result of earthshine.'

Editor's note. The eclipse was total in a narrow band about 100 miles across which stretched from Afghanistan to Borneo. The *Bora Universal* also reported the partial eclipse from 11° 10'N, 51° 41'E. As in the above account, viewing was affected by the interference of clouds. The *Maersk Sussex* reported the event from 06° 42.0'N, 77° 00'E between 0230 and 0430 but from this position the coverage of the sun by the moon was less than one-quarter, at best.

UNIDENTIFIED LIGHT

North Atlantic Ocean

m.v. *Uruguay Express*. Captain H. Chiappara. Santos to Bilbao. Observers: Mr S. Gorriaran, 3rd Officer and Mr J. Esteves, AB.

20 November 1995. At 0230 UTC a very bright light was noted on the port side about 50° from the bow, it lasted for about 5 seconds and then disappeared.

Knowing of no bright star in that position, the observers checked the area with binoculars and saw two small lights which were as bright as a star of very small magnitude, travelling at a very fast rate and at a steady distance from each other. No navigation lights were seen. One light then disappeared and the other changed course upwards before disappearing about 3 seconds later, neither object left a trail. There were no clouds and the visibility was very good. The ship was on a course of 021° some 200 n.mile south of the Cape Verde Islands.

Position of ship: 12° 37′N, 25° 39′W.

EARTHQUAKE

Eastern North Pacific

m.v. *London Spirit*. Captain B. Watkins. At anchor in Manzanillo Bay. Observers: Mr I.C. Stevenson, Cadet and members of ship's company.

9 October 1995. The vessel was lying to port anchor 8 shackles approximately 1 n.mile offshore when at 1540 UTC it began to shudder, initially as if the main engine was running hard astern. The effect increased in intensity until the vessel was shuddering violently, continuing for three or four minutes before quickly fading. Ashore, land slides could be observed along the coast and also a large cloud of dust which was later discovered to have been a hotel collapsing. The barograph was checked but no unusual traces were recorded and the sea temperature remained unchanged throughout. Only minor damage was caused to the vessel and on arrival in port, it was found that the earthquake had registered 7.5 on the Richter scale.

Position of ship: 19° 05′N, 104° 22′W.

MISCELLANY ...

An additional mélange of maritime sightings

Aya II. 27 December 1995. Whilst on passage from Callao to Guayaquil, the vessel passed through a conspicuous area of plankton about 2–3 n.mile wide in position 07° 50′S, 80° 30′W. It persisted for about four hours and was observed by Captain M.J. Bellamy, and Third Officer Gerardo Jonguitud.

Bransfield. 7 November 1995. Whilst 40 n.mile off the coast of Brazil in position 21° 37′S, 40° 24′W, Third Officer S.D. Ward and much of the ship's complement watched three Humpback Whales breaching in water of depth 30 m. Sounding in the shallow water was also observed in addition to gentle flipper waving. The noise of the breaching and subsequent landings was heard at 300 m.

Cardigan Bay. 12 November 1995. Bioluminescence was sighted in the Mediterranean Sea whilst the vessel was on passage between Malta and Port Said. Third Officer D. Stevens and SM1 D. McCubbin watched the phenomenon for its duration of 10 minutes. The first two minutes gave the most intense glow, the greatest effect being around the bow and in the wake with the sides of the ship being less affected. The colour was light-green, occasionally jade-like.

Enterprise. 18 October 1995. At 0515 UTC in position 44° 09′N, 20° 16′W, an exceptionally bright meteor was observed at an elevation of 10° by Chief Officer P.V. Curran and R. Caulian, SG1. It became visible on an azimuth of 120° and travelled horizontally until fading bearing approximately 150°, and was watched for three to four minutes during which time a comet-like tail showed in its wake.

Jostelle. 7 October 1995. Captain J.M. Bullard, Third Officer A. Crew and Fourth Engineer A. Smith spotted a juvenile Peregrine Falcon at the masthead feeding on a smaller bird. The ship was *en route* from Amsterdam to the Mississippi in position 33° 42′N, 55° 14′W. On the 11th at 0330 UTC a lunar rainbow was seen whilst approaching Abaco Island.

Maersk Sussex. 30 October 1995. The vessel was drifting in position 08° 36′N, 72° 48′W and the sea temperature was being taken at 1200 UTC when the sea-water bucket was attacked by three large tuna fish which had been seen around the vessel all day. The tuna were also seen attacking a passing turtle and anything else that floated. Initially witnessed by Chief Officer Cresswell and Third Officer Hodgson, the fish were very aggressive towards everything except fishing lines.

Nexus. 16 December 1995. Whilst on passage from Portsmouth (New Hampshire) to Palermo, Captain A. Giles and Chief Officer D. King noted sea smoke in large patches around the vessel during heavy snow showers at 1400 UTC in position 41° 38′N, 56° 18′W. The air temperature at the time was 3.0°, wet bulb 2.5°, sea 14.0°.

Oakleaf (R.F.A.). 7 December 1995. Whilst in position 20° 18′N, 85° 50′W a green flash at sunset was watched by Second Officer P.A. Lewington. The upper part of the sun's disc became increasingly green until a vivid emerald colour was seen. At the very last instant before the sun disappeared below the horizon the green colour changed to an 'electric blue'.

Peninsular Bay. 12 October 1995. Third Officer J. Geddes watched a group of five pilot whales at 0757 UTC as they travelled north-east in position 44° 17.4′N, 09° 07.2′W, and saw six more at 0820. On the 13th at 1540, another group of eight pilot whales plus two individuals were seen in the Strait of Gibraltar as the vessel continued from Southampton towards Port Said.

Pytchley. 5 December 1995. The formation and decay of a waterspout was observed for a total of about eight minutes whilst the vessel was in the Florida Straits bound for Avonmouth.

Repulse Bay. 5 December 1995. Whilst in the Mediterranean Sea bound for the Suez Canal 230 n.mile away, a full lunar rainbow was first seen at 0055 UTC by E. Robson, SMS and then Second Officer D.J. Vickery. The white bow formed ahead of the vessel, commencing at water level 4 points on the port bow and continued unbroken to 3 points on the starboard bow.

Sachem. 13 December 1995. Second Officer M.J. Catt noted a lunar halo of 22° at 1700 UTC in position 19° 05′S, 153° 09′E; it formed in 8 oktas of cirrostratus and lasted for 40 minutes.

Oiled birds helped by gentle cleaning with a mild solution of detergent.

Left and below: A Black Noddy (sic.) before and during its bath on board the *Siratus* (see page 180).

Photographer unknown

Photos by Captain G.P. Donnelly

Above and right: A Ruddy Kingfisher before and after treatment on board the *Moreton Bay* (see page 181.)

SCENE AT SEA

Photo. by Captain K.S. Hardy

Orographic cloud photographed from the *Table Bay* while at Yantan Container Terminal, China, on 23 November 1995. When first noticed, the cloud had the shape of a 'flying saucer' but continually changed shape while keeping the smooth outline.

Some aspects of the South African coastal low and its rogue waves*

BY J.D. TORRANCE

(Harare **, Zimbabwe)

The name 'coastal low' is given to the rather shallow areas of low pressure which form on the coast of Namibia, and on the south coast of South Africa. Though sharing the same name, the coastal lows of the two areas differ considerably in their weather and behaviour patterns, and this article will be restricted to the coastal lows of South Africa forming near or east of Cape Agulhas. Figure 1 is a map of South Africa showing the location of places mentioned in the text. These coastal lows move eastwards along the coast, gradually turning to move north-eastwards following the alignment of the coast; and in due course they lose their identity not far north of Maputo.

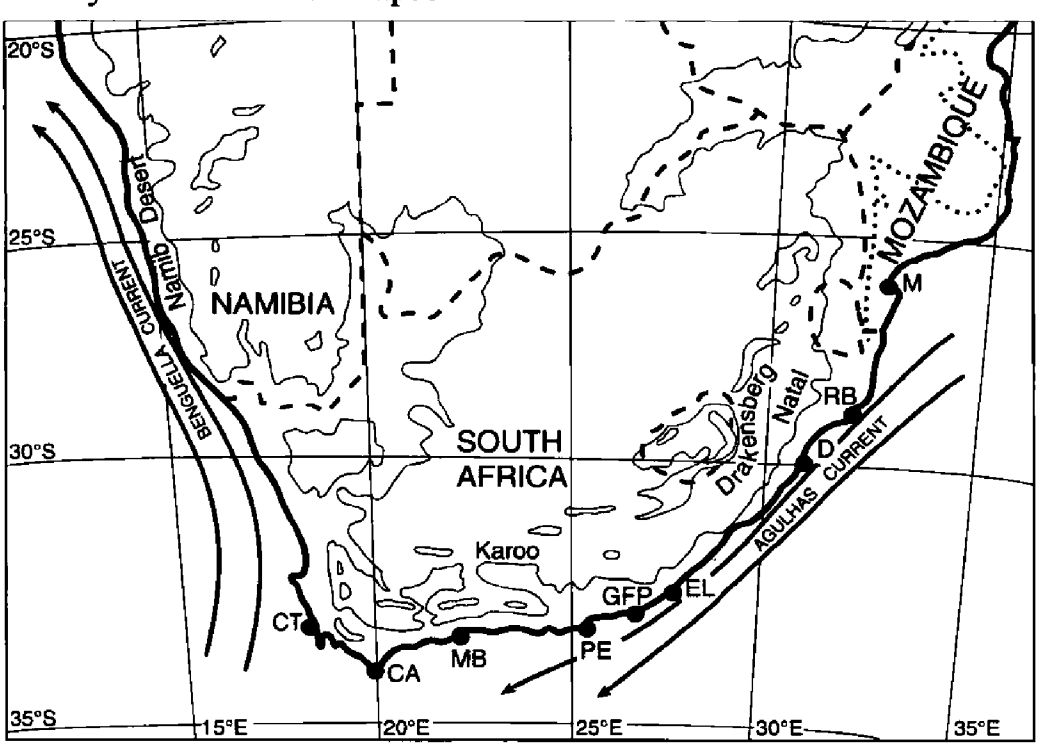


Figure 1. Locations of places mentioned in the text. The initials identify: CA – Cape Agulhas, CT – Cape Town, D – Durban, EL – East London, GFP – Great Fish Point, L – Lesotho, M – Maputo, MB – Mossel Bay, PE – Port Elizabeth, RB – Richard's Bay. Contours at 1, 2 and 3 km (solid lines); and also 200 m (dotted lines) in Mozambique.

In general terms, coastal lows may be identified several times a month, though frequency and intensity do vary widely from season to season. The intensity depends on the strength and direction of the upper winds across the coast, which in turn depend on the intensity of the accompanying depression. Intense cases are more likely in the winter half-year when depressions occur further north and thus nearer the coast. While there is a general family likeness in their formation and behaviour, and most of them go through their life-cycle without causing much concern, every so often one of these coastal lows will attain a strength which causes dangerous conditions at sea. This is the aspect which will be developed here.

* Reproduced from *Weather* (5), 1995, by kind permission of the Editor.

Formation

Depressions moving from west to east off the south coast of South Africa cause upper winds to back towards the north-west and strengthen as the cold front approaches. Such strong offshore winds have a scouring effect on the sub-plateau or coastal zone, so that continental air descends to or near sea-level to replace cooler maritime air, and in the process is heated adiabatically. Such hot dry winds blowing from the interior are known as berg winds. The resulting fall in pressure (whether due to a mechanical/dynamic effect, or to the lower density of the hot air) causes low-level winds on the coast, constrained by the high ground of the interior, to blow directly along the coast towards the low, east to north-easterly on the east side, and west to north-westerly on the west side. Since the strong upper north-westerly winds precede the passage of the cold front of the main depression, the coastal low forms a short distance ahead of the cold front, at the point of strongest winds blowing most directly across the coast. As the cold front approaches, the upper winds back, so causing the strongest offshore component of the winds (and thus the coastal low itself) to travel along the coast eastwards and later north-eastwards. Figure 2 shows the concept of the coastal low developed by J.B. Hattle (1958). The cold front is shown, as well as the lesser fronts between maritime and continental air, and also the descent of some upper north-westerly winds to sea-level or near sea-level.

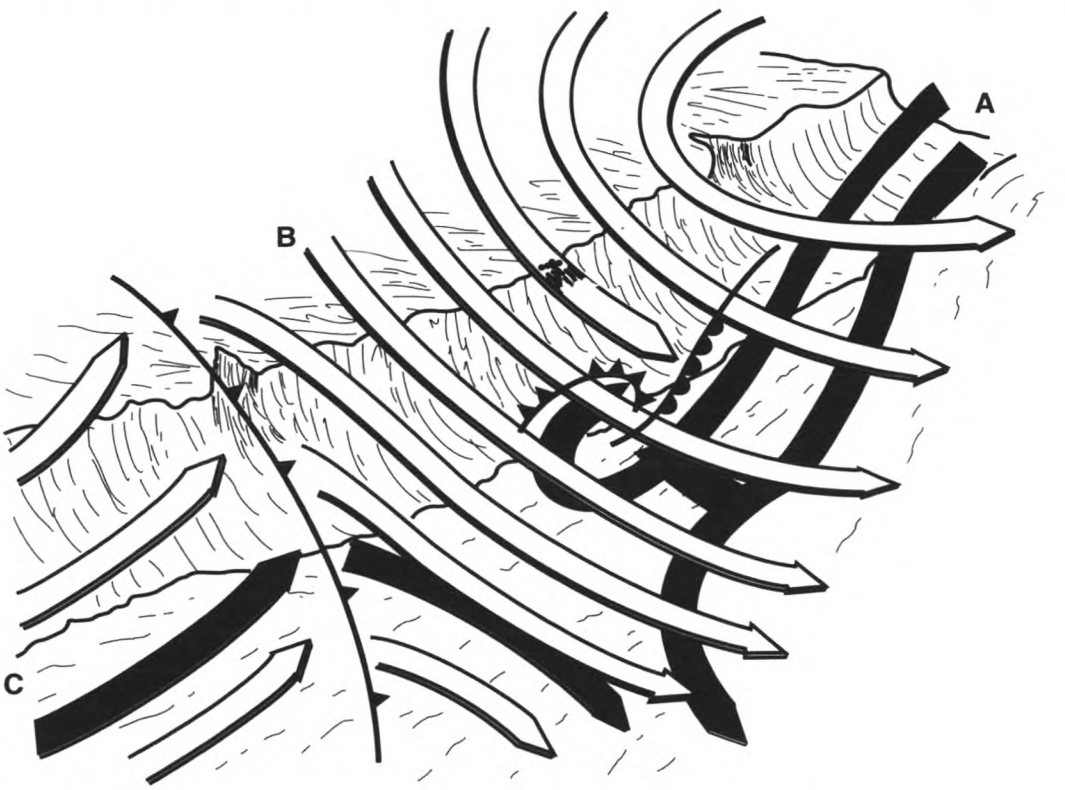


Figure 2. Windflow patterns of a coastal low-cold front sequence, on a backdrop of mountains and coast. Black arrows represent low-level winds, and white arrows upper-level winds. Note a white arrow changing to black in its descent to sea-level in the coastal low. Airmasses are identified as: A – humid coastal air, B – hot dry continental air, C – cold maritime air.

Three main airmasses are involved: humid coastal maritime air, hot dry continental air, and cold maritime air behind the cold front. The South African topography is an important factor in the development of the coastal low. North-westerly winds can only blow offshore east of Cape Agulhas, and so the

formative area is the south coast around Mossel Bay. Here the interior has several mountain ranges more or less parallel to the coast, behind which is the Karoo plateau at about 1 km above sea-level. Beyond East London the Drakensberg occurs and dominates the interior, reaching over 3 km at the Lesotho-Natal border (see Figure 1). The scouring effect of north-westerly winds therefore increases from Port Elizabeth to East London, and on to Durban, so that the intensity of the coastal low is commonly greatest between East London and Durban. Further north, Mozambique is characterised by extensive low-lying plains (see Figure 1) and so coastal lows cannot be sustained much beyond Maputo and fill up in the next 100 km.

Behaviour

While all coastal lows have the same mode of formation, individually they vary in intensity and weather characteristics. Sometimes the weather may remain fine throughout; on other occasions the cooling of the north-easterly winds as they extend southwards may produce low stratus. The south-westerly winds at the rear of the coastal low are more likely to produce cumulus and showers or storms. Very often a period of north-westerly berg winds will intervene between the north-easterly winds and the south-westerly winds.

When a coastal low is strongly developed, an outstanding feature is the onset of the south-westerly winds, particularly if the change is from north-east to south-west. There may be an interval of some hours between the two windflows, but it can take place in a matter of minutes as shown by the example in Figure 3. It is this sudden change in wind direction which makes the coastal low so distinctive.

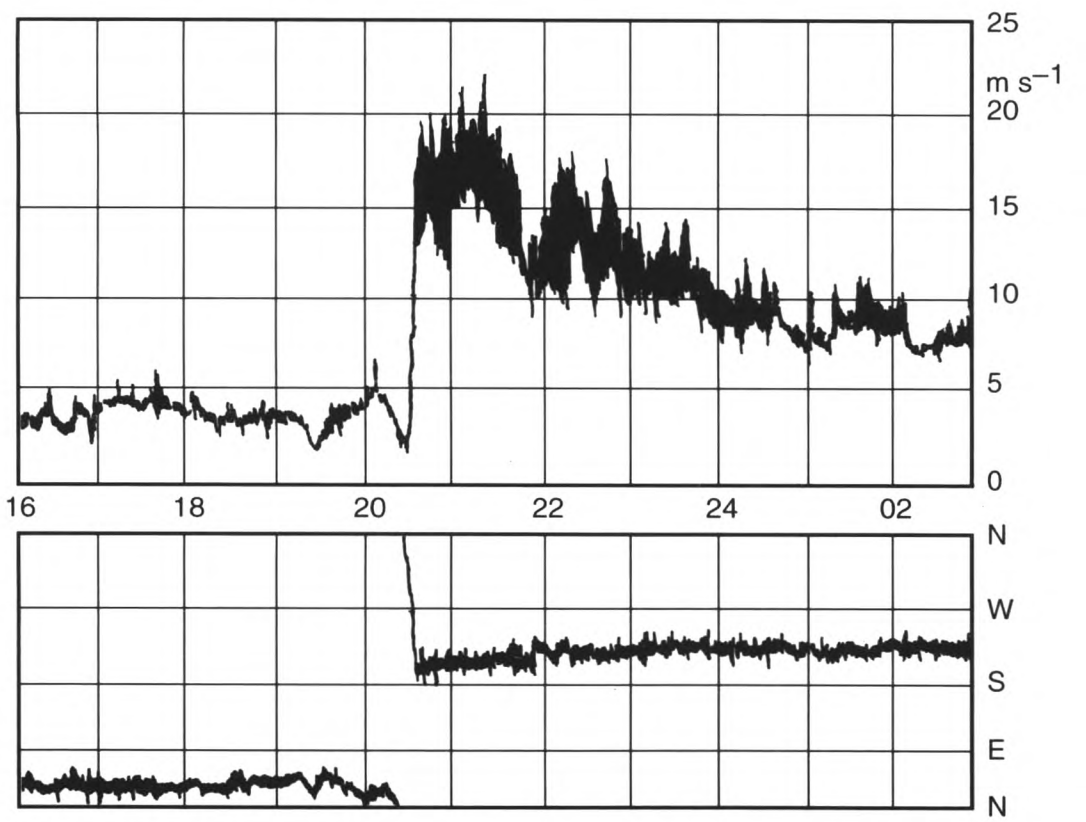


Figure 3. Anemograph trace showing the rapid change of wind direction and speed at Durban on 16 August 1940

The change from south-west winds behind the coastal low to south-west winds to the rear of the cold front is not always distinguishable. The fall in temperature may be masked if there have been showers behind the coastal low; falling dew points may be the most telling sign of the new cold air. Barometric pressure falls during the north-easterly phase of the coastal low, and starts to rise at the onset of the coastal low south-westerly winds; pressure then rises more slowly or even falls again, until the cold front passes and pressure once more rises rapidly.

Effects at sea

The change from north-east to south-west winds may be no more than an inconvenience on land, in a town perhaps with windows slamming, or people caught in a sudden downpour after a cloudless morning, but at sea the consequences can be alarming. Not for nothing is the coast between East London and Durban known as "The Wild Coast", a reminder of the stormy weather and many shipwrecks along this coast. The continental shelf is at its narrowest here, and home to the Agulhas current which can reach a speed of 2.5 m s^{-1} from the north-east along the edge of the continental shelf. Thus in the period of north-easterly winds ahead of the coastal low, wind and waves are in accord with the current. If or when the wind changes to strong south-westerly, conditions soon become chaotic, with the wind imposing new stresses on the north-easterly waves and current. The many reports of high seas and damage from freak waves have caused this area to be investigated intensively. For example, Captain J.K. Mallory, of the Department of Oceanography at the University of Cape Town, has postulated that there may be waves of different periodicities superimposed, which at some critical instant will have their peaks synchronised and so give rise to an exceptionally high wave. See Figure 4 from one of his reports, and notice the depressed sea-level ahead of the high wave. Such synchronisation, occurring randomly, probably lasts only a few minutes or over a limited area, yet a number of ships have had the misfortune to be there, at just the wrong time and in the

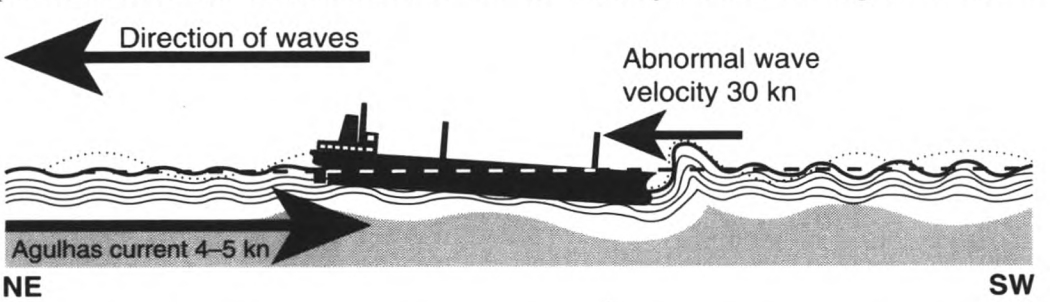


Figure 4. Sketch showing the curves of three wave trains having wavelengths of roughly 25, 50, and 150 m which become superimposed for a short period, creating an abnormal wave upwards of 18 m high (1 kn = 0.5 m^{-1}). In advance of the wave is a long deep trough. (Taken from *Scientiae* July/August 1975.)

wrong place. The ship appears to be sliding down a hill with a giant wave towering above the ship's superstructure. The force of water falling on to the ship can cause great damage to the superstructure or to the hull itself, or the weight of the water may make the ship unstable.

Vasco da Gama Yacht Race 1984

One well recorded instance of extreme weather and damage on this coast following the coastal low-cold front sequence was the Vasco da Gama Yacht Race from Durban to East London in April 1984. Twenty-nine yachts left Durban under

moderate north-easterly winds, with a change to south-westerly forecast and advised. However, late that night storm warnings were issued, closely followed by gale conditions creating havoc among the yachts. Several yachts measured wind speeds exceeding 30 m s^{-1} for several hours, and waves of over 15 m were experienced. Only one yacht reached East London, seven were dismasted, five had lesser damage, three were sunk, one was wrecked on the coast, and three experienced 360° rolls.

The intensity appears to have been due to the rapid deepening of the depression (shown in Figure 5) on the afternoon preceding the start of the race. The scale of

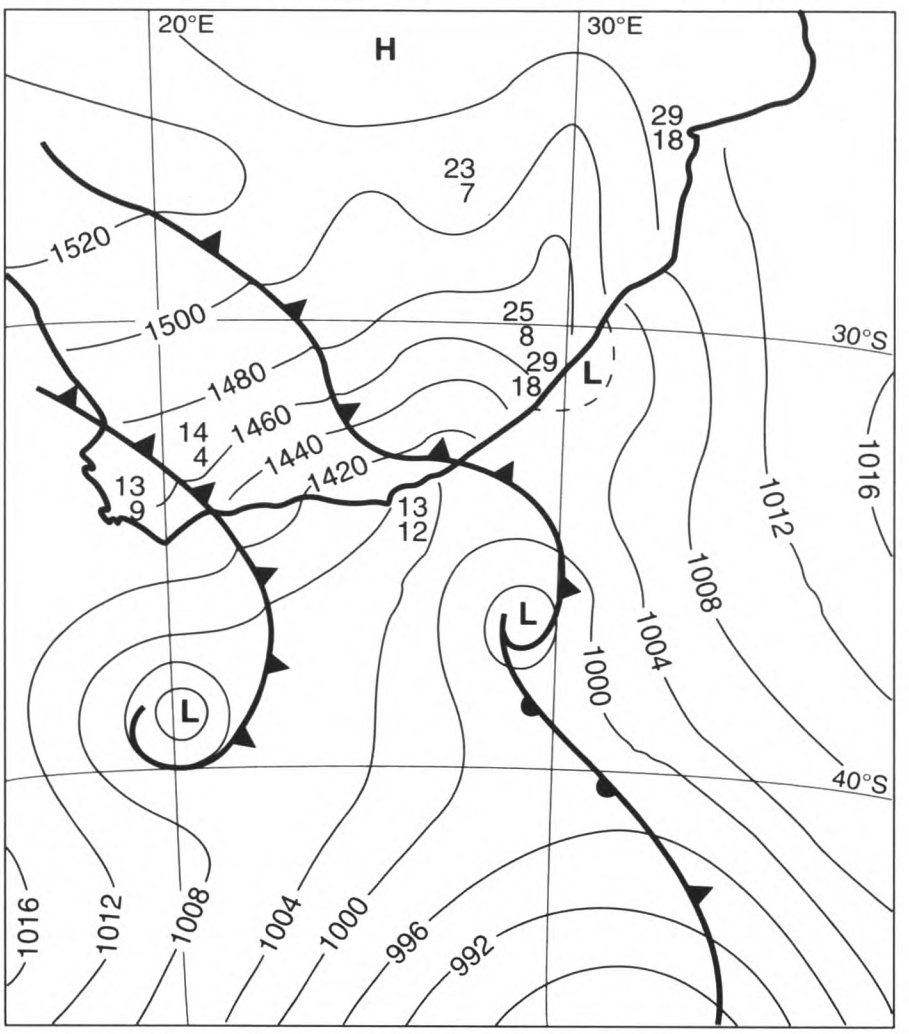


Figure 5. Synoptic chart for 1200 GMT on 25 April 1984, preceding the Vasco da Gama Yacht Race from Durban to East London. Over land is shown the altitude (above sea-level) of the 850 mb surface (m). Also shown are observed temperatures and dew points (°C) at the surface.

the original chart is too small to show a coastal low, but the reality of the coastal low is evident from the autographic charts of meteorological stations on the coast. The wind record for Durban is shown in Figure 6. Other records have been plotted in a quasi-synoptic form at three-hourly intervals (Figure 7) to make it easier to follow the sequence of events. Hot humid north-easterly winds and falling pressure continued to 1700 h local time (GMT+2); a brief squall from the west-south-west and a 1.5 mb pressure jump marked the coastal low cold front at 1745 h. Pressure remained steady, with winds light and variable until 2110 h when there was another 1.5 mb pressure jump at the onset of strong south-westerly winds — the main cold front. Pressure then rose rapidly, the wind continued strong south-westerly, and temperature and dew point fell slowly.

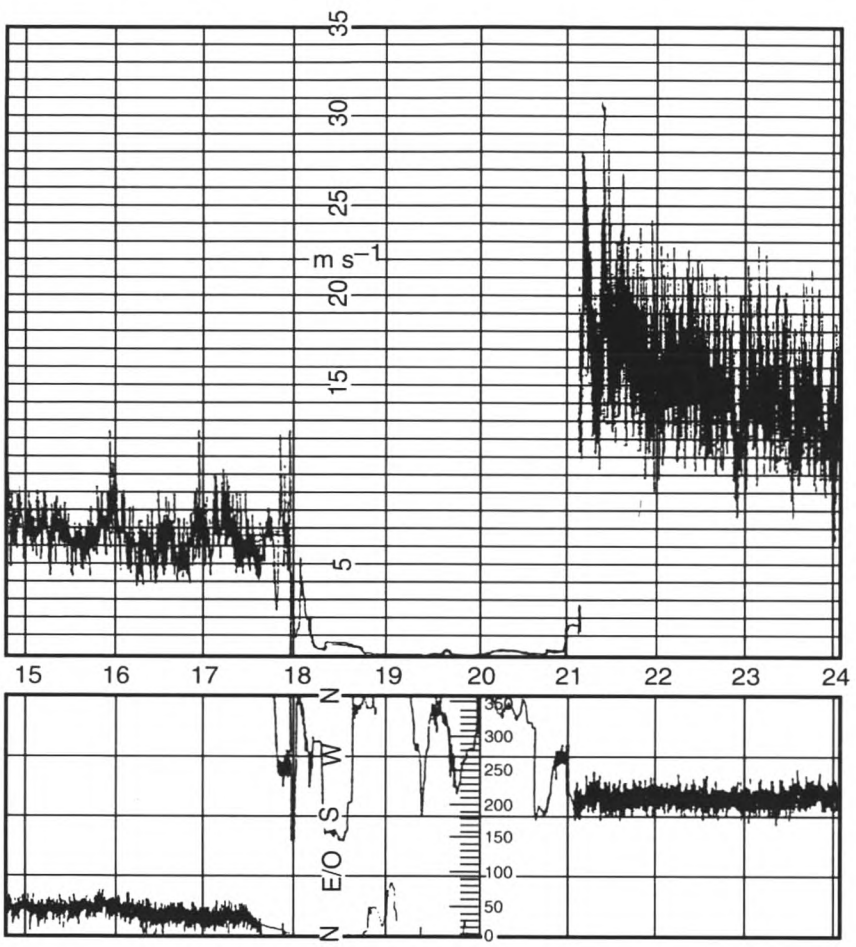


Figure 6. Anemograph trace showing the passage of the coastal low (near 1800h local time) and cold front (near 2100 h local time) at Durban on 26 April 1984.

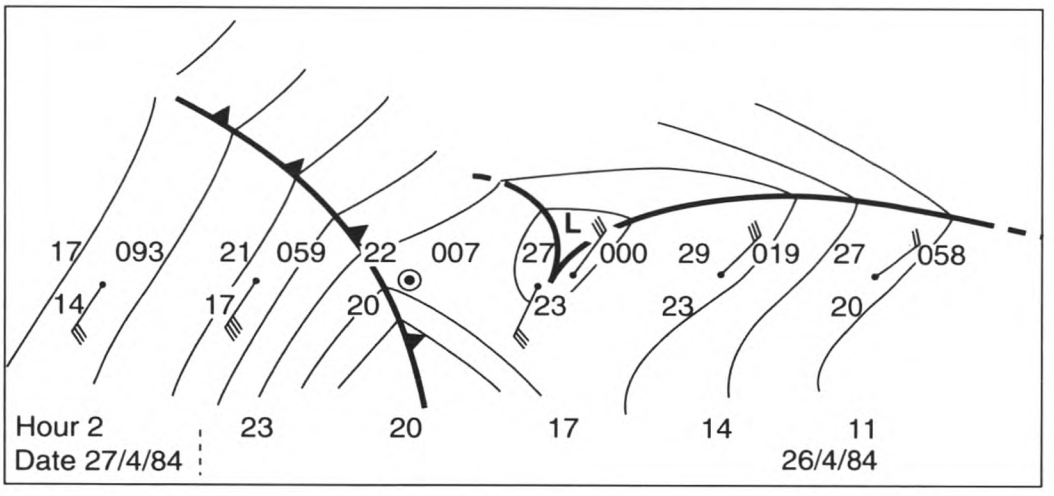


Figure 7. Three-hourly weather observations for the passage of the coastal low and cold front on 26 April 1984 at Durban.

Although this occasion was selected for its extreme weather and hazardous wind/sea conditions for shipping rather than for the clarity of the coastal low sequence, many of the features of the coastal low were observed — the various airmasses and marked changes in wind; at East London the coastal low exhibited a long period of berg winds. This instance illustrates both the coastal variations and the sometimes dangerous sea conditions along this coast.

Sinking of the *Oceanos*

A similar but more recent episode concerned the cruise vessel *Oceanos*, 162 m long, displacing 12,000 tonnes, which left East London on 3 August 1991 bound for Durban. A south-westerly gale warning had been issued, and the harbour pilot drew attention to the squall visible on the south-west horizon. A few hours after sailing, the wind changed to south-west and increased rapidly in strength. Extremely rough seas were experienced, and a starboard hull plate was fractured, flooding the engine room and depriving the ship of power. Worse still, the bulkhead to the adjacent sewage control room had been opened to facilitate maintenance, and control valves removed for repair. Thus the sea pouring into this room, too, had open piped connections to all parts of the ship. The ship was not only helpless, but doomed to sink. The continuing gale hampered rescue operations, but in the end 344 persons were saved by other ships, and 227 by helicopters of the South African Air Force. *Oceanos* finally sank some 16 hours after the damage to the hull.

At East London, all the elements of the coastal low were present on this occasion: winds changed from north-east to north-west and then to south-west without weakening, and later increased to over 20 m s^{-1} with gusts to over 35 m s^{-1}. The cold front arrived some hours later without any noticeable change in the south-westerly winds. Figure 8 shows the situation at 1200 GMT on 3 August 1991. Whether the strength of the south-westerly winds was solely due to the deepening depression or not, the mountainous seas causing the fatal damage to the ship were experienced within 1 km of the coast.

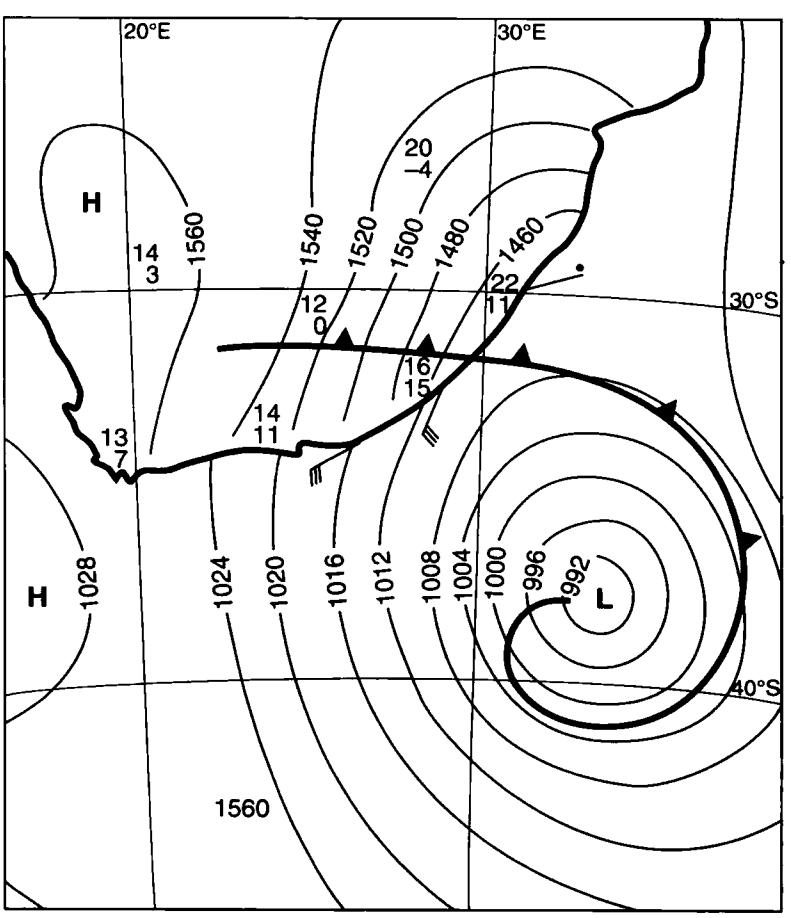


Figure 8. Synoptic chart for 1200 GMT on 3 August 1991, with a deep depression off the south-east coast, leading to the *Oceanos* disaster. See Figure 5 for further details.

Conclusion

The dangers that can develop on this coast following the north-east to south-west wind change are becoming better known, and the National Research Institute for Oceanology has advised mariners to 'stand inshore of the continental shelf [where the Agulhas current will be much weaker] between Richard's Bay and Great Fish Point when steaming towards the south-west with the barometer falling, a fresh NE'ly wind blowing and a change to fresh or strong SW'ly winds forecast within the next 24 hours'.

The South African coastal low, squeezed against the mountainous interior, may be only a few millibars in depth and no more than 1.5 or 2 km in vertical extent, making the intensity of the north-east to south-west wind change somewhat surprising. Although the coastal low can be well represented on large-scale synoptic analyses, it is too small and perhaps too local a phenomenon to feature on published synoptic charts. It remains one of the most interesting features in the meteorology of the South African region.

Acknowledgements

I am indebted to Mr C.B. Archer and Mr M.V. Laing, of the Weather Bureau Directorate in Pretoria, for their help in supplying copies of autographic chart records and other data.

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7. Weather Bureau, Pretoria. Published daily synoptic charts, and copies of autographic records
8. Plus personal experience as forecasters at Port Elizabeth (J.B. Hattle and J.D. Torrance) and Durban (J. D. Torrance), and facilities available at the Central Forecast Offices and in the Investigation Branches of the Meteorological Services in Pretoria (J.B. Hattle) and Salisbury (J.B. Hattle and J.D. Torrance).

**Salisbury now renamed Harare.

Crown Copyright

Captain D.A. Dornom receives his barograph from the Chief Executive of The Met. Office, Professor Julian Hunt.
(See page 210.)

Crown Copyright

Captain R.J. Copeland receives his barograph from Professor Hunt.
(See page 210.)

Crown Copyright

Captain G. de Ferry Foster receives his barograph from Professor Hunt.
(See page 210.)

Crown Copyright

Captain R.A. Woodall receives his barograph from Professor Hunt.
(See page 210.)

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Presentation of Special Long-service Awards at Bracknell on 22 May 1996 (see page 210). Standing, left to right: Professor Julian Hunt, Chief Executive of The Met. Office; Captain R.J. Copeland; Captain D.A. Dornom; Captain R.A. Woodall; Captain G. de Ferry Foster; Dr S.J. Caughey, Director of Observations; Captain S.M. Norwell, Marine Superintendent. Seated, left to right: Mrs Copeland; Mrs Dornom; Mrs de Ferry Foster.

Finished with engines — O.W.S.

By M. Hatch FRMetS*

(Meteorological Officer, O.W.S. *Cumulus*)

The United Kingdom intends to operate an Ocean Weather Ship until June 1996 (ending fifty years of involvement in this field.)

Admiralty List of Radio Signals, Volume 3.

The above 'obituary' is one of the few official indications that the days of the Ocean Weather Service are over. Perhaps it is fitting that a service that began in secrecy should silently fade away! An account recently published in *Weather* [1], tells the story of s.s. *Arkaka* and s.s. *Toronto City* (code named 'Panthers') and those who sailed on board as meteorological staff. These ships went missing presumed sunk in June/July 1941 but it was to be 40 years before the details of their sinking by U-boats were determined.

Both the United Kingdom and French weather services had experimented with ships carrying professional meteorologists in the years 1936–39 but it was the post-war increase in transatlantic air traffic which was the catalyst for the foundation of the Ocean Weather Service.

The Ocean Weather Ship Service was founded as a result of an International Agreement signed in London in the summer of 1946, under the auspices of the International Civil Aviation Organisation [2], see Figure 1 [3].

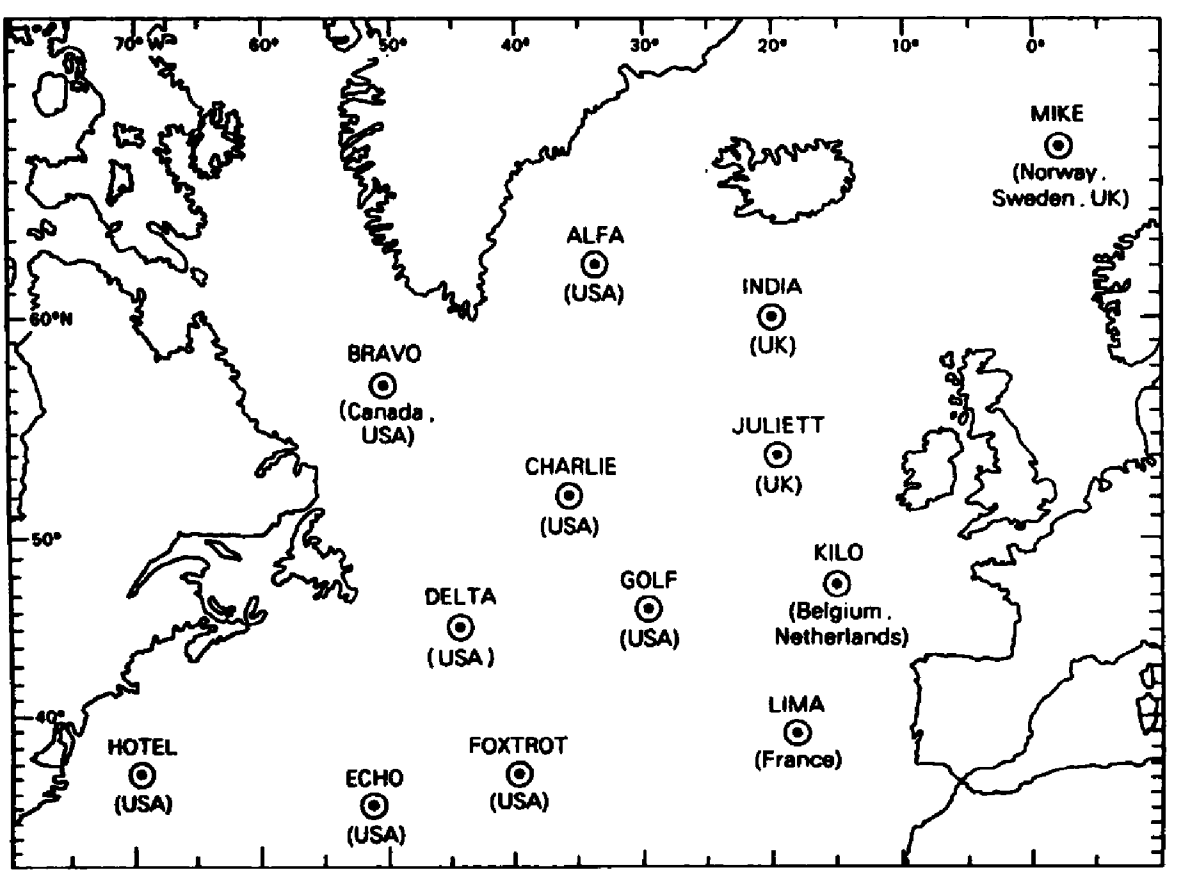


Figure 1. Positions of the ocean weather stations as agreed at the ICAO Conference, London, 1946.

* This article was written during the final voyage of Ocean Weather Ship *Cumulus* in May/June 1996.

Thirteen weather stations in the North Atlantic were to be established. A second conference in 1949 decided to reduce the number of stations to 10 for reasons of economy. At a further conference in Paris in 1954 the number of stations was reduced once again for economy reasons to 9. (This was the state of the service when the writer joined). A gradual reduction continued in the number of stations manned until, at the time of the termination of the International Civil Aviation Organisation/North Atlantic Ocean Station Agreement on 30 June 1975, only stations 'Mike', 'India', 'Juliett' and 'Kilo' were manned, see Figure 2 [3].

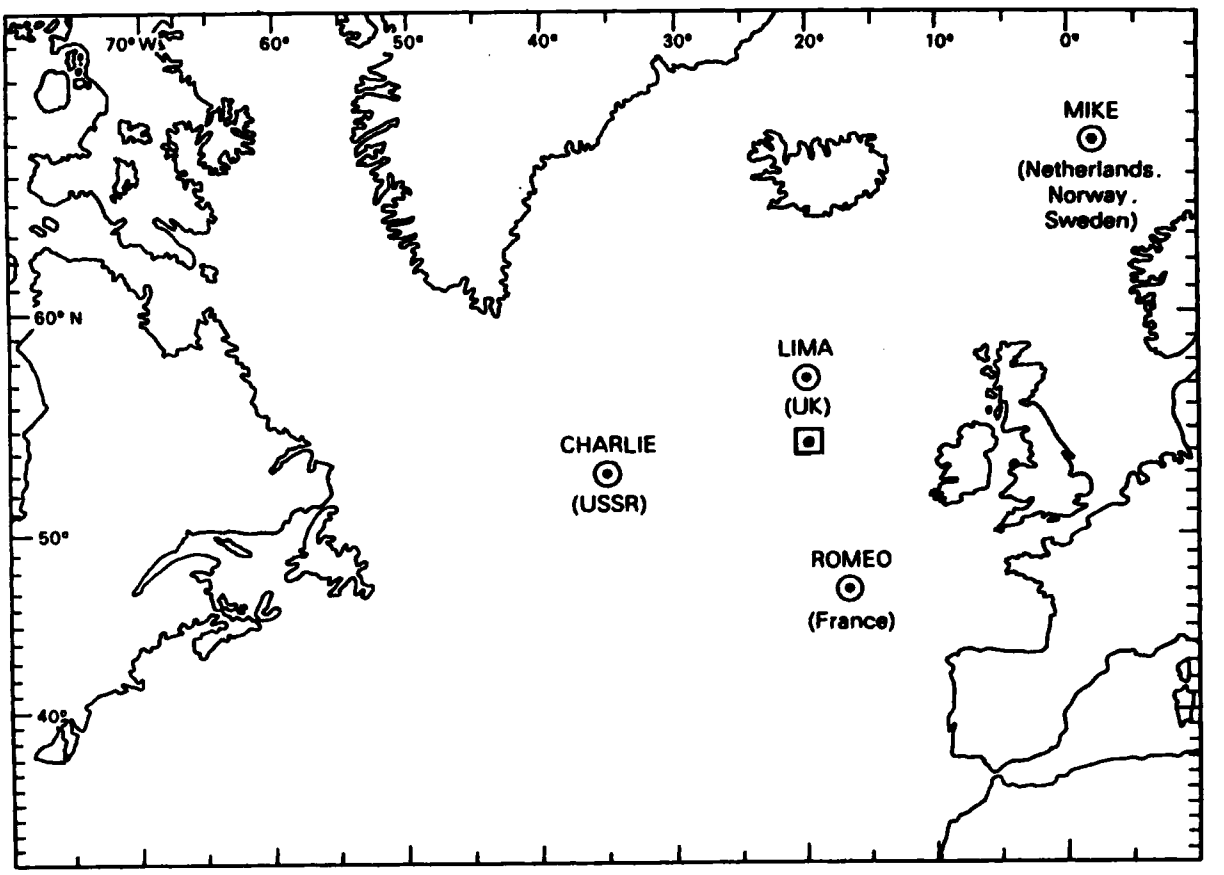


Figure 2. Positions of the ocean weather stations under the Joint Financing Agreement on North Atlantic Stations, 1975. [The boxed position denotes the location of the final station for O.W.S. *Cumulus*, the position formerly known as station 'Juliet'.]

Ex-Royal Navy 'Flower' class corvettes were originally selected for duty on the two British stations because (a) of their excellent sea-keeping qualities, (b) they were surplus to naval requirements and unsuitable for commercial purposes and (c) their market price was low.

The four British 'Flower' class corvettes and their conversions were:-

H.M.S. *Thyme*	*Weather Explorer* (MPKG)
H.M.S. *Marguerite*	*Weather Observer* (MPJJ)
H.M.S. *Genista*	*Weather Recorder* (MPJN)
H.M.S. *Snowdrop*	*Weather Watcher* (MPKJ)

The *Weather Observer* first occupied station on 4 August 1947, the others following when ready for service. Prior to her first voyage the *Observer* was renamed at Shadwell Basin on the Thames. During an 'Open Day' to mark the

occasion, one of the Radar Technicians was showing visitors around his department but it was only later that he discovered that one elderly visitor who had shown great interest in everything was Sir Robert Watson-Watt, radar's wartime developer.

Photo. by N. Matheson

Weather Observer (formerly the 'Flower' class corvette H.M.S. *Marguerite*) on station in the North Atlantic Ocean.

Between 1958 and 1961 all the 'Flower' class vessels were replaced by the larger 'Castle' class frigates which were given the following names:-

H.M.S. *Amberley Castle*	*Weather Adviser* (MDBE)
H.M.S. *Pevensey Castle*	*Weather Monitor* (MEDD)
H.M.S. *Oakham Castle*	*Weather Reporter* (MYDN)
H.M.S. *Rushen Castle*	*Weather Surveyor* (MEDE)

Photo. supplied by M. Hatch

Weather Reporter (formerly the 'Castle' class frigate H.M.S. *Oakham Castle*) receiving the Christmas mail drop at station Juliet in 1963 via a Shackleton aircraft from R.A.F. Kinloss.

Photo. by I. Hitchcock

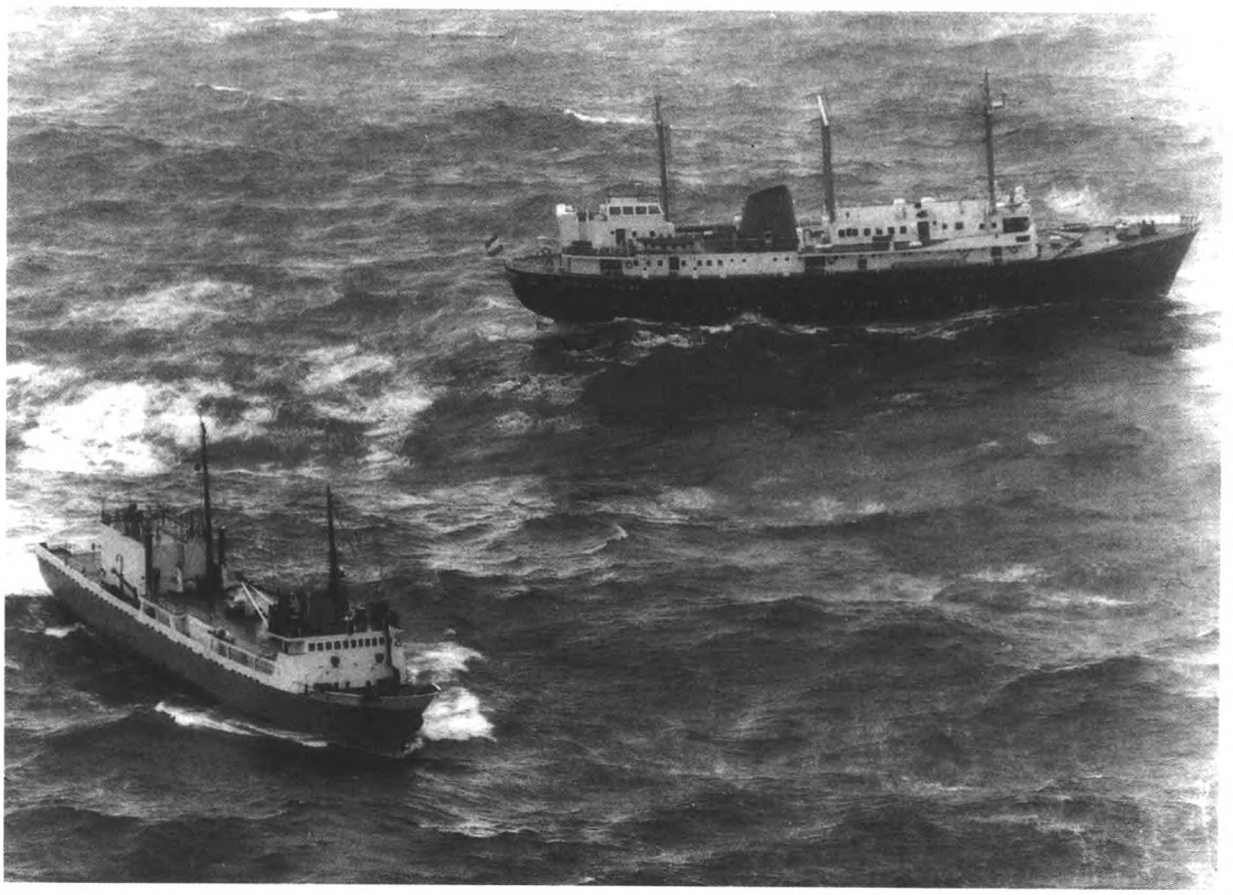
Meteorological staff on the *Weather Reporter* in 1963. At this time, the former Royal Navy frigate was still a Class III reserve and thus carried some 'mothballed' armament. On the gun platform are, from left to right, T. Rogers, H. Morgan, M. Hatch (the author) and K. Hallam.

From 1 July 1975 a World Meteorological Organisation Agreement for Joint Financing of North Atlantic Ocean Stations (NAOS) was entered into on an interim basis until ratification in December 1976. Under the new 1975 agreement the following were manned by the countries indicated:-

STATION		OPERATOR
Mike	66° 00′N, 02° 00′E	Norway and The Netherlands
Lima	57° 00′N, 20° 00′W	United Kingdom
Charlie	52° 45′N, 35° 30′W	U.S.S.R.
Romeo	47° 00′N, 17° 00′W	France

The alteration in the United Kingdom operating commitment to the NAOS network from two to one ocean station in 1977 reduced the United Kingdom requirement for weather ships from four to two vessels and the opportunity was taken to refurbish two of the existing four ex-'Castle' class frigates. The ships selected for refurbishment were *Weather Adviser* and *Weather Monitor* and these were subsequently renamed *Admiral FitzRoy* and *Admiral Beaufort*, respectively and were to complete their weather ship careers in December 1981 and January 1982, respectively. The Met. Office then ceased direct management of its own ocean weather ships but manned a converted distant water trawler, the *Starella*, chartered from Marr Vessel Management Ltd, of Hull. *Starella*'s first voyage as a weather ship commenced in February 1982 when she sailed from Fleetwood to man station 'Lima'. The station still required two ships and so it was manned jointly by the *Starella* and by the *Cumulus* which was a purpose-built weather ship operated and managed by the Royal Dutch Meteorological Institute (KNMI).

The *Starella* was replaced by the *Cumulus* 'going for a song' from KNMI, at £1.00 sterling, in December 1985, and during the next two years the replacement of staff from The Met. Office by personnel employed by Marr gradually occurred.



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The converted distant water trawler, O.W.S. *Starella*, hands over ocean station 'Lima' to the Dutch Ocean Station Vessel, *Cumulus*, on 18 November 1985. The *Cumulus* was formally handed over to the United Kingdom Met. Office in December 1985 and the final handover between the two ships took place in January 1986, the *Starella* then being handed back to her owners. The *Cumulus* continued as the sole United Kingdom Ocean Weather Ship until the Ocean Weather Service ceased in June 1996, before being handed back to her Dutch owners.

The final years of the United Kingdom's Ocean Weather Service have seen the operation of a single vessel which, on a typical voyage, has spent four weeks on station with a total of about six days on passage to and from station and has had a 'turn round' of 36 hours in port. A far cry from the 'dual-manned' voyages that gave a vessel 20 days in port. The last radiosonde ascent was made at 2315 GMT on 28 May 1996, the last observation at 1500 GMT on the 29th, and nothing is known on board at present regarding the future of *Cumulus* but it is the parting of the ways, with all the uncertainty that brings, and with all of us hoping for a bright future.

(Further reading on the Ocean Weather Service may be found published in *The Marine Observer* of 1948, 1978, 1982, 1985, 1986 and 1989.)

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ECAM '95 – A practising shipmaster's view*

By Commodore A.J. Leslie
(P&O Containers Ltd)

I am a serving Master on the P&O Containers vessel *Repulse Bay* which sails under the British Flag, and with her sister ships, is the largest U.K. container ship, comparable in size with large container ships of other countries.

Repulse Bay carries 4,038 twenty-foot equivalent units (teu) containers, or the equivalent in forty-foot, and is propelled by a single engine developing 46,800 H.P. and giving a speed of 23.5 knots, with a fuel consumption of about 130 tonnes per day. She is 293 m long and 32.2 m broad but whilst she is a very large ship, she is about to be overshadowed by even larger container ships now being built, which will carry over 6,000 teu.

The major volume of world trade, other than oil or bulk cargoes such as iron ore and grain, is transported on container ships, large ones such as mine for long ocean passages, and smaller ones for feeding to ports where the containers are transferred to the ocean passage ships. When full *Repulse Bay* carries approximately 45,000 tonnes of cargo of a very diverse nature, from basic raw materials to 'high-tech' products. The significance of the weather on a voyage can be seen in context when I tell you that more than half the containers are carried on deck, well sealed at the doors so that water ingress is not a problem. What is significant is the risk to the containers themselves from the movement of the vessel in a seaway. Underdeck, the containers are secured by the cellular structure into which they slide vertically on loading but on deck up to six high are stowed one on top of another, locked together by twistlocks with lashing rods used to lock the stacks together.

The single most important factor that concerns me during my voyage is the weather, and so the pre-knowledge of what to expect is one of the prime factors in my passage plan. This equally applied to the days of sailing ships, racing from the Far East with tea but those Masters were denied the knowledge which we so readily accept.

A very important factor recently introduced into container ships' world trade is the Fixed Day Schedule. This means that we are required to be at a specific port on a specific day and usually at an exact time, governed either by tides or availability of berth. This requirement could be as much as 26 days away, with many different weather factors to contend with during that time. The service upon which I run, Europe to the Far East, is generally designed to maintain a speed of about 21 knots but any delay brings us up to a speed required which is close to our maximum.

The significance of the Fixed Day Schedule is that, for instance, a Japanese manufacturer of high value electrical goods, exporting to the European market, does not stockpile goods in warehouses in Europe but uses the ship as a warehouse whilst on passage, knowing that the ship will arrive on a certain day. The goods can then be on the shelves within a couple of days. If we are late, there are no Sony radios or Toshiba TVs available in the shops next week.

How then do we obtain all the information which we require? We have no Radio Officer, being fitted under the GMDSS system but we are fitted with Inmarsat A, Inmarsat C, HF/MF telex, telephone, VHF telephones, satellite

* Précis of a paper presented by Commodore Alistair Leslie, P&O Containers Ltd, at the WMO European Conference on Applications of Meteorology (ECAM), 25–29 September 1995 at Toulouse, France.

facsimile, Navtex and weather receiving equipment. The weather facsimile receiver is a very important part of our equipment and we make great use of it in the areas where surface analysis and prognosis are obtainable.

The ship is also fitted with a MOSS (Met. Office Observing System for Ships) by which system the six-hourly weather observations are keyed into a VDU and held in a data collection platform until accessed by the EUMETSAT satellite. The information is then passed to the Met. Office in Bracknell via the coast earth satellite station at Darmstadt in Germany.

The *Repulse Bay* has a crew of 19 which includes three qualified watchkeeping Navigation Officers. These officers are responsible for the formulation and transmission of the six-hourly reports which we always hope are being used in the preparation of weather forecasts. I was inclined to wonder whether it was rational to send my reports from the Pacific back to Europe, and if they assisted the forecasters in the Pacific: on one occasion only 30 minutes after I transmitted my scheduled report to Bracknell, Japan produced a wave height facsimile showing the ship's call sign and my report of a monsoonal disturbance in the South China Sea.

Let me now take you through a typical voyage, the weather problems we encounter and the meteorological information we have available.

On departure from Southampton our speed is governed by the Suez Canal transit time. There is only one convoy a day for vessels of this size and we have to arrive and register in good time. Losing a day here would throw our whole Far East schedule out, so I watch very carefully the weather reports for this initial part of the voyage. As well as the local weather forecast delivered to the ship by the Port Met. Officer at Southampton, Navtex from Niton Radio is giving us forecasts down to Finisterre while excellent faxes from Bracknell or Northwood take us into the Mediterranean. The Sat-C receiver gives us Atlantic weather both from Bracknell or Toulouse, and the areas of responsibility of both these stations covers all the eastern Atlantic. Coastal forecasts on Navtex are then received from Portugal and these give me an indication of what to expect as we approach the Spanish and Portuguese coasts. At this stage I am looking out for head winds and fog. Head winds are not kind to container ship speeds, with the obvious massive resistance presented by five- or six-high containers on deck. Despite having three radars, we are bound by law to moderate our speed in fog, hence my interest in what I can expect in the hours ahead. At this point I am adjusting the revs to conserve fuel whilst trying perhaps to get a few miles in hand. The last few revs available to me take a disproportionate amount of fuel. If I increase revs from, say, 86 to 100 which is the maximum, we probably burn 50 tonnes more fuel for 3 knots extra speed. This at 100 plus dollars per tonne considerably increases our costs. As we enter the Mediterranean, I have, for some unknown reason, to switch my Sat-C to the Indian Ocean satellite in order to receive the weather forecasts from Athens. I would prefer to get these forecasts on the Atlantic satellite but the coverage is good, with the French Met. Office areas being covered on the same broadcast. Also available are the Malta and Cyprus local forecasts on Navtex.

It must be understood that I need to receive forecasts without having to search or listen for them, I cannot allow the Officer of the Watch to 'play' with the radio receiver to find telexed weather. His primary duty is look-out, and we no longer have the luxury of a Radio Officer who could tune into a W/T morse station. Dependent upon the winds in the Suez Canal, we usually enter if the winds are less than 20–25 knots, we transit to the Red Sea in about 14 hours. In the Red Sea

our Navtex produces what appears to be a standard forecast, a northerly wind of 12–24 knots in the north, southerly in the south with a chance of thundery activity. A call at Jeddah breaks up the passage, this being a fairly relaxed couple of days weather-wise, with the only problem being sand in suspension occasionally.

Approaching the Arabian Sea and the Indian Ocean, naturally the season matters immensely. We enjoy the north-east monsoon and find it hard to vary the weather reports from the ship. The south-west monsoon is, of course, another matter and the information received on this is not particularly good. Our best method of judging the strength of the south-west monsoon is through talking to other company ships passing in the opposite direction. They are quite willing to give us gory details of the monsoon blowing at 45 or 50 knots. After all, they are past it. Across the Bay of Bengal we get coverage of weather and warnings of cyclones but I do miss the old W/T forecasts we used to get from Colombo giving us the position of the ITCZ. My attention is now drawn to the north-west Pacific and the South China Sea. Every effort is made to get the Japanese facsimile as this is the first indication of the weather we can expect for the next three weeks. I suppose one of the problems of being a Shipmaster is that it is a toss-up whether you worry when you cannot get certain weather forecasts, or worry more when you do get them! If at this stage I do not get a fax, then ignorance is bliss but when I do get one and see a tropical depression in 140°E, 06°N moving slowly west, I immediately look to my schedule; 12 hours in Port Klang, 18 hours in Singapore, 3 days up to Hong Kong. It is surprising how much a Japanese forecaster can assist my sleep by predicting that the depression will move more to the north, only six hours later to shatter my calm by upgrading the tropical depression to a tropical storm and having it move west again. Fortunately, the area from the Strait of Malacca to Japan and back offers the best overall coverage of the whole voyage, comparable to the Atlantic. Singapore Navtex covers the straits and the southern part of the South China Sea, and then Hong Kong takes over with forecasts which are supplemented by transmissions from China and Japan. I cannot stress too much the importance of knowing about tropical revolving storms whether in the Pacific, Indian or Atlantic Oceans. I would say here that if meteorologists could successfully forecast the track of an impending tropical revolving storm, we would be eternally grateful. No doubt the poor guy sitting in Miami or Manila would say the same but he does not have the imponderable task of deciding whether to divert or slow down, speed up or stop, or even just close your eyes and hope that 'Sadie' or 'Lewis' will go away.

Wherever I am, facing a storm, debating my actions I always have the feeling that there is an affinity between we seafarers and the forecasters covering our area. I hope, ladies and gentlemen, that you can tell me that you sometimes think of the poor sailor when you prepare your forecast from the comfort of your offices.

So we head homewards, back to Europe with our schedule hopefully still being maintained despite delays perhaps in Yokohama because our slot was still occupied by a transpacific ship which had been delayed by dense fog near the Aleutians or a storm tracking across the Pacific. It is usually a matter of one ship off, another ship on, with all cargo planned and labour standing by ready for the ship to arrive. Fortunately, with this different concept in marine transportation, brought in with the container ship, the weather forecasting available to us has improved greatly, on the whole, and whilst I would like to see an advanced weather prognosis at times, rather than surface pressure, the methods of getting forecasts to us have most certainly improved.

My voyage westbound follows the same pattern as outward, though the significance of the monsoon changes and we adopt different routes from Sri Lanka to the Gulf of Aden in order to try and lessen the effect of the south-west monsoon. Again we are governed by the Suez Canal transit, and once through the canal we are in good hands as the forecasts give us every confidence that we are back in an area of excellent coverage. At this stage I should mention my liking for the Northwood four-map significant wind/weather prognosis giving me the visibility, winds and significant surface weather for up to four days ahead. This is most useful and I can plan my speeds in the Mediterranean knowing more or less what to expect in the Atlantic, bearing in mind that my berthing time at Southampton is governed by the tide. Around the European coast, with calls at Rotterdam and Hamburg, I rely on the Bracknell forecasts and local gale warnings from all coastal stations with Navtex.

Let me now mention weather routeing for ships. As you will probably know, this is a system whereby the most advantageous transocean route is advised to the ship by an analyst studying the relevant weather conditions from his office ashore. It is sometimes viewed with suspicion by many Masters as it is usually paid for by the ship's charterers who naturally want the quickest passage for their cargo. Not always the most comfortable, and perhaps not always the safest. Never having used weather routeing, I cannot give any personal view on the matter but I do know that the United Kingdom Met. Office uses seafarers in their routeing service and they probably have a little more sympathy with us. I am probably being most unfair to all routeing analysts who I am sure provide much-needed information to some of our less experienced or qualified fellow seafarers.

I have often wondered how much co-operation there is between meteorological offices. This conference perhaps provides a partial answer but for example, during my last voyage I was watching three tropical storms in the Pacific, 'Janis', 'Kent' and 'Lois'. At least all the meteorological authorities agreed on the names although they did not always agree on anything else. I was monitoring Hong Kong, China, Japan and Guam. Now, I imagine the duty forecaster in each of these stations makes up his mind from all the information available as to where the typhoon is, its central pressure and projected track and wind speeds. I was usually presented with four different situations. As Kent, the biggest storm developed, things rationalised somewhat but I was required to make up my mind as to what to do; Japan had it going at north-west at 12 knots, Hong Kong west-north-west at 10 knots while China still recognised a tropical depression. Guam worried me the most, having it going west at 8 knots which would just about meet me in Hong Kong. I wonder at times if there is any consultation, or exchange of views on an every day basis.

Finally, let me thank you an behalf of all seafarers for the service you give us. I can assure you it is very much appreciated, and it is accepted as very much a part of our lives. Often my first question to the Officer of the Watch on going to the bridge is 'Have you got the forecast?', not 'Where are we?'. As I have stated, weather is the single most important factor in the successful progress of the voyage, and I get a perverse satisfaction from turning the radio off when I am home on leave, when the announcer says, 'Here is the shipping forecast'. Of course, like the majority of the public, we blame you for foul weather and I do not suppose you get much appreciation when it is fine but believe me, we at sea could not do without you.

PRESENTATION OF BAROGRAPHS

On 22 May 1996 the 48th annual presentation of barographs to mark long service in the cause of voluntary weather observing took place at Bracknell. The thoroughly wet and miserable weather failed to dampen spirits as the recipients accompanied by their wives and company officials gathered for the presentation, made by the Chief Executive of The Met. Office, Professor Julian Hunt. Although three of the recipients have retired since the year relating to the awards (1994), the day arranged for the presentation was the only one possible upon which all four could attend. In the Reading Room of the National Meteorological Archive, a venue that has become accustomed to temporarily surrendering its quiet atmosphere for the occasion, Professor Hunt made the presentations to Captain R.J. Copeland, formerly with Ropner Shipping, Captain D.A. Dornom, formerly with P&O Containers Ltd, Captain G. de Ferry Foster of The Geest Line and Captain R.A. Woodall, formerly with the Cunard Line Ltd. (See photographs on pages 199 and 200.) Before making the presentations, Professor Hunt thanked the recipients for all their contributions, past and present, stressing that weather observations from ships are a vital source of data and as important now as ever notwithstanding state of the art satellite sensing and scanning technology.

The early meteorological works of the visiting Captains were kindly displayed by the staff of the National Meteorological Archive, headed by Mr Michael Wood, and no doubt many memories were rekindled upon seeing these records. Later, the guests, including Captain G.A.S. Gaul (Fleet Operations Manager, Cunard Line Ltd) and Captain P. Dixon (Chartering Operations Manager, The Geest Line) were entertained to a lunch hosted in the main by the Chief Executive, Dr Jim Caughey (Director of Observations), Dr Alan McIlveen (Head of Information Technology Operations) and by Captain Stuart Norwell (Head of Observations (Marine)). Afterwards they enjoyed a tour of the Central Forecasting Office led by Mr Brian Oatway, the Operations Manager, and then visited the Information Technology Operations Centre to round off the afternoon.

To qualify for a long-service award Masters must have a minimum of 18 years' voluntary marine observing to their credit and have submitted at least one logbook during the relevant year. However, allowing for the time and care taken by nautical staff to assess all logbooks for a given year before identifying the nominees, a lapse of about 18 months normally occurs between the year in question and the actual presentations.

AURORA NOTES OCTOBER TO DECEMBER 1995

By R.J. Livesey

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

Marine observations of the aurora made in the period under review and received up until the time of writing are listed in Table I. With solar activity low at present as we approach sunspot minimum, auroral activity was correspondingly low at mid latitudes.

A number of observations made at Reykjavik, in Iceland, of homogeneous and rayed bands, spirals and westward drifting forms, sometimes to the north, to the south or overhead, were all typical of activity found regularly in the auroral oval at

that geomagnetic latitude. For example, on 21/22 December, after the apparition of a rayed arc, spirals were reported to drift westwards at a rate of 12 degrees per minute, to be followed thereafter by a pulsating homogeneous arc accompanied by some rays to an altitude of 18°. Such activity would be expected to be visible to ships from the Labrador coast and Cape Farvel, in Greenland, through the northern Norwegian Sea to Bear Island when conditions were suitable.

Table 1 — Marine aurora observations October to December 1995

Date	Ship	Geographic Position	Time (utc)	Forms in Sequence
16/17 Oct.	*Cumulus*	60° 30'N, 22° 25'W	2245–2345	qN.
18/19	*Cumulus*	58° 00'N, 21° 45'W	2215–0245	$a_2p_1$mcRB.qn.ap$_1$mcRB. qn.p_2R_2B brilliant.
12/13 Nov.	*Westra*	61° 00'N, 00° 50'E	1750–1950	qHA.HA+P.RB.a_1RB. RR.HA+G.HA.G.

KEY: a = active, c = coronal, m = multiple, q = quiet, a_1 = movement of folds or irregularities, a_2 = shape of lower border changes rapidly, HA = homogeneous arc, N = unspecified form, P = patch, R = ray, R_2 = medium rays, RB = rayed bands, RR = ray bundle.

On 6/7 October an airline pilot flying over eastern Canada towards London Heathrow Airport noted an active auroral storm in the auroral zone to his north to be followed by a total blackout of high-frequency radio communication right across the Atlantic Ocean.

The most interesting event of the period occurred on the night of 18/19 October when O.W.S. *Cumulus* reported a brilliant auroral display with coronal forms. Active aurorae were also reported from the island of Bornholm in the Baltic Sea, Denmark, overhead at Fair Isle, Scotland, Northern England and right across the Atlantic Ocean to Detroit in the United States, where the aurora was up to an altitude of 50 degrees above the horizon. Inspection of the solar diagram issued by NOAA, at Colorado, showed that a coronal hole lay at the centre of the sun's disc on 16 October and extended from the solar equator northwards to a latitude of about 35 degrees. Allowing two days for travel time between the sun and the Earth, then this coronal hole could have sprayed our planet with electrified particles to cause the aurora. Further, there was an eclipse of the sun observed from India on 24 October which was one-quarter of a solar rotation from the meridian passage of the solar disc of the coronal hole. Observations of the eclipse made by Dr McKim and other members of the British Astronomical Association eclipse party, clearly showed side on the magnetic structures in the sun's corona associated with the coronal hole in the northern solar hemisphere. Thus, there was an interesting link between the solar eclipse observations and the aurora observed and recorded by the *Cumulus*.

Dr David Gavine reports that the year 1995 was a good one for observing noctilucent clouds (NLC) which were visible on 58 nights from western European waters. The most widely observed events took place on the nights of 23/24 June, also the 28th/29th, 29th/30th and 30 June/1 July. In Figure 1 are given the lowest geographic latitudes from which NLC were reported for each night event although they could well have been visible further to the south. In Figure 2 is given the annual frequency with which NLC event nights took place from 1983, as reported to the British Astronomical Association, and analysed by Dr Gavine.

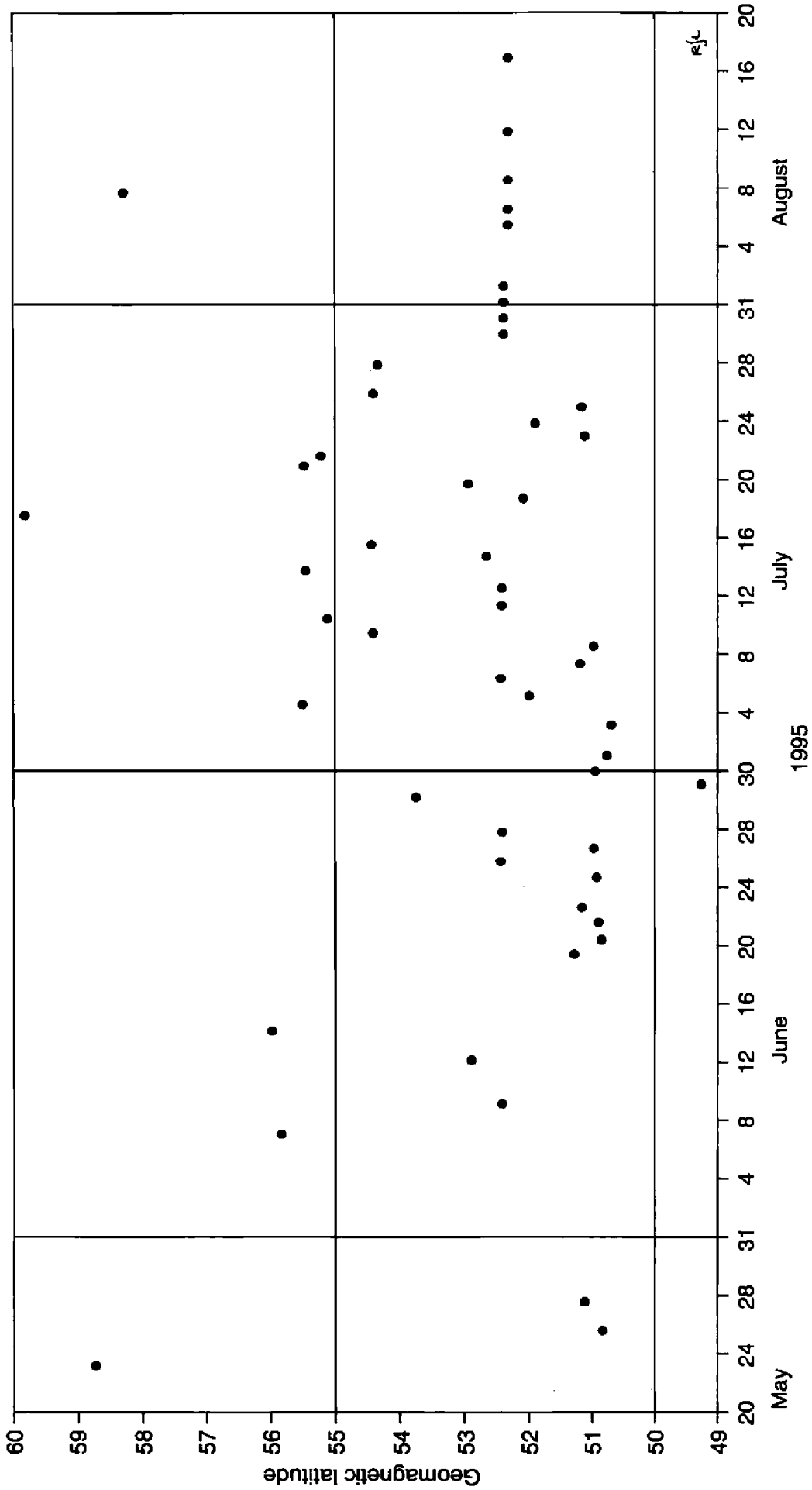

Figure 1. Lowest geomagnetic latitude at which noctilucent clouds were reported in north-west Europe, 1995.

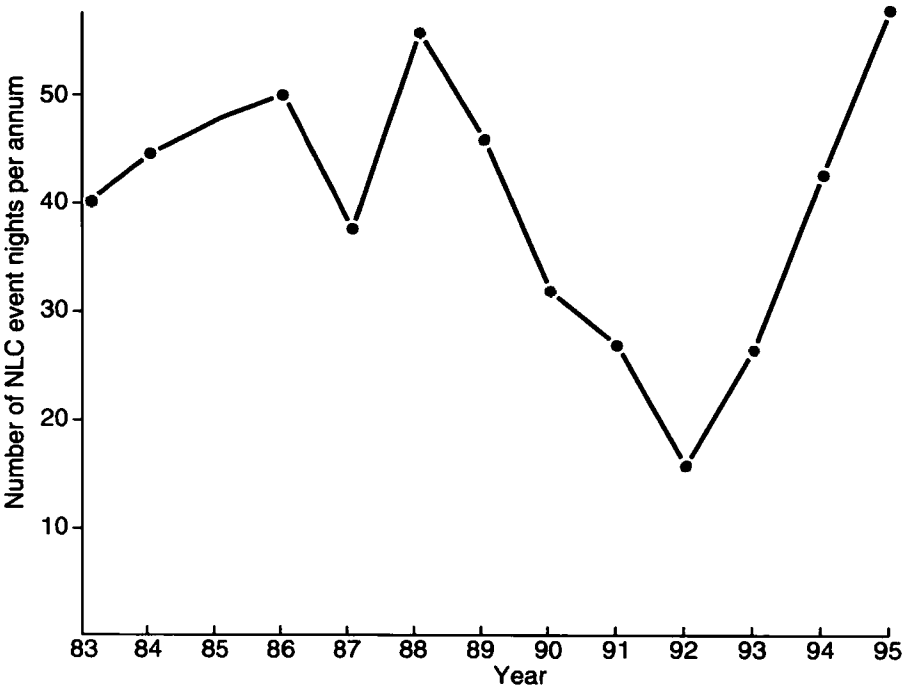

Figure 2. Annual frequency of noctilucent clouds in north-west Europe, 1983–1995. [Data from Dr D. Gavine.]

The deficit in frequency in 1992 is not attributed to a lack of observers because, as Dr Gadsden has pointed out, the number of active and dedicated NLC observers has remained fairly constant over many years. Warm polar summer stratospheric air rises into the upper atmosphere and, in doing so, cools thereby making a mechanism allowing NLC to form. Dr Gadsden has proposed that dust in the high atmosphere emitted from active volcanoes such as Mount Pinatubo could have shielded the stratosphere from solar radiation, thus cooling the stratosphere and interfering with the mechanism for NLC formation.

Why include an interest in noctilucent clouds with that of aurora? They are both high-atmosphere phenomena. Variations in solar activity affect both systems. The general methods of observing, measuring, locations and photographing the aurora and NLC used by mariners, meteorologists and amateur astronomers are identical. Professional scientists are dependent upon these observers for data to further their studies of NLC. Observations of NLC made in the summer of either hemisphere will be, therefore, very welcome from mariners suitably located to see them.

LETTERS TO THE EDITOR

Fish tale

The Chief Officer [Mr M. Watts] and I were taking rounds of the ship on 15 December 1995 and, upon reaching the stern, he looked over the side and proclaimed 'Well, I never!' — not exactly true but it will do.

There, swimming up to the stern were three dorado approximately a metre in length, they appeared to be eating something attached to the stern itself. Taking turns, one would swim forward and have a nibble then fall back and another one would take its place.

Now you may say there is nothing unusual about this, fish often have a nibble on whatever has attached itself to the hull but at the time this was happening the

ship was fully laden having a stern draft of 21.8 m, the propeller (diameter 10.5 m) was turning at 59 r.p.m. and as such, the 25,000–s.h.p. engine was propelling the vessel (displacement 360,220 tonnes) through the water at 14 knots.

As you can imagine, the wash of the prop was such that it was churning the water astern with amazing force but still the fish continued to swim up to the stern into and through the eddies to nibble at whatever was on the hull. We had never seen or heard of anything like it before. Has anyone else?

I came to the conclusion that these fish were either showing off, suicidal or that there is nothing in the Indian Ocean that can compare to the taste of a fully-laden VLCC.

Mr D. Winder, Principal Observing Officer, m.v. *Leonia*. (Shell International Trading & Shipping Co. Ltd)

Notices to Marine Observers

APPOINTMENT OF PORT MET. OFFICER — SOUTH-EAST ENGLAND

Captain Harry Gale has been appointed as Port Met. Officer at Tilbury and succeeds Captain Edward O'Sullivan who finally takes up permanent residence at the Observations (Marine) office, in Bracknell, as Manager of Marine Networks.

Harry Gale was born in Dumfries in 1950 and joined Trident Tankers as a cadet in September 1967, staying with that company as it became P&O Bulk Shipping and until 1973 when he passed for First Mate's Certificate, then joining the Reardon Smith Line. He obtained his Master's Certificate in 1977 and then joined the United Arab Shipping Company with whom he stayed for 10 years before deserting the deep sea for life on the coast with the Union Transport Group, as Master. Since coming ashore in 1994, he worked briefly at London Heathrow Airport, in airline freight but joins The Met. Office from the Hydrographic Office, at Taunton where he was Reviser of Sailing Directions.

APPOINTMENT OF A NEW METROUTE OFFICER

Captain Francois D. Hugo has recently joined the MetRoute team, based within the Central Forecasting Office at Bracknell where he replaces Captain Mike Bechley who has moved on to pastures new. Captain Hugo joins The Met. Office from Shell International Trading & Shipping Company Ltd, his last ship being the *Leonia*.

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