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The Marine Observer

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THE MARINE OBSERVER

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

VOL. 62 **No. 318** **OCTOBER 1992**

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COVER PHOTOGRAPH: Rolls of stratocumulus cloud off the Argentine coast in position 39° 23'S, 59° 13'W, photographed from *Baltic Universal* on 5 February 1992 by Captain I. Ligertwood, Master, m.v. *Baltic Universal*, Jardine Ship Management Ltd. (See 'Meteorological Logbook No. 50,000'.)

LONDON: HMSO

Editorial

Since joining the Met. Office as Chief Executive in January 1992, I have been learning about its many functions. I have been impressed by how much of the important observing work of the Office is performed by voluntary observers on land and at sea, and I have noted how the reliability of our forecasts (especially those of wind and wave over the ocean) depends crucially on the accuracy and the timeliness of the data transmitted to the Meteorological Office. I had already heard at first hand something of the hard work of the Marine Observers from my brother, Clive Hunt, who was one of the engineers on the 'Sea Cat' [*Hoverspeed Great Britain*] that was sending in data to the Meteorological Office during her voyage from Tasmania and then winning the Blue Riband in June 1990.

It is a pleasure to write this editorial, mainly to express my gratitude on behalf of the Meteorological Office to the Marine Observers for all their hard work and dedication to its quality. However, this occasion also provides an opportunity to introduce myself and to outline some of the important future developments in the Meteorological Office.

Although my official background is that I was a Professor of Fluid Mechanics at Cambridge, specialising in theoretical questions of boundary layers meteorology, I have been interested in weather and the sea since I was a young boy sailing dinghies in the Solent. I recall learning that a mild force 2 wind meant moderate waves when my cousin and I sailed in a 13-ft dinghy in 1956 from Seaview to meet the large Russian cruiser *Orkhonikodze* bringing Bulganin and Kruschev to Portsmouth. I learnt about another aspect of the sea when I stayed with my great uncle, L.F. Richardson, and his wife at Kilmun and he recounted his famous experiments on the movement of parsnips that he and Professor Stommel had thrown into Loch Long and then measured their 'relative' diffusion. These influences probably steered me towards a career of research into fluid mechanics. I began with theoretical and experimental studies of winds around buildings, but this led to wider questions when I was advising architects and planners as to the effects of these winds on people. It was traditional to use Admiral Beaufort's wind scale (the land version); but since this wind scale is not relevant to the highly turbulent unsteady winds found near buildings, I and a psychologist colleague conducted some experiments on people in a specially modified large wind tunnel at the National Physical Laboratory! As a result of these and complementary studies the effects of typical urban wind conditions on people are now better understood and quantified.

My recent research has been focussed on the 'classical' problem of how the wind generates waves. The new approach was to make use of the excellent progress made in the study of wind over hills by various research groups including that led by Dr Mason at the Meteorological Office. On the basis of a new theory and also laboratory measurement of wind over waves, the growth rate of small waves can now be calculated and better understood.

But it would not surprise Marine Observers to know that the air and water movement associated with large breaking ocean waves in strong winds have still not been studied in detail and remain poorly understood. This point demonstrates the basic challenge facing the operational and research staff in the Meteorological Office; firstly how to use the current level of knowledge and

techniques to forecast the important aspects of the state of the atmosphere and the oceans, and secondly, how to improve the forecasts using advances in science and technology.

In the last 15 years weather forecasts have improved substantially as a result of better data (including that from satellites), better numerical methods and physical concepts used in the numerical modelling, and larger computers to enable the weather, waves and combined surges to be calculated in more detail.

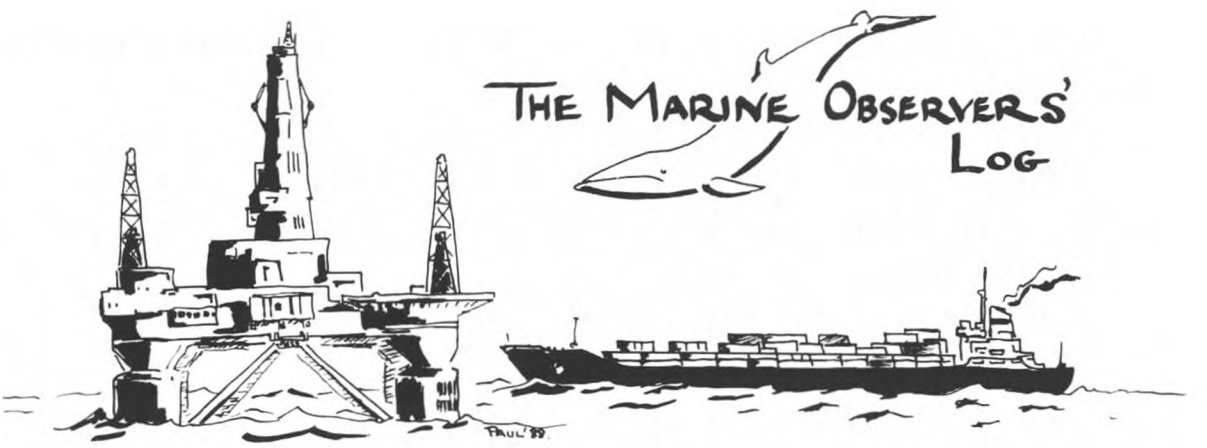
Three-day forecasts now are as good as 24-hour forecasts were 15 years ago, and the forecasts of the growth and movement of tropical cyclones have greatly increased in reliability (the U.K. Meteorological Office being a leader in this field). The forecasting of wave surges and ocean waves has also greatly improved as shown by the forecast of the 1990 floods in North Wales and by international comparisons between forecasts.

Many of these improvements could not have occurred without collaborative work involving the Meteorological Office and research laboratories and universities in Europe and abroad; for example, the coastal and ocean models have been helped by research at the Proudman Oceanographic Laboratory, the University of Oxford, the Max Planck Institute in Hamburg and many other institutes. Information from meteorological satellites is only available to the Meteorological Office as a result of extensive collaboration with the U.S.A., with the EUMETSAT consortium of European Countries, and also with the Science Research Council in the United Kingdom. Since meteorology has always been international, it is natural that these new meteorological activities should also be international, and that the World Meteorological Organization should be involved in their development. The Meteorological Office policy is to provide extensive support to WMO both financially and by our staff contributing to its working groups and specialist committees.

Another new area of international collaboration is the provision by National Meteorological Services (NMSs), including the Meteorological Office, of specialised services for repayment (such as weather routeing for ships). These services, which we refer to as 'Commercial Services', have enabled meteorology to be applied in new ways to the benefit of people's work and leisure activities, and, more generally, to the whole economy and to the environment.

The Meteorological Office has benefitted from providing these services both financially and because they often involve our staff in having to meet new and stimulating technical challenges. But to ensure that these commercial services pose no threat to international meteorology, which continues to be based on the free exchange of basic data, the Meteorological Office is actively working with other NMSs to establish international agreements to ensure that commercial services are consistent with that ideal, and with the financial well-being of the NMSs in **all** countries of the world.

Professor Julian Hunt
Chief Executive



October, November, December

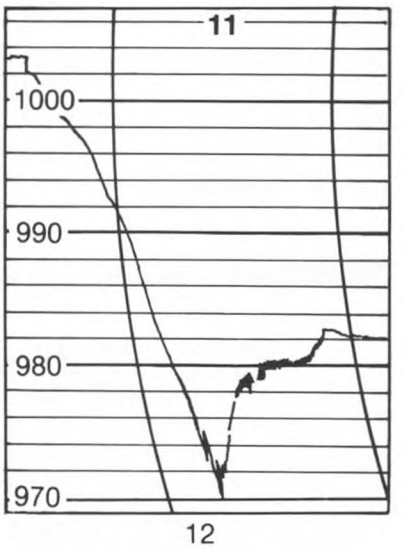
The Marine Observers' Log is a quarterly selection of observations of interest and value. The observations are derived from the logbooks of marine observers and from individual manuscripts. Responsibility for each observation rests with the contributor.

DEPRESSION

Irish Sea

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

12 November 1991. The following observations and barograph trace show the conditions experienced between 1257 UTC and 1700 whilst the vessel experienced the effects of a small depression.



Time	Wind Dir'n	Force	Pressure (mb)	Alt.Co.	Eng. Pwr.	Pitch	Remarks
1257	S×E	6	984.0	290°	85%	Full	Bar Lanby.
1400	SSE	8	973.0				
1440	S×E	9	969.0				Master called.
1452	S	11	967.0	200°	65%	3	Very rough sea with heavy swell.
1515	S	12	967.0				Torrential rain.

1520	S×W	10	968.0				Rain ceased, wind veered.
1530	SW	10	967.0				Heavy rain showers.
1545	SW	12	967.0				Sea white with spray; anemometer off scale.
1550	SW	11	969.0				Heavy rain.
1600	WSW	11	969.0				
1620	W×S	11	972.0				Very heavy rain.
1630	W	11	972.0				Very heavy rain.
1700	W	9	974.0	270°	70%	Full	Moderate rain.

At 1700 the ship's position was 53° 28'N, 04° 15'W and was able to resume passage to Dublin. The sea state throughout was exceptionally rough and was accompanied by a heavy confused swell.

Position of ship at 1452 UTC: 53° 42'N, 04° 06'W.

Bass Strait

m.v. *Alcides*. Captain P. Callaghan. Whangarei to Ras Tanura. Observer: the Master, Mr I. Appleby, 2nd Officer and ship's company.

3 November 1991. The ship was on a course of 255° through the Bass Strait and was receiving indications of a depression in the area via facsimile reports from RMC Melbourne. On approaching the depression the wind was noted to be N'ly, force 2–3 and as the ship neared, the wind began to veer and increase in strength until at 1800 UTC it was NE'ly, force 7 with gusts of 40 knots. The pressure was falling rapidly at this point and the seas were rough.

At 2330 the vessel passed through what appeared to be the eye of the depression. The wind calmed and clear blue skies were observed. After approximately 30 minutes a roll of cumulus cloud was seen to the west and a large area of rain was observed by radar. As the ship passed through the cloud the pressure bottomed out at 995 mb before beginning to rise very sharply; it then continued rising more slowly. The calm conditions of the eye were immediately followed by a violent squall; the wind was observed to back briefly and increase in strength to at least force 6 from a NW'ly direction while rough seas and a fall in the air temperature were also observed. The wind then veered to SW'ly while decreasing in strength to force 4–5.

Position of ship: 38° 38'S, 148° 37'E.

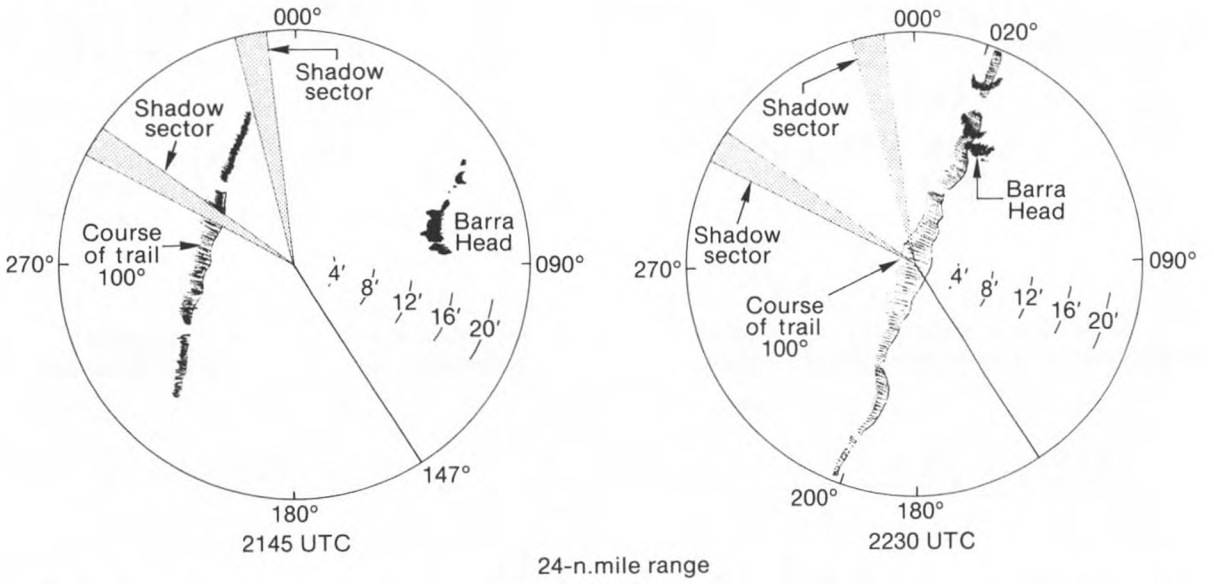
RADAR ECHOES

North Atlantic Ocean

m.v. *Drupa*. Captain J.T. Little. Flotta to Tranmere. Observers: the Master, Mr P.E.P. Roche, 3rd Officer and Mr C. Barnes, G2.

27 November 1991. At about 2130 UTC an unusual radar echo was noticed on the 3-cm radar when attempting to locate the racon on Barra Head. The auto clutter was switched off and immediately the echo shown in the first sketch was seen. On contacting Stornoway Coast Guard the observers were told that a weather front was due in the area shortly and they were requested to keep the Coast Guard informed of the meteorological conditions. At this time the dry-bulb temperature was 10 °C, the pressure was 998 mb and the wind was SSW'ly, force 9–10; there were overcast skies and the visibility was reduced to about

6 n.mile by blowing spray and heavy seas. The radar echo was closely observed; it appeared to travel on a course of 100° at a speed of roughly 8 knots and seemed to be aligned along 020°/200°.



At 2230 the front reached the vessel's position, as shown in the second sketch, and moderate rain began to fall while the wind decreased to force 7–8 and the visibility was reduced to 4 n.mile. The barograph showed a sharp rise of 1 mb in less than five minutes and then steadied at 999 mb. The dry-bulb reading remained unchanged and there was no difference in the state of sky. The front took approximately 10 minutes to pass over the vessel's position and the relevant details were passed to the Coast Guard. When observed on the 48-n.mile range the front could be seen stretching 31.5 n.mile to the north and about 39 n.mile south of the vessel. However, it should be noted that the distances would probably have been longer taking into account the limit of the radar in use which was a Decca 1690 display.

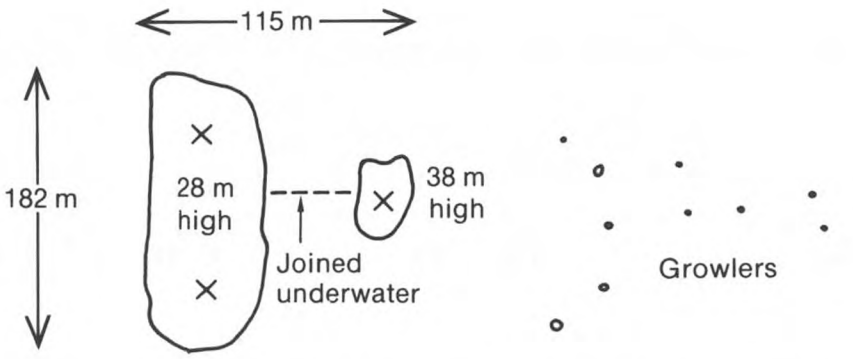
Position of ship at 2145 UTC: 56° 45'N, 08° 03'W.

ICEBERGS

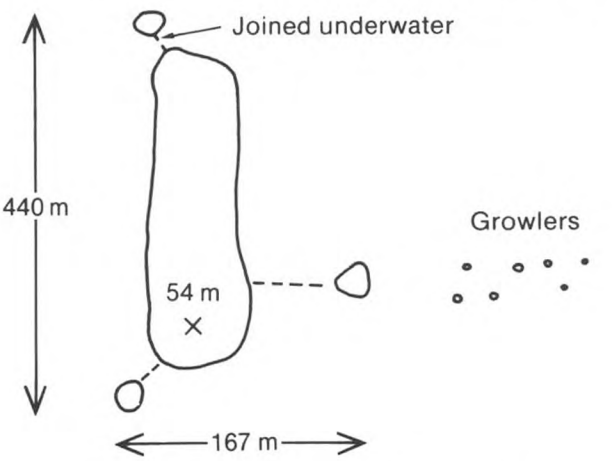
South Atlantic Ocean

m.v. *Falklands Desire*. Captain P. Taylor. Patrol duties south-east of the Falkland Islands. Observers: the Master, Mr J. Davies, Chief Officer, Mr F.F. Khun, 2nd Officer and ship's company.

28 October 1991. Following earlier reports from the fishery patrol aircraft of icebergs approximately 150 n.mile south-east of the Falkland Islands, the vessel went to investigate. At 1500 UTC an iceberg gave a radar echo at 19.5 n.mile and was sighted visually at 1510, distance 18 n.mile. By 1645 the ship was within 2 cables of the berg and a series of vertical and horizontal sextant angles was taken to establish its dimensions as it was circled at slow speed at a safe distance. As shown in the first sketch, the larger part measured 182 m long by 28 m high and the smaller part was 38 m high; there was a submerged area joining the two parts and the total width was 115 m. To leeward were several growlers the largest of which were about 1 m high.



At 1830 another berg and larger than the first was sighted at 26 n.mile by radar and 19 n.mile visually and its dimensions are shown in the second sketch. It was 440 m long and had three small stacks joined below the surface, giving a total width of 167 m. At its highest point the main part of the iceberg was 54 m high



and there was a 'bulbous bow' effect below the old waterline; again there were small growlers to leeward. Photographs of these two bergs appear on page 184.

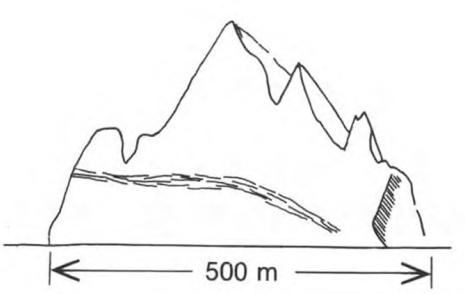
A smaller berg was passed at 1951 and three others were seen on radar but further investigation was not possible as the vessel did not have the time to close with each one.

Position of ship at 1505 UTC: 53° 59.4'S, 53° 19.5'W.

South Pacific Ocean

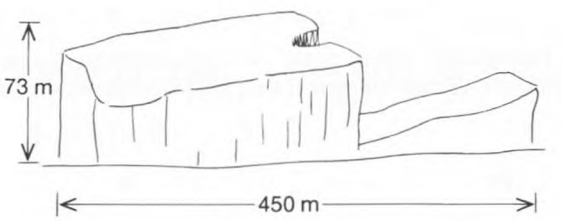
m.v. *ACT 7*. Captain I.C. MacKillop. Auckland to Zeebrugge. Observers: the Master and Mr R.E. Kennington, 3rd Officer.

4–5 November 1991. At 2315 UTC on the 4th the first of two icebergs became visible by radar. It was a glacier berg and was noted at a distance of 19.5 n.mile, becoming a visual sighting at 8 n.mile; there was a distinct brown line running throughout its length which was 500 m at the waterline. The sketch shows the view from abeam at a distance of 1.1 n.mile.



There were signs of decay at the waterline and there was a weather horn eroded smooth by wave action, but no bergy bits were observed. Weather conditions at the time were: air temperature 0.3 °C, wet bulb −0.9°, sea (by bucket) 0.8°, wind W'ly, force 8. The engine room lower induction probe which was 8 m below the surface registered a drop from −0.4° to −0.6° upwind of the iceberg.

At 0330 on the 5th a tabular berg became visible on radar at a distance of 22.7 n.mile on a bearing of 095½°. It became a visual sighting at 10 n.mile and showed vertical walls to a plateau top with little sign of decay. On the beam the side aspect showed a mid-length fracture and slip into a wedge shape which would probably separate eventually, see sketch.



The waterline length was about 450 m and its height was 73 m. At this time the air temperature was −0.2°, wet bulb −1.0°, sea (by bucket) 0.4°, wind W'ly, force 8.

Position of ship at 0015 UTC on the 5th: 57° 54′S, 140° 56′W.

CETACEA

South Pacific Ocean

m.v. *Andes*. Captain R.A. Whistler. Valparaiso to Antofagasta. Observers: Mr P.M. Newman, Chief Officer and Mr J. Segui, Cadet.

2 November 1991. At 2330 UTC whilst proceeding to Antofagasta on a course of 003° a school of approximately 50–60 dolphins was sighted on the starboard bow at a distance of 3.0 n.mile, travelling in a westerly direction away from the coast.

As the school neared the vessel it became apparent that it was an unusual species in that the individuals bore no dorsal fins and had very distinct black-and-white markings. The nearest of the school passed down the port side of the vessel at a distance of about 50 m. At this time *The Natural History of Whales and Dolphins* by Peter G.H. Evans was hastily consulted and the dolphins were positively identified as Southern Right Whale Dolphins.

In these times of decreasing observations of sea life in general, the sighting of such a large school of unusual dolphins was a delight to experience.

Position of ship: 29° 21′S, 71° 49′W.

SALPS

Eastern North Atlantic

t.s. *Astrid*. Captain D.R. Norman. Falmouth to Lisbon. Observers: the Master and trainees in the after part of the port watch.

26 October 1991. As dawn broke the ship was found to be passing through many thousands of spiral objects ranging in length from 10 cm to 1.5 m and

which were tightly curled up like Catherine-wheels on the surface, so numerous that 'rafts' 2–3 m across were forming; they also reached a depth of 4–5 m below the surface. The smaller ones tended to be on the surface and were less tightly coiled whereas the larger ones were under water.

The ship was stopped and several specimens were caught in buckets for examination on board, see photograph on page 185. At first, they were thought to be strings of spawn but closer examination showed the structure to be a double row of gelatinous tubes pumping water through them. The pumping seemed to be rhythmical, starting at one end of the spiral and was observable down the entire length. Small zooplankton were observed in some of the tubes; all of these seemed alive but whether they had been caught or had just swum inside was not known. Another theory was that the specimens were single organisms in segments, like a tapeworm. The final theory was that they were a colony of small jellyfish living together for mutual support; this thought was encouraged by the shedding of several tubes which still seemed to be alive. Attempts to preserve a specimen in formalin failed as it just disintegrated.

It was not known how long before dawn that the vessel had entered the shoal, but they were seen for about 30 n.mile after the first observation. Some small 'standard' jellyfish were also seen.

Position of ship: 23° 24'N, 18° 59'W.

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

'The report and photographs make identification straightforward. The creatures were salps. They alternate between sexual and asexual generations in a way similar to many jellyfish, but they are not jellyfish, being much more complex. It is the sexual generation that lives in chains, the asexual generation being solitary. They live by filtering sea water through a sieve net in the tube-like body.

'The coiled nature of the chains suggests that this was a species of *Cyclosalpa*, the name being self-explanatory. Each complete chain (and they break easily) has arisen from a single solitary parent budding the chain individuals off.

'In good conditions salp numbers can grow at enormous speeds, cleaning up the plankton for miles and even clogging engine-room intakes. The insides of salps are, in turn, eaten out by the crustacean *Phronima* which then makes the carcass its home, and this is probably what the "small zooplankton" were.'

BIRDS

North Sea

m.v. *Seillean*. Captain D.M. Rundle. On station Cyrus oil field. Observers: the Master and ship's company.

10 October 1991. Between 0000 UTC and 0600 a large flock of assorted bird species was seen flying around the vessel. They flew in a clockwise direction with just the occasional individual making a landing. The total number of birds was estimated to be 800–1000 and it was thought possible that the birds were confused by a combination of the prevailing fog, the ship's fog signal and ship's flare, or maybe they were lost.

As the sky became lighter at dawn the numbers of birds decreased rapidly until only about 200–250 remained, and their decrease continued throughout the rest of the day. During darkness the birds were not readily identified but in daylight the following species were positively identified when they were on the deck:

Thrush (1)	Snipe (1)	Blackbird (1)
Starling (7)	Redwing (14)	Blackcap (4)
Chaffinch (12)	Brambling (9)	Wren (2)
Goldcrest (3)	Short-eared Owl (1)	Dunlin (2)
Robin (1)	Pied Wagtail (2)	Tree Pipit (11)

Weather conditions at the time were: wind NE'ly to E'ly, force 3–4, visibility mainly 200–300 m but at best 0.5 n.mile owing to thick fog.

Position of ship: 58° 07'N, 01° 28"E.

North Atlantic Ocean

f.p.v. *Vigilant*. Captain D.L. Beveridge. Patrol duties in north-west Scottish waters. Observers: the Master, Mr A. MacCallum, 1st Officer and Mr I. Smith, 2nd Officer.

20 October 1991. At about 1130 UTC when the ship was 52 n.mile west-north-west of Barra Head and having experienced very heavy rain for some hours an unusual and bedraggled visitor was seen on board. The owl [shown on page 185] very gratefully came to rest on the starboard bridge wing. He was very wet and exhausted and as the ship rolled and pitched he kept upright by swaying about on his wee legs. 'Barny' stayed for four or five hours but left when offered some meat — the Cook took offence and offered to leave as well.

Position of ship: 56° 57'N, 09° 15'W.

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

'I compliment Mr MacCallum on this very nice photo of a Tawny Owl (*Strix aluco*).'

North Pacific Ocean

m.v. *Farnella*. Captain J.B. Nichols. Oceanic research off north-west Hawaiian Islands. Observers: the Master, British Institute of Oceanographic Sciences and U.S. Geological Survey Scientists and ship's company.

4–6 October 1991. At about 0415 UTC a Peregrine Falcon with a silver-coloured identification ring on its right leg landed on the mast. Plumage markings and colour showed it to be a juvenile of the North American variety. The cere and eye were slate-blue, consistent with juvenile markings, but the legs and feet were yellow, possibly indicating that the bird was nearing adulthood. It took several short flights around the ship before roosting overnight on the mast. At 2330, after an exercise flight, it caught a Fairy Tern in flight. The tern's partner harassed the falcon, trying to make it drop its prey but the falcon chased after the second tern as if trying to catch it too. (See photo on 186.)

The second tern flew away and the falcon returned to the mast to eat. It first ripped the tern's throat, then ate the eyes and the head before concentrating on the carcass. At 0400 the following day it caught and ate another Fairy Tern and at the next mid-afternoon it took a storm-petrel while at dusk it caught a Townsend's Shearwater which was eaten in the illumination from the masthead navigation light.

The entire ship's company was impressed with the falcon's hunting ability and speed. The bird finally departed on the 6th at 2120 when the ship was 125 n.mile north-east of Laysan Island, some 205 n.mile east of the position at which it first arrived.

Position of ship on 4th October: 29° 00'N, 174° 03'W.

Note. Commander M.B. Casement comments:

'Many congratulations to Captain Nichols on his splendid photographs of the Peregrine Falcon and other birds, taken on board *Farnella*. I plan to include his records and some of his photos in my annual analysis of landbirds in *Sea Swallow*, the journal of the RNBWS, of which I am the Editor. He is encouraged to become a member of the RNBWS and to enter the *Sea Swallow* Annual Photographic Competition.'

Caribbean Sea

m.v. *Snow Drift*. Captain G.W. Weaver. Bremerhaven to Almirante. Observer: Mr R.J. Murray, Chief Officer.

25–27 October 1991. Whilst transitting the Mona Passage the ship was privileged to receive a visit from three falcons. They were approximately 50 cm long and, apart from their spotted plumage, each had black colouring around the eye, like a prize-fighter. Taking up positions on elevated masts they then proceeded to take on any bird that approached the ship. Some fell to their doom in the sea whilst others were consumed in a most untidy manner. The decks were littered with feathers, heads, wings and the less choice parts.

Ten minutes after sunrise on the next day the falcons left, one by one in different directions. Two hours later three egrets landed on the ship and stayed for a few hours; their visit would have been curtailed if the three 'masters-at-arms' had been present. Half an hour before sunset one falcon arrived with its feathered dinner in its talons and proceeded to litter the recently swept carcass-free decks while 15 minutes later a second one appeared at great altitude, obviously searching for dinner.

On the 27th the only falcon on board left in the morning to return two hours later with breakfast and a while afterwards left for land. Later, the ship arrived in Almirante where there was a high lovebird population next to the quay so the falcons would be in their element.

Position of ship: approximately 18° 18'N, 68° 00'W.

Eastern North Pacific

m.v. *Pacific Teal*. Captain J.M. Miller. Balboa to Hitachi. Observers: the Master, Mr P.A. Booker, Chief Officer and Mr W.R. Durrans, 3rd Officer.

11–14 November 1991. On the morning of the 11th two unusual birds were seen standing on the ship's crane; they were 30–35 cm tall, although taller with their necks outstretched, and were pure-white in colour with the exception of a light-yellowish patch on the forehead/crown. Each foot had three, long, forward-pointing toes with one shorter one at the back and there was a total absence of webbing. Their long black/green legs suggested to the observers that they were wading birds. By 2300 UTC the number of birds had increased to 14 and tended to stay together as a group both on board the ship, see photograph on

page 186, and in flight when disturbed. By daybreak on the morning of the 14th the number had decreased to two again both of which took fresh water from a bowl but refused all food offered with the exception of a few prawns. The general opinion of those on board was that the birds were Snowy Egrets.

Also sighted were two birds of prey, one of which caught a small black bird in mid-flight; the hawks seemed to show no interest in the egrets or in two Brown Boobies which were also on board. In fact, during the night of the 14th one of the boobies was perched within a few metres of a hawk with neither of them seemingly bothered at all. The same booby did not move at all when the ship's whistle was sounded only a few metres directly astern of it, and at one stage the Third Officer was able to get within 30 cm of it, its only reaction being to shuffle its feet slightly and honk at him. The observers were aware that boobies have the reputation for being docile, but are the birds normally as stupid as this?

Position of ship: 12° 35′N, 108° 14′W.

Note. Commander M.B. Casement comments:

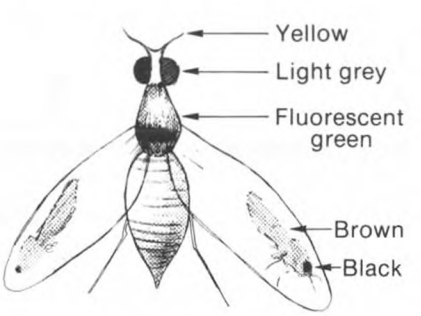
'This excellent photo of the egrets leaves little doubt that they are Cattle Egret (*Bubulcus ibis*) —note the **yellow beak** and **black legs and feet** (the Snowy Egret has yellow feet) - also the typical hunched appearance. This species has colonised both North and South America and is originally from Africa.'

INSECTS

Arabian Gulf

m.v. *British Respect*. Captain M.T. Gordon. At anchor, Fujayrah Roads. Observers: Mr P.A. Anderson, Chief Officer, Mr A.L.C. Smith, 3rd Officer and Mrs Anderson.

24 October 1991. During one of the many anchor watches the Chief Officer was studying the insect life inhabiting the bridge. One fly in particular caught his attention, see sketch; its body was light-grey in colour and about 6 mm long and



it had bright, flourescent-green eyes. What had caught his eye though, were the wings, or rather the pattern on them. Each wing was a mirror image of the other and had what appeared to be an 'insect' on it. These decoys were only 2–3 mm long, but when studied under a magnifying glass showed great detail including body, legs and even an apparent eye.

Whilst studying these flies, variations of the type of decoy were noted, the most common of which appeared to be a small 'bug' or spider. Both types were seen in abundance.

Position of ship: 25° 08′N, 56° 20′E.

Note. Mr G.R. Else, of the Department of Entomology, Natural History Museum, comments:

'This was a fly of the genus *Goniurellia* (Diptera, family Tephritidae). Four species of this genus with similar wing patterns occur in the Middle East. The larvae develop in flower heads of *Pallenis* and *Pulicaria* species (Asteraceae).'

Eastern North Pacific

m.v. *Pacific Swan.* Captain K.N. Young. Japan to Balboa. Observers: the Master, Mr T.C.R. Riley, 2nd Officer and ship's company.

13 November 1991. At 2200 UTC whilst in the aftermath of hurricane 'Nora' the moth pictured on page 185 was found hitching a ride in the accommodation. The nearest land was over 100 n.mile away and it was assumed that the insect had been blown offshore by Nora and had sought out a suitable landing pad on which to rest before flying home again. The moth rested for several days, flying occasionally at night around the Radio Officer's cabin and also frightening the cadets. It eventually expired seven days later after several attempts had been made to feed it sugary substances and water.

Its wing-span was about 180 mm when resting and the body was covered with a thick coating of brown 'fur', but there were no hairs on its legs or other appendages; its eyes were chocolate-brown. The insect was taken into custody by the Radio Officer for his son to take to school; the Chief Engineer believed it to be Japanese, in which case it owes the taxi fare.

Position of ship: 21° 30'N, 111° 00'W.

Note. Mr G.R. Else comments:

'This was the moth *Ascelapha odorata* (Linnaeus) (Lepidoptera, Noctuidae, Ophiderinae). This species occurs in the southern United States, central and tropical South America and has been introduced into Hawaii. The larvae feed on legumes, especially the genus *Cassia*, the source of senna, a laxative drug. The adults are known to be strong fliers and are frequently recorded on board ships many miles offshore.'

BIOLUMINESCENCE

Gulf of Aden

m.v. *Wiltshire.* Captain C.H. Marsh. Aqaba to Fujayrah. Observer: Mr I.G. Macneil, 3rd Officer.

7 October 1991. At 1745 UTC the glow of bioluminescence was first noted around the hull of the vessel, illuminating the hull above the waterline; the passage of an area of phosphorescent wheels was recorded as follows:

1750: First large wheel of diameter approximately 15 m passed by vessel. Smell of fish in the air.
1806: Continuous wheels passing vessel 6–8 at a time down either side. The larger wheels were of 15 m diameter and the smaller ones were about 6 m in diameter.
1811: Wheels stopped but bioluminescence still visible around vessel.
1950: Bioluminescence diminished.

The Aldis lamp was shone upon the water but gave no change, then the echo sounder was switched on and off but made no difference either. Several samples

of sea water were taken which when shaken contained glowing, luminous, yellow-green specks of 1 mm in size.

The wheels were turning in a slow clockwise motion and the closest that any came to the ship was about 12 m. There was intense milky-white colouring in the centres which faded to pale white towards the outer limits.

Position of ship: 14° 45′N, 50° 56′E.

Note. Dr P.J. Herring, of the Institute of Oceanographic Sciences, Deacon Laboratory, comments:

'This is a most interesting report of "phosphorescent wheels". The large number and relatively small size of the wheels is unusual and no mention is made of any "spokes". Assuming the wheels indeed had no spokes, and were more like rotating disks, I suggest they may have been caused by tightly aggregated schools of fish stimulating the luminescence of dinoflagellates as they circled. This is supported by the "slow clockwise motion" described, because typical wheels have spokes which rotate extremely rapidly. The luminous specks in the water sample were probably large dinoflagellates. Nevertheless, there must have been previous reports of more typical "phosphorescent wheels" in the Gulf of Aden.'

SKY COLOUR

South Atlantic Ocean

m.v. *Moreton Bay*. Captain C.D. Croall. Barcelona to Cape Town. Observers: Mr T. Oliver, 2nd Officer and Mr R. Powell, Lookout.

26–28 November 1991. During the evening watches on these dates two prominent 'milky' patches were observed in the sky at an altitude of approximately 40° and about 7° and 22° to the right of the star Capella. Observations were made of the area using binoculars but nothing distinct could be seen. The larger patch was nearer to Capella and was about 3° in diameter whereas the smaller one was about 1° in diameter.

The *Marine Observers' Handbook* was consulted and it was initially considered that the patches may have been auroral in origin. However, from the description it was felt that the vessel was too far north for this. The observers then investigated the possibility of noctilucent cloud, but again came to the conclusion that the vessel was too far north and that the patches were visible for too long afterwards, approximately four hours. The possibility of airglow was considered also; however, the handbook states that this phenomenon has an even distribution over the sky and does not appear in patches. On each evening there were only thin patches of cloud in the sky.

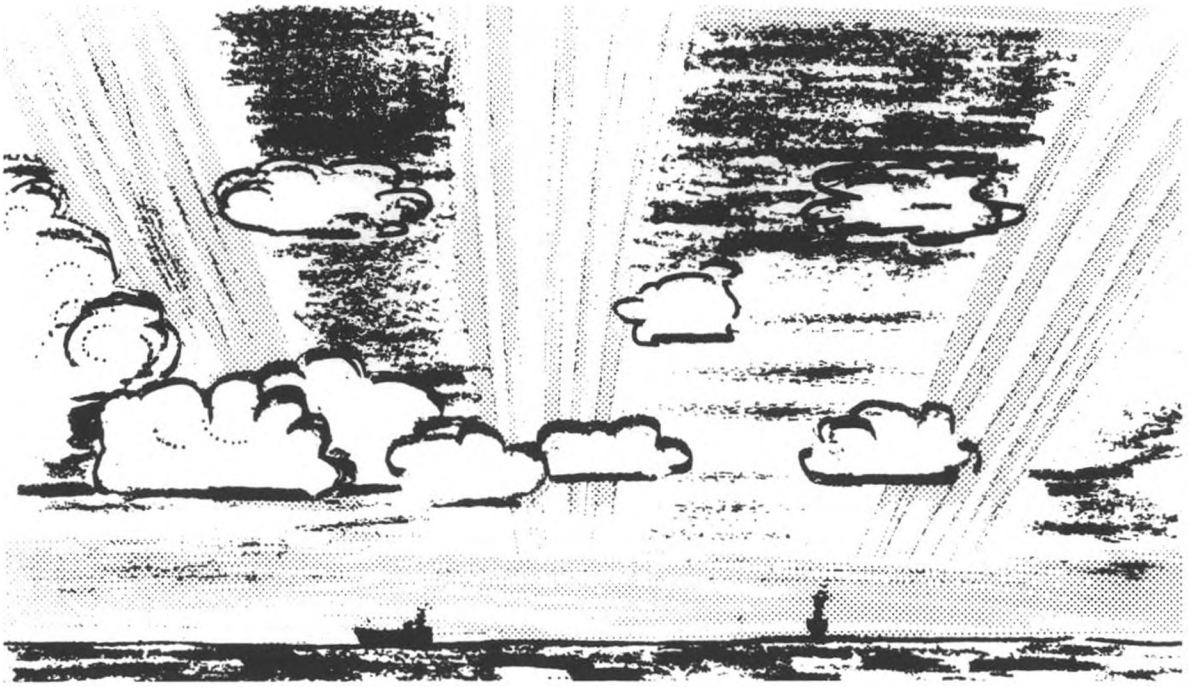
Position of ship at 1200 UTC on the 27th: 28° 24′S, 13° 12′E.

AURORA BOREALIS

Baltic Sea

m.v. *British Trent*. Captain S.R. Montague. Hove-to off Ventspils. Observers: Mr A. Chylak, 3rd Officer and officers on watch.

8/9 November 1991. At 0400 UTC the rays shown in the sketch were seen. The vessel was steering 250°, making about 2 knots headway, and sunrise was not expected for another two hours. In a dark sky to the north-west the rays were seen between the altitudes of 10° and 60°; they lasted for about 20 minutes and



then gradually faded away. For some reason the left-hand ray was a reddish-orange but the others appeared like the sun shining through breaks in cloud. There had been a little rain prior to the observation and the cloud cover was 5 oktas of cumulus.

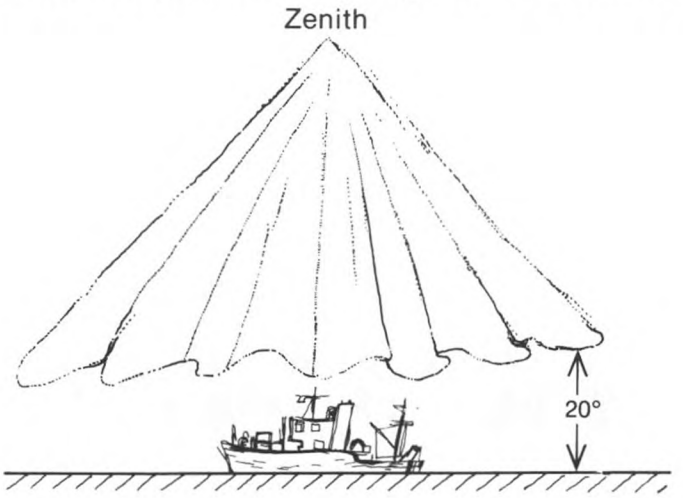
Position of ship: 57° 28′N, 21° 12′E.

North Sea

m.v. *Cirolana*. Captain B.A. Chapman. Vessel on research cruise. Observers: the Master, Mr W. Harding, Chief Engineer Officer, Mr M. Reeder, Junior Fishing Mate and all scientific staff.

31 October/1 November 1991. Between 2300 UTC and 2315 an auroral display of curtains and veils was noted as the sky cleared rapidly after a change of wind from 140° to 180° and a decrease in wind speed from force 9 to force 7. The main activity appeared to be more or less east/west through the zenith, with long curtains to northward and a greenish glow overhead.

A further display at 2325 made the observers feel as if they were inside half a cone with the apex at their zenith and the curtains spreading out to northward, as shown in the sketch. The display was very bright for about five minutes but then



faded to a green glow. The brightness then became mainly moderate in a rayed formation, the lower edge of which was parallel to the horizon and at an altitude of approximately 20°. The activity had largely ceased by 2340, leaving just a small patch to the north-east.

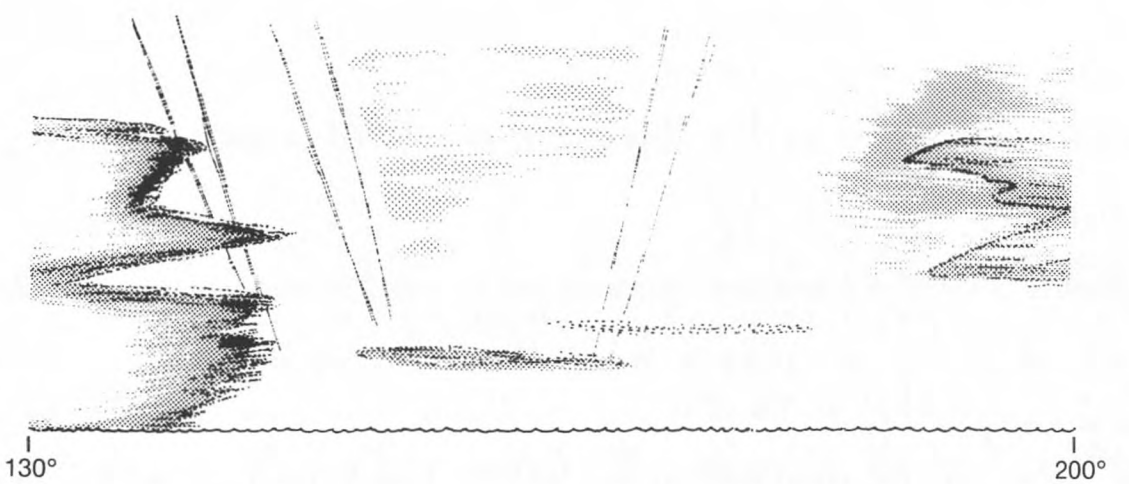
Position of ship at 2300 UTC: 58° 56′N, 01° 54′W.

AURORA AUSTRALIS

Indian Ocean

m.v. *Encounter Bay*. Captain A.W. Ellis. Barcelona to Fremantle. Observers: Mr G.D. Mead, 2nd Officer and Mr G. Jenkins, Senior Seaman.

8/9 November 1991. For most of the evening the sky had been overcast when, at about 1500 UTC, a portion to the south of the vessel cleared and appeared to be brighter than the rest of the sky. At around 1515 three vertical shafts of light, as shown in the sketch, were seen standing out against the background with the



sky in places having a distinct red tinge; as these areas moved towards a southerly bearing their intensity increased, lasting for about 20 minutes. It was thought that these may have been the Southern Lights, but the observers thought it odd for such a northerly latitude.

Position of ship: 35° 49′S, 104° 14′E.

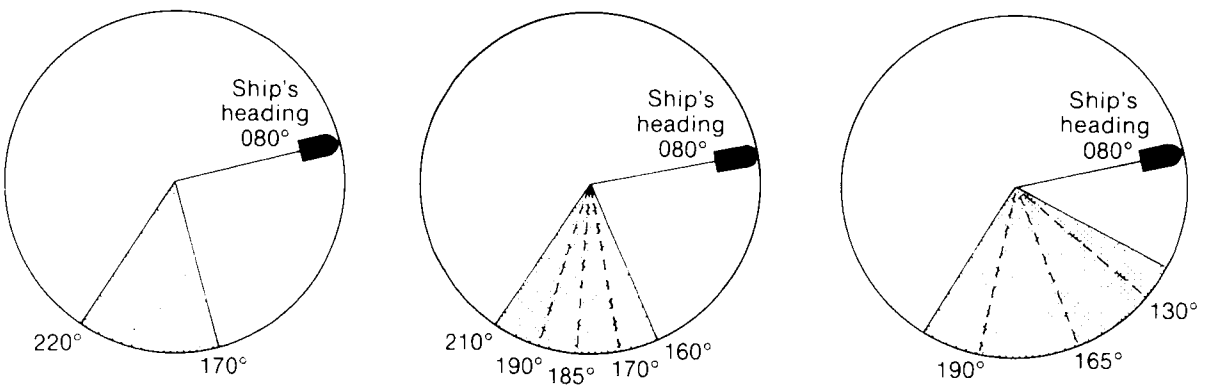
Indian Ocean

m.v. *ACT 1*. Captain J.A. Oscroft. Las Palmas to Fremantle. Observers: the Master, Mr W. Krause, 2nd Officer, Mr L.J. Cheesbrough, 3rd Officer, Mr M. White A.B. and Mr P. Hough, A.B.

28/29 October 1991. At 1440 UTC the aurora was observed and then watched closely as it developed. According to the *Marine Observers' Handbook* the activity when an auroral form waxes and wanes fairly regularly is called 'pulsating', which was the case with this form. Throughout the display the form was rayed, described as a 'searchlight effect', its elevation was 80° from the horizon and was coloured predominantly red. The shaded area in the first sketch shows the initial bearings of the aurora; it pulsated fairly regularly to a point when the observers thought it was going to fade away, but it returned and gradually increased in intensity.

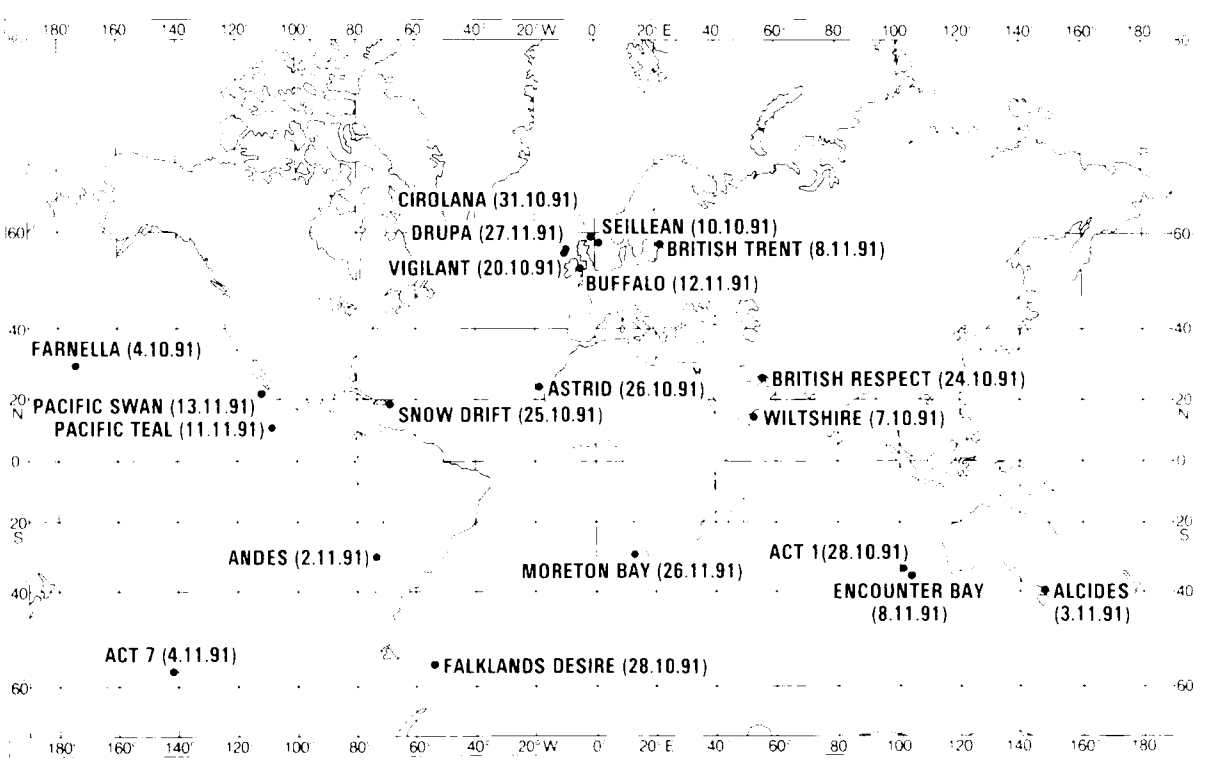
At 1520 rays had developed and their bearings are shown in the second sketch. They could be compared to beams of light which shine through stained-glass windows and were milky-white in appearance, having a constant elevation of about 80°.

The display was at its brightest at 1640, having gradually moved round the horizon but then faded rapidly during the next 50 minutes, disappearing by 1730. The third sketch shows the bearings of the rays in the final stage of the display.



Throughout the period the cloud cover was 1 okta of small, patchy cumulus and those clouds which were in the arc of the aurora had blue and red tinges to their edges. The following evening another display was hoped for but nothing happened. Additionally, perhaps due to the solar activity, the Radio Officer had been having difficulty in transmitting the ship's weather observations for the previous day or two.

Position of ship at 1440 UTC: 34° 50'S, 101° 50'E.



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

A new database for observations of bioluminescence

By M. Watson[1] and Peter J. Herring[2]

Observations of bioluminescence, sometimes called phosphorescence, are frequently described in the 50,000 logbooks which over the years since World War II, and indeed since logs were introduced in the 1850s, have been sent in by the Voluntary Observing Fleet. For many years now these observations have been picked out by the Met. Office and despatched to experts for comment. Many (but by no means all) of the accounts and the interpretative comments are later published in *The Marine Observer*. However, it has always been difficult to draw general conclusions, despite the potential wealth of data, because there has been no easy way of collating all the separate reports sent in over the years.

This problem has now been resolved. In the past year all the observations of bioluminescence sent to the Met. Office since 1924 (when *The Marine Observer* was first published) have been compiled onto a computer database. This work has been sponsored by the Ministry of Defence as part of its wider programme in general oceanography.

The database contains all the reports published in *The Marine Observer*. It also includes all the additional unpublished ones sent to experts over the past 30 years. From 1963 to 1975 the reports went to Dr R.H. Kay of Oxford University and from 1975 to the present have been sent to Dr P.J. Herring at the Institute of Oceanographic Sciences. Over 2,300 observations are now held in the

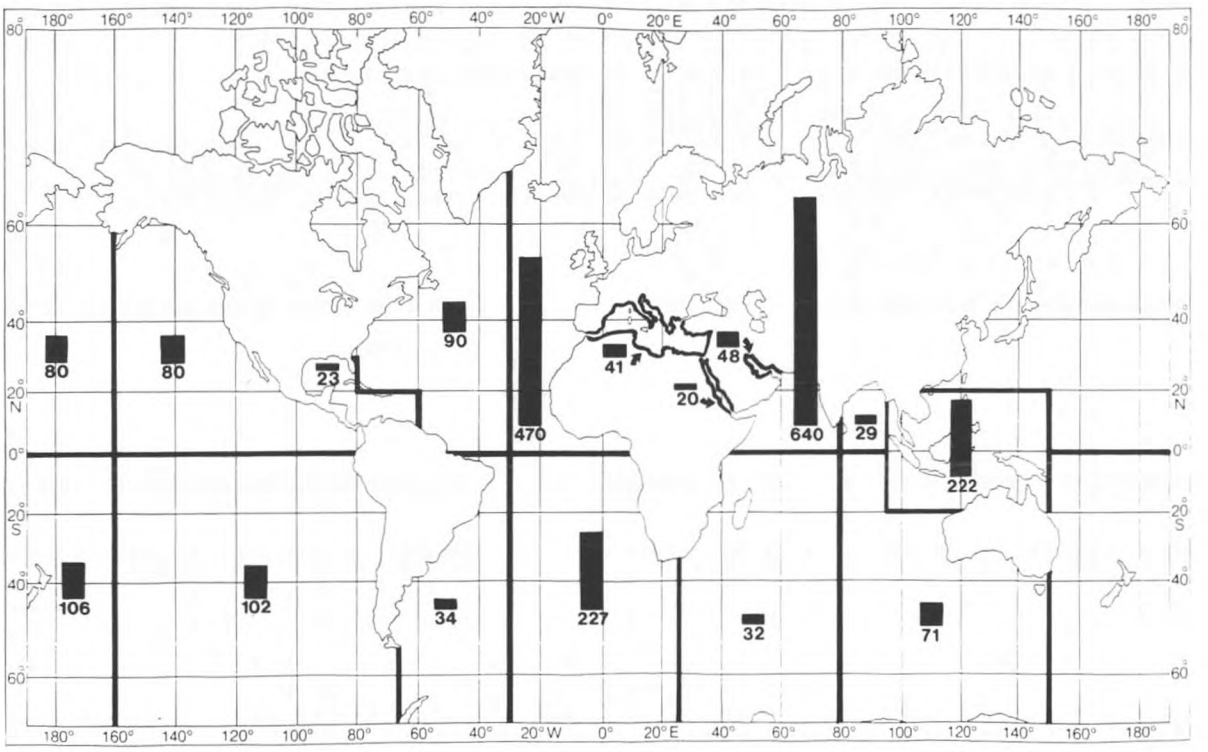


Figure 1. Distribution by area of 2,315 bioluminescence reports in the database. The height of the column provides a graphical representation of the relative numbers in each area. The actual numbers are indicated below the column.

[1] Department of Biology, University of York, Heslington, York Y01.
[2] Institute of Oceanographic Sciences Deacon Laboratory, Brook Road, Wormley, Surrey GU8 5UB.

database, ranging from disturbed water bioluminescence to unexplained phenomena such as Phosphorescent Wheels and Milky Seas. As more reports are received they will be regularly added to the database.

The entries contain information on the date and position of the observation, the accompanying meteorological data, and the characteristic features of the observation, a tentative identification of the organism(s) responsible and comments on special features. The increased number of easily available observations is already leading to new investigations into the causes of the more unusual phenomena. It is now possible to list all observations for a particular area, or season, or year, or of a particular type, and to look for correlations with the meteorological data or with particular organisms. The database contains *all* the observations, with no bias towards one category or another. Figure 1 shows how the observations of all categories of bioluminescence are distributed world-wide. They are inevitably biased by distribution of shipping lanes and favoured trade routes, and the dominance of the north-east Atlantic and north-west Indian Oceans must be viewed in this context. It is in the latter region that many of the reports of Milky Seas and Phosphorescent Wheels are concentrated.

In the longer term it is also hoped to add bioluminescent reports from other sources (both early and contemporary) to the database, in order to make it an even more valuable tool for analysing this global phenomenon. Without the steady flow of reports from the Voluntary Observing Fleet the project could not have been achieved. We thank all who have contributed in the past, and we look forward to continued reports from seafarers on all types of bioluminescent phenomena which they encounter.

Meteorological Logbook No. 50,000

Ever since the Met. Office was set up in 1854 by the Board of Trade as its Meteorological Department, incoming logbooks and forms have been given consecutive numbers and recorded in a register. Log No. 1 was received in 1854 from H.M.S. *Saracen*, Captain J. Richards, RN, covering a voyage from Plymouth to the Cape of Good Hope: this log and several other early receipts have been missing for many years, thus log No. 4, from H.M.S. *Frolic*, is the earliest to be found in the Archives. About 43,000 forms and 19,276 logs were registered in the Marine Division up to the outbreak of World War II, the last of the latter being received from s.s. *Lyndareus*, Captain T.A. Kent, on 22 May 1940; it recorded the weather on two trans-Pacific trips between Japanese and British Columbian ports just before the start of hostilities.

After the war it was decided that logbook numbering should be restarted, and Royal Mail's s.s. *Andes*, Captain R.G. Clayton, D.S.C., became the first ship to submit a log, No. 1. This log was received in March 1947 and concerned a voyage from Southampton to Singapore and return, made between January and March that year. At the end of 1947 there were 495 Selected Ships, 181 Supplementary, 80 MARID coastal vessels and five light vessels recruited to the Voluntary Observing Fleet. At that time there was a self-imposed restriction of 500 Selected Ships maximum. The total of 761 observing ships then compares with the figure of about 520 that applies today.

In March this year we received the 50,000th meteorological logbook from a Selected Ship since World War II. The average annual receipts during this period

Photos by F.F. Kuhn

Icebergs photographed from m.v. *Falklands Desire* on 28 October. (See page 171.)

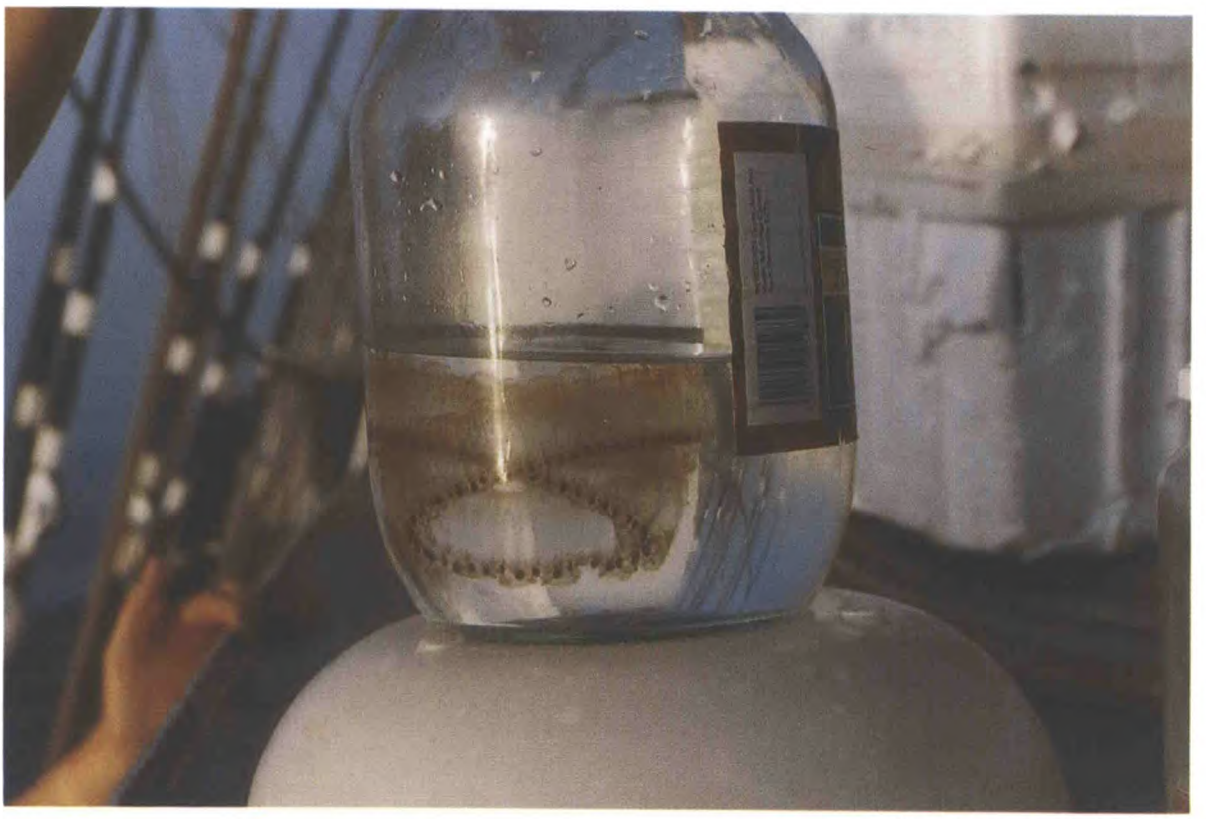


Photo by Captain D.R. Norman

Salps brought on board t.s. *Astrid*. (See page 173.)

Photo by A. MacCallum

Tawny Owl on board f.p.v. *Vigilant*.
(See page 174.)

Photo by T.C.R. Riley

Moth found on m.v. *Pacific Swan*.
(See page 177.)

Photo by Captain J.B. Nichols

Peregrine Falcon on board m.v. *Farnella*. (See page 174.)

Photo by W.R. Durrans

Cattle Egrets pictured on board m.v. *Pacific Teal*. (See page 176.)

were 1100, a figure of about 1200 per year being the norm most of the time, but this has dropped to about 900 due to the longer version of the logbook being brought into circulation, and because of the contraction of the fleet in recent years.

Log number 50,000 was received on 12 March 1992 from m.v. *Baltic Universal*, Jardine Ship Management Ltd, and after the customary assessment the log was awarded an Excellent marking. It was decided to publish a feature in-depth on the ship and her personnel, providing an example of today's observing ships. We are particularly indebted to Captain Ian Ligertwood, Master of *Baltic Universal*, for the time and trouble he took in providing much of the material and photographs for this feature, including his excellent photograph of roll cloud displayed up front.

Baltic Universal (photo kindly provided by Mr Andy Booth, Fleet Manager, Jardine Ship Management, Hong Kong) was recruited in March 1987 as a Selected Ship of the U.K. Voluntary Observing Fleet at Sheerness, by the Port Met. Officer based near Tilbury. The ship is now part of the Jardine Ship Management Fleet, one of nine U.K. observing ships to be so managed. She is a modern refrigerated cargo ship, built in Japan in 1986 to the highest Lloyd's Register classifications, with a gross tonnage of 9,621.96 and a displacement of 17,028.70 tonnes at a draught of 9.2 metres. Her owners are Fortuna Company Inc. of Sri Lanka, with port of registry Colombo.

The ship has a crew of about 20, including Master and nine Officers. They are an interesting polyglot team, British, Filipino and Sri Lankan, plus one perhaps from Thailand judging by his name, a diverse group of people brought together as a result of shortages of U.K. trained officers in the late 1980s, and for reasons of conserving resources.

Captain Ligertwood gained his promotion to command of *Baltic Universal* in January 1990, having joined Gateway Shipping, the original owners, in April 1984 and remained with his ship on transfer to Jardine Ship Management in January 1989. As a cadet starting out on his sea career he joined Ocean Fleets in 1969, serving first on Blue Funnel's *Antenor*. In 1973 he was serving as Third Officer on board *Osaka Bay* when he first sent in a meteorological logbook. This was followed by many more which showed a considerable keenness in 'doing the

weather', and this experience is manifest in the improvement seen in the reporting by his officers on this ship over recent months. He was about ten years with Ocean Fleets before obtaining his Mate's Certificate and soon transferring to Safmarine. He gained his Master's in 1984. Captain Ligertwood is unmarried and lives in the depths of Herefordshire where his main hobbies are gardening and growing different varieties of apple tree in his two-acre orchard.

Captain S. Venner was also in command for part of the period included in log No. 50,000. He has been making weather observations for the Met. Office since 1970, when he sent in a log from Moss Hutchinson ship *Amarna*, and since contributed to this important work while serving on board other ships of the P&O Group.

Chief Officer Katherine Molloy started her career as a deck cadet with the Shipping Corporation of New Zealand in 1982. After obtaining her Second Mates Certificate in 1985, she continued with that company for three years on container, Ro-Ro and LPG ships. She left New Zealand in 1989 to travel and gain further work experience and since then she has been employed on a Trinity House Marine Resources Ltd survey vessel, container ships for Denholm (IOM) Ltd and now for Jardine Ship Management Ltd on bulk and reefer vessels. At the end of her present tour of duty as Chief Officer on *Baltic Universal* she intends returning to New Zealand to study for her Masters Certificate.

Both the Second and Third Officers are from the Philippines. Avelino Del Pilar is the Second Officer, having started his career at sea in 1971 as an apprentice mate on Filipino flag tankers and has since been employed by several manning agencies based in Manila. He is presently employed by Pacific Maritime Agency and during his career has served on bulk, log carrying, container, OBO and reefer vessels. He gained his Second Mates Certificate in 1982 and was promoted to Second Officer a year ago.

Third Officer Crispin Molina is also Principal Observing Officer, and on him falls the duty of ensuring that the weather observations and transmissions are kept up satisfactorily as well as the administration of the equipment and stationery on board. He started his sea career as apprentice mate in 1979 and has since worked for several Manila manning agencies, mainly for Sapphire Shipping Agency. He has been employed on passenger ships, tankers, bulk and reefer vessels, alternating in the positions of Third Mate, Bo'sun and Able Seaman. He gained his Second Mates Certificate in October 1991 and is now employed by Pacific Ocean Manning Agency of Manila.

Radio Officer Senani Ranasinghe hails from Sri Lanka, having started at sea in 1984 with the Ceylon Shipping Corporation. He has since worked for Buries Markes and is presently in Jardine's employ. He has served on general cargo ships, bulk carriers and reefer vessels. We hope that Senani does send any weather obs. messages by radio as soon as convenient after every synoptic hour of observation.

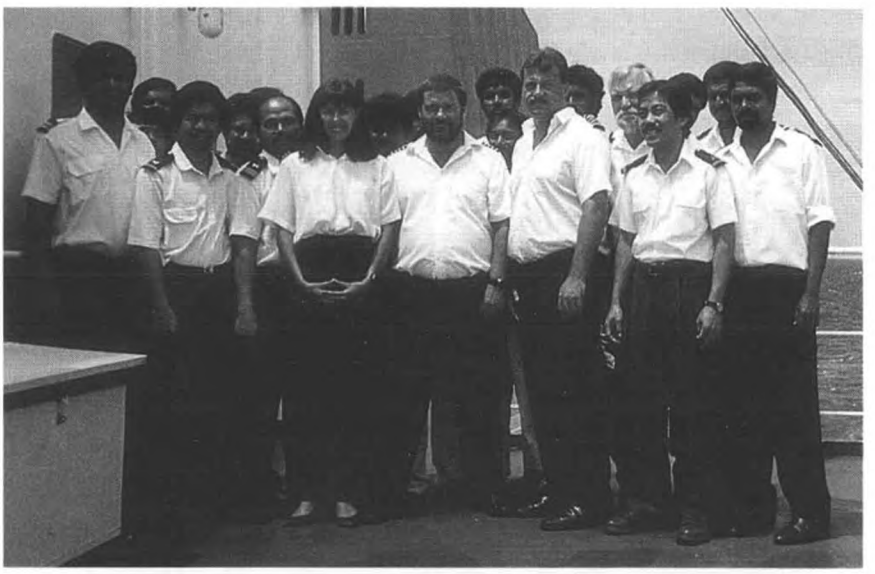
In the photograph of the complete 'weather obs. team' on the bridge of *Baltic Universal*, Captain Ligertwood is on the left, then comes C/O Molloy, R/O Ranasinghe, 2/O Del Pilar and 3/O Molina.

With the exception of Chief Engineer Steve Henry and Electrician Brian Smith, the remainder of ths ship's Officers are from Sri Lanka or the Philippines, as are the rest of the ship's company.

Baltic Universal's recent voyages have been mainly concerned with carrying cargoes of fruit from west coast ports of North and South America to northern Europe and Mediterranean ports. In January apples were loaded at Seattle for Barcelona and Savona, followed by pears from San Antonio Este (Argentina) to Vado and in April a mixed cargo of apples, pears and grapes was transported from San Antonio (Chile) to Marseilles and Vado. Captain Ligertwood says he can also carry 33 forty-foot containers on deck with cargo, and his main runs are from Chile to U.S.A. east coast or north-west Europe, Central America to U.S.A. east coast or north-west Europe with bananas, and South Africa to Europe.

Unusual cargoes carried include several loads of 10,000 tonnes of feta cheese from Denmark to Iran, usually around January each year. About two years ago

his ship carried an assorted refrigerated cargo from Europe to the Persian Gulf, consisting of almost everything for a feast, including frozen meats, all types of chocolate bars, chilled cream, butter as well as frozen vegetables to accompany the rest.



We are thankful to Captain Ligertwood and the ship's company of *Baltic Universal* for their co-operation in providing the data in logbook No. 50,000, and for their assistance in compiling this special article. We look forward to many years of continuing liaison in weather observing over the oceans.

Origins of Jardine Ship Management*

Jardine Ship Management's origins can be traced back to 1819, when Dr William Jardine and Mr James Matheson commenced trading in Canton. From then onwards, concurrent with the breaking of the long established trade monopoly held by the East India Company and the founding of Hong Kong, the Jardine fleet expanded and some of the more famous clippers — *Red Rover*, *Sylph* and *Falcon* — sailed under the Jardines house flag.

In 1881 the shipping interests of three firms, Jardine Matheson and travelling., The China Coast S.N. travelling., and the Yangtze Steamer travelling., were amalgamated and on 1 February 1882, the Indo-China S.N. travelling., Ltd, commenced operations with a fleet of twelve vessels totalling 13,862 tons. The name chosen — Indo-China — had no connection with the former French colony of that name but was a derivative of India and China, which were then the terminals of the company's deep-sea service.

Despite difficult operating conditions, which were so often a feature of Far Eastern trade, the Company expanded steadily. The principal services operated were those on the China coast and the Yangtze River; over the years 'Indo-China' gained an enviable reputation for good service, despite the unsettling effects of provincial wars, piracy and other abnormal hazards. From 1900 onwards, the Company's fleet normally stood at from 35 to 40 vessels.

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*Résumé of company's shipping history provided by Mr A.J. Booth, Fleet Manager, Jardine Ship Management, Hong Kong.

However, the war of 1939–45 took a heavy toll of the Company's ships; of the 1941 fleet of 35 vessels, only 14 remained at the end of hostilities. A large number of our ships took part in the defence of Hong Kong and Singapore, where particularly heavy losses were incurred. The Company is very proud of the part played by the *Liwo*, a river steamer of 707 gross tons, which attacked a heavily armed Japanese convoy single-handed and was sunk in the course of the ensuing engagement. Her Commander, Lt. Thomas Wilkinson, R.N.R., was posthumously awarded the Victoria Cross in recognition of his services.

After the war, the Company set about the task of rebuilding the fleet, re-establishing several former liner services. Many of the traditional routes, however, were now closed to foreign trade, so new links, in particular between Australia and Japan, had to be forged.

In 1970, as a result of the changing structure of regional and international trade, the Company relinquished its direct interest in liner services. Instead, it concentrated on the establishment of a fleet of modern bulk carriers and tankers for medium or long term charter.

In 1973, 'Indo-China', which by then had been operating from Hong Kong for more than 60 years, transferred its registration from London to the Colony, becoming the Indo-China Steam Navigation travelling., (Hong Kong) Ltd. In April 1976 this company was acquired in its entirety by Jardines, becoming for the first time in its 95-year history a wholly owned subsidiary of Jardine Matheson.

In 1983, as severely depressed shipping markets coincided with adverse trading conditions in Hong Kong, the parent company adopted a deliberate policy decision to withdraw from shipowning and expand its ship management activities; Jardine Ship Management Limited (JSM) was therefore formed to market ship management services to new customers, and service 'Indo-China's' existing Principals.

JSM current fleet consists of 28 fully managed vessels of various different types, cape size, handy size and gantry crane bulkers, reefer vessels, general cargo vessels, container vessels and products tankers.

JSM is now represented in three offices, in Hong Kong, Chatham (U.K.) and Singapore.

Extract from the meteorological logbook of the *Loch Rannoch*, Captain D.C. Davidson, Melbourne to London. *

(Received in the Marine Division on 25 April 1893)

February 16th 1893 at 0400 ship's time in 51° 10'S, 49° 20'W. A very large iceberg loomed up through the clouds and haze nearly right ahead and very close. Before it could be cleared with the helm hard up the foreyard and fore topsail yards caught, carrying away and breaking the foreyard in two and damaging the topsail yards. Then the main yard caught and broke in two places. Then the mizen topgallant yard caught and broke in three pieces.

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* First published in *The Marine Observer* in January, 1957.

The temperature of the sea and air having been taken as usual at midnight (or shortly after) did not show any change from the former observations, to lead us to believe that we were in the immediate vicinity of such a huge mountain of ice. Owing to the clouds and haze hanging over it, it did not appear until we were very close to it, the ship going about 5 knots and the Chief Officer in charge of the deck. After passing the berg and getting it between us and the clear western sky, I judged it to be 400 to 500 feet high and about a mile long. When the day broke there were many bergs or ice mountains all round the ship and the ship had to be carefully handled in her disabled state to clear them. Noon position by observation 51° 12'S, 47° 36'W.

February 17. When day broke we were still surrounded with what appeared to be a solid wall of ice from 200 to 500 feet high and some of the bergs seemed to be several miles in length. The greater part of them appeared to be perpendicular on the sides and flat on the top, quite level from end to end. Others had a jagged appearance as if they had parted from the main body. No observation for position this day.

February 18. Blowing hard from the south-westward all night. Having a difficult job to keep clear of the ice under the little canvas we could set in our crippled state. At daylight I went to the masthead and saw a small opening to the north-west and decided to run for it. On nearing it I found immense bergs as far as the eye could reach and miles of floating ice which led me to believe that we were nearing the outer edge. Many of the bergs now appeared to be getting top heavy and were gradually canting over. Some had canted over and showed the part that had been in the water worn quite smooth. Others again seemed to have broken in two pieces, the freshly broken ends having a bluish colour. Some had water rushing down the sides as if they were melting on the top. One I saw had doubled over and had a large brown rock embedded in it. The bergs had now assumed all sorts of shapes and seemed to be the remains of much larger ones. By sunset of this evening no bergs were to be seen ahead from the masthead. It is not possible to give an accurate estimate of the number we saw. I counted 37 separate bergs at one time but the horizon was obscured by mountains of ice as far as the eye could reach from the topgallant yard.

Whilst we were amongst the ice I frequently tested the temperature of the water and did not find the temperature to vary by more than half a degree, even when close to leeward of a large berg and going through the floating pieces of ice. The temperature of the air altered very little all the time, the sea was of a greenish colour. The instruments were carefully attended to and all data recorded may be relied on as correct.

The position of the last berg seen at 6.30 p.m. on the 18th February was 49° 13'S, 45° 08'W by careful dead reckoning. From the first berg to the last one the distance in a direct line was about 200 miles.

AURORA NOTES OCTOBER TO DECEMBER 1991

By R.J. Livesey

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

The observations of the aurora borealis and aurora australis that we have received from mariners during the period under review are listed in Table 1. The

Table 1 — Marine Aurora Observations October to December 1991

Date	Ship	Geographic Position	Time (UTC)	Forms in Sequence
15/16 Oct.	*Cumulus*	56° 36'N, 25° 23'W	0245	Qn
19/20	*Cumulus*	57° 22'N, 21° 08'W	0544	QHA
28/29	*ACT 1*	34° 50'S, 101° 50'E	1440–1640	G.RR. Max. alt. 80°
28/29	*Matco Thames*	58° 49'N, 01° 47'E	2130	RR. Max. alt. 50°
30/31	*Selectivity*	58° 14'N, 05° 37'W	2215–2306	aRA.RB.p_2CRR.mP. RB.RR.p_2RR. RB.mP
31 Oct./ 1 Nov.	*Cirolana*	58° 56'N, 01° 54'W	2300–2340	G.CRR.G.RR.P
1/2 Nov.	*Cirolana*	58° 22'N, 02° 36'W	1830–2350	p_2HA.RR.p_2RR.HB. mP.Pv mP. To zenith.
2/3	*Cumulus*	58° 03'N, 19° 07'W	0427	qHN
3/4	*Cumulus*	58° 33'N, 19° 34'W	0344	HV.R_2R
8/9	*Cumulus*	58° 42'N, 19° 02'W	1940–0400	QRR.QHA.QS.QHA. QR_2R. To zenith
8/9	*BP Adventure*	37° 18'N, 50° 44'W	2205–0300	G.RR.G.mP.G.RR.G.
8/9	*Encounter Bay*	35° 49'S, 104° 14'E	2315–2335	m_3RR.
8/9	*British Trent*	57° 28'N, 21° 12'E	0400–0420	mRR.
9/10	*St Clair*	57° 30'N, 01° 36'W	2200–2256	RA.CRR.mP.p_2CRR. mP p_2.CRR.p_1RR.
28/29	*Cumulus*	58° 06'N, 21° 02'W	0045	QN.
27/28 Dec.	*Cumulus*	57° 53'N, 20° 46'W	0045–0152	QHV.pRR. Max. alt. 20°.
28/29	*Cumulus*	57° 45'N, 20° 51'W	1830–0029	QHA.RR.aHA. QHA.QHV.QN. Max. alt. 40°.
30/31	*Cumulus*	57° 30'N, 21° 48'W	0029–0142	N.
31 Dec./ 1 Jan.	*Cumulus*	57° 18'N, 22° 29'W	2210–2245	N. Max. alt. 20°.

KEY: a = active, f = fragmentary, m = multiple, p = pulsating, p_1 = flaming, p_2 = flickering, A = arc, B = band, C = corona, G = glow, HA = homogeneous arc, HB = homogeneous band, N = unspecified form, P = Patch, Q = quiet, R = ray, RA = rayed arc, RB = Rayed band, RR = rays, R_2 = medium rays, R_3 = long rays, V = veil.

series of active auroral events that began in June continued through to December 1991 and it is pleasing to note that the number of marine observations made reflect this activity.

The present sunspot cycle has been declining since 1989 but there has been quite a flurry of auroral events from 1989 through to 1991, particularly in these two years. In the present period under review auroral events of significance in

mid-latitudes were observed on the nights of 1/2, 2/3, 8/9, 21/22, 29/30 and 30/31 October; 1/2, 4/5, 8/9, 9/10, 14/15 and 19/20 November; 27/28 and 29/30 December. That of 1/2 October was seen in northern Italy. The biggest storm was that of 8/9 November about which 126 reports have been received to date. Coronal structures in this aurora were seen from the English Channel coast and it was widely observed in the United States of America. The Royal New Zealand Astronomical Society Aurora Section newsletter and preliminary report stated that they had experienced a lot of bad weather and only two observers noted active aurora on 8/9 November and nine on 9/10 November. The report from *Encounter Bay* is therefore all the more valuable as it indicates, from the latitude of the vessel, that the aurora had been fairly extensive in southern latitudes.

In Figure 1 a comparison is made between the frequency of active, important mid-latitude auroral events and the degree of disturbance in the Earth's magnetic field, in recent years. The storm sudden commencements (SSC) are the effects of shock-waves in the wind of electrons and ions coming from the sun to affect the Earth's magnetic field. The existence of high-velocity solar particles or shock-waves is not necessarily followed by a magnetic storm and aurora in mid-latitudes. According to Professor Akasofu it is the interplanetary magnetic field and its orientation with respect to the Earth's axis that determines whether or not magnetic storms and auroral storms evolve, with or without SSC. A loose analogy might be to consider the solar wind as tropospheric wind and the magnetic field orientation as being equivalent to humidity. There can be wind without rain, depending on local atmospheric humidity; similarly, one could have a 'rain' of particles to generate the aurora only if the magnetic 'humidity' is of the appropriate orientational value.

The increase in electrical currents in the ionosphere caused by the enhanced conductivity as the result of auroral particle bombardment in turn generates the disturbances in the magnetic field measured at ground level. These disturbances are measured by a variety of indices, some linear, some semilogarithmic such as the Planetary Magnetic Index K_p. In Figure 1 K_p values are compared with the major auroral activity from 1988 to show spells of solar and terrestrial activity of recent months. Again by loose analogy, one might consider the magnetic index to be the equivalent of the Beaufort Scale for magnetic storms and associated aurora. A comparison of two typical magnetic indices is given in Table 2.

Table 2 — Comparison of two typical magnetic indices.

K_p Index Semilogarithmic	0	1	2	3	4	5	6	7	8	9
A_p Index Linear	0	3	7	15	27	48	80	140	240	400

On the A_p scale, values are: 0–10 quiet conditions, 10–20 minor storm, 20–50 stormy, 50–80 severe storm; values above these are equivalent of gales and hurricanes. To put things in perspective the A_p values for the commencement of some recent storms are given in Table 3.

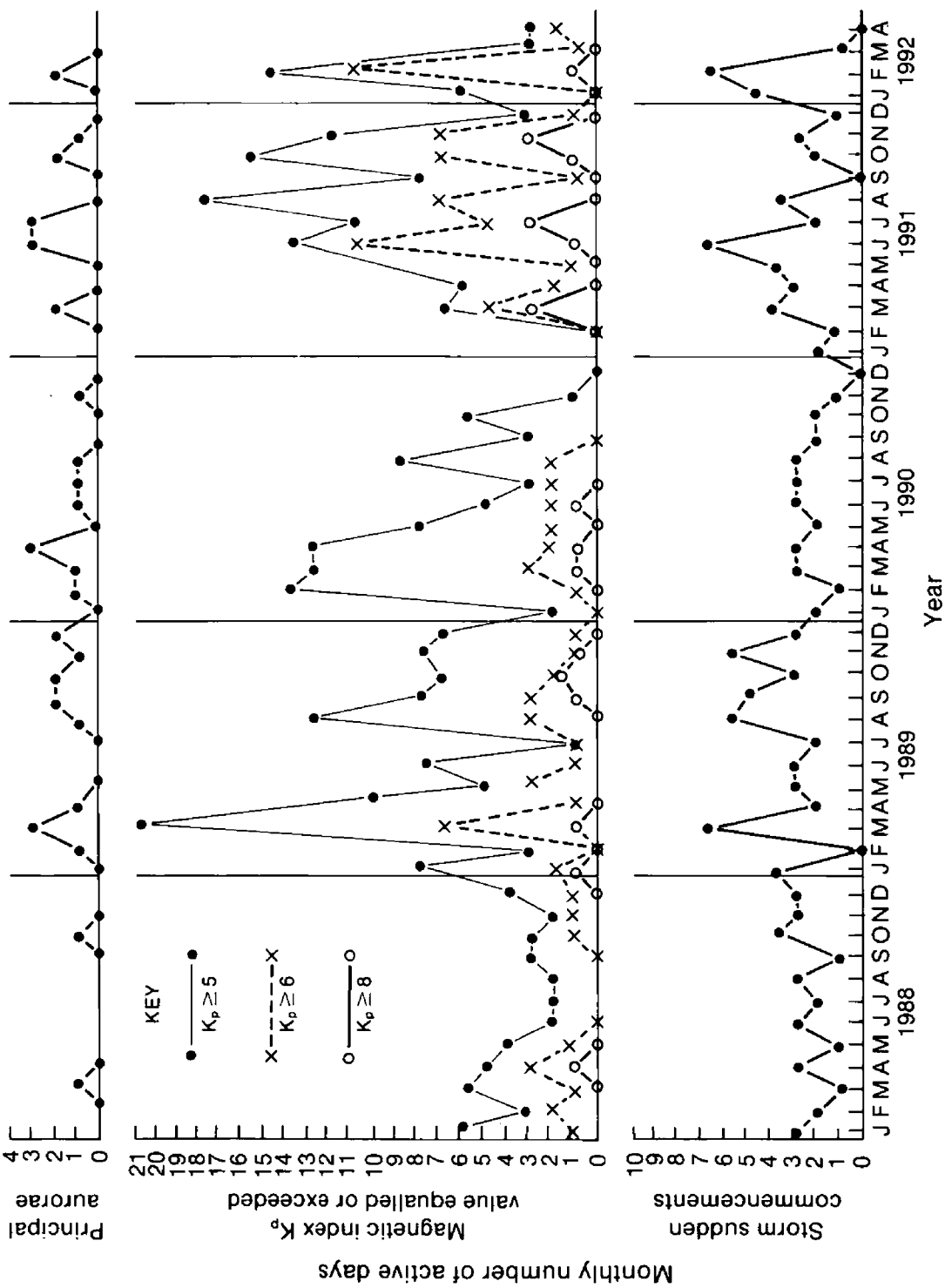


Figure 1. Comparison between the frequency of active, important mid-latitude auroral events and the degree of disturbance of the Earth's magnetic field.

Table 3 — A_p values for commencement of some recent storms.

1986	Feb 8/9	A_p 202	1991	Jul 13/14	A_p 134
1989	Mar 13/14	246	1991	Oct 1/2	54
1991	Mar 24/25	161	1991	Oct 29/30	128
1991	Jun 5/6	196	1991	Nov 1/2	109
1991	Jun 10/11	119	1991	Nov 8/9	98
1991	Jun 12/13	120	1991	Nov 9/10	119
1991	Jul 9/10	117			

We would comment upon the interesting report received from the Master and crew of the *Moreton Bay* on 26–28 November when steaming from 25° S, 10° E to 37° S, 19° E down the south-west coast of Africa [see page 178 of this issue]. The observers concluded that the apparitions were not aurora or noctilucent clouds because the ship was considered to be too far north to see these phenomena. The magnetic field was quiet on those nights, there was no aurora present at that latitude and noctilucent clouds could not have been seen at these latitudes. However, always observe what is seen and shines. Had the *Moreton Bay* been in those same waters on the night of 13/14 March, 1989 the observers would probably have recorded the northern edge of the great apparition of the aurora australis when it was also recorded by other ships as far north as Madagascar. Incidentally the *Encounter Bay* when observing the aurora on 8/9 November 1991 was not far from the position at which the *ACT 1* reported the aurora on 13/14 March 1989.

Many thanks to all contributors of auroral observations, these are much appreciated. Best wishes for safe voyages, clear skies and more sightings of the aurora.

LETTERS TO THE EDITOR

(Letters to the Editor, and books for review, should be sent to the Editor, *The Marine Observer*, Meteorological Office, Eastern Road, Bracknell, Berkshire RG12 2PW, U.K.)

Submarine threat?

On the 22nd December last whilst I was initially on my own on the bridge the following incident occurred.

We were steering on an easterly course at reduced revolutions, there being a strong easterly wind and rough sea against us. I sighted what I can only describe as being a huge dorsal fin moving from starboard to port on the starboard bow, my initial reaction was that it was some kind of submarine periscope at a range of about 50 to 60 yards; by the time I reached the wheel to alter it was apparent that it was indeed a dorsal fin and moving across the bow at an extremely fast rate so I maintained course. As the fin moved across the bow I estimated that its size was approximately 5 feet in height above the water, so high in fact that the strength of the wind was 'bending' it (rather similar to a sailfish).

On reaching a position about four points on the port bow the fin turned towards us, swaying as it did so; it was then joined by another fin of similar dimensions and both headed straight for the mid-ship section without faltering,

at a very fast speed. I was joined at this time by the Radio Officer who also witnessed the incident. At between 50 feet and 100 feet of the ship the creatures dived and were not seen again. I can only describe this final approach as being very aggressive.

The fins were of a very similar shape to those of killer whales, swept back and pointed, their colour was a 'streaky' grey. The ship's position at the time was 30° 44'N, 144° 30'E and the depth of water was about 6000 metres (approximately 75 n.mile east of the Ogasawara Trench). What impressed me most was the fact that in spite of the wave height of about 3 metres no part of either creature's body was visible, only a large shadow.

Captain J.M. Miller, Master, m.v. *Pacific Teal*, James Fisher & Sons plc.

Kingfisher

The contribution of your correspondents is much valued by RNBWS, and in my role as a planning staff officer for the Hydrographer of the Navy, their example is a most useful one with which to spur RN units on to greater efforts to achieve passage environmental observations. I shall in fact be doing so tomorrow, during a briefing for a major deployment which begins later this year.

Meanwhile, may I ask you to include an identification of the bird in the excellent description provided by Captain Edwards of the *Staffordshire* [April, 1992, p. 64]. It is, in fact not a seabird but a Grey-headed Kingfisher (*Halcyon leucocephala*) and *The Birds of the Western Palearctic*, Vol. IV, Cramp, S. (Ed.) (1965) notes that there are a few previous records of observations of this species at sea in the Gulf of Aden and southern Red Sea in November and in April–May. This is thought to be evidence of migration to Africa by the breeding population in southern Arabia, which is absent from there between December and March.

Commander M.K. Barritt, Chairman, Royal Naval Birdwatching Society

Kites

Page 175 of the October 1991 edition of *The Marine Observer* contained a description of two raptors observed from m.v. *Wiltshire* at Tuticorin. A photo of the birds also appeared, opposite page 189. The excellent description and photo make it clear that the birds were Brahminy Kites rather than Ospreys. The birds have tan bodies, unmarked white heads and are about 45 cm high. An Osprey would have a dark-brown body, a black band through the eye and would be about 55 cm high. According to *Eagles, Hawks and Falcons of the World*, 1968, by Brown and Amadon, Brahminy Kites are numerous in South India and '...they also soar or sail continually over harbours, and frequently perch in the rigging of ships.'

I am a satellite meteorologist at the National Weather Service Forecast Office in Honolulu, Hawaii, and an avid birder. Our former Port Met. Officer, Jeff Brown, recently brought several issues of your fine journal to our office. I have greatly enjoyed them.

Peter Donaldson, Pearl City, Hawaii.

VSOP–NA Recommendations

Copies of the *Recommendations* section of the WMO Report No. 25 on the *Voluntary Observing Ships participating in the 'Voluntary Special Observing Project — North Atlantic'*, published in April 1992, were circulated to U.K. Port Met. Officers and Marine Division staff.

The results indicate that the VOF produces observations to a high standard, and our Port Met. Office network and HQ infrastructure is held as an example of efficiency and as a pattern on which other WMO Members' services should base their intended Port Met. Office and other Marine Services.

All credit is due to HQ and Port Met. Office staff and I wish to thank all concerned for their dedication and continuing support. The results of the VSOP–NA clearly demonstrate the valuable contribution which VOF data make to the models, and the record of excellence of the U.K. VOF is not lost on those who watch their performance with interest.

Most of the *Recommendations to Members Operating Voluntary Observing Ships*, issued by WMO, are already incorporated in our VOF organization.

Captain G.V. Mackie, Marine Superintendent, Met. Office.

WMO recommends that all Members take note of the findings of the results of the VSOP–NA project, in which ten U.K. VOF ships, out of a total of 45, co-operated for up to two years to mid-1990. Members are urged to ensure that appropriate equipment, exposures and observing practices are chosen and efficiently maintained. Additionally, one method amongst variables has often been shown to be superior to others, e.g. Sea Surface Temperature by hull-contact sensor. [This refers to met. offices' specially-fitted sensors and not the ship's engine room intake, for which there is evidence, according to the report, that intake measurements are of poorer quality and likely to be biased warm compared to the other methods.]

Results of the project's findings should be published and made available to all WMO Members, for distribution within their countries, using publications such as this to bring the results in appropriate form to the attention of the VOS.

The existing real-time monitoring systems for VOS reports should be extended to cover all variables required for surface flux calculations; specifically VOS databases maintained at each monitoring centre should include more detail for each ship, to facilitate identification of the appropriate corrections. Results of the real-time monitoring should be made available more frequently to WMO Members and PMOs, ideally monthly.

Results show that many errors were made in converting measured relative wind into true wind, and in deriving dew-point from dry-bulb and wet-bulb temperatures. Members are recommended to provide their VOS with dedicated calculators or computer programs for deriving these quantities, in order to achieve a significant decrease in the number of such errors.

The WMO report concludes with an acknowledgment to those without whom the report could not have been assembled: the Owners, Masters and Officers of the VSOP–NA ships; the Port Met. Officers, members of the VSOP–NA Management Committee and the staff of the Meteorological Offices of the six participating countries, i.e., Canada, France, Germany, Netherlands, the United Kingdom and the United States; and relevant WMO and IOC committees.

Messages in bottles

I have been sending off messages in bottles from ships on which I have served, since the late 1960s, but it was not until I read with great interest the report about the replies Captain Biggs had received [*The Marine Observer* No. 291, 1986, page 29], that I too decided to start recording my message-in-a-bottle replies in earnest.

Enclosed is a scrap book that I have compiled, containing messages returned to me since 1987. Also small notes about the voyages completed by the bottles

themselves. As can be seen, my bottles have been found by various people from many different lands and walks of life, but mainly poor people.

It is always a thrill to receive a reply from a message that has drifted for sometimes thousands of miles in a bottle and, to date, I have been lucky enough to enjoy a 'success rate' of nearly ten per cent, consisting not only of letters, but overseas telephone calls as well. I believe this to be reasonable success, considering the following factors:

1. Some bottles may be taken by sharks.
2. Some are smashed on rocks once they reach the shore and end their voyage.
3. Some bottles may be washed ashore on uninhabited islands and coasts, never to be found.
4. Some may be found by illiterate people or others who do not bother to reply.
5. Some bottles may become trapped within the oceans' great circulating currents, destined never to reach the shore.

With the inception of new 'dumping-at-sea' regulations, I forsee that I will have to cease 'posting' bottles in the sea before much longer (my bottles are always thrown overboard more than 12 miles from land), but before then I hope to receive a reply to a message in a bottle that has crossed the Pacific Ocean.

As a reward to discoverers of my bottles, I usually send a commemorative pack of mint condition British postage stamps, but often I send a few dollars as well, especially for the bottles that have covered longer voyages.

I hope one day to be able to write to some distillery, telling them that their bottles travel better than anyone else's.

Mr John N. Balkwill, Second Officer, m.v. *Andes*, Furness Withy (Shipping) Ltd.

Editor's remarks

This is a meticulous and colourful record, unlike any other we have seen to date. It relates to bottles jettisoned from three ships, *Aurora* in 1987, *Bransfield* in 1989 and *Andes* in 1990. Besides the initial and follow-up letters he received from the finders, several in Spanish, he has kept the envelopes with their original stamps, postcards, maps and his own analysis of the probable track and distances travelled by the individual bottles.

From the first ship, on passage from Baltimore to Korea via the Cape, he records four replies, from beachcombers in Mauritius, Japan, the Philippines and Tanzania. From R.R.S. *Bransfield*'s voyage from Montevideo to Grimsby he received responses from St Vincent, Buenos Aires, Trinidad, Saint Lucia, Dominican Republic, Costa Rica, Colombia, Bahamas, Ghana, North Carolina, Lagos, Benin and Ghana again — a remarkable record of recoveries. During his South American voyage on the *Andes* he added Spanish to the original message in English - and immediately received a reply from the Commander of a Swedish minelayer and cadet training ship, H.M.S.S. *Carlskrona*, on a courtesy visit to Balboa: in this case, the Commander had been handed the bottle letter by an inhabitant of Pearl Island off the Panamanian coast, who was unable to read in either language. There was also one response from Miami. In his letter of reply to the finder in Panama, he tells of receiving only 29 replies in seven years of sea bottle despatches.

Perhaps Mr Balkwill's greatest surprise and joy came when he received a letter informing him of the recovery of his bottle released from *Aurora* on 11 June 1987 about 500 n.mile south-east of the Sri Lankan coast, and recovered on 22 June 1990, by a man of 32 living in Lamu, an island north of Mombasa, Kenya, three years and eleven days later.

We are unable to reproduce any of the entries from this carefully kept record, but we are indeed grateful to John Balkwill for sharing his bottle correspondence with us.

Book Reviews

The Nautical Institute on Management of Safety in Shipping. 295 mm × 210 mm, 240 pp, *illus*. The Nautical Institute, 202 Lambeth Road, London SE1 7LQ. Prices: £50 to N.I. Members, £71.43 for non-members; air mail £8 extra per volume.

The editor, compiler and contributors to this book are to be congratulated on an extremely useful production, which provides valuable guidelines for marine managers, seastaff, and for maritime college students and staff on varied aspects of quality assurance in ship management.

Three basic sections cover Policy, Operations and People, and whilst this is not a training manual, each section is contributed by authors with wide experience in these areas, with thought-provoking ideas and comment emphasising the increasing requirements for forethought and structured planning.

The contributions on Policy come from specialists in the broader aspects of management, including academics and fleet managers, from whom should permeate the ideas for changes of attitude throughout the industry, with emphasis being proactive rather than reactive.

On Operations the authors provide much useful information from their own experience of planning, implementation and monitoring of safety procedures.

The section on People deals with all aspects of the personnel themselves and their attitudes to safety as well as performance, training and selection.

This is a most useful publication and a worthy addition to the volumes already published by the Nautical Institute such as *The Work of the Harbour Master*, *The Work of the Nautical Surveyor*, *Pilotage* and *Command*.

G.V. Mackie

Written communications for business, by David Reed. Nautical Briefing, supplement to *Seaways*, April 1992. 298 mm × 210 mm, 16 pp. Published by and available from The Nautical Institute, 202 Lambeth Road, London SE1 7LQ. Price: £5.00.

On promotion to a high-profile position whether at sea or ashore it is certain that frequent reports will be required; it is also likely that the promoted officer will have left school several years previously and may, therefore, appreciate a 'refresher' guide to effective writing in a business context.

This helpful supplement is the first of a special series of publications and is aimed at improving written communications within the shipping industry. The author has utilised his wide experience as librarian, English teacher and latterly as an editor with a group of management consultants to write this extremely useful set of guidelines the contents of which include advice on grammar and syntax; punctuation; spelling; style; jargon and the use of all these in the composition of business letters, memoranda and reports.

All subjects are clearly headed making reference easy and the advice given is presented concisely and accompanied by examples illustrating both preferred and less acceptable alternatives to be used in business writing. However, the majority of the examples are embedded in the text whereas had they been afforded more space they would have become more visible to the reader for quick reference.

The A4 format with no covers means that a bookshelf is not the most suitable place to keep the supplement; it would be better kept at the work station be it writing desk or word processor terminal. Although written with a marine application in mind, the guide would be of use to anyone needing to refresh their business writing techniques.

J.M.

The Ships Atlas, edited by Feargal Hogan. 230 mm × 305 mm, 75 maps + Index, *illus*. Shipping Guides Ltd, Shipping Guides House, 75 Bell Street, Reigate, Surrey RH2 7AN. Tel: (0737) 242255/6/7. Price: £40.00 in U.K., £45.00 outside U.K. including delivery. Reductions for bulk purchase.

The period between the publication of the third and fourth editions of the *Ships Atlas* was less than two years. The increased frequency of editions reflects the speed with which new developments come about in our industry and the new *Atlas* covers these changes with its customary style.

The broad format is as before; 75 large clear maps followed by a very comprehensive index which, for major ports includes such information as maximum dimensions and draught permissible, and brief details of the facilities available. The inclusion of tables giving distances from ports on each map to major ports world-wide is of much value, but to this writer the sheer number of ports listed is the biggest selling point. They are all there, down to the smallest one-berth harbour in the most out-of-the-way location. For this reason alone, the *Ships Atlas* is an important piece of equipment for any well-run ship.

J.R. Pinteau

Personalities

(Readers are invited to notify the Editor of co-operating officers from the Navigating and Radio Departments about to retire.)

RETIREMENT — CAPTAIN R.H. WYATT took early retirement from the sea on 31 March 1992 and sent us this review of his career to date.

Robert Henry Wyatt was born in Bath on 13 May 1941 and educated at the City of Bath Technical School. In September 1958 he joined British and Commonwealth, his first ship being *Clan Mackinnon*. He remained with Clan Line and the Union Castle Line until 1963 and it was during this period that he completed his first meteorological logbook, in July 1962 on s.s. *Capetown Castle*. Between 1963 and 1978 he served successively with Trinder Anderson, Ocean Fleets and Bibby Line (including two winter seasons with United Baltic), providing good weather observations from each company during this period. He obtained his Master's Certificate in May 1968 and was promoted to command in 1977 when he was appointed Captain of *Dart America*.

Captain Wyatt transferred to Curnow Shipping of Helston in 1978 and spent his last 14 years at sea in command of their *St. Helena* and *St. Helena Island*,

keeping us regularly supplied with top class observations during that time. In total, he provided us with 46 meteorological logbooks, five of which were marked 'Excellent'. He received an Excellent Award in 1986.

Following his retirement from sea life at a comparatively early age because his unaided vision no longer reaches the required standard, Captain Wyatt hopes to take up a job in a marine-related field, saying that he has enjoyed weather reporting and the magazine over the years. We certainly wish him well in his endeavours and offer thanks for his experienced co-operation in the weather field.

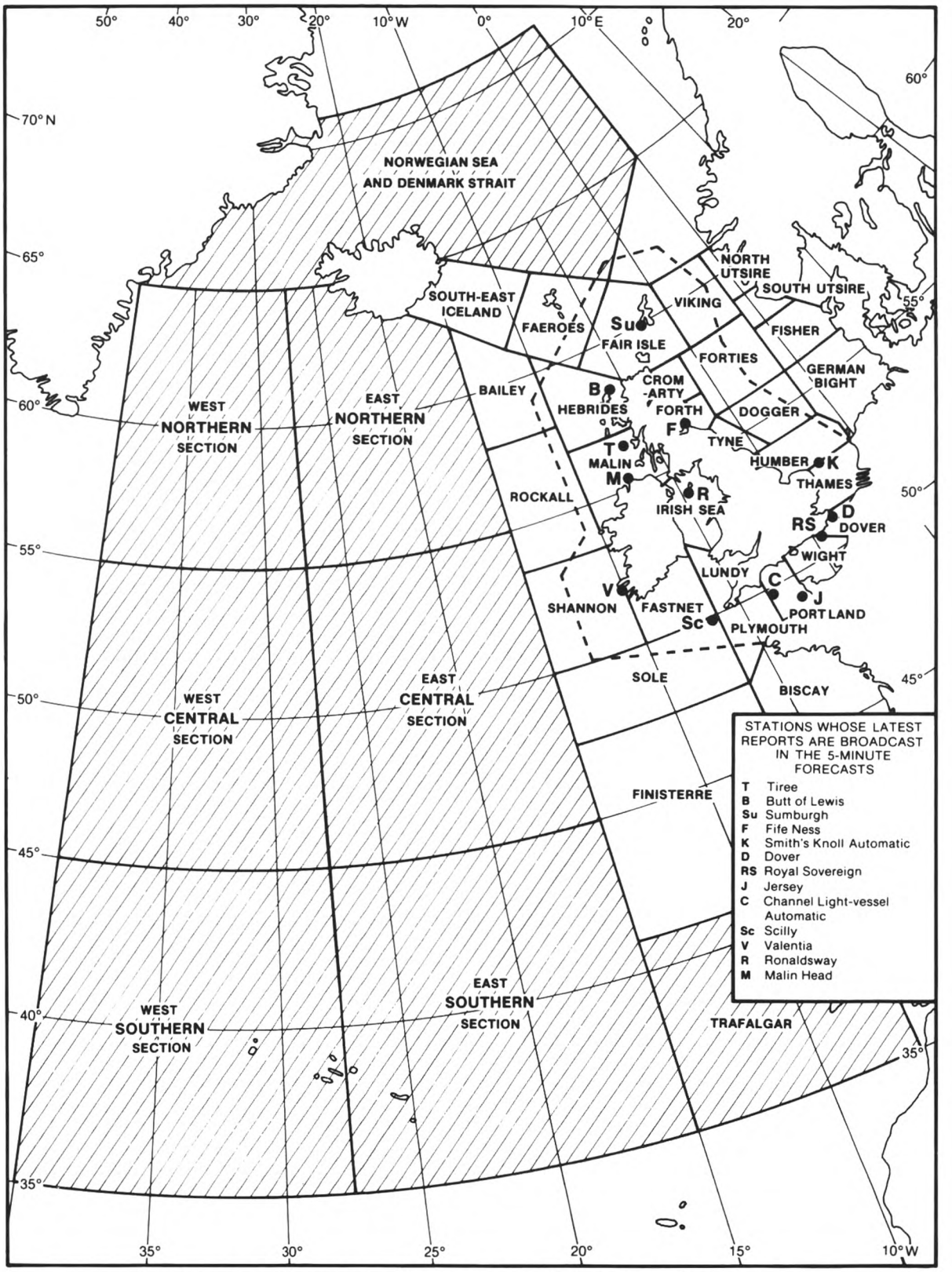
NEW PORT METEOROLOGICAL OFFICER, NORTH-EAST ENGLAND

Captain D.H. Rutherford (seated) hands over to Captain J. Steel, the new Port Meteorological Officer for north-east England. (See July edition, page 146.)

Notices to Marine Observers

GMDSS NEWS

1. Limits of Sea Area A2 around the United Kingdom for coverage of safety messages under the Global Maritime Distress and Safety System arrangements, were declared earlier in the year. These limits pass through certain of the established coastal shipping forecast areas, parts of which will therefore be in both Sea Areas A2 and A3. For this reason the following sea areas are now included in the daily GMDSS broadcasts at 0930 and 2130 UTC for MSI Area I: Sole, Shannon, Rockall, Bailey, Faeroes, South-east Iceland. The attached map shows this area and the full arrangement of U.K. sea area boundaries.



Boundaries of sea areas, as used in weather forecasts transmitted by the BBC and British Telecom International coastal radio stations as from 1 May 1992
The dashed line encloses GMDSS sea area A2 for the United Kingdom and Northern Ireland

2. An interim service to provide worldwide coverage of GMDSS is being introduced to cover those NAVAREAS not yet completely covered by a full GMDSS SafetyNET service. Broadcasts will be transmitted through operational Coast Earth Stations (CES) and the meteorological warning data will be

provided by the Met. Services with GMDSS responsibility for the non-operational areas to the Met. Services in whose country the CES is operational. As an example, Bracknell receives data from France for MSI Area II and from Greece for MSI Area III, passing these data to Goonhilly for broadcast to NAVAREAS 2 and 3 respectively. The following table indicates the status of the GMDSS system as it stood in June 1992, the latest information available at the time of going to press.

GMDSS System — Implementation Status (June 1992)

MSI Area	Issuing Service	CES Operational	Expected	CES
I	United Kingdom	Goonhilly		
II	France		1.9.92	Pleumeur Bodou
III	Greece		1.10.92	Thermopylae
IV	U.S.A.	Semi-operational Southbury	1.10.92	Southbury
V	Brazil		1.8.93	Tangua
VI	Argentina		1.10.92	Southbury
VII	South Africa	Perth (IOR)	August 1992	Goonhilly
VIII	India		End 1993	Arvi
IX	Saudi Arabia		1993	Jeddah
X	Australia	Perth		
XI	China		1.12.92	Beijing (IOR)
XI	Japan	Perth (POR)		
XII	U.S.A.	Semi-operational Santa Paula	1.10.92	Santa Paula
XIII	Russia		1995?	
XIV	New Zealand		1.7.92	Perth (POR)
XV	Chile		End 1993	Santa Paula
XVI	U.S.A.		1.10.92	Southbury

STAFF OF THE OBSERVATIONS (MARINE) BRANCH OF THE METEOROLOGICAL OFFICE

	Telephone	*Facsimile*
Headquarters: Meteorological Office, Observations (Marine), Scott Building, Eastern Road, Bracknell, Berks RG12 2PW. Telex: 849801 WEABKA G. (Switchboard):	0344 420242	*0344 854412*
Captain Gordon V. Mackie, Marine Superintendent and Branch Director, Observations (Marine).	0344 855654	*0344 855921*
Captain Robert C. Cameron, Deputy Marine Superintendent	0344 855913	
Captain John F.T. Houghton, Nautical Officer.	0344 855916	
Captain Michael L. McN. Coombs, Nautical Officer.	0344 855915	
Mrs Jan Freeman, Scientific Officer (Publications).	0344 855918	
Mr Geoffrey Allen, Scientific Officer (Technical).	0344 855914	
Port Meteorological Officers		
South-east England: Captain Clive R. Downes, PMO, Daneholes House, Hogg Lane, Grays, Essex RM17 5QH.	0375 378369	*0375 379320*
North-west England: Captain Albert Britain, PMO, Royal Liver Building, Liverpool L3 1HU. (Captain Britain is also Ocean Weather Ship Officer, with an office at the PMO's in Greenock.)	051-236 6565	*051-227 4762*
South-west England: Captain Douglas R. McWhan, PMO, 8, Viceroy House, Mountbatten Business Centre, Millbrook Road East, Southampton SO1 0HY.	0703 220632	*0703 337341*
Scotland and Northern Ireland: Captain Stuart M. Norwell, PMO, Navy Buildings, Eldon Street, Greenock, Strathclyde PA16 7SL.	0475 24700	*0475 892879*
Bristol Channel: Captain Archie F. Ashton, PMO, Cardiff Weather Centre, Southgate House, Wood Street, Cardiff CF1 1EW.	0222 221423	*0222 390435*
East England: Captain Edward J. O'Sullivan, PMO, c/o Department of Transport, Posterngate, Hull HU1 2JN.	0482 20158	*0482 28957*
North-east England: Captain John Steel, PMO, Room D418, Corporation House, 73–75 Albert Road, Middlesbrough, Cleveland TS1 2RZ.	0642 231622	*0642 242676*

COMMERCIAL SERVICES

Marine Enquiries: Meteorological Office, Marine Advisory Service, Johnson House, London Road, Bracknell, Berks RG12 2SY.	0344 854562	*0344 854906*
Mr Jack S. Hopkins, Head of Marine Advisory Service.	0344 856684	
Mr Robert D. Whyman, Marine Enquiries.	0344 854974	
Metroute:		
Captain James A. Williamson, Ship Routeing Officer.	0344 484905	*0344 854412*
Captain Austin P. Maytham, Ship Routeing and Sea Ice.	0344 854945	
Captain Donald J. Hewitt, Ship Routeing Officer.	0344 854904	
Mr Stephen J. Johnson, Ship Routeing Officer.	0344 854905	
Captain John R. Pinteau, Ship Routeing Officer.	0344 854904	

OFFSHORE ADVISERS

	Telephone	*Facsimile*
Offshore Observing Adviser: Mr Iain J. Hendry, Seaforth Centre, Lime Street, Aberdeen AB2 1BJ. Telex: AA 73446/7.	0224 210573	*0224 210575*
Offshore Network Advisor: Mr Stephen R. Haynes, Met. Office, Observation Provision, London Road, Bracknell, Berks RG12 2SZ. Telex 849801 WEABKA G.	0344 854433	*0344 856412*

PORT MET OFFICERS OVERSEAS

AUSTRALIA — Headquarters: Mr A.D. (Tony) Baxter, Bureau of Meteorology, Regional Office for Victoria, 26th Floor, 150 Lonsdale Street, Melbourne, Vic. 3001. Telex: AA 30664.	(03) 669 4000	
Fremantle: Captain Alan H. Pickles, Port Met. Agent, Stirling Marine, 17 Mews Road, Fremantle, WA 6160. Telex: 92821. (After Hours tel: (09) 335 66700.)	(09) 335 8444	*(09) 335 3286*
Melbourne: Mr Michael J. Hills, PMA, Pier 14, Victoria Dock, Melbourne, Vic. 3001. Telex: AA 151586.	(03) 629 1810	
Sydney: Mr E.E. (Taffy) Rowlands, PMA, NSW Regional Office, Bureau of Meteorology, 13th Floor, 162–166 Goulburn St, Darlinghurst, NSW 2010. Telex: AA 24956.	(02) 269 8555	
CANADA — Burlington: Mr Ronald Fordyce, National Water Research Institute, Port Met. Office, PO Box 5050, 867 Lakeshore Road, Burlington, Ontario L7R 4R6.	416-336-6420	*416-336-4797*
Halifax: Mr Randy Sheppard, AES, 1496 Bedford Highway, Bedford, Nova Scotia B4A 1E5. Telex: 01 21777.	902-426-6703	
Montreal: Mr Denis Blanchard, AES, 100 Alexis Nihon Boulevard, 3rd Fl., Ville St. Laurent, Quebec H4M 2N6. Telex: 05 827697.	514-283-6325	
St. John's: Mr D. Miller, PMO, AES, Bldg. 303, Pleasantville PO Box 9490, Postal Station 'B', St. John's, Newfoundland A1A 2Y4.	709-772-4798	
Toronto: Port Met. Officer, AES, 25 St. Clair Avenue East, Toronto, Ontario M4T 1M2. Telex: 06 23601.	416-973-5809	
Vancouver: Mr Bob McArter, PMO, AES, Suite 700-1200, W. 73rd Avenue, Vancouver, British Columbia V6P 6H9. Telex: 04 508556.	604-666-0360	
FALKLANDS: Captain R. Gorbutt, Marine Officer, Fishery Protection Office, Stanley, Falkland Is. Telex: 2426 FISHDIR FK.	27260	*27265*
FRANCE: — Le Havre: Mr Yanni Prigent, Station Météorologique, Nouveau Semaphore, Quai des Abeilles.	35.42.21.06	*35.41.31.19*
Marseilles (also Fos): Mr A. Rouzier, Station Météorologique de Marseille-Port, 12 rue Saint Cassien, 13002 Marseille.	91.91.46.51, poste 336	

	Telephone	*Facsimile*
GERMANY — Bremerhaven: Mr Henning Hesse, Wetterwarte, An der neuen Schleuse, Bremerhaven. Telex: 238850.	(0471) 72220	
Hamburg: Mr Jurgen Gühne, Seewetteramt, Bernhard Nocht-Strasse 76, Hamburg. Telex: 215515.	040-319 08826	*040-319 08803*
GIBRALTAR: Principal Met. Officer, Meteorological Office, RAF Gibraltar, BFPO 52.	53419	*53474*
GREECE — Piraeus: Mr George E. Kassimidis, PMO, Port Office, Piraeus. Telex: 215255.	(01) 962 1116 (01) 962 8950	*(01) 962 8952*
HONG KONG: Mr S.F. Ip, PMO, Royal Observatory, Nathan Road, Kowloon, Hong Kong. Telex 54777.	3-732 9200	*3-311 9448*
JAPAN — Tokyo: Mr M. Miyauchi, Japan Meteorological Agency, Otemachi, Chiyoda-ku, Tokyo 100.	(03)-212-8341	
Yokohama: Mr S. Sasanara, PMO, Yokohama Local Met. Observatory, 99 Yamate-cho, Naka-ku, Yokohama. Telex: 222 2163.	(045)-621-1991	
KENYA — Mombasa: Mr Ali J. Mafimbo, PMO, PO Box 98512, Mombasa.	(11) 25685 (11) 433440	
NETHERLANDS — Rotterdam: Mr Peter Schnitker, PMO, Aeronautical Meteorological Division of KNMI, Rotterdam Airport.	(010) 437 0766	*(010) 415 1191*
Amsterdam: Mr M. Stam, KNMI de bilt, postbus 201, 3730 AE de bilt.	(030) 206 678	
NEW ZEALAND — Wellington: (For N.Z. ports). Miss Julie Fletcher, Marine Met. Officer, N.Z. Met. Service, Tahi Road, POB 1515, Paraparaumu Beach 6153. Telex: NZ 30636.	(644) 297 3237	*(644) 297 3568*
SAUDI ARABIA — Jeddah: Mr Moh'd Murwani, PMO, National Meteorological Environment Centre, Jeddah. Telex: 601236.	(02) 683-4444 ext.325	
SINGAPORE: Mr Edmund Lee, Port. Met. Supervisor, Meteorological Service, PO Box 8, Singapore Changi Airport. Telex: METSIN RS 50345.	5457198	
SOUTH AFRICA — Cape Town: Mr C. Sydney Marais, PMO, Roggebaai, Cape Town 8012. Telex: 527101.	(021) 934 0450/1/8/9 ext. 213	
Durban: Mr Peter Rae, PMO, Meteorological Office, Louis Botha Airport, Durban 4029. Telex: 624132.	(031) 424 224/5	
U.S.A. — Headquarters: Mr Vincent Zegowitz, Marine Obs. Program Leader, National Weather Service, NOAA, 1325 East West Highway, Silver Spring, MD 20910.	301-713-1724	*301-713-0959*
Alameda, (for San Francisco): Mr Robert Novak, PMO, NWS, NOAA, Coast Guard Island, PO Box 5027, Alameda, CA 94501. Telex: 7402795.	510-273-6257	

	Telephone	*Facsimile*
Anchorage: Marine Program Manager, Alaska Region, NWS, 222 West 7th Avenue #23, Anchorage, AK 99513-7575.	907-271-5121	
Baltimore: Mr James Saunders, PMO, NWS, NOAA, Weather Service Office, BWI Airport, Baltimore, MD 21240.	301-850-0529	
Chicago: See Romeoville.		
Cleveland: Mr George Smith, PMO, NWS, NOAA, Hopkins International Airport, Federal Facilities Building, Cleveland, OH 44135.	216-267-0069	
Honolulu: PMO, Pacific Region, NWS, NOAA, Prince Kuhio Fed. Bldg., Room 411, PO Box 50027, Honolulu, HI 96850.	808-541-1670	
Jacksonville: Mr Lawrence Cain, PMO, NWS, NOAA, Jacksonville International Airport, Box 18367, Jacksonville, Florida 32229.	904-741-4370/4276	
Kodiak: Mr Lee Kelley, MIC, NWS, NOAA, Box 37, USCG Base, Kodiak, AK 99619.	907-487-2102/4338	
Long Beach/Los Angeles: Mr Robert Webster, PMO, NWS, NOAA, 501 West Ocean Boulevard, Room 4480, Long Beach, CA 90802-4213. Telex: 7402731.	310-980-4090	*310-980-4089*
Miami: Mr Steve Fatjo, PMO, NWS, NOAA, 1600 Port Boulevard, Miami, FL 33132.	305-358-6027	
Newark: Mr Martin Bonk, PMO, NWS, NOAA, Building 51, Newark International Airport, Newark, NJ 07114.	201-624-8118	
New Orleans: Mr John Warrelmann, PMO, NWS, NOAA, International Airport, Moisant Field, Box 20026, New Orleans, LA 70141.	504-589-4839	
New York: Mr Dee Letterman, PMO, NWS, NOAA, 30 Rockefeller Plaza, New York, NY 10112.	212-399-5569	
Norfolk: Mr Earle Ray Brown, Jr., PMO, NWS, NOAA, Norfolk International Airport, Norfolk VA 23518.	804-441-6326	
Romeoville (for Chicago): Mr Bob Collins, PMO, NWS, NOAA, 333 West University Drive, Romeoville, IL 60441.	815-834-0600	
San Francisco: See Alameda.		
Seattle: Mr David Bakeman, PMO, NWS, NOAA, 7600 Sand Point Way N.E., BIN C15700, Seattle, WA 98115.	206-526-6100	
Texas: Mr James Nelson, PMO, NWS, NOAA, Houston Area Weather Office, 1620 Gill Road, Dickinson TX 77539-3409.	713-534-2640	
Valdez: Mr Lynn Chrystal, OIC, NWS, NOAA, Box 427, Valdez, AK 99686.	907-835-4505	

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.

AUSTRALIA (Information dated 6.5.92)

NAMES OF VESSELS

Selected Ships:
Abel Tasman
Al Khaleej
Al Kuwait
Al Qurain
Al Rayyan 1
Al Yasrah
Anro Australia
Arafura
Ariake
Arwa
Aurora Australis
Australia Star
Australian Achiever
Australian Advance
Australian Endeavour
Australian Spirit
Australian Trader
Australian Venture
Bass Trader
Brahman Express
Buffalo Express
C.Y. O'Connor
Canopus
Cape Moreton
Coral Chief
Danny F
El Cordero
Energy Searcher
Fairstar
Fernanda F
Frank Konecny

Selected Ships (*contd*)
Franklin
Fua Kavenga
Gordon Reid
Hanne Bakke II
Highland Chief
Icebird
Iron Baron
Iron Flinders
Iron Gippsland
Iron Kembla
Iron Newcastle
Iron Pacific
Iron Prince
Iron Shortland
Iron Sturt
Iron Whyalla
Island Gas
Island Seaway
Jabiru Venture
Joana Bonita
Karina Bonita
Kelvin
Klang Reefer
Kowulka
Lindesay Clark
Maria Bonita
Mawashi Al-Gasseem
Mawashi Tabuk
Meonia
Mobil Astral
Mobil Flinders

Selected Ships (*contd*)
Nivosa
Northwest Shearwater
Northwest Sanderling
Northwest Snipe
Ormiston
Papuan Chief
Pathfinder II
Portland
Rig Seismic
River Boyne
River Embley
River Torrens
Roberta Jull
Sedco B.P. 471
Southern Surveyor
Swan Reefer
TNT Altrans
TNT Capricornia
TNT Carpentaria
Tranztas Trader
Trisha Kate
Uniceb
Wyuna
Young Endeavour
Zincmaster

Supplementary Ships:
Iron Carpentaria
Iron Curtis
Iron Monarch
Iron Spencer

Auxiliary Ships:
Australia has 4 Auxiliary Ships currently reporting.

HONG KONG (Information dated 31.3.92)

NAMES OF VESSELS

Selected Ships:
Al Mariyah
Anna
Bunga Kantan
Bunga Suria
Delmas Bougainville
Delmas Joinville

Selected Ships (*contd*)
Delmas Tourville
Eriskay
Fair Bridge
Fishguard Bay
Gallantry
Golfo De Chiriqui

Selected Ships (*contd*)
Gonosan
Halldor
Hawk Arrow
Jutlandia
Kamaleverett
Karabieverett

Hong Kong *(contd)*

Names of Vessels		
Selected Ships (*contd*)	Selected Ships (*contd*)	Selected Ships (*contd*)
Kwangtung	*OOCL Charger*	*Selandia*
Maersk Asia Tertio	*OOCL Educator*	*Shensi*
Maersk Credo	*OOCL Executive*	*Siam Star*
Maersk Semakau	*OOCL Explorer*	*Talabot*
Mah IV	*OOCL Exporter*	*Tampa*
Marienvoy	*OOCL Fair*	*Trade Dawn*
Maritime Alliance	*OOCL Faith*	*United Sing*
Maritime Champion	*OOCL Fidelity*	
Maritime Express	*OOCL Fortune*	
Maritime Goliath	*OOCL Freedom*	Supplementary Ships:
Maritime Grace	*OOCL Friendship*	*Andes Challenger*
Maritime Joy	*OOCL Honour*	*Asian Challenger*
Maritime Loyalty	*OOCL Hope*	*Cairo*
Maritime Noble	*Ocean Centaurus*	*Eastern Sea*
Maritime Pride	*Ocean Competence*	*Maritime Faith*
Maritime Success	*Ocean Elite*	*Maritime Triumph*
Navios Bulker	*Ocean Pearl*	*Maritime Victory*
New Oasis	*Ocean Sincerity*	*OOCL Charisma*
OOCL Advance	*Ocean Sirius*	*OOCL Fame*
OOCL Alliance	*Ocean Strength*	*Oriental Knight*
OOCL Ambition	*Osprey Arrow*	*Seamaster I*
OOCL Applause	*Red Sea Pioneer*	*Shaplaeverett*
OOCL Award	*Sea Architect*	*Success Bulker*

Auxiliary Ships:
Hong Kong also has 1 Auxiliary Ship currently reporting.

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