

Met. O. 957

The Marine Observer

*A quarterly journal of Maritime
Meteorology*



Volume LIII No. 279
January 1983

£2.20 net

THE MARINE OBSERVER

A Quarterly Journal of Maritime Meteorology
prepared by the Marine Division of the
Meteorological Office

Vol. LIII

1983

THE MARINE OBSERVER

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

VOL. LIII

No. 279

JANUARY 1983

CONTENTS

	<i>Page</i>
Editorial	4
The Marine Observers' Log—January, February, March	6
Marine Radio Communications—from pioneers to satellites, the 80-year miracle. BY ROBERT THOMAS	29
Observations of Dall's porpoise in the North Pacific Ocean. BY CAPTAIN G. A. LANCASTER, MRIN, MNI	34
Special Long-service Awards	38
Aurora Notes, January to March 1982. BY R. J. LIVESEY	39
Ice Conditions in Areas adjacent to the North Atlantic Ocean from June to August 1982	43
Valediction	47
Personalities	47
Notices to Marine Observers	48
Fleet Lists	49

Letters to the Editor, and books for review, should be sent to the Editor 'The Marine Observer', Meteorological Office, Eastern Road, Bracknell, Berkshire RG12 2UR

Published for the Meteorological Office by
HER MAJESTY'S STATIONERY OFFICE

© Crown copyright 1983

To be purchased direct from HMSO at any of the following addresses: 49 High Holborn, LONDON WC1V 6HB; 13a Castle Street, EDINBURGH EH2 3AR; Brazennose Street, MANCHESTER M60 8AS; Southey House, Wine Street, BRISTOL BS1 2BQ; 258 Broad Street, BIRMINGHAM B1 2HE; 80 Chichester Street, BELFAST BT1 4JY, or from booksellers.

PRICE £2.20 NET or £9.62 per annum (including postage)

Editorial

Without doubt 1982 will be remembered as the year of the Falkland Islands conflict or the year of crisis in the Middle East. Such a mundane event as the introduction of a new Common Surface Meteorological Code will no doubt soon be forgotten. Nevertheless it is important that we do look back and carry out an appraisal of that which was new 12 months ago. In the Editorial of the January 1982 edition of this journal I wrote that we had some qualms over how the new Code would be handled by voluntary marine observers as it was impracticable to have a practice day such as was enjoyed by land station observers and the meteorological staff on the Ocean Weather Ships. However, such qualms proved to be absolutely groundless. Of course, there were one or two ships—who shall remain nameless—who forgot to change over. Many more could not change because the necessary publications and stationery had not reached them. But the overwhelming majority of observations received here in Bracknell from voluntary observing ships either direct by radio or through the Global Telecommunications System were of a very high standard right from 0001 on 1 January and have remained so throughout the year. Our very sincere congratulations go to all observers for their efforts and, also, our grateful thanks to the Marine Superintendents and the personnel of many shipping companies for their very kind assistance in the distribution of the new Code publications and stationery.

Nevertheless, a few persistent errors have now been identified and we beg the indulgence of our readers if these are examined and explained.

The first, and probably the most important, is due to an omission on our part. Strictly speaking the Common Surface Code for all types of observing ship should commence

‘D D YYGGi_w 99L_aL_aL_a’

where the group ‘D D’ is the Call Sign of the observing ship. As the Call Sign of the ship from which the radio message originates usually appears in the message preamble, we originally thought this to be unimportant and, in any case, it would be ridiculous to devote a column in the Ship’s Meteorological Logbook to the repetitious recording of this group. However, many weather messages are passed to us by telex from the Coast Radio Station and the Call Sign is sometimes lost. Also, progress is now being made in the automation of data exchange between meteorological centres and this requires the Call Sign to be included in the text. Therefore, we must now ask all voluntary observers, regardless of whether they observe on board Selected, Supplementary or Auxiliary reporting ships, to enter their ship’s Call Sign as the first group in the text of the radio weather message when the observation is copied on to Metform 139, the message form which is passed to the Radio Officer. As a Call Sign may consist of from 4 to 6 characters, this group should always stand on its own. It should never be combined with another group to form a 10-figure group.

In the writer’s opinion, one of the worst aspects of the new Code is that the code figure for the height of cloud is divorced from the actual cloud group. We have always appreciated that estimating cloud height is extremely difficult and have never expected this quantity to be very accurate. However, since the introduction of the new Code and the isolation of the height code figure from the cloud identification group the incidence of evident errors has become much greater. For instance, on many occasions observers have reported the height of medium or even high cloud as code figures 3, 4 or 5 i.e. 600 to 3000 feet. In Chapter 5 of the ‘Marine Observer’s Handbook’ on pages 46 and 52 there is a

guide to the appropriate limits between which certain types of cloud can be found but, of course, it is not always convenient to refer to the Handbook when making an observation. However, a new edition of 'Cloud Types for Observers' is now being issued and in this a special effort has been made to give as much advice as possible on the probable heights of the observed cloud. As a final check, when the cloud group is completed it is advisable to refer back to the height code figure and ensure that it is compatible with the type of cloud observed.

Most observing ships are now omitting the Weather Group from the radio message when the observed present and past weather have been insignificant as defined in note 6 on page 3 of the 'Ship's Code and Decode Book'. When we were preparing this publication for the new Code we thought we should not make this omission mandatory. However, the ever increasing cost of transmitting observations by radio impels us to enjoin all observers to omit this group when possible not forgetting, of course, to enter the correct indicator in the meteorological logbook. One final point on this, regardless of whether the group is transmitted or not, is that it should always be recorded in the meteorological logbook for climatological purposes.

A number of queries have been received from voluntary marine observers concerning the recording and transmission of the Wave Groups. The 'Ship's Code Card' states that if there is a swell with no wind waves the Wave Group commencing with Indicator 2 should be omitted. Perhaps we should have added 'from the radio message' after the word 'omitted'. The 'Ship's Code and Decode Book' states, in footnote (3) on page 6, 'if there is a swell with no sea waves the sea wave group should be reported as 20000' and perhaps here we should have added 'in the logbook but the group omitted from the radio message'. In summary:

- (a) If there is no sea or swell, report the Wave Group with Indicator 2 as 20000 in both logbook and radio message.
- (b) If there is no sea but a swell or swells, report the Wave Group with Indicator 2 as 20000 in the logbook but omit this group from the radio message. Record and report the swell or swells as appropriate in both logbook and message.
- (c) If there is a sea but no swell, record and report the Wave Group with Indicator 2 in both logbook and radio message, omitting all other Wave Groups.
- (d) If no wave data are available, omit the Wave Groups in both logbook and message.

One final matter; in Part II of the Marine Observer's Guide on page II-2 we state 'ships using precision aneroid barometers should enter (in the logbook) the algebraic sum of the mean sea level correction and the calibration correction'. These days many voluntary observing ships do not return to the UK for very long periods and frequently they have their precision aneroid barometer checked at a port abroad. In this event may we respectfully draw your attention to note 7 under the heading 'Reading the Precision Aneroid'—also on page II-2 of the Guide—which states 'if a barometer check is made abroad and an error different to that shown on the calibration card is found, a note should be made in the remarks column of the logbook but the new error, which may be only temporary, should not be applied to the barometer reading'.

The original Ship's Meteorological Logbook, issued in 1854, required voluntary marine observers to enter date and time, position, currents and sea surface temperature, magnetic variation, wind direction and force, pressure, dry and wet bulb thermometer readings, cloud type and amount, weather and additional remarks. There has been little basic change in the 129 years since then either in what was observed or, indeed, in the standard of the observations carried out

by voluntary marine observers. We hope that this keenness and interest will be sustained for many years to come and that 1983 will be a happy and prosperous year for all our readers both ashore and afloat.

C.R.D.



January, February, March

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

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

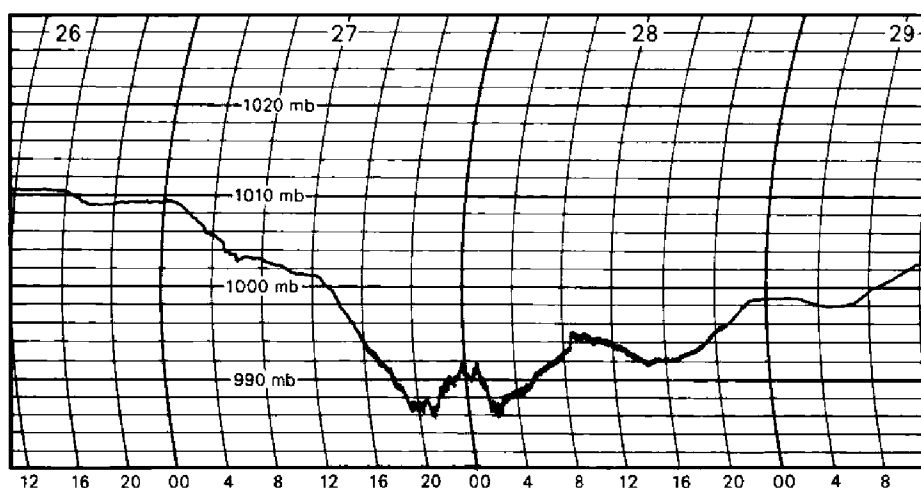
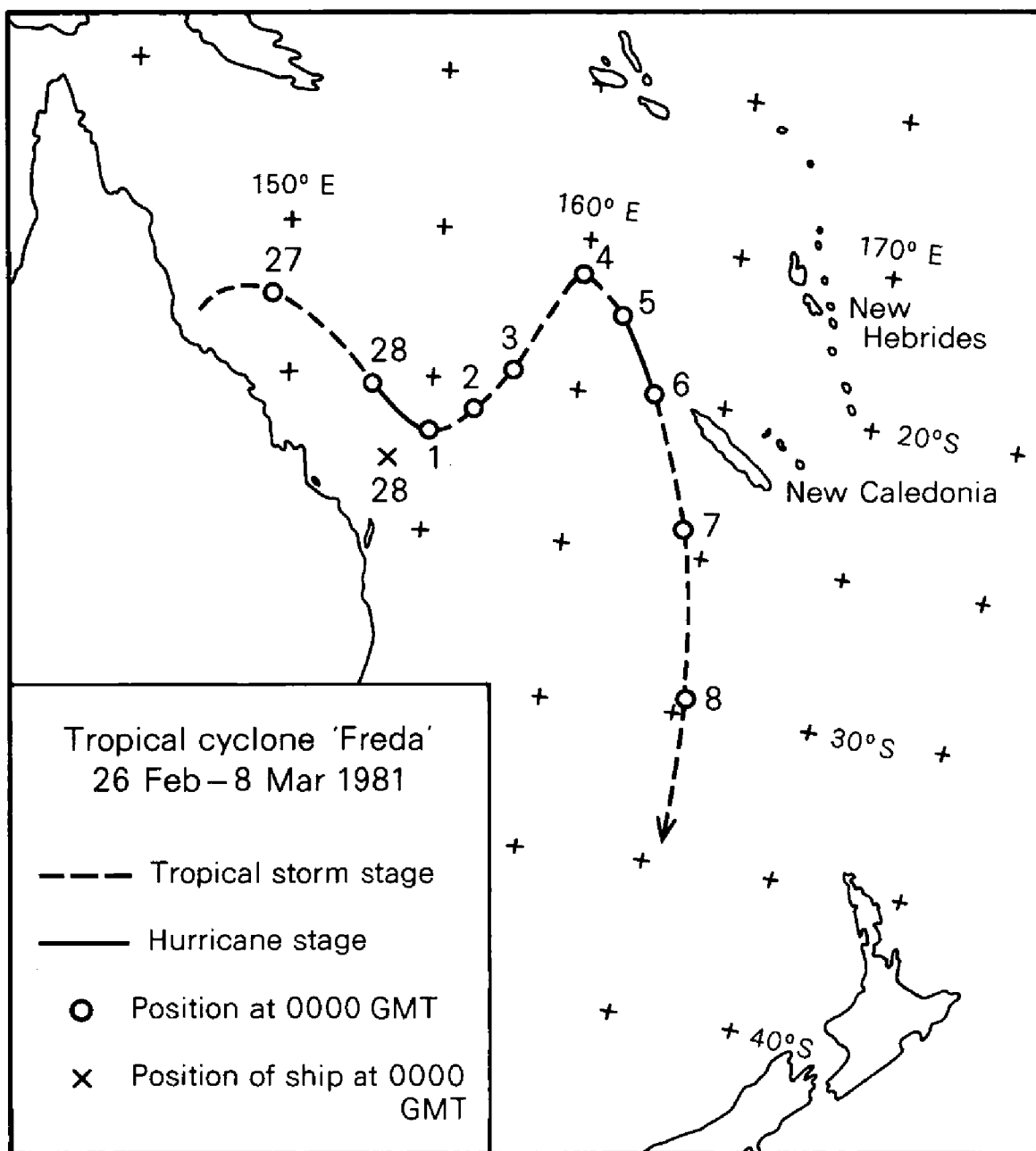
TROPICAL CYCLONE 'FREDA'

Coral Sea

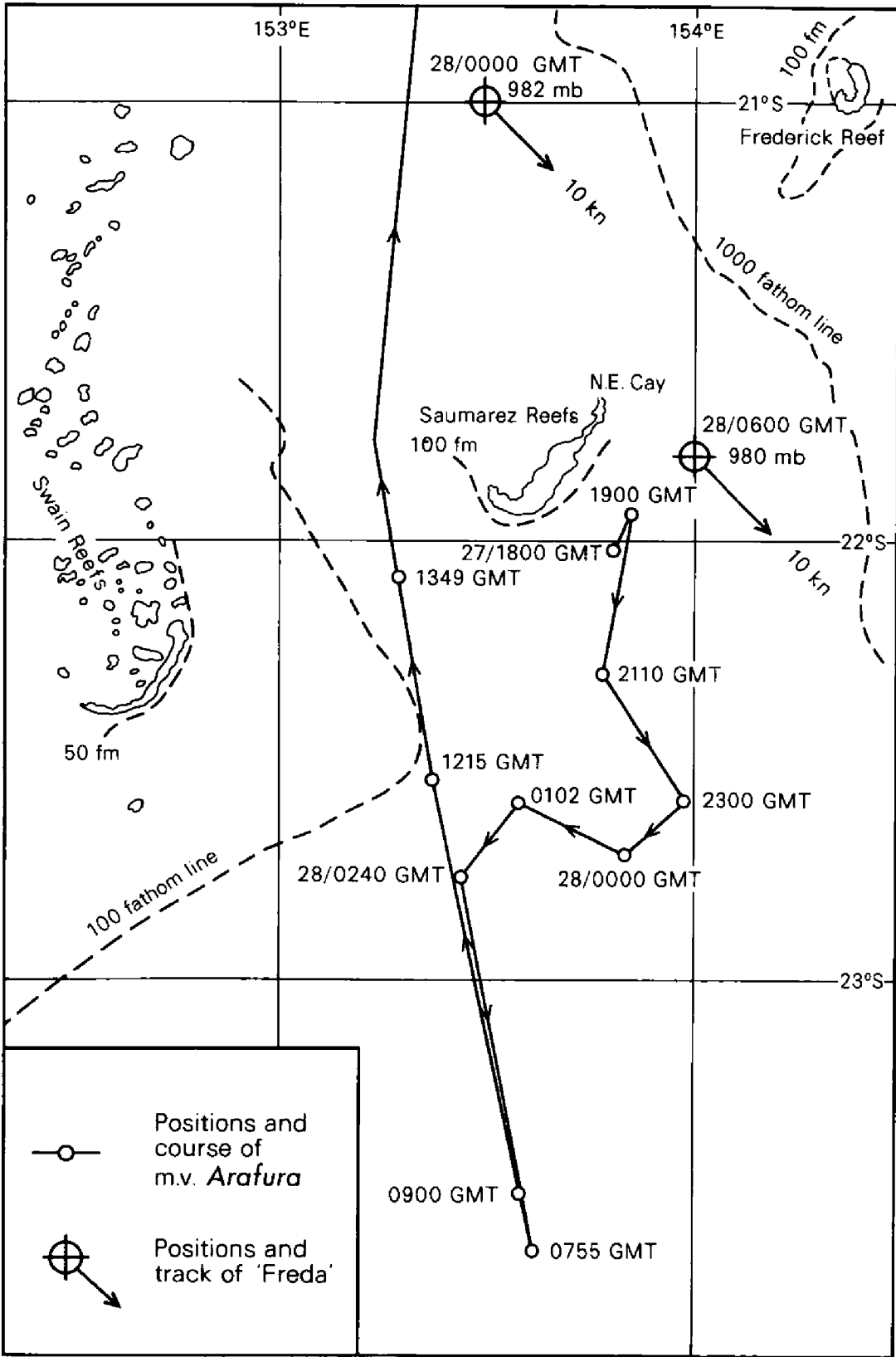
m.v. *Arafura*. Captain R. M. Coates. Brisbane to Yakkatchi (Japan). Observers, the Master, Mr P. D. Sheppard, Chief Officer, Mr L. M. White, 2nd Officer and Mr P. A. Willing, 3rd Officer.

26–28 February 1981. At 1800 GMT on 26 February, tropical cyclone Freda was located at 16° 36' S, 148° 18' E. It had a central pressure of 987 mb and was moving SE at 13 knots. At 0200 GMT on the 27th the vessel's speed was increased from 16 to 18 knots so that the ship could pass well to the east of the cyclone. However, by 0900 GMT it had been reported that Freda was moving in an ESE'ly direction which made it impossible to get clear to the east of the cyclone.

At 0923 GMT the ship's speed was reduced to 12 knots. Extracts from the ship's logbook show: speed 12 knots, course 007°(T), wind E'ly, force 6, barometric pressure 1002.3 mb, rough sea with moderate swell, and sky overcast with occasional showers. By 1800 GMT (see sketch) the wind was ESE, force 8,



the barometric pressure 991.4 mb, and there were high seas and a heavy swell, the sky being overcast with heavy rain. At 1900 GMT, course was altered to 180°(T) and speed increased to 14 knots. From this time on, the vessel was kept on a southerly course away from the cyclone; however, course and speed were altered as necessary to maintain steerage and prevent any heavy-weather damage to the ship.



Logbook extracts are as follows:

27 Feb. 1981, 2200 GMT: wind ESE, force 9, barometric pressure 991.4 mb, very rough seas and heavy swell; vessel rolling heavily (up to 35°) and shipping water overall, continuous heavy rain. 28 Feb. 1981, 0300 GMT: highest wind speeds recorded at this time, wind SE's, force 11, barometric pressure 989.7 mb, very high seas, very heavy swell, vessel pitching heavily and shipping water forward, overcast, occasional rain showers. By 0800 GMT the wind had decreased to SSE, force 9, the barometric pressure was 996.3 mb and there were very rough seas and a very heavy swell. At this time course was set to pass to the west of Saumarez Reef and speed increased to 18 knots. By 1500 GMT the wind had dropped to S'W, force 7-8, the barometric pressure was 993.6 mb, and there were rough seas and a heavy swell. At this time speed was reduced to 16 knots and the vessel proceeded on its voyage.

Position of ship at 0500 GMT on 27 February: 21° 57'S, 153° 51'E.

Position of ship at 0000 GMT on 28 February: 22° 43'S, 153° 50'E.

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

Note 2. The tropical cyclone Freda came to life over the Great Barrier Reef on 26 February. It intensified as it moved SE and reached hurricane strength on the 28th. It then turned, weakened to tropical storm, and over the next 3 days moved NE. On 4 March it turned S and re-intensified, on the 5th, to hurricane. After this it continued moving S, as a tropical storm, until the 8th, before finally dissipating over the Tasman Sea. The several stages and tracks involved are shown in the sketch opposite.

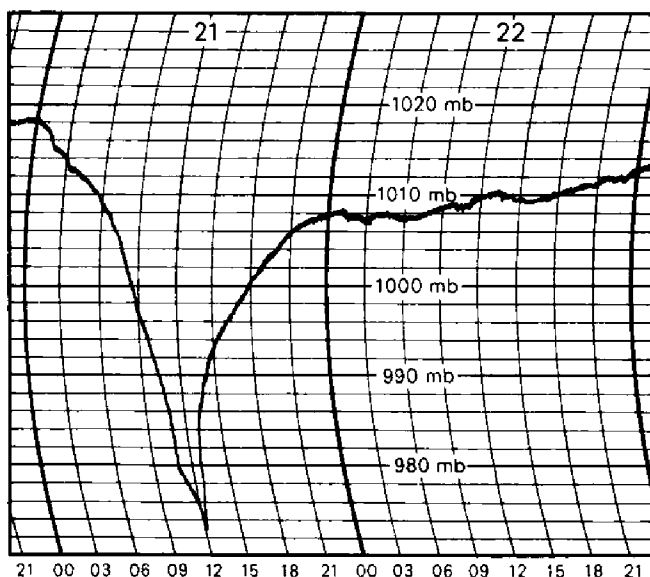
Note 3. This observation was omitted from the January 1982 edition of *The Marine Observer*.

HEAVY WEATHER

North Atlantic Ocean

m.v. *Dart Americana*. Captain J. Waling. Le Havre to New York. Observer, Mr N. S. Miller, 3rd Officer.

21 January 1982. Owing to bad weather encountered at the beginning of the voyage the vessel had been forced to make a southerly course until the 40th parallel had been reached and then a westerly heading towards Norfolk. At 1212 GMT the vessel's position by satellite navigator was 40° 06'N, 48° 41'W. The wind had been a steady SE, force 7, with a confused and unsettled swell. The barometric pressure had been falling since midnight, when a corrected reading



of 1021.1 mb was recorded, and it now stood at 999.6 mb and was still falling. The sky, which had started the day clear and light, now had cirrus and cumulus clouds coming from the west. By 1200 GMT the sky had a dark appearance with an 8/8 coverage of cumulonimbus without anvil of great vertical depth and horizontal extent. The wind was now ssw and veering and the visibility was deteriorating rapidly. At 1247 GMT the vessel's speed was reduced in view of the worsening conditions. The wind was now WNW at 55 kn and the air temperature 13 °C. By 1300 GMT the vessel was on manœuvring revolutions and on engine room control. The wind was now WNW and estimated to be in excess of 100 knots. The sea was completely white and visibility was severely restricted. The pressure had stopped falling at 1230 with a reading of 975.2 mb and was now rising rapidly. The ship was hove-to, with the log showing her to be driven astern at about 1 knot. These high winds continued for about 20 minutes until they slowly dropped to 70–80 knots. By 1500 GMT the barometer showed that the centre of the storm was now well past but the wind was still WNW and in excess of 60 knots and the air temperature was 10 °C. The vessel remained hove-to until 0200 GMT on the 22nd, when the swell and wind dropped sufficiently to allow the voyage to be resumed; the wind was then WNW, force 8 and the air temperature 7 °C.

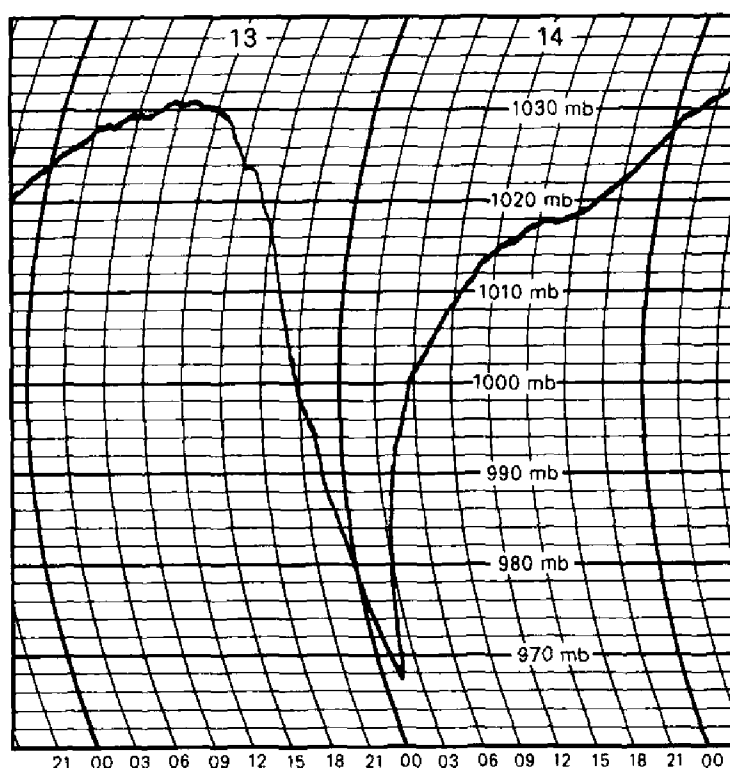
Position of ship at 1200 GMT: 40° 06' N, 48° 30' W.

SEVERE DEPRESSION

North Atlantic Ocean

m.v. *Anco Sovereign*. Captain H. Watson. Rotterdam to New York. Observers, the Master and ship's company.

13–14 February 1982. At 1200 GMT on the 13th the ship was in position 40° 49' N, 58° 59' W, steaming on a course of 268°(T) at a speed of 14.5 knots. The barometric pressure was 1028.9 mb; in the following 13½ hours it fell by 61.9 mb to 967.0 mb. At 2330 GMT the wind suddenly veered from 090° to 150° and increased to 22 knots.



At 0100 GMT on the 14th the wind was 190°, 52 knots and the pressure 975.1 mb. At 0200 the wind was 190°, 60 knots and the pressure 968.8 mb; it was at this stage of the depression that the vessel was hove-to.

At 0300 GMT the wind veered to 270°, 70+ knots. The pressure was then 978.6 mb, rising rapidly. At 0400 GMT the wind was 310°, 52 knots, the pressure 989.0 mb and the air temperature 5.4 °C.

At 0500 the wind was 310°, 48 knots and the pressure was 995.1 mb, rising rapidly. There was a heavy, confused swell and whilst the wind waves slowly decreased in size, the swell waves from the NW gradually increased after 0400 GMT.

Conditions between 0100 and 0400 GMT were severe, visibility being nil owing to spray flying off the sea. The constant loud roaring of the wind and the pressure fluctuations caused by gusting and buffeting were painful to the ears.

Position of ship at 0000 GMT on 14 February: 40° 42' N, 62° 42' W.

Note. This storm later caused the loss of the *Ocean Ranger* Oil Rig and a Russian container ship off the Newfoundland coast.

SEVERE DEPRESSION

South Pacific Ocean

m.v. *Mairangi Bay*. Captain R. J. Bland. Wellington (N.Z.) to Zeebrugge. Observers, the Master, Mr K. J. Adams, 3rd Officer, Sir Frederick Harmer, and other members of the ship's company.

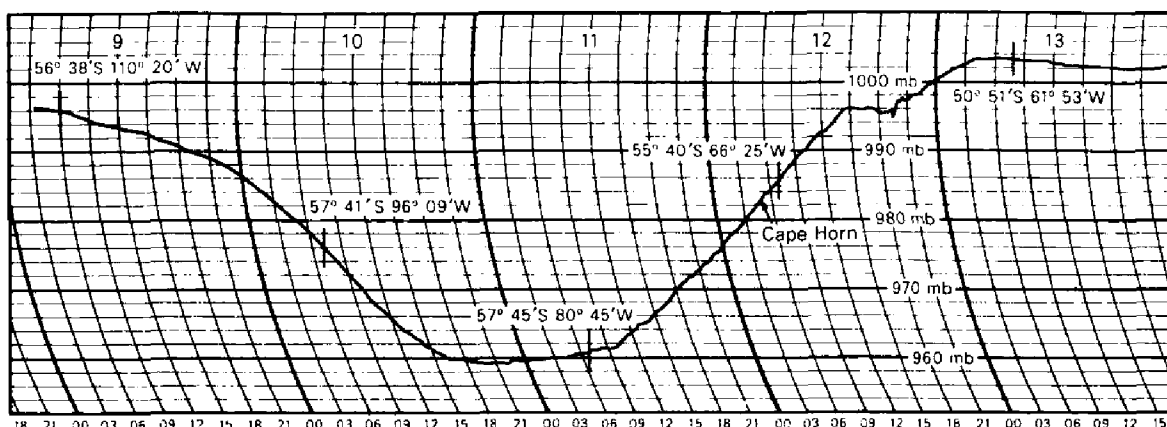
7–12 March 1982. *The Marine Observer* for January 1982 (No. 275) published an account of a severe depression which was encountered in the South Pacific Ocean by m.v. *Resolution Bay* (sister ship of the *Mairangi Bay*). The following account of another such depression in the same region of the ocean and at the same season—just 12 months later—may be of interest.

The *Mairangi Bay* sailed from Wellington on 3 March. For a few days she was within the influence of a large High moving sw from New Zealand. During the night of 6/7 March the barometric pressure began to fall and it continued to do so for about three days. The barograph trace is reproduced here, but bearing in mind that the vessel was moving, as no doubt was the weather system in question, the following table may be helpful.

Date	Time	Baro. Pressure	Position		Weather Extracts
March	GMT	mb	Lat. (s)	Long. (w)	(Logbook)
7	0800	1014.2	56° 00'	146° 00'	Various
7	2000	1005.7	56° 36'	138° 40'	w'ly force 4
8	1900	998.7	56° 36'	124° 20'	wsW, force 6, rough seas and mod. swell
9	1800	990.6	56° 38'	110° 30'	wsW, force 8, rolling heavily at times in rough seas and swell
10	1700	960.2	57° 41'	96° 10'	NNW, force 7, rolling heavily as on 9th
11	1700	969.9	57° 45'	80° 45'	NW'ly, force 8, rolling heavily as on 9th
12	1700	996.8	55° 40'	66° 00'	NW'ly, force 3, slight seas and swell

Vessel rounded Cape Horn and turned N'ly about 1600 GMT.

The barograph traces of the two depressions are quite similar, though the *Mairangi Bay*, coming out of a High, had a greater fall—45 mb compared with 30 mb—over a correspondingly longer period. Both traces bottom out abruptly at about 960 mb and run horizontally for about 15 hours before turning abruptly upwards (*N.B.* after the *Mairangi Bay* has rounded Cape Horn comparisons cease to be valid).



Here the similarities end. Whereas the *Resolution Bay* in the easterly sector of her depression met E'ly winds up to force 10, 'very rough dangerous seas' and 'dangerous, steep, fast-moving swell', the *Mairangi Bay* in the westerly sector of hers experienced little if anything more than may be expected in these waters—winds up to force 7–8, 'rough seas' and 'heavy swell'.

Position of ship on 7 March: 56° 00' S, 146° 00' W.

Position of ship on 12 March: 55° 40' S, 66° 00' W.

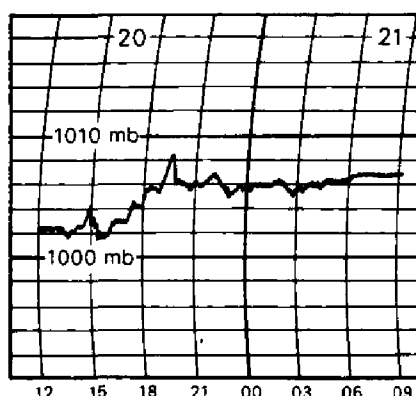
ELECTRICAL STORM WITH ST ELMO'S FIRE

South African coastal waters

m.v. *Aurora*. Captain W. E. N. Dwelly. Le Havre to Richards Bay. Observer, Mr C. Stuchbury, 3rd Officer.

20 January 1982, 1800 GMT. While proceeding up the east coast of South Africa the vessel encountered a severe electrical storm. Many interesting lightning patterns were observed. 'Chained' lightning was prevalent as was 'rocket' lightning, with the flashes lasting for up to five seconds. The storm was moving in a southerly direction, but at the time there was no discernible direction of the wind, the strength being no more than force 4.

The barograph showed sudden changes of pressure of up to 3 mb over a period of 30 minutes. During the height of the storm St Elmo's Fire was visible on the aerials and a loud 'buzzing' sound could also be heard. Towards 1930 GMT the lightning died down, with only an occasional flash visible on the horizon as well as flashes between clouds. Precipitation during the storm was mainly light drizzle, although heavy rain was visible to the naked eye and on the radar. Despite this, no heavy rain fell on the ship except for the odd drop.



Weather conditions at 1800 GMT: dry bulb 25.7 °C, wet bulb 24.1, barometric pressure 1006.3 mb, wind SE'ly, force 4.

Position of ship: 31° 42' S, 29° 36' E.

ST ELMO'S FIRE

North Pacific Ocean

m.v. *Aeneas*. Captain A. A. Railton. Portland (Oregon) to Kobe (Japan). Observer, Cadet D. M. Jeffrey.

18 January 1982, 0800–1200 GMT. Whilst off the coast of Japan (about 60 n. mile west of Kii Suido) several thunderstorms were encountered accompanied by some very heavy showers. During one of the thunderstorms a form of St Elmo's Fire was observed on the radio aerial (a single-wire aerial). The St Elmo's Fire consisted of white spots of light 'running up and down' the aerial and lasted for approximately 5 minutes.

Weather conditions: dry bulb 10.9 °C, wet bulb 9.4, sea temperature 16.2, barometric pressure 1004.5 mb, wind w's, force 6.

Position of ship: 33° 40' N, 137° 00' E.

ICE ACCRETION

North Pacific Ocean

m.v. *Aeneas*. Captain A. A. Railton. Portland (Oregon) to Kobe (Japan). Observers, Mr D. K. MacLeod, 2nd Officer, Mr W. J. K. Mulcahy, 3rd Officer and Cadet D. M. Jeffrey.

15–16 January 1982. During these two days ice was observed to be accumulating on the fore part of the vessel on several occasions (mostly after sunset). This was caused by sea water and spray breaking over the vessel and the air temperature being sub-zero. The ice eventually reached a thickness of approximately 10 cm and covered most of the forward superstructure. During the two days of ice accretion, the wind was sw'ly to w'ly in direction, the air temperature varied between –1 °C and –4 °C and the sea temperature varied between 1 °C and 4 °C.

Position of ship on 15 January: 45° 00' N, 152° 00' E.

Position of ship on 16 January: 39° 00' N, 145° 00' E.

SUBMARINE EARTHQUAKE

South Pacific Ocean

R.V. *Tangaroa*. Captain B. J. Wardle. At Esperance Rock, Kermadec Islands. Observers, the Master, Mr J. C. Parsloe, Chief Officer, Mr R. L. McKenzie, 2nd Officer and ship's company.

28 March 1982. At 0354 GMT when the vessel was 7 cables to the north-east of Esperance Rock, 6 to 10 vibrations or lurches were felt by many people on board. The vessel was severely shaken by the vibrations which had a period of about 1 second and a vertical amplitude of about 5 cm. The vessel was in 245 m depth of water and the engines were functioning normally at slow ahead (6 knots). It was assumed that this was caused by an earthquake close to the vessel. Information was received later than an earthquake of magnitude 6.5 on the Richter Scale had been recorded by the seismological observatory in Wellington, N.Z. at 0354 GMT, the earthquake's centre being approximately 1220 kilometres to the north of Wellington.

Position of ship: 31° 21' S, 178° 49' W.

Note 1. The R.V. *Tangaroa* is a New Zealand Selected Ship and government research vessel.

Note 2. The report summarized above was forwarded to the Institute of Geological Sciences, Edinburgh. The following comments have been received from Mr Graham Neilson:

'Thank you for the report concerning a submarine earthquake which was felt on board the R.V. *Tangaroa*. The quake which shook the vessel on 28 March 1982 originated in $31^{\circ} 20.8'S$, $178^{\circ} 41.4'W$, close to the reported position of the vessel in $31^{\circ} 20.8'S$, $178^{\circ} 49.2'W$. The seat of the disturbance lay 80 kilometres beneath the sea floor and the time of origin was 03h 52m 34.7s UT. The Richter Scale magnitude of the shock was 6.1, which just puts it into the category of 'large' earthquakes and the shock waves radiating through the earth were detected by 172 seismological observatories world wide. The Kermadec Islands are prone to earthquakes, the reason for this being that the Pacific Plate is being subducted beneath the Fiji Plate along the boundary marked by the island chain and its associated trench.

'As the Pacific Plate bends downwards, along the line of the Kermadec-Tonga Trench, fractures start to appear which generate 'shallow' earthquakes (at depths of 30 kilometres or less). As the downgoing crust is forced deeper, additional forces arise which cause further deformation and fracturing and this gives rise to deep-focus earthquakes (depths up to a value of about 700 kilometres). If a section is taken through the earth at right angles to the arc, the positions of the earthquakes define a narrow zone starting under the trench and dipping down at an angle of about 45° to depths of 600 kilometres or more.

'Reports of submarine quakes being felt on ships are most valuable as they allow, for example, the checking of the accuracy of epicentre locations and all the reports which you have sent me over the years have provided valuable details concerning individual events. While I am most grateful for the trouble which you, the ships' masters, officers and crews have taken over these reports might I make a plea for more detail concerning the effects of earthquake shaking on particular pieces of equipment, loose objects, compasses and so forth? Additional information relating to the effects of shaking on objects such as those mentioned would be specially valuable as it will allow a more exact quantification of the shock than has hitherto been possible.'

CETACEA

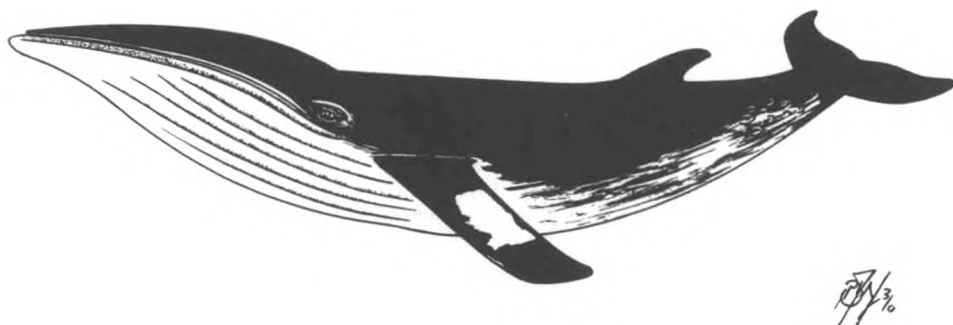
North Atlantic Ocean

m.v. *King Alfred*. Captain A. R. MacIntyre. Lisbon to New Orleans. Observers, Mr P. J. Hooper, 2nd Officer, Mr B. T. Marks, 3rd Officer, Mrs A. J. Barton and other members of the ship's company.

3-8 January 1982. On 3 January about 15 dolphins, $2\frac{1}{2}$ -3 metres long, light grey in colour with cream undersides and light brown mottling at the indistinct demarcation between the grey and cream, were sighted. Whilst moving in a generally E'ly direction, the dolphins darted in all directions, rarely breaking the surface and often diving out of sight. On briefly breaking the surface the dolphins would twist to land, crashing on their sides in a purposeful rather than playful manner. Owing to the brevity of each sighting it was difficult to assess the true number of what were believed to be bottlenose dolphins. It was also noted that all sightings were of single dolphins of a similar size, fairly broadly spread out.

At 2000 GMT on 7 January a dorsal fin was sighted off the starboard bow moving southwards. The fin dived out of sight and the next indication was two separate tracks of turbulence, thought to be from the tail flukes, with spots of calm water racing across the rippled sea surface, as if spots of oil were being deposited across the sea surface. Although they were moving eastwards and passing close to the ship's side, nothing of the 'whales' was sighted. At a distance from the ship, two more sightings were briefly made, moving with the ship at a speed of 14-15 knots, and further out a small 'blow'. Although no details could be seen during the brief sightings, the 'whales' were approximately 5-6 metres long, black on top and white underneath with some irregular white markings. In one case there was a distinct white mark before the flipper. The flipper appeared to be broad and short. The number was estimated to be within the range 3 to 5.

8 January 1982, 2100–2125 GMT. A lazy, warm, sunny afternoon was brought to life by the flash of white through the water. This turned out to be the distinct white markings on the flipper of what was believed to be a Minke whale. The whale was about 8–9 metres long and had a dark upper side with the fin set well back and a long 'snout'. The whale settled in the bow wave and for 25 minutes cruised effortlessly along a few metres from the ship. Every few minutes it took a breathing roll and then returned to the effortless movement. On a few occasions the whale rolled on to its side. Towards the tail could be seen white circular scale or 'crater' markings (see sketch). Within a few minutes the whole ship's company lined the rails to watch this majestic mammal until 'she' dived deep from sight.



Position of ship on 3 January: $30^{\circ} 18' \text{N}$, $52^{\circ} 45' \text{W}$.
 Position of ship on 7 January: $26^{\circ} 25' \text{N}$, $73^{\circ} 04' \text{W}$.
 Position of ship on 8 January: $26^{\circ} 03' \text{N}$, $79^{\circ} 22' \text{W}$.

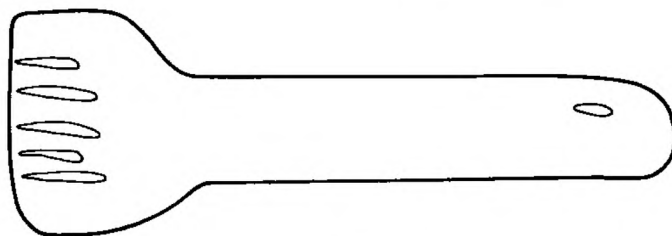
LUMINOUS FISH

Great Australian Bight

m.v. *Iron Endeavour*. Captain E. Hughes. Newcastle (N.S.W.) to Port Hedland. Observer, Mr D. Kemp, 3rd Officer.

26 January 1982, 1410 GMT. For about 20 minutes, luminous fish were noticed in the ship's wake along both sides of the vessel. These fish appeared singularly and at any one time only one or two were visible; most of them were only visible up to 1 m from the vessel's side with the occasional one 2 m from the side. A bluish glow was visible from the fish and when an Aldis lamp was shone on the water, no increase in the intensity of the glow was noticed.

The fish were about 30 cm long and about 5 cm across. At their rear ends the bodies appeared to increase in width to about 10 cm in the shape of a fin on either side of the body. An accurate sketch was not possible owing to the distance from the water (approximately 22 m) coupled with the swift passage of the fish along the vessel's side. Some sort of eye may possibly have existed on the forward end of the fish (see sketch). On the following day, 27 January,



in position $36^{\circ} 10' \text{S}$, $124^{\circ} 43' \text{E}$ and between 1340 and 1540 GMT, similar luminous fish as recorded above were observed, but not in such large numbers or at such regular intervals. From better studies of the passing fish, the fins described above might possibly have been in the form of tightly joined tentacles on the rear of the body.

Position of ship: $37^{\circ} 08' \text{S}$, $130^{\circ} 23' \text{E}$.

Note 1. The *Iron Endeavour* is an Australian Selected Ship.

Note 2. Dr P. J. Herring, of the Institute of Oceanographic Sciences, comments as follows:

'Judging by the drawing and the remarks of 27 January, I am convinced that the 'fish' were in fact squid. The appearance of many squid seen at the surface at night can be very fish-like. They were probably of the family *Ommastrephidae* (some species of which grow to more than 2 metres in length). Most of these squids have luminous organs over their underside and some also have a large patch of luminous organs in the middle of their back. Their light is blue, but observations of luminescing specimens (such as this one) are rare.'

SHARK

Turkish coastal waters

s.s. *Uganda*. Captain B. J. B. C. Biddick. At anchor off Alanya. Observers, the Master and Mr P. D. P. Dilks, 2nd Officer.

14 March 1982. At 1200 GMT a hammerhead shark was observed to swim slowly past the port side just under the surface of the water. It was identified as a hammerhead by the two distinctive lobes on either side of the head. The length was estimated at 2.0 metres and the overall width of the head at about 50 cm. The colour was closest to khaki. The observation was made from the bridge-wing at a height of 21 metres, looking straight down as the shark passed by.

Position of ship: $36^{\circ} 31' \text{N}$, $32^{\circ} 02' \text{E}$.

Note. Dr F. Evans, of the Dove Marine Laboratory, University of Newcastle upon Tyne, comments as follows:

'There are several species of hammerhead, the head being increasingly drawn out. They range from the least distorted, the bonnet-head, to the true hammerhead with a hammer as much as a metre in a big shark. The true hammerhead, of which this may have been a small specimen, is known from most warm seas. The animal grows to a length of 5 metres and more. By the way, there appears to be little to fear from sharks in the Mediterranean, or from hammerheads anywhere.'

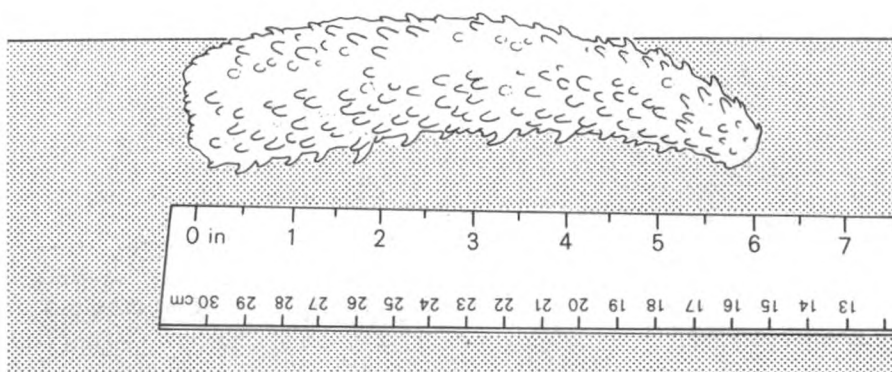
MARINE LIFE

Spanish Moroccan waters

m.v. *Singularity*. Captain M. W. Salsbury. At anchor in Ceuta Bay. Observers, Mr P. G. Powell, Chief Officer, Cadet P. M. Greaves and Mr A. Coull.

7 March 1982. Whilst the vessel was at anchor $2\frac{1}{2}$ cables NNW of Ceuta Harbour entrance in 14 fathoms of water, large numbers of red jellyfish, approximately 10 cm across and 20 cm long, were observed floating past in the 2 knot westgoing current. Amongst these were noticed equally large numbers of long, thin bullet-shaped objects which were seen to be moving slowly and were assumed to be some form of jellyfish. One was eventually removed from the water in a bucket for closer inspection. It was 15 cm long and 5 cm in diameter at the larger end. The outside was covered in thick spikes curved back towards the larger end and the body was hollowed from the larger end towards the other

rounded end, starting as a 2 cm diameter hollow thus leaving a 6 mm thick wall, and the inside of this cavity appeared to be lined with small short spikes. At the aperture leading to the hollowed inside of the object was an iris-like apron that reduced the aperture to about 6 mm. The whole body looked like clear pink jelly and had a slimy skin, but as a whole was quite rigid. When handled in a cloth the exterior spikes, although slimy, seemed quite stiff and sharp, as if they had a thin needle down their centre. After the object had been removed from the water for 10 minutes it was seen to be collapsing, so photographs were taken of it and it was returned to the water.



It was noticed that these objects were mainly seen near the surface, though some were seen quite deep, and that in the immediate vicinity of the ship they were passing at a density of about 10 a minute; they would therefore have been numbered in thousands. Although the average size was about 15 cm, they varied between 10 and 25 cm.

At 1000 GMT the ship proceeded into Ceuta Harbour where no further specimens were seen.

Position of ship: $35^{\circ} 52' \text{N}$, $5^{\circ} 26' \text{W}$.

Note. Dr Evans comments as follows:

'The long, thin bullet-shaped objects were colonies of a tunicate called *Pyrosoma*. Resembling in outline the finger of a knobby glove, the colony consists of numerous individuals piercing the jelly walls which they have themselves secreted. Each individual pumps water from the outside of the finger into the central cavity, filtering off food in the process. The colonies are found in all warm seas, usually in deep water. They are most conspicuous at night, when they luminesce steadily, giving the appearance of ghostly blue sausages.'

Arabian Sea

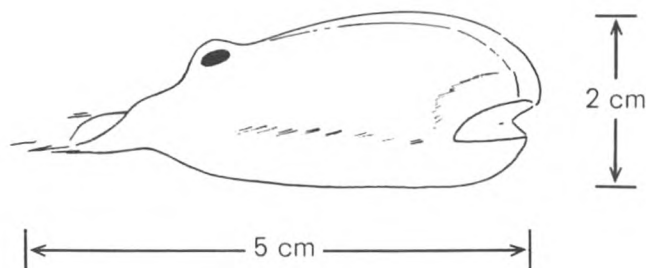
s.s. *Sivand*. Captain J. F. Thomson. Ain Sukhna to Khor al Fakkan (United Arab Emirates). Observers, the Master and Mr K. Gregg, 3rd Officer.

10 March 1982, 0500 GMT. When the ballast tank was being inspected it was noticed that there were hundreds of small jellyfish in the clear ballast that had been pumped into the tank the previous day between about 0800 GMT and 1230 GMT (positions $20^{\circ} 40' \text{N}$, $59^{\circ} 32' \text{E}$ and $21^{\circ} 15' \text{N}$, $59^{\circ} 40' \text{E}$).

They varied in size but the largest were 5 cm long, 1 cm wide and 2 cm high. They were transparent and colourless except for rust-coloured markings on the side and tail. On the back, about $\frac{3}{4}$ length from the mouth, was a hump containing a black spot. There was a large mouth-like opening at the fore end (see sketch).

They appeared to propel themselves by taking in water by the mouth and expelling it through the opening at the tail.

Position of ship: $23^{\circ} 20' N$, $59^{\circ} 25' E$.



Note. Dr Evans comments:

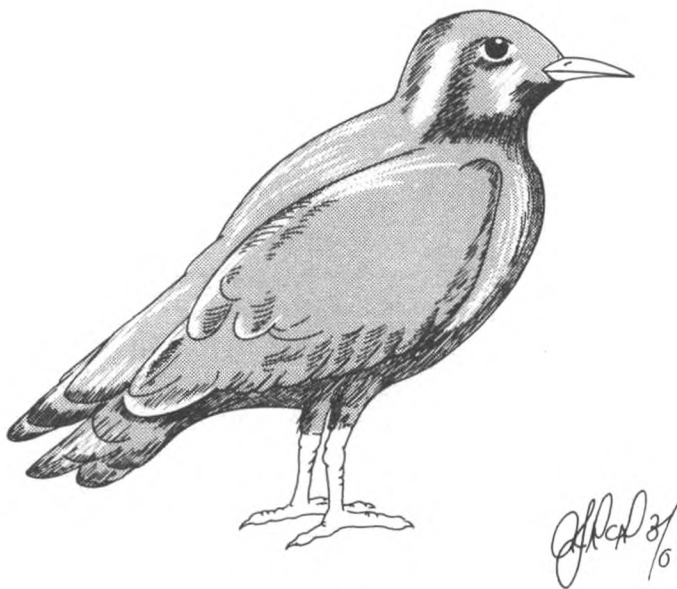
'The creatures were not jellyfish, but salps, which are more complicated and higher in the animal kingdom. Structurally they consist of a little barrel made of jelly, with a filtering screen stretched across the inside halfway down. As reported, water is taken in at one end, filtered and pumped out at the other. The dark spot in the drawing is the stomach, full of food. Salps can put on weight at an enormous rate, up to 10 per cent an hour in the right conditions, and given the chance will increase explosively in numbers. The animals are very closely related to the *Pyrosoma* reported by the *Singularity* but they are not colonial and are, of course, individually much bigger.'

BIRDS

North Atlantic Ocean

m.v. *King Charles*. Captain K. Morton. Hampton Roads to Savona. Observers, the Master and ship's company.

16 January 1982. A pair of small birds were observed on the vessel; they were about 18–20 cm long with a wingspan of 22–25 cm, were predominantly black-brown in colour and had a vivid orange 'flash' on the underside of their wings extending forward to their breasts. They remained on and about the vessel for two days, at one stage finding their way into the accommodation,



where they appeared quite tame and readily accepted the food and water offered to them. It was not known what type of bird they were but it was suggested that they were a variety of American blackbird (see sketch).

Position of ship: 36° 43' N, 65° 04' W.

Note. Captain G. S. Tuck, Vice-President of the Royal Naval Birdwatching Society, comments:

'The two birds were difficult to identify; perhaps between an Eastern Towhee and a Red-winged Blackbird. Reference should be made to Roger Tory Peterson's 'Field Guide to the Birds' eastern land and water birds for any final decision on such similar species.

'The Guide shows four almost identical illustrations of American species of Grackles and Blackbirds; the sketch is an excellent posture of these species from which the fine points cannot be deduced.'

North Atlantic and South Atlantic Oceans

m.v. *Act 7*. Captain R. M. Burns. Hamburg to Melbourne. Observers, Mr J. R. Weller, Chief Officer, Mr P. Mitchell, 3rd Officer, and Cadets D. Robbie and S. Willis.

15 February 1982, 1600–1700 GMT. A flight of some dozen gulls stayed with the vessel for some time and dropped to the water to feed during the course of the period. The birds had a wingspan of 95–100 cm and the underparts, head and tail were white, the crown having brown, mottled plumage. The legs were yellowish, the beak yellow and the wings black/slatey grey with darker primaries and lighter secondaries. There were distinctive white bands on top of the wings at both leading and trailing edges and white markings on the tips of the primaries. On the undersides the wing linings and primaries were black and the secondaries white. These birds were observed landing on the water for brief periods and then flying off with fish between their mandibles, carrying them for some time before eating them. The birds were considered to have been black backed gulls; two days later a few more birds of the same species were seen north and south of the Canary Islands.

Position of ship on 15 February: 42° 10' N, 10° 30' W.

19 February 1982, 1730 GMT. A medium-sized bird, apparently of the petrel family, was seen. Its beak, head, neck, upper parts and tail coverts were black. The tail was rounded and the legs and feet were dark in colour. The underparts, abdomen and neck were white and the wings brown/black both on top and underneath. A distinctive line was shown on the underneath of the neck where the white abdomen joined the brown. The white underside where the wings joined the body was lightly mottled. The flight pattern was a long gliding flight over the ship's wake and alongside the vessel. Wingbeats were slow, and the length of the bird 40–45 cm with wingspan about 95 cm. The bird closely resembled the Schlegel Petrel described in Tuck and Heinzel's 'Field Guide to Sea Birds of Britain and the World', Plate 10, Map 71, page 35, but the range does not agree.

Position of ship on 19 February: 09° 53' N, 17° 27' W.

2 March 1982, 0215 GMT. Four penguins were observed swimming along the starboard side of the vessel about 7 m off for 3–4 minutes. They were diving in and out of the water and bow-wave. Whilst under the water they used their flippers to propel themselves forward. The birds had red yellow beaks, black upper parts, white underbelly and white rumps and were 60–90 cm in length. The penguins headed off in a s'ly direction at speed. They were thought to be Gentou penguins.

Weather conditions at time of observation: dry bulb 7.0 °C, wet bulb 6.0, barometric pressure 1023.5 mb, wind w'ly, force 3, slight sea, w'ly swell.

Course 105°(T), speed 19.5 knots.

At 0500 GMT on the 2nd a small grey/blue seabird was found to be resting on the mooring deck. It was 25 cm in length and had a wingspan of 50 cm. The beak was bluish grey on the cutting edges of both mandibles, a light grey colour on the bottom of the lower mandible and dark grey/black on the upper mandible. There were two large nostrils where the beak joined the head. The top of the beak was hook-shaped for about 4 cm on the top mandible. The top of the head was grey/blue in colour with a white band between the eyes and the crown, to just behind the eyes. The face around the beak and the eyes were dark with dark grey markings underneath and behind the eyes. The wings were white underneath with very fine dark edges on the primaries and secondaries. The tips of the wings were grey/blue on the primaries and secondaries, but the primaries on the very tips of the wings were darker, almost black, forming an edging to the bend of the wing through the primary coverts and alula. This dark pattern continued from the head of the wing across the greater coverts and across the back, forming a distinctive W tail or wedge with blue/grey upper tail covert and a dark band around the tail. The underside was dark blue/grey becoming almost black at the end. The legs were grey-coloured, webbed and fat. After consulting 'Tuck and Heinzel', it was decided that the bird was a Dove Prion (*Pachyptila desolata*).

Position of ship on 2 March: 45° 17'S, 51° 04'W.

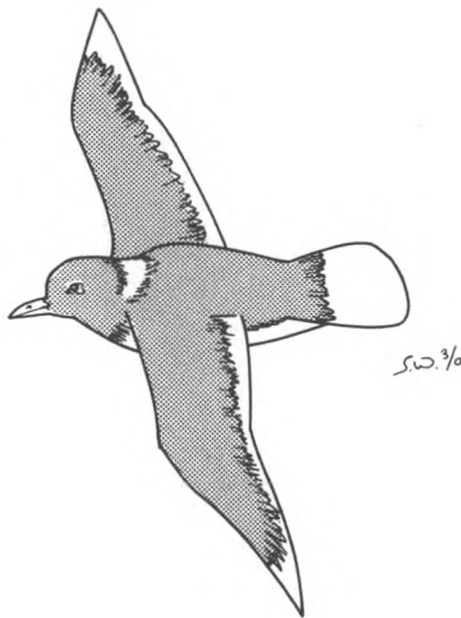
Note. Captain Tuck confirms the various identifications and commends the very detailed descriptions.

Northern Red Sea

m.v. *Hampshire*. Captain M. M. Reeves. Juiamyah Terminal to Port Said. Observers, Mr S. L. J. Walker, 3rd Officer and Mr -. Lewis.

10 March 1982, 0630-0715 GMT. A seabird of the gull type was observed. Its length was approximately 35 cm and its head and neck were coloured greyish-black with white back of neck. The upper back and sides were brownish black, and the wing tops black with white tips. The lower breast, stomach and tail were white.

Position of ship: 27° 18'N, 34° 20'E.



← 36 cm →

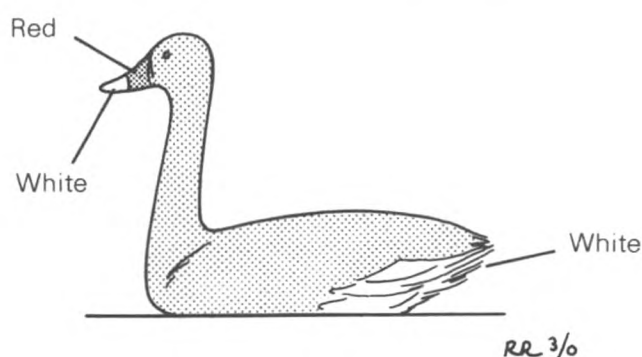
Note. Captain Tuck comments as follows:

'This sighting is considered to have been either the Red Sea Black-headed Gull or the White-eyed Gull (*Larus leucoptalmus*). The Red Sea Black-headed Gull is seen regularly at the northern end of the Red Sea, while the Aden Gull occurs regularly further south near Aden. The Aden Gull is larger and browner and shows a distinct white ring of feathers around its nape. In breeding dress in summer the Aden Gull shows a coffee-brown hood while the Red Sea Black-headed Gull shows a deep black hood.'

Bass Strait

s.s. *Encounter Bay*. Captain M. J. Heron. Adelaide to Lyttelton. Observers, Mr R. B. Robinson, 3rd Officer and Mrs J. Robinson.

24 January 1982, 2346 GMT. A pair of birds were spotted 3 points on the port bow. They were flying side by side in a SE'ly direction, possibly towards Tasmania. The birds then alighted on the water and the vessel passed them at



a distance of 60 metres. The body colour was of a mottled brown but with broad white bands across the rear upper side of the wing. The beak was a red colour with a yellowy white tip. The necks were very straight when the birds were sitting in the water and there were no appreciable colour differences between them.

Position of ship: 39° 37'S, 145° 00'E.

Note. Captain Tuck comments as follows:

'These birds are considered without doubt to have been Black Swans (*Chenopsis atrata*). Black Swans are distributed throughout Australia except the extreme northern areas and also Tasmania and usually occur in pairs or flocks in coastal regions and beside inland lakes, rivers and swamps.

'Book reference: "What bird is that—a guide to the birds of Australia" by Neville W. Cayley, F.R.Z.S., Plate I.'

INSECTS

North Atlantic Ocean

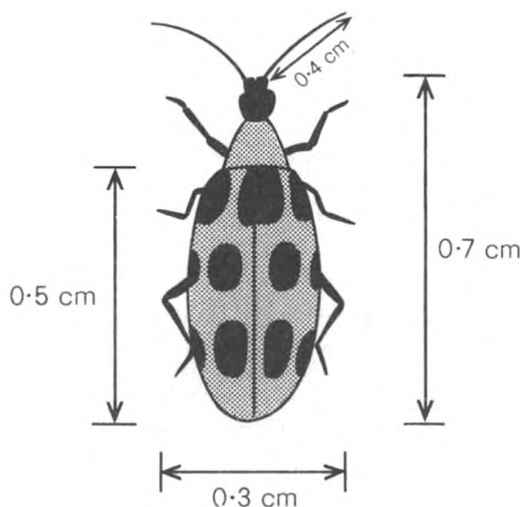
m.v. *Dart Britain*. Captain M. J. Winter. New York to Southampton. Observers, the Master, Mr W. S. Enright, 3rd Officer and Mr I. Conn, Radio Officer.

3 February 1982, 1400 GMT. A small, winged insect was found on the bridge on a warm, sunny morning. The insect was walking along the forward bridge windows, which were facing the sun, and was very active. On the previous day, when the voyage began, temperatures had been low (i.e. not more than 6 °C) and no other insect had been observed.

The insect was 7 mm long and 3 mm wide and had wing cases 5 mm long. The wing cases were light green with three horizontal rows of black marks, four

marks in each row. The body between the head and wing case was of a lighter green colour. The insect was still alive on 6 February but was found dead on the following day.

Position of ship: $40^{\circ} 46' N$, $60^{\circ} 48' W$.



Note. Mr R. D. Pope, of the Entomology Department of the British Museum (Natural History), comments as follows:

'The beetle found aboard the *Dart Britain* is clearly a galerucine chrysomelid belonging to the genus *Diabrotica*. Of the few North American species, *Diabrotica 12-punctata* (F.) (the 12-spotted cucumber beetle) is the most likely. It is widespread in the USA and, as its name implies, can be something of a pest. Reports show that dry seasons, with a consequent shortage of cucumber vines, seem to be no handicap to the species. It takes to feeding on petals and pollen from many kinds of plant and so tides itself over, until the cucumbers are around again.'

Red Sea

m.v. *Resolution Bay*. Captain W. A. Murison. Genoa to Melbourne. Observers, the Master, Mr C. K. Urwin, 3rd Officer and Mr A. Brown.

4 January 1982, 0930 GMT. While working on the monkey island a rating found a dead dragonfly. On closer inspection it was seen that this dragonfly was



in perfect condition, showing no signs of damage or cause of death. It was assumed that the dragonfly had come on board the vessel while in transit through the Suez Canal on 2 January.

Position of ship: $20^{\circ} 45' \text{N}$, $38^{\circ} 32' \text{E}$.

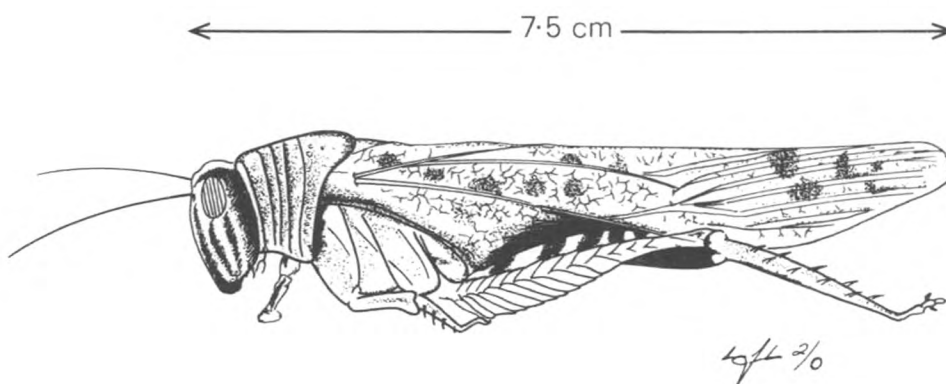
Note. Mr Stephen Brooks, of the British Museum (Natural History), comments:

'The dragonfly found on board the *Resolution Bay* is *Hermianax ephippiger* (Burm.). This species is a migrant and occurs commonly throughout Arabia and the Mediterranean region.'

Southern Red Sea

s.s. *British Trident*. Captain R. F. Adams. Suez to Khor al Fakkan (United Arab Emirates). Observer, Mr L. J. Loftus, 2nd Officer.

21 February 1982, 0900 GMT. The insect depicted in the sketch was first seen at this time and was identified as a locust. About three more were sighted around the vessel during the afternoon and it was uncertain when they had



arrived on board, none of them having been seen in flight. The specimen which was captured and drawn was brown in colour with slight pink markings. The wind at the time was S'E, force 5, as it had been for the previous 12 hours. Three days later a total of five similar locusts had been found dead on board.

Position of ship: $13^{\circ} 32' \text{N}$, $43^{\circ} 00' \text{E}$.

Note. Mr David R. Ragge, of the British Museum (Natural History), comments:

'The insect found on the *British Trident* was a large grasshopper, perhaps *Anacridium melanorhodon*, a common African species that is known occasionally to fly for quite long distances.'

New Zealand coastal waters

m.v. *Matra*. Captain M. Thwaite. At anchor in Cloudy Bay, N.Z. Observers, the Master and ship's company.

10 January 1982. During the morning an insect's 'nest' for want of a better description was found adhering to the underside of a fluorescent light fitting situated in the alleyway on the bridge deck. The nest had to be removed with a hacksaw for further examination. It seemed to be constructed out of a form of mud or dust that had been bonded together in layers. It measured 3 cm in length, 2 cm in width and 2 cm at its deepest. There were three distinct chambers in a pyramidal formation with openings at one end.

Each chamber was cut open. The first was empty except for a silk-like lining. The next chamber revealed the same lining at the bottom and the remains of a small spider (presumably food for the hatching insect). In the last chamber

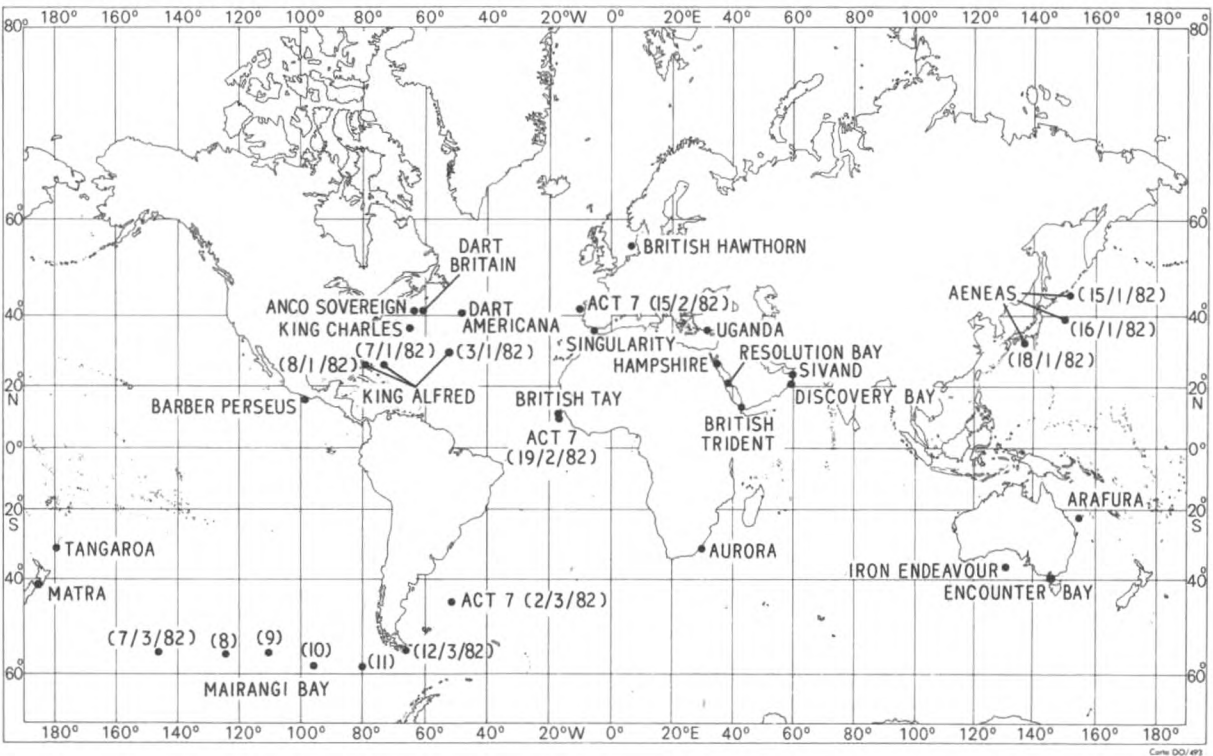
were found the dried-up remains of the inhabitant that had not hatched (this chamber was still sealed at the entrance). The carcass was about 1.5 cm long but had no distinguishing features.

It was assumed that the nest had been constructed whilst the vessel was laid up at anchor at Rabaul (Papua New Guinea), probably by hornets, as these were found flying around the accommodation in this area.

Position of ship: 41° 27' S, 174° 07' E.

Note. Mr C. R. Vardy, of the British Museum (Natural History) comments as follows:

'The nest is probably that of a *Sceliphron* wasp, often known as a Mud-Dauber Wasp. The nest must have been made at a previous port of call, as indicated by the advanced stage of the contents and by the absence of any species from New Zealand. These wasps provision their nests with spiders as food for the developing larvae. Most species of *Sceliphron* are bright yellow and black, and very slender with a long-stalked abdomen. They are common in most hot countries.'



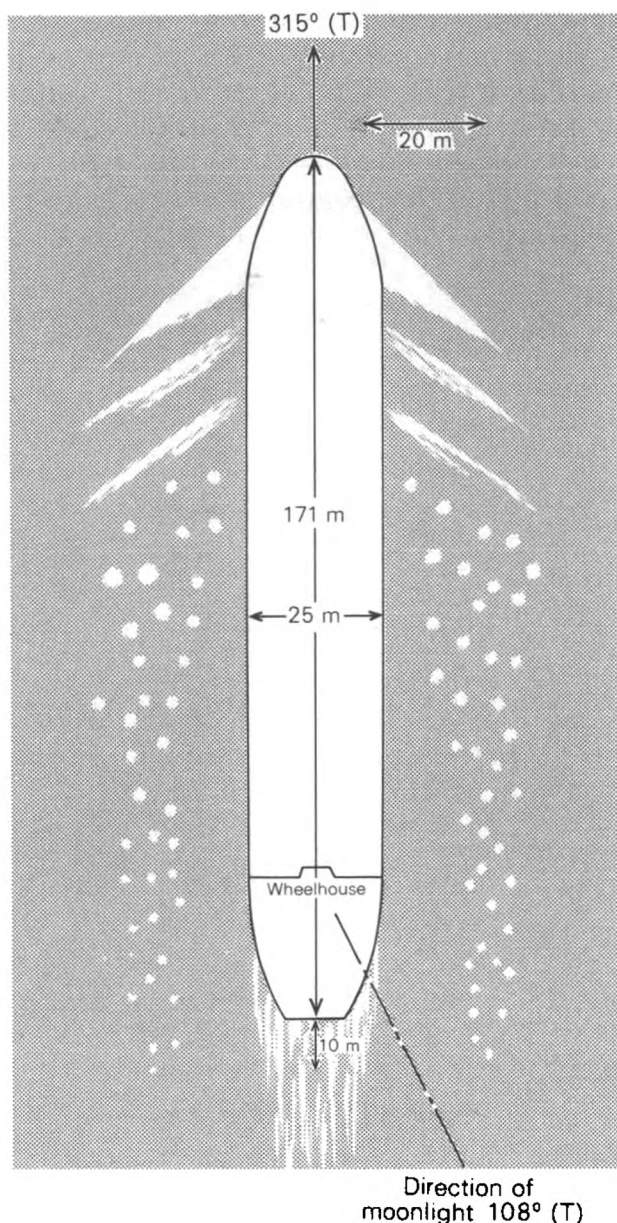
Position of ships whose reports appear in *The Marine Observers' Log*

BIOLUMINESCENCE

North Atlantic Ocean

m.v. *British Tay*. Captain K. Meacock. Monrovia (Liberia) to Gibraltar. Observer, Cadet T. M. Stone.

13 March 1982, 2330 GMT. On this evening particularly bright luminescence was observed. It started initially in the bow wave on either side of the vessel and then extended to the beams in bright streaks, gradually breaking up into small groups, visible 10 m astern of the vessel.



This was so bright that it lit the entire hull and main deck area of the vessel, reaching up to the bridge and superstructures. At times the illumination appeared to exceed that which would have been present if the main deck floodlights had been switched on.

This extreme example may have been partly attributable to the moon rising, bearing $101^{\circ}(\text{T})$.

Weather conditions: dry bulb 23.0°C , wind light variable, force 1–2, sky cloudless.

Course $315^{\circ}(\text{T})$, speed 16 knots.

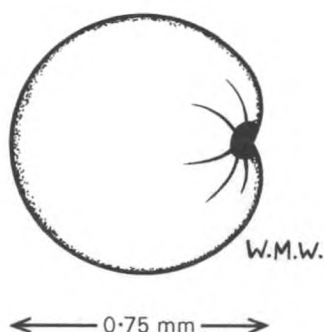
Position of ship: $11^{\circ}00'\text{N}$, $17^{\circ}12'\text{W}$.

Arabian Sea

m.v. *Discovery Bay*. Captain J. H. Hutson. Jeddah to Dubai. Observers, Mr R. T. M. Whelan, 2nd Officer and Ms W. M. Winter, 3rd Officer.

31 January 1982, 1100–1145 GMT. The vessel was on a course of $025^{\circ}(\text{T})$ passing the island of Masirah. Upon crossing the 100 fathom bank at Ras Yei, extensive water discoloration was observed lying in bands at 90° to the ship's heading. The rust-red colour was noted for approximately 45 minutes, though

the initial and clearly defined bands of one to two metres in width and indeterminate length were more common for a period of 30 minutes. Samples were taken with the rubber bucket. Upon examination under a magnifying glass individual organisms could be distinguished of a cell-like structure consisting of a reddish-orange off-centred nucleus surrounded by an opaque substance. The diameter of the complete cell was approximately 0.75 mm. Group cohesion with fibrous bonds was apparent between some of the cells. On being shaken



in the dark only the organisms at the surface of the water and on the sides of the sample jar emitted bioluminescent green/white irregular flashes. The organisms appeared to be unaffected by torchlight.

Weather conditions: dry bulb 24.2 °C, wet bulb 21.7, sea temperature 25.0, barometric pressure 1014.3 mb, sea slight, produced by light airs accompanied by a low, long E'ly swell.

Position of ship: 20° 30' N, 59° 09' E.

Note. Large concentrations of bottlenosed dolphins were encountered both before and after the observation reported above.

North Pacific Ocean

m.v. *Barber Perseus*. Captain C. M. Sandy. Los Angeles to Balboa (Panama). Observers, Mr W. Kirrane, 3rd Officer and Mr J. H. Prentice.

31 March 1982, 0505–0535 GMT. During this period many rapid light flashes were observed in the sea adjacent to the ship. The flashes were greenish-white in colour and appeared to emanate from immediately below the sea surface. As many as five flashes could be seen at any one time on either side of the ship, but more frequently nearer the ship's side. Shining an Aldis lamp on to the sea had no noticeable effect on the frequency or intensity of the light flashes, nor had the switching on and off of the ship's radars.

Weather conditions at time of observation: dry bulb 27.2 °C, wet bulb 26.2, sea temperature 30.0, wind WNW, force 2, cloud cover 2/8 cumulus and altocumulus.

Height of observer above sea level: 30.2 metres.

Position of ship at 0520 GMT: 15° 45' N, 98° 36' W.

Note 1. The *Barber Perseus* is a Hong Kong Selected Ship.

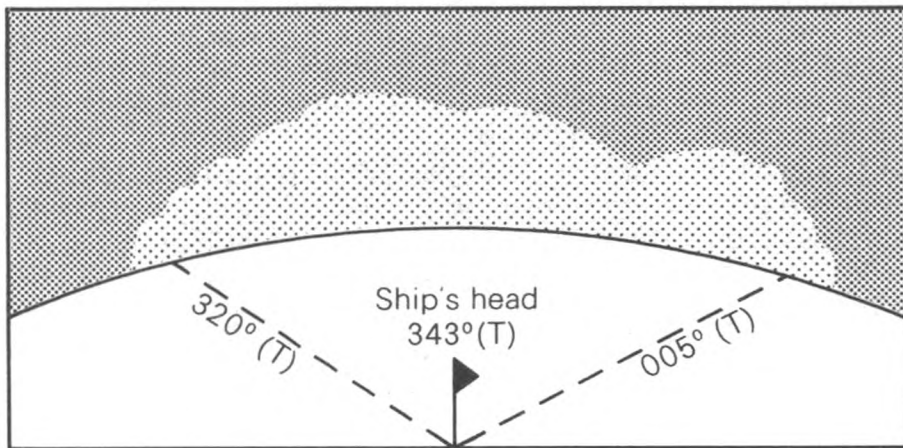
Note 2. Dr P. J. Herring, of the Institute of Oceanographic Sciences, considers luminous jellyfish or comb jellies to have been the most likely cause of this reported bioluminescence.

AURORA BOREALIS

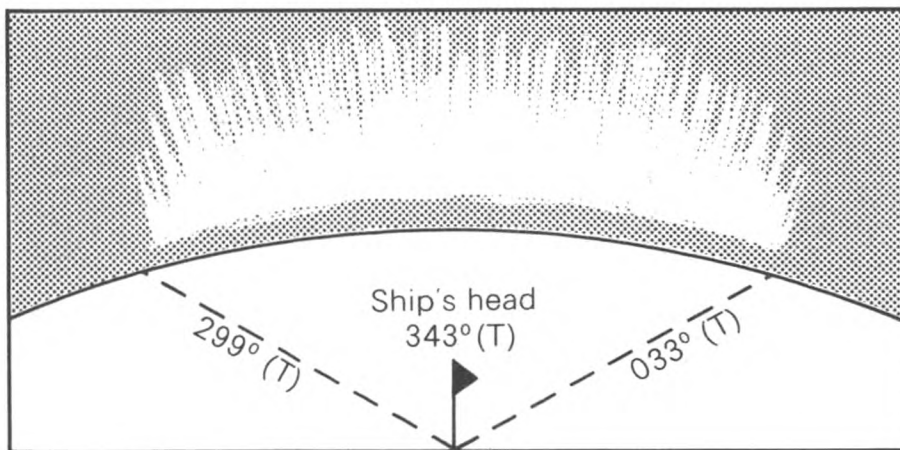
North Sea

m.v. *British Hawthorn*. Captain E. Coates. Hamburg to Stavanger. Observers, Mr G. English, Chief Officer, Mr S. D. Hunton, 2nd Officer and Mr C. Buckingham, 3rd Officer.

2 March 1982, 0050–0430 GMT. The vessel was steaming at $12\frac{1}{2}$ knots on a course of $343^\circ(\text{T})$ under cloudless star-ridden skies; the wind was gusting to force 6 from the sw, and visibility was more than 10 n. mile. At 0050 GMT a glow of weak to moderate brightness was observed dead ahead spanning over an arc of the horizon of 25° on either side of the bow. The phenomenon was at first thought to be cloud illuminated by the moon, but no moon was present. The glow reached an estimated height of 25° above the horizon.

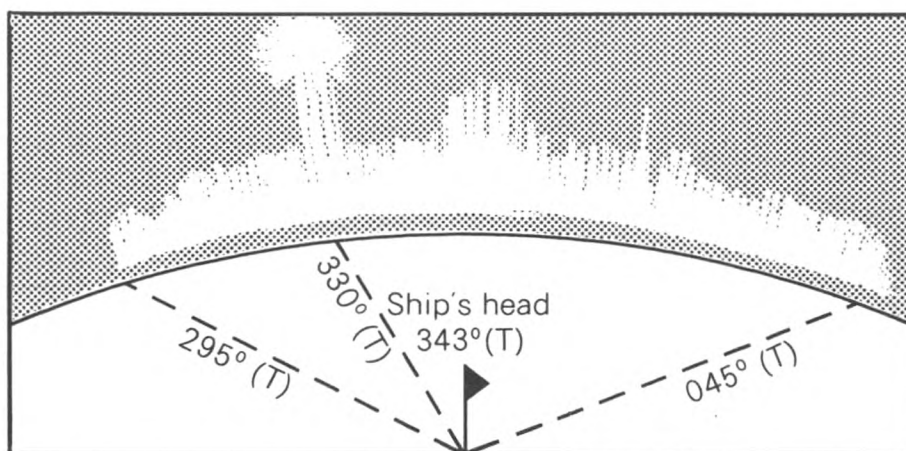


At 0102 GMT the brightness of the glow had increased to moderate and a rayed arc had formed across 90° of the arc of the horizon; as the phenomenon became more active, the upper points of the rayed curtain effect reached an altitude of 40° above the horizon.



At 0110 GMT the rayed curtain had become very distinctive and the Chief Officer, who had previously asked to be informed should the phenomenon occur, was called. At this time a single ray was observed 13° on the port bow, with a searchlight effect reaching to an altitude of 60° above the horizon.

At 0112 GMT the single ray multiplied into four rays which began to emit a red glow around their apex. By now the rayed curtain had stretched across the horizon over an arc of 110° , and there were multiple arcs across the curtain. The

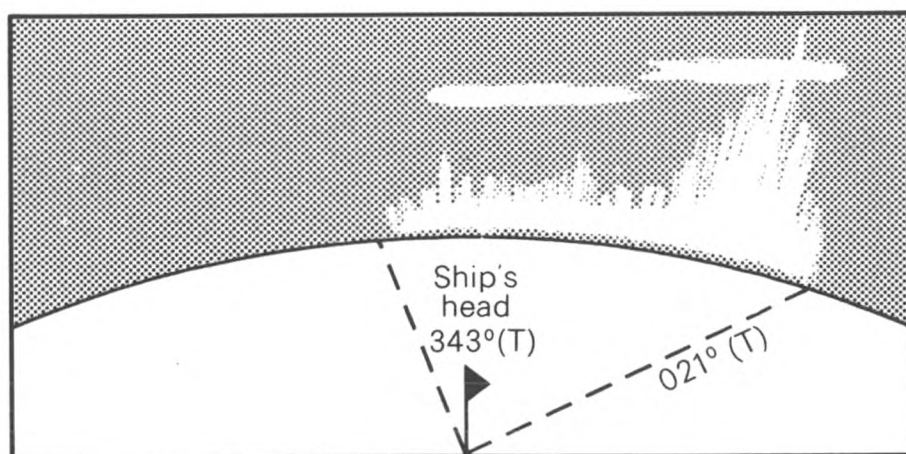


ray bundle was of moderate to brilliant brightness. At 0115 GMT the bundle of rays dispersed and faded.

At 0128 GMT another bundle of rays was observed 35° on the starboard bow which had the same characteristics as the previous bundle, with a red patch at the apex. The second searchlight effect lasted for $4\frac{1}{2}$ minutes, during which period at 0130 GMT there seemed to be flashes of horizontal light bands, which became more distinctive at 0135 when they began to pulsate at regular intervals of 20–30 seconds (later discovered to be the activity of 'flaming'). At 0133 GMT yet another bundle of rays with similar characteristics was seen, this time 45° off the port bow, which lasted for 3 or 4 minutes before fading.

At 0140 the activity of the phenomenon began to decline; the flaming had stopped and the rayed curtain was reduced to a weak to moderate brilliance once more. At 0200 GMT the rayed curtain had become indistinct and weak in brightness, covering an arc of the horizon of about 50° . At 0215 the rayed curtain disappeared and became just a weak glow on the horizon. This state of affairs persisted until 0250 when two isolated rays 24° on the starboard bow were observed which attained an altitude of 40° above the horizon; they were of weak to moderate brightness and gave no coloration to the night sky.

At 0332 GMT the rayed curtain once more became distinctive and of moderate brightness, stretching from 5° on the port bow to 43° on the starboard bow. At 0344 isolated rays became moderate to brilliant, reaching altitudes of 60° above the horizon and a red band stretched across their apices from right ahead to 38° on the starboard bow. A green tinge was also visible along the horizon. At 0351



the red and green patches faded away and the whole phenomenon again began to reduce in brightness to a glow on the horizon. At 0430 the auroral glow disappeared completely.

Position of ship at 0050 GMT, $55^\circ 08'N$, $6^\circ 59'E$.

Marine Radio Communications—from pioneers to satellites, the 80-year miracle*

BY ROBERT THOMAS

Fewer than 80 years separate the establishment of the first maritime wireless service and the Marisat† network of satellite communications. Marconi International Marine was formed in 1900, and Marconi's pioneering work was steadily built upon over the next 70 years. Marisat, the first maritime satellite communications system, was launched in 1976.

Marconi brought his wireless telegraphy apparatus to Britain, home of the world's biggest mercantile fleet, in 1896. His first priority was to demonstrate that radio waves would travel across water, and an experiment was staged across the Bristol Channel.

These first experiments led to the construction of the first coastal station at the Needles Hotel, Alum Bay, Isle of Wight. Morse had been successfully exchanged between two steamers—the *Solent* and the *May Flower*—but the first ship to be contacted from the Needles station was the *St Paul*, which was bringing Marconi back from a trip to the United States. The vessel was 66 nautical miles off the English coast when she received the latest news from Britain. In February 1900, the German liner *Kaiser Wilhelm Der Grosse* became the first ship to be fitted with wireless telegraphy. The first British ship was equipped the following May. Lloyd's was quick to recognize the significance of these developments and placed contracts for the installation of wireless apparatus in its own signal stations. In 1901, the *Lucania* became the first Cunarder to be fitted with wireless, followed by the *Campania* and the *Philadelphia*. Marconi then ordered the construction of a chain of coastal stations. The most powerful was at Poldhu, in Cornwall. By December 1901, 69 land stations and 124 ship stations were in operation, demonstrating that the owners were quick to recognize the importance of wireless communications.

A milestone was reached on 1 January 1905, when the first messages for ships at sea were accepted at British Post Offices, for transmission via the Marconi coastal stations. The radio pioneer had been sure to offer shipowners a complete service, with apparatus, operators and use of the shore station provided on a rental basis.

Between the years 1905 and 1915 a large number of British ships were fitted with wireless apparatus, including the first two oil tankers to carry such equipment.

The murderer Crippen provided Marconi with a global public relations coup in 1910, when radio messages from Captain Kendall, of the Canadian Pacific vessel *Montrose* alerted Scotland Yard and led to the fugitive's arrest. Two years later, the 'unsinkable' *Titanic* went down and it was recognized at the time that many, if not all, of the survivors would have died if the vessel had not been equipped with wireless.

*This article was published in *Lloyd's List* on 1 February 1982 and is reproduced with the kind permission of the Editor.

†See list of abbreviations and acronyms on page 33.

As is so often the case with new technology, the advent of war rapidly accelerated progress. By the end of World War I, wireless telegraphy had a range of up to 3000 n. mile. By 1920, great strides had also been made in ship telephony. During that year, press delegates sailing on board the *Victorian* to a conference in Canada used telephone facilities linking the ship to Poldhu and Chelmsford in England and St John's, Newfoundland, covering distances of over 1000 n. mile.

Commercial wireless telephony equipment was fitted for the first time in 1922. Meanwhile, the Marconi direction-finder had been developed and by 1929 the fitting of this type of equipment was made compulsory by law in all British passenger ships of 5000 tons gross and over. New applications and devices were soon developed. In 1930, for example, Marconi introduced the echometer, which indicated the depth of water beneath a ship's keel. Seven years later, Guglielmo Marconi died, having witnessed the spread of wireless communications worldwide.

World War II provided further impetus for the development of improved maritime communications. By the time the war ended, two-way VHF radio telephone installations were growing in popularity, being used in ports to direct the movement of vessels and on large ships for communication between pilot cutters, tugs and owners' offices. Later, specialist radiotelephone equipment was developed specifically for users in the growing offshore industry. By the 1950s the advantages offered by the single-sideband mode of operation began to be appreciated, and this method of working became mandatory in 1976. Over the years, it considerably lightened the load on maritime radio bands.

Maritime communications received an important boost with the introduction of automatic error-correcting systems. This raised the reliability of radioteleprinter contact over ship-to-shore circuits to a level suitable for connection to international networks.

Telex is four times as fast as hand Morse telegraphy—it operates at around 66 five-character words a minute compared with 16 words a minute for Morse.

In addition, sophisticated navigational systems became available such as Omega, a long-range hyperbolic navigation system, and automatic Loran C, which provides continuous position information for coastal and deep-sea navigation.

Despite many technical innovations, maritime communications still suffered greatly from interference caused by ionospheric disturbance and also the long delays sometimes resulting from congestion.

These problems were overcome with the introduction of maritime satellite communications, inaugurated in 1976 by Comsat's Marisat system. For the first time, ships had an assured means of sending and receiving immediate high-quality messages, by line-of-sight microwave radio.

Marisat, the predecessor to Inmarsat, was based on three satellites placed in geostationary orbit over the Atlantic, Pacific and Indian Oceans.

The first moves towards setting up the Marisat system date back to 1966, when IMCO decided to examine the potential of satellite communications for ships. In 1971, frequencies for the development of maritime satellite communications were allocated by the World Administrative Radio Conference in Geneva. Early experiments with mobile aerials culminated in successful trials of equipment installed on board the *Queen Elizabeth 2*, used in conjunction with an International Telecommunications Satellite Consortium (Intelsat) satellite. Two years later, IMCO convened the first of a number of conferences, which eventually led to the adoption of the Inmarsat Convention and the birth of Inmarsat in 1979.

Meanwhile, the shipping community first had an opportunity to make use of satellite technology in 1976, as a result of United States Navy requirements. In 1972 the US Navy decided to set up a satellite communications network,

prior to the establishment of its Fleetsatcom satellite chain later in the decade. Capacity for the so-called 'Gapfiller' military service was leased from Comsat. The company christened the new service Marisat, as it knew the satellites to be used by the Navy would have a service life far beyond the military requirement. The result was a hybrid type of satellite, with equipment designed to provide the UHF services demanded by the US Navy, and transponders operating at frequencies in the maritime service bands to cater for commercial users.

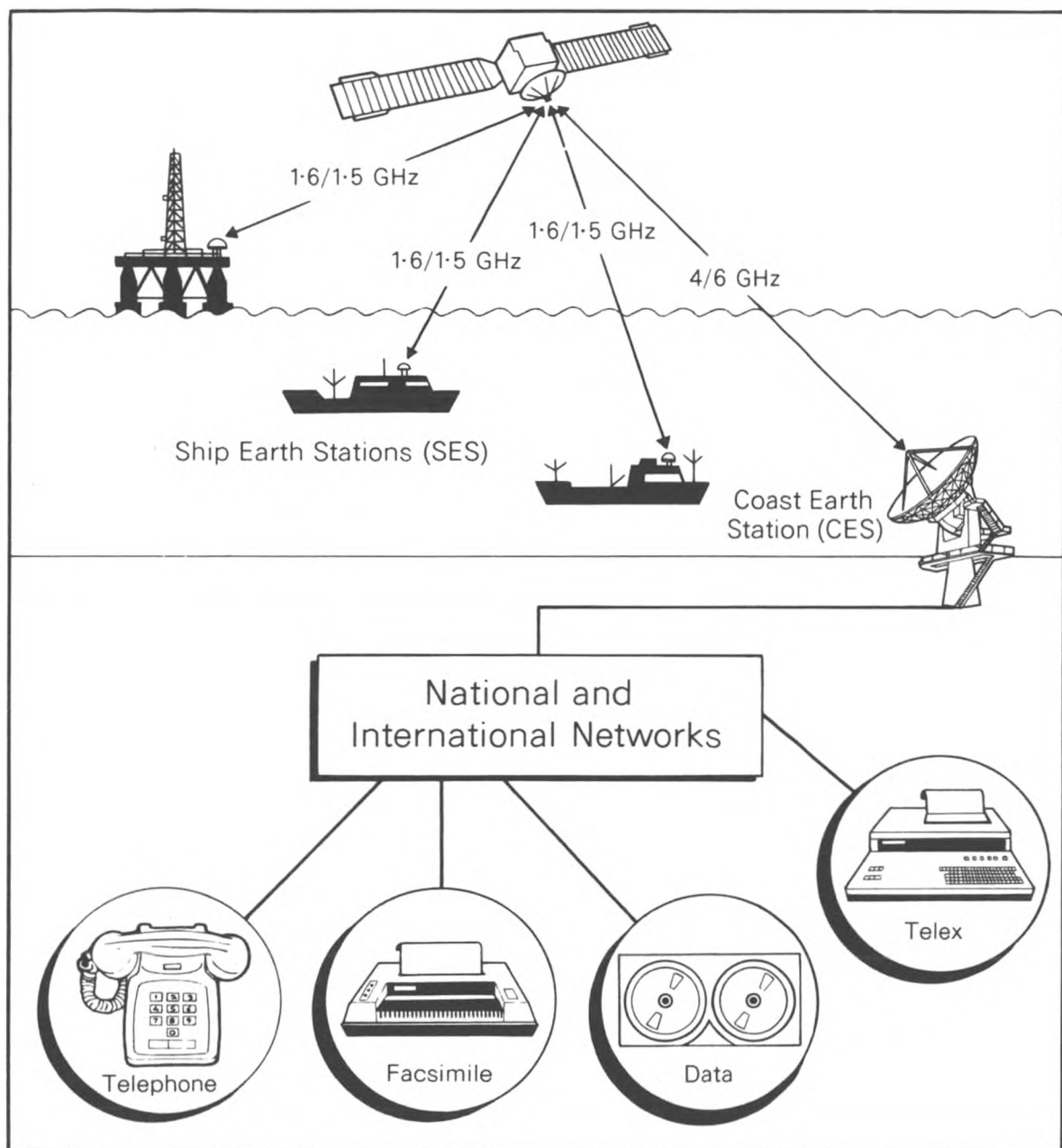
Comsat took a gamble with Marisat, and its venture proved successful. As planned, US Navy requirements built up rapidly in the initial years of satellite life. Then, as military use slackened, the commercial demand for the service increased. The satellites in the Marisat series each have three transponders. The UHF transponder contains three channels—one wideband (500 kHz) and two narrowband (25 kHz) channels which can be activated and deactivated by ground command. The other transponders are for the L-band service of commercial users.

One transponder has the job of translating shore-to-ship signals from 6 GHz to 1.5 GHz, while the other translates ship-to-shore signals from 1.6 GHz to 4 GHz. The Marisat L-band transmitters can be operated at three different power levels, so that limited satellite power can be shared between UHF and L-band users. This meant more power could be switched to enhance the service to commercial users in line with declining navy requirements.

As Marisat became established, Comsat switched the operation to a new subsidiary, Comsat General Corporation. It then entered into partnership with other groups and the resulting body was called Marisat Joint Venture. Comsat retained an 86.29 per cent share in the system. Initially, Marisat was planned to cover the Atlantic and Pacific only. However, a third satellite, allocated as a spare, was eventually placed in orbit to cover the Indian Ocean. The result was a global communications capability. Coastal earth stations were built at Southbury, Connecticut, and Santa Paula, California, to serve the Atlantic and Pacific satellites. In 1978, a third station for the Indian Ocean satellite was built at Yamaguchi, Japan. The American stations handle satellite tracking, telemetry and command functions, while the Italian station at Fucino provides the same for the Indian Ocean satellite.

The first commercial telephone call was made by Marisat on 9 July 1976. Using the Atlantic Ocean satellite, the seismic ship *Deep Sea Explorer* called company headquarters at Barthesville, Oklahoma, while off the coast of Madagascar. Marisat offered the shipowner both voice and telegraph capacity, assigned on demand. Meanwhile as a result of its wealth of experience in the field, Comsat was selected in 1978 as the United States operating entity in Inmarsat. Operating experience with the Marisat system helped the experts clarify the potential of maritime satellite communications. At the same time, the industry itself began to appreciate fully the unsatisfactory state of conventional maritime communications in the modern business world. Today, the vast majority of ships still rely on MF Morse telegraphy and VHF telephony for short-range communications, IF and HF telephony and telegraphy for medium-range services, and HF for long range.

The weaknesses of present communications result from the multiplicity of transmission means, the vagaries of ionospheric conditions and the lack of channels to meet the growing demand. With satellite communications, shipowners can benefit in many ways, enjoying the advantages of short, medium and long-range communications via the same equipment, with highly reliable and mostly automatic connections. There are also the new services, including high-speed transmission for real-time ship-to-shore computer 'conversations'. Following studies of what its services could do to improve cost-effectiveness in the industry, Inmarsat has identified the areas in which the owner needs improved information flow. This could assist in achieving better voyage planning



Outline of maritime satellite communications

and rotation in ports, routing changes in response to weather and other changes, voyage documentation and accounting, daily vessel reports on voyage performance and loading/discharging progress, and collation of information on economic factors, voyage conditions, market conditions and vessel data, to plan the best fleet use and scheduling.

In the cargo-handling area, satellite communications could lead to more effective preparation of cargo specifications, storage plans, bunkers, ballast and fresh water calculations, and the optimization of cargo and container scheduling, and handle reports on cargo booking, distribution and handling. More reliable communications should also improve personnel management and inventory control and maintenance.

The growth in the use of Marisat and confidence in the future of space communications technology led to rapid development of Inmarsat and its system, which will offer lower telex and telephone charges than the earlier service. In the UK British Telecom is to exploit Inmarsat's potential to the full. When the new Goonhilly station becomes operational, services available will be automatic, except for telephony from shore to ship.

The following services will be available to ships:

- Distress alerting to the Coastguard Maritime Rescue Co-ordination Centre, Falmouth.
- Medical assistance through the Coastguard.
- Medical advice from a hospital.
- Connection with Lloyd's for provision of tugs.
- Connection to the Meteorological Office.
- Telephone connection to the automatic international direct dialling system, with a one-minute minimum charge.
- Telephone connection from the UK by direct dialling.
- Telex connections by automatic international direct dialling shore-to-ship and ship-to-shore.
- Telephone and telex connections between ships.
- Radiotelegrams from ships via Portishead Radio.
- Messages dictated by telephone and forwarded to ships via telex.

Ships can send weather reports and position reports to the US Coast Guard AMVER system by dialling a two-digit code. Facsimile or low-speed data services (up to 24 bit/s) are also available. These services will be vital to the progress of the shipping industry in the years ahead.

Abbreviations and acronyms:

AMVER = Automated Mutual-assistance Vessel Rescue.
Comsat = Communications Satellite Corporation.
Fleetsatcom = Fleet Satellite Communications.
IMCO = Inter-Governmental Maritime Consultative Organization (renamed International Maritime Organization (IMO) on 22 May 1982).
Inmarsat = International Maritime Satellite.
Marisat = Maritime Satellite.

Observations of Dall's porpoise in the North Pacific Ocean

BY CAPTAIN G. A. LANCASTER, MRIN, MNI
(World-Wide Shipping Co., Hong Kong)

Introduction

During the long watch-keeping hours on a ship's bridge, navigating officers are in a position to see a wide and varied selection of animal life. The observations they may make of the patterns of distribution and behaviour of different animals can be a useful source of information for marine biologists.

The following notes are based on observations made by the author and his ship's officers during eight transpacific voyages in the period from 10 February 1981 to 10 September 1981, and form part of a continuing record of all sightings of whales and dolphins (*Cetacea*) from merchant vessels in which he serves.

These 'sighting' records also form a very small part of the information being gathered by D. A. McBrearty of the Department of Anatomy, University of Cambridge in the course of their Dolphin Survey.

Identification

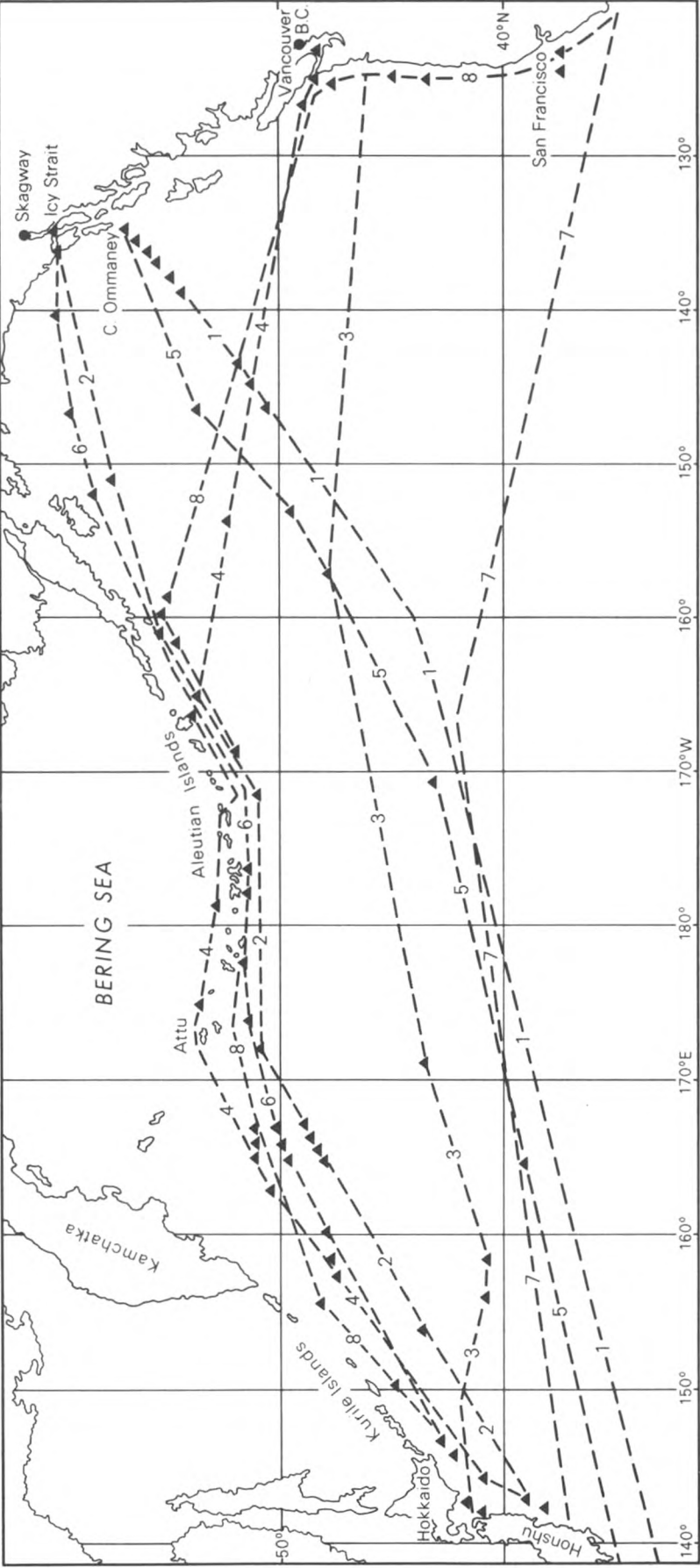
Dall's porpoise (*Phocoenides dalli*) is a small, black-and-white, fast-swimming cetacean found in the colder waters of the northern Pacific Ocean. Adult males reach a length of 2.1 metres and a weight of 145 kilograms. Sexual dimorphism is apparent, males being larger than females. The head is small and does not have a prominent beak but it does have a slight projection of the lower jaw beyond the upper. The rather powerfully built body has a chunky appearance and is topped by a triangular-shaped dorsal fin, slightly forward of the mid-point. The caudal region of the body in front of the flukes has quite distinct dorsal and ventral keels. The colour pattern is dark slate grey to black on the head and dorsal surfaces, and white on the flanks and belly. White areas are also found on the trailing edges of the flukes and dorsal fin. All-black animals and other patterned variants have been reported.

Unlike many other small cetaceans (bottlenose, common and white-sided dolphins etc.), Dall's porpoise does not leap from the water when travelling at speed to intercept a passing vessel, or when playing in a vessel's bow wave.

It approaches the surface at a very shallow angle when breathing and only the blowhole, the dorsal area between blowhole and fin and the fin itself break the surface. The distinctive white colouring of the upper and trailing part of the fin can usually be easily seen, as can the sharp demarcation between the black head and dorsal area and the white lower flanks and ventral area.

The sightings

The accompanying map shows the areas in which sightings of Dall's porpoise were made. From the ship's tracks one can also identify areas where Dall's porpoise were not seen. However, non-sighting is not evidence of a lack of these animals in a given area as one must remember that observations can only be made in daylight and in calm to moderate sea conditions.



▲ Sightings of Dall's porpoise, 1981. Ship's tracks are numbered as follows:

- | | | | |
|---|----------------------------------|---|--------------------------------------|
| 1 | 27/1 to 12/2, Japan to Alaska. | 5 | 14/5 to 27/5, Japan to Alaska. |
| 2 | 14/2 to 27/2, Alaska to Japan. | 6 | 29/5 to 10/6, Alaska to Japan. |
| 3 | 9/3 to 25/3, Japan to USA. | 7 | 1/7 to 15/7, Japan to USA. |
| 4 | 8/4 to 23/4, Vancouver to Japan. | 8 | 16/8 to 10/9, USA & Canada to Korea. |

Dall's porpoise, owing to their low breathing profile, are less easily sighted than many other cetaceans. Leaping bottle-nosed dolphins have been observed from a ship's bridge, with height of eye of 17 metres, at a distance of 2.8 n. mile ascertained by radar. It would seem that observations of small cetaceans which leap from the water are limited to a semicircle of about 3 n. mile radius forward of a line at right angles to the vessel's course, as watch-keeping officers on today's ships only very occasionally look behind. The inconspicuous Dall's porpoise, with its small flurry of water as the dorsal fin breaks the surface, is unlikely to be seen at greater than three-quarters of a nautical mile in the most favourable weather conditions. In bad weather one would be fortunate to notice this flurry of water at more than a cable.

Sea conditions at time of observation of Dall's porpoise, during the period under review, are shown below.

	Sea condition				
	Very rough	Rough	Moderate	Slight	Calm
Number of sightings:	1	7	14	24	19
Total sightings: 65					
Total number of Dall's porpoise seen: more than 1067.					

Although the time span covered by the observations is 7 months, only 110 days of that time were actually spent at sea. The details of the voyages are as follows:

Miike, Japan to Skagway, Alaska:	27 January to 12 February.
Skagway to Onahama, Japan:	14 February to 27 February.
Miike to Aberdeen, Wash., U.S.A.:	9 March to 25 March.
Vancouver, B.C. to Hakodate, Japan:	8 April to 23 April.
Kasado, Japan to Skagway:	14 May to 27 May.
Skagway to Onahama:	29 May to 10 June.
Nagoya, Japan to Los Angeles:	1 July to 15 July.
Los Angeles to Vancouver and thence to Korea:	16 August to 10 September.

Voyages in a westward direction (i.e. from North America towards Japan), all passed through the Bering Sea or close south of the Aleutian Islands. Voyages in the opposite direction passed further south.

From the map it will also be noted that the ship's tracks show passages through a number of areas on more than one occasion at different times during the period under review. No evidence arose to suggest that, because Dall's porpoise were seen in a given area, sightings could be expected on subsequent passages through the same area. There would, however, appear to be one exception to this and that is in the area between Attu Island and the Kurile Islands. On each of the four passages through this area (100 n. mile radius from 50°N, 167°E) groups of up to 50 Dall's porpoise were seen. This area would be about 300 n. mile from the nearest land.

The lowest latitudes in which Dall's porpoise were sighted were as follows:

Western Pacific:	36° 15' N on 28 April, i.e. 35 n. mile off Inubo Saki, Japan.
Central Pacific:	38° 43' N on 20 May, i.e. 650 n. mile south of Aleutians.
Eastern Pacific:	37° 27' N on 18 August, i.e. 28 n. mile off San Francisco.

Groups of more than 40 were seen on 5 occasions. Groups of between 15 and 39 were seen on 17 occasions. On only 2 occasions was a solitary Dall's porpoise seen.

The largest groups were seen on:

11 February, 60 n. mile south-west of Cape Ommaney in the Alaska Panhandle, when more than 150 were seen, and

28 April, 35 n. mile north-north-east of Inubo Saki, Honshu, Japan, when more than 180 were seen.

From a total of 65 sightings, 21 (32.3 per cent) were over 200 n. mile from land. The furthest sighting was 750 n. mile from the nearest land.

All the sightings, even those in Icy Strait and the Lynn Canal, were in depths in excess of 100 fathoms.

The range of sea temperature was from 0 °C, between the Aleutians and the Kuriles in April, to 15 °C off San Francisco in August.

Behaviour

The Dall's porpoise shows little fear of ships and readily approaches to observe and investigate the vessel. They have been observed 'bow-riding' (i.e. swimming in the pressure wave ahead of the vessel's bow) but this was not the most commonly observed behaviour. They were most frequently seen swimming in the bow wave which spreads out on each side of the ship in a widening vee, the most preferred position being about one-quarter of the ship's length abaft the bow and about 15 metres out from the ship's side.

They were also frequently observed swimming alongside and very close to the ship. Observations of other small cetaceans tend to show a preference for the closest approach to be in the bow area, with distance from the vessel increasing in proportion to the distance from forward, perhaps indicating some fear of the propeller. This is not the case with Dall's porpoise. A number of observations were made when large adult animals would approach very close to the propeller, (as near as 3 to 5 metres), swim quickly forward, close to the ship's side, thence curving outwards and returning to the propeller area—my officers often writing in the record 'investigating prop.' or 'racing alongside ship'. It was noted that smaller animals tended to stay further from the ship than the larger adults. At such close quarters the very distinctive black and white colouring was plainly seen. It was also noted that all the animals seen at such close range had a very clearly defined white band along the upper trailing edge of the fluke.

Speed

The behaviour of swimming close alongside for up to several minutes allowed an attempt to determine the speed at which the animals were swimming. On two occasions, 5 July and 31 August, large adult Dall's porpoise were timed by stop-watch swimming forward from abreast the bridge to a point 85 metres along the main deck. As the speed of the ship at the time of observation was 13 knots and the stop-watch times were 9.5 seconds and 9.1 seconds respectively this would put the speed through the water in the region of 31 knots! This speed seems unbelievably high and the author is awaiting an opportunity for further checking. As this short burst of speed was attained in the disturbed and uncertain currents from the vessel's bow wave the outcome may have been affected by factors unknown to the author.

True's porpoise

In view of the author's awareness that controversy exists over the status of True's porpoise, all sightings have been considered as Dall's. On four occasions,

however (three in April and one in September), all off the north-east coast of Japan, groups of from 10 to 25 porpoises were observed which, whilst retaining the same general appearance as Dall's, were seen to be in some respects different. An absence of white colouring on the fin and a pronounced backward curve to the fin together with a larger expanse of white on the lower flanks extending further forward than in those Dall's seen elsewhere, were the main differences.

Acknowledgements

My thanks go to Mr D. A. McBrearty who suggested the compilation of this paper and for his comments on it, and also to the watch-keeping officers of several ships in the fleet of World-Wide Shipping of Hong Kong, who have cheerfully tolerated 'the Old Man's eccentricity' and willingly helped with the observations.

REFERENCES

- | | |
|-----------------|---|
| Morejohn, V. G. | 1979 The natural history of Dall's porpoise in the North Pacific Ocean. <i>In</i> 'Behaviour of Marine Animals (H. E. Winn and B. L. Olla, eds), Vol. 3, Cetaceans. New York, Plenum Press. |
| Nishiwaki, M. | 1972 General biology. <i>In</i> 'Mammals of the Sea: Biology and Medicine' (S. H. Ridgway, ed.). Springfield, Ill., C. C. Thomas. |

SPECIAL LONG-SERVICE AWARDS

Each year since 1948 the Director-General of the Meteorological Office has made special awards to the four voluntary marine observers whose long and zealous work on behalf of the Meteorological Office is considered as deserving special recognition.

All officers who have sent us meteorological records in 15 or more years, and who have compiled at least one meteorological logbook in the previous year, come within the orbit of the special award scheme and each year their personal cards are brought out and scrutinized. Consideration of the length of their service combined with the quality of their records effectively forms them into an order of merit.

This year the Director-General is pleased to make the special awards to the following shipmasters:

1. CAPTAIN H. C. HYNARD, P. & O. Deep Sea Cargo Division, who sent in his first meteorological logbook from the *Baron Fairlie* (H. Hogarth & Sons Ltd) in 1953. Since then Captain Hynard has provided us with 44 meteorological logbooks during his 23 years observing for us.
2. CAPTAIN F. S. ANGUS, P. & O. Deep Sea Cargo Division, whose first meteorological logbook was received here in 1947 from the *City of Khartoum* (Ellerman Hall Line) and who has subsequently provided us with 50 meteorological logbooks during his 23 years of observing.

3. CAPTAIN J. W. WALDIE, Bibby Line Ltd, who sent us his first meteorological logbook from the *Leicestershire* in 1952. Since then we have received 36 meteorological logbooks bearing his name during the course of 20 years observing for us.
4. CAPTAIN R. J. BLAND, Overseas Containers Ltd, whose first meteorological logbook was received here in 1951 from the *Alcantara* (Royal Mail Lines) and who has subsequently provided us with 37 meteorological logbooks during his 22 years of observing.

As in past years, the award will be in the form of a suitably inscribed barograph and we congratulate these four shipmasters on this recognition of many years voluntary meteorological work at sea. Each of them has been personally notified of the award and of the arrangements which will be made for its presentation.

C.R.D.

AURORA NOTES JANUARY TO MARCH 1982

By R. J. LIVESEY

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

Marine observations of the aurora for the period are shown in the accompanying table.

January was a very quiet month while much cloud hampered visual observers. A multiple rayed arc was noted north of Oslo on the 3rd. Glows were reported by the Dutch weather ship *Cumulus* at station Lima on the 21st and by the *British Trident* west of Scotland on the 23rd. Rays and glows were again reported north of Oslo on the 27th while the *Flinders Bay* noted rayed arcs and bands together with ray structures to the south of New Zealand. No reports of radio auroral effects were received but stormy magnetic conditions were found on the 21st, 29th, 30th and 31st of the month when the planetary magnetic index K_p rose above 5 in value.

Marine Aurora Observations January to March 1982

DATE 1982	SHIP	GEOGRAPHIC POSITION	TIME (GMT)	FORMS
22 Jan. ..	<i>Cumulus</i> ..	57° 00' N 19° 30' W ..	0300-0600 ..	qHG
24 ..	<i>British Trident</i> ..	59° 42' N 05° 00' W ..	0200 ..	G
31/1 Feb. ..	<i>Flinders Bay</i> ..	45° 43' S 171° 43' E ..	2315-1145 ..	G, mR, RA, HB, G, mR, RB
1 ..	<i>C.P. Voyageur</i> ..	37° 20' S 99° 50' E ..	1800-1830 ..	G, RA
2 ..	<i>Flinders Bay</i> ..	47° 24' S 150° 50' E ..	1300- ..	G, mR, CmRR
4 ..	<i>Cumulus</i> ..	56° 00' N 18° 35' W ..	2015-2035 ..	qfSG, p ₁ R, B
14 ..	<i>Iron Endeavour</i> ..	38° 45' S 148° 10' E ..	1140-1155 ..	G, RG, RA
22 ..	<i>Abbey</i> ..	67° 40' N 11° 30' E ..	2100- ..	RA
23 ..	<i>Abbey</i> ..	64° 20' N 06° 30' E ..	2300 ..	hA, RA, P
2 Mar. ..	<i>Starella</i> ..	56° 06' N 20° 07' W ..	0041-0545 ..	qRB, a ₄ CB, qP, qRmP
2 ..	<i>Assiniboine</i> ..	51° 40' N 01° 20' W ..	0430-0530 ..	mRR
2 ..	<i>Singularity</i> ..	51° 05' N 04° 33' W ..	0520-0540 ..	G, RA
2 ..	<i>Matco Avon</i> ..	59° 30' N 01° 21' E ..	2200-2330 ..	CRR
16 ..	<i>Frederick Russell</i> ..	58° 31' N 10° 38' W ..	2245 ..	RB
17 ..	<i>Frederick Russell</i> ..	59° 44' N 10° 03' W ..	2330 ..	HA, RA
17 ..	<i>Canadian Explorer</i> ..	48° 21' N 69° 10' W ..	0328-0350 ..	RA, HA

KEY: A=arc, a=active, B=band, C=corona, f=fragmentary, h=homogeneous, m=multiple, P=patch, p₁=flaming, q=quiet, R=rayed, RR=ray structures, S=surface.

February was much more active and the month began with isolated reports of ray structures and active storms from both hemispheres on the 1st and 2nd. The *Flinders Bay* reported a corona between Stewart Island and Tasmania. On the 4th, 5th and 6th arcs and ray structures were seen by the weather ship at station Lima and by a land observer in Orkney. On the 7th pulsating homogeneous patches were recorded from central Scotland. There was a period of considerable activity between the 11th and 14th when glows, arcs, rayed arcs and general activity were visible from the Scottish Border northwards. On the 14th a corona was recorded over Galway and there were homogeneous arcs over Northumbria as well as other activity. Further rays and arcs were visible in Orkney on the 17th and 18th, with active rays, rayed arcs and veils in Norway on the observing site north of Oslo, where similar events took place on the 21st and 23rd, reported also from south Finland. From 25th to 27th rayed arcs and ray structures appeared to the observer in Orkney. Radio aurorae were reported on the 2nd, 4th, 6th, 10th, 11th, 13th, 14th, 16th, 17th and 22nd. The Earth's magnetic field remained highly disturbed for the entire month with particularly high storm conditions on the 1st, 2nd, 4th, 5th, 6th, 10th, 11th, 12th, 13th, 14th, 22nd, 25th, 26th and 27th.

On the evening of 1 March there began a massive auroral storm clearly visible from the English Channel northwards. The accompanying diagram indicates the geographical and temporal distribution of auroral forms. Coronal structures were manifest in central Scotland and down into the English Midlands. Four ships contributed to the observations. All-sky auroral coverage was recorded at Inverness as the auroral oval expanded southwards, while on occasions observers at that latitude were having to face southwards to observe auroral forms.

Corona was seen at Orkney on 2 March with rayed arcs on the 3rd and 4th. Further isolated reports of arcs and rayed arcs came from Orkney and the North of Scotland on the 8th, 16th, 21st, 22nd, 27th, 29th and 30th. Radio aurora reports have been received only for 1, 2 and 31 March. The magnetic field was much quieter and stormy conditions with K_p above 5 in value were observed only on the 1st, 2nd and 22nd of the month. The magnetic storm of 1 February appears to have repeated itself on 1 March after one revolution of the Sun, which brought the active region on the solar surface into the same relative position with respect to the Earth. At that time the Sun was liberally sprinkled with active sunspot groups.

(In the foregoing paragraphs the dates refer to the evening of the storm night.)

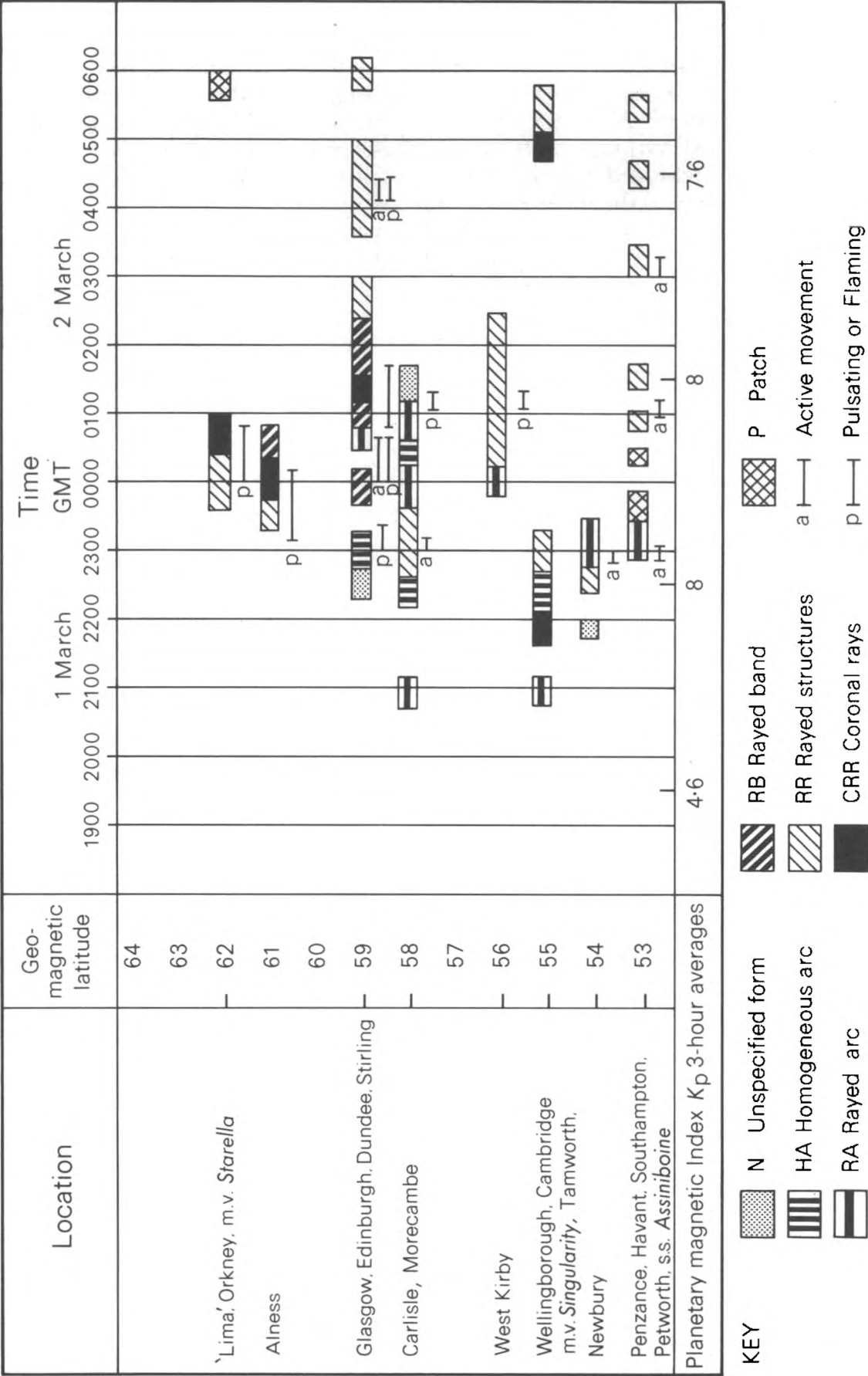
It might be of interest to note that whereas the classical aurora comprising the auroral zone and its equatorward extension during storm conditions is relatively well known, other auroral conditions are becoming apparent, especially as the result of studies with the aid of artificial earth satellites. The marine observer may encounter some of these conditions although they present difficulties in observation.

The classical aurora is bright and discrete, that is to say, it has structure and form. The mantle, or diffuse aurora as it is more recently termed, comprises weak unstructured auroral light found either in conjunction with discrete forms or on the equatorward side of the diffuse forms. The diffuse aurora, albeit faint, when aggregated together emits as much light as the concentrated discrete forms. Both forms appear together and it is possible that auroral absorption of radio transmissions may be associated with high ionization related to the diffuse aurora.

It has also been reported that detached auroral arcs have appeared about 10 to 12 hours after the peak of a magnetic storm. These have been detected by satellites in the evening skies but are fainter than the diffuse aurora, weakening towards their eastern ends. They do not co-rotate with the Earth.

Oval-shaped patches have been detected in the evening and morning skies

Plot of observations received for Auroral storm on night of 1–2 March 1982



after magnetic storms. They are said to be brighter than the detached arcs and co-rotate with the Earth. It is likely that the arcs and patches may be related to ionized particles left behind as the main auroral storm retreats poleward after maximum activity.

The mid-latitude aurora, known also as the stable auroral red arc, appears at the same time as auroral activity in high latitudes, especially when the planetary magnetic K_p index is 5 or more. The arc may be several hundred kilometres in meridional width and is caused by low-energy particles at high altitude, hence the red colour. The arc encircles the Earth in the 40° latitudes. The light is more in the nature of an airglow.

The true airglow is faint diffuse light caused by the release at night in the upper atmosphere, by atomic particles, of energy which has been stored from sunlight during daylight hours by photochemical processes. It is not auroral in form although the colours are similar. Were the light of the airglow to be concentrated it would be found to be the brightest source of light in the night sky including the stars themselves. Airglow is unstructured and appears at all latitudes.

ICE CONDITIONS IN AREAS ADJACENT TO THE NORTH ATLANTIC OCEAN FROM JUNE TO AUGUST 1982

The charts on pages 44 to 46 display the actual normal ice edges (4/10 cover), sea-surface and air temperatures and surface-pressure anomalies (departures from the mean) so that the abnormality of any month may be readily observed. (The wind anomaly bears the same relationship to lines of equal pressure anomaly as wind does to isobars. Buys Ballot's law can therefore be applied to determine the direction of the wind anomaly.) Southern and eastern iceberg limits will be displayed during the iceberg season (roughly February to July). In any month when sightings have been abnormally frequent (or infrequent) this will be discussed briefly in the text.

The periods used for the normals are as follows. Ice: 1966-75 (Meteorological Office). Surface pressure: 1951-70 (Meteorological Office). Air temperature: 1951-60 (US Department of Commerce, 1965). Sea-surface temperature: area north of 68°N, 1854-1914 and 1920-50 (Meteorological Office, 1966), area south of 68°N, 1854-1958 (US Navy, 1967).

JUNE

The main feature was for higher than normal pressure over southern Greenland. Over much of the Barents and Kara seas the anomaly for colder than usual easterly winds resulted in ice remaining south of its usual position. The polynya south of Franz Josef Land was much more extensive than normal. Ice conditions off east Greenland were near normal. Over south-eastern Canada there was some anomaly for south-easterly winds. Break-up was earlier than usual in Hudson Strait and in the south-eastern parts of Hudson Bay. However, over north-western Hudson Bay and in Baffin Bay the overall tendency was for some excess of ice.

JULY

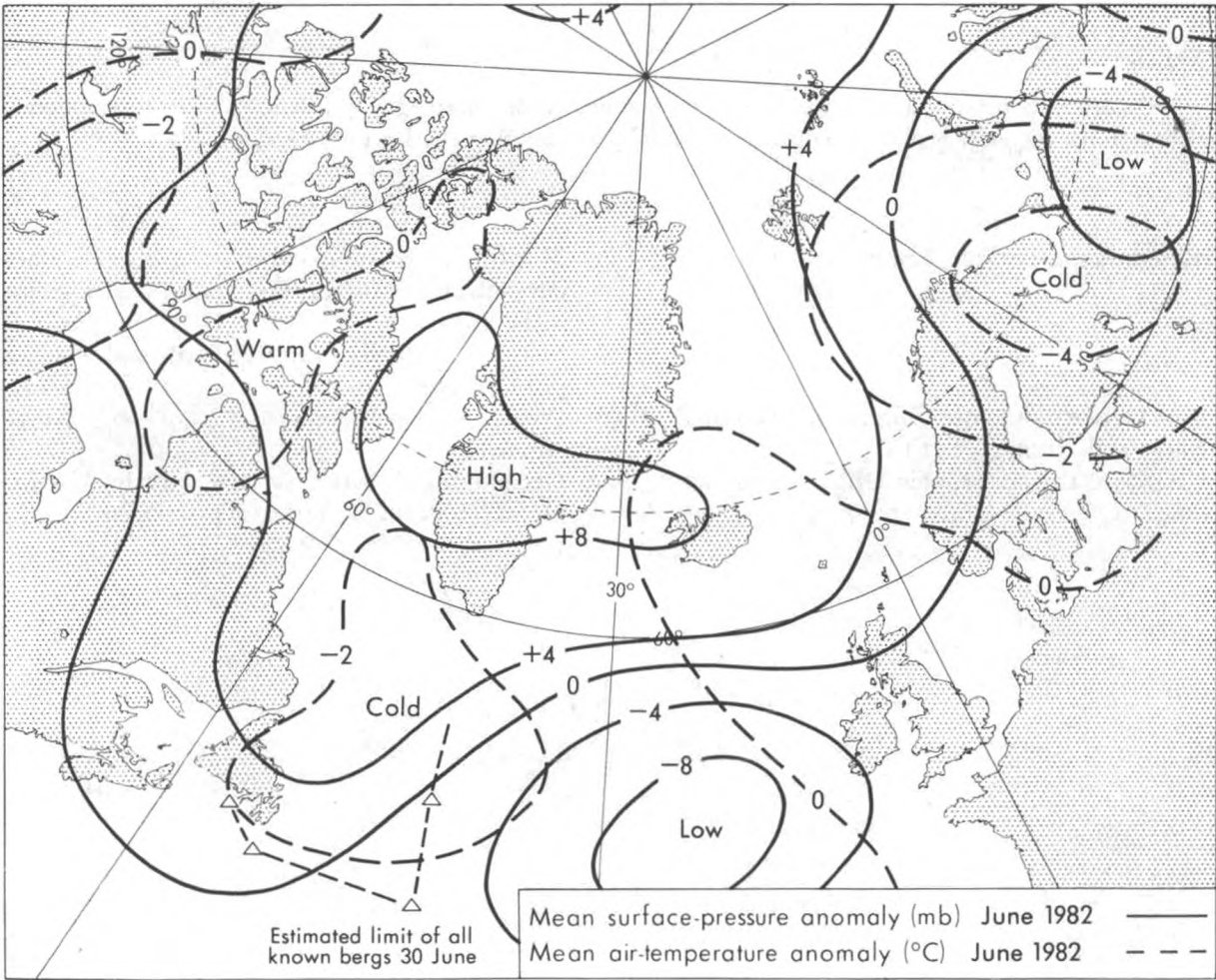
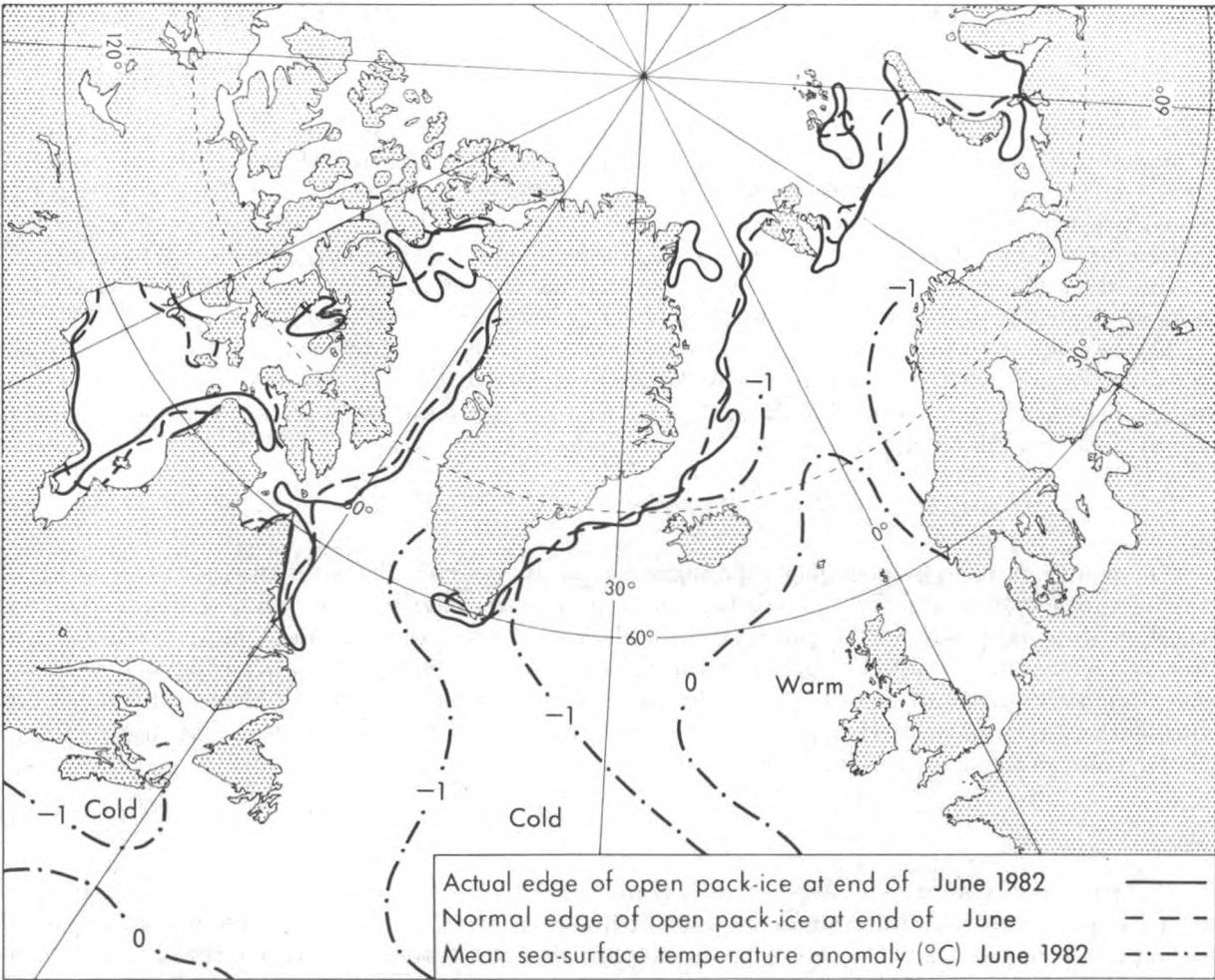
The pattern of sea ice anomaly was rather complex and some features cannot be readily explained by pressure and temperature anomalies which, however, were rather small. There was a marked deficit of ice in the Kara Sea. Ice over the Barents Sea and through Denmark Strait was slow to clear. West of Greenland the general tendency was for break-up to be somewhat earlier than usual.

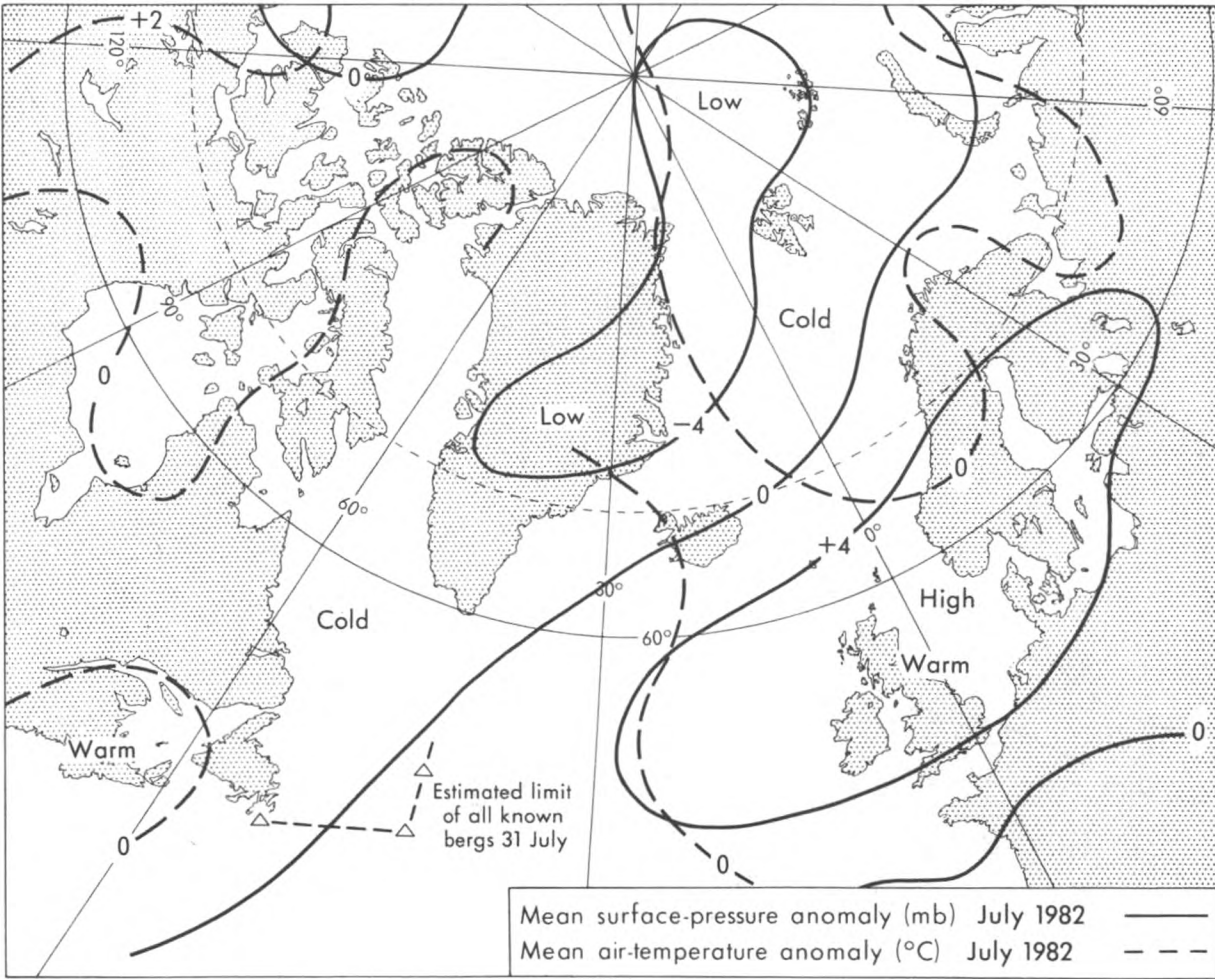
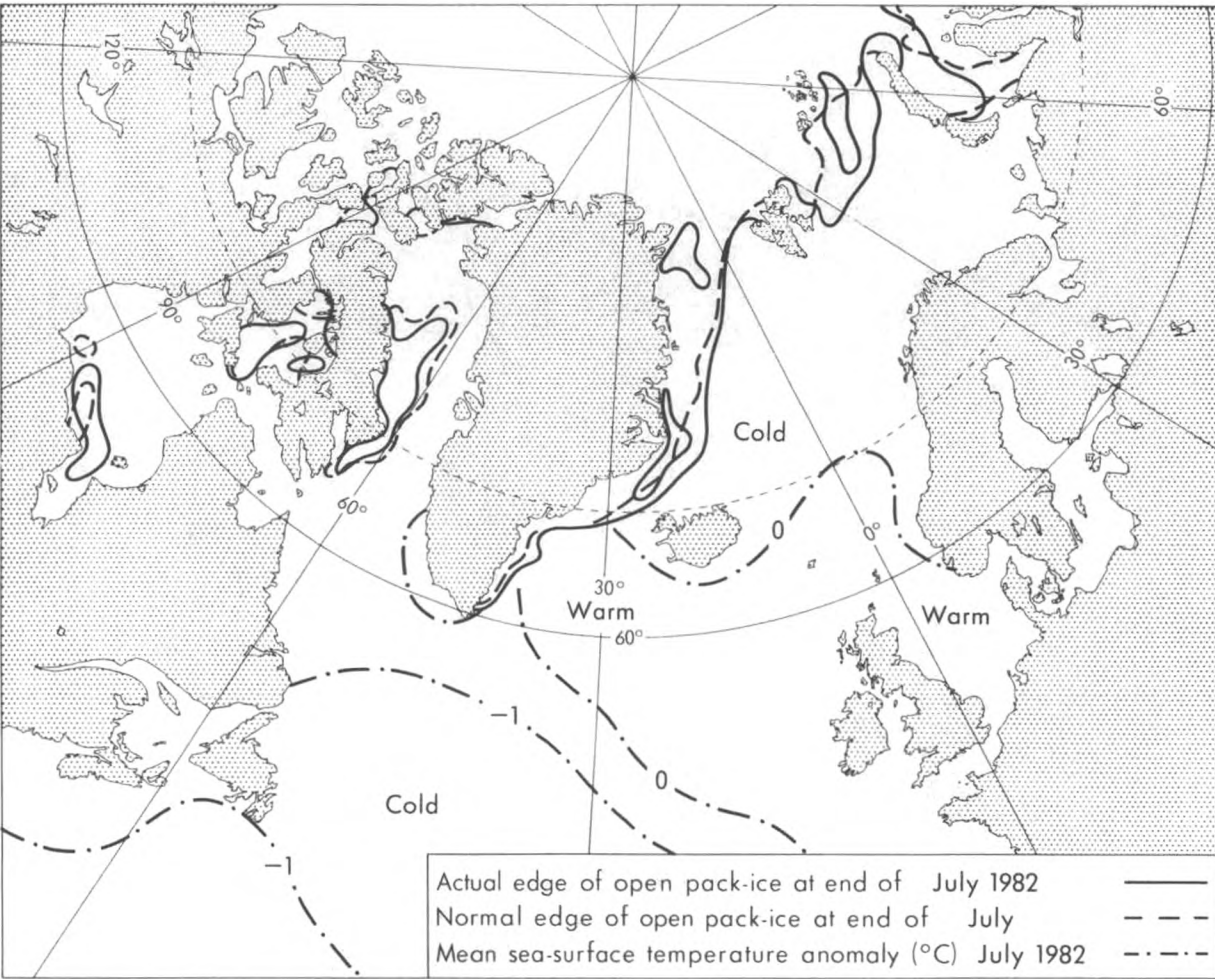
AUGUST

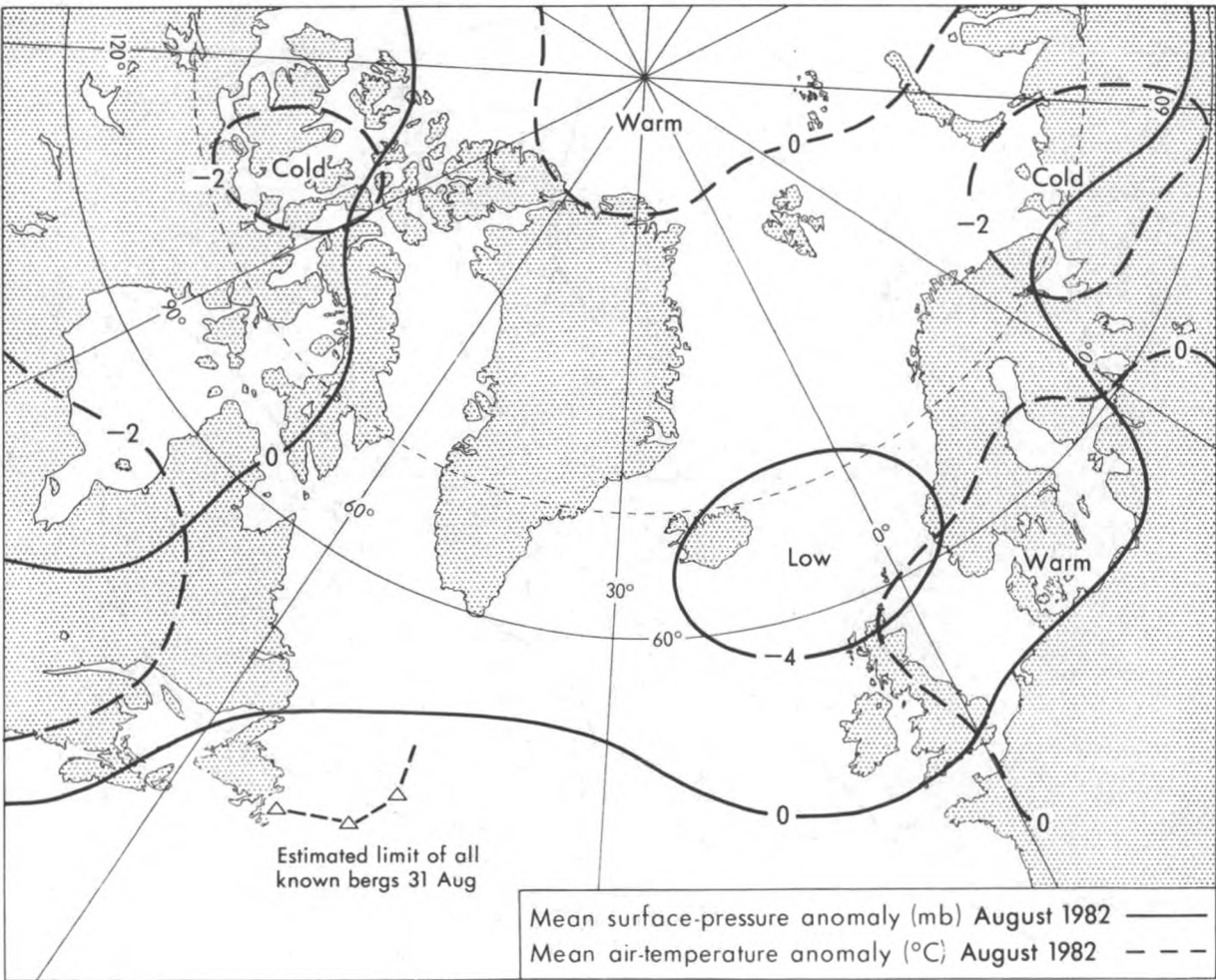
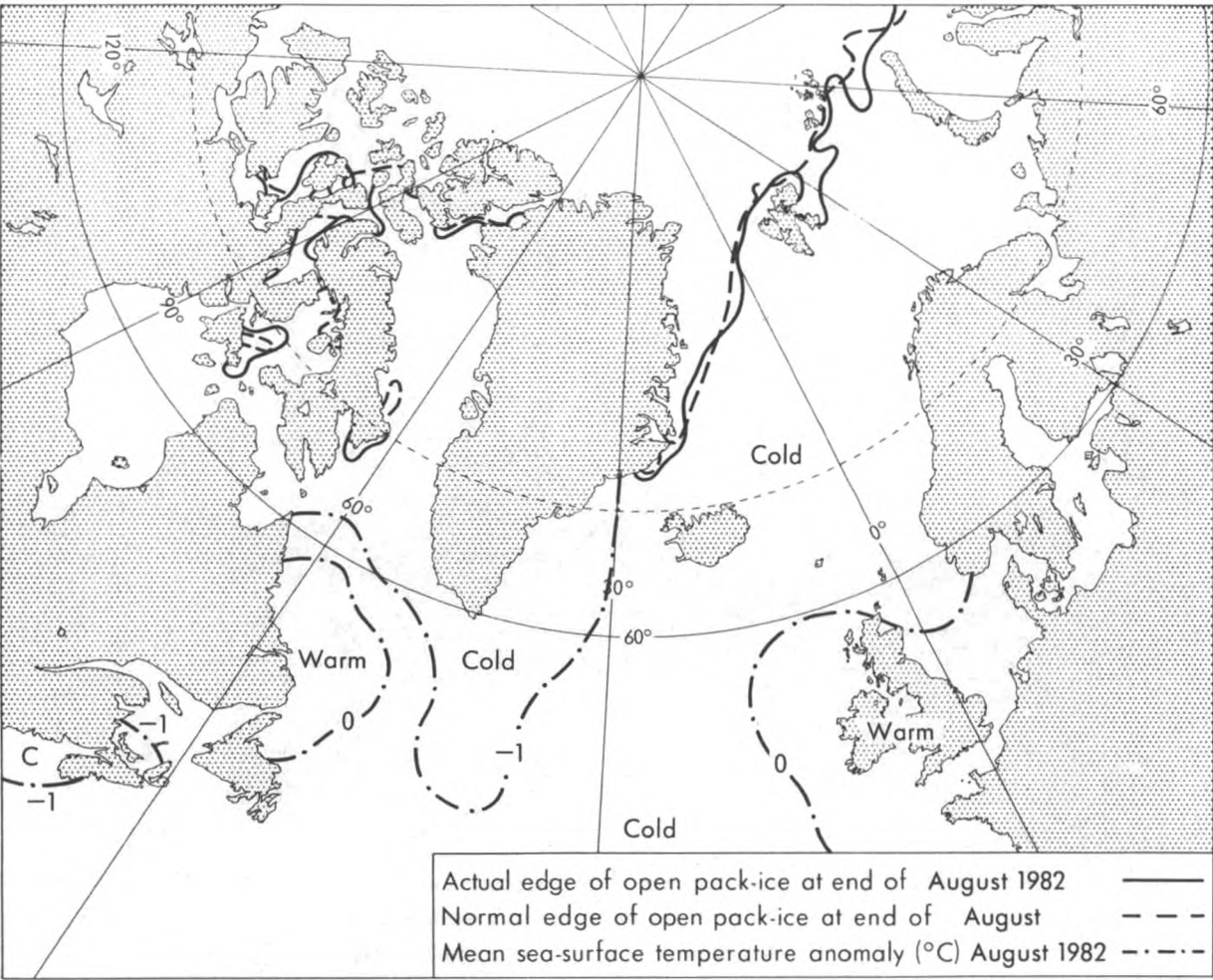
Pressure and temperature anomalies were again rather small. Ice conditions were near normal although the ice edge remained south of its usual position over the Barents Sea.

REFERENCES

- | | |
|--|--|
| Meteorological Office, London | 1966 Monthly meteorological charts and sea surface current charts of the Greenland and Barents Seas. |
| | — Sea ice normals (unpublished) and various publications. |
| US Department of Commerce Weather Bureau, Washington, D.C. | 1965 World weather records, 1951-60. North America. |
| US Naval Oceanographic Office, Washington, D.C. | 1967 Oceanographic atlas of the North Atlantic Ocean, Section II: Physical properties. |







VALEDICTION

The Marine Observer was first published under the editorship of Captain L. A. Brooke Smith, RD, RNR, in 1924. My predecessor Commander C. E. N. Frankcom, OBE, RD, RNR (Ret'd), followed immediately in his wake. I have therefore been only the third editor within a period of 58 years. My term of office has been relatively short, covering some 13 years, but I have always been greatly impressed by the interest shown by those at sea, and many ashore, in this small quarterly journal and very pleased by the valuable contributions our marine observers have made, providing so much detail of unusual phenomena, tropical cyclones, birds, cetacea, aurora and many other interesting matters they encountered at sea. As editor it has been my pleasure to publish them and by the time this number is issued I shall have retired both as editor and also as Marine Superintendent of the Meteorological Office.

I should like to thank all those who have contributed to *The Marine Observer* and the Masters, Deck Officers, Radio Officers and Cadets, numbering several thousand, who have so willingly made meteorological observations which contribute not only to the safety of life at sea but also to many other aspects of work encouraged by the World Meteorological Organization.

During my time in post shipping has changed dramatically. We in the Marine Division of the Meteorological Office, Port Meteorological Offices and the World Meteorological Organization have endeavoured to see that the meteorological requirements of shipping have been met and I believe some success has been achieved. I also hope that this journal has helped in retaining a bond between mariners and meteorologists.

Farewell and 'bon voyage'.

G.A.W.

Personalities

OBITUARY.—It was with great regret that we learned of the death of **LIEUTENANT COMMANDER L. B. PHILPOTT, DSC, RD, RNR (Ret'd)** on 7 August 1982.

Leslie Benjamin Philpott ('Joe' to his colleagues and many friends) was a Nautical Officer in the Marine Division of the Meteorological Office for over 23 years until he retired on 3 July 1974. Full details of his career at sea in Port Line and the Royal Navy and ashore appeared in the October 1974 edition of this journal. However, he will be remembered by Voluntary Marine Observers for the many editorials and articles which he wrote for this journal and for his letter of thanks for each and every meteorological logbook that passed through his hands. During the course of 23 year's service in this office, he must have examined about 27 000 meteorological logbooks—enough, he calculated, to stretch from the Royal Docks to Greenhithe Pier if placed end to end. He was a Liveryman of the Honourable Company of Master Mariners and a Freeman of the City of London.

We extend our condolences to his widow and family.

RETIREMENT.—**MR S. A. WHITE**, Radio Officer, retired last July after serving at sea for 37 years.

Sydney Annsley White was born in February 1924. He joined the Marconi International Marine Company in April 1943 as an Assistant Radio Officer with a special war-time certificate. He served without mishap until May 1946 when his services with Marconi were terminated as his certificate had become invalid.

He subsequently obtained a 2nd Class Certificate and rejoined Marconi in January 1948, remaining with them for the rest of his career. He served continuously as Radio Officer aboard the *Port Invercargill* from March 1959 to August 1972 and on board the *Avon Forest* from March 1974 to July 1982.

We received the first meteorological logbook bearing Mr White's name from the *Port Invercargill* in 1960. Since then he has sent us a further 27 logbooks and he received Excellent Awards in 1960, 1969, 1970 and 1971.

We wish him a long, healthy and happy retirement.

RETIREMENT.—MR P. MANNION, Radio Officer, retired last September after serving 32 years at sea.

Patrick Mannion was born in May 1925 in Aughlacloy, Co. Tyrone. He joined Marconi International Marine Company in June 1950 and remained with them for the whole of his career. Since June 1958, Mr Mannion has served exclusively on vessels owned by Ben Line, amongst which he completed 28 voyages on board the *Benavon* between January 1959 and January 1970. His last appointment was to the *City of Edinburgh* in the early part of last year.

Mr Mannion sent us his first meteorological logbook from the *Benavon* in 1965. Since then we have received a further 35 logbooks bearing his name. He received Excellent Awards in 1975, 1978 and 1979.

We wish him a long and prosperous retirement.

Notices to Marine Observers

WEATHER MESSAGES

As and from 5 January 1983, please insert your vessel's Call Sign as the first Group in the text of the Weather Message on the Metform 139 that you hand in to your Radio Officer. This Group must stand on its own. Do NOT endeavour to combine it with the next group to form a 10-character group.

DISCOLOURED OR BIOLUMINESCENT SEA WATER SAMPLES

The Institute of Oceanographic Sciences and the Marine Biological Association have decided to discontinue providing jars and formalin for preservation of water samples. Instead they have issued the following instructions for the preservation of these samples.

1. Samples taken without any preservative are usually useless as all the organisms will decay in transit.
2. Samples (of about 100 ml of sea water) may be preserved in:
 - (a) Formaldehyde: final concentration in the sample should be about 2 per cent. 'Formalin' is a solution of formaldehyde and has a maximum concentration of 40 per cent formaldehyde; a 2 per cent solution of formaldehyde therefore is the same as 5 per cent 'formalin'. The preserved sample should smell of formaldehyde.
 - (b) Alcohol: industrial alcohol (adulterated methanol) and pure methanol or ethanol are equally effective. If the pure alcohol is not available any clear spirit (gin, vodka, white rum etc.) will do almost as well. A 50 per cent solution by volume should be used. Any slight cloudiness of the final sample can be ignored.

(c) Iodine: add enough to give a weak tea colour. Large animals are less well preserved by this method but it is good for discoloured water samples.

The sample is best kept in the dark. In all cases the sample must be adequately mixed with the preservative, the bottle tightly sealed and clearly labelled.

(Note. Tins or metallic containers should not be used for these or any other samples or specimens preserved by these means.)

Fleet Lists

Corrections to the list published in the July 1982 edition of *The Marine Observer*.

Information regarding these corrections is required by 30 September each year. Information for the July lists is required by 31 March each year.

GREAT BRITAIN (Information dated 20.9.82)

The following coasting vessels ('Marid' ships) have been recruited:

NAME OF VESSEL	MASTER	OWNER/MANAGER
<i>Dallington</i>	R. Thompson	Stephenson Clarke Shipping Ltd
<i>Washington</i>	G. B. Panes	Stephenson Clarke Shipping Ltd

The following vessels have been deleted:
Cairnfreighter, Esso Severn, Mole Venture, Whitegate.

GREAT BRITAIN (contd)

The following ships have been recruited as Selected or Supplementary ships:

NAME OF VESSEL	DATE OF RECRUITMENT	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Ajax</i> ..	17.8.82	J. B. Hughes	M. S. Finn, J. McGregor	..	Ocean Transport & Trading P.L.C.
<i>B.P. Harrier</i> ..	7.4.82	A. P. C. Hill	S. Jesson, M. Thompson	..	B.P. Oil Ltd
<i>British Resource</i> ..	—9.82	..	..	..	B.P. Shipping Ltd
<i>British Wye</i> ..	13.7.82	D. M. Rundle	G. Cleary, A. G. Bagley, F. W. Abernethy	..	B.P. Shipping Ltd
<i>Broompark</i> ..	13.4.82	D. Dickson	I. Watson, D. Thompson, R. Lamb	..	J. & J. Denholm Ltd
<i>Cape Finisterre</i> ..	14.6.82	W. Andersen	M. Barker, C. Williamson, N. Brewer	..	Scottish Ship Management Ltd
<i>Cast Kittiwake</i> ..	19.7.82	C. M. Schiller	..	..	J. & J. Denholm Ltd
<i>Farnes</i> ..	12.7.82	A. Gatt	I. Herbert, A. Farthing, D. Platt	..	Jebsens (U.K.) Ltd
<i>G. A. Walker</i> ..	20.4.82	J. B. Jones	J. Evans, R. Williams, R. Barber	..	Canadian Pacific Steamships Ltd
<i>Isomeria</i> ..	20.4.82	N. Brooks	C. Spink	..	B.P. Shipping Ltd
<i>Lagos Palm</i> ..	18.3.82	D. Nicol	— Scott, — McKay, J. Grisdale	..	Shell Tankers (U.K.) Ltd
<i>Lima</i> ..	19.8.82	R. Vinton	A. Peden, I. Haffenden, R. Ellesmoor	..	Palm Line Ltd
<i>London Spirit</i> ..	—6.82	B. Wilkinson	A. D. Lowery, D. R. Wood, G. Cable	..	Shell Tankers (U.K.) Ltd
..	30.6.82	E. G. Humby	J. Peters, F. R. Samford, B. C. Watkins	..	London & Overseas Freighters P.L.C.
<i>Mahsuri</i> ..	13.8.82	G. E. Round	G. Varghese, J. D. Willis-Richards, A. Z. Osman	..	Blue Star Line Ltd
<i>Mandama</i> ..	5.5.82	J. D. Igoo	N. M. Hope-Inglis, K. G. Warmisham, B. M. Truran	..	Blue Star Line Ltd
<i>Matco Clyde</i> ..	23.4.82	P. J. Chambers	N. J. Cooke, N. A. Abbott, J. M. L. Ramage	..	Mobil Shipping Co. Ltd
<i>Meynell</i> ..	14.7.82	M. Hicks	E. O. Morris, D. Warren, J. W. Gill	..	P. & O. S.N. Co.
<i>Northia</i> ..	12.8.82	C. G. Scarf	M. J. Honey, M. J. H. Cronie, P. M. Hudson, L. J. Twynholm	..	..
<i>Pacific Challenge</i> ..	16.6.82	R. I. G. Calder	D. A. Duance, C. Spencer-Payne, A. Hamhill	..	Shell Tankers (U.K.) Ltd
<i>Pacific Courage</i> ..	31.5.82	P. Barry	W. Tobolewski, G. Leggett, E. Evans	..	Furness Withy (Shipping) Ltd
<i>Pacific Peace</i> ..	1.3.82	E. W. Foxworthy	J. D. Gray, R. Wooding, M. Vansdowne	..	Furness Withy (Shipping) Ltd
<i>Pacific Prestige</i> ..	2.7.82	A. Jones	D. Pritchard, J. Nutter, R. Palmer	..	Furness Withy (Shipping) Ltd
<i>Port Hawkesbury</i> ..	13.9.82	G. Wright	M. Heffer, D. Westwaton, M. Kneen	..	Furness Withy (Shipping) Ltd
<i>Rangaitira</i> ..	26.5.82	P. Liddell	R. Paterson, R. Venables, P. Brown	..	Canadian Pacific Steamships Ltd
<i>Sapele</i> ..	7.12.81	A. J. Milmine	A. J. Houghton, I. D. MacPherson, G. K. Thompson	..	Blue Star Line Ltd
<i>Seagair</i> ..	26.7.82	J. B. Gorrie	M. Smith, G. Gardiner	..	Ocean Transport & Trading P.L.C.
<i>Security</i> ..	29.7.82	A. McKinnon	J. Y. Dymock, S. Bean	..	B.P. Shipping Ltd
<i>Sekondi</i> ..	7.7.82	H. McCole	H. J. Houghton, A. F. Vincent, L. Aye-Maung	..	F. T. Everard & Sons Ltd
..	..	..	..	..	Ocean Transport & Trading P.L.C.

GREAT BRITAIN (contd)

The following ships have been recruited as Selected or Supplementary ships:

NAME OF VESSEL	DATE OF RECRUITMENT	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
Swiftnes	28.4.82	C. Thompson	M. Monday, S. Comfort, M. Court	S. Smith	Jebsens (U.K.) Ltd
Tanjong Tokong	3.12.81	D. T. White	K. Y. Yong, Y. W. Leong, A. Shukor Ahmad	R. Napatupulu	Scottish Ship Management Ltd
Tectus	20.8.82	R. J. Williams	A. Comrie, D. Inverarity, M. Stickley, S. Barber	A. Bellamy	Shell Tankers (U.K.) Ltd
Tog Mor	10.8.82	J. Suddes	G. Patience		Howard Doris Marine Services Ltd
Tor Bay	26.7.82	P. J. Clark	D. P. Crowley, D. Tracey, S. E. Bligh	P. I. Pegg	Overseas Containers Ltd
Troll Maple	14.5.82	L. J. J. Figueiredo	N. S. Satpute, J. S. Randhawa, D. Bhardwaj	A. K. Desai	J. & J. Denholm Ltd
Troll Viking	28.4.82	V. K. Khurana	K. Nagarkattis, K. Ponnappa, D. C. Miranda	S. B. Rodrigo	J. & J. Denholm Ltd
Vic Bilh	27.7.82	K. M. Fowles	I. C. Massey, A. J. Cable, G. Hutchinson	B. J. Padfield	Fairfield Maxwell Services Ltd
Vigilant	9.9.82	D. Rattery	N. E. McInnes		Department of Agriculture & Fisheries for Scotland
Voreda	—5.82	M. Lindsay			Harrisons (Clyde) Ltd

The following Selected and Supplementary Ships have been deleted:

Achilles, America Star, Annuity, Arctic Troll, Atlantic Conveyor, Barbury, Benefactor, Benstac, Bon Entente, Booker Challenge, Booker Crusade, Cairncarrrier, Carchester, Caroline Weston, Celtic Venture, Cluden, Danah, Derwent, Esso Caledonia, Esso Northumbria, Gladstone Star, King George, King Richard, King William, Lancashire, Lycaon, Lynton Grange, Masirah, Prince Rupert City, Sandgate, Scotia, Sheerman, Troll Lake, Wadhurst.

BRITISH COMMONWEALTH

NEW ZEALAND (Information dated 11.8.82)

The following ships have been recruited since the list published in the July 1982 edition of *The Marine Observer*:

Ile de Lumiere, Union Nelson.

The following ship has been deleted:

Nuivakai.

