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prepared by the Marine Divison of the
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A QUARTERLY JOURNAL OF MARITIME METEOROLOGY PREPARED BY THE MARINE DIVISION OF THE METEOROLOGICAL OFFICE

VOL. 66 **No. 331** **JANUARY 1996**

CONTENTS

COVER PHOTOGRAPH: Altocumulus cloud 15 n.mile south-east of Barra Head at 1320 UTC on 15 October 1994 photographed by Captain H.A. MacKenzie, Master of f.p.v. *Vigilant*.

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.

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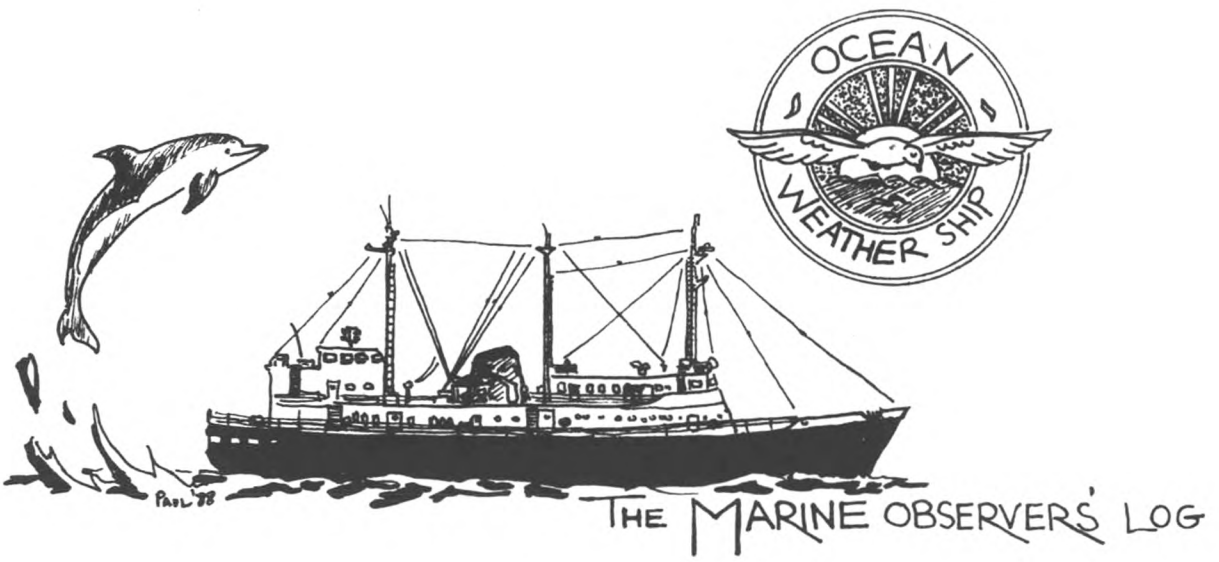


January, February, March

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).

DEPRESSIONS

Irish Sea

m.v. *Buffalo*. Captain J.D. McCann. Liverpool to Dublin. Observers: the Master, Mr S.C. Formstone, 2nd Officer and ship's company.

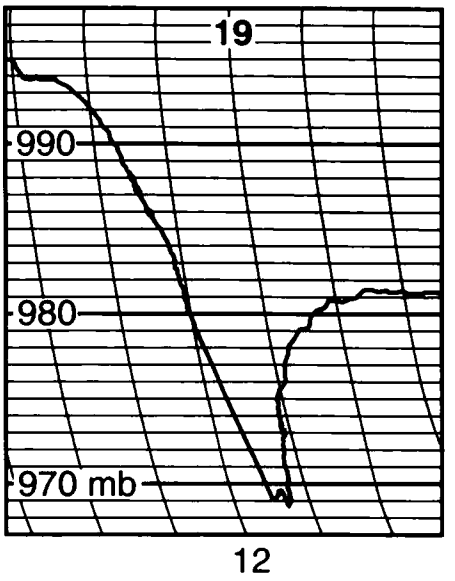
19 and 21 January 1995. The vessel departed Liverpool Bar Light Float at 1303 UTC on the 19th, the wind being E×S'ly, force 7 and the pressure 978 mb. The sea was moderate to rough and there was a low easterly swell.

By 1400 the wind had increased to force 10 with a very rough sea but shortly before 1500 the wind began to decrease and at 1500 had become variable, force 7. The pressure at this time had dropped to 967 mb.

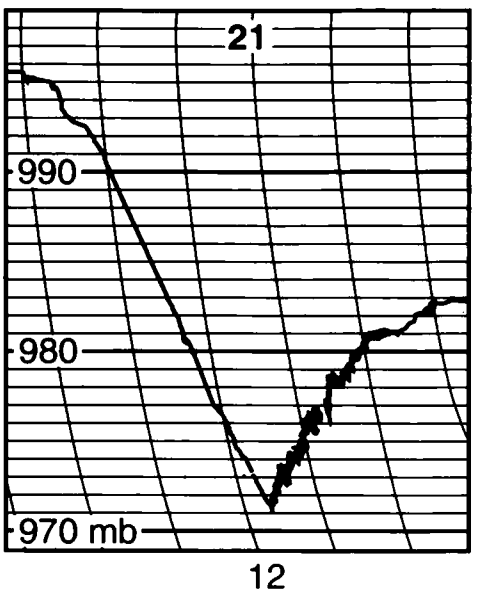
At 1510 the wind had steadied at NNE'ly, force 8–9 accompanied by heavy wintry showers while the pressure started to rise very rapidly, as indicated by the barograph trace. At 1600 the wind, force 7 by this time, began to back and had settled at W'ly, at force 7 by 1650 with scattered wintry showers.

The wind remained W'ly until the vessel's arrival in Dublin at 1830 but the outstanding feature of the weather encountered was the rapid fall in pressure of some 18 mb in three hours.

21 January 1995. At 1200 when the vessel departed Liverpool Bar Light Float the wind was SSE'ly, force 6, the pressure was 980.4 mb and there were heavy rain showers and a moderate sea. At 1315 the wind started to veer and the following observations were made in the heavy weather that developed while the barograph trace shows the pressure changes experienced.



Barograph traces for the 19th and 21st January



Date and time	Wind Dir'n	Force	Pressure	Sea	Weather	Remarks
21st 1340	SSW	9	974.3	Rough	Heavy rain showers.	
1345	SW×S	11	972.4	V. rough	Torrential rain.	
1355	SW	12	971.8	V. rough	Torrential rain.	Poor visibility in flying spray.
1415	SW×W	12	972.4	V. rough	Torrential rain.	Visibility poor.
1430	SW×W	12	973.5	V. rough	Torrential rain.	Anemometer off the scale at times.
1457	SW×W	11	973.8	V. rough	Heavy rain showers.	Moderate visibility. Engine power reduced to 80%.
1530	SW×W	9	974.6	V. rough	Heavy rain showers.	Cloud beginning to break.

At 1600 engine power was reduced to 65 per cent and pitch brought back to 6. From 1615 when Skerries bore 180° at 3.5 n.mile, the vessel's courses were various but generally south-westerly at 6–9 knots. By 1630 the wind had decreasd to W×S'ly, force 10 but with occasional gusts to force 12 and the weather was fine although the sea remained very, very rough as the vessel began to pitch heavily. An hour later the vessel was pitching very heavily to a short, very steep swell with very rough sea and was pounding occasionally. The pressure continued to rise while the wind decreased to SW×W'ly, force 9 by 1800. The sea remained very, very rough and there were occasional moderate rain showers. The wind steadied at SW'ly, force 9 until the vessel reached shelter off the Irish coast, eventually berthing at 2200.

Position of ship at 1500 UTC on the 19th: approximately 53° 28'N, 04° 12'W.

Position of ship at 1415 UTC on the 21st: 53° 27'N, 03° 52'W.

WATERSPOUTS

English Channel

m.v. *Pride of Le Havre*. Captain M. Edward. Portsmouth to Le Havre. Observers: the Master and members of ship's company.

13 February 1995. Whilst on a course of 328° at 18 knots, approximately 12 n.mile north-west of Le Havre, a large squall with lightning was observed to

the west. The wind was WSW'ly, force 6 and picked up very quickly (in a few seconds), becoming very noisy. Then, what appeared to be a whirlwind or waterspout moved across the vessel in an easterly direction, causing the vessel to list to starboard. The base of the phenomenon was approximately 100 m across and the sea was very turbulent.

At the time the dry-bulb temperature was 8.3° and the pressure was 998.2 mb.

Position of ship: 49° 40'N, 00° 09'W.

Note. Mr M. Rowe, of the Tornado and Storm Research Organisation, comments:

'This is a very interesting report. It is the only case we know of in recent years where a ship has actually been hit by a waterspout. It is also unusually early in the season for the English Channel, where the peak month is September and the least waterspout-prone month probably February. We know of only two waterspouts in the British Isles, the North Sea or the English Channel in the last 25 years.'

Mediterranean Sea

m.v. *Singapore Bay*. Captain P.A. Furneaux. Port Said to Southampton. Observers: the Master, Mr F.H. Alrai, 3rd Officer, Mr M. Ellis, SMS and members of ship's company.

13 January 1995. At 0725 UTC a waterspout was seen developing from the base of cumulonimbus cloud of strong vertical extent at a distance of about 6 n.mile on the port beam, and after six minutes it was fully formed and reached the sea surface.

Its height from the base of the cloud was about 850 m and its diameter was approximately 50 m while spray from the surface was lifted to about 60 m. At the time of observation there were moderate to heavy rain showers accompanied by thunder and lightning and also hail showers lasting about 2.5 minutes, the hailstones being measured at 10 mm in diameter. The waterspout lasted for 20 minutes but its direction of rotation could not be determined owing to its distance from the ship and also the showers which obscured it.

Weather conditions were: air temperature 12.4°, wet bulb 10.6°, sea 16.1°, pressure 1006.5 mb, wind NNE×N'ly, force 8.

Position of ship: 35° 53.13'N, 16° 29.89'E.

Note. Mr M. Rowe comments:

'This is a useful observation of a very typical waterspout and the detailed measurements of the spout, as well as the meteorological data, are just what such a report should include. The diameter of the spout, 50 m, is perhaps greater than usual. Not many waterspout reports mention the height to which spray is lifted, nor do many of the observations mention hail at the time of the spout.'

LIGHTNING STRIKE

Pacific Ocean

m.v. *Chiquita Brenda*. Captain W.A. MacRitchie. Auckland to Antwerp. Observer: Mr P.T. Clegg, Chief Officer.

24 January 1995. At 1145 UTC, as the weather obs was being made up, the sky became overcast and rain was visible on the radar (just activated from standby in anticipation, about 12 n.mile away). During the preceding several hours lightning had been visible but with no thunder or rain at the ship, and there had been patches of clear sky between the clouds.

At 1212 transmission of the obs had just been completed as the ship approached the rain, with lightning still visible ahead; entry into the rain was very abrupt with just a couple of minutes of very light rain before a torrential downpour started and obscured the focsle. There was one crash of thunder which followed a flash of lightning and a fractional easing of the rain so that the sea could be seen just ahead, and watching, I saw lightning strike the sea, fine on the starboard bow simultaneously, it seemed, with a deafening crash of thunder right overhead. I was not blinded but saw 'bits' before my eyes as the bridge came alive with virtually every alarm sounding.

It had not been a crash of thunder overhead but a lightning strike on the duplex aerial at the front of the monkey island. Somehow the strike had tripped out the shaft generator causing a short blackout while the diesel generators came on line, hence the plethora of alarms on the bridge. The 'bits' were fragments of the struck antenna, previously a 7.3-m whip aerial, which had been totally disintegrated into shreds of fibreglass, and its base. The weather fax aerial was also found broken off, most likely by the base of the other one.

Resetting the bridge equipment revealed that various pieces had been affected in different ways, some of which were not known until after a shore technician had been called in at Balboa. On restarting the steering gear and resetting the autopilot, a separate digital repeater had been 'frozen' and needed switching on and off again to be functional. This was more likely due to the blackout rather than the strike itself. The Saturn-C had no power but after pulling out each plug and fuse, without renewing anything, it was restored and became functional again. The starboard radar No. 1 'S' band (port scanner) had been on at the time, and when switched on again seemed fine except the GPS positions were 'out'. Doing a 'master reset' had the same results but then it was noticed that the LCD GPS display was frozen although still apparently working correctly! This required switching off and on again to restore the display. The VHFs, an RT2048 and DSC RM2042 are housed together, one pair on each side of the bridge; the port pair (off at strike) was removed ashore for investigation in Panama, and found to be uneconomical to repair but the starboard pair (on at strike) were damaged although still to be assessed how badly.

On return to Balboa, the duplex antenna was replaced and the receiver input transformer was found damaged and also replaced. The weather fax is still to be checked when a new antenna is fitted but seems to be working.

Position of ship at 1212 UTC: 03° 18′N, 83° 58′W.

Korea Strait

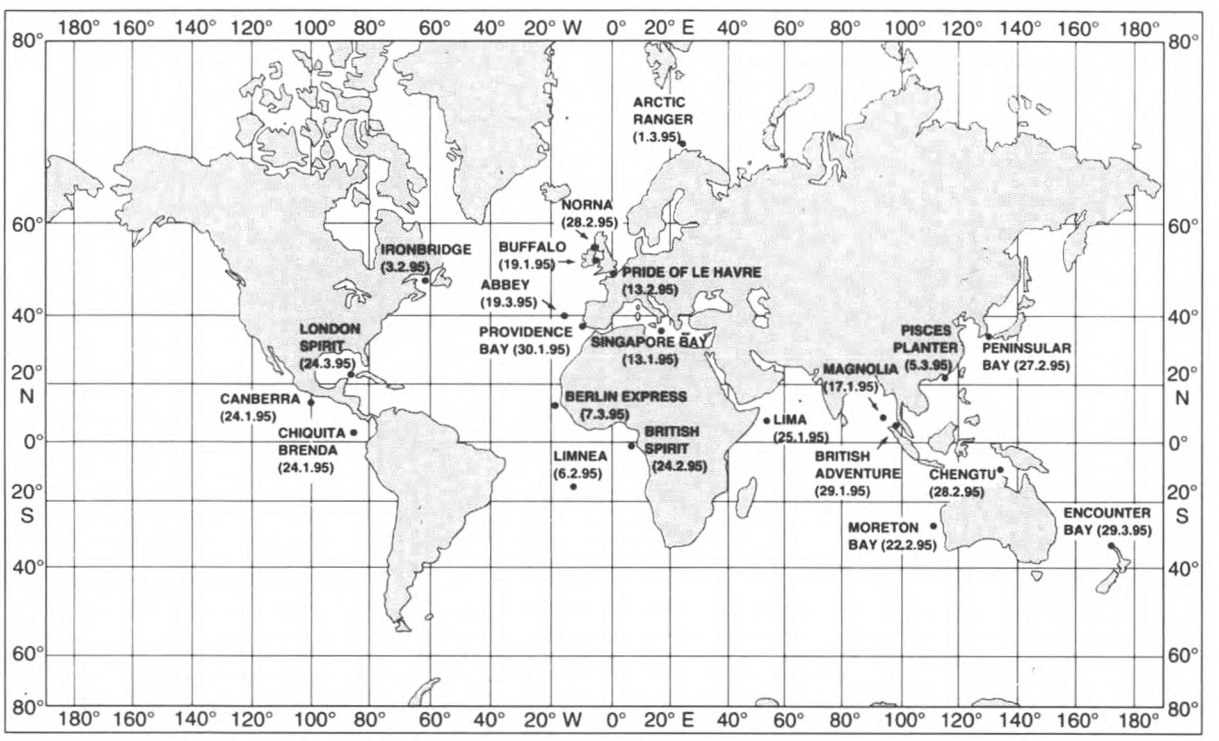
m.v. *Peninsular Bay*. Captain P.J.R. Manson. Hong Kong to Busan. Observers: the Master, Mr J.E. Parnaby, 3rd Officer and Mr M.S. Waite, SMS.

27 February 1995. At 2332 UTC whilst manoeuvring off Busan a heavy snow squall passed over the ship and the foremast was struck by forked lightning, producing a bright flash, a loud report and a large puff of smoke. A 6-m long aerial on the mast was stripped of its fibreglass cover and the aerial wire was left hanging. The cover was later found on deck. A second strike then damaged the aerial on the mainmast.

Position of ship: approximately 35° 00′N, 129° 06′E.

Note. Mr M. Rowe comments:

'This is an interesting report for two reasons. Lightning seems to be reported relatively rarely with snow; and the ship was struck twice, disproving, if that were necessary, the old saying that "Lightning does not strike in the same place twice!" There are a number of very tall structures that have been struck many times.'



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

FOG

South Pacific Ocean

m.v. *Encounter Bay*. Captain R. Moxon. Sydney to Auckland. Observers: the Master, Mr C.D. Howarth, 3rd Officer and members of ship's company.

29 March 1995. Whilst the vessel was on a course of 091° at 19.5 knots, she entered a thick, low fog-bank at 2140 UTC. At the time of entering the fog the air temperature was 19.3°, the wet bulb read 18.6° and the sea-water temperature was 18° which was a drop of 2° in a period of only 5 minutes.

The fog, thought to be advection fog, reduced visibility to about 2 cables and seemed to extend to an approximate height of 200 feet. Above the layer of fog was a relatively clear sky with some semi-transparent altocumulus. At 2214 the vessel cleared the fog-bank to find the visibility increasing to only 1 n.mile; all around beyond this distance was more fog. The vessel continued to enter and leave line after line of fog-banks, even after altering course to 125° to proceed down the eastern coast of New Zealand. Whilst proceeding through the fog, the wind varied from 3–6 knots and often changed direction while the swell changed direction from south-west to north-east.

Also observed during this period was Ulloa's ring or fog-bow which seemed to move along with the ship, projecting out from the starboard beam to about 70 m at a sextant arc of 60°. Lasting for about 20 minutes, it was at a height less than that of the bridge wing and covered an arc of 75° between 175° and 250°. Its colour was a strong white on the inward side, and just over half of its width toward the outer edge turned a whitish-yellow/orange colour, the colour change being very sharp. A second ring was seen about 10 minutes after the first but although being smaller and lasting for only 5 minutes, it had exactly the same characteristics as the earlier one. The last of the fog was finally cleared at 2350.

Position of ship at 2140 UTC: 34° 18'S, 172° 31'E.

Editor's note. A photograph showing part of a fog-bow observed from the *Selectivity* whilst in U.K. waters appears on page 21.

TIDE RIP

Indian Ocean

s.s. *Magnolia*. Captain J.J. Birchenough. Fujairah to Singapore. Observers: the Master and Mr C.W. Blacker, 2nd Officer.

17 January 1995. Whilst approaching the Strait of Malacca on a course of 079° at 12.2 knots (Doppler log, on water track) an extensive tide rip, running approximately 160°–340° was observed ahead at about 5 n.mile, becoming visible on both the 3-cm and 10-cm radars shortly afterwards. The tide rip was marked by a particularly short sea.

On crossing the rip the vessel took a shear to port, followed quickly by a shear to starboard before returning to her original course. At this time the log speed increased to 16 knots in the space of a couple of minutes, the speed being maintained on clearing the rip, slowly reducing back to 12.2 knots over the following 20 minutes. At the time of observation the wind was ENE'ly, force 6–7.

The *Magnolia* is a VLCC of 139,092 grt, laden at this time, 275,000 dwt with a draught of 21.6 m.

Position of ship: 06° 09'N, 94° 33'E.

CETACEA

Eastern North Atlantic

m.v. *Providence Bay*. Captain R.A. Kenchington. Suez to Southampton. Observer: the Master and Mr E. Esinduy, 3rd Officer.

30 January 1995. At 1400 UTC while about 8 n.mile west of Cabo de Sao Vicente the observers were on the focsle monitoring the behaviour of the vessel which was pitching moderatly in the long and moderate west-north-westerly swell when three dolphins were sighted. They came along ahead of the bulbous bow for about five minutes during which time they were jumping and swimming over each other and just playing as they raced with the vessel. After this time they suddenly dived to the side and gave up the race.

On consulting *The Seafarer's Guide to Marine Life* it was thought that they were Atlantic White-sided Dolphins (*Lagenorhynchus acutus*) as their snouts were short while the upper and lower jaws were of different shades which became

apparent as the dolphins rolled in the water. Another point which fitted the description of these dolphins was the distinct khaki-coloured patch which ran along their sides, slightly contrasting the white belly. Their backs were a rather dark shade of grey.

Weather conditions were: air temperature 16.4°, wet bulb 15°, sea 16.2°, wind NW'ly, force 3–4. Course of ship 344° at 22 knots

Position of ship: 37° 03'N, 09° 11'W.

South China Sea

m.v. *Pisces Planter*. Captain A. Dhurandhar. At anchor off Shekou, China. Observers: the Master, Mr R.D. Kapadia, Chief Officer and Mr A.A. Avate, 3rd Officer.

5 March 1995. On this and the following day a school of white dolphins was observed around the vessel. There were about 8–10 individuals, some having greyish patches on their bodies whereas others were pinkish-white. The observers were left wondering if there is a breed of white dolphins or whether these were albinos.

The weather on both days was overcast with air temperatures of around 15°.

Position of ship: approximately 22° 24'N, 113° 53'E.

Editor's note. The *Pisces Planter* is a member of the Canadian Voluntary Observing Fleet.

Unfortunately, we do not have contact with a cetacean expert at this time but having referred to identification sources in our offices, we think that rather than albinos the dolphins may have been Indopacific Humpback Dolphins which have variable colouring including grey, cream and white and can also have patterns of pink, yellow, grey and ruddy spots or freckles.

On the matter of albinism among cetaceans, readers may be interested to hear of a small item which appeared in the *Independent* newspaper which described the sighting in July 1995 of an albino Humpback Whale mid-way along the east coast of Australia. According to a state wildlife officer, this was the fourth sighting since 1991 of what is thought to be the same whale.

River Clyde

f.p.v. *Norna*. Captain D.L. Rattray. At Greenock. Observers: the Master and members of ship's company.

28 February to 2 March 1995. On three consecutive evenings at 1630 UTC, 1700 and 1730 a young Humpback Whale approximately 12 m long was observed feeding in the buoyed channel off the James Watt Dock.

It surfaced with its mouth open and blew every 30 seconds, its point of surfacing being high-lighted in advance by a flock of assorted seabirds which were obviously feeding on small fish. When the whale surfaced, its mouth came some 3 m out of the water causing the birds to scatter. The channel at this point was only about 150 m wide witn rocks and the entrances to James Watt Dock on one side and a sand bank on the other but the whale fed for about 40 minutes each evening while the tide was in the last hour of the ebb with 8–9 m of water in the channel.

The whale was believed to have been in the Clyde estuary since early January, mainly being sighted around Gourock but these sightings would appear to be the furthest up river.

Position of ship: 55° 57'N, 04° 44'W.

TURTLE

Eastern North Atlantic

m.v. *Abbey*. Captain P.J. Creber. Ponta da Madeira, Brazil to Port Talbot. Observer: Mr D. Grennan, 3rd Officer.

19 March 1995. At 0830 UTC whilst the vessel was on a course of 031° at 2.5 knots, an unusual ripple or disturbance was observed on the port side; on closer inspection with binoculars, the disturbance was found to be a brownish-green turtle of about 15 cm in length. Its movement consisted of 'scuttling' away from the ship and then disappearing below the surface for about 10 seconds before surfacing again, and seemed to be heading in a south-westerly direction.

About 20 minutes later a second similar ripple was seen which, on inspection, was another turtle similar to the first; it too seemed to be heading south-west. The sea was calm with a moderate bow swell while the sea temperature was 14.1°. It was thought to be a little strange to observe turtles in these waters.

Position of ship at 0600 UTC: 40° 00′N, 16° 12′W.

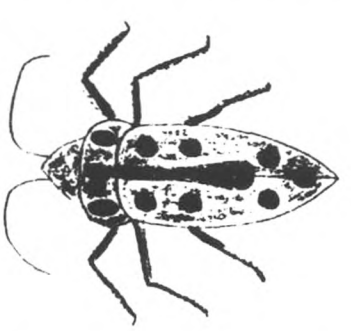
Editor's note. Our identification sources indicate that this might have been a young Green Turtle but the Hawksbill, Loggerhead and Leatherback Turtles could be possibilities too. Little is known about the sea-going activities of marine turtles but they are all under threat from hunting and the effects of pollution.

INSECTS

Equatorial Atlantic

m.v. *British Spirit*. Captain M. Etherington. At Oguendjo Oil Terminal, Gabon. Observers: the Master and Mr C. Henrickson, 2nd Officer.

24 February 1995. Shortly after sunrise the beetle shown in the sketch landed on the hand rail outside the bridge-wing door. The insect was about 3.5 cm long and was a metallic lime-green colour with distinctive symetrical black markings over its length.



It had six legs the upper sections of which were red and the lower ones green. Another distinctive feature was the pair of long and alert antennae. The insect did not take kindly to close scrutiny and after a few minutes beat a hasty retreat on foot before taking to the air with a loud droning noise.

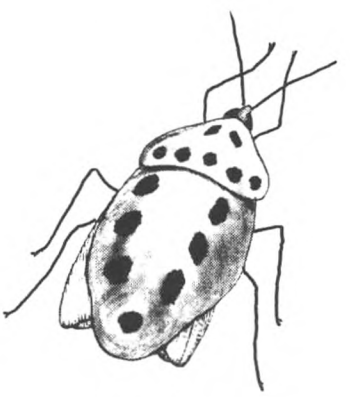
Position of ship: 01° 39′S, 08° 59′E.

Arafura Sea

m.v. *Chengtu*. Captain C. MacDonald. Jakarta to Port Moresby. Observers: Mr S. Che Mat, 2nd Officer and Mr G. Hamilton, 3rd Officer.

28 February 1995. At 0200 UTC an insect was found on the wheelhouse window. It was about 20 mm long, 12 mm across and its colouring was a glossy

orange/green/pale-blue metallic tint on its upper body with a distinguishable series of black spots, as shown in the sketch by Mr Hamilton, while the underside had a series of 'armadillo-like' bands running horizontally in the same metallic gloss but without the spots. The head was small and of a brilliant pale-blue colour.



It had two sets of wings enclosed under its upper body shield which it constantly ruffled. Both wings were dark and semi-transparent and it was constantly cleaning its antennae with its front feelers. At the time of observation the wind was WNW'ly, force 5.

Position of ship: 09° 15.12′S, 135° 28.2′E.

Editor's note. The *Chengtu* is a Selected Ship observing for the Hong Kong VOF.

BIOLUMINESCENCE

Indian Ocean

s.s. *Lima*. Captain J.P. Briand. Juaymah to Rotterdam. Observers: Mr S.P. Thompson, 2nd Officer, Mr S.M.F. Masud, 3rd Officer and members of ship's company.

25 January 1995. At 1800 UTC on a clear moonless night while 150 n.mile east of the Somalian coast a whitish glow was observed on the horizon and, after 15 minutes of steaming, the ship was completely surrounded by a sea of milky-white colour with a fairly uniform luminescence. The bioluminescence appeared to cover the entire sea area, from horizon to horizon but above the surface and it appeared as though the ship was sailing over a field of snow or gliding over the clouds.

There was no damping effect on capillary waves or reduction of visibility at all and there was no mist at deck level although at a distance it seemed as if there was either low-lying mist or the upwelling of the luminescence itself. The bow waves and the wake appeared blackish in colour and thick black patches of oil were passing by. Later, the Aldis lamp revealed that the 'oil patches' were actually light-green kelp, amazingly black against the white water.

On close examination of a water sample with a magnifying glass, many single-celled, milky, jelly-fish-like micro-organisms were observed, some of them being large enough to be detected by the naked eye while one very tiny shrimp-like crustacean was found which measured about 3 mm long; however, there was no luminescence as such.

There was no significant change in temperature or the weather during the following six hours after which the luminescence gradually disappeared as the moon rose. Conditions at the time of observation were: air temperature 25.5° wet bulb 22.5°, sea 26.5°, pressure 1014 mb, wind NE'ly, force 4. Course of ship 207° at 13.2 knots.

Position of ship: 08° 01.3'N, 52° 45.4'E.

Note. Dr P.J. Herring, of the Southampton Oceanography Centre (formerly the Institute of Oceanographic Sciences, Deacon Laboratory), comments:

'This is a very interesting and informative account of a Milky Sea. In this area this phenomenon is most often associated with the South-west Monsoon but a few also appear in the North-east Monsoon, as did this one. The black bow wave and wake are a dramatic sight and it is useful to read that no obvious mist was present because there is often some doubt about this. I do not know what the small organisms were, possibly fish-egg-like dinoflagellates but they do not appear to have been contributing to the luminescence. An oily scum with luminous bacteria on it is unlikely because of the absence of any effect on the capillary waves. The slicks might have been slicks of microscopic algae, though the observers clearly thought they were kelp masses. In either case they were clearly not as luminous as the rest of the sea.

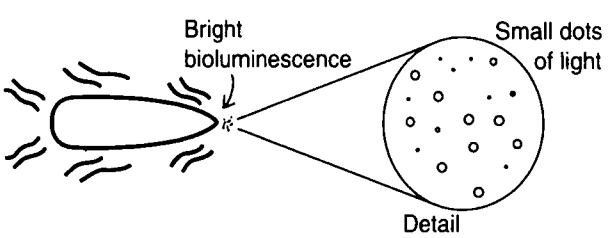
'A large number of research vessels have been working on the north-western Indian Ocean in 1994 and 1995 but none of them have been fortunate enough to encounter a Milky Sea. The mystery of its cause remains unsolved.'

Editor's note. Further reading on the subject of Milky Seas can be found in the article *Milky Seas: a Bioluminescent Puzzle* published in *The Marine Observer*, 1993, pp. 22–30.

Eastern North Pacific

s.s. *Canberra*. Captain D. Lumb. Acapulco to Los Angeles. Observers: Mr A. Clark, Chief Officer, Mr R. Kevan, 2nd Officer, Mr C. Bourne, 3rd Officer, Miss C. Middleton, Cadet and members of ship's company.

25 January 1995. At 1030 UTC, approximately an hour after sunset on a clear night when the ship was heading out of Acapulco Bay, marine bioluminescence was observed around the vicinity of the ship's hull and was especially noticeable around the bow wave, see sketch.



Bright blue-green lights each lasting 2–3 seconds were seen around the bow area, some growing from a pinprick in size into a light approximately 30 cm in diameter. When light from a torch was shone upon the bioluminescence, it seemed to fade slightly in the beam. The display continued for two hours.

Conditions at the time were: air temperature 27.5°, wet bulb 25.0°, sea 27.2°, pressure 1012.7 mb, wind W'ly, force 4.

Position of ship: 16° 48'N, 99° 54'W.

Note. Dr P.J. Herring comments:

'I cannot easily identify the organisms responsible. The small dots would probably have been luminous jellyfish but the enlarging spots might have been small shrimp squirting clouds of luminescence into the water, or a bright jellyfish sinking deeper to give a "larger", more diffuse glow.'

North Atlantic Ocean

m.v. *Berlin Express*. Captain J. Hutson. Rotterdam to Fremantle. Observers: Mr D. Stevens, 3rd Officer and Mr J. Wesley, SM1.

7 March 1995. At 2200 UTC an interesting example of bioluminescence was observed while passing Dakar. It could only be described as an upwelling of the subsurface water which, upon reaching the surface broke and then bubbled into vivid circles of luminosity at the surface. Each took a second or two to reach full size and maximum intensity before the centre cleared to leave a luminous ring for another few seconds, only then to disappear completely. The circles or rings ranged in size from about 5 m up to a huge 30 m in diameter but not all were of the same intensity; the larger the circle the greater the intensity, and the largest lit up the whole ship's side like floodlighting.

The phenomenon lasted for about 20 minutes during which time about 40 upwellings were counted. Although fairly common, this phenomenon was interesting to watch.

Conditions at the time were: air temperature 18.9°, wet bulb 18.5°, sea 19.5°, wind N'ly, force 3. Course of ship 180° at 20 knots.

Position of ship: 14° 42.3'N, 17° 50.4'W.

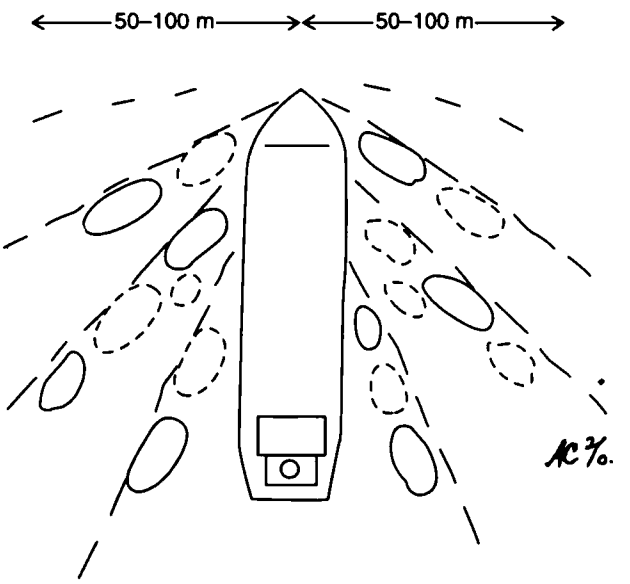
Note. Dr P.J. Herring comments:

'This is a remarkable report for which there is no certain explanation. Upwelling luminescence has been reported from many parts of the world and attributed to seismic activity by some authors. This report may alternatively have been caused by schools of fish coming to the surface and then spreading out, their movement causing the local tiny plankton to luminesce. This area is indeed one of intense local fisheries.'

Strait of Malacca

m.v. *British Adventure*. Captain D.R. Lewis. Singapore to the Persian Gulf. Observers: Mr A. Chylak, 2nd Officer and Mr A. Guste, OS.

29 January 1995. At about 1930 UTC as the ship was proceeding north-west out of the Strait of Malacca, oval milky-white patches of light approximately 5 m by 2.5 m formed astern of the bow wave, flashing alternately in random positions as if someone was quickly operating a spot-light on a theatre stage, see sketch.



The effect was visible up to 100 m away from the ship and along its whole length of 150 m, and the phenomenon lasted for roughly 30 minutes. There were a few small cumulus clouds in the sky at the time, there was no moon but the ship was carrying extra lighting on the poop deck to deter pirates. The wind was NE'ly, force 3 and there was a slight sea, the ship's speed was 15.5 knots.

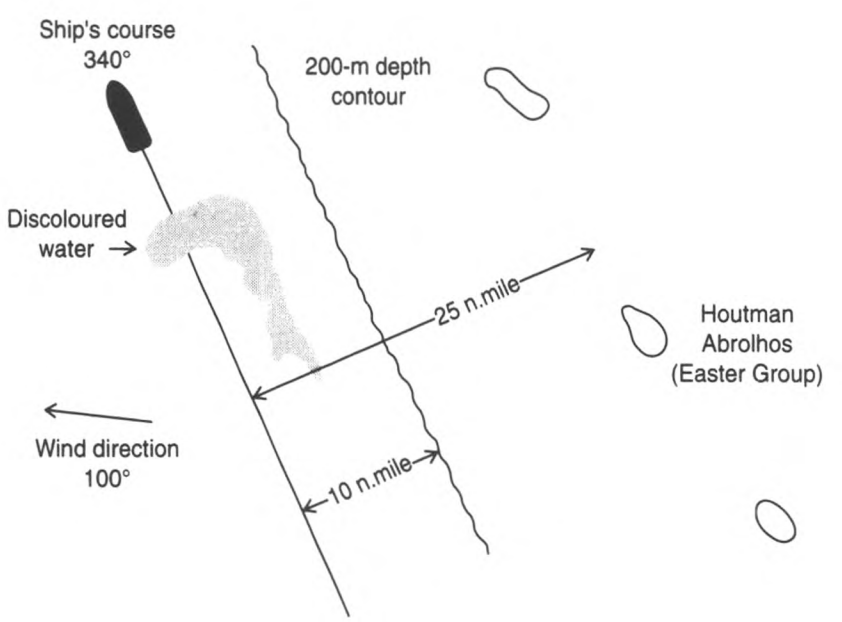
Position of ship: 05° 45′N, 97° 40 ′E.

DISCOLOURED WATER

Indian Ocean

m.v. *Moreton Bay*. Captain C.C. Woodward. Fremantle to Singapore. Observer: Mr M. Samwell, 3rd Officer.

22 February 1995. At 0210 UTC a line of discoloured water was observed on the starboard bow and it was obvious that the vessel would pass through it. The echo sounder was switched on to check for any tendency to shoaling but a steady depth of over 740 m was recorded (the ship was 10 n.mile west of the 200-m depth contour). The area of discolouration extended some 10 n.mile in the path of the vessel whilst being estimated to stretch about 5 n.mile to starboard and 2 n.mile to port. The main body of colour terminated in a large curved arc with the 'leading edge' to leeward, see sketch.



A sample of sea water was taken prior to entering the area of discolouration and a temperature of 24.9° was obtained. As the ship entered the area, the discolouration appeared to be a milky brownish-orange colour blown in streaks along the wind. At first, it was suspected to be some form of tank washings and a sample was obtained whilst passing through a particularly dense patch but it was surprising to see that the water was not oily at all. There were numerous tiny objects similar to minute grass seeds, floating in it along with a couple of pinkish-red swimming 'dots'. Another sample was taken in the sample jar to which four or five drops of formalin were added; the floating objects appeared to settle at the surface where they formed the milky-orange film. The remainder of the sample was filtered through two muslins (from the wet-bulb supply!), dried and placed in a screw-topped container.

It was noted eight hours later that the tiny floating objects were no longer on the top of the sample but were suspended at random although the container had not been disturbed. One day afterwards, they appeared to be 'swollen' and 'furry' but what effect the formalin might have had on them was unknown.

Position of ship: 28° 35.6′S, 113° 16.8′E.

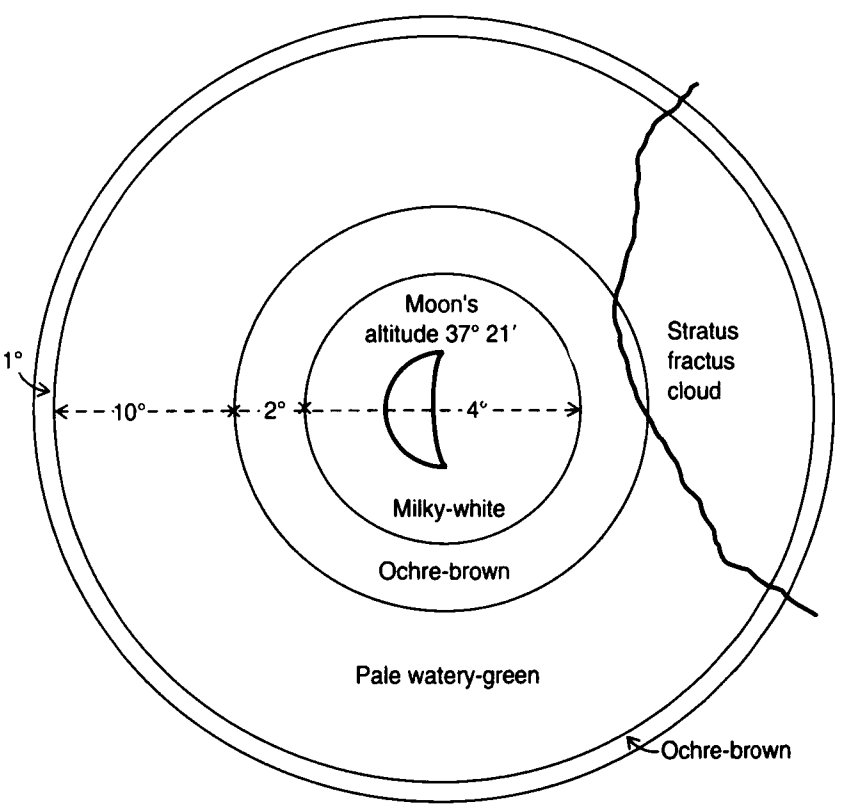
Note. Dr P.J. Herring comments:

'The discolouration sounds very much like a series of windrows of the alga *Trichodesmium*. This needle-shaped organism looks like sawdust or grass-seed and is often present in large numbers at the surface of tropical waters. It is capable of using atmospheric nitrogen rather than the more usual dissolved nitrate in the water; it can therefore flourish in impoverished water too low in nitrate for other plants to succeed. One species is reputedly responsible for giving the Red Sea its name.'

CORONAE
South Atlantic Ocean

m.v. *Limnea*. Captain D. Freeman. Mina Al Ahmadi to Galveston. Observers: Mr J.D. Moore, 3rd Officer and Mr S. O'Neil and members of ship's company.

6 February 1995. At 2030 UTC coronae consisting of three concentric rings were observed around the half-moon, see sketch. The moon's altitude was 37° 21′and the azimuth was 308°.



The inner ring was 4° in diameter and of milky appearance while the second ring was 2° wide although its outer circumference was not as clearly defined as its inner border; it was an ochre-brown colour. The third ring was a pale watery-green colour and was not circular in its outer circumference because of stratus fractus cloud impinging on its easterly edge, as indicated in the sketch (which is not to scale).

A final very thin outer ring of 1° width then formed briefly and was the same colour as the second ring. The duration of the coronae was about 7 minutes by which time the cloud had obscured much of the moon.

Position of ship: 15° 56′S, 11° 07′W.

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

'The first two (milky-white, then ochre-brown) rings represent an ordinary diffraction corona produced by particles, probably water droplets, some 10 microns (one-hundredth of a millimetre) in diameter. The greatest interest here, however, attaches to the outermost ring of 14° radius which seems to correspond to very small particles of one micron (one-thousandth of a millimetre) radius and is quite unusual. Very large coronae or Bishop's Rings, have been seen occasionally owing to very small particles in the atmosphere after volcanic eruptions but this one is twice the size usually quoted for these and does not seem to have persisted for anything like as long (remember the size of the corona is approximately inversely proportional to those of the particles producing it) '

AURORA BOREALIS

Gulf of St Lawrence

m.v. *Ironbridge*. Captain D.G. Olley. Port Talbot to Port Cartier. Observers: the Master, Mr D.J. Nelson, Chief Officer, Mr R. Moore, 2nd Officer and Mr P.H. Woodcock, 3rd Officer.

2/3 February 1995. An auroral display was seen between 2330 UTC and 0430. The forms seen were a large homogeneous arc stretching from west to north and very intense in nature, lighting most of the sky, and this changed periodically into a rayed or partially rayed arc where only a certain portion would change.

The maximum altitude attained was 45° and the colour varied from a bright yellow-green to dull green. The ship course was 310° at 10 knots.

Position of ship: 48° 10′N, 63° 30′W.

Arctic Ocean

m.v. *Arctic Ranger*. Captain A.W. Walker. Fishing operations, North Cape (Norway). Observers: the Master and Mr M. Allison, Radio Officer.

1/2 March 1995. At 1940 UTC the first sighting of an auroral display was made when homogeneous bands appeared stretching across the horizon and to an elevation covering half the sky. It was weak at first but then parts changed to rayed arcs with a light green-blue colouration, pulsating continually before taking on a pinkish-red lower edge, the colour change occurring within two minutes. The display then became pulsating rays before slowly fading and had progressed from weak to moderate to bright, lasting 17 minutes.

At 2010 a homogeneous arc became visible for 12 minutes between the elevations of 10° and 30°; it was quiet and weak. At 2030 the main display commenced, to last 20 minutes, with patches changing rapidly to rayed bands with rays penetrating the bands. The colours were predominantly light green-blue with pinkish-red tinges on the lower edges of the rayed bands. This display was very brilliant and pulsating and covered about one-third of the sky.

Afterwards, Mr Allison said, 'Never having to describe this type of phenomenon before, and going by the descriptions in the *Marine Observer's Handbook*, I can only say that the spectacular display observed covered all the activity and brightness descriptions laid down in the manual.'

Position of ship: 71° 10′N, 22° 38′E.

4/5 March 1995. The following observations are a summary of auroral activity seen between 1915 and 2023.

Time	Form	Condition	Brightness	Elevation
1915	Rays, patches.	Quiet	Weak	10°–30°.
1917–18	Rayed bands.		Quiet	05°-40°.
1931	Homogeneous arcs with patches.	Quiet	Weak	
1934	Homogeneous arcs.	Active	Moderate	
1943	Homogeneous arcs.	V. weak		
1948	Display ending.			
2016	Homogeneous band.	Active	Moderate to bright.	20°–90°°.
2023	Homogeneous band	Weak		

Between 2026 and 2032 homogeneous bands slowly appeared, progressing from quiet to active conditions and passing from weak to moderate then bright. The form changed quickly to rayed bands, pulsating and bright, the colour being light-green to turquoise before the brightness faded to moderate with rays penetrating the bands and patches appearing above the bands. The display faded to weak at 2034 and ended at 2038. A short display commenced at 2117 consisting of weak patches which changed to weak but active rayed bands. This lasted until 2128 when the display faded to leave a weak to moderate horizonal glow. Further displays were seen between 2154 and 2203, and 2325 and 2332 both mainly comprising rayed bands and arcs, the earlier display showing light blue-green colours.

Position of ship: 71° 16′N, 22° 15′E.

10/11 March 1995. The following observations are a summary of auroral activity seen between 1940 and 2212.

Time	Form	Condition	Brightness	Elevation
1940–44	Homogeneous arc.	Quiet	Weak	
2038	Homogeneous arc.	Quiet	Weak	10°–70°
2049–51	Homogeneous arcs.	Quiet	V. weak	
2159	Rayed bands becoming homogeneous arc with rayed arc.	Quiet then active.	Weak then bright.	20°–90°+
2201	Homogeneous band.	Active. Pulsating	V. bright	
2203	Rayed band (light-blue).	Active. Pulsating	V. bright	Half sky
2209	Patches	Quiet	Weak	
2212	Glow on horizon to north-east.	Quiet	Bright	

At 2220 the display restarted with a homogeneous band quickly becoming pulsating and flaming. It was very bright and was light-green to light-blue or turquoise in colour with pinkish-red lower edges at its northern end. This form then turned into a bright and pulsating rayed arc before becoming an active but weak rayed band at 2222. One minute later, the band had become very bright and pulsating, with bundles of rays penetrating it; by 2228 it was still very bright and then started to flame, the colour was light-green to light-blue with red and distinctly purple lower edges. At 2230 the rayed band turned into a homogeneous band with single rays and large patches, the display still being active and of moderate brightness. By 2234 the band was going to quiet and weak as the rays and patches faded and the display continued to weaken and fade, finally disappearing at 2241.

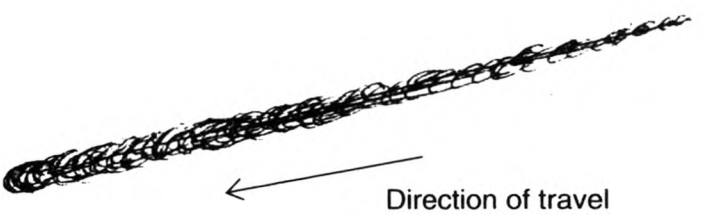
Position of ship: 68° 49′N, 13° 12′E.

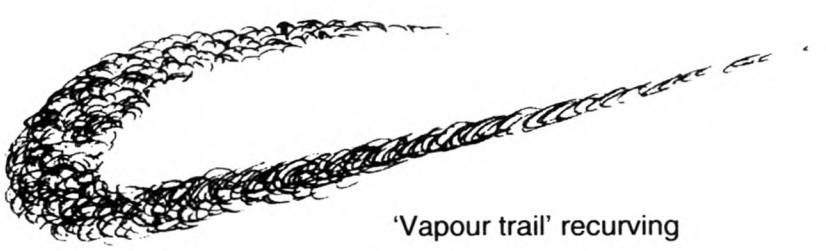
SPACE DEBRIS

Yucatan Channel

m.v. *London Spirit*. Captain C.A. Cornish. Corpus Christi to Puerto Cardon. Observer: Mr T.C. Swatton, 2nd Officer.

24 March 1995. At 0615 UTC a brilliant 'object' that lit up the whole sky was observed to the north of the vessel. It lasted for about 1.5 seconds and then faded to leave a 'vapour trail' which persisted for about 12 minutes in total during which time the leading edge of the trail started to recurve back on itself to form a hook shape, being affected by the upper winds, see sketches.





The bearing of the object was 010°, elevation 45°. It was thought that the event was the re-entry of a satellite or space debris of some sort. There was no moon, no cloud and the visibility was excellent; five other ships, including passenger ships were also nearby.

Position of ship: 22° 18′N, 85° 40′W.

MISCELLANY ...

An additional mélange of maritime sightings

Appleby. 28/29 March 1995. A pronounced 'curtain' display of aurora borealis covering an arc of 60° (bearing 325° to 025°) at altitude 15°, was seen by Captain K. Milburn and 3rd Officer Mr. Westcott in position 48° 42.6′N, 62° 14.7′W.

Berlin Express. 13 February 1995. A lunar rainbow with full spectrum of colours and possible secondary bow observed by 2nd Officer P. Trickey, Mrs Trickey and E. Pike, SMS in position 21° 49′S, 34° 15′W.

Bransfield. 19 January 1995. A very bright red light descending from about 25° altitude, becoming green in colour at 10° altitude and burning out at 5° altitude, lasting for 2–3 seconds in all, was seen by 3rd Officer K. Penny in position 48° 14.5′S, 57° 20.8′W. The light 'was about the size and brightness of a "Jumbo" aircraft with its landing lights on'.

Cavendish. 1 February 1995. In position 36° 06'N, 16° 31'E two waterspouts were watched by 3rd Officer D.F. Black and Chief Engineer P.F. Scovell. The first spout created large amounts of spray at the surface and lasted for 20 minutes before being replaced by a smaller one which was accompanied by lightning and which increased its diameter from about 70 m to 200 m before disappearing after 10–15 minutes.

Chiquita Frances. 28 March 1995. A Red-tailed Tropicbird was sighted by Chief Officer W. Tebbutt, 2nd Officer R. Canete and 3rd Officer A.L. Derla whilst *en route* from Ecuador to Auckland, in position 25° 09'S, 152° 42'W.

Ironbridge. 27 March 1995. In position 09° 37'N, 17° 00'W a distinctly 'fishy' smell in the air was noted, accompanied by blue-white luminescence in the bow wave and along the ship's side and large yellow-green spots in the calm water between the hull and the bow wave.

Lima. 4 February 1995. Conspicuous 'green flash' phenomenon, lasting for 4 seconds, was observed at sunset by the Principal Observing Officer, in position 35° 09'S, 21° 16'E.

Pacific Princess. 17 March 1995. Grey Whale observed heading north, in position 29° 34'N, 116° 06.5'W.

Peninsular Bay. 22 January 1995. A pair of medium to large-sized Sei Whales were spotted in the Strait of Gibraltar, then watched for three minutes by 3rd Officer C. Henderson and the Watchkeeper, P. Neale.

Queen Elizabeth 2. 14 February 1995. In position 13° 29'S, 152° 06'E, a single whale, possibly a Dense Beaked Whale was spotted heading west, about 40 m from the ship, by 3rd Officer S. Smith.

Shetland Service. 27 January 1995. While in the North Sea, near the Kittiwake oil platform, several Little Auks were seen near the ship by Chief Officer D.E. Grief.

Singapore Bay. 5 January 1995. In position 09° 28.12'N, 65° 11.18'E, a bright light having the colour and magnitude of Mars, and bearing 320° was seen by 3rd Officer F. Alrai while taking a star bearing of Kochab. The light split into two, the first part becoming as bright as Sirius, falling towards the sea and disappearing on bearing 290°; the other part maintained its original brightness and continued its downward path to disappear on bearing 250° and apparently 500 m above the sea surface.

Superiority. 1 January 1995. While the ship was hove-to in position 55° 20'N, 00°18.1'E, in NNW'ly winds of force 9–10, it was struck by seas of 7–8 m from about north-by-east and lost a quantity of packaged timber over the side. Maximum wave heights were 11–12 m and there were also violent snow and hail squalls.

Toisa Cougar. 11/12 March 1995. Aurora borealis in the form of a spectacular rayed band was watched from position 61° 36'N, 01° 18'E.

SCENE AT SEA

Photographer unknown

Part of a fog-bow photographed from the *Selectivity* on 26 November 1994 whilst on passage in U.K. waters. (A report of a fog-bow from the *Encounter Bay* appears on page 8.)

Photo. by Captain A. Walsh

26 March 1995. 'Spiral' formation in cirrus cloud noted looking south-west from Tobago Cays toward Union Island, Windward Islands. At an altitude of about 15° it was the only example seen by the Master of the *Wind Star*, Captain A. Walsh and his Chief Officer M. Boylin. The wind was E'ly, force 4, pressure 1014 mb.

Editor's note. This type of formation might have indicated the presence of superimposed layers of air moving at different speeds or in different directions.

SCENE AT SEA (contd)

Photo. by Captain P.J. Pratley

Lenticular altocumulus cloud about 15 minutes after sunset on 4 January 1995, photographed from the *Raven Arrow* (observing for the Canadian VOF) while passing through the Strait of Gibraltar at 1700 UTC, looking towards the north African coast, over Cape Ciris.

Towards the lower right-hand corner of the photograph can be seen lenticular clouds of orographic origin. They are typically associated with standing waves set up over and to the lee of high ground when the wind blows across it. If, initially, a moist layer is present in the airstream, then after lifting it may give a cloud over but well above the high ground. The wind blows through the cloud which is continuously forming upwind and dispersing downwind so the cloud appears to be stationary. Several clouds may be superimposed over each other in a 'pile of plates' formation.

Progress in forecasting Tropical Cyclones

By Alan Radford
(Operational Systems, Meteorological Office)

1. Introduction

Tropical cyclones are among the most powerful and destructive meteorological systems on earth. Their breeding grounds are the warm tropical oceans, and they often track for days without affecting any populated land area. The terminology used when referring to a tropical cyclone varies depending on the ocean basin in which it occurs. For instance when the maximum sustained wind speed reaches 64 knots a system will be called a *hurricane* if it is in the eastern North Pacific, a *typhoon* if it is in the western North Pacific, or a *severe cyclonic storm with a core of hurricane winds* if it is in the North Indian Ocean. In this paper the term tropical cyclone (TC) will be used generically to refer to any warm-core system, with a maximum sustained wind-speed of at least 34 knots - the usual lower limit for naming purposes.

The violent winds and extreme waves[1] within the circulation of an intense TC can cause severe problems to ships at sea. It is therefore vitally important that timely and accurate forecasts of these weather systems are available.

The function of providing detailed regional forecasts for each of the ocean basins is performed by specialised centres, such as the National Hurricane Center (NHC) in Miami, Florida, whose area of responsibility covers the North Atlantic and the eastern North Pacific.

Many techniques have traditionally been used to predict the track of a TC, the two most straightforward being climatology and persistence. A climatological method might search for all TCs in a historical record that have similar location and movement to the one to be forecast. The persistence method can be very accurate for short-period predictions. The simplest way of applying this method is to extrapolate the track of the TC from the past movement. A combination of the two methods, known as CLIPER, is widely used nowadays and is usually relatively accurate during the first 24 or 36 hours of the forecast. Other, more sophisticated, methods have also been developed. For example, statistical/dynamical techniques use some form of statistical screening using past storms together with output from a numerical model.

Global numerical weather prediction models are now becoming capable of providing further useful information to the forecaster on the likely motion of TCs. Rapidly increasing computer power over recent years has resulted in a corresponding increase in the horizontal and vertical resolution of these models. For instance, the global version of the Unified Model in operational use at the Met. Office has a horizontal resolution of 0.83° latitude by 1.25° longitude (approximately 100 km) with 19 levels in the vertical. A model with a resolution of around 100 km cannot be expected to resolve the detailed structure that exists at the heart of a TC. However the dominating influence of the large-scale flow on TC motion means that track forecasts from a global model can be surprisingly accurate. Many centres around the world now use numerical models to this end,

[1] The highest wave associated with a TC is 34 m, reported by the U.S.S. *Ramapo* in the western North Pacific, 6–7 February 1933.

but the remainder of this paper concentrates on the methods used at the Met. Office, Bracknell, to optimise the prediction of TC tracks in the operational global model.

2. Analysis and Initialisation

The movement of TCs can be very erratic and often depends on subtle interactions between the tropical and mid-latitude large-scale flow patterns. It is therefore extremely important that the initial position of the cyclone centre is correctly identified by the model's analysis. However, since TCs form and intensify over the open oceans, the observation coverage at any one time is usually insufficient to enable a good positional fix to be obtained. The chances of a radiosonde station being nearby are small, and ships will be attempting to steer well clear of the system.

There are formally designated regional centres around the world, e.g. NHC Miami, that issue bulletins over the Global Telecommunications System (GTS) giving the best estimate of the position of a cyclone centre together with the estimated wind structure. All available data are used, including satellite imagery and rainfall radar displays. However, errors of up to 400 km can still occur when the cloud structure is not well organised, particularly in the early stages of cyclone development.

Forecasters in the Central Forecast Office (CFO) at the Met. Office make use of these bulletins by creating 'bogus', or synthetic, observations. The Met. Office is different from many other centres in that considerable effort is put into the manual quality control of data presented to the assimilation system. This procedure is known as intervention and involves, amongst other things, supporting, correcting or deleting data. Another important aspect of the intervention forecasters' work is to create, when applicable, bogus observations in data-sparse areas. By using the information contained within the TC advisory messages from world-wide monitoring centres they are therefore able to input extra 'pseudo-observations'. These are then fed into the data assimilation system so that the analysis has some reasonable representation of the system on the scales it can resolve. In the case of a global model with a horizontal resolution of around 100 km this may only be a weak circulation with strength no more than the large-scale average of the outer-core winds.

A special intervention facility, which is particularly related to the positioning of TCs, is provided to forecasters, and was substantially enhanced in October 1994. Following the insertion by the forecaster of a few pieces of information (e.g. position, maximum wind speed, radius of gale force winds) obtained from the TC advisory message, the new technique produces bogus wind observations at the surface, 850 hPa, 700 hPa and 500 hPa on rings of radius 2°, 4° and optionally 6° and 8° depending on the strength of the storm. If there are any real observations of surface winds in the area (from ships, for example) they are used to help construct the radial profile of wind speed.

Before being introduced operationally in October 1994, the new bogussing technique underwent a full parallel trial between 25 August and 12 September 1994 during an active part of the northern hemisphere TC season. During the trial the forecasters continued to use the old TC bogussing technique as they felt necessary and the bogus observations were presented to the operational run. However, alongside this, the forecasters generated the new form of bogus observations as well, which were used in a parallel run of the model. A 5-day forecast from the 1200 UTC run of the model was produced each day.

There were 12 active tropical storms during the trial period: 7 in the western North Pacific, 4 in the eastern and central North Pacific and 1 in the North Atlantic. For the duration of the trial each main run analysis (0000 UTC and 1200 UTC) and each 1200 UTC forecast were verified, for both the operational (OP) and parallel (PS) runs.

Forecast Period	Analysis	24 Hrs	48 Hrs	72 Hrs
No. Verified	119	45	29	16
OP — mean DPE (km)	110	201	326	528
PS — mean DPE (km)	39	123	240	394
Improvement	65%	39%	26%	25%

The table above is a summary of the mean forecast direct positional errors (DPE) for all 12 storms. [Note that the number of analyses verified refers to both 0000/1200 UTC, whereas only 1200 UTC forecasts were verified.] OP refers to the operational run, i.e. using the old bogussing method, and PS refers to the parallel run using the new method. The DPE is the distance in km between the forecast centre of the TC and the observed position. The statistics show that analysis errors were cut by almost two-thirds to a mean value of 39 km (approximating to one third of a model grid length) and mean forecast errors were reduced by between 25% and 40%.

3. Verification

A semi-automated scheme has been developed to verify the forecast positions of TCs. The manual part of the system is restricted to entering into a computer dataset the actual locations of TCs (as given in the advisory bulletins received over the GTS). The analysed and forecast errors are then derived automatically by identifying the location of the TC in the model and calculating the distance from the reported position.

At the beginning of each month a brief summary of the global model's TC predictions is published and distributed to interested centres world-wide. For each TC occurring during the previous month, a variety of statistics are given. These include mean errors in the zonal and meridional directions, and mean errors resolved into along-track and cross-track components, as well as the more straightforward mean DPE. A skill score is also published using the CLIPER forecast as the standard. Finally, for each TC a graphical plot of the observed track together with forecast positions is produced.

Figure 1 shows an example of such a plot for Typhoon Zelda, which tracked across the western North Pacific Ocean between 29 October and 8 November 1994. This was the first TC to develop after the new bogussing technique was introduced. The continuous solid line indicates the actual track of the storm (as located by the Joint Typhoon Warning Centre, Guam, in real time); 0000 UTC positions are indicated by the TC symbol, together with the appropriate date. The dashed lines indicate the forecast tracks from each 0000 UTC global model run; the solid triangle represents the position analysed by the model (usually slightly offset from the reported position), and the crosses represent the predicted positions at 24-hour intervals. The majority of the forecasts were skilful, and were particularly impressive during the period of recurvature (5–8 November).

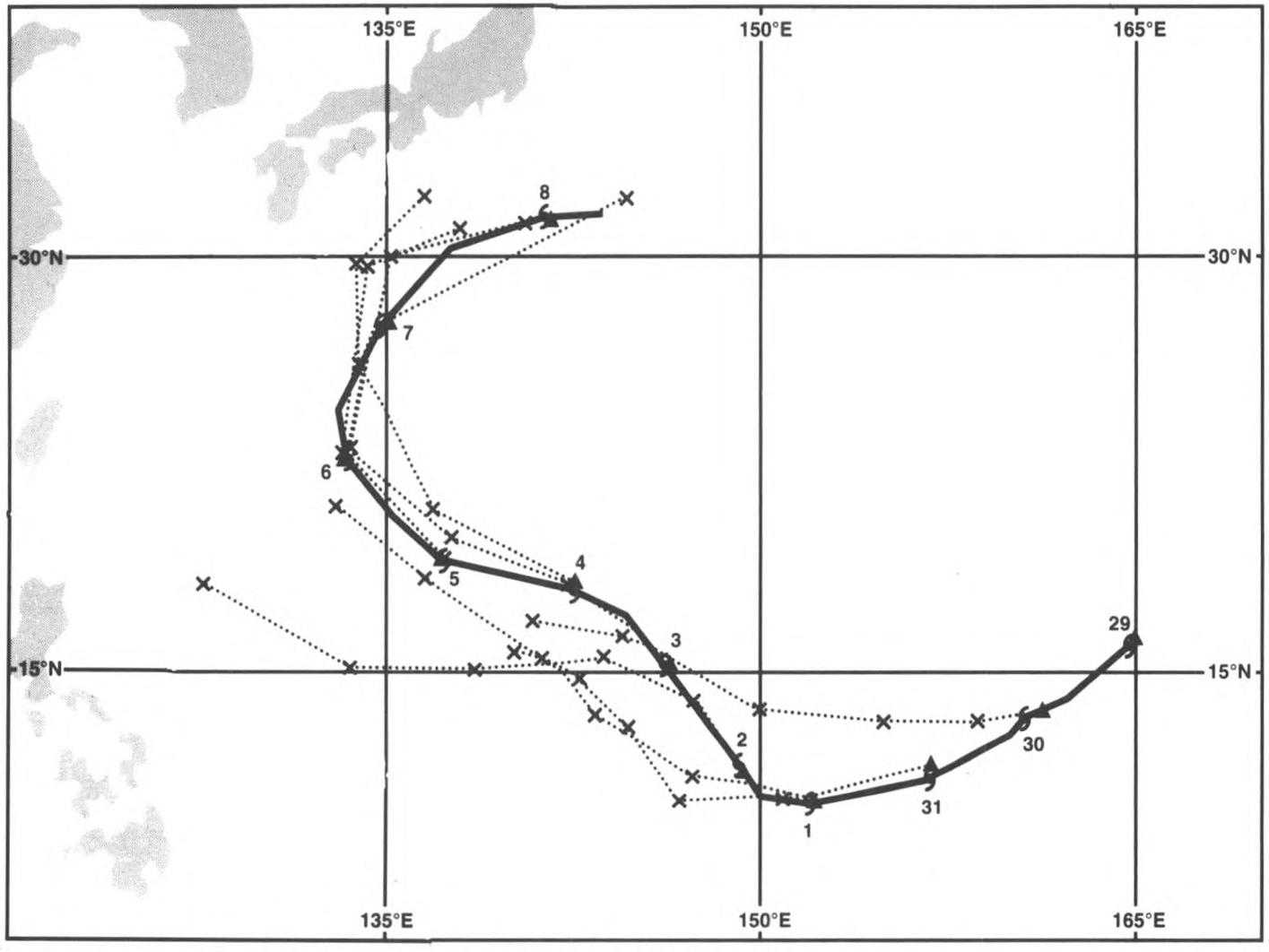


Figure 1. Graphical plot of observed and forecast tracks for typhoon 'Zelda', 29 October–8 November 1994.
KEY: ▬ actual track of storm (as located by the Joint Typhoon Warning Centre, Guam, in real time), with 00 UTC position for the appropriate date.
..... forecast tracks from each 00 UTC global model run. The solid triangle represents the position analysed by the model; the crosses represent the predicted positions at 24-hour intervals.

4. Summary

Although the United Kingdom is not affected directly by tropical cyclones the Met. Office, by running a global numerical model, is able to provide useful guidance on the forecast tracks of TCs world-wide. The CFO provides special advisory messages, under bilateral agreement, twice a day to specific centres around the world.

Intense Tropical Cyclone 'Hollanda'

By Edley Michaud*

South-West Indian Ocean, 8–12 February 1994

In 1994 some fifteen named tropical systems roamed in the south-west Indian Ocean. Seven were major cyclones, whilst Madagascar was the worst hit, with three storms during the season.

'Hollanda' was the eighth named system and was the only cyclone that has evolved very close and brought severe devastation to the island of Mauritius.

Hollanda developed from a well marked low pressure area along the south-west Indian Ocean Tropical Convergence Zone (ITCZ), which was very active in the region of Diego Garcia, near position 10°S, 72°E. On 4 February a ship in the northern sector reported surface winds of 33 knots and falling pressure. The system intensified slowly while moving towards the south-west. At 1200 (times UTC except where stated) on the 8th it reached moderate tropical storm status and was named by the Met. services. Between the 9th and 10th at 0001 it developed steadily into a tropical cyclone with maximum wind speeds of 64 to 90 knots and momentary gusts in excess of 115 knots at its centre.

It became a potential threat to Mauritius and the 1200 forecast on the 10th predicted that the ring of the most violent winds would certainly pass over Mauritius during the night. It continued to approach on a modified south-south-west track at a speed of 12 kph, bringing its centre nearer. By then it was located in 19°S, 58°E, due north of Mauritius. By 1500 the pressure was falling rapidly, rain became torrential and winds reached gale force.

At its peak intensity as an Intense Tropical Cyclone it passed very close by during the night of the 10th and the morning of the 11th, some 20 km off the north-west coastline. The island was spared from a direct hit, probably as a result of a slight oscillation in the movement of the system. During the passage of Hollanda the island experienced destructive winds in the order of 80 mph for almost 15 hours. The system later moved away from the island and by the afternoon, local time, on the 11th it was located about 80 km off the south-west coast of Mauritius, maintaining its peak intensity for some hours whilst south-east of the island of Reunion. After becoming embedded in a northerly upper-level current and moving in a generally southerly direction, Hollanda weakened considerably and by the 13th became an extra tropical depression. Its lifespan was nine days.

*Edley Michaud has been studying the weather as a hobby, in close collaboration with the Mauritius Met. Service, for 20 years. He operates and maintains his own weather station with standard traditional meteorological equipment, mainly provided by the U.K. Met. Office.

The anemograph station situated on the north-west coast of Mauritius, Fort William Harbour Radio, recorded a one-hour wind speed of 90 mph between 2000 and 2110 local time, with a peak of 133 mph during the period. Mean sea-level pressure fell between Noon and Midnight local time by 25 mb to an observed minimum of 975.5 mb. Heavy rainfall in some areas resulted in severe flooding and landslides. The mean rainfall measured over Mauritius was 310 mm with a peak of 711 mm in 24 hours at Mare aux Vacoas Reservoir situated on the high plateau. Severe cloud-to-ground lightning from heavy cumulonimbus clouds was seen but no thunder was heard, probably due to wind force.

On the 12th a state of emergency was set up in Mauritius. Significant damage was sustained by the economic sectors such as agriculture, electricity, the communications network, dwellings and roads. Thirty per cent of the forestry and reserves suffered. There were two deaths reported, attributed to the collapse of a dwelling due to a falling tree and some 1,048 people were temporarily made homeless.

Unofficial weather reports from members of the public indicated that a central calm of about 15 minutes was felt along the north coast of the island. However, this was not confirmed by a study of the pertinent barograms and anemograms received from official stations, carried out by the Mauritius Met. Services.

PRESENTATION OF BAROGRAPHS

During 1995 it was necessary to hold two separate barograph presentation ceremonies, as once again it proved impossible to bring together at one time all four shipmasters who were to be honoured in this way. See photographs on pages 29 and 30.

The main event was held on 12 July when the Chief Executive of the Met. Office, Professor Julian Hunt, made the presentations of three long-service barographs at Bracknell. In 1948 the Director at that time, in consultation with the Marine Superintendent Commander C.E.N. Frankcom, R.N.R., introduced the award scheme as a means of encouragement to serving navigating officers to maintain a high standard of observing at sea, thus setting an example for their successors and providing them with an incentive to perpetuate the accuracy of observations in the best traditions of British seafaring.

Those present, out of the four listed in the initial announcement in this journal of April 1995, were: Captain M.L. Bechley, formerly P&O European Ferries and now of MetROUTE, the ship routeing arm of the Met. Office; Captain J.R. French, retired from Ministry of Agriculture and Fisheries Research Vessels, Lowestoft; and Captain M. Watts, Master of m.v. *Shenzhen Bay*, P&O Containers Ltd.

In welcoming the three Masters, their wives and shipping company officials, the Chief Executive reiterated the sentiment of previous years in saying how pleased he and the senior members of his staff present were to be able to reward the recipients' long and diligent voluntary co-operation with the Met. Office. He confirmed that surface observations from ships were as vital now as they had ever been, particularly those that produced valuable data from 'sparse areas', where so few ships are on passage that there are insufficient observations to draw a true picture of surface weather conditions in those areas, such as the Southern Ocean, mid-Pacific and northern ice regions of the seas.

Crown Copyright

Captain Bechley receives his barograph from the Chief Executive.

Captain French receives his barograph from the Chief Executive.

Crown Copyright

Crown Copyright

Captain Watts receives his barograph from the Chief Executive.

Crown Copyright

Barograph Awards ceremony in the Met. Office Archive, 12 July 1995. Standing, left to right: Captain G.V. Mackie, Marine Superintendent; Dr S.J. Caughey, Director (Observations); Captain French, Captain Bechley, Captain Watts, Chief Executive. Seated: Mrs French, Mrs Bechley, Mrs Watts.

Crown Copyright

Captain Rattray receives his barograph from the Marine Superintendent on 12 September 1995.

The qualifying period for the awards includes a minimum of 18 years in which observations were received at the Met. Office, up to the end of 1993, and a meteorological logbook must have been submitted during the year in question.

In the second barograph ceremony, held in the Marine Division offices on 12 September, Captain Gordon Mackie made what would appear to be his final presentation as Marine Superintendent, to Captain D.L. Rattray of Scottish Fisheries Protection Agency, in the presence of his wife, one of the Agency's Directors and the Marine Superintendent.

This was a particularly significant and poignant occasion, being the last such ceremony to be held with a seaman as Director of the Marine Division, following an unbroken line of mariners in the position since the founding of the Met. Office in 1855. Following Vice Admiral FitzRoy as the first Director of the Meteorological Department of the Board of Trade, there have been seven further seamen providing continuous service as Marine Superintendent, maintaining close contact with ships and the shipping industry, proving what a benefit it has been to the observing, forecasting and climatological fields of meteorology. There is also liaison in the wider field of international co-operation on marine meteorology and safety at sea, through such bodies as the World Meteorological Organization, the International Maritime Organization and the Marine Safety Agency. Now, in the name of modernisation and refinement of the operations of the Met. Office, it appears that a director with this marine expertise and goodwill, built up by professional contact with the shipping industry over 140 years, is no longer necessary. Only time will show whether the termination of such an efficient and manifestly successful series of appointments will be of any benefit to the Met. Office and its contacts.

AURORA NOTES JANUARY TO MARCH 1995

By R.J. Livesey

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

Table 1 contains details of the auroral observations submitted by mariners to date for the period under review. The higher latitude observations made by the *Arctic Ranger* were of particular interest as it is a while since observations have been sent in from the region around North Cape and the Lofoten Islands. It may be of interest to compare the marine observations with what was going on at other locations on the same nights and this information is given in Table 2.

During the period auroral light was recorded on four occasions in January, twice in February and four times in March at the latitude of the port of Leith. Observers on the Moray Firth coast, including those at R.A.F. Kinloss, recorded auroral light on four occasions in January, four times in February and seven times in March. Some of these events were active and others related only to quiet glows or arcs. As observations depend upon the availability of observers and cloud conditions the above observations may not reflect the true frequency with which auroral light was present.

The present sunspot cycle is in decline and the above auroral activity is generally attributed to repetitive streams of particles emanating from the coronal holes that have been a feature in the sun's outer atmosphere for the past two years, or so. Some analysts suggest that the minimum of the present sunspot cycle will

Table 1 — Marine aurora observations January to March 1995

Date	Ship	Geographic Position	Time (UTC)	Forms in Sequence
Feb. 3/4	*Ironbridge*	48° 10′N, 63° 30′W	2330–0430	HA.RA.fRA.fHA+fRA. Max. alt. 45°.
7/8	*Cumulus*	62° 00′N, 22° 13′W	0723–0807	HB.R_3R.cR_2B.R_2B. Max. alt. 90°.
26/27	*Arctic Ranger*	71° 06′N, 22° 56′E	2110–2118	mRB. Max. alt. 40°.
Feb. 28-Mar. 01	*Arctic Ranger*	71° 09′N, 22° 48′E	1940–2050	mHB.mp$_1$RA.mp$_1$RR. HA.mP.RB.p$_1$RB. One-third sky. Max. alt. 30°.
4/5	*Arctic Ranger*	71° 19′N, 22° 25′E	1915–2332	RR+P.RB.HA+P.HA. HB+RR.HB.RR+P.P. RB.HB+P.RB.p$_1$RB.RR. RA.RR. Max. alt. 90°.
10/11	*Arctic Ranger*	68° 48′N, 13° 12′E	1940–2241	HA.m$_2$HA.RB.HA.RA. p$_1$HB.p$_1$RB.mP.HB. p$_1$p$_2$HB.RA.RB.p$_1$RB. p$_2$RB.HB+mP.HB. RR.P. Half-sky. Max. alt. 70°.
11/12	*Toisa Cougar*	61° 36′N, 01° 18′E.	—	mRB.
29/30	*Appleby*	48° 43′N, 62° 15′W.	0200	RB.

KEY: A=arc; B=band; H=homogeneous; R=rayed; R_1=short ray; R_2=medium ray; R_3=tall ray; P=patch; c=coronal; f=fragmentary; m=multiple forms; p_1=pulsating, uniform variation in brightness; p_2=flaming.

Table 2 — Comparison of marine aurora observations with auroral activity in other locations

Date	Location of auroral activity	Magnetic activity
Feb. 3/4	Aurora seen down to Banff on Moray Firth coast.	Magnetic storm in progress.
7/8	Aurora observed at Reykjavik.	Magnetic storm in progress.
26/27	Aurora seen down to Banff.	Start of magnetically stormy period.
Feb. 28/ Mar. 01	Aurora seen along Moray Firth and near Aberdeen.	Magnetic storm in progress.
4/5	Aurora seen down to Portpatrick, Reykjavik and Denmark.	Magnetic storm in progress.
10/11	Aurora seen down to Portpatrick.	Magnetic activity building up for magnetic storm.

take place in 1997, not 1996 as was suggested at one time. However, it is reported that the first sunspots of the new cycle have been observed, their identities having been determined by a reversal of their magnetic field orientation with respect to sunspots of the current cycle. Auroral observers in the mid-latitudes south of the auroral zone are hopeful that the build-up of the next sunspot cycle will be accompanied by increased auroral activity. We shall see.

In Figure 1 is given a comparison between magnetic and auroral activity for the past few years. There has been a reduction in transient solar activity as

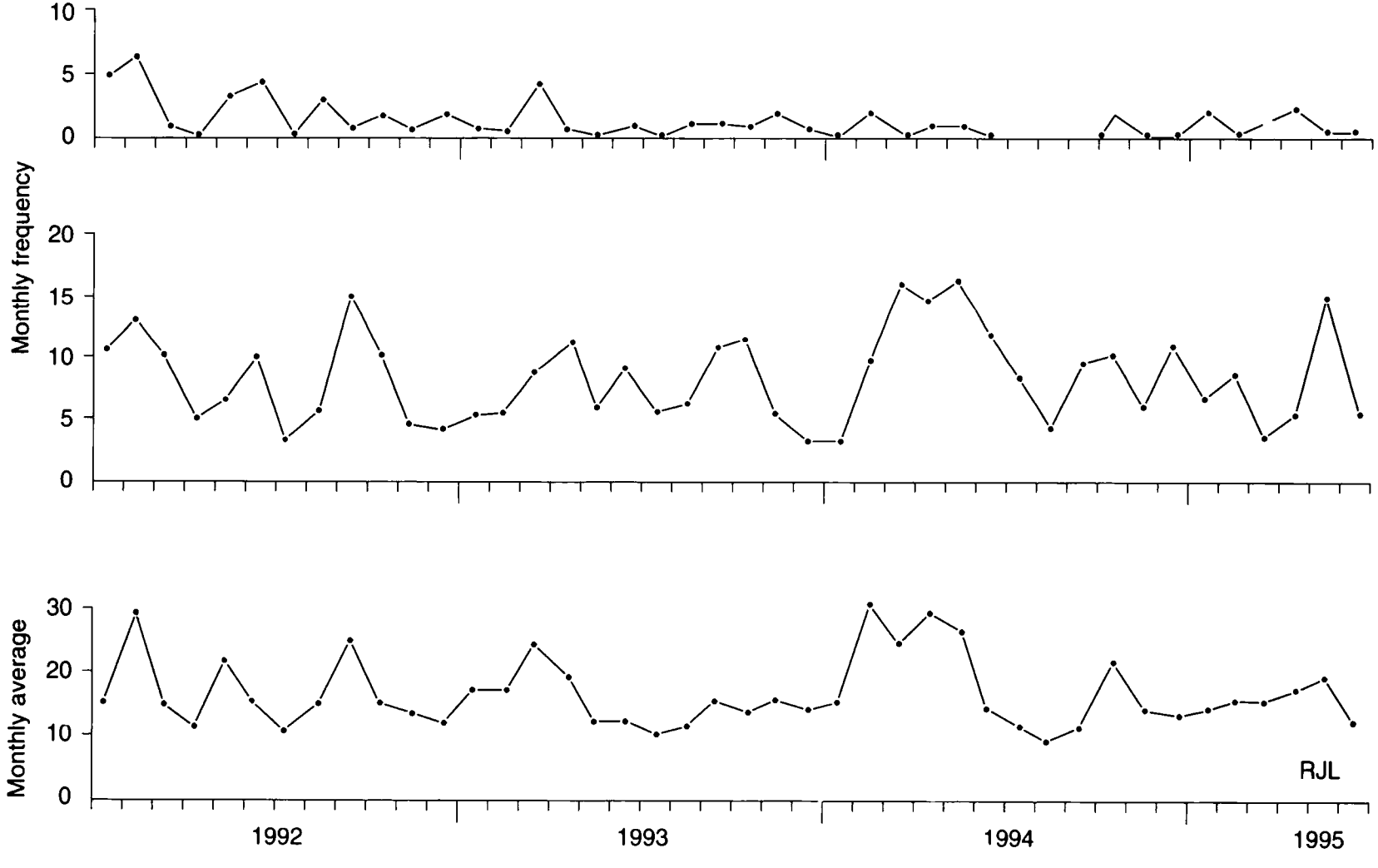


Figure 1. (Top): Geomagnetic storm sudden commencements (after Göttingen world data).
(Centre): Estimate of auroral apparitions observed at corrected geomagnetic latitude 57°N (from Brauch's data).
(Bottom): Monthly average of geomagnetic index A_p (after Göttingen world data).

demonstrated by the frequency of magnetic storm sudden commencements. The monthly magnetic index A_p represents the degree of magnetic disturbance from which it will be noted that the extensive coronal-hole driven activity in the first quarter of 1994 has not been repeated in 1995. An estimate from the observations of the aurora on the corrected magnetic latitude of 57°N shows a similar trend.

With the event of the new solar cycle we would expect an increase in transient magnetic and auroral activity which would penetrate more frequently to lower geomagnetic latitudes. This ought to lead to an increase in the number of marine observations made of aurora if our analysis of previous trends is anything to go by.

LETTERS TO THE EDITOR

The Marine Observer launches a career

Until recently I was Head of the Central Forecasting Office at Bracknell, and retired on 6 September 1995 after some 34 years service with the Meteorological Office. It was a bound volume of *The Marine Observer* that my father, Captain William Stubbs, had been awarded as an acknowledgement of his valuable voluntary meteorological work at sea for the year ended 31 March 1937 as Master of the s.s. *Tudor Star*, that caught my imagination while still a boy at school. Fascinated with the information on the availability of weather information by radio, and the importance of observations from ships in the weather forecasting process, I developed an interest in meteorology during my school years.

My earliest memories of my father are when he was on the Blue Star Line vessel *Sydney Star* before World War II. Later he was Master of s.s. *Doric Star*, which was hunted down by the German battleship *Admiral Graf Spee* soon after the outbreak of hostilities in 1939. The tale of the incident is a well-known one, but worth repeating here. The *Doric Star* was carrying a cargo consisting mainly of refrigerated meat from Australia to Britain, but also some wool. In expectation of the challenge from the *Graf Spee*, the hatch covers were removed and the bales of wool were spread over the top of the refrigerated cargo compartments and the hatches closed again. In those days before the introduction of steel hatch covers, they consisted of wooden hatch boards covered with tarpaulins. When the raiding party came on board the answer 'wool' was given to the question 'What was the cargo?' Several single hatch boards were removed from most of the hatches and the reply was accepted. The *Doric Star* was then sunk with its precious cargo of meat — a cargo which would have been a godsend to the Germans. Obviously the Germans had not done their homework well in not knowing that the Blue Star Line was fully involved in the carriage of refrigerated meat to Britain, and in any case all trace of recognition had probably been removed from the ship in wartime.

In the summer of 1952 my father, then Master of the m.v. *John Lyras* of Marine Enterprises Ltd (London), was involved with a charter to Canada to ferry rolling stock from Montreal to Sept Îles in the Gulf of St Lawrence. As the trip fell within the school holidays the 'young' Stubbs was allowed to make the trip as a Supernumerary. During the voyage to Montreal from Bremerhaven I was tasked with the plotting of the land and ship reports that used to be broadcast with the

North Atlantic Bulletin. The Radio Officer was also encouraged to receive the coded analysis at 1130 GMT, although this was not too popular as it was outside the single operator watch period and was a rather long message.

At the end of the charter the *John Lyras* was sent to Vancouver and I came back to Liverpool on the m.v. *Ramore Head* of the Head Line. During the passage back, Hurricane 'Baker' caused some problems as it moved northwards, and then up to the west of Greenland and became an extra-tropical depression. The Master, Captain Haddock, and one of the passengers, Commander A. O'Brien Twohig, the then Harbour Master at the North Wall, Dublin, had several conferences since the track of the hurricane was by no means certain. Forecasting in those days did not have the backing of powerful computers as forecasting does today. I recall the entry in the Ship's Log for 1800 on Tuesday 9 September 1952 (Noon position 56°36′N, 44°13′W) as the hurricane centre passed several miles to the east of the vessel: *'NW×N Force 12, very heavy sea, vessel pitching and rolling heavily and shipping water fore and aft, overcast with moderate visibility and rain'.*

During my career in the Meteorological Office, I have written many North Atlantic Weather Bulletins and as Head of the Central Forecasting Office I set up the procedures for the new service via Inmarsat. During a period in the International Branch of the Office, I was involved with the decision on the new common North Sea Areas to be used for Shipping. Now some 58 years since Captain W. Stubbs was awarded a bound copy of *The Marine Observer,* 'his son' confirms that the observations from ships at sea are still the life-blood in the forecasting process. Without these observations in real time an analysis of the current situation could not be made, however big the computers for forecasting may be. A good forecast depends on a good analysis.

Mr Martin Stubbs, retired Head (CFO).

Editor's note. The Marine Superintendent wishes to acknowledge Martin Stubbs' whole-hearted co-operation and liaison with the Marine Division during his time in charge of the Central Forecasting Office. Whenever a critical comment on the outcome of shipping forecasts is received from shipmasters, a copy is sent to the Head of CFO, and Martin has always replied with candour and in detail, in sympathy with the needs of seafarers. Whenever possible, his comments have also been published in this journal in response to letters from observing ships.

Farewell *Mariners Weather Log*?

As we go to press all indications are this will be the last issue of the *Mariners Weather Log*. Since 1957 the *Log* has provided marine weather information to the mariner as well as many others in the marine community. It has been a pleasure to serve an audience who has always appreciated our efforts and often said so in writing or by phone. We have felt and it has generally been acknowledged that the *Log* has been an effective method of encouraging the taking of weather observations worldwide and informing mariners and others of just how those observations are used in real time and in research.

At the very least there will be a break in the continuity of issues as options for continuing the publication are explored. There are a number of possibilities and we are hopeful that the magazine will be revived in the future.

We hope that the demise of the *Mariners Weather Log* will not affect the number of observations taken at sea. The Marine Weather forecasters and the

National Climatic Data Center are very much dependent on the observations provided by the merchant mariner as well as the U.S. Coast Guard and the other military services. Both have also been very supportive of the *Log*.

The *Log* had a good run. We hope that it has been entertaining as well as informative. We have been able to provide data that was either not available anywhere else or was very hard to come by. Even though we were always a small operation, we had outstanding support both in the United States and abroad. The unselfish contributions of so many people and their willingness to go the extra mile is in the main what gave us the success that we did enjoy.

We have faced similar crises in the past and our supporters have made their feelings known. We are still trying to keep things going and feel that the *Log* is an integral part of the overall marine voluntary observing program. We would like to take this opportunity to thank those in the marine community for their support in the past and hope that we may return.

Nancy O'Donnell, Acting Editor, *Mariners Weather Log*. (Editorial to the Summer 1995 edition).

There will be many in U.K. Voluntary Observing Ships who, like us, will mourn the (temporary?) passing of MWL. We have enjoyed a most fruitful partnership over the years, particularly during recent times when the retired editor, Dick DeAngelis, was in the chair for eight years. Nancy O'Donnell has also included a well-deserved tribute to Dick's tireless dedication to the *Log*, which he revitalized and modernised.

Anyone who corresponded with the *Log* in the past who is now looking for a new home for their articles, photographs or reports of a marine meteorological or oceanographic nature need look no further - send them to *The Marine Observer*. We will look after them until the *Log* or whatever rises from its ashes returns to our shelves.

Whether by design or not, it happens that this final edition of the *Log* carries an announcement of the launch last fall of a new quarterly journal in the United States, *Marine Watch*, covering 'events occurring on, under and over the oceans of the world'. John Grissim, the journal's publisher and editor, has spent three years in preparation for the launch of his journal which is geared to a cosmopolitan readership, from scientists and meteorologists on the one hand to professional and amateur mariners on the other, all of whom share a deep appreciation of the marine world. The new publication will initially be 16 to 20 pages in size and feature in-depth reporting on marine related news from a wide spectrum of topics: shipwrecks, shark attacks, sea floor exploration and high tech undersea research.

The editor invites readers to send news of their marine activities, sightings or experiences, and information about subscribing to the journal can be obtained by contacting him on P.O. Box 810, Point Reyes, CA 94956, U.S.A. Telephone (415) 553-8700. Fax (415) 663-8784. Email: *marwatch@nbn.com. Editor*

Night rainbow

February 16, 1995 at 0800 UTC, 2000 LMT. Observers: Third Mate Nelson O. Seduco, Ordinary Seaman Rodrigo B. Grata and passenger Mr Daniel Melody. The time I relieved the Chief Officer from watch the weather was bit windy. Winds continuously blowing from south-east at 25 knots. Coming from port side. Cloudy skies with patches of light rain showers within the vicinity. Moderate seas and low swell. Occasionally, the moon is shining quite well from cloud openings. As the vessel passsed a patch of light rain showers, suddenly about 200 metres away on the ship's starboard side appeared an arc of beautiful rainbow so clear enough with its band of colours visible to three of us. Twice it did occur. It began at 0815 and ends at 0819 and followed at 0902 to 0905. I wonder if only the sun's light could produce such majestic colour in nature but I do understand that moon has its borrowed light to refract [sic.] on passing through droplets of rain showers. Before I forget, certainly no one of us could find that pot of gold at the end of that

rainbow for it was at the middle of the sea and again the moon was concealing it by slipping through the clouds. Our old passenger could only sigh for through all his life (at 79 years of age) it was the first time he had seen such nocturnal display of colours, so did we. Ship's position: 25° 20'S, 176° 48.2'E. Speed at 17 knots.

Nelson O. Seduco, Third Mate, *California Star.*

Sea temperatures

A pattern is noted from a number of passages made by *Seki Pine* between Cabo de Sao Vincente (south-west Portugal) and Cabo de Palos (south-east Spain), of a rise and fall in sea temperatures. This no doubt results from inflow from the Atlantic to the Mediterranean which is confirmed by an increase in ship speed over the ground when travelling west to east (and vice versa). Also, when travelling east to west between Cabo de Gata (south-east Spain) and Gibraltar, it is the practice of the ship to stay close inshore on the southern Spanish coast as far as Malaga before turning south-westerly to Gibraltar, to avoid the main inflow. The additional distance is more than compensated for in maintaining (and occasionally improving) ship speed over the ground.

Whilst none of the foregoing is surprising, the amount of rise and fall in sea temperature seems unusual as inflow is thought to originate from deep ocean currents surfacing in the western approaches to the Strait of Gibraltar. With a range of up to 5° rise and fall in sea temperature within the confines of this article, noted by *Seki Pine*, the conclusion is drawn that the inflow comes from subtropical waters of the Atlantic rather than from the branching of the south-going element of the Gulf Stream gyre off the Portuguese coast. Recognised is the improving thesis that main weather systems may be dependent to an extent on sea temperature heat transfer and that movement of main ocean currents is presently an object of 'in depth' study. It would be interesting to discover if this rise (and fall) of sea temperature between said geographical locations is 'normal' and/or seasonal, and if associated climatic conclusions i.e., Mediterranean weather seasons, may be drawn. (The article *Oceans of data* by O. Tickell, *The Marine Observer*, January 1995, triggers the foregoing.)

Captain P.W. Jackson, Master, *Seki Pine.*

To kill tornadoes and hurricanes

The attached cutting from an English newspaper reminds me that there is an old Mariners' lore from the last century, when even merchant ships carried cannon to deter pirates, that a waterspout over the sea can be killed by the bang of a gun. I have seen it done in the Malacca Straits with a small 3-pounder saluting gun from a quarter of a mile away.

It should not be too difficult or expensive with a little advice from a friendly chemist, local army unit or fireworks manufacturer to devise a rocket or mortar bomb from a tube made of plastic or cardboard, three inches in diameter and two feet long, as used for mailing rolled-up maps and plans, to attain a height of 1,000 feet or more near the root of a tornado in the cloud, and to carry a sufficient bang. It would be possible to make up a couple of dozen after a few trials. Consider the launcher on a truck then make some sort of a sighting and consider

tactics, probably from the safest point, the tornado's past track. The debris from the projectile would be safe for people and farm and animals. If the experiment is successful, funding in a bigger way should be easy, or perhaps the Army could eventually take on the duty.

If that is successful, consider what might be done to break up the birth of a hurricane, as it is tracked by satellites, in mid-Atlantic long before it hits the Caribbean or coasts of the U.S.A., by a string of half-a-dozen height-fused U.S. Air Force 100-lb bombs delivered from above into the eye of the storm.

> 'It must be the ultimate chase: this spring, around 20 U.S. scientists and 100 students will grab their instruments and sprint down tornado alley in pursuit of the twisters. Tornadoes form in many parts of the world, but the United States has more of them than anywhere else, and the nation's central region has most of all. Most tornadoes occur when the changing weather brings warm and cool fronts into conflict, generating unstable and stormy air that builds during the warmth of the day to create the common late-afternoon thunderstorm and twister outbreak. Then the chasers set off in pursuit. According to Harold Brooks, a meteorologist at the National Severe Storms Laboratory in Norman, Oklahoma, "If you know what you're doing, it's not as dangerous as it seems."
>
> 'It is all part of a project called Vortex — Verification of the Origin of Rotation in Tornadoes Experiment. "We don't have good measurements of wind speeds, temperatures and pressure in tornadoes", says Brooks. The chase, the second of its kind, begins on April 1, ends on June 15 and covers a swathe of the Mid-west hundreds of miles wide. There will be scatters of small instruments ahead of the twisters; airborne and portable ground radar and instruments of balloons ..."

Commander Sharpey-Schafer, RN, Secretary, Open University Computer, Sci-Tech & Space Society.

Book Reviews

The Admiralty Chart — A New Edition by Rear Admiral G.S. Ritchie, C.B., D.S.C. 155 mm × 220 mm, 444 pp., *illus.*, ISBN 1-85821-234-0. The Pentland Press, Hutton Close, South Church, Bishop Auckland, Durham DL14 6XB. Tel: 01388 776555. Fax: 01388 776766. Price: £19.50.

First published in 1967, this new edition of the comprehensive work by the former Hydrographer of the Navy has been extensively updated with help from the author's fellow surveyor, Lieutenant Commander Andrew David, who was asked to examine the original text in the light of considerable new information he uncovered whilst working in the Sailing Directions Division of the Hydrographic Office.

Rear Admiral Ritchie steers the reader through the complete history and development of the compilation of the charts, including the personalities, their organisations, surveying and the expeditions which resulted in the drawing of so many of the original charts. Among many famous figures prominently featured in these pages are Beaufort, FitzRoy and Darwin, highlighting the important part played by many great scientists, explorers and professional mariners in this age of oceanic discovery.

Amongst a wealth of interesting illustrations is a painting by Stephen (the caption should read that it is an engraving of a print by Stephen Pearce) depicting the Arctic Council meeting under the chairmanship of the Hydrographer in 1851 to

discuss the search for (the remains of) Sir John Franklin, who had sailed from Chatham with *Erebus* and *Terror* six years earlier in search of the Northwest Passage. A lithograph of this print hangs in the National Meteorological Archive at Bracknell, and Mr Michael Wood, Head of the Archive, points out that the picture is a montage from separate portraits of the ten distinguished people shown. Sir Edward Sabine, President of the Royal Society, is shown wearing military uniform but hanging near this picture in the Archive is his portrait in the identical pose but wearing cravat and morning coat. The profile of Admiral Beaufort, seated as Hydrographer and 'Chairman' of the meeting, is also copied from an earlier portrait known to the Met. Office. A study of the print in the book will soon reveal how unnatural are the gazes of the majority of the subjects depicted.

Several weather logbooks from ships mentioned in the book, engaged on hydrographic and humanitarian expeditions, are held in the National Meteorological Archive as part of the Royal Meteorological Society Collection, notably the log of *Assistance*, a 400-ton sailing bark commanded by Captain Horatio Austin, recording the several Arctic expeditions undertaken between 1850 and 1854, the year of the founding of the Met. Office.

J.F.T.H.

GMDSS for Navigators by P.C. Smith & J.J. Seaton. 156 mm × 234 mm, 192 pp., *illus.*, ISBN 0-7506-2177-X. Butterworth Heinemann/Reed Book Services, PO Box 5, Rushden, Northants NN10 9YX. Tel: 01865 310366. Fax: 01865 310898. Price: £18.95.

GMDSS for Navigators claims to 'bring together in one publication the knowledge required to assist anyone who seeks to fulfil the statutory requirements to become a qualified and competent operator of GMDSS communications equipment'.

Most colleges at the moment rely on in-house notes put together by college staff to cover the GMDSS examination syllabus. It is high time an approved textbook was made available and this book would appear to be a 'first' to attempt to fill this slot. It is aimed squarely at those working towards taking their GMDSS certificate, the content and layout being formed around current accepted examination procedures.

No single book could hope to explain the hardware operating methods for the numerous different makes of radio equipment, and Smith and Seaton stress the need to read the manufacturer's manual. In the Chapter *Detailed practical knowledge and ability to use the basic equipment of a ship station* they do attempt to cover the basic functions common to accepted types of equipment; however, the book really concentrates on operating procedures and regulations, and these it covers clearly and fully with little or no padding.

The comprehensive contents list ensures ease of location for chapters covering everything from a basic understanding of frequencies and their characteristics, to communication procedures in the GMDSS, with practical operation of the system's various elements, both for general communications and for distress, urgency and safety communications, covered *en route*.

Appendices cover the examination syllabus, some practical examples of transmitted messages and advice to the equipment user and watchkeeper on choice of means of communication.

One cannot fail to notice a slight Australian bias and a leaning towards small craft users; however, as the GMDSS is a worldwide system for all types of vessel,

this must be taken as comment rather than criticism. On the whole I would say this book will be a worthwhile read for anyone likely to be involved in maritime communications whether or not they are planning to sit for their GMDSS certificate.

Mr Christopher Hall, I.O.N, *Newport Bay*.

Personalities

RETIREMENT — CAPTAIN C.S. KINGSTON retired towards the end of 1995 after voyage leave, ending a career lasting almost 40 years continuously under the umbrella of Cunard Steamship Company.

Colin Sydney Kingston was born in October 1938 and educated at Doncaster Grammar School and Boulevard Nautical College, Hull. His first ship, which he joined in August 1956, was Thos. & Jno. Brocklebank's s.s. *Mahronda*. After obtaining his Master's Certificate in October 1966, he continued to serve as Chief Officer with Brocklebank's, and then Cunard Shipping Services, until promotion to Master of the Cunard Reefer *Carinthia* in October 1983.

He sent his first completed meteorological logbook to the Met. Office from Brocklebank's *Mandasor* in June 1961, and followed it with a further 40 logs, of which 16 were marked as Excellent. He was presented with Excellent Awards on six occasions.

Captain Kingston was involved with the Campaign 'Desert Storm' in 1990 and 1991 as Master of *Atlantic Conveyor*, when that ship was chartered to the Ministry of Defence for a voyage to Al Jubayl south of Kuwait in the Arabian Gulf.

He has been married 25 years and has two daughters, and says that it has been saddening to witness the decline of the British Merchant Navy during his career, from a thriving industry to its present existence, and he has fond memories of the past and the many fine people he has met over the years at sea.

Our good wishes, and sincere thanks for his long years of co-operation with the Met. Office, go to Captain Kingston and his family for his retirement, which began on 1 November 1995.

RETIREMENT — CAPTAIN G.V. MACKIE, Met. Office Marine Superintendent for twelve years, retired from this position on 31 December 1995, rather earlier than had been anticipated, and in common with several other senior members of the Met. Office staff, to accommodate the far-reaching changes required in the progress towards Trading Fund. He followed his first 12 years at sea in foreign-going ships with 32 years service to the Met. Office in Ocean Weather Ships, Weather Routeing and the Marine Division.

Gordon Vincent Mackie was born in Glasgow in February 1934 and received pre-sea training at Glasgow Technical College, now University of Strathclyde. He served his time as a Navigating Officer Cadet with Lyle Shipping Company of Glasgow on world-wide trading ships. He remained with Lyle's until gaining his Mate's Certificate in 1957, when he joined Elders & Fyffes Line, trading from U.K. ports to Jamaica or West Africa. One year after receiving his Master's Certificate he was appointed Chief Officer; in December 1960 he was serving with

the Moss Hutchinson Line (P&O Group) on Mediterranean trade, and later with the Canadian Pacific Company in the passenger liner *Empress of Britain* on the North Atlantic.

For a short period Captain Mackie operated as a cargo surveyor in the Clyde area before joining the Met. Office Ocean Weather Ship Service in 1963; he served for five years on the North Atlantic as Navigating Officer and finally as Master of the *Weather Watcher*, the former Castle Class frigate H.M.S. *Rushen Castle*. In 1968 he was appointed to Met. Office Headquarters in Bracknell to commission the new Weather Routeing Service for shipping, at that time attached to the Central Forecasting Office. In 1973 he was promoted to Deputy Marine Superintendent with responsibility for the seven U.K. Port Met. Officers.

In 1983 he succeeded Captain G.A. White as Marine Superintendent, thereby becoming Head of the Marine Division and Nautical Adviser to the Directors General of his day, Sir John Mason and Sir John T. Houghton, and later to the present Chief Executive, Professor Julian Hunt, as well as to senior staff of the Office. In the Met. Office reorganisation when it became an Agency within the Ministry of Defence in April 1990, he received the additional title of Branch Director of the Observations (Marine) branch. He is responsible for all Met. Office aspects of the operation of Ocean Weather Ship *Cumulus*, and it is anticipated he will maintain this connection after he leaves the Office, becoming a Consultant for OWS matters. Although he has had to loosen his official ties with MetROUTE, as the Ship Routeing Service he helped to establish 25 years earlier is now known, he still maintains a watching brief over the functions of the four remaining Master Mariner staff of the service.

Captain Mackie is the World Meteorological Organization representative to the International Maritime Organization, becoming involved with the creation of the Global Maritime Distress and Safety System at an early stage. He is Chairman of the WMO sub-group on the GMDSS and is also a WMO Commission member for Marine Meteorology. Since becoming Marine Superintendent his mission has been to maintain a thorough and effective liaison with the Shipping and Fishing industries, keeping a weather eye on the safety needs of seafarers from the marine forecasting services viewpoint.

He is a Fellow of the Nautical Institute, Member of the Royal Institute of Navigation and a Fellow of the Royal Meteorological Society. He lives in Wokingham, Berkshire, and is married with two mature sons. The small body of dedicated staff he leaves behind in the reduced Marine Division, now headed by Deputy Marine Superintendent Captain Stuart Norwell, wish him success and happiness in his changed circumstances. They will be doing their best to sustain the expertise and keep up the contacts with the marine industry which he so carefully nurtured and maintained, to the benefit of the whole organisation.

Notices to Marine Observers

APPOINTMENT OF PORT MET. OFFICER, SCOTLAND AND NORTHERN IRELAND

Captain P.J. Barratt has been appointed to the Port Met. Office at Greenock in succession to Captain A.P. Maytham who was transferred to the Cardiff office in 1995.

Peter John Barratt, aged 50 years, was brought up in Derby and educated at the Henry Cavendish School. He joined his first ship, *Denbighshire* of Alfred Holt and Company, as Apprentice in 1961. He sailed in ships from all the Alfred Holt Group companies until 1983, during which time he sent in his first meteorological logbook from the *Glenorchy* in 1965 and gained his Master's Certificate in 1971.

Between 1984 and 1995, Captain Barratt served with the Denholm, Tamahine, Jebsen and Wah Tong companies in a variety of ships, having been promoted to command of the Ro-Ro ferry *Exxtori* in 1987.

Fleet Lists

UNITED KINGDOM

Updated information regarding the list published in the July 1995 edition of *The Marine Observer*. Amendments for this list are required by 15 September.

Name of Vessel	Date of Recruitment	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Alpha Centauri	7.9.95	J.S. Rekhi	S. Islam, J.D. Patel, A.A. Khan	S.N. Das	Wallem Ship Management (H.K.) Ltd
Amethyst	4.4.95	W. Venning	B. Standlerline, A. Weintrit	—	Stephenson Clarke Shipping Ltd
CMBT America	14.7.95	P. Le Sueur	E. Redil, G. Paxton, N. Badillo	S. Palay	Furness Marine Services Ltd
Cable Installer	25.4.95	S. Hibberd	M. Stuck, F. Sobrink, D. Flemington	—	Cable & Wireless (Marine) Ltd
Colombo Bay	10.5.95	B.V. Chipperfield	G.D. Bissett, N. Barrington, M. Barraclough	—	P&O Containers Ltd
Front Hawk	29.8.95	C.P. Subramanian	A.S. Gill, V. Kopitsa, S. Ahmed	R.E. Forson	Wallem Ship Management (H.K.) Ltd
Front Rider	2.8.95	B. Ekman	T.M. Ta-Ay, E.B. Paopio, E.A. Botista	L.S. Leopoldo	Nordic Oriental Management Pte Ltd
Helen Maersk	17.5.95	R. Boserup	A.D. Joanesarson, M.L.E. Harboe, C. Bacher	—	A.P. Moller
Hemera	—	T.H. Goldsmith	P.M. Yambaro, R.N. Cublio, R.M. Deyes	N.P. Entona	A/S Havtor Management
Ibex	23.5.95	N.C.E. Spencer	D. Crerar, R. Madden, K. Wilson	M. McKenna	Pandoro Ltd
Knock Allan	30.6.95	R. Keys	A. Cabrera, B. Hogmo, G. Bielinski	—	Red Band A/S
Maersk Shetland	21.3.95	W.T. Munro	C.J. Sproul, M.S. Kent, D.A. Yorke	—	The Maersk Company Ltd
Maersk Sussex	14.4.95	N. Vause	B. Smith, L. Power, S. Creswell	—	The Maersk Company Ltd
Merchant Paramount	16.8.95	S. Pushpendar	P.B.A. Gordon, S.H. Gupte, B. Kumar	—	V.Ships (U.K.) Ltd
Merchant Prestige	21.8.95	A.K. Bakshi	S. Chandrasekhr, A. Ahmed, S. Kaul	—	V.Ships (U.K.) Ltd
Oriana	7.4.95	Commodore I. Gibb	S. Pritchard, D. Watson	—	P&O Cruises Ltd
TRSL Antares	18.8.95	G. Wostenholme	C. Guthrie, G. Griffiths, M. Kenny	—	Sea-Land Container Ships
Tamamima	28.5.95	D.E. Ginder	S. Radiak, J. Bukala, N. Nowicki	R. Halubek	Andrew Weir Shipping Ltd
Uisge Gorm	13.6.95	M. Burns	R. Allan, J. Clarry	D. Anderson	Bluewater Operations (U.K.) Ltd
Waasland	8.6.95	J. Vandermeiren	C. Maerten, J.L. Andre, D. Cinotti	—	Tecto, N.V.
World Nord	16.3.95	M.J. Chambers	Lam Chiu Tung, L.G. D'Silva, Law Wai Tim	G.G. Kamat	World-Wide Shipping Agency
World Place	15.3.95	B.S. Sidhu	V.P. Gore, S. Khanna, S.A. Bhatia	S.K. Mathew	Univan Ship Management Ltd

The following ships have been withdrawn:

Alcides, Atlantic Conveyor, Brodospas Sun, C.S. Alert, Celtic Challenger, Edinburgh Maersk, Ibn Rushd, Jevington, Limne, Malcolm Miller, Nirja, Onda, Resolution, Retriever, St Christopher, Star Pembroke, West Moor, Zealous.

BRITISH COMMONWEALTH

The following Selected and Supplementary Ships have been recruited to or withdrawn from the lists published in the July 1995 edition of this journal.

AUSTRALIA

Recruited (Sel.): *Inger Maersk, Iron Curtis, Iron Monarch, Northwest Seaeagle, Northwest Stormpetrel.*
Withdrawn (Sel.): *Anro Fremantle, Frank Konency, Iron Baron, Island Seaway.*
Withdrawn (Sup.): *Iron Curtis, Iron Monarch.*

HONG KONG

Recruited (Sel.): *Ardmore, Grand Fortune, Gulf Spirit, Hai Kang, IBN Zuhr, Jahre Rose, Kurama, OOCL Concord, OOCL Fame, Phichit Navee, Rickmers Shanghai, Rowan, Shantung, Surin Navee, Szechuen, Venture.*
Withdrawn (Sel.): *Eagle Pride, Kamaleverett, Karabieverett, Maritime Champion, Maritime Success, Ocean Sirius.*
Withdrawn (Sup.): *Grand Fortune, Ivyeverett, Kurama, OOCL Fame, Rickmers Shanghai, Rowan, Shaplaeverett, Splendor River.*

INDIA

Recruited (Sup.): *INS Rana, INS Ranjit, INS Ranvijay, INS Shakti.*
Withdrawn (Sup.): *INS Trishul, Vishva Madhuri.*

NEW ZEALAND

Recruited (Sel.): *Capitaine Fearn, Pacific Onyx, Rangiora, Turakina.*
Withdrawn (Sel.): *Atlantic Defender, Forum Papua New Guinea, Fulmar.*

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