

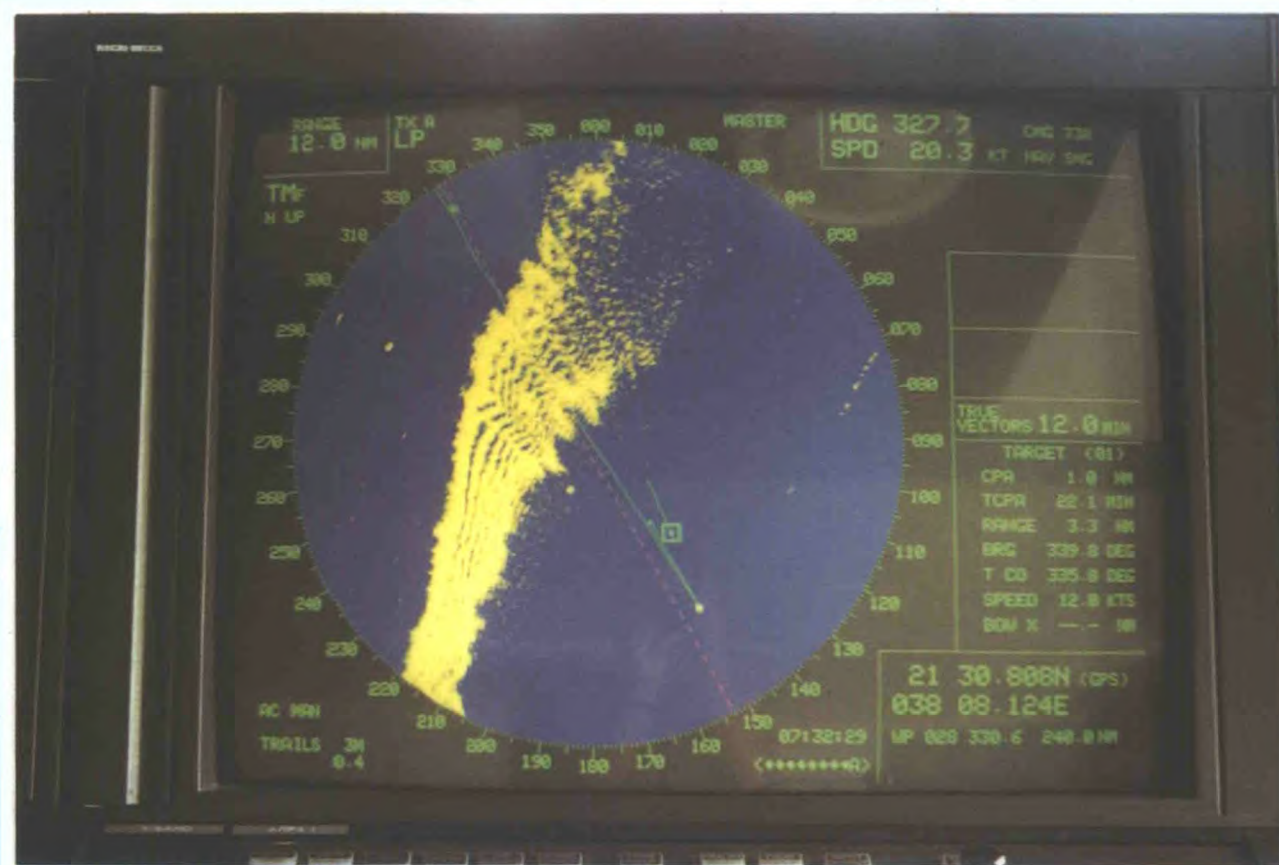
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The Met.Office

# The Marine Observer

*A quarterly journal of Maritime  
Meteorology*



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July 1996



# THE MARINE OBSERVER

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

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COVER PHOTOGRAPH: Echoes of airborne dust displayed on the Decca Bridgemaster of the *Colombo Bay* on 28 August 1995, photographed by Mr N.P. Barrington, 2nd Officer. (See page 104.)

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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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## Editorial

On the first day of April this year the organisation brought into being in 1854 as the Meteorological Department of the Board of Trade, and headed by Captain and later Vice-Admiral Robert FitzRoy in 1855 when operations first commenced, became a Trading Fund and fully entered the competitive commercial world of trading as a business known as The Met. Office. Major internal reorganisation has resulted in new departments while the management structure has been reviewed right down the line.

The Observations (Marine) branch, the founder member of the original office, is now one of the many cogwheels in the gearbox of The Met. Office machine, being part of the Observations Division, which works alongside specialist areas such as Operational Services and Research and Development, among others. While FitzRoy no doubt hoped his original organisation would be successful, he could hardly have imagined the scope, capabilities and success of The Met. Office today.

At the end of the day, regardless of how the office continues to evolve, and no matter what or how much progress is made technically and scientifically, there will always be a hunger for data, for the raw material on which forecasts depend and on which research is based. Observations of all types are the forecasters' tools and the researchers' library while the beneficiaries of their joint work will continue to include mariners and the shipping industry, those watching global climate change and also those dealing with meteorological needs relating to defence. Incoming weather data from observers on ships of the United Kingdom VOF are particularly valuable since the equipment used has, since the very early years, been scientifically tested and calibrated before issue thus the observations can be compared over long periods. Sea temperatures will always be vital, so those vessels making reduced observations, especially observers in the MARID ships, need not feel that their work is any less important.

The weather bulletins issued by various means for shipping around the United Kingdom and the eastern Atlantic are as comprehensive as anywhere in the world and reach a high standard of accuracy. However, as with a computer program, the quality or accuracy of the output relies heavily on the quality and quantity of the input combined with, in meteorology, the skill of the forecaster. Reports from a large number of ships are always necessary in order to produce a reasonable synoptic chart, forecasters cannot get enough marine reports even though satellite data are available; ship reports are important in their own right and also for verification of the satellite data.

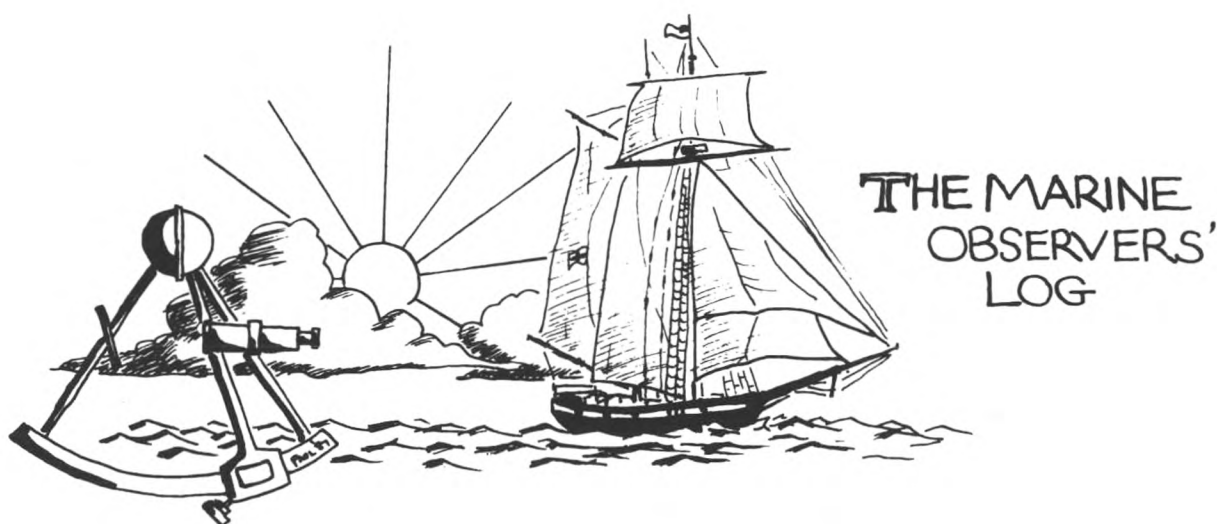
There are observers who have perhaps become disillusioned with recording weather details and who literally "can't be bothered" or who are not as accurate as they could be when making observations. Well, no observation at all is better than a bad one but a single accurate observation could answer the prayer of a forecaster watching a developing meteorological situation. The United Kingdom fleet list, beginning on page 145, carries the names of all ships recruited to make observations as Selected or Supplementary ships; there are many from which no reports have been received for twelve months or more and it would be good to see some of them, if not all, in action again.

On the subject of observations, the office lost a star performer on 9 June when the Ocean Weather Ship Service was terminated and O.W.S. *Cumulus*, purchased in 1985 from the Royal Dutch Meteorological Institute for the nominal sum of £1.00, was taken out of service as the United Kingdom's weather ship. Her

passing, largely due to her work being superseded by the Atlantic Buoy Network, marks the end of an era which we hope to recall in a future edition of the journal. Thanks for a job well done must go to all her observing complement, past and present, and to Marr Vessel Management Ltd, of Hull for tending so well to the needs of *Cumulus* during her time as the U.K. weather ship.

As stated in the April edition of *The Marine Observer*, planning is under way to produce a calendar specifically for ships of the U.K. VOF and largely comprising pictures from the VOF. We are therefore looking for a selection of observers' photographs of anything maritime be it "meteorological, animal, vegetable or mineral" from which can be chosen those for the calendar. The deadline for their receipt at Bracknell is 31 July so there is still time to send in a picture (35 mm prints or slides only, please) either direct to the Editor's address given at the foot of the previous page, or through any U.K. Port Met. Officer, or with a completed met. logbook. Please do not use paperclips or other fixings on your picture and remember to include your name along with details of the picture you send. We will not be able to return your photographs so please be sure you have the negatives. The calendar, together with the annual book awards and barograph presentations are a gesture of appreciation in respect of work carried out by observers in the VOF. However, accurate and plentiful observations made by the weather 'user' at sea can only serve to increase the benefits for the user at sea, and the latter may be the greater prize for all.





## July, August, September

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

### TYPHOON 'OSCAR'

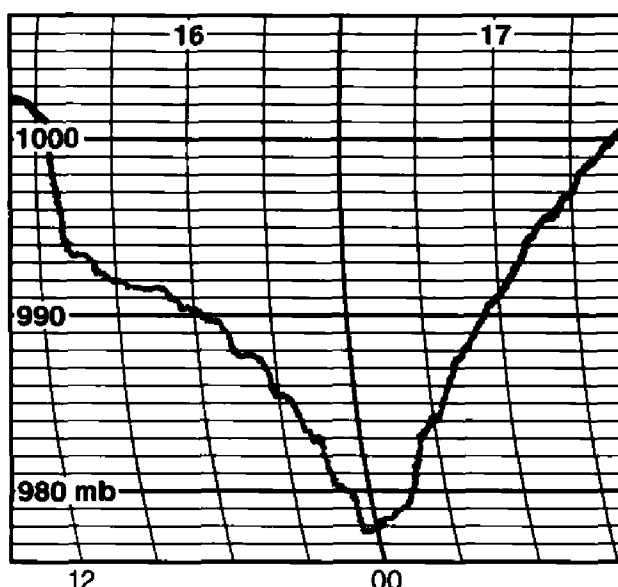
#### Japanese coastal waters

m.v. *Providence Bay*. Captain R.A. Kenchington. Sheltering in Suraga Wan. Observers: the Master, Mr J.C. Bennett, 3rd Officer and ship's company.

16–17 September 1995. Prior to arrival at Yokohama the weather forecasts received indicated that tropical storm Oscar was approaching; for the vessel to depart from the port on time was therefore of paramount importance. Oscar was upgraded to a severe tropical storm by 1200 UTC on the 14th and was further upgraded to a typhoon by 0600 on the 15th. Upon departure from Yokohama, the Master decided to proceed to Suraga Wan and weather the storm in the lee of the land.

The following observations summarise the conditions experienced as Oscar passed by, while the barograph trace shows the associated pressure changes.

Date and time (UTC)	Temperature			Pressure	Wind		Remarks
	Air	Wet	Sea		Dir'n	Force	
16th 1100	18.1°	18.0°	23.6°	1004.0	N	8–9	Vessel proceeds to Suraga Wan. Gusts to 55 knots.
1500	19.8°	17.5°	23.9°	994.4	NNE	8–9	Low stratus with periods of rain.
1600				994.0	NE	8–9	Vessel in shelter of Suraga Wan. Gusts to 60 knots.
2000				990.5	NNE	8–9	Wind increasing to 80 knots.
2100				988.3	NNE	10	
2300	20.8°	17.0°	24.0°	981.9	N	11	Oscar reaches closest point of approach. Pressure reaches lowest point.



17th 0000			982.7	N	11	
0100			987.9	N	11	
0200			987.3	NNE	10	Gusts to 85 knots.
0300	23.4°	20.0°	23.6°	988.7	W	9-10 Sky covered by stratocumulus.

The vessel was sheltering between 1500 on the 16th and 0200 on the 17th but by 0400 on that day the weather eased with the passage of Oscar and the vessel was able to depart. At the typhoon's closest approach its centre was about 120 n.mile to the south-east of the ship.

Position of ship: 34° 58'N, 138° 43'E.

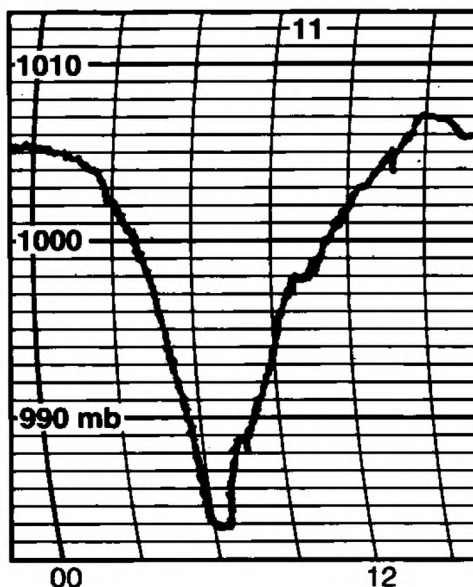
## TROPICAL STORM 'HELEN'

### South China Sea

m.v. *Cardigan Bay*. Captain R.J. McLarty. Hong Kong to Singapore. Observers: the Master, Mr D. Stevens, 3rd Officer and ship's company.

10-11 August 1995. On the 10th when the vessel was still in Hong Kong, all Navtex and fax reports were gathered to plot the track of the deepening tropical storm Helen, and it was estimated that at the time of the vessel's departure the storm would be some 200 n.mile south of Hong Kong, moving north-westerly at 10 knots. On leaving the port the course was adjusted to steer SE×E to allow the storm to pass ahead of the vessel.

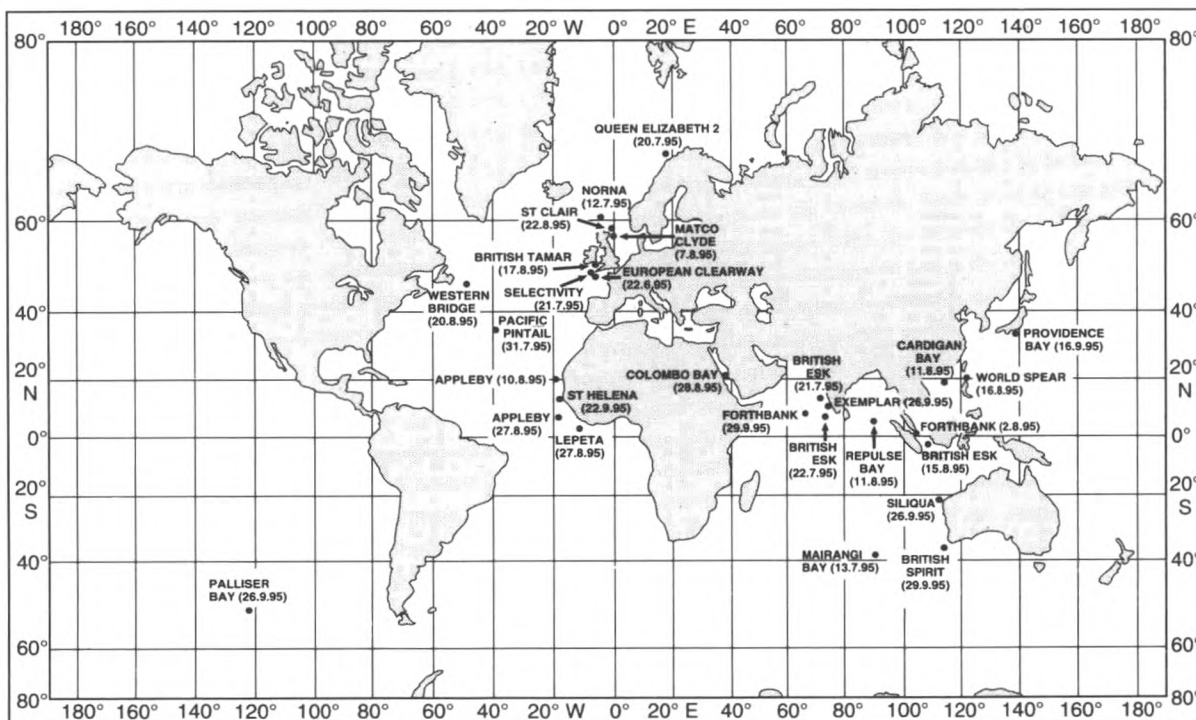
During the morning of the 11th the reports and forecasts were plotted but at 0300 it was observed that Helen, instead of tracking north-west as anticipated, had altered course and was tracking towards the ship. The ship's course was then altered to take it away from the eye of the storm. By 0400 UTC the wind had increased to ENE'ly, force 7 and was strengthening all the time as the pressure fell to 1001.4 mb. At 0600, the wind was SE×E'ly, force 8 while the pressure had fallen to 986.9 mb, see barograph chart, and the storm centre was only 25 n.mile away on the starboard bow, with winds of force 9 being experienced. Throughout the next 20 minutes or so, a band of torrential rain crossed the vessel before the heavy cloud cleared partly to give blue skies while the rain then ceased as the wind died to no more than force 3.



These conditions lasted for about 10–15 minutes, then, more torrential rain followed by increasing winds of S'y, force 8–9 reached the ship. Over the next two hours the wind veered to SW'y at a steady force 9; during this period the vessel's course was altered accordingly to give bow seas, the vessel was pitching moderately and rolling no more than 5°.

At 1300 the wind decreased rapidly to SSW'y, force 5 and veered slightly, indicating that the storm was away to the north. The vessel met its original track of 208° at 2100 and the storm's progress was plotted for the next day or so as it headed through Mirs Bay, just east of Hong Kong.

Position of ship at 1200 UTC on the 11th: 18° 42'N, 115° 18'E.



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



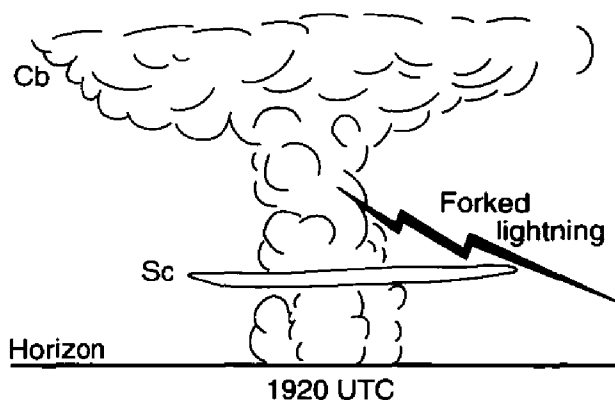
## THUNDERSTORMS

### Eastern North Atlantic

R.M.S. *St Helena*. Captain D. Roberts. At Banjul. Observers: the Master and ship's company.

22 September 1995. At 0400 UTC strong winds were experienced whilst the vessel was alongside at Banjul and at 0500 heavy rain stopped cargo work; during the height of the squall the wind reached force 9 and waves were breaking onto the jetty. The rain ceased an hour later and the weather throughout the rest of the day settled into calms or light airs with partly clouded skies.

At about 1915 when the vessel was departing from the Gambia River a towering cumulonimbus cloud was observed to starboard, over the mouth of the Saloum River, with frequent flashes of forked lightning and rain echoes off the river mouth showing on both 3-cm and 10-cm radars. The cloud had the appearance of a mushroom, see sketch, as a tall and narrow cumuliform column extended apparently to the tropopause then spread to form a circular canopy with mamma beneath it and some cirrus around the outer edge. There was also a thin layer of stratocumulus about one-quarter of the way up from the base of the column.



At 1930 the cloud lost its definition, becoming a featureless mass of altostratus covering 5 oktas of the sky accompanied by some 'flattened' cumulus below, visible in the lightning. The vessel was 12 n.mile offshore, heading 325°, and almost continuous sheet lightning was visible through an arc of 90° at the horizon along with occasional vertical forks extending to the surface, no thunder was heard. The dry-bulb temperature at this time was 29.5° whilst the sea-water temperature was 30.2° and the pressure was 1012.2 mb.

The sheet lightning was still continuous at 2100, with frequent forked lightning, the sky being completely covered by altostratus and cirrostratus; half an hour later the whole starboard horizon from right ahead to right astern was lit by sheet lightning and the area increased over the next 15 minutes to include the entire horizon as occasional vertical forks were noted in the direction of Dakar. The wind at this time was N'y, force 3. Rain echoes showed 7 n.mile to starboard, extending 13–15 n.mile from the coast in a band parallel to the shore, and at 2200 rain commenced at the vessel, lasting for half an hour during which time thunder was heard and the wind increased to E'y, force 5–6. Lightning continued to be visible until 0300 on the 23rd.

Position of ship at 2130: 14° 03'N, 17° 09'W.

## **DUST**

### **Red Sea**

m.v. *Colombo Bay*. Captain D.C. Thomson. Singapore to Suez. Observer: Mr N.P. Barrington, 2nd Officer.

28 August 1995. At 0730 UTC during the morning watch, a band of interference varying from 2–4 n.mile in width was observed to be developing slowly at a range of about 8 n.mile on the 3-cm radar and steadily increased in density, making targets difficult to distinguish. [See photograph on the cover of this issue.]

The 'auto clutter' function on the radar reduced the interference by about 50 per cent, and although it was also present on the 10-cm radar, in exactly the same form, it was not nearly as pronounced.

After about 2½ hours the interference had increased to its maximum density before reducing to more or less nothing. This phenomenon is frequently observed in the Red Sea.

Weather conditions at the time were: air temperature 32.3°, wet bulb 27.6°, sea 30.8°, pressure 1003.5 mb. Visibility 18 n.mile with clear skies.

Position of ship: 21° 31'N, 38° 08'E.

*Note.* Captain J.F. Hayes, Senior Lecturer at Fleetwood Nautical Campus, comments:

'An excellent photograph of the Decca Bridgmaster radar picture showing what appears to be echoes of airborne dust. The unusual aspect of this sighting is that it appeared to move with the vessel for a considerable period of several hours.'

## **TIDE RIP**

### **Luzon Strait**

m.v. *World Spear*. Captain R.G. Pym. Shimizu to Singapore. Observer: Mr B.H. Birch, Chief Officer.

16 August 1995. At 0910 UTC whilst the vessel was crossing the Calayan Bank, it met a very distinct tide rip lying 170°–350°. The appearance of the sea surface to the east of it was normal for the winds of force 4 being experienced but to the west of the rip, the sea was calm and glassy for approximately 80 m before gradually building up to the normal 'force 4' appearance over the next 600 m. The sea-water temperature dropped from 30.5° to 29.5° across the rip.

The vessel's beam is 32 m and its wake of approximately 40 m across was displaced by its breadth in 1½ minutes indicating that the water to the east of the rip was moving north at nearly 1 knot in relation to the water to the west of the rip.

At the time the vessel was on a course of 228° at 14.0 knots and the wind direction and speed was E×N'y, force 4.

Position of ship: 19° 47'N, 121° 20'E.

## **CETACEA**

### **Arabian Sea**

m.v. *Forthbank*. Captain W. Campbell. Singapore to Suez. Observers: Mr A.D. MacPherson, Chief Officer.

29 September 1995. At 1200 UTC whilst the vessel was on a course of 282° at 15.5 knots, a school of whales was sighted fairly close on the starboard bow;

several sightings of unidentified blows had been made over the previous 36 hours but this one looked more promising. Course was altered by 10° to starboard and just reward was received as the whales did not sound. Of the estimated 12–15 individuals, one large pair in particular appeared to be basking in the sun and seemed to be oblivious of the ship's presence; they are shown in the sketch.



These whales were about 12 m long and passed roughly 3 cables from the vessel, travelling in a north-westerly direction. They were brownish-grey in colour with a low triangular dorsal fin and they behaved very lazily, blowing frequently (at least every minute). It was thought that they were probably Sperm whales but doubt existed because at no time, with this pair or any of the other whales, were their flukes seen.

Weather conditions were: air temperature 28.0°, wet bulb 25.4°, wind, WNW'ly, force 1. The cloud cover was 1 okta of altocumulus and there was a south-westerly swell.

Position of ship: 09° 12'N, 64° 48'E.

### North Atlantic Ocean

f.p.v. *Norna*. Captain D.L. Rattray. Fishery patrol duties. Observers: Mr A. Davidson, Chief Officer and Mr D. Reid, A.B.

12 July 1995. Whilst on routine patrol duties at 0450 UTC, west of Shetland, two groups of Killer whales were observed about 1 n.mile apart, swimming in a north-easterly direction. The first group consisted of five or six large individuals with dorsal fins up to 1.8 m high while the second group held three large whales and two smaller ones which were leaping out of the water. These two smaller individuals were 2.4–3.0 m long with dorsal fins about 0.6 m tall.

The sea state was moderate with waves of 1.8 m and the whales travelled fairly fast, passing within 0.3 n.mile of the ship.

Position of ship: 60° 14'N, 04° 14'W.

*Note 1.* We have received two other reports of Killer whales: Mr S. Smith, 2nd Officer on the *Queen Elizabeth 2* spotted two groups of about six whales heading south-south-west in position 69° 25'N, 15° 31'E on 20 July 1995, and Mr J. Parkin, 3rd Officer on the *Western Bridge* watched two Killer whales breaching whilst the ship was off Newfoundland, in position 46° 21'N, 49° 19'W, on 20 August 1995.

*Note 2.* Miss K. Hughes, of Earthkind's *Ocean Defender* project, comments:

'Killer whales or Orcas (*Orcinus orca*) are the largest members of the Delphinidae. The black-and-white markings and huge dorsal fin of the males makes them unmistakable. Male Orcas are about 9 m long, weighing up to 5000 kg, the females being smaller at about 7 m and 2000–3000 kg.

'Breaching, along with spy-hopping, lobtailing and flipper-slapping, is common behaviour. Close-knit family groups, known as pods, are also typical of Orcas. It is known, especially from studies of Orcas off the north-west coast of North America, that the pods are of two types, "transients" or

"residents", distinguishable by both their appearance and behaviour. Individual pods also differ in their vocalisations, each having a distinct dialect. This species shows no set pattern of migration and is one of the most wide-ranging mammals on earth. Their movements tend to be determined by the distribution and density of their prey, which is extremely varied ranging from fish to seals, and attacks have even been noted on Blue whales. However, they are more frequently sighted in cooler waters.

## **TURTLES**

### **Indian Ocean**

m.v. *British Esk*. Captain P.R. Anderson. Mormugao to Singapore. Observers: Mr T.T. Latto, 2nd Officer and Mr K.C. Tullock, Cadet.

22 July 1995. At 1101 UTC a wooden pallet was noted passing close down the ship's side; on closer inspection through binoculars, a large turtle was seen swimming close to it. Observation was brief but a distinct yellow edge to the turtle's shell was noted, the shell colour being a light-grey colour and quite ridged in the middle. The pallet was helpful in giving an idea of size and the turtle was estimated to be about 80 cm long.

At the time of the sighting the the wind was NW'ly, force 2 and there was a confused swell of 3 m in height.

Position of ship: 09° 24.0'N, 75° 52.9'E.

### **Strait of Singapore**

Mormugao to Singapore. Observers: Mr T.T. Latto, Mr K.C. Tullock, Cadet and Mr A.O. Ganguly, Cadet.

On 15 August 1995 whilst alongside SRC No.2 Berth, Selat Jurong (Singapore) during ballast operations prior to loading cargo, a turtle was seen swimming on the surface close to the vessel's port side, between the ship and the jetty. The turtle was very large, estimated at 1 m long and its shell was a mottled-brown colour while its thick neck and head were of the same colour but also had black patches. Its front flippers were longer than the rear ones and were the same colour as its head and there was also a long tail which was about the same length as the rear flippers.

As it approached the side of the ship, the turtle dived but reappeared about 20 minutes later in the same position and so photographs were taken [one of which appears on page 123]. After less than a minute on the surface it dived and was not seen again. On consulting *The Seafarer's Guide to Marine Life*, by P.V. Horsman, it was decided that this was probably a Loggerhead turtle.

Position of ship: 01° 17.6'N, 103° 43.08'E.

## **FISH**

### **North Atlantic Ocean**

m.v. *European Clearway*. Captain K. Riley. Cherbourg to Rosslare. Observer: Mr A.A. Facey, 2nd Officer.

22 June 1995. The morning was beautifully sunny with a gentle to moderate breeze and, needless to say, sailing craft and fishing boats were out in numbers. At 0640 UTC when the ship was just outside Mount's Bay [Cornwall, south-west England] the Lookout reported a few fishing markers so I picked up the binoculars

to scan the horizon and also the vicinity of the ship; it was then I spotted two fins at around 45 m fine on the starboard bow, and instantly assumed them to be a couple of dolphins engaged in 'horseplay' but as they drew closer it was apparent that the fins were not 'dolphin-like' and the behaviour was not right.

As they came closer still, I was amazed to discover the two fins belonged to one fish and they were both upright (one dorsal and the other the tail fin). My thought was 'shark', it was a uniform medium to dark-brown colour and was at least 6 m long approximately although the length was difficult to judge from the bridge wing. The shark remained seemingly undisturbed by the ship's bow wave but it decided to dive when half-way along the ship's side.

On consulting *The Seafarer's Guide to Marine Life*, I was in doubt whether it was a Basking shark because the dorsal fin appeared somewhat displaced towards the rear end of the fish and it was of a fairly rounded outline while its head looked quite slender and fairly sharp. It was more like a Thresher shark, going by the description in the book but the only thing the did not quite fit was the long tail fin of the Thresher.

Weather conditions at the time were: dry bulb 16.0°, sea-water temperature 15.0° (by condenser intake), pressure 1029.5 mb and the cloud cover was 5 oktas of cirrus.

Position of ship: 49° 59.5'N, 05° 35'W.

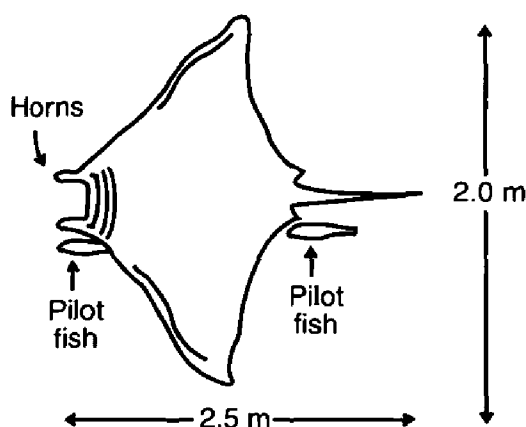
### North Atlantic Ocean

m.v. *Appleby*. Captain K. Milburn. Saldanha Bay to Port Talbot. Observers: the Master, Mr I. Gravatt, Chief Officer, Mr G. Terriza, 2nd Officer and members of ship's company.

10 August 1995. Whilst the vessel was following a course of 024° at 12 knots, hundreds of flying-fish were disturbed to starboard and to port of the vessel at 1600 UTC; there were enough on the starboard side to make it hard to distinguish individuals re-entering the water in all the splashing, the whole area close to the bow wave was disturbed by the movement of the fish.

At the time the sea temperature was 26.0°, the wind was NE×N'ly, force 6 and there was a moderate sea with heavy swell.

Later in the month, on the 27th, when the vessel was on the return voyage to Port Talbot a large Manta ray was sighted at 1400. As shown in the sketch it was



about 2.5 m from head to tail and had a 'wing-span' of about 2 m and was a golden-brown colour. It swam just below the surface and was accompanied by two pilot fish, white in colour, one of which swam at the head (under the ray's mouth)



while the other was at the back, below its tail. The fish passed approximately 5 m down the ship's side and were heading north.

Position of ship on 10th August: 20° 47'N, 19° 36'W.

Position of ship on 27th August: 08° 26.99'N, 18° 39.78'W.

*Note.* Dr F. Evans, of the Dove Marine Laboratory, Cullercoats, comments:

'I do not recall a Selected Ship report of flying-fish at this remarkable density, although I have myself seen intense concentrations of spawning flying-fish in the West Indian fishery but that was close inshore. However, there are numerous summer reports of the two-winger *Exocoetus volitans* seen west of C. Blanco (21°N), all reports being clustered to the south, or tropical side, of the 23-degree isotherm. It may be that these are pre-spawning populations assembling in an area of tight surface isotherms. Records of distribution fluctuations suggest the shoals migrate over many hundreds of miles in the course of the year. I am pleased to add this interesting report to my records.

'All mantas (cow rays, bat rays, eagle rays, devil rays) are tropical in distribution but the two largest are distinguished by having horn-like projections at the front of the head, as in the present illustration. Both the horned species grow to a very large size. In the Atlantic the larger *Manta birostris* is more widespread, *Mobula mobular* being more restricted to the eastern side. (Common names are unhelpful; both rays are called by several names, in particular, "great devil ray".) Both species look remarkably similar except on the closest inspection and it is not possible to say which of the two the observers saw. There are said to be ten Indo-Pacific species of big manta ray but they seem to differ in name only and are probably all the same species.'

## BIRDS

### Indian Ocean

m.v. *Siliqua*. Captain D.H. Rayfield. At anchor off Dampier. Observers: the Master and members of ship's company.

26 September 1995. At 1300 UTC a bird, thought to be a Wedge-tailed Shearwater was found on the starboard bridge wing; it seemed unable to lift off the deck although it could flap its wings freely. The bird was approached and allowed the Master within 30 cm of where it was sitting. The decision was made that the best course of action was to lift the bird over the bulwark and let 'her' fly away, so the Master lifted it up and let it go over the ship's side. The bird then flew down to the surface and was eventually lost from sight. At the same time, four or five dolphins were noticed at the ship's side and were present for about four hours. They were 2.1–2.4 m long and had very white undersides. With the ship's lighting attracting fish, it seemed to be dinner time for the dolphins and they swam on their backs while chasing flying-fish.

Position of ship: approximately 20° 45'S, 116° 48'E.

m.v. *British Spirit*. Captain M. Pocklington. Ras Tanura to Whangarei. Observer: Mr T. Blyth, 2nd Officer.

29 September 1995. The vessel was south of Cape Leeuwin, south-west Australia and four large albatrosses had been with it since the early hours of the morning. All four seemed to be at different stages of adulthood as their markings were all quite different. They looked like the Yellow-nosed albatross [sic] as the bill was a very light pink with the tip a definite light yellow. Their bellies were all white and the undersides of the wings were too with the exception of the edges

which were a brownish-black colour. The top sides of the birds were also very different. The first had a brilliant white back with very black wings, the whiteness of the back tapered off sharply into the black of the wings; half-way down the length of the wings were white strips which were slightly speckled on either side. The second albatross was much the same but the colour of the wings was more brown than black and its back was very slightly speckled. The third one looked a very dirty off-white colour with brown-and-white speckled wings and a muddy-brown coloured back; the tips of its wings were a darker blackish-brown on both the top and undersides but the head was in total contrast as it was brilliant white. The fourth one seemed to keep its distance from the other three and had the same characteristics as the first one mentioned. It was the most curious and flew at eye level past the bridge many times; it followed the bow and sides of the ship whereas the others circled the wake astern and occasionally flew away from the ship.

At 0951 UTC as the sun started to set, all the albatrosses landed on the sea and seemed to be settling down for the evening. A few minutes earlier some very tall fins had been sighted, obviously belonging to Killer whales; they were right astern of the ship at about 3 n.mile, surfacing every 30–40 seconds and showed a quantity of their backs while the albatrosses were circling them. Mr Blyth did not think it was wise for the albatrosses to land where they did! Albatrosses stayed with the vessel until the evening of 1 October when it was in the middle of the Great Australian Bight.

Position of ship on 29 September: 35° 10'S, 115° 26'E.

*Note.* Captain P.W. Chilman of the Royal Naval Birdwatching Society, comments:

'I am afraid I cannot agree with your identification, the birds sound to me to be the Wandering Albatross (*Diomedea exulans*). The Wandering albatross always has a pink bill with a yellow tip while the Yellow-nose albatross has a black bill with a yellow to orange stripe along the top, except for juveniles which have entirely black bills. Yellow-nosed adults and juveniles are much the same except that the juvenile has a greyish head; they are both white with black upper wings which join black across the mantle. Wandering albatrosses go through a long series of plumages from almost brown as juveniles to practically pure white as full adults. Your birds could be described as teenage birds; the first and fourth are known as Stage 4, the second is Stage 3/4 and the third is Stage 2/3. As you will understand, the plumage changes slowly from one stage to another, the dark colouring is usually dark-brown but varies from almost black to quite light brown. The birds concerned would probably be two to four years old. After they leave the nest they are said to remain at sea for about seven years before returning to the breeding grounds.'

### **South Pacific Ocean**

m.v. *Palliser Bay*. Captain D.K. MacCorquodale. Port Chalmers to Lisbon.  
Observer: Mr K.S. Dowden, 3rd Officer.

26 September 1995. At 0100 UTC a large flock of seabirds came within close proximity to the vessel. Having a wing-span of 30–60 cm, the most striking feature about the birds was the patchy black-and-white plumage across the upper wings and back, see sketch.

The flock was very active, flying close to the sea surface and moving with the wind waves and swell; it was a pleasing sight to see after five days on passage with overcast skies and grey seas.



The birds remained with the vessel for several days but none were seen to land on the ship. Upon consulting the guide to seabirds by Gerald Tuck, the birds were considered to be Cape Pigeons (or Pintado petrels). The nearest land was Pitcairn Island some 1434 n.mile to the north.

Position of ship: 50° 00'S, 122° 55'W.

*Note.* Captain Chilman comments:

'The Cape Petrel (*Daption capense*), is also known as the Cape Pigeon or Pintado Petrel. I agree with your identification, a delightful little bird which is found all around the world in the Southern Ocean. They breed on many of the oceanic islands and also on the Antarctic Peninsular and spread north to about 25°S although they have been seen as far as the Equator. They are usually seen in flocks, there is no difference between the sexes or between adults and immatures.'

## BIOLUMINESCENCE

### Indian Ocean

m.v. *Exemplar*. Captain I. Beetham. Singapore to Mormugao. Observers: Mr C. MacSweeney, 2nd Officer and Mr J. Simbajon, A.B.

26 September 1995. Bioluminescence had been noted for three hours around the vessel and in the wake when, at about 2000 UTC the effects around the ship increased in amount and intensity while there also appeared to be a brightening of the horizon ahead.

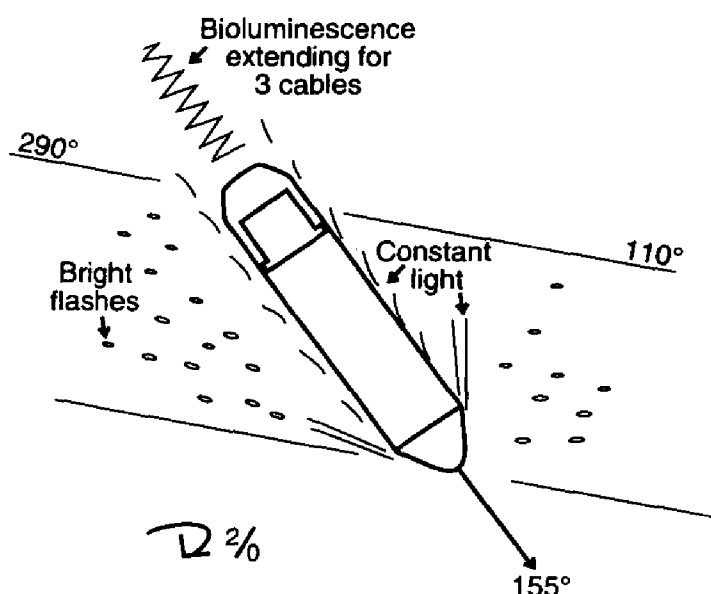
This 'brightening' drew closer rapidly and turned out to be intense bioluminescence extending to approximately 0.5 n.mile either side of the bow and giving the appearance of the sea being alight. As the vessel closed on this area the bioluminescence started to draw in closer to it and eventually a bright luminous-green colour extended out to about 18 m on either side. The area beyond this and also the wake was covered in rapid flashes of light. The display continued for the next two hours but was less intense and gradually faded away. At the time of the sighting the ship was in ballast with a draft of 7.6 m and was on a course of 337° at 14.0 knots. The wind was W'ly, force 4 and there was a moderate sea. On the vessel's return voyage through the same area about a fortnight later several unidentified whales were seen during the daylight hours.

Position of ship: 09° 18'N, 75° 57'E.

## Indian Ocean

m.v. *British Esk*. Captain P.R. Anderson. Mormugao to Singapore. Observers: Mr T.T. Latto, 2nd Officer, Mr K.C. Tullock, Cadet and Mr T.O. Davies, Cadet.

21 July 1995. At 2352 UTC bioluminescence was observed at some distance off the vessel's starboard bow, taking the form of bright flashes in breaking waves and it was estimated to be 0.5 n.mile ahead. As the vessel approached, a wide band of bright flashes could be seen lying  $290^{\circ}$ – $110^{\circ}$  and when the bow wave reached it a spectacular display of bioluminescence took place in the bow wave and then the wake while a constant and very bright light given was off along the ship's entire length, see sketch.



Further out from the wake, bright flashes of about 1 second in duration continued in the breaking waves. Astern in the propeller wake, the light continued for about 3 cables but was not quite as bright as along the ship's side and in the bow wave. The display lasted for just over one minute while the vessel passed through the band, no further lights were seen afterwards.

At the time the air temperature was  $27.6^{\circ}$ , wet bulb  $25.6^{\circ}$ , sea  $27.5^{\circ}$ , pressure 1007.7 mb, wind SW'ly, force 4. The ship's course was  $155^{\circ}$  at 14.2 knots and there was a long, heavy swell from the west at 4.5 m.

Position of ship:  $11^{\circ} 51.5'N$ ,  $74^{\circ} 43.5'E$ .

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

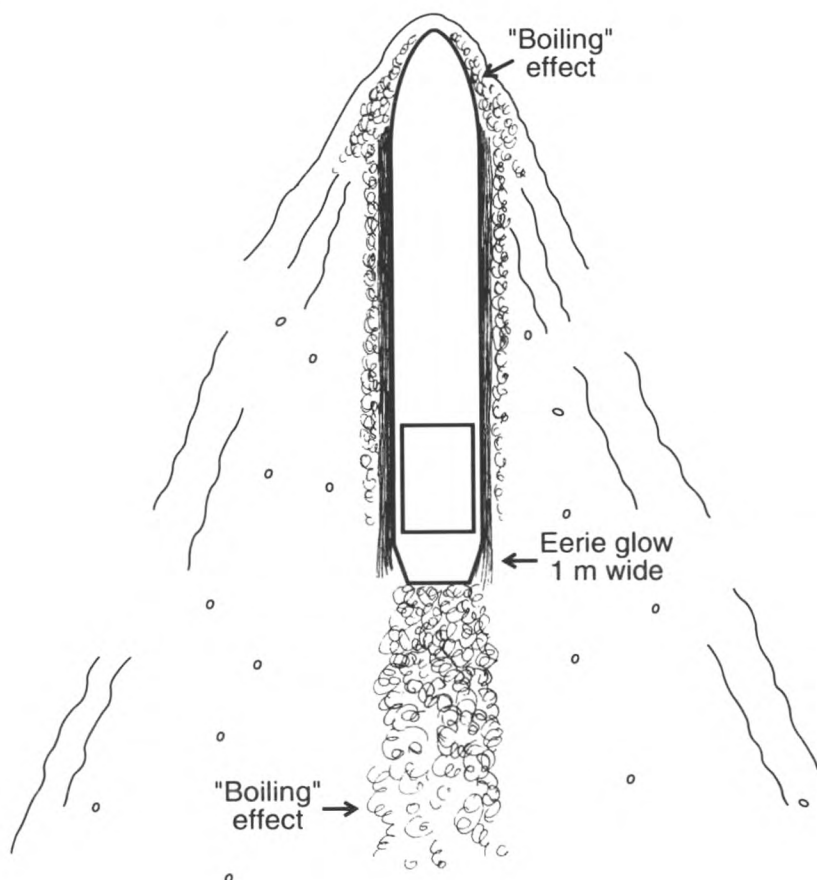
'The vessel appears to have crossed a windrow of surface plankton and the luminescence was probably produced by several kinds of organism. Dinoflagellates were probably responsible for the constant light and perhaps jellies or lanternfish for the flashes.'

## North Atlantic Ocean

m.v. *Pacific Pintail*. Captain J.M. Miller. Barrow-in-Furness to Cristobal. Observers: the Master, Mr J. Appleby, Chief Officer, Mr C. Bates, 2nd Officer, Mr P. Mahoney, 3rd Officer, Mr P. Austen, Radio Officer and ship's company.

31 July 1995. During evening twilight the vessel was steaming through the unusually smooth waters of the North Atlantic, headed for the Panama Canal. The sea was almost like a mirror and there was a gentle half-metre swell.

As darkness approached, it became apparent that the vessel's wake was much more prominent than was usually the case. Indeed, as it got darker the wake began to glow and effervesce in a vivid turquoise-green. The effect was even more noticeable far out to port, starboard and well astern, the net result being a large, vivid V-shaped wake trailing astern for perhaps 3 cables, with numerous offshoots, see sketch.



As the cloak of darkness fully closed in, the effect became ever more startling and another phenomenon occurred. The ship's hull along the entire length took on an eerie glow about 1 m wide, as if a gigantic, green florescent tube had been installed on either side. The aura was of a marked intensity, and the combined effect of this and the luminous wake effectively turned night into day. Backscatter was such that visibility was affected somewhat and the inside of the wheel-house was illuminated to a great extent.

Bioluminescence had been seen before by all the observers but they were all agreed that on this particular night it was of a rare and awe-inspiring intensity.

The amazing light show continued for most of the night and it was no surprise to find that the following night, even though bioluminescence was evident, it was nowhere nearly as impressive as that which has been described. All of the observers were grateful that they had witnessed what was probably a unique occurrence and it left them marvelling at how nature can continue to provide such impressive and surprising phenomena.

Position of ship: 34° 19'N, 39° 33'W.

*Note.* Dr Herring comments:

'This must indeed have been a spectacular sight. The cause would almost certainly have been a dense surface layer of dinoflagellates, probably one called *Noctiluca*. Some two weeks after this event I



was on the Royal Research Vessel *Charles Darwin* in the same area (to the south-west of the Azores) when we encountered similar luminescence in very calm water, caused by this dinoflagellate. It was as intense as I have ever seen but not quite up to the standard of the *Pacific Pintail*!

### St George's Channel

m.v. *British Tamar*. Captain T.L. Cullen. Swansea to Dunkirk. Observers: Mr G. Whammond, 3rd Officer, Mr A. Shearer, 3rd Officer and Mr J. McGowan, Cadet.

17 August 1995. Between 2215 and 2340 UTC intense bioluminescence was encountered whilst the ship was on a course of  $217^\circ$  at 14 knots [at the southern end of the Irish Sea]. The luminescence was at its greatest effect as the crests of the bow wave broke, forming bright streaks along the side of the vessel. The brilliance of these streaks decreased as they dispersed to form a faint speckle in the wake. A sample of water was taken and found to have a temperature of  $18.9^\circ$ ; when shaken, luminous particles were observed in the jar, the sample was then returned to its natural habitat. At the time of the observation there was virtually no swell and the sea was calm, with light airs.

Position of ship:  $50^\circ 51'N$ ,  $05^\circ 20'W$ .

*Note.* Dr Herring comments:

'This is typical of a dinoflagellate bloom, especially the speckles in the sample. Some species float to the surface in calm conditions (as here), forming a scum, and the displays are often at their most intense under these conditions.'

### ABNORMAL REFRACTION

#### Java Sea

m.v. *Forthbank*. Captain W. Campbell. Singapore to Port Moresby. Observer: Mr A.D. MacPherson, Chief Officer.

2 August 1995. At 2300 UTC whilst in transit of the Karimata Strait (between Borneo and Sumatera) the refraction phenomenon shown in the sketch was observed. On the horizon, P. Pesemut ( $02^\circ 30'S$ ,  $108^\circ 50.5'E$ ) was seen at a distance of 16.5 n.mile; this is a very small, low-lying island and has a light which is charted as being 43 m high.



As the vessel closed on the island to a distance of 10 n.mile it became as expected, a low-lying tree-covered island. Also visible at the time of sighting P. Pesemut was P. Nangka at 23.5 n.mile; this island was 180 m high and showed no refractive effects.

Weather conditions at the time were: air temperature 26.8°, wet bulb 25.4°, pressure 1008.3 mb, wind SE'ly, force 3. Cloud cover was 4 oktas of small cumulus and 7 oktas of altocumulus.

Position of ship: 02° 17'S, 108° 49'E.

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

'I think this can be claimed as a case of Fata Morgana, which combines the conditions of superior mirage with those of inferior mirage (that is where there is warm air very near the surface, then cold air with warmer air again above that), resulting in a condition in which rays can be trapped or "ducted" for a long distance in the cold layer by, in effect, being repeatedly reflected at its upper and lower surfaces. This gives a series of images of each feature of the object, one above the other, one image corresponding to each possible number of reflections at one of the surfaces of the cold layer. Both the observed object and the observer must be in that cold layer, between its two surfaces. Apart from this, there is a partial analogy to the way multiple images can be seen by oblique viewing in a thick glass mirror.'

## **RAINBOWS**

### **North Atlantic Ocean**

m.v. *Lepeta*. Captain D. Freeman. On passage towards Antifer. Observer: the Master and Mr A.K. Gladstone, 3rd Officer.

27 August 1995. At 0920 UTC a large and distinct rainbow was observed forming at a distance of approximately 4 n.mile, bearing 280°. As the primary rainbow formed, two secondary bows with the colour sequence reversed, also formed but to a lesser extent. The colours of the primary rainbow became more defined as the vessel neared it and the base of it increased.

The cloud cover was altocumulus formed from the spreading out of cumulus, with rain reaching the surface, and the phenomenon lasted for 20 minutes. Ship's course and speed was 322° at 13.0 knots.

Position of ship: 05° 48'N, 14° 50'W.

*Note.* Dr White comments:

'In talking of the distance of the rainbows from them, the observers here are really referring to the distance of raindrops producing the bows. For the "base" of the primary bow to have increased significantly during the observation, I take it that it did not extend right down to the horizon, at least initially. A point which puzzles me is that the observers refer to "two secondary bows". The only way I can think that this could happen is if one of them were a supernumerary secondary bow, in which case the two secondary bows should have been concentric and adjacent (contiguous) without any significant gap between them, such would be quite rare.

## **CORONA**

### **Indian Ocean**

m.v. *Mairangi Bay*. Captain A.W. Ellis. Rotterdam to Fremantle. Observers: Mr S.L. Rayson, 3rd Officer and Mr K. Thompson, SM1.

13 July 1995. A cumulus cloud passed across the bright full moon at about 1658 UTC and a corona was observed. The area immediately around the moon was white and this was surrounded by a reddish ring; outside this lay the full colours of the spectrum, from blue nearest the centre to red at the outer edge.

These outer coloured rings were well defined and it was a truly beautiful sight. Unfortunately, it did not last long as the cloud was only a small one, and it was impossible to measure any size except by 'guestimate', perhaps 5° across.

Many other clouds passed across the moon after that and showed the aureole but none produced a corona.

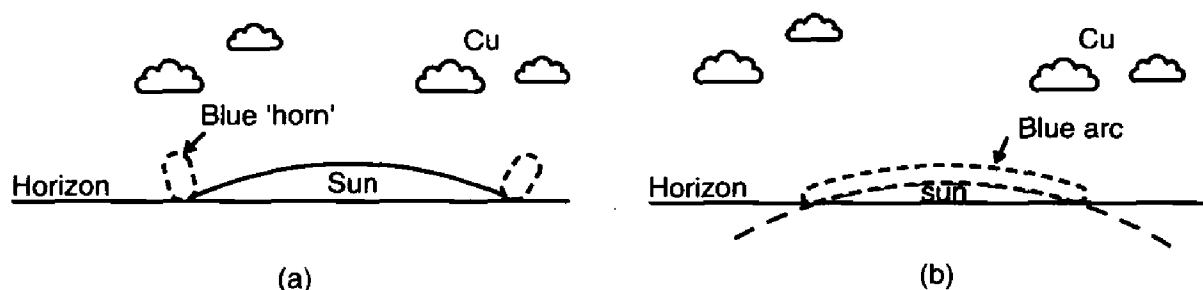
Position of ship: 38° 23.9'S, 92° 33.3'E.

## BLUE FLASH

### Bay of Bengal

m.v. *Repulse Bay*. Captain A.J. Leslie. Jeddah to Port Klang. Observers: Mr N.A. Voss, 3rd Officer and Mr A. Howes, SM1.

11 August 1995. Prior to sunset the vessel was proceeding due east across the Bay of Bengal and it was quite apparent that the sun was still very bright and had not taken on its usual dark-orange or red appearance; even with half its diameter above the horizon, the sun was much too bright to view directly. As the last segment of the sun dipped below the horizon, a blue 'horn' formed at each end of it, as shown in sketch (a), and these then closed up to form a bright-blue arc, as shown in sketch (b).



At the time the air temperature was 31.0°, wet bulb 25.0°, sea 29.6°, pressure 1009.8 mb. There were light airs and the cloud cover was 1 okta of small cumulus with 6 oktas of altocumulus and altostratus with bases at different levels.

Position of ship: 05° 56'N, 91° 36'E.

*Note.* Dr White comments:

'This is very interesting. As the observers seem to be aware, this blue flash, or a white flash followed by a deep-blue one, is a known variant of the green flash. In fact, the second sketch shows what would be known as a "blue rim". The fact that only "horns" were seen at first may owe something to contrast and irradiation effects obscuring the fainter blue rim at azimuths where part of the brighter white disc is



above the horizon, though refraction could also produce a distortion, shown in my sketch, without significant variation in surface brightness within the blue and white arcs.'

*Editor's note.* The observers on *Mairangi Bay* recorded a green flash at sunset on 27 August whilst on passage between Yokohama and Hong Kong.

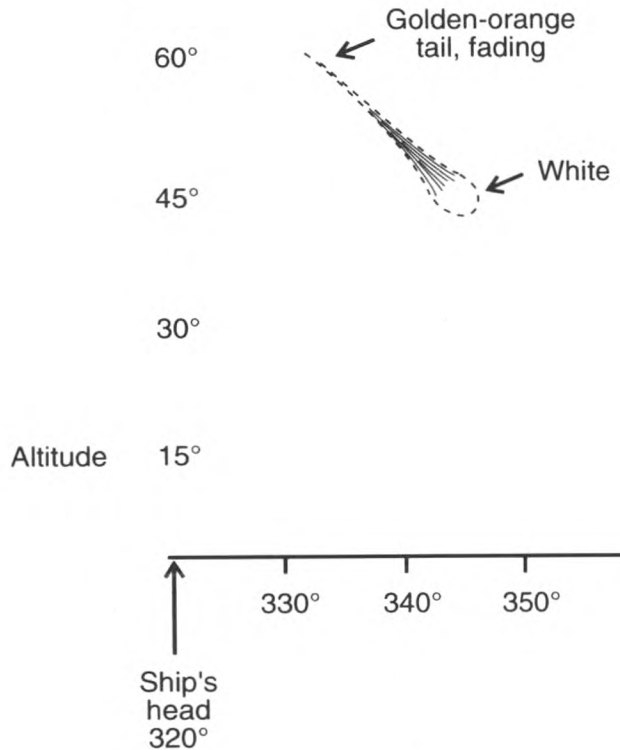
A green flash was also noted at 2016 on 21 July by Captain T.L. Jeffery, on board the *Selectivity* in U.K. waters between Hunterston and Ipswich, it lasted for 1-2 seconds.

## METEOR

### North Sea

m.v. *Matco Clyde*. Captain M. Cadman. Le Havre to Scalp Bank. Observers: Mr S.A.S. Olbison, 3rd Officer, Mr A. Fleming, Cadet and Mr G. Keogh, SG1.

7 August 1995. At 2225 UTC whilst the vessel was east of the Firth of Forth, on a course of  $320^\circ$  at 12.5 knots, a quite spectacular scene was observed as a remarkably impressive shooting star was seen to reach across the night sky, see sketch. It was first seen bearing approximately  $330^\circ$  at altitude  $60^\circ$  and gradually, over the following 4 seconds, it descended to an altitude of about  $45^\circ$  before finally disappearing from sight bearing  $345^\circ$ .



The light consisted of a large white ball which was followed by a long, golden-orange tail that seemed to fade away as the star fell.

Position of ship:  $56^\circ 10'N$ ,  $01^\circ 18.6'W$ .

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

'The phenomenon was without doubt a fireball produced when a small fragment of interplanetary material burned up as it descended in the atmosphere. The tail of orange lights suggests that the fragment consisted of very friable material and that small pieces broke away from the main body as it fell.'

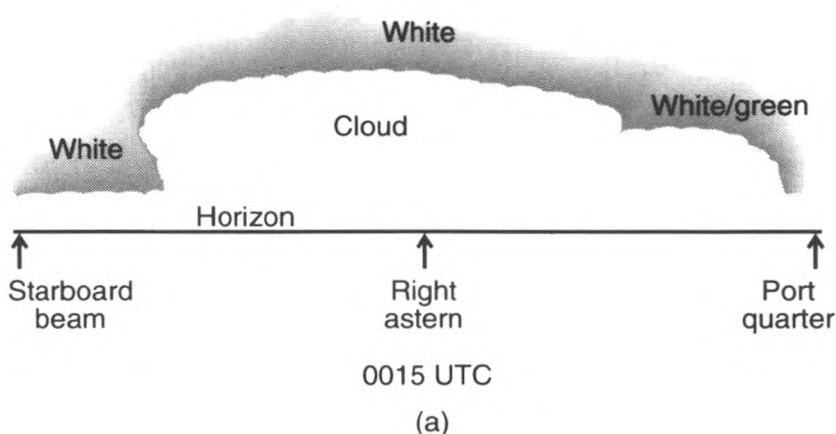
## AURORA BOREALIS

### North Sea

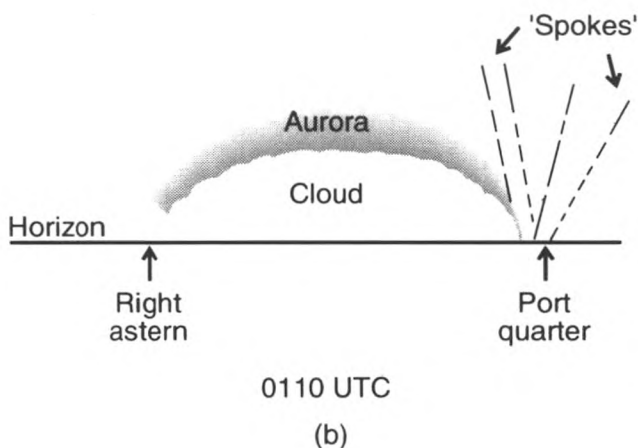
m.v. *St Clair*. Captain J.C. Cowie. Lerwick to Aberdeen. Observers: Mr M.R. Pickles, 2nd Officer, Mr G. Webster, SG1A and Mr J. Williamson, SG1B.

22/23 August 1995. At 0015 UTC the aurora was evident in a white band about

8° deep at an estimated altitude of 15°–20° above the horizon. The band covered an arc of 90° from the starboard beam to the port quarter, as viewed right astern, see sketch (a).



The band ‘thinned out’ on the starboard quarter at 0044, becoming more green in appearance, and at 0056 it became much less pronounced on the port quarter while remaining very bright to starboard, the display being about 6° above the cloud (3 oktas, all to the north) and generally white in appearance.



At 0110 ‘spoking’ was very evident on the port quarter, see sketch (b), while the area on the starboard quarter began to fade. The aurora was fading out rapidly at 0118 and the spoke effect ceased. Observations were then ended owing to traffic commitments.

Position of ship at 0015 UTC: 58° 29.5’N, 01° 24.3’W.

## MISCELLANY ...

### An additional mélange of maritime sightings

*Appleby*. 16 July 1995. Second Officer G. Terriza, watched several large hammerhead sharks near the ship in position 03° 19.5’S, 08° 48.3’W.

*Arctic Ranger*. 28 July 1995. Radio Officer M. Allison watched Humpback whales on two occasions in the Arctic Ocean whilst on course for new fishing grounds.



*British Skill.* 27 August 1995. Whilst in the Tasman Sea on passage to Whangarei Captain G.M. Hallett noted a school of 12 Common dolphins of various sizes. All were proceeding in a most active fashion as the vessel passed them in position 34° 39'S, 170° 31'E.

*Chiquita Jean.* 5 August 1995. Whilst on passage from Cristobal to Tilbury in position 40° 51'N, 24° 51'W, an orange-coloured drifting buoy was noted. The body was about 60 cm across and carried an antenna and what appeared to be a transmitter. It was assumed to be recording ocean current data.

*City of Durban.* 7 July 1995. Exceptional visibility was recorded by Third Officer B.M. Stroude as Cap Vert light was sighted at 33.4 n.mile from position 14° 14'N, 17° 46'W, whilst on passage between Cape Town and Zeebrugge.

*Colombo Bay.* 27 September 1995. Captain B.V. Chipperfield, Third Officer A. Firman and J. Capon, SM1 watched bioluminescence in wind waves from horizon to horizon in position 07° 03'N, 76° 11'E.

*Excelsior.* 29 August 1995. At 1900 UTC in position 39° 49'N, 44° 52'W, pilot whales of differing sizes and numbering 20–40 were sighted heading south before reversing their course to the north as the vessel passed.

*London Glory.* 10 July 1995. Whilst the vessel was passing through the Moçambique Channel on her maiden voyage, a tide rip was encountered at 21° 12'S, 37° 50'E. There were no 'white horses' marking the rip but numerous small whirlpools were noted. Crossing the rip produced an immediate swing of 12° to starboard.

*Kotuku.* (Observing for the New Zealand VOF). 28 September 1995. Frequent spots of bioluminescence were sighted around the vessel while off the east coast of South Island, by Chief Officer H.K.H. Taylor. Close observation revealed that the lights were caused by squid or jellyfish.

*Pholas.* 24 July 1995. A pod of 10–12 Killer whales was seen in position 65° 10.7'N, 06° 42.9'E; a further eight Killer whales were seen on 31 July in the same location.

*Putford Blazer.* 17 August 1995. At 0700 UTC and in thick fog, Captain W.A.E. Smith witnessed his first fog-bow in position 53° 45'N, 01° 05'E.

*Putford Skua.* 17 July 1995. Between 1500 and 1800 UTC whilst the vessel was in position 54° 03'N, 00° 52'E, a Minke whale was spotted in close attendance, sometimes coming alongside.

*Seillean.* 11 September 1995. Numerous small birds were recorded by Second Officer V. McAdam, Third Officer D. Smith and ship's company whilst stopped and producing oil from the Donan Oil Field (58° 22.7'N, 00° 52.7'E). Species noted up to 18 September included: Robin, Pied Wagtail (see photograph on page 122), Blackcap, Starling, Chaffinch, Redwing, Snipe, Dunlin and Kestrel (which helped itself to some of the smaller birds on one or two occasions).

(*Editor's note.* Commander M.B. Casement O.B.E., of the Royal Naval Birdwatching Society, said that this interesting variety of species is typical of what passes in great numbers across the North Sea, from Scandinavia to Western Europe, in September and October.)

*Shetland Service.* 2 September 1995. Whilst in position 57° 24'N, 11° 13'W on passage between Aberdeen and the Kittiwake Oil Field, Chief Officer D.E. Grief and M. Cruickshanks, Engineer, watched dolphins, porpoises and a Minke whale, the latter leaping clear of the water several times and landing on its back.

*Seki Cedar.* 31 August 1995. Whilst in position 42° 05.2'N, 07° 48.8'E, on passage between Livorno and Newcastle, Second Officer B.M. Stroude watched a waterspout develop and decay over a period of five minutes during which time it extended to about 300 m of the surface while raising spray to a height of 15 m.

*Westra.* 29 July 1995. In position 60° 20'N, 02° 04'W, Captain W.A. Brown and Chief Officer J. Ebby watched 10 groups each of 10–12 dolphins, possibly Bottlenose dolphins, in the vicinity of a fishing vessel and apparently feeding.

## SCENE AT SEA



*Photo. by N.P. Barrington*

A funnel cloud photographed from the *Colombo Bay* on 4 September 1995, in position  $45^{\circ} 26'N$ ,  $08^{\circ} 16'W$ .

*Editor's note.* The Tornado and Storm Research Organisation was pleased to see this example. Mr M. Rowe, of TORRO, said that although the phenomenon was reported as a funnel cloud, the fact that the sea surface was disturbed below it shows that it was in fact a waterspout. The lower part of it was invisible as the humidity was too low for condensation to occur.





Photo. by Captain W. Yeo

A composite picture showing shallow fog photographed from the *Cast Wolf* while about 25 n.mile west of Escoumains Pilot station, on 26 July 1995. At the time the sea temperature was  $1.7^{\circ}$  and the dry-bulb reading was  $17.5^{\circ}$ . The fog was about 25 m deep and showed a clear edge when the vessel passed clear of it, at which point the sea temperature increased sharply to  $10.5^{\circ}$ .

*Editor's note.* Without details of the wind speed or direction at the time of observation it is difficult to confirm the exact cause of the fog's formation but advection would be a possibility given the temperatures recorded. Advection occurs when moist air flows from a warm sea surface across one which is colder. The wind is the agent which spreads the coolest lower layers of the air through a greater depth, the stronger the wind the greater the depth of mixing. Arctic sea smoke can also be dense throughout a shallow layer close to the sea surface but forms when cold air flows across a relatively warm sea surface, the reverse of the conditions described.



Photo. by V.A. McAdam

Pied Wagtail pictured on board the *Seillean* in September whilst the vessel was working on the Donan Oil Field. (See page 118.)



Photo. by N. Coombs

A dragonfly on the *Superiority* in the English Channel on 21 September 1995. The insect was about 7.2 cm long and had a wing-span of 10.4 cm.

*Editor's note.* The dragonfly was identified by Mr A. Whittington, Assistant Curator of Entomology at the Royal Museum of Scotland, as a male of the species *Aeshna mixta* [one of the Hawker dragonflies], which is widespread in the Mediterranean region, central Europe and the near East.





A Corncrake which landed on the *Pacific Crane* on 17 September 1995. The ship was in position 41° 06'N, 15° 18'W, on passage from Cherbourg to Cristobal.

*Editor's note.* Commander M.B. Casement, O.B.E., of the Royal Naval Birdwatching Society, said that the bird's position so far out into the Atlantic, was remarkable. This species can be seen, often in great numbers, crossing the Mediterranean but the Atlantic would clearly have been suicidal.

*Photo. by T. Lunt*

A Sooty Tern on board the *Botany Bay* on 7 August 1995, in position 04° 38'N, 61° 38'E. Its arrival was heard during the night as a series of high-pitched screams and chirrups but it was not found until the morning. It remained on board for the whole day but did not touch any food offered.



*Photo. by M.A. Haynes*

*Editor's note.* Captain P.W. Chilman, of the Royal Naval Birdwatching Society, confirmed the identity of the tern and said the Sooty Tern is widespread throughout the tropical oceans, breeding on many oceanic islands, often in immense colonies. They are often met with many hundreds of miles from land, usually in quite large flocks but small groups and singles are not uncommon. They rarely settle on the water and it is suggested that they may feed at night as well as by day. Noted for their screams and squawks at night, they have the nickname of 'Wideawake' bird. They get their prey by swooping low over the water and snatching it from the surface. Captain Chilman said that he has rarely found any seabirds, except gulls, that feed on board.



Turtle, thought to be a Loggerhead, probably male, at Singapore. (See page 106.)

*Photo. by T.T. Latta*

# Coastal wind patterns revealed by hourly reports from a ship at sea\*

BY ERIC BRENSTRUM

(Meteorological Service of New Zealand Ltd)

Hourly wind reports from an automatic weather station onboard a research vessel have shown interesting structure in the wind field around New Zealand, and in particular, the existence of areas of strong winds tens of kilometres wide and hundreds of kilometres long formed by the interaction of a stable airstream and the orography of New Zealand.

## Introduction

The equipping of the fisheries research vessel *Tangaroa* with an automatic weather station provides an unprecedented opportunity to measure spatial and temporal variations in the wind field over the ocean, where data traditionally are very sparse.

Occasional anecdotes from fishers and other seafarers over the years have indicated much stronger winds than the forecasters expected in a number of places around the New Zealand coastline.

Reports of extreme winds southwest of Taranaki were confirmed with the commencement of synops every three hours from the Maui gas production platform. These showed, on occasion, 60–80 knots mean speed, when 30–40 knots might have been expected.

A study by Neale and Thompson (1978) of reports from fishing vessels off the West Coast of the South Island found large differences between the wind over land and sea. Another study by Stainer (1983) showed dramatic small-scale effects in the lee of high ground, with enhanced wind speeds being associated with small pressure falls.

During the period of this study the *Tangaroa* visited a number of different locations around the New Zealand coast in a variety of different synoptic situations.

The anemometer of the *Tangaroa* is positioned on top of a mast 25 m above sea level, and reports are received almost every hour when the ship is at sea. An onboard computer automatically allows for the ship's speed and direction in calculating the wind speed and direction.

The reports from the *Tangaroa* show the wind at sea is almost always stronger than the wind reported from adjacent land stations. This is thought to be due to a number of causes including friction, damming, position of the lee trough, and channelling around topography.

## Method

Some ten months of *Tangaroa* wind reports were examined to find cases when the ship was near the coastline of New Zealand's main islands. The ship's wind was then compared with nearby land stations and the synoptic situation was examined.

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\* Reprinted from the journal of the Meteorological Society of New Zealand, *Weather and Climate*, (1994) 14, by permission of the Editor.

## Results

### Case 1 (Figure 1)

At 17 UTC 24 March 1992 the *Tangaroa* was 70 km northeast of East Cape with a westnorthwest wind of 40 knots. Winds of 30–40 knots were experienced for about 12 hours, during which time *Tangaroa* covered an area of about 100 km long and 10 km wide. Prior to this, the wind was 20–25 knots and the ship was positioned further south, as can be seen from the diagram. From 23 UTC onwards, a different regime applies as the wind turns southwest when the lee trough moves offshore ahead of the weak front approaching from the south.

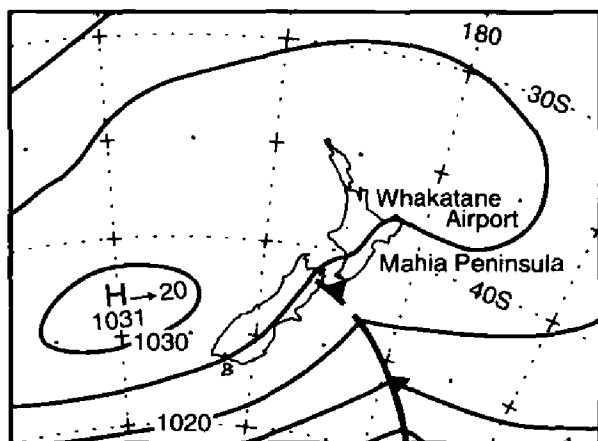


Figure 1a. Mean Sea Level pressure pattern at 18 UTC 24 March 1992 with 5 hPa spacing.

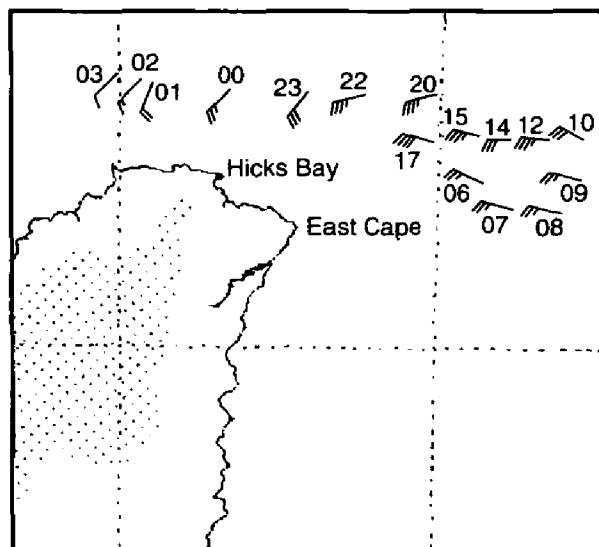


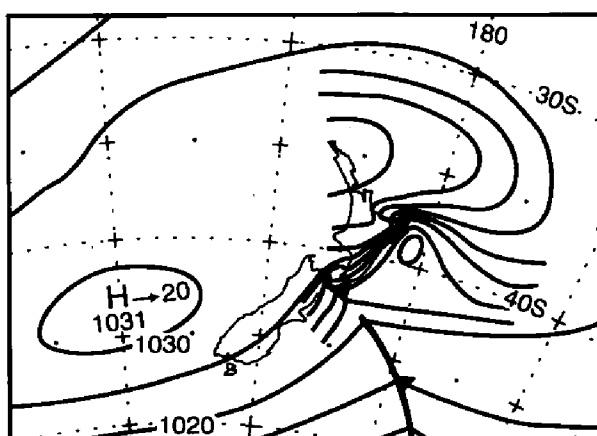
Figure 1b. Hourly wind reports from *Tangaroa* on 24 March 1994. Wind speed in knots, time in UTC.

Comparison with adjacent land stations shows they had much lighter winds than the *Tangaroa*. Hicks Bay automatic had a few reports around 20 knots but were often in the range 10–15 knots. Whakatane Airport and Mahia Peninsula automatics were never more than 15 knots and mostly less than 10 knots during the period *Tangaroa* had 30–40 knots.

Inspection of the tephigram shows that the air was stable with a marked inversion near 1500 m, which is the height of the peaks of the Tararua and Ruahine ranges in the south of the North Island, and considerably below the volcanoes in the centre of the North Island.

The inversion would have made it difficult for air to rise over the mountains. Instead the air would have been channelled around the end of the ranges, forming the belt of gales that affected the *Tangaroa*.

This area of gales seems to have been tens of kilometres wide and hundreds of kilometres long and has led the author to coin the phrase 'a river of wind'. It is certainly an area of stronger winds way beyond that catered for by the notion of 'near exposed headlands'.



**Figure 1c. Same as Figure 1a but 1 hPa spacing east of New Zealand.**

The synoptic analysis with isobars every 5 hPa has no indication of the westerly gales *Tangaroa* reported. However, it is possible on an analysis with isobars every 1 hPa, to indicate a long narrow area of enhanced gradient on the northern side of the low pressure area in the lee trough.

### Case 2 (Figure 2)

On 1 August 1992 the *Tangaroa* left Nelson and proceeded westward around Farewell Spit then down the west coast. As it moved southwestwards from Farewell Spit it crossed a river of strong southwest wind with one report of 31 knots and one of 37 knots, before dropping down to 22 knots and eventually 17 knots. At this time the Maui production platform, some 140 km downstream, also had strong southwest winds, twice reporting 30 knots and once 32 knots.

This river of wind is thought to be due to a lee trough caused by the Tasman Mountains that lie to the west of Nelson and rise to heights of over 1500 m, and are oriented perpendicular to a southwest flow.

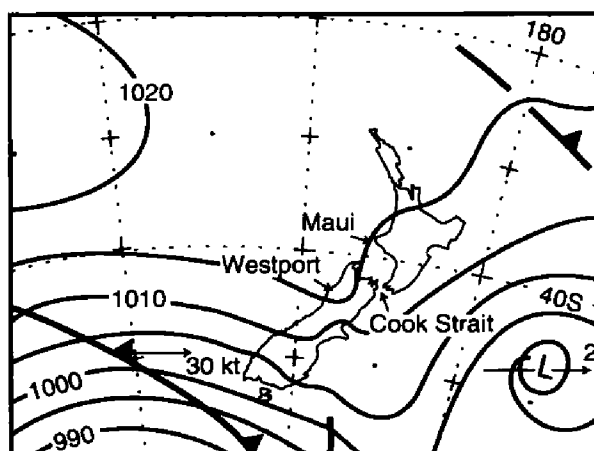


Figure 2a. Mean Sea Level pressure at 18 UTC  
1 August 1992.

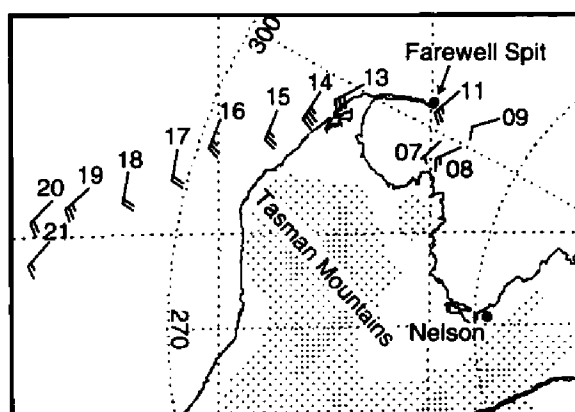


Figure 2b. Hourly wind reports from *Tangaroa* on 1 August 1992. Wind speed in knots, time in UTC.

Other reporting stations had considerably less wind. Farewell Spit automatic reported 10–15 knots throughout the period and Westport Airport automatic had 5 knots or less.

Again the 5 hPa analysis gave no indication of a belt of 30–35 knots winds but analysis at 2.5 hPa or finer resolution did.

#### Case 3 (Figure 3)

On 6 March 1992 the *Tangaroa* was moving southwards from Wellington to Lyttleton. As it was offshore of the Kaikoura coast it reported northnortheast winds of around 25 knots, similar to Brothers Island in Cook Strait, while Kaikoura, Le Bons Bay (just east of Lyttleton), and Christchurch Airport (just west of Lyttleton) all reported considerably less than 10 knots and often southwest in direction. Christchurch Airport was northeast about 10 knots or less and Le Bons Bay northerly or northeast 10–15 knots.

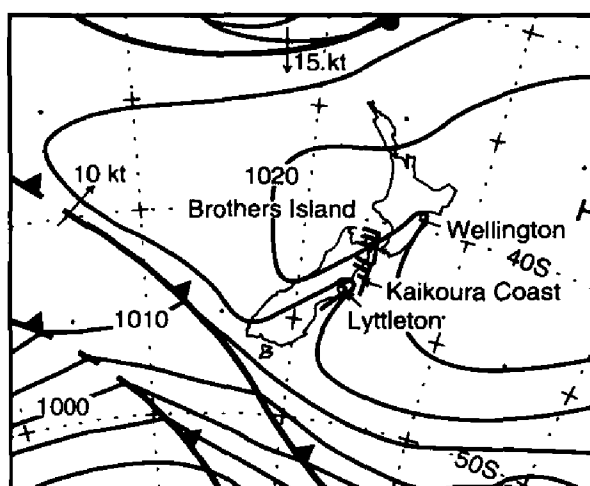


Figure 3. Mean Sea Level pressure at 00 UTC 6 March 1992. *Tangaroa* just east of Kaikoura.

The MSL analysis of the pressure field shows a ridge lying east to west across the North Island with northwest isobars approaching the South Island and a pronounced lee trough near the east coasts of New Zealand. It appears that the *Tangaroa* was in an area of strong pressure gradient just beyond the lee trough on the seaward side but the other reporting stations were in less gradient closer to the trough axis.

So again on this occasion the strength of the wind reported at the land stations is a poor indication of the wind strength at sea.

As a weak front in the westerlies over the Tasman Sea approached the South Island, the lee trough moved offshore and all stations changed to the southwest. *Tangaroa* briefly reached 30 knots in the southwesterly but the maximum speed reported from Le Bons Bay was 8 knots and Christchurch Airport was around 18 knots.

#### Case 4 (Figure 4)

On 19 April *Tangaroa* was moving south off the coast of Fiordland with 5–15 knots winds from a variety of directions. However, as it came abreast of Puysegur Point, the wind speed jumped to 35 knots from the eastsoutheast. The MSL analysis showed a large anticyclone centred just east of Otago. With 5 hPa

spacing the analysis suggests only light winds over the area but at 2.5 hPa it can be seen that there is a modest lee trough with enough easterly gradient across Foveaux Strait to produce strong easterly winds.

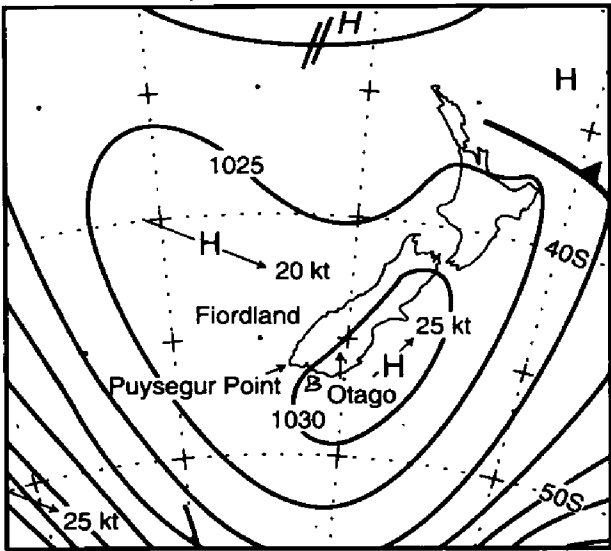


Figure 4a. Mean Sea Level pressure at 12 UTC 19 April 1992.

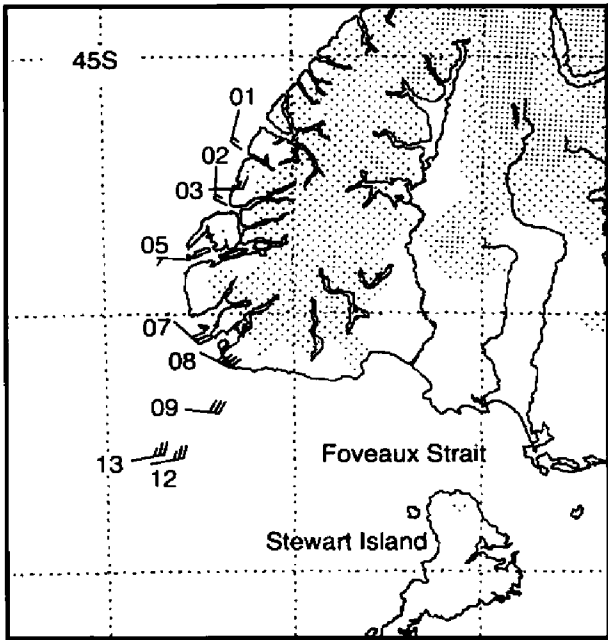


Figure 4b. Hourly wind reports from *Tangaroa* on 19 april 1992. Wind speed in knots, time in UTC.

Puysegur Point was about 5 knots when *Tangaroa* had its maximum wind. A few hours before Puysegur had been up to 20 knots. This is a good example of how a land station may experience a sudden drop in wind speed, which is not evidence that a river of wind has ceased to exist, but only that it may have changed orientation slightly so as to no longer affect the land station.

Southwest Cape was 10 knots or less throughout the time *Tangaroa* had strong winds, which suggests the river of wind was only blowing through Foveaux Strait and downwind of it but not affecting the southern side of Stewart Island.

#### Case 5 (Figure 5)

On 18 and 19 April *Tangaroa* was moving southwards off the coast of Fiordland. A weak cold front moved northwards over the South Island. Behind the front the wind went southeast at *Tangaroa* and speeds dropped to 10 knots or less.

However, at 22 UTC on the 18th as the ship passed the mouth of George Sound the speed jumped to 25 knots, then dropped again once the ship had moved on.

The tephigram for Invercargill one hour later shows a strong inversion at about 1300 metres. The pass at the head of George Sound is about 1000 m although the mountains either side are higher, with peaks above 1500 m.

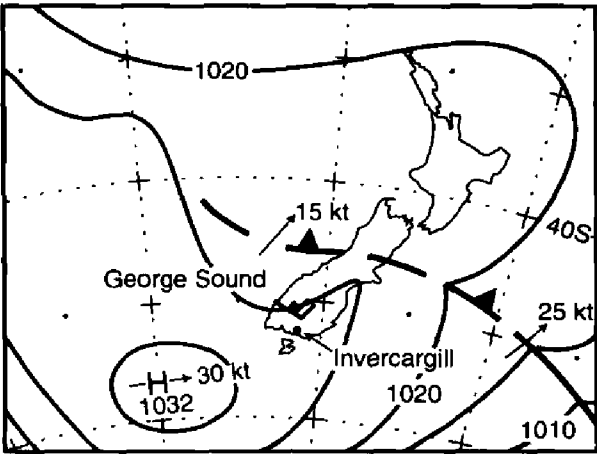


Figure 5. Mean Sea Level pressure at 18 UTC 18 April 1992. *Tangaroa* moving south off the coast Fiordland, has seven hours of 10 knots or less until off the mouth of George Sound when wind rises to 25 knots.

It would seem there was a strong wind blowing down George Sound because the air was able to move from high to low pressure, beneath the inversion and above the land. Further north or south of this mountain pass, the land was significantly higher than the inversion and so the air could not move freely from east to west and consequently the *Tangaroa* had only light easterlies.

Case 6 (Figure 6)

On 11 September 1992 the *Tangaroa* was 100 km southwest of Puysegur Point reporting a southwest wind of 25 knots whilst Puysegur was reporting only 10 knots southwest. By contrast Southwest Cape, on the upwind corner of Stewart Island, and Nugget Point, on the Otago coast, both had similar wind speeds to the *Tangaroa*.

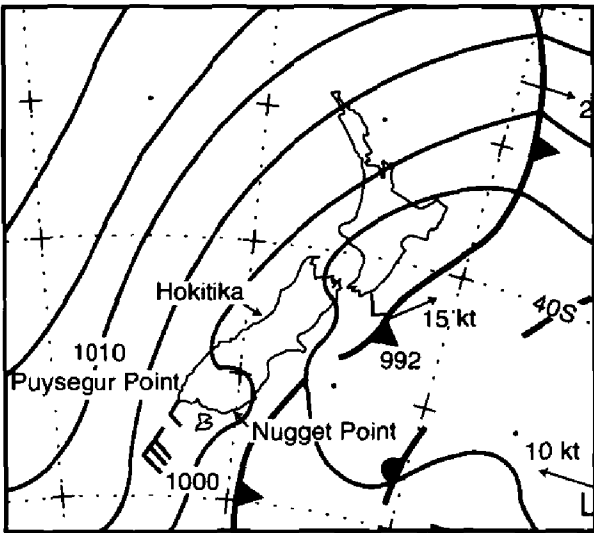


Figure 6. Mean Sea Level pressure 06 UTC 21 August 1992. *Tangaroa* (30 knots) 100 kilometres upwind of Puysegur Point (10 knots).



A similar situation also occurred on 21 August with *Tangaroa* in about the same location in a southwest flow. Puysegur reported 15–20 knots less wind than *Tangaroa* or southwest Cape.

The explanation is thought to be this: the greater friction the air experiences over land causes it to slow down, and over time this results in air piling up or ‘damming’ against the land. This is most pronounced where the land rises steeply from the sea and is perpendicular to the wind flow, as it is near Puysegur Point.

By contrast the automatic weather station at Southwest Cape on Stewart Island is situated on a narrow neck of land oriented so that it protrudes into the southwest flow and therefore is unlikely to experience this effect in a southwesterly. Nugget Point lies on a narrow point where the large scale land-sea boundary is oriented to the southwest flow, so damming is also unlikely there in these conditions.

A third example of damming occurred on 2 August 1992 when *Tangaroa* was about 110 km westnorthwest of Westport in a westnorthwest flow. The ship reported northwest 30 knots while both Westport and Hokitika airports automatics reported northwest 15 knots.

#### Case 7 (Figure 7)

On 11 March 1992 *Tangaroa* was returning to Wellington from east of the Wairarapa. After *Tangaroa* turned the corner near Cape Palliser it reported northerly winds between 35 and 45 knots for five hours out of six but on the other hour had 56 knots. At this stage it was about 25 km south of the southern end of the Rimutaka Ranges. It is thought that the ship passed through an area of locally enhanced wind downstream from the high ground similar to that documented by Stainer (1983) near Karori Rock. This also ties in with occasional reports from

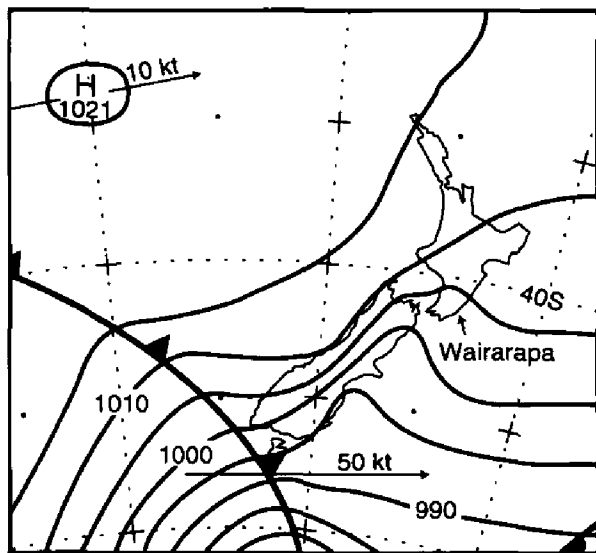


Figure 7a. Mean Sea Level pressure 12 UTC 11 March 1992.

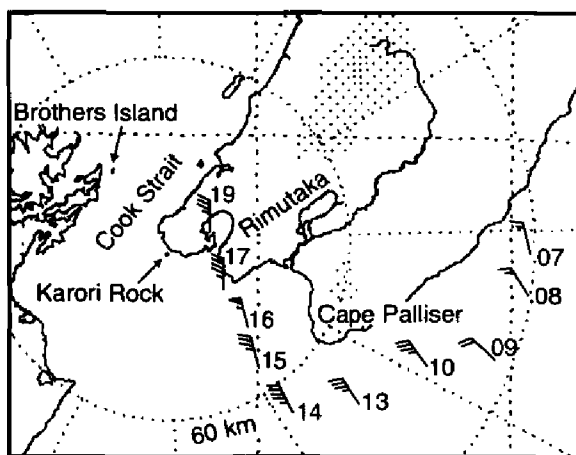


Figure 7b. Hourly wind reports from *Tangaroa* 11 March 1992. Wind speed in knots, time in UTC.

fishermen of extreme northerly winds in Palliser Bay that pick up stones from the land and hurl them against fishing boats many kilometres out to sea ‘with the force of rifle shots’.

As the *Tangaroa* entered the area of enhanced wind it also reported a sudden pressure fall of 0.7 hPa in one hour against a rising trend. Stainer also reported a small pressure fall in association with the enhanced winds near Karori rock.

Case 8 (Figure 8)

On 15 April 1992 *Tangaroa* was moving southwards just east of Gisborne, reporting a southerly wind of 25 knots easing to 20 knots as it came south. The synoptic situation showed a large high across New Zealand with one centre 500 km west of the North Island and another centre 300 km east of Cook Strait. A weak southeast flow was indicated over the Gisborne area.

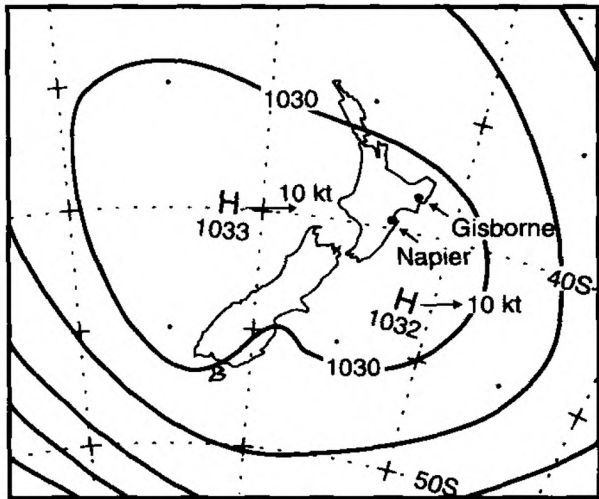


Figure 8a. Mean Sea Level pressure 00 UTC 15 April 1992.

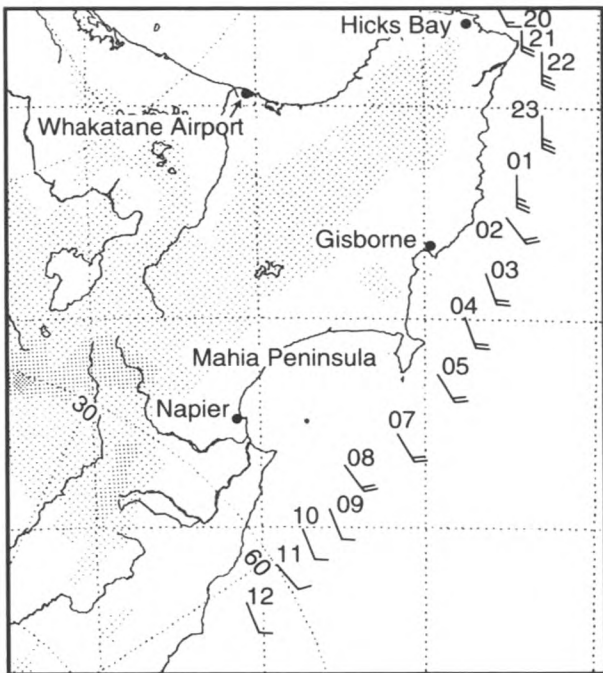


Figure 8b. Hourly wind reports from *Tangaroa* 15 April 1992. Wind speed in knots, time in UTC.

Winds reported from adjacent land stations such as Mahia Peninsula, Gisborne and Napier airports were mostly less than 10 knots.

The stronger winds at the ship are thought to be caused by the stable conditions under the anticyclone. Air is unable to rise over the North Island ranges and instead is deflected to blow around the northern end of the hills.

**Case 9 (Figure 9)**

On 27 and 28 August 1992 the *Tangaroa* was near 47° south 166° east — about 100 km westnorthwest of the automatic weather station on the southwest corner of Stewart Island. The area was covered by a broad strong to gale force southeast flow between a complex trough over central New Zealand and a ridge of high pressure over the southwest Tasman Sea.

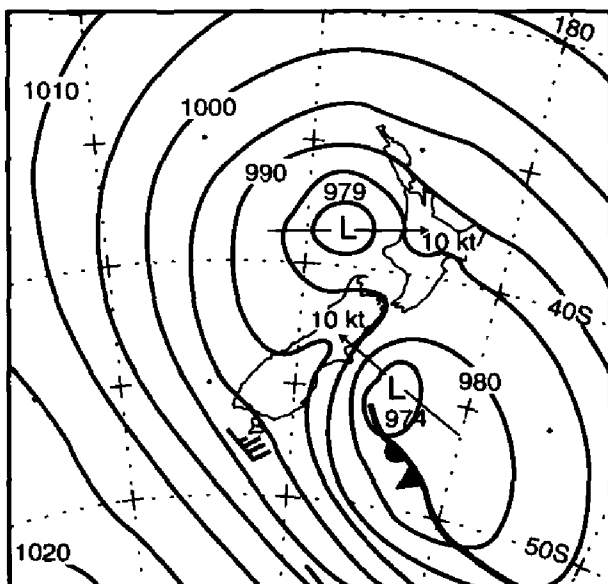


Figure 9a. Mean Sea Level pressure at 12 UTC 27 August 1992.

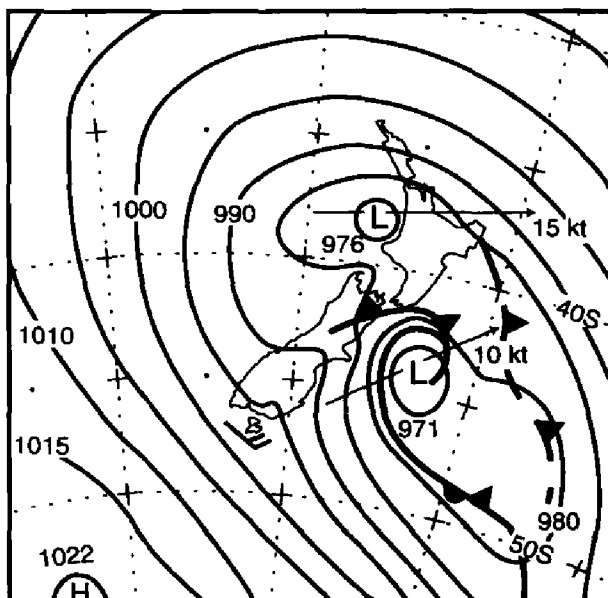


Figure 9b. Mean Sea Level pressure at 18 UTC 27 August 1992.

During a period when *Tangaroa* was mostly around 33 knots it dropped briefly to 22 knots (19 UTC) and 26 knots (20 UTC) before rising to 33 knots again.

At the same time Southwest Cape also registered a minimum of 14 knots for one hour when mostly it was blowing at 25–30 knots.

The synoptic analysis at 5 hPa spacing showed a smooth featureless southeast flow over the area, so the explanation for this simultaneous drop in wind affecting two points 100 km apart must lie in the sub-synoptic or mesoscale, possibly with gravity waves.

Since the *Tangaroa* did not lie directly downstream of Stewart Island but to the westnorthwest it seems possible that the explanation may not lie in the orographic consequences of Stewart Island but rather something intrinsic to a strong stable flow over open ocean.

This phenomenon creates an analysis problem when a ship reports only once or twice a day and may experience an atypical light wind at reporting times.

### Other cases

Among other examples, too numerous to be shown here, several common threads emerge. When *Tangaroa* moves across the boundary between a river of wind and its surroundings, the change in wind strength is often dramatic. For example, on 5 August 1992, *Tangaroa* was about 50 km west of Hokitika in a southwest airstream. As the ship moved closer inshore its wind speed dropped from 29 knots to 7 knots in one hour, then when it moved back out to sea a little later the wind speed rose from 14 knots to 33 knots in one hour.

On 1 June 1992 with a large high over the North Island the *Tangaroa* reported a drop from northerly 30 knots to 10 knots in one hour as it moved away from Cook Strait towards Cape Palliser, while Brothers Island automatic in Cook Strait continued to blow between 30 knots and 35 knots from the north.

Whenever an anticyclone was over or near New Zealand, and *Tangaroa* was near the end of a mountain range the ship reported strong or gale force winds despite the fact that the MSL pressure analysis at 5 Hpa spacing indicated no strong winds.

This requires a modification of the popular notion that anticyclones only have light or moderate winds. When the flow around an anticyclone is blocked by high ground, the wind then blows from high to low pressure parallel to the ranges and becomes strong or gale force around the end of the orographic obstacle, in conjunction with a lee trough in the pressure field.

### Conclusion

The hourly wind observations from R.V. *Tangaroa* show interesting structure in the wind field around New Zealand. In particular, in stable atmospheric conditions when the air tends to flow around the land rather than over it, they show areas of strong or gale force wind that are typically tens of kilometres wide and hundreds of kilometres long. These so-called rivers of wind form in association with lee troughs that create strong pressure gradients that show up clearly in a 1 hPa analysis, but not when isobars are drawn every 5 hPa. Wind speeds at land stations rarely give an indication of the presence of these strong winds at sea.

It is intended in future work to further investigate the relationship between rivers of wind and stability, and also see to what extent satellite-derived wind fields show these features. It is important to have an independent way of measuring the extent and intensity of rivers of wind in order to verify any mesoscale models of wind flow around New Zealand that may appear in the future.

This material was originally presented at the Meteorological Society [of New Zealand] conference at Lincoln University in August 1992. A series of workshops for marine forecasters on rivers of wind was held soon afterwards.

### REFERENCES

1. Neale, A.A. and G.H. Thomas, *Surface Winds in Coastal Waters off Westland*. N.Z. Met. Service, Tech Note No. 234, 1978.
2. Stainer, B.A., *The Distribution of Wind and Pressure in Cook Strait in strong Northerlies*. *The Marine Observer*, **280**, pp.77-84, 1983.

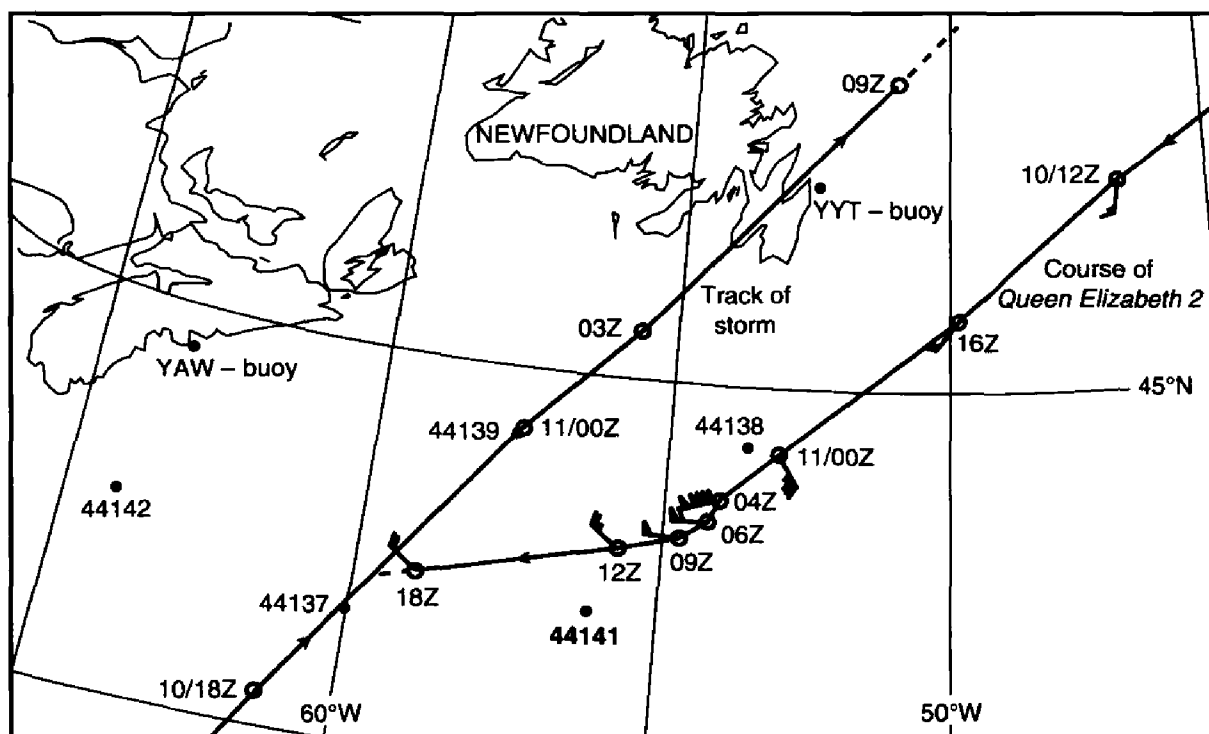
## Hurricane 'Luis', the *Queen Elizabeth 2* and a rogue wave

The following account describes the meeting of the *Queen Elizabeth 2* with a rogue wave in the North Atlantic Ocean on 11 September 1995 and has been compiled from the combined reports of the Master, Captain R.W. Warwick and the following officers of the 8–12 and 12–4 watches: R. Bridge and S. Smith, 1st Officers; N. Broomhall, 2nd Officer; T. Armstrong, 3rd Officer; Al Yuson and I. Divinigratia, Quartermasters.

When the *Queen Elizabeth 2* sailed from Southampton on 7 September 1995 bound for Cherbourg, there was some doubt as to whether she would be able to dock owing to the proximity of hurricane 'Iris'. However, luck was with us and our arrival coincided with a period of calm as the eye of the storm passed over the vicinity of the port. The same could not be said for the next leg of the voyage!

After clearing Bishop Rock early on the morning of the 8th, a great circle course was set for New York via Cape Race on the south coast of Newfoundland. During the passage, the situation for the whole Atlantic was monitored regularly by the officers on watch, and accordingly the movement of hurricane 'Luis' was plotted from the start of the voyage. As the hurricane left the Caribbean area it soon became apparent that there was a chance of it passing close to the course of the *Queen Elizabeth 2*. The chart shows the track of the storm relative to the ship on 10 and 11 September.

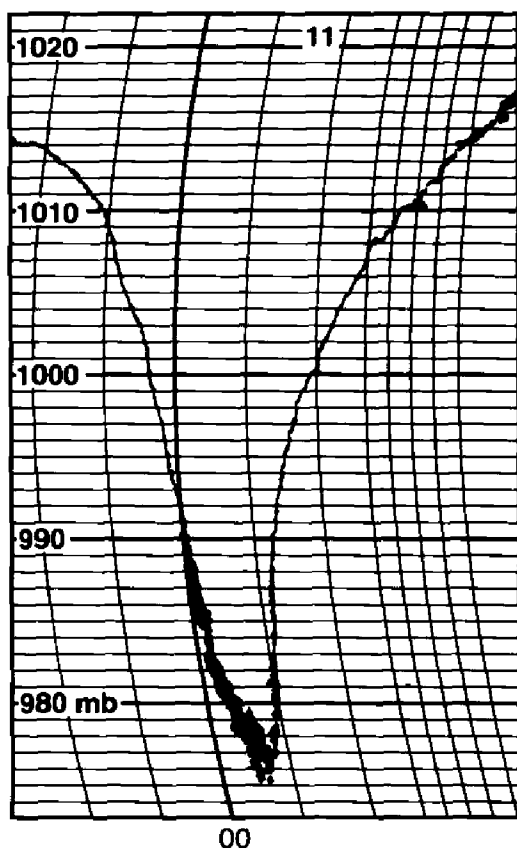
On 10 September the great circle course was abandoned and the course was altered to south-westerly to increase the distance from the predicted path of the storm, which was estimated to pass ahead of the ship that evening.



Tracks of hurricane Luis and the *Queen Elizabeth 2*. (Positions of Luis based on bulletins from Hurricane Centres CF METOC Centre, Halifax.) Canadian moored meteorological buoys are also shown, indicated by the identifiers 44xxx.

In a morning speech to the passengers, the Master informed them of the proximity of Luis; the situation was updated for them late in the afternoon and they were told to expect to feel the effects of the storm sometime after dinner while also being warned of the danger of going out on deck as the wind increased. At the same time, the crew had orders to prepare for unfavourable weather conditions.

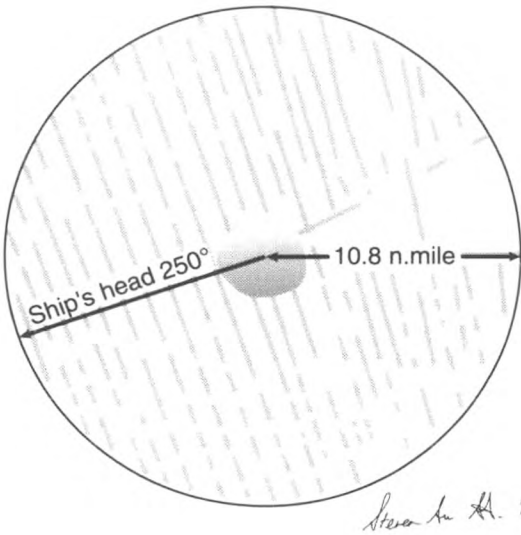
At 0000 UTC on the 11th the wind was SE'ly, force 8, the pressure was 994.0 mb (falling rapidly, see barograph trace) and the seas were building but the vessel was pitching easily and although shipping spray forward, maintained her speed of 26 knots. An hour later the wind had increased to force 11 and the seas had built up to 8 m, the vessel was now pitching moderately and shipping spray overall but there was little movement felt at her speed of 22 knots. At 0120 the strength of the wind caused the ship to list 7° to starboard when blowing on the port beam. By this time Luis was making a forward speed estimated to be between 40–50 knots, and as it headed north-easterly the wind soon started to move from the port beam to the bow and very heavy head seas were encountered.



A heavy sea was shipped forward, landing in part on the bridgewing and running through the wheel-house. Floods from shipped water were reported from other parts of the ship, and the speed was reduced to 17 knots. There was a further reduction in speed to 12 knots at 0130, the wind speed indicator needle now hard over on the stops at the maximum reading of 120 knots. Severe gusts of wind five minutes later carried the anemometer away with a loud 'bang' while the 10-cm radar stopped rotating amid loud grinding noises and vibration from the gearbox. The wind had flattened the sea and was estimated to be 130–140 knots in the worst gusts. Further heavy seas were shipped forward at 0140 as the average wave

height climbed to 11–12 m and the vessel pitched heavily in visibility seriously reduced by spray. Ship's speed was further reduced to 7 knots at 0200 as the wind maintained a steady, estimated speed of 110 knots while the seas remained at 12 m.

It was a dark night and the visibility was considerably affected by the storm conditions. The sea was nearly white in appearance with foam and driving spray lashing the ship while waves were continuously breaking over the foredeck, leaving it awash for minutes at a time. The sea height had gradually built up to 15 m by 0230 as the wind very slowly started to veer SSW'ly with a maximum estimated sustained speed of 115 knots; the ship's speed continued to decrease as the seas and wind increased until, by 0300 with the pressure at 986.3 mb, the wind estimated at 120–130 knots, and the seas at 18 m, the ship's speed was 5.5–6.0 knots. The port navigation lights, at a height of 27 m above the waterline, were lost at 0330 after a wave of about 20 m high was encountered and at 0345 the ship's speed was reduced to 4.5 knots, the minimum required for steerage. The Grand Lounge windows stove in on the aft starboard quarter at 0400, the windows being 22 m above the water and 200 m from the stern. At 0410 the rogue wave was sighted right ahead, looming out of the darkness from 220°, it looked as though the ship was heading straight for the white cliffs of Dover. The wave seemed to take ages to arrive but it was probably less than a minute before it broke with tremendous force over the bow. An incredible shudder went through the ship, followed a few moments later by two smaller shudders. There seemed to be two waves in succession as the ship fell into the 'hole' behind the first one. The second wave of 28–29 m (period 13 seconds), whilst breaking crashed over the foredeck, carrying away the forward whistle mast. The sea was cascading all over the fore part of the ship including the bridge and it was several seconds before the water finally drained away from the wheel-house windows, thus restoring vision ahead. Sea clutter on the 3-cm radar was heavy and obliterated the screen to a range of 10.8 n.mile; maximum anti-sea clutter was applied which gave the picture indicated in the diagram, the pattern of waves can be clearly seen.



Wave formations (wave period 13–14 seconds) as seen on the 3-cm radar.



At 0430 the wind was WSW'ly at 110 knots giving 24–25 m seas but then started to moderate a little as the seas decreased to 18 m although the ship was still taking heavy seas forward. Conditions were moderating all the time by 0445; the direction of the seas veered to south-west-by-west and the ship's course was altered accordingly. By 0530 the wind had eased to 80 knots while the seas had reduced to 15 m and the ship was on a heading of 250° at 6 knots. As the weather continued to moderate, the ship was able to set course for Nantucket with gradually increasing speed in W×S'ly winds of force 9–10.

The *Queen Elizabeth 2* withstood the wrath of the ocean despite the severity of the impact and the weight of hundreds of tons of water landing on the bow. There was some superficial damage such as bent railings and buckled deck plating but nothing that would not be expected under such circumstances. No passengers or crew were injured and, while most slept, there was however a 'Hurricane Party' in full swing in the Yacht Club!

### **Afterword**

Captain Warwick admits that sometimes it can be difficult to gauge the height of a wave but in this case the crest was more or less level with the line of sight for those on the bridge, about 29 m above the surface; additionally, the officers on the bridge confirmed that it was definitely not a swell wave. The presence of extreme waves was also recorded by Canadian weather buoys moored in the area, and the maximum measured height from buoy 44141 (shown on the chart on page 134) was 30 m (98 feet).

The encounter took place in position 43° 30'N, 54° 09'W where the water has a charted depth of 4000 m and the theory on board the ship was that waves may have been 'stacking' up while approaching the Grand Banks.

### **SPECIAL LONG-SERVICE AWARDS**

The Chief Executive of the Met. Office is pleased to announce the names of the four shipmasters who have been selected to receive presentation barographs in recognition of their observing service up to the end of 1994. They are:

CAPTAIN R.J.A. COPELAND, formerly with Ropner Shipping Services Ltd

CAPTAIN D.A. DORNOM, formerly with P&O Containers Ltd

CAPTAIN G. DE FERRY FOSTER, The Geest Line

CAPTAIN R.A. WOODALL, formerly with Cunard Line Ltd

Following long-standing practice, the awards are made on the basis of the number of years in which meteorological logbooks were received from ships observing for the U.K. VOF, given a minimum requirement of 18 years inclusive of the year in question, 1994. The presentation for 1994 is unusual in that three of the four recipients have retired from the sea but their services to voluntary weather observing at sea are gratefully acknowledged nevertheless. We hope that all four recipients will be attending the event, to be held on a mutually agreeable date.

Captain Copeland sent his first logbook to the Met. Office in 1961, from the *Carrigan Head*. During 27 years of observing he provided 68 logbooks, 13 of which were classed as Excellent, and he received an Excellent Award in 1986.

Captain Dornom's first logbook was received in 1956, from the *Socotra*, during his observing career he was involved with 44 logbooks of which 19 were classified as Excellent. He was awarded a total of six Excellent Awards between 1985 and 1993.

Captain De Ferry Foster, the only recipient still at sea and making observations, started his observing career in 1960 when the Met. Office received his first book from the *Tremayne*. In 1988 he was Master of the *Geestcape*, one of ten ships which participated in the Voluntary Special Observing Programme — North Atlantic (VSOP-NA), and received an Excellent Award for work in that year. All but five of his 87 logbooks were received from ships of the Geest Line, the total including the data contributed to VSOP-NA.

Captain Woodall spent his sea-going career with Cunard, sending his first logbook in 1953 from the *Alsatia*. During his 26 observing years, he submitted 46 logbooks of which 15 were classed as Excellent.

The concept of the long-service award was introduced in 1948 by the Director of the day, Sir Nelson K. Johnson, and it is hoped that the 48th annual presentation, made by the Chief Executive, will be taking place at Bracknell as this edition goes to press.

## AURORA NOTES JULY TO SEPTEMBER 1995

By R.J. LIVESEY

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

The auroral event observed on 22/23 August from the *St Clair* (on page 117) was seen between 2200 and 0150 UTC by meteorologists and amateur astronomers from the southern shores of the Moray Firth up to Orkney. It was not a major aurora and reached a maximum altitude of only 20 degrees at the Dornoch Firth, comprising homogeneous arcs and rays. The magnetic record showed a field that had been very quiet but was disturbed by a sudden storm commencement followed by a magnetic event lasting for about one day. This aurora was also observed in Canada and the U.S.A. at similar corrected geomagnetic latitudes.

Generally in the period, the aurora was quietly active but there were repetitive periods of magnetic disturbance on 16–20 July, 7–16 August and 5–15 September related to the 27-day synodic rotation period of the sun.

There was a mid-latitude auroral event on 27/28 September first reported at 1800 from Helsinki, comprising active rays. Between 1930 and 2345 it was observed from all over Scotland, northern England, north Wales and the Isle of Man and consisted of quiet and rayed arcs, rays and patches. The maximum altitude of the forms was recorded as 90 degrees at Carlisle and Portpatrick. The aurora was seen from Reykjavik between the hours of 2030 and 2200 where a

large 65-degree spiral was recorded. The aurora was also observed in Canada and the U.S.A. and recorded as a major active storm at Glen Ullin in North Dakota. This event was associated with a short-lived magnetic storm which was probably due to an isolated transient event on the sun. Thereafter the field reverted rapidly on 28 September to a level of very low activity.

In British waters, 1995 was a very good year for noctilucent cloud (NLC) activity. From May until August there were 48 nights upon which NLC were observed somewhere in the area. The most widely observed major events recorded in British waters were those of 20/21 June and 23/24 June which, as might be expected, were close to the summer solstice on 21 June. The NLC were reported first from the English Channel and became visible progressively northwards as the twilight moved into higher latitudes. There were several nights when NLC were photographed in North Dakota at the extreme low latitude of  $46^{\circ} 48' \text{N}$ . On 31 May/1 June and on 30 June/ 1 July, the Dakota NLC were accompanied by auroral arcs.

There has been a general increase in the annual frequency of NLC apparitions with the years, modulated by variations that have some connection with the sunspot cycle. There is still some uncertainty about the mechanism causing NLC. They have not apparently been noted prior to the eruption of Krakatoa, in 1883, and were first recognised as not being tropospheric phenomena in 1894. It was thought at one time that aurorae, which heat the upper atmosphere, could not co-exist with NLC on the same night but there is an increasing number of observations of the two in the same sky, sometimes together, sometimes appearing alternately.

The polar upper atmosphere is warmer in mid-winter and colder in summer and would appear to have to cool to the order of  $-150^{\circ}\text{C}$  before NLC can form at a height of about 83 km. Unless auroral activity is intense, the base of the auroral forms would expect to be in excess of an altitude of 100 km, so it is possible that aurora and NLC could co-exist.

Determining the causes of false aurora reports can lead to some interesting atmospheric phenomena. For example, a patch of luminosity was seen in the sky above Grangemouth refinery in the Forth Estuary. As the refinery lies near to the Bonnybridge area which has a certain reputation with 'Ufologists', they thought they were on to something. A colleague of mine took bearings on the light patch from various locations on the shore line and concluded that it lay above the refinery and consisted of light from the flare stacks reflected by ice crystals in the high troposphere.

On 20 October 1993, bright patches of light were seen by crews on the Danish gas platforms Tyra and Gorm together with Danish land observers. Subsequent investigation eliminated the aurora, emissions from space craft and other phenomena, leading to the conclusion that the light was reflected from the flare stacks by atmospheric ice crystals. The form of the light patches and their number depended upon the type and orientation of the crystals involved. The Danes christened this phenomenon a 'Tygorm' from the names of the two platforms from which the sightings of the patches were first made.

On one occasion a false aurora was reported from the southern shores of the Bristol Channel but turned out to be the flare stacks at Milford Haven refinery being reflected from ice crystals in the troposphere. This has a close similarity with NLC in that a source of illumination below the observer's horizon is being reflected from a zone of crystals in a dark sky down to the observer.

## LETTERS TO THE EDITOR

### Deep depression detection theory

I have a theory that may help predict the movement of deep low-pressure systems.

Several years ago, whilst on the Japanese trade, I noticed that when a typhoon was approaching directly towards me, short wave radio communication was disrupted, or was almost completely blotted out. The circumstances were that the low-pressure area was between 500 and 1000 miles away.

Over the years since then I have put my theory to the test and it has always proved reasonably correct. I have come to believe there is a beam of 'anti-short-wave radio matter', for want of better words, in front of a deep low-pressure system. The beam also appears to be very narrow.

If my guess proves to be correct, there should be a method of determining accurately the forward movement of the deep low pressure. It does not work with all systems, but only with deep lows of around 970–960 hPa, e.g. with tropical storms.

Why do I record this at this moment, you may ask? As I sit in my office on this fully-computerised weather ship for NOAA of the United States, in Vancouver BC, waiting to load grain, I could not receive the BBC on my radio. I inspected my antenna and made all the other usual checks, finally deciding to take a weather map on my facsimile receiver. Sure enough, there was a deep low heading straight for Vancouver.

Captain James N. Gowrie, Master, m.v. *Goldensari Indah*.

### Whale sharks *en masse*

I thought you might like to hear about an unusual sighting on 26 September 1995. The ship had just entered the Red Sea (north-bound) that morning in the usual conditions of light winds, clear skies and blue water, when one Seaman I was working with shouted over to me to look over the ship's side as he had spotted a large school of whales very close indeed.

As we got closer I noticed something was not quite right; sure enough they were big enough to be whales but were swimming like sharks, with large tail and dorsal fins. Just for one moment the whole scene had me baffled but then it dawned on me that the only possible explanation was Whale Sharks. Having never seen one before, I was quite taken aback by the size of these magnificent creatures. As we got even closer my theory was to be confirmed by the clearly visible spots covering their bodies.

We agreed between the four of us (myself, John Dodd, Steve Seafeld and Tomo the deck boy) that at least 20 sharks were swimming on the surface, closely packed together within a 50-metre area, and that they did not seem to be at all bothered about the ship which was doing a speed of about 21 knots.

I have seen plenty of spectacular sights in my 19 years at sea as, I am sure, have most seafarers but nothing comes close to all those amazing prehistoric fish.

Mr Tim Dales, Seaman, m.v. *Liverpool Bay*.

*Editor's note.* Dr Frank Evans, of the Dove Marine Laboratory, Cullercoats, was very pleased to hear of Mr Dale's sighting, and said:

'This fascinating account of about twenty Whale Sharks swimming close together within a 50-metre radius in the Red Sea is, nevertheless, not the first we have received. Let me say at once that the identification is certainly correct. In *The Marine Observer* for July 1990 the following report from the *British Renown* occurs:

16 September 1989. At 0600 GMT several objects were sighted in the sea close ahead of the vessel. On drawing closer, the objects revealed themselves to be a big school of approximately 15 large whale sharks. Three individuals passed very near to the vessel's port side at a distance of about 30 m. The distinctive, flattened snout, speckled body and rounded dorsal fin were clearly visible in all of them. These closest specimens were estimated to be about 6 m long. Despite being near to the vessel, the sharks appeared to take no notice of the engine noise and continued to swim lazily around.

'We have numerous reports of Whale Sharks but most of them are of individuals. The parallels between the two reports from the Red Sea may be significant. I am struck particularly by the coincidence of the months and suppose that this seasonal shoaling may be concerned with reproduction. Other texts mention that the species may be seen in schools, basking at the surface but do not supply dates. Whale Sharks are fairly widespread in the tropics. More reports, please!'

This event has obviously now imprinted itself firmly in Mr Dale's memory. Do any other readers have long-standing memories of spectacular events or unusual sightings during their careers at sea, that we may not yet have heard about? We would be pleased to hear of them.

## Book Reviews

*Designs 95*. 295 mm × 210 mm, 255 pp., *illus.*, edited by Klas Brogren. ISBN 0282 8898. Plus 2 Ferry Consultation, PO Box 7067, S-300 07 Halmstad, Sweden. Tel: +46-35 218370. Fax: +46-35 130129. Price: SEK 475 per copy plus airmail postage.

The enduring and increasing popularity of the big ships is thoroughly reflected in this classy production containing an unequalled selection of excellent colour photographs, both of the internal features and of the pleasing lines of the cruise ships and ferries included in such an extensive book.

Pride of place goes to P&O Cruises *Oriana*, deservedly so considering the meagre interest shown at her introduction to the U.K. cruise market in April 1995: despite the fact that she was built by Meyer Werft in Germany, her internal fittings and decor are primarily British, and it is appropriate that a ship so advanced and yet with such classic lines should be the theme ship for this edition of *Designs 95*. In all there are five comprehensive features covering 72 pages which describe the design, building and fittings of the *Oriana*, plus reviews of P&O's 150-year and Meyer Werft's 200-year histories.

Further chapters cover other country's shipping industries, passenger ship interior design and overall design trends in cruise, ferry and ro-ro ships, and includes a feature on the latest Mississippi cruise vessel, built to resemble her nineteenth-century predecessors with stern or side paddle-wheel propulsion. As a concession to modern ship handling capability, the *American Queen* is also equipped with two thrusters at both bow and stern, but then she is the largest cruise vessel to be built in a shipyard in the U.S.A. for 40 years.

This annual publication in stiff paperback will appeal mainly to the ship enthusiast, particularly the passenger ship follower. It should, however, also be of value to professionals who doubtless share with the casual reader a fondness for the minutiae of shipboard design.

*Marine Pilot Safety* by C.M. Long. 210mm × 295 mm, 62 pp., *illus.* ISBN 1 870077 31 8. The Nautical Institute, 202 Lambeth Road, London SE1 7LQ. Tel: 0171 928 1351. Fax: 0171 401 2817. Price (paperback): £15.00 Members, £21.43 non-members, postage extra.

This Nautical Institute monograph by a Tees pilot with a lifetime's experience in the profession, is probably the first such complete study into the acknowledged high risk occupation of the transfer of pilots. The ten chapters and 3 annexes cover standard aspects of the pilot's speciality but also include sections on unique aspects such as details of the new techniques for recovery of pilots from the water and the development of pilot safety clothing.

All the published codes of practice and SOLAS regulations concerned with pilotage are included, and it is clear the author has made every effort to incorporate in one publication the hard-learned lessons that contribute towards accident prevention and loss of life in this most hazardous of marine occupations, and he has enhanced the cause of the personal safety of pilots into a new and understandable discipline.

This book is worthy of study not only by those who may be or may become involved in the operation of pilot craft of any kind, but also by all those who depend upon the services of pilots in their business to gain an insight into the requirements for pilot boarding and disembarkation in a safe and proper manner.

J.F.T.H.

*Shorebirds, An identification guide to the waders of the world* by Peter Hayman, John Marchant and Tony Prater. 160 mm × 240 mm, pp. 400 plus bibliographies and index. *illus.* ISBN 0-7136-3509-6. Published by Christopher Helm (Publishers) Ltd, a subsidiary of A&C Black (Publishers) Ltd, 35 Bedford Row, London, WC1R 4JH. Price: £24.99.

This reviewer, who has not made a point of scouring likely publications for new titles on the subject of waders, has managed in the past to eventually identify birds with the aid of two or three of the usual guides which describe the species of all groups of birds for a given area. However, as a very amateur birdwatcher all too frequently flummoxed by the identity of any wader not immediately resembling a curlew, whimbrel, redshank or turnstone, *Shorebirds* is a revelation.

Supremely qualified for their work: a wildlife artist, a member of the British Trust for Ornithology and a Regional Officer for the Royal Society for the Protection of Birds, respectively, the authors have painstakingly produced a guide which describes and illustrates with magnificent colour paintings all 214 species of wader both coastal and inland, occurring world wide (long-legged birds such as herons, cranes and ibises which are classified as 'waders' by other authors, are not covered by this book) and shows plumage variations, frequently including diagnostic detail on individual feathers, so that any bird can be positively identified anywhere in the world. Additionally, there is expansive text detailing each bird down to its voice and habits including migration routes where known, and there are accompanying maps showing species distributions. *Shorebirds* is designed to be a field guide, that is, it is to be carried in a jacket pocket but at just over two pounds in weight, I cannot help but think that my pocket will sag a little. Even so, for a book that serves so well the advanced birder and the novice, not to mention watchers at sea whose ships may be the only source of refuge for an

exhausted wader on migration, such inconvenience is a small price to pay for a positive identification. Admittedly, the book was not in my pocket on a recent excursion around the back lanes of south Somerset when I needed to identify a bird previously unknown to me but upon my return to base, *Shorebirds* provided the vital details which enabled me to add a Jack Snipe to my list of 'ticks', so the publishers of this guide can now register another 'satisfied customer'.

This book was first published in 1986 having been reprinted four times since then, the latest apparently being in 1991. This must speak for its popularity and it would be interesting to know whether in the interim it has become 'the definitive' work about waders, as was first hoped.

*Note.* At the time of writing, the reviewer is aware of a very recently published title about waders of the world but has not sighted it.

J.F.

## Personalities

RETIREMENT — CAPTAIN B.C.W. NORTON recently contacted us with his final ship's log, mentioning he was taking a 'trial retirement', with the result that we asked him to send us information about his career. He replied as follows:

Brian Norton was born in Exeter in April 1937 and educated at Mount Radford School; in 1954 he completed his pre-sea training at the School of Navigation at Plymouth and Devonport Technical College and became apprenticed to the Furness Withy Company, joining s.s. *Pacific Northwest* after a short period standing by the company's famous liner *Queen of Bermuda*. He served in all ranks up to Chief Officer with Furness Withy under the group's various titles and house flags, gaining his Masters Certificate in January 1964 in the process. It was during this period that we received the first of 21 meteorological logbooks from him, from the *Pacific Reliance* in October 1964, although Captain Norton points out that he was assisting in the collection of observations as early as 1954: he also made observations for the Israeli Met. Service on the *Egyptian Prince* in 1959/60. All of his logs were marked to a very good standard, and four were classed as Excellent.

When in May 1984 his vessel *Oropesa*, (formerly of the Pacific Steam Navigation Company and fitted with the prototype meteorological automatic telex transmission equipment) was sold he took voluntary redundancy from Furness Withy and transferred with the ship to her new Managers, Denholms of Glasgow, remaining with that company until April 1991, meanwhile obtaining his first command, *African Begonia*, in April 1987. After leaving Denholm he served as Master with Kapal Management of Singapore, until retirement on 1 April 1995.

Captain Norton is pleased to record that weather forecasts and warnings have improved and, thanks to advances in communications, they have become far easier to obtain compared to 40 years ago, but he says, nevertheless, that the weather is still as rough or as calm as it was then, regardless of the vast changes in ship's design and advances in equipment for navigation. We are happy that he is now able to 'sail' in the calmer waters of retirement, with peace and happiness we trust.

## **Notices to Marine Observers**

### **CHANGE OF PORT MET. OFFICE DETAILS — BRISTOL CHANNEL**

Whilst still located at Companies House, Crown Way, Cardiff, the Port Met. Officer can now be contacted through P.O. Box 278 instead of Room 3.52. All other details remain unchanged.



## **FLEET LISTS**

# Fleet Lists

## UNITED KINGDOM

### As for 1 March 1996

1. The names of Masters, Observing Officers and Radio Officers (where carried) are as given in the latest meteorological logbooks received, up to the date shown above. The date of the latest logbook received is given in the second column. Masters and Officers are invited to notify the Editor of any errors or omissions found in the lists.

\* Indicates a recently recruited ship from which a logbook has not yet been received.

† Indicates a ship from which no logbook has been received during the last 12 months, and therefore for which it is impractical to show the names of Masters and Officers.

2. All logbooks received will be acknowledged by the Marine Superintendent.

3. Port Met. Officers will personally call on Masters and Observing Officers as opportunity offers, and on requests from ships.

Masters and operators of ships are particularly requested to advise the Marine Superintendent or a Port Met. Officer with prior notice of any changes of service or ownership which may necessitate the withdrawal from the ship of equipment on loan from The Met. Office.

## Selected and Supplementary Ships

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	RADIO/GMDSS OFFICER	OWNER/MANAGER
Abbey .....	19.6.95	P. Creber .....	J.R. Hollamby, G. Simpson, D. Grennan .....	GMDSS S. Juaniza .....	Furness Withy (Shipping) Ltd
African Ruby .....	13.9.95	K. Curry .....	C. Tomlinson, R. Triksson, E. Briones .....		MOL Tankship Management Ltd
Al Awdah .....	29.1.96	J.E. De Renzy-Martin .....	Ajoy Kumar .....		Kuwait Oil Tanker Co.
Al Funtas .....	31.10.95	Z.A. Rizwani .....	J. Coleman, S. Haider, Z.A. Ahmed .....		Kuwait Oil Tanker Co.
Al Rayyan .....	†	—	—	—	United Arab Shipping Co. (S.A.G.)
Al Samidoon .....	8.1.96	A. Langmuir .....	J.A. Curran, G. Al Dhafeeri, W. Korshed .....	J. Junio .....	Kuwait Oil Tanker Co.
Al Shukadaa .....	22.1.96	D. Carrick .....	C. Johns, W. Fares, D. Moussa .....	D.P. Canengngng .....	Kuwait Oil Tanker Co.
Al Tahreer .....	5.12.95	M.L.J. Aranha .....	R. Sud, G.I. Offor, A. Mohammed .....	M.S. Espino .....	Kuwait Oil Tanker Co.
Alam Selaras .....	†	—	—	—	Pacific Carriers Pte. Ltd
Aldington .....	25.4.95	P. Johnson .....	R.D. Spooner, R.M. MacLure .....	GMDSS	Stephenson Clarke Shipping Ltd
Alexis .....	†	—	—	—	Thorstone Ship Management Ltd
Alliance .....	7.3.96	L. Holtschmidt .....	N. Campbell, S. Hamer, K. McNeil .....	J.J. Stone .....	Denholm Ship Management (U.K.) Ltd.
Almeda Star .....	6.1.95	L.M. Colam .....	J.V. Sheridan, R.P. Cambil, R.R. Elisiorrio .....	E.L. Pardillo .....	Columbia Shipmanagement Ltd
Alnmouth .....	†	—	—	—	Sea Cadet Corps, H.M.S. <i>Dolphin</i>
Alpha Centauri .....	22.2.96	S.S. Hamal .....	A.A. Khan, A. Pachori, A.K.M.S. Islam .....	S. Das .....	Wallem Ship Management (H.K.) Ltd
Ambon .....	†	—	—	—	Wallem Ship Management (H.K.) Ltd
Amethyst .....	6.2.96	W.V. Venning .....	B. Standerline, A. Weinrit, M.N.G. Smith .....	GMDSS	Stephenson Clarke Shipping Ltd
Anja C .....	*	—	—	—	Carlsbrooke Shipping plc

<i>Antwerpen</i> .....	†	I.C. Gravatt .....	A.G. French, J.P. Whiteley, P.C. Handley .....	M. Allison .....	—	ABC Containerline N.V.
<i>Appleby</i> .....	1.2.96	—	—	—	GMDSS	Ropner Shipping Services Ltd
<i>Arctic Gaise</i> .....	†	A.W. Walker .....	M. Allison .....	M. Allison .....	—	Mermaid Marine Management Ltd
<i>Arctic Ranger</i> .....	11.9.95	A.W. Walker .....	V. Pantelcer, M. Hachiman, B. Host .....	V. Ermakov .....	—	Boyd Line Management Services Ltd
<i>Arctic Swan</i> .....	4.10.95	A. MacPherson .....	J.L. Panghulan, E. Rabe, T.P. Relayosa .....	R.M. Sayajon .....	—	Mermaid Marine Management Ltd
<i>Arctic Universal</i> .....	20.12.95	S. Venner .....	— Groom, — Pablo, J.F. Bequilla .....	—	GMDSS	London Ship Managers Ltd
<i>Argentina Star</i> .....	8.1.96	P. Holtby .....	J.F. Toft, M.N. Nielsen, R. Aban .....	—	GMDSS	Blue Star Ship Management Ltd
<i>Arktis Vision</i> .....	31.10.95	F. Gustavsen .....	—	—	—	C.Gee & Co.
<i>Asprella</i> .....	*	—	—	—	—	Shell International Trading & Shipping Co. L
<i>Assurity</i> .....	*	—	—	—	—	F.T. Everard & Sons Ltd
<i>Astrid</i> .....	30.11.95	G. Ulrich .....	P. Compton, C. Pfenninger .....	—	GMDSS	The Astrid Trust
<i>Atlantic Universal</i> .....	30.11.95	R.J. Kendall .....	F. Bartolome, J.R. Pesudas, M.N. Gurusinghe .....	S.R. Jayawickrama .....	—	London Ship Managers Ltd
<i>Auckland Star</i> .....	8.3.96	S. Mortimer .....	C. Canlas, R. Husain, L. Tarroza .....	A. Sacay .....	—	Blue Star Ship Management Ltd
<i>Auk Arrow</i> .....	7.9.95	J. Misra .....	V. Cedric, V. Sukumaran, J. Shamhu .....	— Mukund .....	—	Gearbulk (U.K.) Ltd
<i>Author</i> .....	6.2.96	P. Thompson .....	R. Rautenberg, S. Almond, I. Pretorius .....	S. Govender .....	—	Denholm (I.O.M.) Ltd
<i>Aya II</i> .....	29.1.96	M.J. Bellamy .....	E. Delgado, M.D. Lemus, G. Jonquid .....	V. Martinez .....	—	Cardiff Ship Management & Services Ltd
<i>Aztec I</i> .....	†	—	—	—	—	Cardiff Ship Management & Services Ltd
<i>BT Nautilus</i> .....	19.6.95	G.N. Gaunt .....	V. Sireesh Reddy, A.K. Thakur, R.B. Webb .....	K.B. Irani .....	—	BT Shipping (London) Ltd
<i>BT Navarin</i> .....	6.3.96	C.J. Bland .....	K.J. Vijapure, M.B. Aserkar, N.K. Sharma .....	P.K. Dutt .....	—	BT Shipping (London) Ltd
<i>BT Navigator</i> .....	13.10.95	G.N. Grant .....	G.A.D. Cunha, A.K. Thakur, V.L. Mathur .....	T. Fernandes .....	—	BT Shipping (London) Ltd
<i>BT Neptune</i> .....	†	—	—	—	—	BT Shipping (London) Ltd
<i>BT Nestor</i> .....	7.4.95	C.J. Bland .....	P.U. Sarma, K.J. Vijapure, C.J. MacNeil .....	J.C. D'Sa .....	—	BT Shipping (London) Ltd
<i>BT Nimrod</i> .....	†	—	—	—	—	BT Shipping (London) Ltd
<i>Baltic Breeze</i> .....	16.3.95	Teo Ho Wat .....	—	U. Tin Maung Than .....	—	Wallenius Lines (Japan) Ltd
<i>Baltic Eagle</i> .....	†	—	—	—	—	Andrew Weir Shipping Ltd
<i>Baltic Eider</i> .....	†	—	—	—	—	Andrew Weir Shipping Ltd
<i>Baltic Tern</i> .....	8.1.96	K.F. Steven .....	C. Taylor, A.J. Coull, S.J. Palmer .....	—	GMDSS	Andrew Weir Shipping Ltd
<i>Baltic Universal</i> .....	4.3.96	D. Winsor .....	A.F. Pagatapan, E.A. Capapas, G.A. Sanares .....	S. Kodikara .....	—	London Ship Managers Ltd
<i>Belo Oriente</i> .....	†	—	—	—	—	Eurasia Ship Management Co. (H.K.) Ltd
<i>Berlin Express</i> .....	3.11.95	J.H. Hutson .....	I.S. Norris, M.J. Daniels, J.B. McGruer .....	M. Hannan .....	—	P&O Containers Ltd
<i>Bison</i> .....	†	—	—	—	—	Pandoro Ltd
<i>Blue Flame I</i> .....	12.3.96	F.J. Powderill .....	J. Smith, M.A. Adams .....	—	GMDSS	Boston-Putford Offshore Safety Ltd
<i>Bora Universal</i> .....	12.12.95	B.M. King .....	R.N. Elikewela, Z. Wilczynski, A. Ogniski .....	J. Cardownite .....	—	London Ship Managers Ltd
<i>Botany Bay</i> .....	12.12.95	L.J. Fletcher .....	U.K. Urwin, M. Harrington, L.M. Butler .....	C.Y. Constantinou .....	—	P&O Containers Ltd
<i>Bransfield</i> .....	23.5.95	J. Cole .....	G.P. Chapman, J.R. Harper, K.C. Penny .....	S. Mee .....	—	British Antarctic Survey
<i>Brisbane Star</i> .....	16.1.96	A.J. Brown .....	D.R. Johnston, B.F. Cortez, R.M. Bat-og .....	A. Endomila .....	—	Blue Star Ship Management Ltd
<i>British Admiral</i> .....	21.12.95	R.M. Standing .....	S. Keitch, R. Miller, J. Zurek .....	B. Casey .....	—	BP Shipping Ltd
<i>British Adventure</i> .....	27.6.95	A.K. Birley .....	P.D. Walker, A. Chylak, I.C. Hodges .....	J. Smith .....	—	BP Shipping Ltd
<i>British Argosy</i> .....	30.11.95	P. Hebden .....	G. Reich, A.J. Salisbury, P.S. Westgate .....	P.E. Davies .....	—	BP Shipping Ltd
<i>British Esk</i> .....	11.1.96	J.M. Ronald .....	C.G. Vernon, J. Dzieciatla .....	—	GMDSS	BP Shipping Ltd
<i>British Ranger</i> .....	14.12.95	K.E. Peacock .....	W. Gozdecki, C.W.M. Stewart, K. Kowalczyk .....	A.D. Moore .....	—	BP Shipping Ltd
<i>British Reliance</i> .....	29.1.96	N.J. Greig .....	J.E. Tyson, P. Wroblewski .....	C. Lyon .....	—	BP Shipping Ltd
<i>British Resolution</i> .....	8.11.95	J.N. Gregson .....	A. Lagan, D. Sutton .....	—	GMDSS	BP Shipping Ltd
<i>British Resource</i> .....	8.3.96	G.M. Hallett .....	E. Mornice, J. Gutowski, J. Lewandowski .....	J. Minogue .....	—	BP Shipping Ltd
<i>British Skill</i> .....	8.3.96	J. Atkins .....	P.B. Hawkin, R.D. Holt, T. Lubelski .....	M. Taylor .....	—	BP Shipping Ltd
<i>British Spirit</i> .....	20.10.95	M. Pocklington .....	T.J. Blythe, S.A. Henderson .....	D. Riddle .....	—	BP Shipping Ltd

# Selected and Supplementary Ships (contd)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	RADIO/GMDSS OFFICER	OWNER/MANAGER
British Steel .....	14.12.95	P. Creber .....	J. Meador, W. Clear, D. Grennan .....	GMDSS .....	Furness Withy (Shipping) Ltd
British Success .....	10.5.95	P. Hebden .....	J. Lewandowski, G. Butler, J. Gutowski .....	GMDSS .....	BP Shipping Ltd
British Tamar .....	14.9.95	T.L. Cullen .....	D.L.S. West, A. Chylak, G. Whammond .....	B. Doherty .....	BP Shipping Ltd
Broompark .....	†	—	—	—	Denholm (I.O.M.) Ltd
Brussel .....	21.12.95	J.P. Hasselle .....	J. Moons, B. Van Rossen, O. Brenns .....	C. Calonce .....	ABC Containerline N.V.
Buenaventura .....	†	—	—	—	Jardine Ship Management (U.K.) Ltd
Buffalo .....	†	—	—	—	POETS Fleet Management Ltd
CGM Magellan .....	†	—	—	—	Furness Withy (Shipping) Ltd
CMB Ebony .....	†	—	—	—	Aseco (Antwerp) Ltd
CMBT America .....	8.11.95	S. Crole .....	G. Paxton, N. Badillo, E.T. Redill .....	S. Palay .....	Furness Maritime Services Ltd
CMBT Emerald .....	20.10.95	E.J. Warwick .....	R.S. Bajwa, S.S. Jadhav .....	M. Echarath .....	V.Ships (U.K.) Ltd
C.S. Iris .....	25.7.95	R.J. Walter .....	N.P. Smith, D. Darlington, J.D.F. Darbyshire .....	P. Craft .....	Cable & Wireless Marine (Southampton) Ltd
C.S. Monarch .....	†	—	—	—	Cable & Wireless Marine (Southampton) Ltd
C.S. Nexus .....	5.10.95	A.H. Giles .....	A. Huntington, A.N. Hamlett, P. Chrissy .....	GMDSS .....	James Fisher & Sons (Liverpool) Ltd
C.S. Sovereign .....	22.5.95	C.D. Knight .....	M.R. Swaffield, R. Gray, D.R. Williams .....	P. Muri .....	Cable & Wireless Marine (Southampton) Ltd
CSAV Los Angeles .....	†	—	—	—	Jardine Ship Management (U.K.) Ltd
CSO Constructor .....	†	—	—	—	Coflexip Stena Offshore Ltd
CSO Seawell .....	4.4.95	D. Smith .....	M.J. McGhee, R.B. Bryant, J. Pinney .....	GMDSS .....	Coflexip Stena Offshore Ltd
Cableman .....	*	—	—	—	P&O Tankships Ltd
Cable Innovator .....	*	—	—	—	Cable & Wireless Marine Ltd
Cable Installer .....	31.1.96	F.D. Kitt .....	A.M. Nash, F. Brearley, V.J. Walters .....	D.R. Woods .....	Cable & Wireless Marine Ltd
Cabo Negro .....	†	—	—	—	Cable & Wireless (Marine) Ltd
Caledonian Isles .....	18.7.95	A. McCrindle .....	C.C. Bain, P. Welsh, D. MacNeil .....	GMDSS .....	MOL Tankship Ltd
Canberra .....	22.1.96	P.D. Lumb .....	J.P. Bryant, C.M. Bourne .....	GMDSS .....	Caledonian MacBrayne Ltd
CanMar Conquest .....	13.9.95	Z.A. Jawed .....	L. Bhatti, V. Khurana, H.A. Mistri .....	J. Tanna .....	P&O Cruises Ltd
CanMar Courage .....	*	—	—	—	Anglo-Eastern Ship Management Services Ltd
CanMar Fortune .....	25.4.95	I.S. Donaldson .....	R.S. Sekhon, Z.A. Osmani .....	—	OOCL Agency Ltd
CanMar Glory .....	22.2.96	M.B. Iranpur .....	S. Chopra, K. Uphatak, A.K. Gopinathan .....	N.R. Kanwar .....	OOCL Agency Ltd
CanMar Triumph .....	†	—	—	Q. Maxi .....	Anglo-Eastern Ship Management Services Ltd
CanMar Victory .....	31.1.96	J.F. Dobson .....	N. Tunida, G. Dolor, S. Ilisan .....	M. Delfin .....	Canada Maritime Agencies GmbH
Canterbury Star .....	21.8.95	G. Vladimir .....	R. Bobic, C.T. Mueco, R.A. Saure .....	G.A. Villavilla .....	Blue Star Ship Management Ltd
Cape Horn .....	11.3.96	D.W. Lax .....	M.C.P. Sutcliffe, R.H. Ellison, M.C. Wise .....	K. Gaughan .....	MOL Tankship Management Ltd
Cardigan Bay .....	†	—	—	—	P&O Containers Ltd
Cartagena .....	1.2.96	H.K. Quai .....	U. Soe Yee, Bonia Ukyaw Soe, U. Tin Nyunt .....	U Hla Baw .....	Dole Fresh Fruit International Ltd
Cast Elk .....	7.9.95	Teck Hing W. Yeo .....	Belal Ahmed, Aung Htar Kyaw, John Albert Mah .....	U Hla Baw .....	Cast Europe (U.K.) Ltd
Cast Wolf .....	13.10.95	A. Wielbinski .....	J. Ziolkowski, J. Broi .....	GMDSS .....	Cast Europe (U.K.) Ltd
Celtic Warrior .....	24.11.95	R.H. Nightingale .....	L.A. Smith, D.J. Sweet, G.I. Hamer .....	GMDSS .....	C.M. Willie & Co. (Shipping) Ltd
Cervantes .....					Andrew Weir Shipping Ltd

<i>Challenger</i> .....	23.5.95	R.C. Plumley .....	M.L. Crofts .....	GMDSS	NERC Research Vessel Services
<i>Charles Darwin</i> .....	24.11.95	R.C. Plumley .....	C.M. Leather, P. Gauld, J.C. Holmes .....	—	NERC Research Vessel Services
<i>Cheshire</i> .....	2.10.95	M.M. Reeves .....	A.C. Montgomery, D.E. Morton, D.A. McAuley .....	GMDSS	Bibby Line Ltd
<i>Chilham Castle</i> .....	+	—	—	—	Kuwait Oil Tanker Co.
<i>Chiquita Baracoa</i> .....	29.1.96	P.G. Pinkerton .....	L.O. Moreno, R.D. Hussain, H. Jales .....	—	Logbridge Ltd
<i>Chiquita Barn</i> .....	26.2.96	C.I. Kitchen .....	E.D. Tan, C.E. Sanchez, A.A. Egos .....	—	Logbridge Ltd
<i>Chiquita Belgie</i> .....	29.1.96	D.A. Jackson .....	E.J. Patrakka, P. Enriquez, E.L. Sumbillo .....	—	Logbridge Ltd
<i>Chiquita Bremen</i> .....	30.11.95	G.W. Weaver .....	P. Nicholson, R. Rata, L.S. Delfin .....	—	Union Kühl-Schiffahrt GmbH
<i>Chiquita Brenda</i> .....	31.1.96	R.E. Lough .....	P. Ruszczyński, D. Osunero, A. Diana .....	—	Logbridge Ltd
<i>Chiquita Deutschland</i> .....	11.1.96	D. Rae .....	M.I.J. Carroll, I. Gazmin, T.E. Reyes .....	GMDSS	Logbridge Ltd
<i>Chiquita Elke</i> .....	11.9.95	C.I. Kitchen .....	I.T. McGarry, J.T. Mores, F.R. Galapón .....	—	Logbridge Ltd
<i>Chiquita Frances</i> .....	21.12.95	C.R. Darnley .....	M.D. Nash, J.R. Baulista, A.L. Derla .....	GMDSS	Logbridge Ltd
<i>Chiquita Italia</i> .....	13.9.95	W.V. Harwood .....	J. Hughes, P. Lontoc, N.D. Dalangin .....	—	Logbridge Ltd
<i>Chiquita Jean</i> .....	8.1.96	O.G. Keen .....	N.E. Gardiner, D.B. Awat, A.E. Avellana .....	GMDSS	Logbridge Ltd
<i>Chiquita Joy</i> .....	16.1.96	M.L. Kinnear .....	B.A. Pepito, R.T. Santos, N.J. Mauger .....	—	Logbridge Ltd
<i>Chiquita Nederland</i> .....	12.12.95	N. Flinterman .....	R.J. Dobson, R. Cayabyab, R.B. Lapinid .....	GMDSS	Logbridge Ltd
<i>Chiquita Rostock</i> .....	20.10.95	E.C. Lyon .....	M. Light, J.R. Lapatha, R.B. Arenal .....	—	Logbridge Ltd
<i>Chiquita Scandinavia</i> .....	30.11.95	N. Colling .....	J.H. Clamp, R. Pogoy, J. Valero .....	GMDSS	Union Kühl-Schiffahrt GmbH
<i>Chiquita Schweiz</i> .....	16.1.96	J.K. Wilkinson .....	A.W. Barr, D.H. Hoarmogino, H.J.M. Kaundoy .....	—	Logbridge Ltd
<i>Crolana</i> .....	+	—	—	—	Logbridge Ltd
<i>City of Barcelona</i> .....	23.2.96	W. Bartlett .....	J.C. Barton, T. Nyunt, M. Hood .....	—	MAFF Fisheries Laboratory
<i>City of Durban</i> .....	23.2.96	D.A.K. Bamford .....	B.P. Murphy, M. Rippon, A.S. Deans .....	—	Denholm Ship Management (U.K.) Ltd
<i>City of Sunderland</i> .....	+	—	—	—	P&O Containers Ltd
<i>Claymore</i> .....	+	—	—	—	Denholm Ship Management (U.K.) Ltd
<i>Clinton K</i> .....	+	—	—	—	Caledonian MacBrayne Ltd
<i>Clydebank</i> .....	21.12.95	E.F. Stewart .....	G.R. Armstrong .....	—	John McRink & Co. Ltd
<i>Colombo Bay</i> .....	22.1.96	D.C. Thomson .....	A. Firman, M.K. Hands, M. Dunbar .....	GMDSS	Andrew Weir Shipping Ltd
<i>Columbus</i> .....	23.5.95	R. Marfen .....	S.M. Singh .....	—	P&O Containers Ltd
<i>Columbus Valparaiso</i> .....	+	—	—	—	V.Ships (U.S.A.) Inc.
<i>Condor Arrow</i> .....	13.7.95	S. Behl .....	U.M. Thanawala, V. Kapoor, R.K. Pandey .....	—	Jardine Ship Management (U.K.) Ltd
<i>Coppename</i> .....	6.2.96	D. W. Bunyan .....	C. Bryson, W.C. Eleria, C.F. Falculan .....	GMDSS	United Ship Management Ltd
<i>Cordella</i> .....	+	—	—	—	Marine Management Services Ltd
<i>Cormorant Arrow</i> .....	7.4.95	I. Pavasic .....	E.P. Crucillo, F.P. Virgo .....	—	Mar Vessel Management Ltd
<i>Cornelis Verolme</i> .....	20.10.95	P. Corveleyn .....	B. Basyn, D. Verhelst, M. Hermans .....	—	Westfleet Management AS
<i>Corysies</i> .....	30.11.95	B.A. Chapman .....	—	—	ABC Containerline N.V.
<i>Cotinga</i> .....	15.2.96	A.G. Radomski .....	P. Gorski, B. Budniak, Z. Zielinski .....	GMDSS	MAFF Fisheries Laboratory
<i>Cotswold</i> .....	7.3.96	J.A. Smeeton .....	S.L. Pradhan, J. Khare .....	—	F.T. Everard & Sons Ltd
<i>Cotica</i> .....	4.3.96	D.J. Robinson .....	J.B. Clemente, E. Realizan, W.C. Eleria .....	GMDSS	P&O Bulk Shipping Ltd
<i>Dallington</i> .....	8.1.96	E. Gaffney .....	P. Dawson, M. Arden .....	GMDSS	Marine Management Services Ltd
<i>Dana Anglia</i> .....	3.4.95	C.E. Springborg .....	W. Simonsen, K. Laursen .....	GMDSS	Stephenson Clarke Shipping Ltd
<i>DeLoris</i> .....	+	—	—	—	DFDS Ltd
<i>Discovery (R.R.S.)</i> .....	4.10.95	K.O. Avery .....	P.W. Newton, R.M. Atkinson, R.J. Chamberlain .....	—	ABC Containerline N.V.
<i>Discovery</i> .....	2.4.95	A. Collee .....	J. Bloeman, T. Van Hoemeghen .....	—	NERC Research Vessel Services
<i>Discovery Bay</i> .....	30.11.95	T.G. Whitaker .....	C. Henderson, R.J.C. Neale, M.C. Wise .....	—	Cable & Wireless Marine (Southampton) Ltd
<i>Donnington</i> .....	+	—	—	—	P&O Containers Ltd
<i>Duhalow</i> .....	19.2.96	J.E. Sinnott .....	M.J. Howarth, H.D. Narvekar, J.S. Parhar .....	—	Stephenson Clarke Shipping Ltd
					P&O Bulk Shipping Ltd

# Selected and Supplementary Ships (contd)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	RADIO/GMDSS OFFICER	OWNER/MANAGER
<i>Durrington</i> .....	18.4.95	A. Wormald	J. Ashley, M.B. Wdowikowski, B. Martins	GMDSS	Stephenson Clarke Shipping Ltd
<i>Eagle</i> .....	18.4.95	P.D. Kelly	C. Rochon, B. Forsyth, W.J. Grabiec	GMDSS	Mobil Shipping Co. Ltd
<i>Eagle Arrow</i> .....	8.2.96	C.H.C. Knight	O. Riisem, J. Togonon, J.P. Galam	—	Gearbulk (U.K.) Ltd
<i>Eastern Bridge</i> .....	12.12.95	L.P. Bridges	M.C. Collins, T.M. Ryan, C. Edwards	GMDSS	Ropner Shipping Services Ltd
<i>Ebalina</i> .....	†	—	—	—	Shell Marine Personnel (I.O.M.) Ltd
<i>Eburna</i> .....	†	—	—	—	Shell Marine Personnel (I.O.M.) Ltd
<i>Echoman</i> .....	†	—	—	—	P&O Tankships Ltd
<i>Edinburgh Fruid</i> .....	11.9.95	M.G. Hancock	M.K. Sharan, S.M. Francis, R.S. Barretto	S. Kagawala	Denholm Ship Management (U.K.) Ltd
<i>Ek-River</i> .....	22.3.95	J.E. Karlsson	T. Harsvik, E. Jansen, A. Lyungberg	GMDSS	Ektank AB
<i>Elisabeth C</i> .....	16.3.95	C.W.K. Holmes	B. Carter	R. D'Arcy	Cansbrooke Shipping plc
<i>Elk</i> .....	2.3.96	B. Luke	P.A. Marcon, J.A. Robbie, J.T. Jamieson	M.J. Sheldon	POETS Fleet Management Ltd
<i>Ellen Hudig</i> .....	30.11.95	B. Hooimaert	G. Somers, D. Rollin, F. Willemen	R. Cawaling	ABC Containerline N.V.
<i>Encounter Bay</i> .....	22.5.95	R. Moxon	D. Lewis, R. Neale, C. Howarth	J. Bridge	P&O Containers Ltd
<i>Endeavor</i> .....	29.1.96	K.A. MacLeod	P.S. Jobling, C.M. Ashon, N. Atkinson	M. Pitcher	Souter Shipping Ltd
<i>English Star</i> .....	13.10.95	K. Lumby	R.J. Camara, D. Rivera, B.B. Garing	GMDSS	Blue Star Ship Management Ltd
<i>Equinox</i> .....	8.1.96	P.C. Harris	L.G. Andrews, J.O. Greig, M.A. Sloan	A.P. Clarke	Souter Shipping Ltd
<i>Eredine</i> .....	11.9.95	D.L. Walkins	S.K. Ong, P.J. Moss, K.A. Johnston	N.W. Harrison	The China Navigation Co. Ltd
<i>Eridge</i> .....	8.1.96	B.J. Kirtley	E.M. Holmyard, K. Govindarajan, G. Vathiath	B.G. Palankar	P&O Bulk Shipping Ltd
<i>Erradale</i> .....	22.1.96	R. Proud	J. Harvey, I. Ronquillo, E. Espirtu	GMDSS	The China Navigation Co. Ltd
<i>Ervilia</i> .....	†	—	—	—	Shell Marine Personnel (I.O.M.) Ltd
<i>Explanade</i> .....	8.1.96	P.C. Harris	J.M. Towler, P.S. Jobling	C.A. Dillon	Souter Shipping Ltd
<i>Euplecta</i> .....	†	—	—	—	Shell Marine Personnel (I.O.M.) Ltd
<i>European Shearwater</i> .....	†	—	—	—	James Fisher & Sons Plc
<i>European Trader</i> .....	†	—	—	—	P&O European Ferries Ltd
<i>Excelsior</i> .....	14.9.95	R.W. Purser	J. Barnett, R.M. Warner, P. O'Neil	R.J. Spencer	Souter Shipping Ltd
<i>Exemplar</i> .....	5.12.95	I. Beetham	M. Legg, G. Pearce, T.A. Longstaff	F. Wilson	Souter Shipping Ltd
<i>Eye of the Wind</i> .....	†	—	—	—	Crediton Country Courier
<i>Fairwind</i> .....	18.4.95	A. Malinowski	A. Wielbinski, K. Trebicki	A. Malinowski	C.M. Willie & Co. (Shipping) Ltd
<i>Faki III</i> .....	23.6.95	L.C. Rowse	L.C. Rowse	GMDSS	Sea Falcon Fishing Co. Ltd
<i>Falcon Arrow</i> .....	13.10.95	J.R. Thomas	R.A. Maiquez, G. Fajardo, A.S. Cabanban	P.J. Acebes	United Ship Management Ltd
<i>Finch Arrow</i> .....	8.11.95	R.M. D'Souza	V.S.K. Sason, P. Mehrotra, S. Sundaravelu	V.V. Raghothaman	United Ship Management Ltd
<i>Flinders</i> .....	*	—	—	—	ASP Ship Management
<i>Flinders Bay</i> .....	30.11.95	A.E. Spencer	B. Brierley, S. Bryans, J.D. Lay	J. Mitten	P&O Containers Ltd
<i>Forthbank</i> .....	3.11.95	W. Campbell	A.D. MacPherson, J. Choma, R. Baran	M. Jarecki	Andrew Weir Shipping Ltd
<i>Foylebank</i> .....	*	—	—	—	Andrew Weir Shipping Ltd
<i>Francis Drake</i> .....	†	T. Mansell	S. Ranoa, L.F. Soratorio, A. Arrogancia	—	Ocean Youth Club
<i>Fremantle Star</i> .....	31.10.95	J.F. Rowe	N.I. Protasoc, Y.I. Danilenko, V.A. Courevich	GMDSS	Blue Star Ship Management Ltd
<i>Frines</i> .....	13.9.95	V.K. Tolmachyou	—	A. Kolpaschikov	Sakhalin Shipping Co.
<i>Front Hawk</i> .....	*	—	—	—	Wallen Shipmanagement (H.K.) Ltd



<i>Front Rider</i> .....	*	—	—	S. Korshakov, R. Artyom .....	—	B. Yariy .....	Nordic Oriental Shipmanagement Pre Ltd
<i>Fullnes</i> .....	29.1.96	—	C. Vladimir .....	—	—	—	Sakhatin Shipping Co.
<i>Gardline Locater</i> .....	†	—	—	—	—	—	Gardline Shipping Ltd
<i>Geest Dominica</i> .....	12.12.95	—	R.A. Cole .....	A.B. Ward, J. Kolański, K. Czulak .....	—	—	Ugland Intercean Management Ltd
<i>Geest St Lucia</i> .....	31.10.95	—	R.A. Cole .....	A. Ward, Ziemianski Mariusz, J. Kolacinski .....	—	GMDSS	Ugland Intercean Management Ltd
<i>Gem</i> .....	†	—	—	—	—	—	Stephenson Clarke Shipping Ltd
<i>General Delgado</i> .....	†	—	—	—	—	—	Jebsens Ship Management (Bergen) AS
<i>General Tirona</i> .....	†	—	—	—	—	—	Jebsens Ship Management (Bergen) AS
<i>General Villa</i> .....	†	—	—	—	—	—	Jebsens Ship Management (Bergen) AS
<i>Glen Maye</i> .....	21.8.95	—	C.A. McDowall .....	G.M. Connolly, J. Heylen, W.E. Krause .....	—	R. Dalsay .....	MOL Tankship Management Ltd
<i>Glen Roy</i> .....	†	—	—	—	—	—	MOL Tankship Management Ltd
<i>Golden Ray</i> .....	†	—	—	—	—	—	Stanco Ship Management Co. Ltd
<i>Gracechurch Sun</i> .....	*	—	—	—	—	—	C.M. Willie & Co. (Shipping) Ltd
<i>Greater Manchester</i> .....	†	—	T.B. Andersen .....	—	—	—	Ocean Youth Club
<i>Challenge</i> .....	†	—	—	—	—	—	Greenpeace Marine Division
<i>Greenpeace</i> .....	†	—	—	—	—	—	Westfleet Management AS
<i>Gull Arrow</i> .....	18.4.95	—	C.H.C. Knight .....	—	—	P.B. Palomata .....	Marr Vessel Management Ltd
<i>HV Fox</i> .....	16.3.95	—	E. Casson .....	A. Somerton, G. Strachan .....	—	GMDSS	Kuwait Oil Tanker Co.
<i>Hadiyali</i> .....	*	—	—	—	—	—	Barber Ship Management AS
<i>Harmac Dawn</i> .....	†	—	—	—	—	—	Mobil Shipping Co. Ltd
<i>Harrier</i> .....	†	—	—	—	—	—	Gearbulk (U.K.) Ltd
<i>Hato Arrow</i> .....	*	—	—	—	—	—	A/S Havor Management
<i>Havdrott</i> .....	†	—	—	—	—	—	A/S Havor Management
<i>Havjarl</i> .....	14.12.95	—	V. Cook .....	C.J. Graner, R.S. Plaza, M.V. Cayone .....	—	A.B. Gaviola .....	A/S Havor Management
<i>Havkong</i> .....	11.9.95	—	D.J. Elson .....	R. Valintine, M. Villar, D.T. Rudinas .....	—	S.E. Sabanal .....	A/S Havor Management
<i>Havpil</i> .....	†	—	—	—	—	—	A/S Havor Management
<i>Hawk</i> .....	8.11.95	—	R.B.N. Stuart .....	D.M. Hopkin, C.A. Pragadas, C. Rochon .....	—	R.A. Trope .....	Mobil Shipping Co. Ltd
<i>Hebridean Isles</i> .....	16.9.95	—	M. Kennedy .....	G. Shepherd, K.M. MacDonald, S. MacDonald .....	—	GMDSS	Caledonian MacBrayne Ltd
<i>Hekabe</i> .....	31.10.95	—	T.N. Ferguson .....	K.P. Ratcliffe, E. Tapia .....	—	L.P. Lim .....	A/S Havor Management
<i>Helen</i> .....	†	—	—	—	—	—	ABC Containerline N.V.
<i>Helene Maersk</i> .....	*	—	—	—	—	—	A.P. Moller
<i>Helikon</i> .....	8.3.96	—	G.R. Phillips .....	M. Youel, K. Brothers, S. Speirs .....	—	J. Genato .....	A/S Havor Management
<i>Helios</i> .....	9.8.95	—	V. Cook .....	M.M. Deyes, R. Irvine, F. Sacro .....	—	A. Suarez .....	A/S Havor Management
<i>Hemera</i> .....	3.11.95	—	V. Cook .....	A.G. Genovaia, F.I. Mana-ay, R.N. Cubilo .....	—	N.P. Entonia .....	A/S Havor Management
<i>Hemina</i> .....	31.10.95	—	P.R. Dew .....	R.M. Deyes, H. Wilks, D.A. McCracken .....	—	C. Esmael .....	A/S Havor Management
<i>Hermad</i> .....	22.2.96	—	M. Larsen .....	R. Dalton, J.L. Echsandia, D. Rosaluna .....	—	R. Sim .....	A/S Havor Management
<i>Hestod</i> .....	9.8.95	—	T.N. Ferguson .....	F. Sacro, B. Murrin, M.A. Youel .....	—	A.S. Suarez .....	A/S Havor Management
<i>Hoegh Duke</i> .....	†	—	—	—	—	—	Leif Høegh & Co. A/S
<i>Hoo Kesrel</i> .....	27.6.95	—	T.J. Pollitt .....	T.J. Pollitt .....	—	GMDSS	R. Laphorn & Co. Ltd
<i>Hordnes</i> .....	†	—	—	—	—	—	Jebsens Ship Management (London) Ltd
<i>Hornbeck Integrity</i> .....	*	—	—	—	—	—	Hornbeck Offshore Ltd
<i>Hornbeck Invincible</i> .....	26.2.96	—	P.J. Cooper .....	M. Paxton, J.A. Macinnon, A. Caig .....	—	W. Gordon .....	Hornbeck Offshore Ltd
<i>Hornbreeze</i> .....	30.11.95	—	D.P. Neaves .....	J.A. Josua, P.R. Roldan, D.A. Selvido .....	—	M.M. Yaoyao .....	London Ship Managers Ltd
<i>Horncloud</i> .....	12.12.95	—	T.N. Abbott .....	J.B. Hangstang, C.A.W. Samaranyake .....	—	S.N. Gurusinghe .....	London Ship Managers Ltd
<i>Husnes</i> .....	†	—	—	—	—	—	Jebsens Ship Management (London) Ltd
<i>Hyundai Vancouver</i> .....	13.9.95	—	R.R. Mogul .....	M.S. Bhatti, M.N. Modak, R.P. D'Sa .....	—	S. Sharan .....	Wallem Ship Management (H.K.) Ltd

# Selected and Supplementary Ships (contd)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	RADIO/GMDSS OFFICER	OWNER/MANAGER
<i>Ibex</i> .....	*	—	—	—	Pandoro Ltd
<i>Ibis Arrow</i> .....	*	—	—	—	Gearhulk (U.K.) Ltd
<i>Ibn Abdoun</i> .....	†	—	—	—	United Arab Shipping Co. (S.A.G.)
<i>Isolair</i> .....	23.2.96	M. Ramsbottom	L.C. Farquhar	GMDSS	Reading & Bates (U.K.) Ltd
<i>Ironbridge</i> .....	23.2.96	J.O. Jubb	I. Woollard, G. Simpson, R.M. Sharp	C. Jackson	Furness Withy (Shipping) Ltd
<i>Island Princess</i> .....	18.7.95	C.J. Sampley	J.L. Hobbs, A. Draper, C. Ward	A. Turner	P&O Cruises Ltd
<i>Isle of Arran</i> .....	†	—	—	—	Caledonian MacBrayne Ltd
<i>Isle of Lewis</i> .....	*	—	—	—	Caledonian MacBrayne Ltd
<i>Isle of Mull</i> .....	24.3.95	D. Finlayson	S. Ross, A. Colquhoun, I. Scarr	GMDSS	Caledonian MacBrayne Ltd
<i>Isocaradia</i> .....	6.10.95	P.N. Bowden	J. Cartwright, C.M. Doyle, J.A. Stone	GMDSS	Shell Marine Personnel (I.O.M.) Ltd
<i>Isomeria</i> .....	24.11.95	D.C.J. Still	S.F. Breen, P.E.P. Roche, T.S. Page	GMDSS	Shell Marine Personnel (I.O.M.) Ltd
<i>Ivybank</i> .....	30.11.95	P.S. Chase	S.M. Eggleston	A.M. Zawirski	Andrew Weir Shipping Ltd
<i>Jahre Prospect</i> .....	20.10.95	G.V. Pereira	B.S. Duggal, S.G. Shetty, S.S. Sandhu	R. Tomasz	Wallem Ship Management (H.K.) Ltd
<i>Jahre Spirit</i> .....	17.8.95	M.K. Chaturvedi	H. Desa, Y. Puzhaev, Y. Savelev	M.P. Bacha	Wallem Ship Management (H.K.) Ltd
<i>Jahre Spray</i> .....	15.2.96	V. Garg	V. Kolyadyuk, S. Ahmed	P. Das	Wallem Ship Management (H.K.) Ltd
<i>James Clark Ross</i> .....	14.9.95	J. Burgain	R. Jackson, G.C. Morgan, J. Tolson	R. Pavida	British Antarctic Survey
<i>Jarikaba</i> .....	8.11.95	R. Mitchell	R.H.C. Mitchell, S. Magboo, E.E. Erispe	C. Waddicor	Marine Management Services Ltd
<i>Jervis Bay</i> .....	29.1.96	C.C. Woodward	T. Oliver, N.P. Barrington, R.D. Bogue	GMDSS	P&O Containers Ltd
<i>John Laing</i> .....	*	—	—	GMDSS	Ocean Youth Club
<i>Jostelle</i> .....	24.11.95	J.M. Bullard	M. Monk, T.A. Meharry, A. Crew	A.P. Daff	Souter Shipping Ltd
<i>Kathe Sif</i> .....	†	—	—	—	Jeppesen Heaton Ltd
<i>Kazimah</i> .....	27.6.95	M.M. Vashist	M. Hanafy, A. Habib, E. El Afify	G. Crispino	Kuwait Oil Tanker Co.
<i>Kedah</i> .....	10.3.95	M. O'Carrol	V.G. Fainsol	GMDSS	Kapal Management (Pte) Ltd
<i>Keta Lagoon</i> .....	†	—	—	—	Black Star Line Ltd
<i>Kiukiang Career</i> .....	*	—	—	—	Kapal Management (Pte) Ltd
<i>Kiwi Arrow</i> .....	22.5.95	J. Smith	R. Peralta, R. Willanueva, M.G. Caleja	GMDSS	United Ship Management Ltd
<i>Knock Allan</i> .....	*	—	—	—	Red Band AS
<i>Kowloon Bay</i> .....	30.11.95	J.G. Bose	J.C. Harris, E.F.S. Harrison, L.J. Cheestbrough	C.B. Hardie	P&O Containers Ltd
<i>Kukawa</i> .....	8.1.96	D.S. Ritchie	J.R. Acquah, K. Torto-Rockson, J. Coffie	V.A. Arcegonio	Acomarit (U.K.) Ltd
<i>Kumasi</i> .....	13.10.95	W.E.L. Godsell	R.J. Smith, P.K. Hine, S.K.A. Hagan	I. Saquilayan	Acomarit (U.K.) Ltd
<i>Lackenby</i> .....	4.7.95	B.F. Middleton	S.H. Avery, J.D. Williams, D. Bridgeman	GMDSS	Ropner Shipping Services Ltd
<i>Lady Rebecca</i> .....	†	—	—	—	John McRink & Co. Ltd
<i>Lampas</i> .....	†	—	—	—	Shell Marine Personnel (I.O.M.) Ltd
<i>Larkfield</i> .....	*	—	—	—	Westfleet Management AS
<i>Leonia</i> .....	29.1.96	T.H. Scott	R.J. Collier, S.P. Thompson, D.B. Winder	GMDSS	Shell Marine Personnel (I.O.M.) Ltd
<i>Lepeta</i> .....	31.1.96	P. Pinches	J. Arnott, N. MacNab, H.T. Ward	GMDSS	Shell Marine Personnel (I.O.M.) Ltd
<i>Lerna</i> .....	25.7.95	C. Aleksander	J.R. Hernandez, A.R. Aguilar, D.A.R. Chavez	D.P. Bidmead	Cardiff Ship Management & Services Ltd
<i>Licorne Pacifique</i> .....	*	—	—	—	Sosena S.A.
<i>Lima</i> .....	18.7.95	M. Clifford	A.P. Martin, J. Anwar, J. Arnott	GMDSS	Shell Marine Personnel (I.O.M.) Ltd

<i>Lincolnshire</i> .....	7.9.95	R.A.F. Edwards.....	C.A. Jackson, I.D. Handford, S. Howat.....	G.J. Simpson.....	Bibby Line Ltd
<i>Lincoln Universal</i> .....	2.2.96	R. Hutchinson.....	L. Montilla, D.F. Paca, M.B. Simogan.....	L. Niviella.....	London Ship Managers Ltd
<i>Lioness</i> .....	30.11.95	R. Chadha.....	R.N. Sanyal, C. Pereira, M.S. Ladera.....	D.D. Laichandani.....	Wallem Ship Management (H.K.) Ltd
<i>Liverpool Bay</i> .....	23.2.96	K.W. Smith.....	M. Grimshaw, B.G. Ball, F.S. Wilson.....	P.A.A. Gooch.....	P&O Containers Ltd
<i>London Enterprise</i> .....	†	—	—	—	London & Overseas Freighters (U.K.) Ltd
<i>London Glory</i> .....	21.12.95	J.W.W. Peters.....	S. Proctor, I.V. Hughes, B. Baker.....	I.G. Swales.....	London & Overseas Freighters (U.K.) Ltd
<i>London Spirit</i> .....	30.11.95	B. Watkins.....	T.P. Hutton, S.J.F. Millar, G.A. Whitaker.....	D. Lawrence.....	London & Overseas Freighters (U.K.) Ltd
<i>London Splendour</i> .....	*	—	—	—	London & Overseas Freighters (U.K.) Ltd
<i>Lord Nelson</i> .....	1.3.96	C.B. Bailey.....	S. Sourbutts, H. Maynard, M. McNeil.....	P. Miller.....	London & Overseas Freighters (U.K.) Ltd
<i>Lord of the Isles</i> .....	2.5.95	J.P.H. Fisher.....	J.P. Paling, B.A. Campbell, D.J. Naggs.....	GMDSS	Jubilee Sailing Trust Ltd
<i>Lough Foyle</i> .....	13.10.95	R.E.T. Sneedon.....	R.M. MacLeod, J.A. MacLeod, G. Shepard.....	GMDSS	Caledonian MacBrayne Ltd
<i>Lucky Bulker</i> .....	†	—	—	—	Heyn Engineering & Shipping Service
<i>Maersk Gannet</i> .....	13.7.95	R.R. Pradhan.....	G.J. Saldanha, S. Biswas.....	Raghavan.....	Valles Steamship Co. Ltd
<i>Maersk Shelland</i> .....	16.1.96	S. McCollin.....	G. Muir.....	GMDSS	The Maersk Co. Ltd
<i>Maersk Stafford</i> .....	*	—	—	—	The Maersk Co. Ltd
<i>Maersk Sussex</i> .....	22.2.96	M. Brocklesby.....	S. Creswell, A.T. Whale, B. Murnin.....	—	The Maersk Co. Ltd
<i>Magnolia</i> .....	1.3.96	J.H. Birchenough.....	C.W. Blacker, B. Forsyth, L. Lopez.....	GMDSS	Mobil Shipping Co. Ltd
<i>Mairangi Bay</i> .....	4.3.96	A.W. Ellis.....	L.H.N. Johnson, T. Robinson, J.S. Orr.....	GMDSS	P&O Containers Ltd
<i>Martha II</i> .....	16.1.96	F. Nelissen.....	J.M. Touzani, G. Abbeels, K. De Vlegelaar.....	H.G. Roe.....	ABC Containerline N.V.
<i>Maico Clyde</i> .....	20.10.95	M. Cadman.....	A. Fleming, H.D. Murray, J.P. Steen.....	Z. Alconcel.....	Mobil Shipping Co. Ltd
<i>Maico Thames</i> .....	22.8.95	K.M. Calladine.....	H. Murray, J. Manoch, I. Gray.....	GMDSS	Mobil Shipping Co. Ltd
<i>Med Barcelona</i> .....	†	—	—	—	Tecto N.V.
<i>Med Singapore</i> .....	1.2.96	J. Bermimolin.....	P. Pommecoucke, —, Mukundas, —, Mugangu.....	GMDSS	Tecto N.V.
<i>Merchant Paramount</i> .....	*	—	—	—	V. Ships (U.K.) Ltd
<i>Merchant Patriot</i> .....	†	—	—	—	V. Ships (U.K.) Ltd
<i>Merchant Premier</i> .....	4.7.95	R. Sidney.....	B. Indranath, Z. Khoekar, K.G. Chezian.....	S.C. Kulkarni.....	V. Ships (U.K.) Ltd
<i>Merchant Prestige</i> .....	*	—	—	—	V. Ships (U.K.) Ltd
<i>Merchant Princess</i> .....	30.11.95	A. Sahling.....	K. Raghavan, S.K. Das.....	N. Jose.....	V. Ships (U.K.) Ltd
<i>Merchant Principal</i> .....	†	—	—	—	V. Ships (U.K.) Ltd
<i>Mercury</i> .....	21.9.95	J. Paterson.....	G.L. Williams, S.B. Beal, G.W. Farrant.....	I. Barnes.....	Cable & Wireless (Marine) Ltd
<i>Mineral Zulu</i> .....	*	—	—	—	Anglo-Eastern Ship Management Services Ltd
<i>Moraybank</i> .....	2.2.96	E.M. Pallister.....	J.P. Warren, P. Zielinski, M. Konczak.....	Z. Cybulski.....	Andrew Weir Shipping Ltd
<i>Moreton Bay</i> .....	5.12.95	G.J.H. Peaston.....	J.G. Swindlehurst, M.N. Messenger, C.P.J. Robins.....	C.P.J. Robins.....	P&O Containers Ltd
<i>Mountain Cloud</i> .....	†	—	—	—	Norbulk Shipping (U.K.) Ltd
<i>Murex</i> .....	*	—	—	—	Shell Marine Personnel (I.O.M.) Ltd
<i>Nand Nidhi</i> .....	†	—	—	—	Essar Sisco Ship Management Co. Ltd
<i>Nanda Arrow</i> .....	†	—	—	—	United Ship Management Ltd
<i>Neptune Jasper</i> .....	†	—	—	—	Neptune Ship Management Services (Pte) Ltd
<i>New Generation</i> .....	†	—	—	—	James Fisher & Sons plc
<i>Newport Bay</i> .....	6.2.96	A.C. McCulloch.....	S.J. McNeil, L.S. Mahdi, S. Frediani.....	GMDSS	P&O Containers Ltd
<i>Nivaga II</i> .....	†	—	—	—	Government of Tuvalu
<i>Nolizwe</i> .....	†	—	—	—	South African Marine Corp. Ltd
<i>Nord Jahre President</i> .....	†	—	—	—	Wallem Ship Management (H.K.) Ltd
<i>Nornia</i> .....	19.2.96	D.L. Rattray.....	A.R. Davidson, D.A. Smith, M.C.J. Jewell.....	GMDSS	Scottish Office Agr. & Fisheries Dept.
<i>Norrista</i> .....	†	—	—	—	Shell Marine Personnel (I.O.M.) Ltd

# Selected and Supplementary Ships (contd)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	RADIO/GMDSS OFFICER	OWNER/MANAGER
Norsea.....	9.2.96	J. Walker .....	P.J. Wade, S. Brambles, A.P. Tyson .....	GMDSS	North Sea Ferries Ltd
Norihella.....	†	—	—	—	Marr Vessel Management Ltd
Northern Desire.....	13.7.95	P. Taylor .....	M. Urchman, S. Brown, M. Bradley .....	GMDSS	Marr Vessel Management Ltd
Northern Horizon .....	13.10.95	G. Renardson .....	D. Gouldson, J. Roberts, A. Somerton .....	P. Appleyard.....	Marr Vessel Management Ltd
Northern Prince.....	†	—	—	—	Marr Vessel Management Ltd
Northia.....	†	—	—	—	Shell Marine Personnel (I.O.M.) Ltd
Oakby.....	†	—	—	—	Ropner Shipping Services Ltd
Ocean Goose .....	†	D.A. Church .....	—	—	Captain D.A. Church
Olivebank.....	†	—	—	—	Andrew Weir Shipping Ltd
OOCL Assurance.....	27.6.95	D.J. Pritchard .....	I.M. Wright, W.J. Coxon, E. Godolphin .....	T.S.G. Jarra .....	OOCL (U.K.) Ltd
OOCL Bravery.....	8.1.96	J.P. Ayling .....	J. Balkwill, E. Godolphin, B. Dunleavy .....	T.S.G. Jarra .....	OOCL (U.K.) Ltd
Oriana.....	16.1.96	R. Knight .....	T. Mills, T. Clark, I.P. Grubb .....	GMDSS	P&O Cruises Ltd
Orient Star .....	†	—	—	—	Acomani (U.K.) Ltd
Oriental Bay .....	11.1.96	B. Graham .....	J.W.S. Tolman, J. Holmshaw, D.R.N. Cropley .....	—	P&O Containers Ltd
Oriental Venture.....	30.11.95	R.D. Mead .....	D. Wirts, D.M. Way, M.M. Robinson .....	W. Smith .....	BP Shipping Ltd
Orion Reefer .....	†	—	—	—	Wallem Ship Management (H.K.) Ltd
Ormond.....	22.5.95	R.M. Ellsmoor .....	I.C. Oke, J.S. Dhindsa, V.S.S. Fernandes .....	A. Mamaparo.....	P&O Bulk Shipping Ltd
Osaka Bay.....	7.2.96	C.R. Short .....	I.G. Travis, F.N. Cambra, J.P. Melles-Sawyers .....	P. Pegg.....	P&O Containers Ltd
Pacific Crane.....	11.1.96	T.R. Greig.....	S. McBride, T.T. Lunt, S.D. Palmer .....	D.P. Coutnadge .....	James Fisher & Sons plc
Pacific Guardian.....	†	—	—	—	Cable & Wireless (Marine) Ltd
Pacific Horizon.....	16.3.95	S. Morrell .....	—	—	Marr Vessel Management Ltd
Pacific Pinail.....	5.12.95	J.M. Miller .....	J.B. Appleby, C.A. Bates, P.J. Mahoney .....	A.P. Austen .....	James Fisher & Sons plc
Pacific Princess.....	29.1.96	M.J.F. Moulin .....	R.G. Metkle, B.M. Sadler .....	S.L. Coveney .....	P&O Cruises Ltd
Pacific Sandpiper .....	16.1.96	A.G. Lacey .....	P.A. Booker, K.M. Chester, J.P. Gaskin .....	P.G. Golsen .....	James Fisher & Sons plc
Pacific Swan.....	†	—	—	—	James Fisher & Sons plc
Pacific Teal.....	7.9.95	D. Marr .....	G. Farrell, D. Hadfield, M.L. Constantine .....	A. Watt .....	James Fisher & Sons plc
Pacific Universal .....	4.7.95	J.E. Dingle .....	Rene Mallo .....	P. Sathiyamurthy .....	London Ship Managers Ltd
Pacific Venture .....	8.11.95	R. Megran.....	C.B. Chapman, M. Alarcon, Z. Clemente .....	T. Laude .....	MOL Tankship Management Ltd
Pacific Wave .....	13.7.95	C.R. Naraway .....	—	I.O. Ramos .....	MOL Tankship Management Ltd
Palliser Bay .....	1.2.96	S.D. Smith .....	D.W. Smith, C.N. Hallim, K. Krishnakumar .....	F.A. Dunn.....	P&O Containers Ltd
Panther .....	16.1.96	K. Riley .....	D. Gale, G. Henderson, A.A. Facey .....	GMDSS	POETS Ship Management Ltd
Pelican Arrow.....	†	—	—	—	United Ship Management Ltd
Peninsular Bay .....	23.2.96	J.W. Welch .....	A. Murray, L. Rigby, C.J.P.H. Seares .....	GMDSS	P&O Containers Ltd
Petro Aberdeen.....	26.2.96	G.T. Rymer .....	G. Kane, D.I. McIntosh, A.W. Nolan .....	GMDSS	Petroleum Shipping Ltd
Petro Fife.....	15.5.95	F. Cook .....	M.K. Elson .....	GMDSS	Petroleum Shipping Ltd
Petro Milford Haven.....	22.5.95	H.N. McQuad .....	T. Stone, G.P. Young, K.F. Hodson .....	GMDSS	Petroleum Shipping Ltd
Petro Tyne .....	†	—	—	—	T. & J. Harrison Ltd
Pisces Pioneer .....	†	—	—	—	P&O European Ferries (Portsmouth) Ltd
Pride of Bilbao .....	20.6.95	R.J. Ross.....	K. Whittaker, J.E. Hutchings, W. Douglas .....	GMDSS	

<i>Pride of Cherbourg</i> .....	30.3.95	C.E. Banks.....	C. Illidge, J. Gordon, R.T. Harding.....	D. Thomas.....	P&O European Ferries (Portsmouth) Ltd
<i>Pride of Hampshire</i> .....	2.2.96	A.F. Bonehill.....	I.V. Hughes, P.M. Eastwood, D. Worrin	GMDSS	P&O European Ferries (Portsmouth) Ltd
<i>Pride of Le Havre</i> .....	18.4.95	M. Edward.....	P.N. Hill, J.L. McCorquodale, J.M. Webster	GMDSS	P&O European Ferries (Portsmouth) Ltd
<i>Pride of Portsmouth</i> .....	22.5.95	R.A. Shopland.....	— Carter, —, Hilton.....	GMDSS	P&O European Ferries (Portsmouth) Ltd
<i>Pride of Suffolk</i> .....	4.3.96	D.T. Kirkwood.....	A. Coombs, A.M. Smith, R. Cole.....	GMDSS	P&O European Ferries (Felixstowe) Ltd
<i>Providence Bay</i> .....	21.12.95	D.L. Bachelor.....	A.N. Murray, J. Poulter, J.C. Bennett	GMDSS	P&O Containers Ltd
<i>Puerto Cortes</i> .....	25.4.95	S.A. Francis.....	C.D'Souza, R.B. Manabat, L.J. Rodrigues	Unileasing A/S	
<i>Puma</i> .....	25.4.95	N.C.E. Spencer.....	S.N. Parvin, R. Kilroy, J.H. Coite	POETS Fleet Management Ltd	
<i>Pufford Achilles</i> .....	31.10.95	P.H. Corbett.....	H. Reese, G. Winram, S. Murphy	Boston-Pufford Offshore Safety Ltd	
<i>Pufford Artemis</i> .....	21.12.95	R.A. Stockley.....	P.G. McCardle, P. Thomas, T. Bell	Boston-Pufford Offshore Safety Ltd	
<i>Pufford Puffin</i> .....	29.1.96	I. Smith.....	C. Townsend, J.E. Marshall, C. Pook	Boston-Pufford Offshore Safety Ltd	
<i>Pufford Shore</i> .....	16.1.96	C.H. Pearce.....	D.G. Cook, D.P. Clegg.....	Boston Pufford Offshore Safety Ltd	
<i>Pufford Skua</i> .....	12.12.95	D. Spivey.....	A. Farnery, D. Newbury, G. Smith	Boston Pufford Offshore Safety Ltd	
<i>Pychley</i> .....	31.10.95	J. Lacey.....	D. Williams, S. Chawla, H. Kameshwar	P&O Bulk Shipping Ltd	
<i>Queen Elizabeth 2</i> .....	22.1.96	J. Burton-Hall.....	S.M. Smith, T. Armstrong, J. Haylen	Cunard Line Ltd	
<i>Queensland Star</i> .....	14.9.95	D. Craddock.....	A. Bold, E. Murias, N. Acedo	Blue Star Ship Management Ltd	
<i>Rafnes</i> .....	16.3.95	R.P. Paderes.....	E.O. Clemente.....	Jebsens Ship Management (London) Ltd	
<i>Ravenscraig</i> .....	17.8.95	W.G. Mair.....	B. Pocklington, B. Laing, C.J. Burt	Ropner Shipping Services Ltd	
<i>Reefar Janbu</i> .....	23.2.96	A.J. Wilson.....	R.Q. Surigao, D. Majic, G.M. Villavieja	Sembawang Shipping Co. (Pte) Ltd	
<i>Regent Park</i> .....	13.7.95	Vejko Bruketa.....	Davor Kucica, Daniel Zanetic.....	Roderiet Otto Danielsen	
<i>Regina Oldendorff</i> .....	†	—	—	Egon Oldendorff (H.K.) Ltd	
<i>Repulse Bay</i> .....	†	—	—	Orient Ship Management Ltd	
<i>Repulse Bay</i> .....	1.2.96	A.J. Leslie.....	N.A. Voss, D.C. Collins-Williams, D.J. Vickery	P&O Containers Ltd	
<i>Resolution Bay</i> .....	23.2.96	J.N. Kelleher.....	D. Hinson, F.N. Cambra, G.H. Smith	P&O Containers Ltd	
<i>Rhone</i> .....	9.8.95	N.I. Beg.....	S.K. Sen, S.K. Kartha, M.M. Aung	United Ship Management Ltd	
<i>Rixia Oldendorff</i> .....	4.3.96	A.K. Arora.....	A.R.K. Sawant, F.D. Ganai, J. Leonharot	Egon Oldendorff (H.K.) Ltd	
<i>Royal Princess</i> .....	9.8.95	I. Tompkins.....	P. Heslop, Z. Joachim.....	P&O Cruises Ltd	
<i>Royal Star</i> .....	30.11.95	S.K. Chandra.....	M. Mubeen, D. Dias, A. Pinto.....	Blue Star Ship Management Ltd	
<i>S.C. Lancer</i> .....	†	—	—	Schahin Cury	
<i>St Clair</i> .....	30.11.95	J. Cowie.....	G. Gove, E. MacKay, M. Pickles	P&O Scottish Ferries Ltd	
<i>St Helena</i> .....	14.12.95	M.L.M. Smith.....	R.J. Murray, G. Wilson, N.R. Mogg	Curnow Shipping Ltd	
<i>St Rognvald</i> .....	†	—	—	P&O Scottish Ferries Ltd	
<i>St Sanniva</i> .....	23.2.96	S.R. Allen.....	I. Easton, W. MacKay, S. Gunn	P&O Scottish Ferries Ltd	
<i>Sachem</i> .....	11.1.96	C.R. Booker.....	M.J. Catt, J.O.R. Rebelo	Mobil Shipping Co. Ltd	
<i>Sagacity</i> .....	30.11.95	T. Haalski.....	M. Smigielski, L. Lewandowski	F.T. Everard & Sons Ltd	
<i>Santos Star</i> .....	8.8.94	P.L. Holtby.....	R.D. Reoyan, F.M. Vidallon, D.J. Tejero	Columbia Shipmanagement Ltd	
<i>Satucket</i> .....	†	—	—	Mobil Shipping Co. Ltd	
<i>Saudi Splendour</i> .....	*	—	—	Mobil Shipping Co. Ltd	
<i>Scillonian III</i> .....	30.3.95	C.P. Row.....	P. Crawford, D. Pascoe.....	Isles of Scilly Steamship Co. Ltd	
<i>Scirocco Universal</i> .....	†	—	—	London Ship Managers Ltd	
<i>Scotia</i> .....	†	—	—	Marr Vessel Management Ltd	
<i>Scott Guardian</i> .....	4.3.96	J. Cargill.....	L.D. Pettitt, J. Nicholson, M. MacDonald	Hornbeck Offshore Ltd	
<i>Scottish Star</i> .....	30.11.95	P. Buckley.....	P.M. Regaspi, C.S. Abadico, E.B. Isidoro	Blue Star Ship Management Ltd	
<i>Sea Searcher</i> .....	†	—	—	Cardline Shipping Ltd	
<i>Seilean</i> .....	30.11.95	D. Tobin.....	G. Gardiner, J.Y. Simpson, P. O'Sullivan	BP Shipping (SWOPS)	
<i>Seki Cedar</i> .....	16.1.96	P.W. Jackson.....	T.T. George, B.R.G. Tasker.....	Denholm Ship Management (U.K.) Ltd	

# Selected and Supplementary Ships (*contd*)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	RADIO/GMDSS OFFICER	OWNER/MANAGER
<i>Seki Pine</i> .....	8.11.95	R. Lyall.....	S.J. Cole, J.C. Haque.....	P.S. Sinclair.....	Denholm Ship Management (U.K.) Ltd
<i>Selectivity</i> .....	7.2.96	T.L. Jeffery.....	E.K. Andoh-Wilson.....	GMDSS	F.T. Everard & Sons Ltd
<i>Semac I</i> .....	+	—	—	—	European Marine Contractors Ltd
<i>Seniority</i> .....	12.12.95	I. Anderson.....	P. Heasman, W. Dophiede.....	GMDSS	F.T. Everard & Sons Ltd
<i>Shabonee</i> .....	20.7.95	D.B. Douglas.....	M. Knight, M.J. Cant, R.E. Munchbach.....	GMDSS	Mobil Shipping Co. Ltd
<i>Shenzhen Bay</i> .....	4.3.96	M. Watts.....	R. Wood, G. Langley, S.L. Rayson.....	GMDSS	P&O Containers Ltd
<i>Sherland Service</i> .....	23.2.96	M. Hooson.....	D.E. Grief, M. Jones, N. Sheard.....	GMDSS	Tidewater Marine (U.K.) Ltd
<i>Sibela</i> .....	†	—	—	—	Denholm Ship Management (U.K.) Ltd
<i>Siliqua</i> .....	8.1.96	D. Freeman.....	C. Green, M.S. Hasan, G.D. Nicholls.....	GMDSS	Shell Marine Personnel (I.O.M.) Ltd
<i>Singapore Bay</i> .....	23.2.96	P.A. Fumeaux.....	K. Worthington, S.J. Young.....	C.I. MacLeod.....	P&O Containers Ltd
<i>Siratus</i> .....	1.2.96	G.P. Donnelly.....	P.C. Thorneloe, J.A. Stone, J. Kneewshaw.....	GMDSS	Shell Marine Personnel (I.O.M.) Ltd
<i>Sir Eric Sharp</i> .....	†	—	—	—	Cable & Wireless (Marine) Ltd
<i>Siakin Arrow</i> .....	*	—	—	—	Gearbulk (U.K.) Ltd
<i>Snow Crystal</i> .....	23.2.96	A. Hamill.....	R. Cubilo, V. Arcay, A. Goyena.....	C. Unato.....	Holy House Shipping AB
<i>Snow Delta</i> .....	26.6.95	T.J.M. Harnets.....	H.O. Redentor, V. Aseniero, S. Recamadas.....	E. Racan.....	Blue Star Reefers Ltd
<i>Snow Drift</i> .....	29.1.96	W.G. Lockie.....	E.N. Santos, E. Jusay.....	T.M. Alarte.....	Holy House Shipping AB
<i>Snow Flower</i> .....	29.1.96	W.G. Lockie.....	O. De los Santos.....	A. Laurente.....	Holy House Shipping AB
<i>Sociality</i> .....	13.10.95	M. Bailey.....	J. Funge, F. Axon.....	GMDSS	F.T. Everard & Sons Ltd
<i>Solena</i> .....	6.10.95	R. Matuszak.....	R. Clitar, O. Rodenburg, E. Lumberio.....	GMDSS	Shell International Trading & Shipping Co. Ltd
<i>Speciality</i> .....	3.4.95	I. Anderson.....	R.J. Fearn.....	GMDSS	F.T. Everard & Sons Ltd
<i>Spreybank</i> .....	*	—	—	—	Andrew Weir Shipping Ltd
<i>Stability</i> .....	†	—	—	—	F.T. Everard & Sons Ltd
<i>Staffordshire</i> .....	7.2.96	M.M. Reeves.....	C.J. O'Brien, D. MacKinnon, A.B. Fleming.....	GMDSS	Bibby Line Ltd
<i>Stena Europe</i> .....	†	—	—	—	Stena Line Ltd
<i>Stena Felicity</i> .....	30.3.95	J. Wilcox.....	M. Salmon, M. Baxter, A. Jones.....	GMDSS	Stena Line Ltd
<i>Stena Londoner</i> .....	30.3.95	R.A. Forsyth.....	C.G. Cowell, R. Mills.....	GMDSS	Stena Line Ltd
<i>Stena Normandy</i> .....	18.4.95	R.A. Hollows.....	M.K. Lee, M.G. Dexter, L. Roskell.....	GMDSS	Stena Line Ltd
<i>Storrington</i> .....	3.11.95	W. McNaughton.....	D.M. Shaw.....	GMDSS	Stephenson Clarke Shipping Ltd
<i>Stresa</i> .....	†	—	—	—	Wallem Ship Management (H.K.) Ltd
<i>Sulisker</i> .....	5.12.95	D.W. Temple.....	J.J. Coyle, I.A. Craig, T. Wilson.....	GMDSS	Scottish Office Agr. & Fisheries Dept.
<i>Summer Meadow</i> .....	20.10.95	C. Bunt.....	R.E. Ho, D.Z. Pascual, R.V. Inserto.....	L.G. Alayon.....	Logbridge Ltd
<i>Summer Wind</i> .....	28.2.96	R. Lough.....	M. Balanay, D. Aquino, J. Aquilino.....	E. Sanano.....	Logbridge Ltd
<i>Sunda</i> .....	†	—	—	—	Wallem Ship Management (H.K.) Ltd
<i>Sun Suma</i> .....	13.7.95	U.K. Teji.....	E.M. Kutty.....	GMDSS	United Ship Management Ltd
<i>Sunny Clipper</i> .....	30.3.95	P.K. Mukhjee.....	J. Rajput.....	C.M. Joseph.....	Grand Seatrade Shipping Agencies Ltd
<i>Superiority</i> .....	8.11.95	P.L. Whitehouse.....	N. Coombs.....	GMDSS	F.T. Everard & Sons Ltd
<i>Swan Arrow</i> .....	†	—	—	—	Westfleet Management AS
<i>Swan Bay</i> .....	†	—	—	—	Swan Shipping AS
<i>Swan River</i> .....	†	—	—	—	Swan Shipping AS





## ‘Marid’ Ships

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

NAME OF VESSEL	MASTER	OWNER/MANAGER
<i>Achatina</i> .....	D. Lakeman .....	Shell International Trading & Shipping Co. Ltd
<i>Acila</i> .....	W. Ammerlaan .....	Shell International Trading & Shipping Co. Ltd
<i>Amiry</i> .....	M.J. Corlett .....	F.T. Everard & Sons Ltd
<i>Amoria</i> .....	S. Soady .....	Shell International Trading & Shipping Co. Ltd
<i>Anchorman</i> .....	W. Miller .....	P&O Tankships Ltd
<i>Apricity</i> .....	D. Cornelious .....	F.T. Everard & Sons Ltd
<i>Arco Arun</i> .....	R.J. Peck .....	ARC Marine Ltd
<i>Arco Avon</i> .....	D. Griffiths .....	ARC Marine Ltd
<i>Arianta</i> .....	B. Lohnes .....	Shell International Trading & Shipping Co. Ltd
<i>Ashington</i> .....	A. McKinnon .....	Stephenson Clarke Shipping Ltd
<i>Authenticity</i> .....	J. Sampson .....	F.T. Everard & Sons Ltd
<i>BP Joustier</i> .....	D. Faulkner .....	BP Oil U.K. Ltd
<i>BP Springer</i> .....	N. Easton .....	BP Oil U.K. Ltd
<i>Blackfriars</i> .....	A.F. Rees .....	Crescent Shipping Ltd
<i>Briarthorn</i> .....	J. Culham .....	James Fisher & Sons (Liverpool) Ltd
<i>Celtic Terrier</i> .....	W.A. Bishop .....	Campbell Maritime Ltd
<i>Chartsman</i> .....	D.H. Roberts .....	P&O Tankships Ltd
<i>City of Bristol</i> .....	A.S. Lanucha .....	United Marine Dredgers Ltd
<i>David M</i> .....	R. Vine .....	James Fisher & Sons (Liverpool) Ltd
<i>Emerald</i> .....	B.L. Reed .....	Stephenson Clarke Shipping Ltd
<i>Frederick M</i> .....	D. Solly .....	James Fisher & Sons (Liverpool) Ltd
<i>Hera</i> .....	B.F. Sverdrun .....	A/S Havtor Management
<i>Hernes</i> .....	—	Jebsens Ship Management (London) Ltd
<i>Lady Stephanie</i> .....	S. Ganguly .....	Exmar N.V.
<i>Marine Explorer</i> .....	R. Wood .....	Eidesvik Shipping Ltd
<i>Merchant Brilliant</i> .....	C. Morrison .....	Merchant Ferries/V. Ships (U.K.) Ltd
<i>Merchant Venture</i> .....	N. Barningham .....	Merchant Ferries/V. Ships (U.K.) Ltd
<i>Michael M</i> .....	R.B. McQuat .....	James Fisher & Sons (Liverpool) Ltd
<i>Nicholas M</i> .....	G. Oland .....	James Fisher & Sons (Liverpool) Ltd
<i>Northern Star</i> .....	P. Coyle .....	Marine Management Services Ltd
<i>Pamela Everard</i> .....	H.J. Norton .....	F.T. Everard & Sons Ltd
<i>Pentland</i> .....	D. Linter .....	Torbult Ltd
<i>Petro Avon</i> .....	J. Preece .....	Petroleum Shipping Ltd
<i>Petro Clyde</i> .....	C.C. Jorgensen .....	Petroleum Shipping Ltd
<i>Petro Fawley</i> .....	T. Lowe .....	Petroleum Shipping Ltd
<i>Petro Mersey</i> .....	C. Starr .....	Petroleum Shipping Ltd
<i>River Lune</i> .....	M.H. Farmer .....	Belfast Freight Ferries
<i>Robert M</i> .....	—	James Fisher & Sons (Liverpool) Ltd
<i>Rosethorn</i> .....	A. Lomas .....	James Fisher & Sons (Liverpool) Ltd
<i>Saga Moon</i> .....	G. Black .....	Belfast Freight Ferries
<i>Sand Kestrel</i> .....	R.T. Harding .....	South Coast Shipping Co. Ltd
<i>Sanguity</i> .....	D. Golden .....	F.T. Everard & Sons Ltd
<i>Silverthorn</i> .....	G. Bedwell .....	James Fisher & Sons (Liverpool) Ltd
<i>Stena Adventurer</i> .....	T. Roberts .....	Stena Line Ltd
<i>Stena Antrim</i> .....	D. Ramsey .....	Stena Line Ltd
<i>Stena Caledonia</i> .....	T. Griffiths .....	Stena Line Ltd
<i>Stena Galloway</i> .....	R. McCready .....	Stena Line Ltd
<i>Stolt Avocet</i> .....	J. Frisby .....	Stolt-Nielsen Rederi A/S
<i>Superferry</i> .....	D. Dimitrios .....	Swansea-Cork Ferries Ltd
<i>Susanne</i> .....	L. Bak .....	Terkol Tank A/S
<i>Taikoo</i> .....	I. Lerner .....	Ocean Youth Yacht Club
<i>Tillerman</i> .....	K. Blacker .....	P&O Tankships Ltd
<i>Vanessa C</i> .....	T. Gladwin .....	Carisbrooke Shipping PLC
<i>Vibrence</i> .....	P.D. Mills .....	Crescent Shipping Ltd
<i>Waverley</i> .....	S. Michel .....	Waverley Excursions Ltd
<i>Welsh Piper</i> .....	D.J. Jones .....	British Dredging Aggregates Ltd
<i>Whitide</i> .....	J. Whitford .....	J.H. Whitaker (Tankers) Ltd
<i>Whitsea</i> .....	—	J.H. Whitaker (Tankers) Ltd

## Oil Rigs and Platforms

NAME OF RIG OR PLATFORM	OWNERS/OPERATORS
AH001 .....	Amerada Hess Ltd
Beryl A .....	Mobil North Sea Ltd
Beryl B .....	Mobil North Sea Ltd
Buchan A .....	BP Petroleum Development Ltd
Cleeton Platform .....	BP Petroleum Development Ltd
Drill Star .....	Sedco-Forex Drilling Services Ltd
Glomar Arctic III .....	Global Marine Drilling Co. Ltd
Gryphon A .....	Kerr-Magee Oil (U.K.) plc
Heather A .....	Unocal U.K. Ltd
Henry Goodrich .....	Sonat Offshore (U.K.) Inc.
John Shaw .....	Sonat Offshore (U.K.) Inc.
Maureen A .....	Phillips Petroleum U.K. Co. Ltd
Montrose A .....	Amoco (U.K.) Exploration Co.
Morecambe Bay API .....	British Gas
Neddrill 6 .....	Neddrill U.K. Ltd
Ocean Alliance .....	Diamond Offshore Ltd
Ocean Countess .....	Diamond Offshore Ltd
Ocean Guardian .....	Diamond Offshore Ltd
Paul B. Loyd Jr. ....	Reading & Bates (U.K.) Ltd
Petrolia .....	Enterprise Oil plc
Polyconcord .....	Shell U.K. Exploration & Production
Santa Fe Galaxy I .....	Santa Fe Drilling Co. Ltd
Santa Fe Magellan .....	Santa Fe Drilling Co. Ltd
Santa Fe Rig 135 .....	Santa Fe Drilling Co. Ltd
Sedco 706 .....	Sedco-Forex Drilling Services Ltd
Sedco 707 .....	Sedco-Forex Drilling Services Ltd
Sedco 712 .....	Sedco-Forex Drilling Services Ltd
Sedco 714 .....	Sedco-Forex Drilling Services Ltd
Sovereign Explorer .....	Sedco-Forex Drilling Services Ltd
Tartan A .....	Texaco North Sea U.K. Co. Ltd
Tiffany Platform .....	Agip (U.K.) Ltd
Viking B .....	Conoco (U.K.) Ltd

# BRITISH COMMONWEALTH

The following lists give the names of Selected and Supplementary Ships, and the number of Auxiliary Ships where known (i.e., those which only report in 'sparse areas'), which voluntarily co-operate with meteorological services of the British Commonwealth. Information for these lists is required by 15 March each year. Information for the January corrective lists is required by 15 September each year.

## HONG KONG (Information dated 13.3.96)

NAMES OF VESSELS		
Selected Ships:	Selected Ships (contd)	Selected Ships (contd)
<i>Al Mariyah</i>	<i>Mercury Diamond</i>	<i>Ratana Valai</i>
<i>Anna</i>	<i>Mundogas Orinoco</i>	<i>Rickmers Shanghai</i>
<i>Ardmore</i>	<i>New Oasis</i>	<i>Rowan</i>
<i>Asian Challenger</i>	<i>Nongkhai Navee</i>	<i>Seafalcon</i>
<i>Asimont</i>	<i>OOCL Alliance</i>	<i>Seamaster</i>
<i>Bunga Kantan</i>	<i>OOCL Award</i>	<i>Shantung</i>
<i>Bunga Suria</i>	<i>OOCL California</i>	<i>Sishen</i>
<i>Chengtu</i>	<i>OOCL Concord</i>	<i>Surin Navee</i>
<i>Delmas Bougainville</i>	<i>OOCL Envoy</i>	<i>Szechuen</i>
<i>Delmas Joinville</i>	<i>OOCL Exporter</i>	<i>Talabot</i>
<i>Delmas Tourville</i>	<i>OOCL Fair</i>	<i>Tampa</i>
<i>Eagle Respect</i>	<i>OOCL Faith</i>	<i>Tapiola</i>
<i>Fair Bridge</i>	<i>OOCL Fame</i>	<i>Texas</i>
<i>Grand Noble</i>	<i>OOCL Fidelity</i>	<i>Torrens</i>
<i>Gulf Spirit</i>	<i>OOCL Fortune</i>	<i>Venture</i>
<i>Hai Kang</i>	<i>OOCL Freedom</i>	<i>Wawasen Setia</i>
<i>Hawk Arrow</i>	<i>OOCL Friendship</i>	
<i>Highlander</i>	<i>OOCL Frontier</i>	
<i>IBN Jubayr</i>	<i>OOCL Hong Kong</i>	Supplementary Ships:
<i>IBN Khaldoun</i>	<i>OOCL Honour</i>	<i>Andes Challenger</i>
<i>IBN Zuhr</i>	<i>OOCL Hope</i>	<i>Eastern Sea</i>
<i>Jahre Rose</i>	<i>Ocean Centaurus</i>	<i>Green Era</i>
<i>Jin Fa</i>	<i>Ocean Competence</i>	<i>Lamphun Navee</i>
<i>K.I.A. Waleed</i>	<i>Ocean Elite</i>	<i>Maritime Faith</i>
<i>Kurama</i>	<i>Ocean Sincerity</i>	<i>Maritime Victory</i>
<i>Kwangtung</i>	<i>Ocean Strength</i>	<i>Rainbow</i>
<i>Maersk Asia Decimal</i>	<i>Osaka</i>	<i>Seamaster I</i>
<i>Maersk Nanhai</i>	<i>Osprey Arrow</i>	<i>Silver Clipper</i>
<i>Marienvoy</i>	<i>Pacific Islander</i>	<i>Success Bulker</i>
<i>Maritime Challenger</i>	<i>Pearl</i>	<i>Toba</i>
<i>Maritime Grace</i>	<i>Phichit Navee</i>	
<i>Maritime Joy</i>	<i>Poyang</i>	

### Auxiliary Ships:

Hong Kong also has 1 Auxiliary Ship currently reporting.

## INDIA (Information dated 1.3.96)

NAMES OF VESSELS		
Selected Ships:	<i>Bhavabhuti</i>	<i>Samudra Manthan</i>
<i>Akbar</i>	<i>Harshavardhan</i>	<i>State of Andhra Pradesh</i>
<i>Arunachal Pradesh</i>	<i>Lokmanya Tilak</i>	<i>State of Nagaland</i>
<i>B.R. Ambedkar</i>	<i>Sagar Kanya</i>	<i>Vishnu Sagar</i>
<i>Bharatendu</i>	<i>Sagar Sampada</i>	

**India (contd)**

NAMES OF VESSELS		
<b>Supplementary Ships:</b>	<b>Supplementary Ships (contd)</b>	<b>Supplementary Ships (contd)</b>
<i>A.B. Tarapore</i>	<i>Jag Preeti</i>	<i>Netaji Subhash Bose</i>
<i>APJ Anand</i>	<i>Jag Skakti</i>	<i>Nicobar</i>
<i>APJ Angad</i>	<i>Jag Shanti</i>	<i>Onge</i>
<i>APJ Anjali</i>	<i>Jag Vijay</i>	<i>Patliputra</i>
<i>APJ Priti</i>	<i>Jag Vivek</i>	<i>Prabhu Das</i>
<i>APJ Shalin</i>	<i>Jagat Samrat</i>	<i>Prabhu Daya</i>
<i>APJ Sushma</i>	<i>Jagat Swamini/Priyamvada</i>	<i>Prabhu Gopal</i>
<i>Aditya Usha</i>	<i>Jagat Vijeta</i>	<i>Prabhu Puni</i>
<i>Alaknanda</i>	<i>Jala Murugan</i>	<i>Prabhu Satram</i>
<i>Annapurna</i>	<i>Jala Tapi</i>	<i>Rafi Ahmed Kidwai</i>
<i>Lt Arun Khetrapal PVC</i>	<i>Jala Vallabh</i>	<i>Rajiv Gandhi</i>
<i>Aurobindo</i>	<i>Jala Vijaya</i>	<i>Rama Raghoba Rane PVC</i>
<i>Bhagat Singh</i>	<i>Jameela</i>	<i>Ramdas</i>
<i>Bharat Seema</i>	<i>Jawaharlal Nehru</i>	<i>Ratna Vandana</i>
<i>Chandidas</i>	<i>Jay Laxmi</i>	<i>Ravidas</i>
<i>Chennai Jaayam</i>	<i>Jay Narayan Vyas</i>	<i>Sabarimala</i>
<i>Chennai Ookkam</i>	<i>Kabirdas</i>	<i>Sagar Deep</i>
<i>Chennai Perumai</i>	<i>Kalidas</i>	<i>Sagar Samrat</i>
<i>Chennai Polivu</i>	<i>Kanchan Junga</i>	<i>Samarat Ashok</i>
<i>Chennai Sadhanai</i>	<i>Kanpur</i>	<i>Sanmar Pioneer</i>
<i>Chennai Veeram</i>	<i>Kolandia</i>	<i>Sarojini Naidu</i>
<i>Chennai Velarchi</i>	<i>Lal Bahadur Shastri</i>	<i>Satya Murti</i>
<i>Chatrapati Shivaji</i>	<i>Lance Naik Albert Ekka</i>	<i>Skandy Surveyor</i>
<i>Chm Piru Singh PVC</i>	<i>Lok Maheshwari</i>	<i>State of Gujarat</i>
<i>Continental Rose</i>	<i>Lok Prakash</i>	<i>State of Haryana</i>
<i>Dadabhai Nowroji</i>	<i>Lok Pratap</i>	<i>State of Manipur</i>
<i>Dakshineshwar</i>	<i>Lok Pratima</i>	<i>State of Orissa</i>
<i>Diglipur</i>	<i>Lok Preeti</i>	<i>Subhedar Joginder Singh</i>
<i>Dweep Setu</i>	<i>Lok Rajeshwari</i>	<i>Tirumalai</i>
<i>FONJ Shekhan PVC</i>	<i>Lok Vikas</i>	<i>Tulsidas</i>
<i>Ganga Sagar</i>	<i>MMP Wealth</i>	<i>Uttar Kashi</i>
<i>Guru Bachlan Singh Salaria</i>	<i>Maharashtra</i>	<i>Varanasi</i>
<i>Hardwar</i>	<i>Maharshi Dayanand</i>	<i>Varuna Adhar</i>
<i>Harkishan</i>	<i>Maharshi Karve</i>	<i>Vishva Bandhan</i>
<i>Har Govind</i>	<i>Major Dhansingh Thapa PVC</i>	<i>Vishva Karuna</i>
<i>Havildar Abdul Hamid</i>	<i>Major Hoshiar Singh</i>	<i>Vishva Kaumudi</i>
<i>Homi Bhabha</i>	<i>Mandakini</i>	<i>Vishva Mohini</i>
<i>Indian Goodwill</i>	<i>Maratha Melody</i>	<i>Vishva Nandini</i>
<i>Indian Valour</i>	<i>Maratha Prudence</i>	<i>Vishva Pallav</i>
<i>Indira Gandhi</i>	<i>Mizoram</i>	<i>Vishva Pankaj</i>
<i>INS Deepak</i>	<i>Motilal Nehru</i>	<i>Vishva Parag</i>
<i>INS Godavari</i>	<i>Murshidabad</i>	<i>Vishva Parijat</i>
<i>INS Gomati</i>	<i>Naik Jadunath Singh PVC</i>	<i>Vishva Parimal</i>
<i>INS Kripan</i>	<i>Nancauri</i>	<i>Vishva Vikram</i>
<i>INS Magar</i>	<i>Nand Hari</i>	<i>Vishva Yash</i>
<i>INS Ranvir</i>	<i>Nand Kala</i>	<i>Vishwesharayya</i>
<i>INS Taragiri</i>	<i>Nand Kavita</i>	<i>Vivekananda</i>
<i>INS Vikrant</i>	<i>Nand Kishore</i>	<i>Yerawa</i>
<i>INS Vindygiri</i>	<i>Nand Rati</i>	
<i>Jag Manek</i>	<i>Nand Smiti</i>	
<i>Jag Pari</i>	<i>Nand Srishti</i>	
<i>Jag Prabhat</i>	<i>Nandu</i>	
<i>Jag Prakash</i>	<i>Nanga Parbat</i>	

## NEW ZEALAND (Information dated 1.3.96)

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### NAMES OF VESSELS

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#### Selected Ships:

*America Star*  
*Atlantic Defender*  
*Auckland Express*  
*Canterbury Express*  
*Capitaine Tasman*  
*Challenger*  
*Chitral*  
*Columbia Star*  
*Crusader*  
*Direct Kea*  
*Fishguard Bay*  
*Forum Papua New Guinea*  
*Forum Samoa*  
*Fulmar*  
*Golden Bay*  
*Kotuku*  
*Kuaka*  
*Melbourne Star*  
*New Zealand Pacific*

#### Selected Ships (contd)

*New Zealand Star*  
*Pacific Ariki*  
*Pacific Onyx*  
*Rangikura*  
*Ranginui*  
*Rangiora*  
*Rangitane*  
*Rangitata*  
*Rangitoto*  
*Socoŋ Stream*  
*Søren Larsen*  
*Spirit of Competition*  
*Spirit of Freedom*  
*Swan Tide*  
*Sydney Star*  
*T.A. Navigator*  
*Taiko*  
*Tainui*  
*Takitimu*

#### Selected Ships (contd)

*Tangaroa*  
*Tarihiko*  
*Tasman Enterprise*  
*Tasman Venture*  
*Tui Cakau III*  
*Turakina*  
*Union Auckland*  
*Union Rotoiti*  
*Union Rotoma*  
*Union Rotorua*

#### Supplementary Ships:

*Arahanga*  
*Arahura*  
*Aratika*  
*Straitrunner*  
*Suilven*

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#### Auxiliary Ships:

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











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