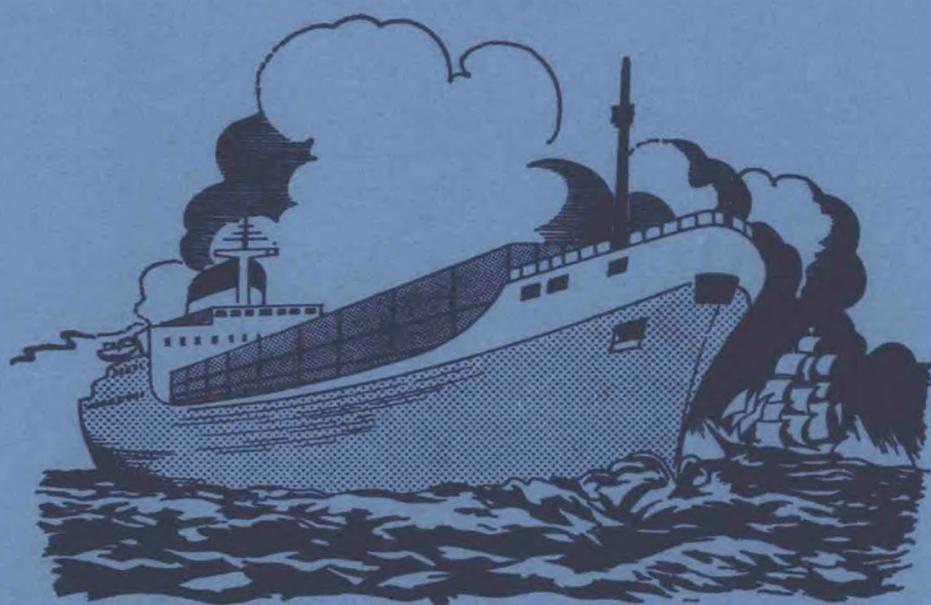


Met. O. 953

The Marine Observer

*A quarterly journal of Maritime
Meteorology*



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July 1982

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THE MARINE OBSERVER

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

VOL. LII

No. 277

JULY 1982

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*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*

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EXCELLENT AWARDS 1981

Every year since its inception in 1924, the July edition of *The Marine Observer* has contained the names of the Masters, Principal Observing Officers and, since 1947, the Radio Officers who, by the standard of the meteorological logbooks which they have sent in during the previous year, have earned an Excellent Award. The list for 1981 appears on pages 107-111 and, once again, we have very great pleasure in congratulating those named. In doing so, it is appropriate to add a note of commiseration with the Masters and Officers in many observing ships whose meteorological logbooks attained an Excellent standard but did not quite qualify for an award.

The assessment of the 1200 or so logbooks we receive every year and the placing of them in an order of merit is a task which is not lightly undertaken. It is always done by a master mariner who well remembers and bears constantly in mind the varying opportunities for precise and continuous observations in differing types of ships engaged in different trades. For instance, he appreciates that observing in a small coaster trading round the UK/Continental coasts in winter calls for far more effort and zeal than observing onboard a large container vessel on a 'fair weather' run across the Pacific. The standard of the books is assessed accordingly.

The following is a 'short list' of those ships from which we received the best meteorological logbooks during the year:

1. m.v. *Aeneas* (Ocean Transport & Trading P.L.C.), Captain A. J. Dyne.
2. m.v. *Dacebank* (Bank Line Ltd), Captain T. D. Scott.
3. R.R.S. *Bransfield* (British Antarctic Survey), Captain S. J. Lawrence.
4. m.v. *Act 7* (Blue Star Ship Management Ltd), Captain D. M. McPhail.
5. s.s. *Esso Hibernia* (Esso Petroleum Co. Ltd), Captain J. W. H. Aalen.
6. m.v. *Solentbrook* (F. T. Everard & Sons Ltd), Captain W. G. Hunt.

Photographs of the first three ships appear opposite page 148. It is perhaps worthy of note that *Aeneas* appears in the 'short list' for the second year running and that *Bransfield* appeared in the 'short list' for 1973. Our special congratulations go to Captain Hunt whose name appears in the 'short list' for the fourth time also to Captains Lawrence and Aalen whose names appear for the second time.

The list of officers serving in 'MARID' ships who have gained awards is shown on page 111. The meteorological work done by these Officers is seldom mentioned in *The Marine Observer* but it is nevertheless a vital contribution to our work of providing a meteorological service for shipping.

As in previous years, the recipients of the awards will be notified individually by post and requested to provide an address to which the award may be sent. If, however, any Master or Officer sees his name in this list, or any other list which may be published by his Company, before hearing from us, we would be very pleased if he would write and claim his award giving us a forwarding address.

The initial award this year is the *University Atlas*, the second *Brewer's Dictionary of Phrase and Fable*, and the chosen book for the third award is the *National Trust Atlas*.

C.R.D.

EXCELLENT AWARDS (Year ended 31 December 1981)

CAPTAIN	COMPANY	CAPTAIN	COMPANY
J. W. Aalen	Esso Petroleum Co. Ltd	C. Gowans	Cayzer Irvine Shipping Co. Ltd
I. Anderson	F. T. Everard & Sons Ltd	S. M. Grant	Cayzer Irvine Shipping Co. Ltd
R. G. Asplet	Cunard S. S. Co. Ltd	J. W. M. Guy	B. P. Shipping Ltd
G. C. Barrett	Overseas Containers Ltd	P. D. Harrison	B. P. Shipping Ltd
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J. B. Clemenson	Cunard S. S. Co. Ltd	J. O. Jones	Ocean Transport & Trading P.L.C.
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Excellent Awards (contd)

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R. J. Smith ..	T. & J. Harrison Ltd	P. G. Young ..	Ocean Transport & Trading P.L.C.

PRINCIPAL OBSERVING OFFICER	COMPANY	PRINCIPAL OBSERVING OFFICER	COMPANY
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K. R. Bark ..	Cayzer Irvine Shipping Co. Ltd	D. R. Moody ..	Cunard S. S. Co. Ltd
S. Barraclough ..	Overseas Containers Ltd	G. S. Nixon ..	Esso Petroleum Co. Ltd
N. J. Bennett ..	F. T. Everard & Sons Ltd	C. M. Notman ..	Esso Petroleum Co. Ltd
R. J. Bennett ..	Jebsens (U.K.) Ltd	G. F. Penberthy ..	P. & O. S.N. Co.
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		T. J. Pymont ..	B. P. Shipping Ltd

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J. Browning	Esso Petroleum Co. Ltd	G. H. Rees	Cunard S. S. Co. Ltd
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M. N. A. Evans	Ocean Transport & Trading P.L.C.	R. Spall	British United Trawlers Ltd
T. P. Flower	P. & O. S.N. Co.	A. Spencer	Boyd Line Ltd
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R. Fullager	London & Overseas Freighters P.L.C.	L. D. Thomson	Ben Line Steamers Ltd
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G. P. Hunt	B. P. Shipping Ltd	M. B. Wdowikowski	Ellerman & Wilson Line Ltd
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Excellent Awards (contd)

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M. P. Atherton	Overseas Containers Ltd	D. Leeson	Marconi International Marine Co. Ltd
G. R. Bailey	P. & O. S.N. Co.	P. A. Lloyd	Sealink (U.K.) Ltd
R. P. Bate	Overseas Containers Ltd	T. N. Martel	Cayzer Irvine Shipping Co. Ltd
R. Baty	Marconi International Marine Co. Ltd	P. Mathews	Overseas Containers Ltd
K. Bent	Ocean Transport & Trading P.L.C.	J. Mercer	Radio & Electronic Services Ltd
C. Bolton	Ocean Transport & Trading P.L.C.	T. Mitchell*	Furness Withy (Shipping) Ltd
H. Brady	Marconi International Marine Co. Ltd	I. M. Morgan	Marconi International Marine Co. Ltd
P. Braxton	Ben Line Steamers Ltd	P. C. Morris	Townsend Thoresen Car Ferries Ltd
T. P. Bunce	Panocean-Anco Ltd	M. Newton	Radio & Electronic Services Ltd
C. E. Butterworth	Ocean Transport & Trading P.L.C.	H. M. O'Gorman	British Antarctic Survey
D. Byne	P. & O. S.N. Co.	B. Oldroyd	Ocean Transport & Trading P.L.C.
A. W. T. Camp	Marconi International Marine Co. Ltd	J. G. Palethorpe	Bibby Line Ltd
A. Campbell	Cayzer Irvine Shipping Co. Ltd	A. Pampling	International Marine Radio Co. Ltd
W. H. Cartwright	Ocean Transport & Trading P.L.C.	D. Phaesey	B. P. Shipping Ltd
R. D. Cause	Ocean Transport & Trading P.L.C.	W. C. A. Phillips	Ocean Transport & Trading P.L.C.
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W. Donaldson	International Marine Radio Co. Ltd	R. B. Redhead	Overseas Containers Ltd
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D. S. Flemington	Overseas Containers Ltd	R. M. Rigg	Marconi International Marine Co. Ltd
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M. Furlong	Panocean-Anco Ltd	I. Snowden	Furness Withy (Shipping) Ltd
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RADIO OFFICER	COMPANY	RADIO OFFICER	COMPANY
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D. Gunning ..	Ocean Transport & Trading P.L.C.	A. G. Thomson ..	Ocean Transport & Trading P.L.C.
M. Hanraads ..	International Marine Radio Co. Ltd	G. K. Thornalley ..	Overseas Containers Ltd
C. B. Hardie ..	Radio & Electronic Services Ltd	A. Titley ..	Overseas Containers Ltd
R. J. Harris ..	P. & O. S.N. Co.	T. A. Verling ..	Canadian Pacific Steamships Ltd
R. Hart* ..	F. T. Everard & Sons Ltd	C. D. Waddingham*	Offshore Marine Ltd
I. D. Hay ..	Furness Withy (Shipping) Ltd	R. Wade** ..	Natural Environment Research Council
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R. L. Hollows ..	Kelvin Hughes Ltd	R. Wheeler ..	Cayzer Irvine Shipping Co. Ltd
R. S. Hough ..	Cayzer Irvine Shipping Co. Ltd	M. J. White ..	B. P. Shipping Ltd
C. Hughes ..	Overseas Containers Ltd	P. A. Whyley ..	P. & O. S.N. Co.
E. Hughes ..	Radio & Electronic Services Ltd	P. L. G. Wolledge*	F. T. Everard & Sons Ltd
A. D. Hutchinson ..	Overseas Containers Ltd		

'MARID' SHIPS††

CAPTAIN	PRINCIPAL OBSERVING OFFICER	RADIO OFFICER	COMPANY
T. H. Hills ..	A. B. Hunton ..	M. Churchouse ..	A.R.C. (Marine) Ltd
J. N. Macdonald ..	D. M. Mackay ..	J. S. MacDonald ..	Caledonian MacBrayne Ltd
R. H. Rendell ..	K. E. Greendale ..	W. B. Campbell ..	Esso Petroleum Co.

* Deck Officer.

** Also Principal Observing Officer

† Surveyor.

†† Vessels recruited for the purpose of observing and transmitting sea temperatures with non-instrumental observations in the North Sea.



July, August, September

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

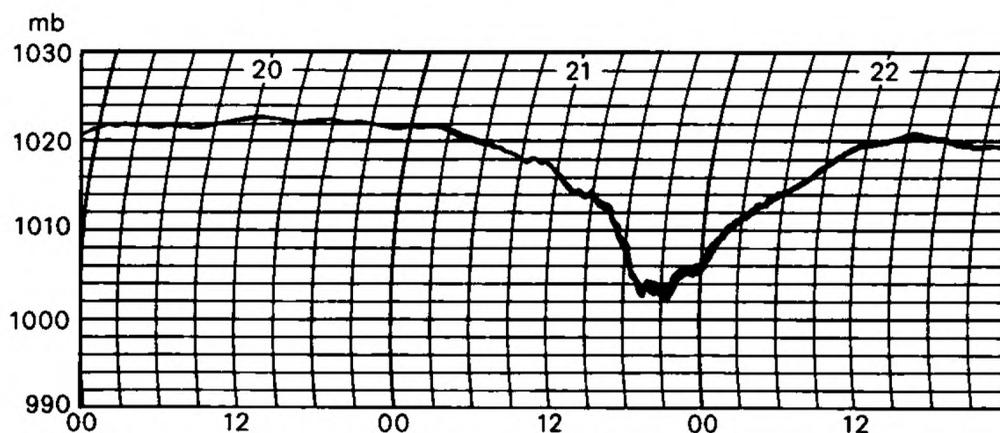
Observing officers are reminded that preserved samples of discoloured water, luminescent water, etc. considerably enhance the value of such an observation. Port Meteorological Officers in the U.K. will supply bottles, preservative and instructions on request.

TROPICAL STORM 'DENNIS'

North Atlantic Ocean

m.v. *Baron Belhaven*. Captain N. Walsh. Port Alfred (Canada) to Port Esquivel (Jamaica). Observer, Mr J. S. Millar, 3rd Officer.

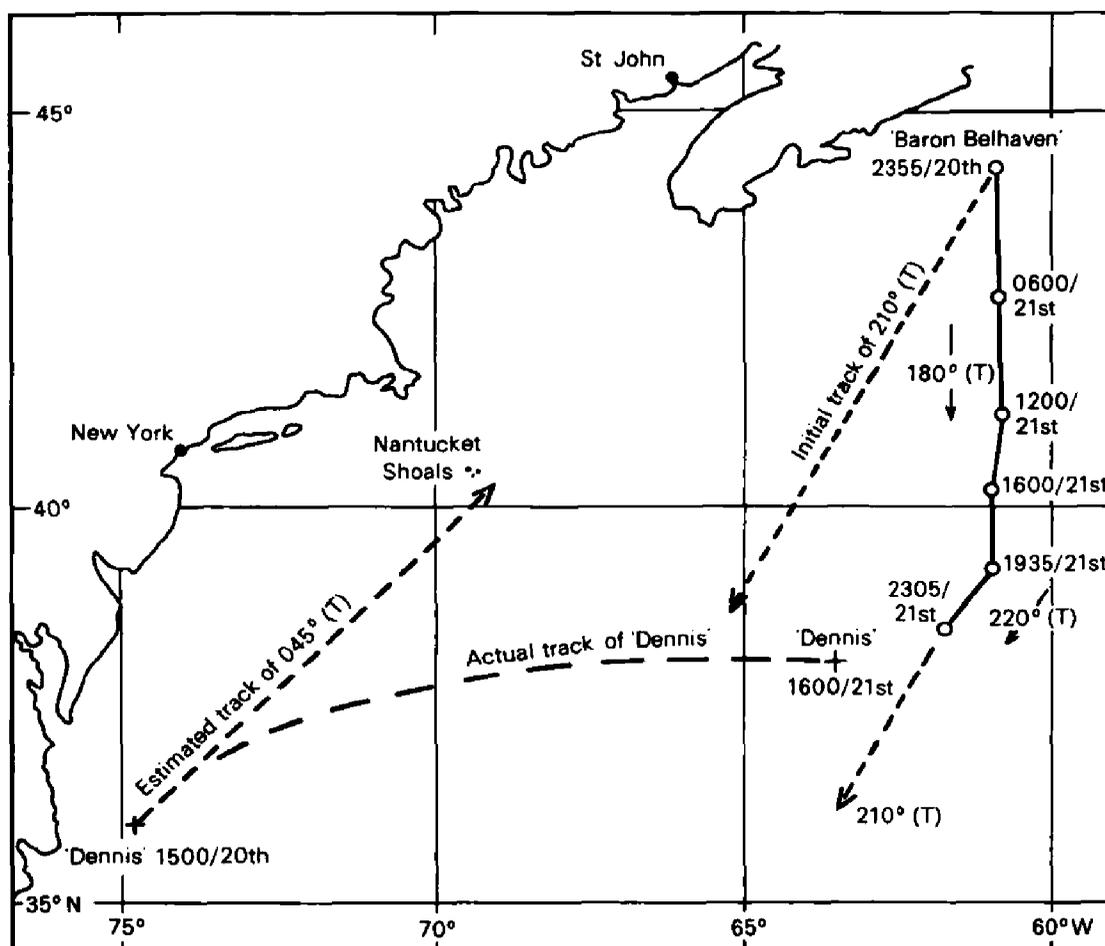
20-22 August 1981. At 2355 GMT on the 20th the vessel was in position $44^{\circ} 16' N$, $60^{\circ} 55' W$ and heading on course $210^{\circ}(T)$ at a speed of 15.5 knots for the Mayaguano passage. At this time warning was received of tropical storm 'Dennis' in location $35^{\circ} 42' N$, $74^{\circ} 49' W$, moving NE at 15-20 knots. After having plotted the path of the storm it was found that the vessel would pass about 140 n. mile southwards of the storm. It was felt that there was a danger of the storm curving more to the east and it was subsequently decided to alter course to $180^{\circ}(T)$, thus giving more sea room. This course was held until 1935 GMT on the 21st at which time the vessel was in position $39^{\circ} 11' N$, $61^{\circ} 01' W$. Upon receipt of



Extracts from Meteorological and Deck Logbooks

Date Aug. 1981	Time GMT	Latitude N	Longitude W	Wind		Barometric pressure (mb)	Remarks
				°(T)	kn		
21	0000	44° 17'	60° 46'	170	10	1022.3	Mainly cirrus cloud.
21	0600	42° 42'	60° 54'	090	10	1020.1	Mainly cumulus cloud; alto cumulus formed from spreading out of cumulus sometimes observable.
21	1200	41° 12'	60° 48'	080	24	1016.7	Wind freshened to 090° 24 kn at 0800 GMT.
21	1800	39° 42'	61° 00'	060	37	1007.1	Continuous moderate to heavy rain.
21	2100	38° 54'	61° 12'	035	52	1003.0	Low cloud, rain and spray severely reducing visibility; very confused swell.
21	2300	38° 35'	61° 41'	035	44	1005.3	Cloud cover dissolving.
22	0000	38° 31'	61° 35'	040	40	1005.8	Cloud cover developing; 2/8 alto cumulus at several levels also present.
22	0300	37° 48'	62° 15'	020	35	1012.0	Rain showers at station.
22	0600	37° 04'	62° 40'	360	21	1014.9	Predominantly NE'y swell decreasing and becoming more confused.
22	1200	35° 54'	63° 36'	030	27	1020.0	Cloud dissolving at 1000 GMT.
22	1800	34° 00'	64° 29'	060	21	1020.9	Light showers in sight at 2000 GMT.

a weather bulletin which put 'Dennis' at $38^{\circ} 00'N$, $63^{\circ} 30'W$ and moving $080^{\circ}-090^{\circ}$ at 22 knots at 1600 GMT, course was altered to $220^{\circ}(T)$. 'Dennis' was therefore found to be progressively curving more to the eastward and was now passing ahead of the vessel. At 2305 GMT on the 21st, when the vessel's position by satellite navigator was $38^{\circ} 35'N$, $61^{\circ} 41'W$, it was felt safe to revert to the



original course of $210^{\circ}(T)$. The tracks of 'Dennis' and of the vessel are shown in the sketch and extracts from the Meteorological and Deck Logbooks in the table.

Position of ship: 20 August 1981, 2355 GMT: $44^{\circ} 16'N$, $60^{\circ} 55'W$
 21 August 1981, 2305 GMT: $38^{\circ} 35'N$, $61^{\circ} 41'W$.

TYPHOON 'THAD'

Western North Pacific

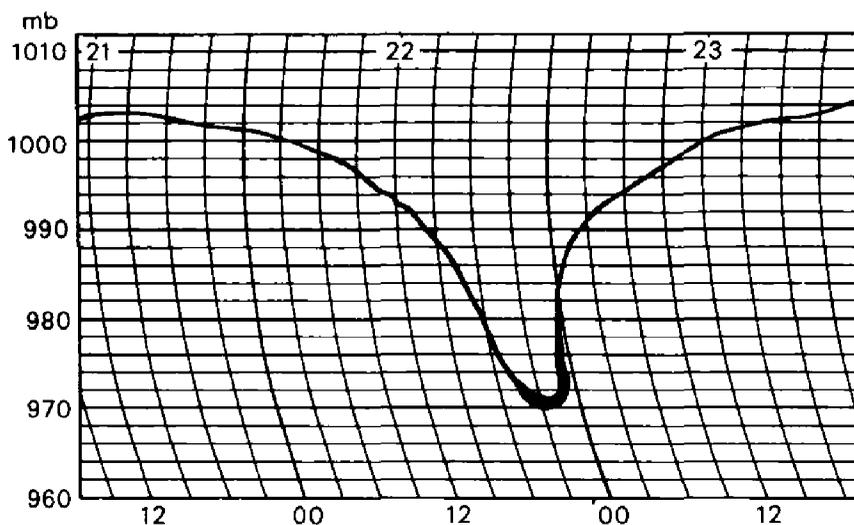
m.v. *Aotea*. Captain L. Howell. Dunedin to Tokyo. Observers, the Master and ship's company.

15-23 August 1981. Whilst the vessel was in the vicinity of Guam we passed through an area of much disturbance with heavy rains and fresh winds. This was from about noon (local time) on the 15th to midnight (local time) on the 16th in the region between $10^{\circ} 30'N$, $145^{\circ} 30'E$ and $20^{\circ} 00'N$, $141^{\circ} 30'E$. This disturbance became a tropical depression as the vessel cleared the region and was eventually upgraded to typhoon 8115, 'Thad'.

The Japanese coast was under its influence during our coastal passages and we experienced very heavy southerly swells and fresh easterly gales between ports.

During this time the typhoon was slowly heading towards Tokyo from a ssw'ly direction. Upon our arrival at that port preliminary warnings were being given by the harbour authorities to all vessels within Tokyo Wan. We berthed at 0730 on 22 August, but after about eight hours' work it was felt prudent to move into Tokyo Bay to a safe anchorage and the vessel moored with two anchors at 1800 that evening. There were over three hundred ships in our vicinity at anchor.

The typhoon reached land at 0400 on the 23rd (1900 GMT on the 22nd) about 30 n. mile to our south and then sped quickly NE'wards, passing closest to us an hour later at 2000 GMT on the 22nd. The lowest corrected barometric pressure reading on board was 967.8 mb (see sketch).



Conditions—which were never too bad—quickly improved and we returned to our berth eight hours later. Much damage was done to local coastal areas with disruption and damage to vessels at sea. The Japan Meteorological Agency said that the typhoon was unusual in having a fairly large eye with strong winds being just over 30 n. mile from the centre.

Position of ship at 2000 GMT on 22 August: $35^{\circ} 43' N$, $139^{\circ} 45' E$.

Note. The *Aotea* is a New Zealand Selected Ship.

LINE SQUALL

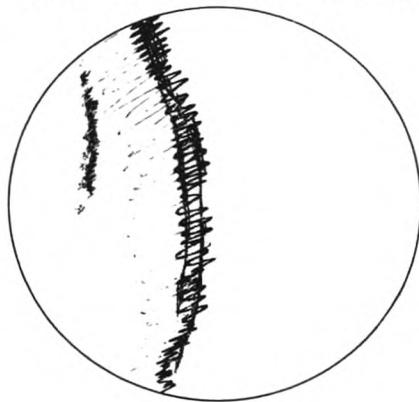
Great Australian Bight

m.v. *British Avon*. Captain C. Brandon. Westernport to Djakarta. Observer, Cadet D. Barker.

28 August 1981, 1415 GMT. A severe line-squall was experienced moving in an easterly direction at a speed of approximately 30 knots. The wind strength was noted to increase substantially as the squall approached and the wind backed as the squall passed over. A pressure fall of some $10\frac{1}{2}$ mb was observed in the 15 hours previous to its passage. Heavy rain was experienced for 5–10 minutes at the passage, after which the sky cleared rapidly for most of its extent. The wind speed decreased as the squall receded. (See sketch overleaf.)

Position of ship: $36^{\circ} 59' S$, $127^{\circ} 48' E$.

Appearance on PPI (24 n. mile range)



WATERSPOUTS

Inner Hebridean Waters

m.v. *Columba*. Captain A. B. Ferguson. At Tiree Pier. Observer, the Master.

25 September 1981. At 1000 GMT, while the vessel was lying at Tiree Pier, a huge waterspout was observed about 10 n. mile to the south.

The uplift of the spray from the sea surface was estimated to have been about $\frac{1}{4}$ n. mile in diameter by about 200 ft high. From the top of this disturbance a long spout of water rose right into the cloud, which was flat-based in a line-squall formation.

Weather conditions: barometric pressure 980.0 mb, wind sw'ly, force 4-5, occasional rain showers, 6 oktas cloud cover.

Captain Ferguson states that he has witnessed a fair number of waterspouts in the tropics, but never before in these waters, and that none of those observed abroad were as large and well defined as this one.

Position of ship: 56° 30' N, 6° 48' W.

English Channel

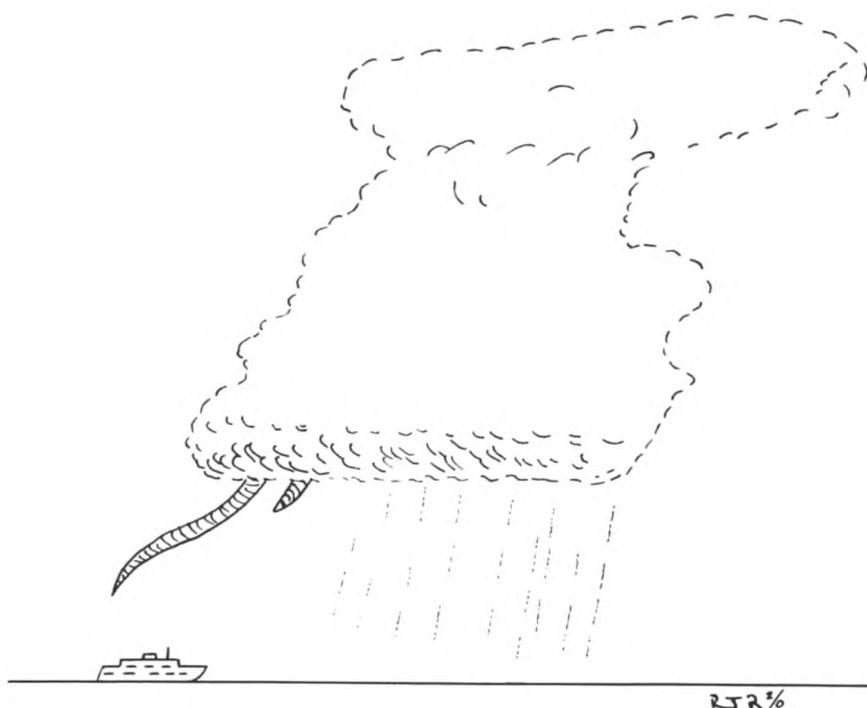
m.v. *Viking Venturer*. Captain R. H. Plant. Cherbourg to the Solent. Observers, Mr D. Beresford, Chief Officer, and Mr R. Ross, 2nd Officer.

12 September 1981, 1425 GMT. The day crossing from Portsmouth to Cherbourg had been unusual, owing to the exceptional visibility, coasts on both sides of the Channel being clearly visible at distances up to 40 n. mile. On leaving Cherbourg it was noticed on the radar that there were several heavy rain showers to the west, and precipitation was seen under some of the larger cumulonimbus clouds.

At the time of the observation the vessel was approximately 7 n. mile from a particularly good example of towering cumulonimbus with anvil, which was very darkly coloured at its base, with very obvious precipitation.

A waterspout was seen to emanate from the base of the cloud, slowly bending and undulating in direction, and growing to its greatest length after about 8 minutes. At this time it extended nearly three-fifths of the distance from base of cloud to sea level. A secondary spout then started to show, but this lasted only for about 3 minutes. The main spout was very clearly seen and evenly formed; the scale is depicted in the sketch by the outline of the ship, which was 6 n. mile away from the *Viking Venturer*.

After 12 minutes the waterspout faded away, without having reached the sea surface. The direction of rotation was not discernible.



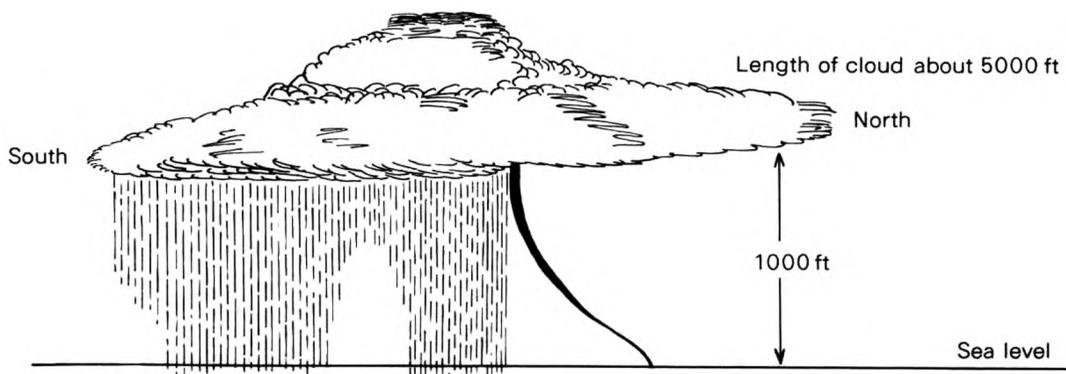
Weather conditions: barometric pressure steady at 1012.5 mb, 5 oktas cloud cover, visibility superb, the Isle of Wight having been sighted at 43 n. mile. Position of ship: 49° 55' N, 1° 42' W.

North West Australian Coastal Waters

m.v. *British Beech*. Captain J. L. W. Dwight. Singapore Roads to Fremantle. Observers, Mr C. J. Coxhead, 2nd Officer, Mr M. Liddle, Radio Officer, Mr J. Rix, Supernumary, and Cadet S. Rhodes.

31 August 1981, 2230 GMT. At this time a cumulonimbus cloud with very little vertical extent was noted 40° on the starboard bow. Its range was determined as 15 n. mile from the echo which it formed on the radar.

The top of the cloud appeared to have been compressed into the base so that the middle of the cloud seemed to be missing. Some convection was observed below the cloud and at 2320 GMT the waterspout shown in the sketch was observed below the cloud. It lasted until 2340 GMT and at the end just appeared to fade into the convection which appeared to be increasing all the time.



The waterspout was duly reported at 0000 GMT on 1 September when the normal observation was sent to Meteo Melbourne via Perth Radio. The observation of the waterspout caused great local interest in Western Australia

and on arrival at Kwinana a telephoned report was given to Mr Kingwell's office at the Perth Bureau of Meteorology. Photographs were taken and were left in Perth to be developed and, if successful, sent to the Perth Bureau of Meteorology.

Position of ship: $22^{\circ} 27' S$, $111^{\circ} 08' E$.

ELECTRICAL STORM

Western North Atlantic

m.v. *Aurora*. Captain A. Matthews. Hampton Roads to Richards Bay. Observers, Mr N. Langrish, Chief Officer and Cadet D. Britton.

13 August 1981. Between 0400 and 0530 GMT the vessel experienced a severe electrical storm. Bolts of lightning (both inter-cloud and surface-earthing) and heavy thunder frequently occurred. Occasionally lightning covered the whole of the sky and was accompanied by heavy rain.

At one stage the following electrical phenomena happened for no apparent reason:

The bridge telephone rang; the bridge console lights increased in intensity; the radio auto-alarm was set off.

Weather conditions: dry bulb $27.4^{\circ} C$, wet bulb 24.5 , barometric pressure 1017.7 mb.

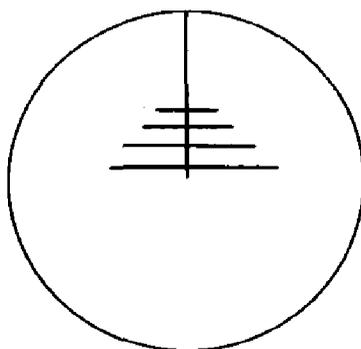
Position of ship: $34^{\circ} 36' N$, $70^{\circ} 18' W$.

UNUSUAL WIND AND SEA PHENOMENA

Sunda Sea

m.v. *Baron Wemyss*. Captain F. M. Dalby. Singapore Roads to Port Kembla (N.S.W.). Observer, Mr S. A. Budd, 2nd Officer.

31 August 1981, 1855 GMT. The ship was steering a course of $194^{\circ}(T)$ through the Lombok Strait, and shortly before the above-mentioned time, sea clutter was observed on the radar as shown in the sketch. As the sea clutter was



Radar screen

approached, it was apparent that visibility was reduced locally. Within seconds the wind increased from force 2 to force 6, and the sea changed from a rippled surface to waves of one metre in height. The sea temperature fell from $27^{\circ} C$ to $22^{\circ} C$ and the air temperature from $26.6^{\circ} C$ to $23.4^{\circ} C$. A cold, fine mist or spray obscured vision, whereas previously the visibility had been in excess of 12 n. mile.

The occurrence lasted for three and a half minutes from start to finish, and over a distance of approximately 7 cables. The sea clutter remained on the radar screen until it was 6 n. mile astern.

Position of ship: $8^{\circ} 30' S$, $115^{\circ} 46' E$.

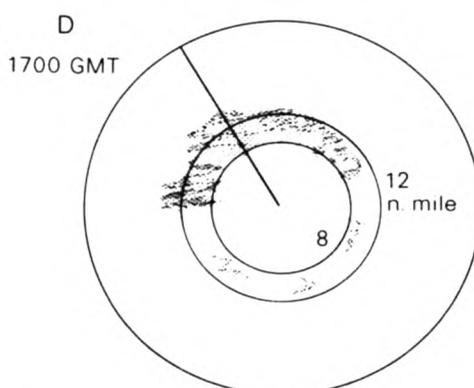
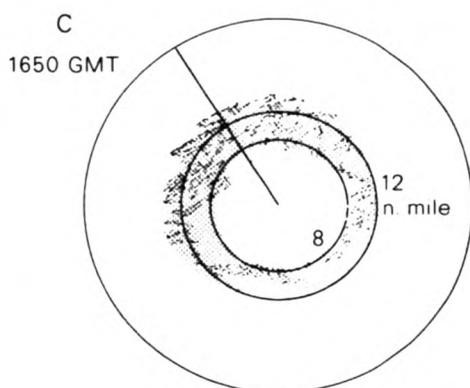
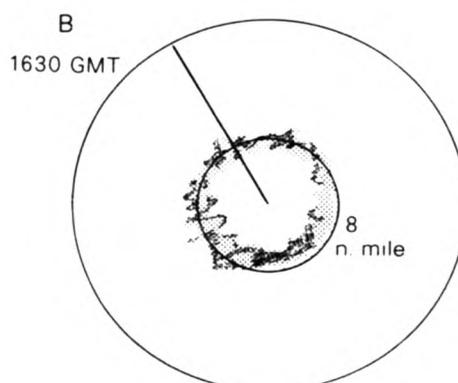
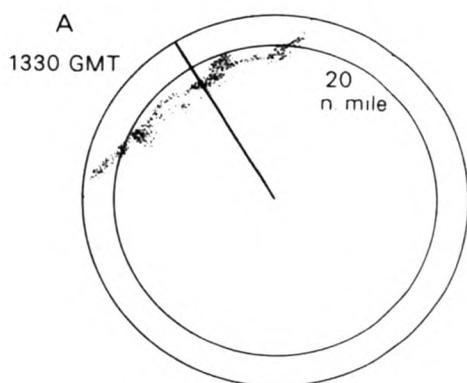
Note. The *Baron Wemyss* is an Australian Selected Ship.

RADAR PHENOMENON

Red Sea

m.v. *British Trent*. Captain P. Harrison. Dairen (China) to Rotterdam. Observers, Mr J. H. Miller, 2nd Officer and Cadet M. Swan.

24 July 1981, 1330–1700 GMT. At 1330 GMT a medium band of interference appeared on the radar at a range of about 20 n. mile. This took the form of an irregular line of speckling, which varied in intensity, and was at right angles to the ship's heading marker (see sketch A). By 1600 GMT this band was reduced in range to about 10 n. mile and curved in a horseshoe shape to surround the ship on the Plan Position Indicator (PPI) by 1620 GMT. At this time the funnel smoke of a passing ship, 6 n. mile to starboard, spread in a horizontal band from starboard to port across our path, at an estimated height of about 150 ft above sea level although there was practically no surface wind. This would suggest some sort of inversion layer in the lower atmosphere. There was also a lot of dust or sand in suspension in the atmosphere, although the visibility at the surface level was at least 15 n. mile.



Radar : Decca TM 1629 on 24 n. mile range.
long pulse, relative motion, picture stabilized

By 1630 GMT the band had completely encircled the ship (see sketch B) at a mean range of about 8 n. mile. At this time it presented its densest form. By 1650 GMT the band had started to break up astern, and broaden and thin ahead (see sketch C). At this stage the band was about 4 n. mile ahead, stretching from 8 to 12 n. mile.

By 1700 GMT the band had practically disappeared astern, and had become less well defined and less dense ahead (see sketch D). Shortly afterwards the band began to disperse even more, with scattered patches on the PPI from 8 to 14 n. mile. By this stage the cloud had dispersed and there was a slight breeze from the north.

Weather conditions at 1630 GMT: dry bulb 32.5 °C, wet bulb 27.0, barometric pressure 1002.1 mb, barometric tendency rising steadily in past 3 hours by 0.2 mb, cloud 2/8, low on horizon, light altocumulus with altostratus.

Time of sunset 1602 GMT. Ship's course and speed 329°(T) at 15.3 knots.

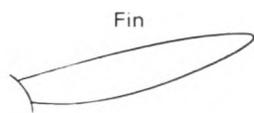
Position of ship at 1630 GMT: 19° 30' N, 39° 18' E.

CETACEA

North Atlantic Ocean

s.s. *Tantalus*. Captain J. O. Jones. Brest to Tubarão (Brazil). Observers, Mr J. W. Stewart, 2nd Officer, Mr D. J. Mecklenburgh, 3rd Officer and Cadet M. H. Coakley.

4-5 July 1981. On 4 July a school of large whales (approximate length 18 metres) was sighted heading in a westerly direction. They were dark in colour

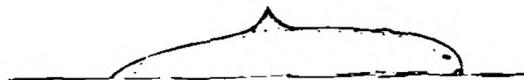


Two blow holes side by side raised above level of back and slanted towards the tail



(black?) with a small dorsal fin (about 0.5 metre in height). The head appeared to be quite narrow. One whale turned slightly on to its side, raising a fin which appeared to be about 3 metres by 1 metre.

On 5 July a single whale was sighted heading in a westerly direction. It was about 7.5 metres in length. Its colour was light brown with grey freckles or



small patches. The dorsal fin was quite small (0.5 metre) and it was about 2.5 metres from the blowhole, which in turn was about 1.25 metres behind the nose. There was hardly any difference between the width of the head and that of the body.

Position of ship: 4 July, 42° 41' N, 10° 12' W

5 July, 38° 30' N, 11° 55' W.

Note. Mr D. A. McBrearty, of the Department of Anatomy, University of Cambridge, comments:

'There are a number of features which suggest that these may be humpback whales. The colour, the size and shape of the dorsal fin, the sideways motion and raising of the long narrow pectoral fin are all indicative of the humpback. However, the pectoral fin is shown with smooth edges whereas the humpback fin has a scalloped leading edge. A humpback head is also quite noticeably knobby on the upper surface in front of the blowhole.

'Without the confirmation of the two latter identification features, I would say that these are only probably humpbacks.

'As for the single whale, the measurements quoted put this animal into the category of medium sized toothed whale. There is nothing in the description which would make identification positive. One possibility would be Cuvier's whale (*Ziphius cavirostris*).

'Cuvier's whale grows to a length of about 7 metres and has been variously described as being from brown to fawn to grey. Light patches and white scars are also found on the body. The distribution pattern of this whale is such that it is generally described as being a cosmopolitan species, inhabiting tropical and temperate seas. It is a pelagic, deep-water whale feeding mainly on squid and has been sighted off the Iberian Peninsula on previous occasions.'

North Atlantic Ocean

m.v. Fresno City. Captain A. Gosset. Saldanha Bay to Rotterdam. Observers, Mr M. J. Clarke, 3rd Officer and Cadet S. F. Broderick.

11 July 1981. At 1331 GMT four whales were observed just below the sea surface, about 60 metres from the ship's side. Although their size was not ascertained they were thought to be quite large. On breaking the surface the 'blow' appeared more as a mist than as a jet of water.

Three of the whales appeared to be a smoky grey colour from the dorsal fin back, with a mottled grey and white in front of the dorsal fin. The fin itself seemed to be very small. The fourth whale was a muddy brown in colour with a not-so-pronounced mottled brown in front of its dorsal fin.

As the vessel moved past them they began to swim off in a south-easterly direction.

Weather conditions: sea temperature 26.8 °C, wind southerly, force 3.

Vessel's course and speed: 323°(T) at 15 knots.

Position of ship: 6° 03' N, 13° 12' W.

m.v. London Enterprise. Captain J. Clark. Tenerife to Rotterdam. Observer, Mr A. H. Atkins, 3rd Officer.

1 September 1981, 1458 GMT. At this time a school of dolphins was sighted on the starboard side heading for the ship. As they approached they began to leap from the water to a height of about 2 metres and to crash back into the sea on their sides. They were approximately 2.5 metres in length and numbered about 12 individuals, all about the same size. They had slate to blue-grey upper parts and a very white belly clearly seen as they leaped. The white extended up about one-third of the body. A clear and distinguishable beak was seen, leading to the conclusion that they were Bottle-nosed Dolphins.

The group was lost to view for a couple of minutes and then reappeared off the port quarter where its members put on a terrific display of body surfing and spectacular leaps before heading off in an easterly direction. They seemed to have no difficulty in staying with the ship and the display lasted about 10 minutes.

Course and speed of ship: 178°(T) at 12.25 knots.

Weather conditions: dry bulb 24.5 °C, wet bulb 22.5, sea temperature 26.0, wind N'E, force 4, sky clear, seas moderate with a long moderate swell from the north, about 3 metres high.

Position of ship: 21° 01' N, 18° 01' W.

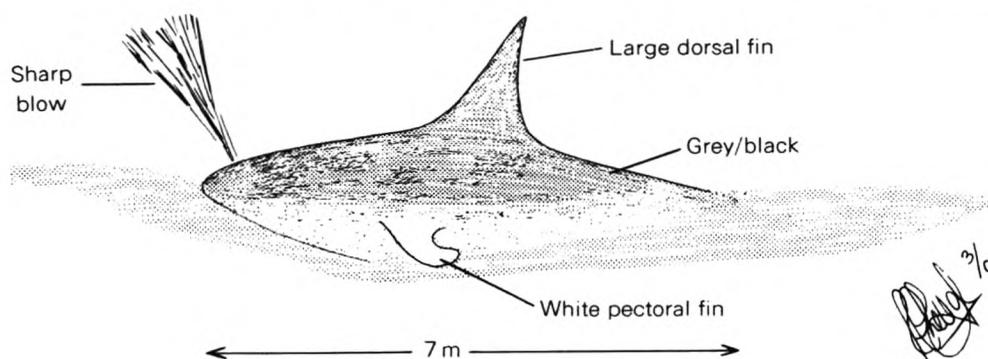
Note. Mr McBrearty comments as follows:

'These are possibly *Stenella* sp., but there is not really enough information to be sure of which one.'

South Atlantic Ocean

m.v. *Rockhampton Star*. Captain A. H. White. Salvador (Brazil) to Vigo (Spain). Observers, the Master and Mr L. C. Colam, 2nd Officer.

28 July 1981. At 0915 GMT a large whale was observed swimming alongside the vessel. It broke the surface occasionally, only the upper half of the body then being exposed. A prominent large dorsal fin could be seen and two distinctive pectoral fins, white in colour, were also quite plain; the lower part of the body was also white, whilst the upper portion was of a dark grey or black colour.



When the whale broke surface a sharp, heavy 'blow' was observed. The whale swam alongside for about 5-6 minutes before shearing off; its length was estimated at about 7 metres.

Weather conditions: dry bulb 22.6 °C, wet bulb 20.5, sea temperature 25.0, barometric pressure 1026.0 mb, wind E'ly, force 2, rippled sea, low swell.

Position of ship: 18° 32' S, 38° 33' W.

Note. Mr McBrearty comments:

'I think there is little doubt that this is a male killer whale (*Orcinus orca*). No other cetacean has a dorsal fin which is so characteristic as that of the killer whale. The pectoral fin is a little perplexing, for it is in the wrong position and of the wrong shape and colour. I think that the observer has been confused by the disruptive colour pattern on the flanks of the killer whale. The pectoral fins are further forward, large and rounded and black on both sides. The flukes incidentally are black only on the upper surface, the lower being white.'

CRUSTACEA

Spanish Coastal Waters

m.v. *London Enterprise*. Captain J. Clark. At anchor off Bilbao. Observer, Mr A. H. Atkins, 3rd Officer.

24-25 August 1981. At 1015 GMT on the 24th it was noticed that an unusual number of crabs were to be seen passing the vessel's starboard side on the surface or just under it. They appeared at first to be dead and motionless, but under observation they were seen to adjust the depth at which they were floating

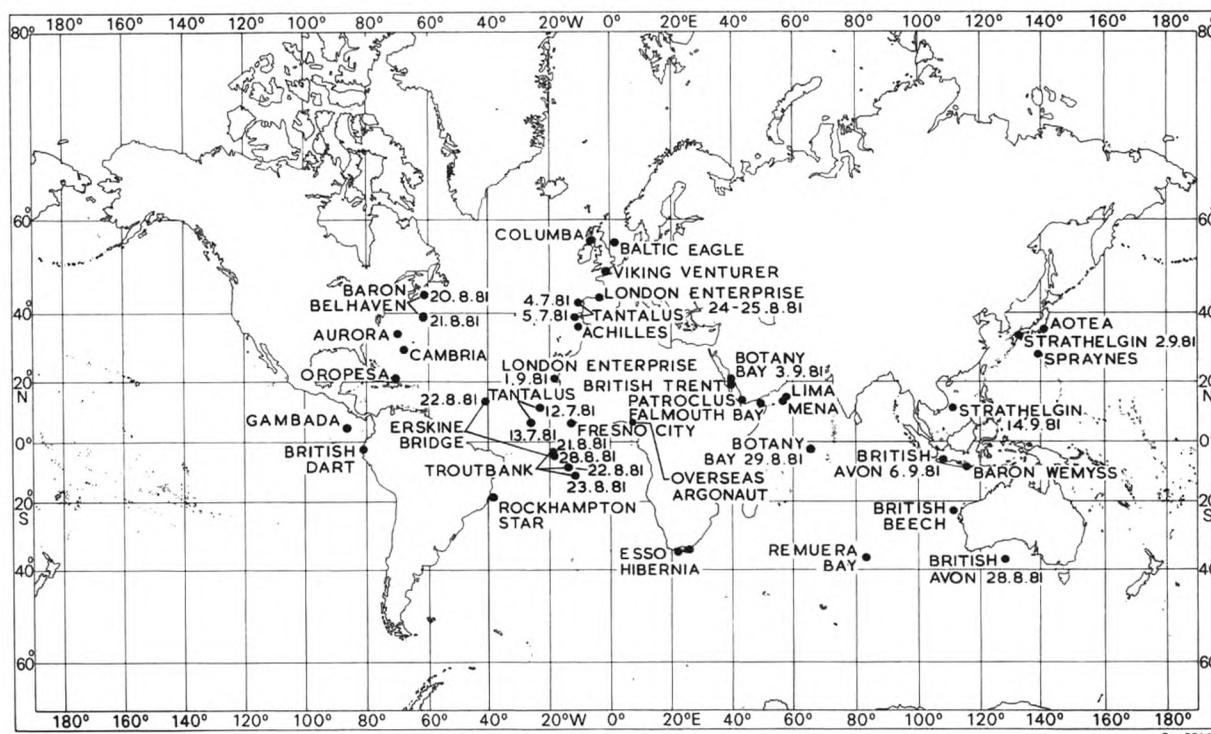
by a paddling motion of the rear two pairs of legs; also, if the current turned them so that the eyes were facing the direction from which they had come, they quickly turned to face the direction of the drift. The ship's heading was $085^{\circ}(\tau)$ and the crabs drifted by parallel to the side. They appeared to range from 5 to 9 cm in size, some being of a reddish-brown colour and others of a brownish-green, the latter being generally larger and appearing to have bluish backs. In an hour a total of 85 individuals were observed and they continued after that hour but not in such great numbers.

Weather conditions: dry bulb 30.6°C , wet bulb 24.2 , sea temperature (by intake) 22.0 , sky generally clear with $3/8$ cumulus cloud at approximately 800 ft over land, where there was also slight mist or haze. Current setting $265^{\circ}(\tau)$ at about 3 knots.

At 1015 GMT on the 25th crabs were sighted in greater numbers than on the previous day and on both sides of the vessel. The ship's heading was $080^{\circ}(\tau)$ and the wind 030° at 3 knots, and in consequence the crabs on the starboard side drifted into the ship's side and then swam away still facing the direction of drift. On both occasions the numbers seen dwindled up to 1100 GMT after which only odd ones were spotted.

Weather conditions on 25th: dry bulb 23.4°C , wet bulb 21.8 , sea temperature again 22.0 . Sky generally clear, heavy mist or fog over land, visibility 3 n. mile.

Position of ship: $43^{\circ} 25' \text{N}$, $03^{\circ} 08' \text{W}$.



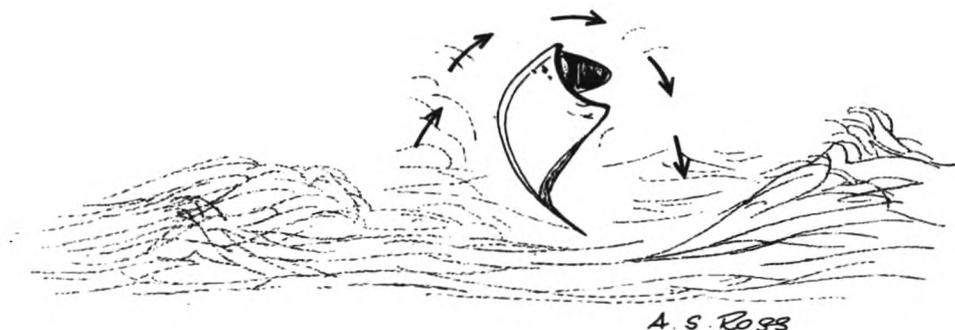
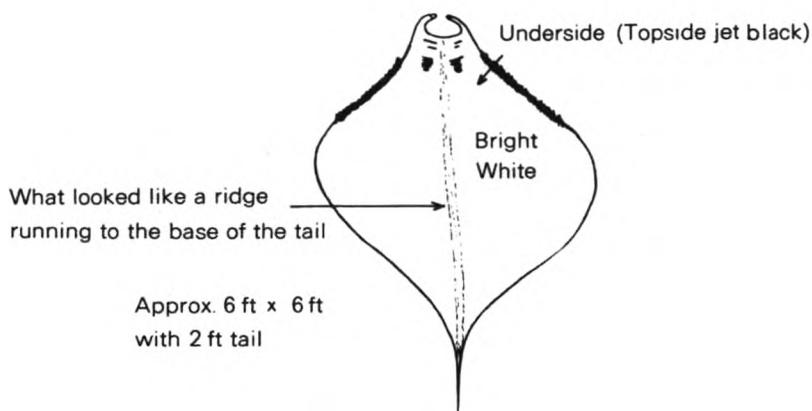
Position of ships whose reports appear in *The Marine Observers' Log*.

FISH

South Atlantic Ocean

m.v. *Troutbank*. Captain T. D. Faithfull. New York to Cape Town. Observer, Cadet A. S. Ross.

21 August 1981. At 1840 GMT what appeared to be a large Manta Ray was observed, at first on the port bow and then progressing to the port beam, where it disappeared. The fish was travelling with the wind, somersaulting backwards and landing with a loud 'belly-flop'. It stayed no closer than a cable from the



vessel and there were 10–15 somersaults in 2–3 minutes, in each of which it cleared the water by about 30 cm. At the time no other marine life was observable.

Weather conditions: dry bulb 24.6 °C, sea temperature 25.6, wind SE, force 5, sea force 4.

Ship's course and speed 131°(T) at 17.0 knots.

Position of ship: 4° 00'S, 18° 27'W.

BIRDS

North Sea

m.v. *Baltic Eagle*. Captain A. Wilford. Ronne (Denmark) to Teesport. Observers, the Master, Mr D. Sweet, 3rd Officer and Mr B. Lazenby, Catering Officer.

2 July 1981, 1900 GMT. For two hours up to the time of observation, about

30 young Kittiwakes had been flying around the ship. It was noted that they were diving and weaving about, and it was assumed that they were chasing insects.

Weather conditions: dry bulb 12.6 °C, barometric pressure 1003.0 mb, wind s'ly, force 3.

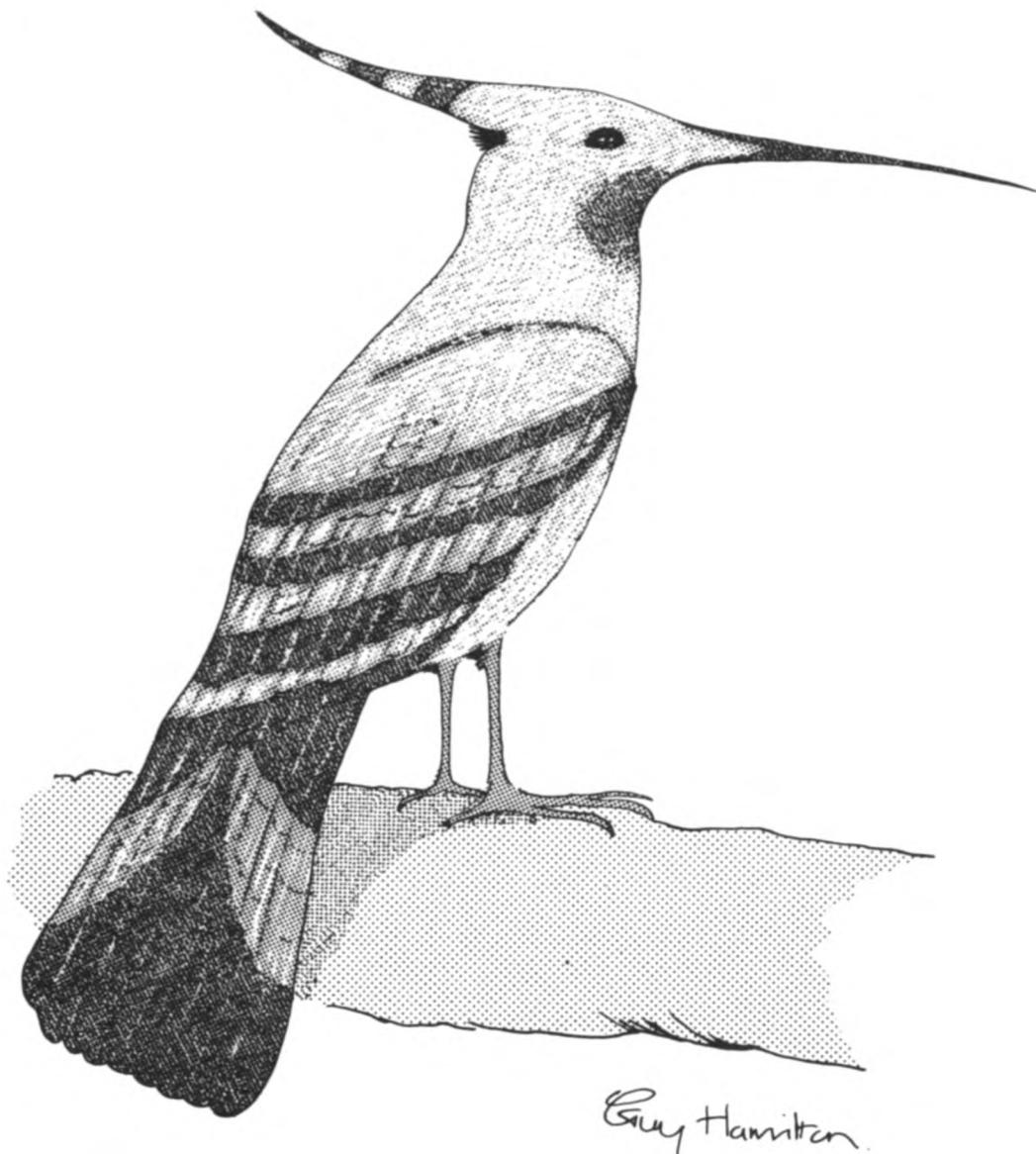
Position of ship: 55° 40' N, 02° 27' E.

Note. Captain G. S. Tuck, Vice-President of the Royal Naval Birdwatching Society, confirms the observation as being of immature Kittiwakes (*Rissa tridactyla*).

North Atlantic Ocean

m.v. *Achilles*. Captain M. Foster. Alexandria to Norfolk (Va). Observers, Mr G. N. C. Hodges, 3rd Officer and Cadets G. Hamilton and W. Mulcahy.

14 August 1981, 0700–1800 GMT. The vessel was steering a westerly course towards the Azores. During the day two birds were observed (of the same species), circling the ship and occasionally landing. They were 18–22 cm high with a wingspan of perhaps 25–28 cm. They flew mostly close to the sea surface and with much flapping of their wings. During the late morning one landed on the foredeck and remained standing for about 20 minutes, which enabled the



observers to sketch it with the aid of binoculars. Unfortunately this was the only time when one landed for more than a minute or so, and the estimates of size are therefore only approximate.

A similar bird was observed while the vessel was in Alexandria. Its long, pointed beak caused some consternation and it was concluded that it must be some kind of insect-catcher, but certainly not a sea-bird. When the birds which landed on the vessel were last seen, the nearest land was about 200 n. mile away.

Position of ship at 1200 GMT: $36^{\circ} 14' N$, $10^{\circ} 21' W$.

Note. Captain Tuck states that these birds were Hoopoes (*Upupa epops*).

Western North Atlantic

m.v. *Cumbria*. Captain B. C. Bass. New Orleans to Lisbon. Observers, Mr A. Malcolm, 2nd Officer and Mr R. M. Price, 3rd Officer.

26 September 1981, 1600–1800 GMT. A bird which was believed to be an immature or young adult gannet was sighted. The plumage had not yet reached the distinct markings of the adult bird, the upper parts being marked by brown/dark speckles and the crown also being lightly speckled, but also characteristically marked yellow. The bird was visible for nearly two hours during which it put on a display of diving quite close to the ship (a plentiful supply of food in the form of flying-fish being readily available).

Eventually it flew off in a NE'ly direction, presumably to Bermuda, which was the nearest land at a distance of 200 n. mile.

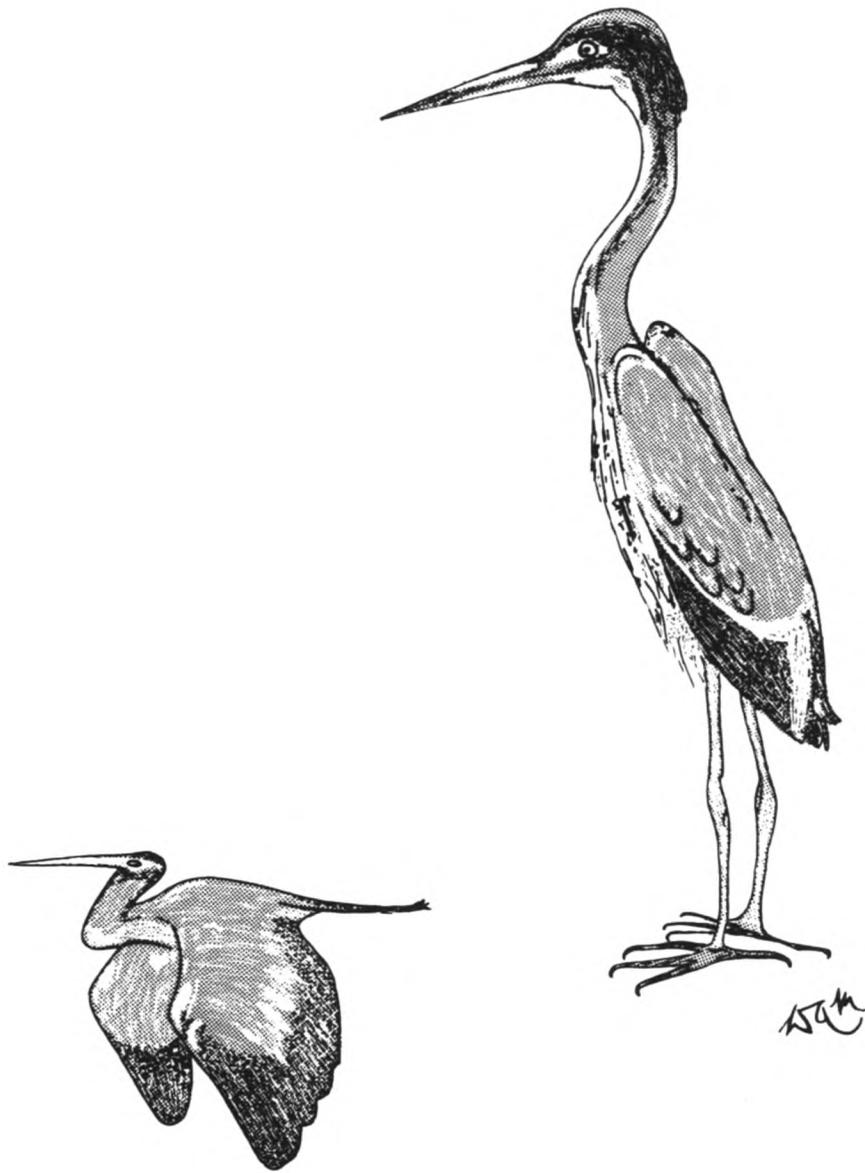
Position of ship: $30^{\circ} 12' N$, $68^{\circ} 00' W$.



Indian Ocean

s.s. *Botany Bay*. Captain W. A. Murison. Fremantle to Jeddah. Observers, the Master, Mr R. B. Robinson, 3rd Officer, and other members of the ship's company.

29 August and 3 September 1981. At 1100 GMT on 29 August a heron landed on a container on the fore deck and appeared to be ventilating itself with wings held slightly open away from its body. Having surveyed its surroundings for about an hour, it flew round to the poop deck where it remained for about half an hour. It then returned to the top of a container, not far from the bridge front, where it remained until sunset. As the sun went down, the heron closed its wings and drew in its neck, and when the sun set it flew up to the fo'c'sle where it stayed until 1000 GMT on the following day before finally flying away.



In shape and size it resembled the British Heron, but the plumage was a grey brown in colour with black primaries. It had a pale beak with white throat and a greeny-yellow area around the eyes. The back of the neck was golden brown and had a small crest. The front of the neck was white with dark streaks which continued down under the body. The rump was chocolate brown and the legs were pale grey with yellow knuckles.

At 0800 GMT on 3 September an Ibis was observed on a container forward of the bridge. The bird stood about 45 cm high and was a greeny black colour



all over. The head was of a paler shade with a white face. There was a near-white stripe at the top of the curved beak where the upper mandible joined the forehead. The bird tended to stand for long periods on one foot, and it seemed to be preening its left leg. It was thought to be a juvenile Glossy Ibis. The bird stayed for about an hour before flying off towards the coast.

Position of ship: 29 August, 2° 43' S, 65° 23' E
3 September, 20° 30' N, 39° 00' E.

Note. Captain Tuck comments:

'The excellent sketches accompanying the narrative indicate that the first bird was indeed a Black-headed Heron, (*Ardea melanocephala*), a species resident throughout the coast in Ethiopia and in East Africa. It is a species related to the Grey Heron but considerably more frequent and common in East Africa.

'There is no doubt from the sketch that the second was a species of Ibis, and the mention of its being of greeny-black all over conforms most nearly to the Hadada Ibis, which is of overall grey plumage with its broad upper wings washed metallic green overall.

'It is resident throughout Ethiopia in swamps, marshes, flooded areas and edges of lakes, and common in East Africa; its loud, far-reaching call "hak-hak-hak" is one of the best-known African bird sounds.'

s.s. *Remuera Bay*. Captain K. E. Howard. Cape Town to Melbourne. Observers, Mr S. Barraclough, 3rd Officer, Cadet S. Sanders, Mr K. Robinson and Mrs J. Rutter.

28 September 1981. At 0315 GMT, after two days of strong NW'ly winds, force 6-7, a small bird was found on the main deck. The bird (see sketch) was later identified as a White-faced Storm Petrel. It was in a very exhausted condition



and appeared to have damaged one of its legs. Although shrimps prawns and water were offered to the petrel it did not eat or drink anything and flew away during the evening.

Position of ship: $36^{\circ} 51' S$, $83^{\circ} 16' E$.

Note. Captain Tuck confirms that the bird was a White-faced Storm Petrel (*Pelegodroma marina*).

INSECTS

Southern Red Sea

m.v. *Patroclus*. Captain D. S. Walker. Suez to Singapore. Observers, Mr M. N. Baldwin, 2nd Officer, Mr R. G. Daley, 3rd Officer, and Cadets M. N. Leveridge and P. R. Daniels.

19 July 1981. The insect depicted in the sketch was found on board the vessel.



It was approximately 37 mm long with head section 8 mm and the widest part of its body measured 7 mm. The insect's colour was of various shades of brown, the darkest parts being the head and lower body. It was thought to have boarded during the vessel's transit of the Suez Canal.

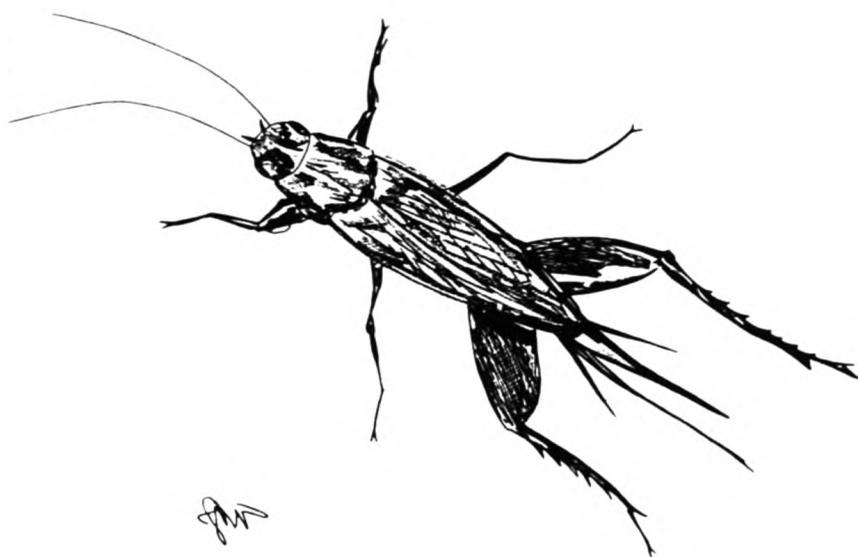
Position of ship: $13^{\circ} 29' N$, $43^{\circ} 00' E$.

Note. Mrs J. Marshall, of the British Museum (Natural History), states that the insect was a field-cricket (*Gryllus bimaculatus* De Geer), which is found in southern Europe, Africa and Asia and is occasionally captured at sea.

South-east Arabian Waters

m.v. *Falmouth Bay*. Captain B. V. Chipperfield. Jeddah to Mina Qaboos (Oman). Observer Mr J. M. Torkington, 3rd Officer.

3 July 1981. While the vessel was steaming 18 n. mile off Ras Al Kalb several large black beetles were found onboard (see sketch). They were approximately 5 cm long, with two large rear legs, four smaller front legs, two large antennae (feelers?) 3 cm long, plus two smaller 'feelers' (at the front of the head) which were approximately 0.5 cm long. Each beetle had a large pointed tail $1\frac{1}{2}$ cm in length with a longer but thinner tail underneath. At each side of this tail there were two thin feelers with very fine hair on them.



Position of ship: $14^{\circ} 00' N$, $49^{\circ} 00' E$.

Note. Mr B. C. Townsend, of the British Museum (Natural History) states that the sketch is of a female cricket (*Gryllus bimaculatus* De Geer). The upper 'tail' is the folded hind wings, and the lower the ovipositor, with which eggs are deposited in the ground.

Nigerian Waters

m.v. *Overseas Argonaut*. Captain E. G. Humby. At anchor off Niger River. Observers, Mr J. W. W. Peters, Extra Chief Officer and Mr G. A. Cole, 3rd Officer.

8 August 1981. A colourful moth was observed after having landed on board at night, attracted by the bright bridge lights.

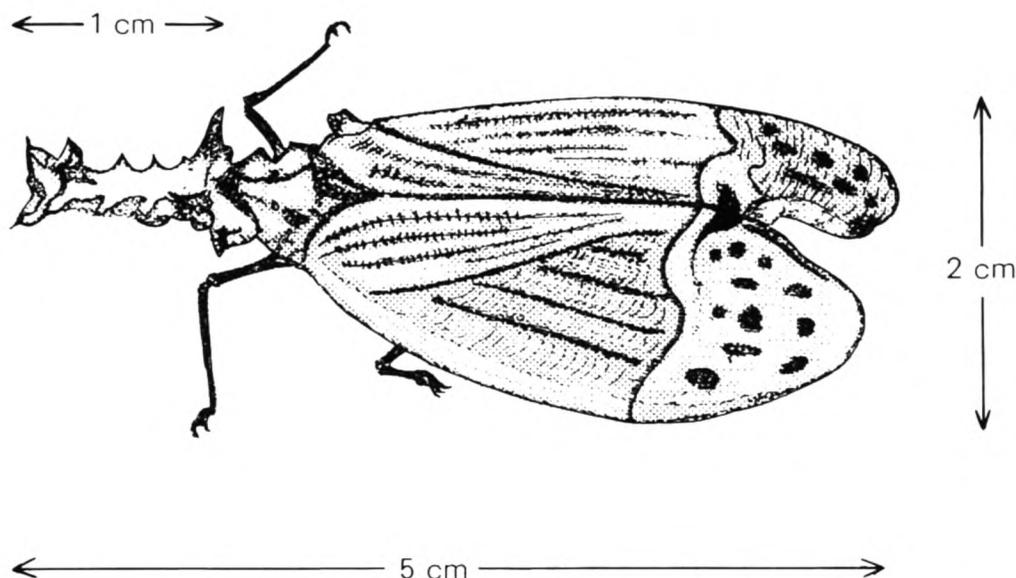
Position of ship: $4^{\circ} 16' N$, $6^{\circ} 09' E$.

Note. Mr A. H. Hayes, of the British Museum (Natural History), states that the moth has been identified as *Cephonodes hylas virescens* Wallengren, of the family Sphingidae; this species is commonly found in the Ethiopian region.

Ecuadorian Waters

m.v. *British Dart*. Captain D. M. Rundle. Botlek (Rotterdam) to Guayaquil (Ecuador). Observers, Mr G. P. Hunt, 2nd Officer, Cadets A. Plows, I. Cannings, J. Browne and other members of the ship's company.

29 July 1981. The insect shown in the sketch was found on the fore part of the vessel whilst at anchor off Punta Arenas, Guayaquil. It was brought up to the bridge and examined thoroughly. The most striking aspect of the insect was its head with the 'rhinoceros' type horns just above its eyes and the three reddish horns at the tip of its head. It had two pairs of wings, the upper pair as seen in the sketch and the lower pair a dark brown colour with patches of bright red.



A. PLOWS

On its underside it was seen to have a proboscis, approximately $1\frac{3}{4}$ cm long, this being a light grey in colour. The underside of the head was a deep red/brown in colour, which was thought to serve no purpose other than that of a deterrent to predators. The legs were mainly black except for a reddish colour at the joints and the ends of the legs. Two small claws were at the tip of each leg. The hindmost legs were barbed in the mid-portion. The insect was very drowsy and made no attempts to fly away; it was assumed to be dying.

Position of ship: $2^{\circ} 00' S$, $81^{\circ} 12' W$.

Japanese Waters

m.v. *Strathelgin*. Captain D. H. Roberts. Sakai (Japan) to Hong Kong. Observers, the Master and Mr R. James, 3rd Officer.

2 September 1981. Whilst the ship was under pilotage through the Inland Sea of Japan a praying mantis was observed on the starboard bridge-wing. The specimen, some 13 cm in length, moved very awkwardly and when it attempted to fly, which it did a number of times, it covered distances of between 4 and 5 metres, appearing to be exhausted after each flight.

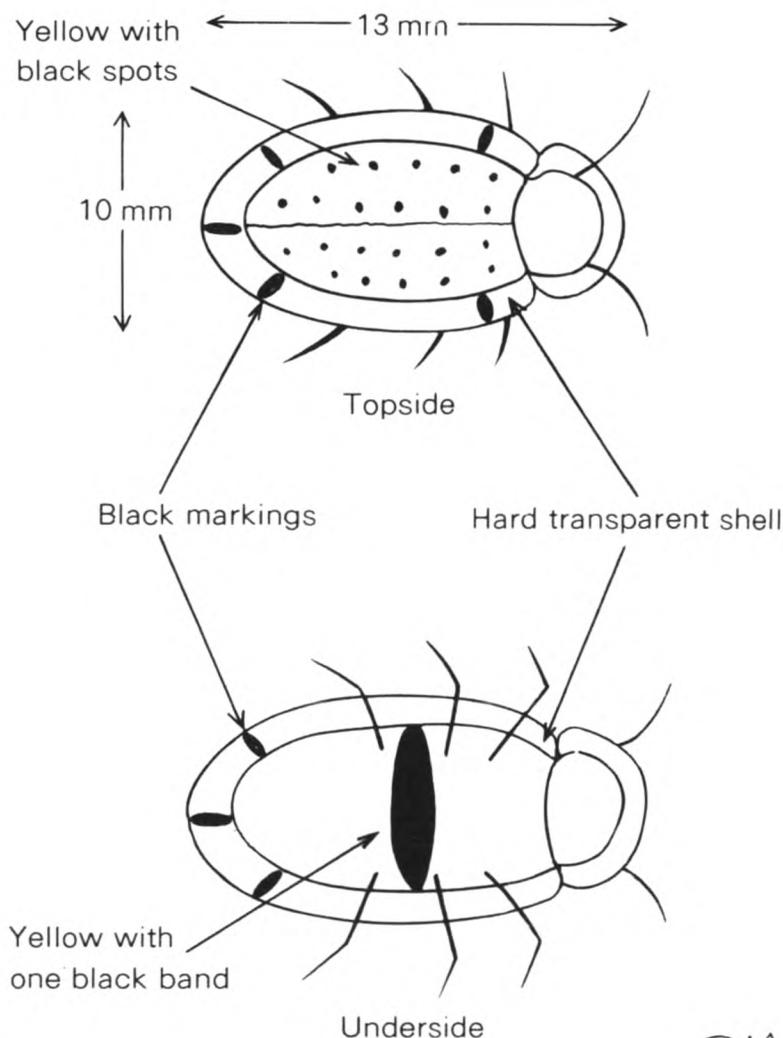
Position of ship: $33^{\circ} 30' N$, $132^{\circ} 00' E$.

Note. Mrs J. Marshall, of the British Museum (Natural History), states that examination of a photograph of the insect reveals that it was a female praying mantis (*Tenodera* sp.), but that specific identification is not possible without the specimen.

South China Sea

m.v. *Strathelgin*. Captain D. H. Roberts. Hong Kong to Singapore. Observer, Mr R. J. Smith, Chief Officer.

14 September 1981, 2230 GMT. After some 40 hours' steaming on a course of 207°(T) at a speed of 16.0 knots from Hong Kong a small beetle was found on the starboard bridge-wing. It was mainly yellow in colour, with black spots (see sketch). When turned over for inspection of its underside it flipped back



with a strong kick, the observer jumping with surprise. The legs were able to cling very tenaciously to varying surfaces.

Position of ship: 12° 10' N, 111° 15' E.

Note. Mr R. T. Thompson, of the British Museum (Natural History), comments:

'This is one of the tortoise beetles. These constitute the subfamily Cassidinae of the leaf-beetle family Chrysomelidae. They occur throughout the hospitable regions of the world. Many of them are partly translucent and possessed of a beautiful iridescence which fades after death. Both adult and larval stages feed on the leaves of plants.

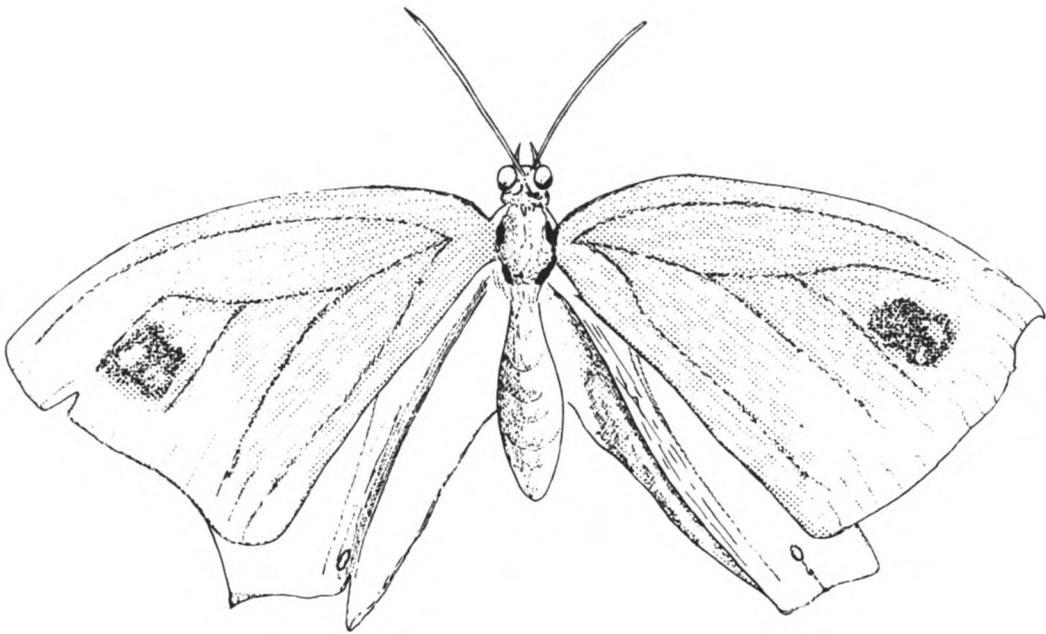
'Notwithstanding the stylized drawing provided, I have little doubt that the present specimen belongs to the species *Aspidomorpha miliaris* (F.), which is very common and widespread in Asia. It lives in various climbers of the genus *Ipomoea*, including *I. batatas*, the sweet potato.

'In spite of its ungainly appearance, this beetle is well able to fly and this may account for its presence on a ship at sea.'

Javanese Waters

m.v. *British Avon*. Captain C. Brandon. At anchor at Djakarta. Observer, Cadet D. Barker.

6 September 1981. A large butterfly was found perched on the bridge window. Its large size made it conspicuous, body length being 3 cm and wingspan approximately 8 cm. The undersides of the wings were a light tan colour, heavily veined and closely resembling a dried-out leaf (obviously a natural camouflage). The edges of the wings were ragged, the upper set being in better condition than the lower. The upper surfaces of the wings were a much darker



brown, fading towards the extremities, with a sooty patch near to the leading edge of the upper wing. Two white spots were observed in this patch near to the leading edge of the upper wing. The abdomen was a dark brown colour and consisted of 6–7 segments greater in depth than beam. The butterfly was observed to fly slowly with an exaggerated flapping motion.

Position of ship: $6^{\circ} 01' S$, $106^{\circ} 53' E$.

Note. Mr R. I. Vane-Wright, Head of the Butterfly Section, British Museum (Natural History), comments:

'This is clearly the 'Evening-Brown Butterfly, *Melanitis leda* (L.). This dull brown, leaf-like species flies readily only at dusk, and can thus easily be mistaken for a moth. The larvae feed on grasses and related plants, including cereals and rice. The butterfly is extremely common throughout the old-world tropics, including Java. It has often been noted on ships, and seems to make offshore "migrations"—these are poorly understood.

'I would like to congratulate Mr Barker on the excellence of his sketch, which is most sensitive.'

BIOLUMINESCENCE

North Atlantic Ocean

s.s. *Tantalus*. Captain J. O. Jones. Brest to Tubarão (Brazil). Observer, Mr D. J. Mecklenburgh, 3rd Officer.

12 July 1981, 0030–0300 GMT. During this period, bioluminescence was observed as follows: it took the form of bright 'balls' of white light about the same size as a table tennis ball. The lights occurred only in a narrow band on either side of the ship in areas of turbulence caused by the vessel moving through the water. When the Aldis lamp was directed on to them, the majority of the lights disappeared, although one or two lights turned red and remained visible. The red lights could possibly have been some sort of fish.

Height of eye: 34 metres.

Weather conditions: dry bulb 26.0 °C, wet bulb 24.1, sea temperature 26.7, barometric pressure 1013.8 mb; sea state: calm, slight sea, low swell; 2/8 cloud cover, moon still up.

Position of ship: 11° 13' N, 23° 38' W.

Note. Dr P. J. Herring, of The Institute of Oceanographic Sciences, comments:

'These were probably comb-jellies, or other jellyfish, which produce a bright burst of light when stimulated by the ship's turbulence.'

South Atlantic Ocean

m.v. *Erskine Bridge*. Captain R. Sidney. Hampton Roads to Richards Bay. Observer, Mr S. Chalk, 2nd Officer.

28 August 1981, 0215–0240 GMT. Bioluminescence, mainly in the form of bands, was observed around the ship and up to 2 n. mile distant. The bands were around 200 metres in length and 3–5 metres in width, running parallel to the wind direction. The individual organisms were no more than 3 cm in size. Blue–green light was emitted, but it was not dense.

From 0220 to 0240 GMT the bands disappeared, only small patches of bioluminescence being visible. The vessel's wake produced areas of bright blue light visible up to 2 n. mile. The Aldis lamp was directed on to the water, but only slight intensity was observed. Three water samples were taken in sea buckets, but no bioluminescence was observed when they were stirred. There was no moon.

Weather conditions: dry bulb 23.5 °C, wet bulb 21.0, sea temperature 24.5, barometric pressure 1014.8 mb, wind ESE, force 4–5, sky partly cloudy.

Position of ship: 5° 00' S, 18° 15' W.

Note. Dr Herring comments:

'Not identifiable; the bands observed were windrows of luminous organisms.'

Arabian Sea

s.s. *Lima*. Captain W. A. Clark. Mina al Fahal (Oman) to Lyme Bay. Observers, Mr A. F. De Vanney, Chief Officer, Mr G. J. Lea, 2nd Officer, and other members of the ship's company.

31 July 1981. The vessel had left its loading port of Fahal on 27 July and was proceeding in heavy seas due to the South West Monsoon, steering a course of 209° (T) at a speed of 5.2 knots. At 2036 GMT on the 31st the sea suddenly turned a 'milky-white', giving the impression that the vessel was steaming

through a snow-covered ploughed field, and causing mixed reactions among those on the bridge. The 2nd Officer was the initial observer and he was a little dubious as to what he was seeing, having only rarely visited the Arabian Gulf area he had not seen the like before. The effect continued through until morning twilight at approximately 0100 GMT on 1 August. The Chief Officer states that the effect was nowhere near as bright as he had seen it on previous occasions, and possibly owing to his having 'seen it before' not as eerie, though just as fascinating and exciting as in the past.

Weather conditions: air temperature and sea temperature 26.0 °C, barometric pressure (uncorrected) 1013.0 mb, wind ssw, force 8, rough sea, and heavy swell, sky clear, visibility more than 12 n. mile.

Height of eye: 29 metres.

Position of ship at 2036 GMT on 31 July: 14° 55' N, 57° 45' E.

Note 1. The phenomenon was also observed on the following night, 1/2 August in position 13° 04' N, 56° 44' E.

Note 2. Dr Herring comments:

'Another clear description of "milky-sea" conditions during the South West Monsoon period. There is still no clear indication of why such conditions are so characteristic of this season in this area. The source of the luminescence is also a matter of doubt; sometimes it has been attributed to luminous bacteria but the prevailing wind conditions render this unlikely in this example. Luminous bacteria need to be present in very high concentrations before they luminesce and wind mixing of the surface layers would prevent this. Small crustaceans or dinoflagellates are the most likely alternatives.'

m.v. *Mena*. Captain P. F. Redfern. Mina al Fahal (Oman) to Mombasa. Observers, the Master and Mr J. Y. Simpson, 3rd Officer.

1 August 1981. On the evening of 1 August while the vessel was steaming on a course of 204°(T) at a speed of 11 knots, 'white water' was sighted. At 2130 (Local Time) the visibility, which had previously been 6 n. mile, suddenly lifted to 10 n. mile and the horizon became sharp where previously it had been hazy owing to heavy seas and spray. A band of 'white water' was observed on the port side and was seen to be increasing in size. By 2145 the creamy white area was now across the path of the vessel and spreading all round the horizon. The size of the area was estimated as about 6 n. mile diameter, approaching from an ESE'ly direction. At 2230 the vessel was still in the centre of the area of 'white water' and both sea and sky were still intensely illuminated.

The effect given was that of sailing on top of a cloud. Where the bow wave actually broke, the water took on its normal colour but returned to its luminous appearance the moment the water settled. Lights were shone on the surface and the white milky effect disappeared but when the lights were switched off the luminous effect reappeared instantly.

At 2330 there was still no sign of this effect disappearing although some patches about 3 n. mile from the vessel appeared more greyish in colour. The sky remained clear and no fluctuations occurred in the air or sea temperatures. The barometer was steady, there was no trace on the echo sounder and no magnetic anomaly was noted. Although the wind remained force 8 the wave tops had disappeared almost as if a light film of oil had been spread over the surface. At 2350 the area ahead looked as if it was returning to its normal state although a large white loom showed across the horizon ahead. Midnight came and the normal sea state for force 8 had lasted 10 minutes, then once again the vessel was in the midst of this milky white sea. The area was again as large as previously and with the same intense illumination effect.

At 0045 the sea was turning from creamy white to a more greyish colour although the size of the area still remained as far as the eye could see all round the horizon. By 0110 the effect had thinned out with the sea surface returning to normal for a force 8 gale. By 0120 there was no trace of 'white water' in any direction; it was just as if it had never been.

The Master states that although he has witnessed 'white water' on previous occasions, he has never seen such an extensive display as the one recorded above, which persisted for four hours during which the vessel sailed some 45 n. mile.

Weather conditions: air temperature 25.0 °C, sea temperature 28.5, barometric pressure 1000 mb, steady, wind ssw, force 8.

Position of ship: 13° 25' N, 56° 35' E.

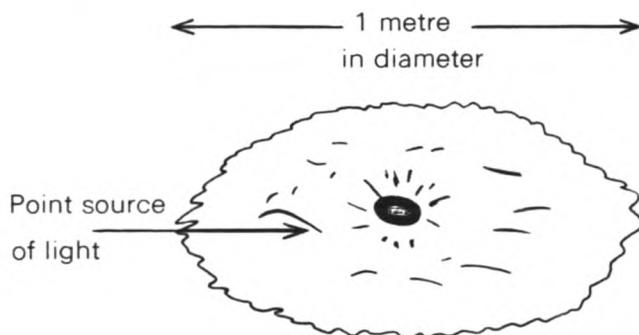
Note. Dr Herring comments:

'This is another very detailed and clear account of "white water" or "milky sea". Two points of particular interest are, first, that the phenomenon appeared to be associated with the extreme surface, and absent in the breaking bow wave, and secondly that despite the force 8 winds the sea appeared "as if a light film of oil had been spread over the surface". Dense concentrations of luminous bacteria maintained in a surface film might account for this phenomenon. In this area one of the results of the South West Monsoon is that deep water upwells off the south Arabian coast and provides the appropriate conditions for dense growth of the phytoplankton. Their death and decay might lead to the formation of such a surface film or slick (compare *Lima*, above).'

Arabian Sea

m.v. *Strathelgin*. Captain D. H. Roberts. Singapore to Karachi. Observers, Mr R. James, 3rd Officer and Mr D. Lloyd.

20 September 1981, 1515 GMT. Whilst steaming 50 n. mile off the West Coast of India (closest town New Mangalore, well known for prawns) the vessel passed through intense bioluminescence; so much so that the ship's side was clearly seen above the sea surface and below water level to an estimated depth of 4 metres. All about the ship the breaking waves were clearly seen at some distance (estimated to be 2 n. mile) and it seemed as if a large wave was approaching the ship. The area of bioluminescence was localized, being about ½ n. mile square. It is possible that some underwater current was the cause; the occasional 'flashes of light' from the sea were fairly bright point sources giving rise to a surrounding area of diminished brilliance (see sketch).



Weather conditions: sea temperature 29.5 °C, wind wnw, force 5-6, sky overcast.

Ship's course and speed: 330° (T) at 14 knots.

Position of ship: 13° 03' N, 73° 52' E.

Note. Dr Herring comments:

'I cannot ascribe this report to any specific cause but it has been reported from similar regions that dense patches of small luminous crustaceans (ostracods) are occasionally encountered. However, I think it is more likely that a dinoflagellate bloom was responsible and the dramatic effects caused by the disturbance of these organisms by the breaking waves and ship's passage. The bright "point sources" were clearly something different and probably larger (e.g. fish or jellyfish).'

Chilean Coastal Waters

m.v. *Oropesa*. Captain T. J. Sax. Iquique to Antofagasta. Observers, the Master and Cadet M. C. Hill.

31 July 1981, 0025 GMT. While the vessel was steaming along the coast of Chile on a course of 188°(T) at a speed of 16 knots, very strong bioluminescence was observed. It was of a very light green colour, which was slightly irritating to the eyes. Further away from the vessel the sea had the appearance of being rough, as if the white horses were caused by a force 6 wind, when in fact the sw'ly wind was no more than force 3. On the horizon to the south-west there was a light band similar to what may be seen on a cloudy sky during the period of very early dawn. This phenomenon proved to be an optical illusion as within minutes the sea could be seen to be covered in what appeared to be a very low-lying illuminated haze, but again this was proved to be an illusion, and in fact, as the vessel passed the area, estimated to be about $\frac{1}{4}$ n. mile on the starboard beam, it could be seen that it was the sea itself which was glowing with a very pale, milky dim light. This phenomenon disappeared within a few minutes. The glowing white-horses, rough-sea effect faded in about 12 minutes; the very bright bow wave began to fade at the same time but remained just visible for a further 15–20 minutes.

Weather conditions at time of observation: dry bulb 14.8 °C, wet bulb 12.9, sea temperature 15.9, barometric pressure 1013.6 mb, slight sea with long, low sw'ly swell.

Position of ship: 20° 56'N, 70° 26'W.

Note. Dr Herring comments:

'I cannot identify the source of this bioluminescence but the transient appearance of the milky sea condition is unusual, if indeed the phenomenon was similar to the more widespread "milky sea" situations better known from the Arabian Sea.'

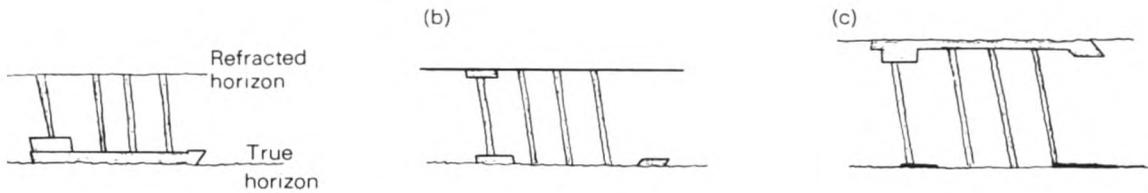
ABNORMAL REFRACTION

South African Coastal Waters

s.s. *Esso Hibernia*. Captain J. W. H. Aalen. Dubai to Las Palmas. Observers, Mr A. Hodgson, Chief Officer and Mr D. Bunker, 2nd Officer.

12 September 1981. During the afternoon refraction was observed; it was considered extreme owing to the clarity of the mirror images and the amount of sea and number of other vessels visible, although in fact below the horizon. For most of the horizon a thin line of refracted horizon was seen above the actual, and in the east (opposite bearing of the sun) this became a definite band.

At a range of approximately 9.25 n. mile, funnels, masts and derricks appeared to be extended, and then as range increased the mirror image increased until the true image had gone and only the mirror image remained, once the vessel was below the horizon. One of the several notable images is shown in the sketch.



General cargo ship, also steaming west, range increasing

Position of ship: 12 September, 1200 GMT: $34^{\circ} 18' S$, $25^{\circ} 30' E$.

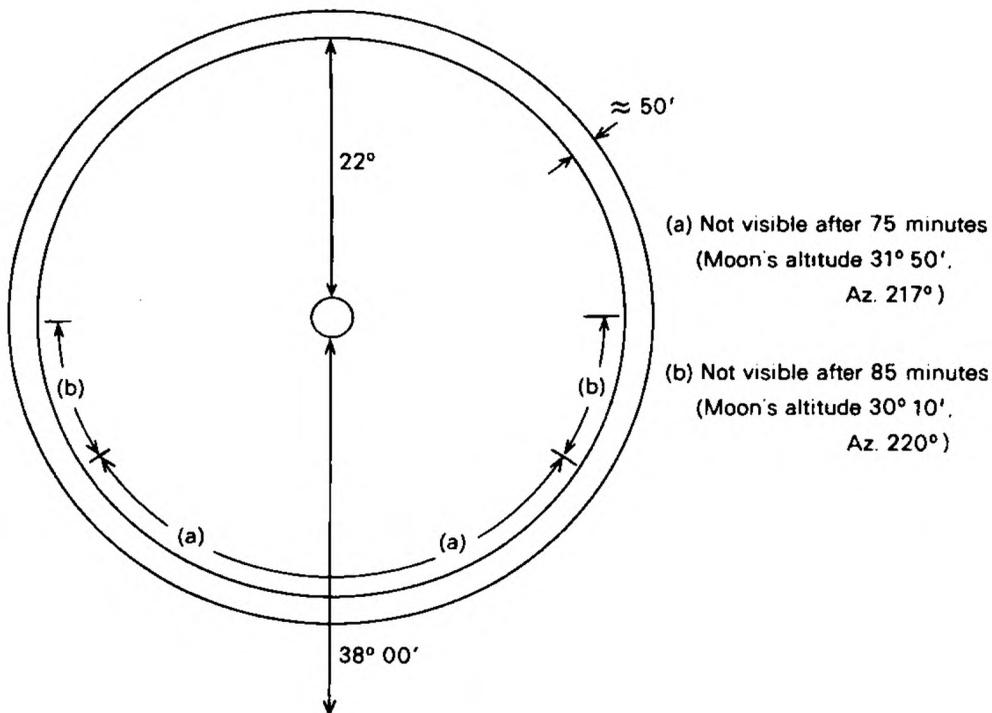
LUNAR HALO

North Pacific Ocean

m.v. *Spraynes*. Captain A. M. Smart. Portland (Oregon) to Singapore. Observers, the Master and ship's company.

11 August 1981, 1220 GMT. A halo of 22° was observed around the moon. The halo, which could be seen in its entirety, was quite bright and white in colour with a width of approximately $50'$ of arc. The altitude of the moon was $38^{\circ} 00'$ and the azimuth $209^{\circ}(T)$.

The sky at the time was covered with a thin layer of cirrostratus through which most of the brighter stars were visible. After 75 minutes the lowermost 120° of the halo was not visible. The altitude of the moon at this time was $31^{\circ} 50'$ and the azimuth $217^{\circ}(T)$. After 85 minutes a further 60° of the halo was lost, leaving the upper semicircle, the moon's altitude then being $30^{\circ} 10'$ and azimuth $220^{\circ}(T)$; at this time small fractocumulus clouds were moving across the moon. After 100 minutes the upper semicircle was barely visible; altitude of the moon $27^{\circ} 42'$ and azimuth $222^{\circ}(T)$. After 115 minutes, no trace of the halo was visible; altitude of the moon $25^{\circ} 43'$ and azimuth $225^{\circ}(T)$, with altostratus moving across the sky.



The halo was observed for some 115 minutes, during which no arcs of contact were observed.

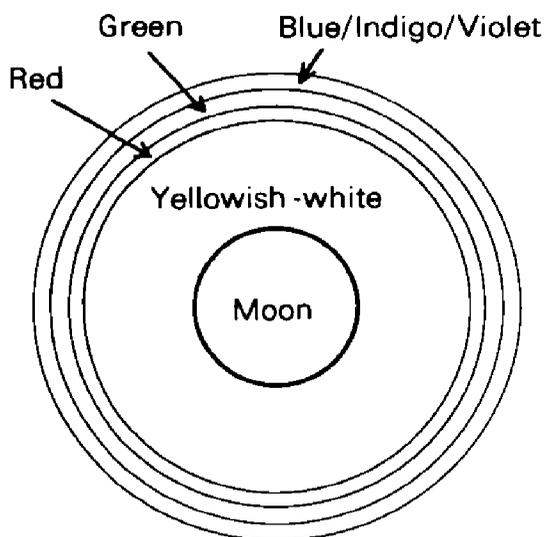
Weather conditions at 1200 GMT: dry bulb 27.4 °C, wet bulb 24.6, barometric pressure 1006.2 mb, wind and seas calm.

Position of ship: 28° 32' N, 138° 40' E.

East Central Pacific

m.v. *Gambada*. Captain G. W. McDermott. Melbourne to Balboa. Observers, Mr G. Owen, 3rd Officer and Mr Hasan Mohd, Quartermaster.

14 August 1981. At 0330 GMT a 22° halo was observed around the full moon which persisted for about 20 minutes. Clouds were dissolving at the time. The vessel had recently passed through a brief line-squall of low cumulus cloud. The cloud around the moon at the time of observation was cirriform; as this cloud started to redevelop the halo disappeared but quite clear rings of red, orange/yellow, green, blue/indigo/violet were seen to develop close to the moon.



Weather conditions: dry bulb 24.5 °C, wet bulb 23.1, barometric pressure 1013.5 mb, rising slightly (diurnal variation), wind light variable, force 2.

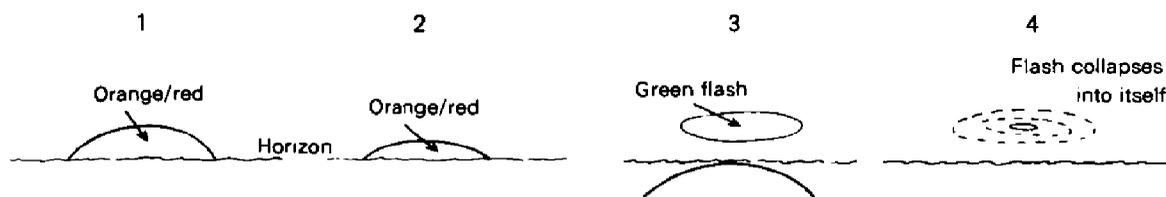
Position of ship: 4° 57' N, 86° 30' W.

GREEN FLASH

South Atlantic Ocean

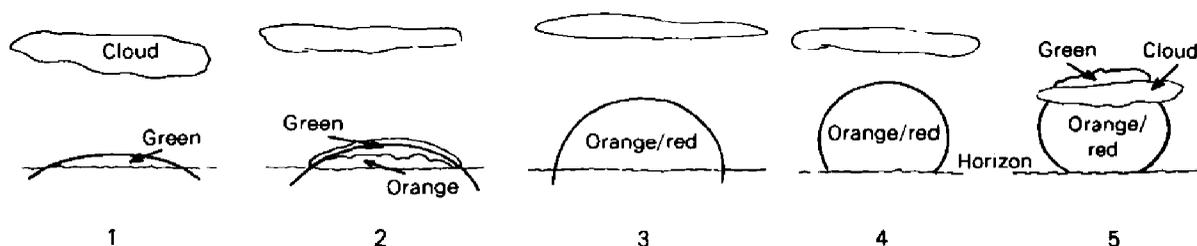
m.v. *Troutbank*. Captain T. D. Faithfull. New York to Cape Town. Observer, Mr E. Harrison, 3rd Officer.

22 and 23 August 1981. At sunset (1852 GMT) on the 22nd a green flash was observed. It was of such an intensity as to be easily visible to the naked eye. The duration of the flash was about $\frac{1}{2}$ second and the colour was a brilliant emerald green. The flash appeared as an oval after the sun had set and then collapsed into itself and disappeared.



Weather conditions: dry bulb 24.5 °C, wet bulb 20.0, sea temperature 24.4, barometric pressure 1016.3 mb.

At sunrise (0652 GMT) on the 23rd a green flash was again observed. It was of low intensity and of short duration, approximately $\frac{1}{3}$ of a second. It was less



well-defined than the flash observed on the previous day. The flash was an extension of the sun itself and only ran around the circumference of the sun.

Position of ship: (22nd), 8° 27' S, 13° 22' W
(23rd), 11° 02' S, 10° 56' W.

Note. A detailed account of this interesting phenomenon is to be found on pages 99–101 of *The Marine Observer's Handbook*.

UNIDENTIFIED PHENOMENON

North Atlantic Ocean

m.v. *Erskine Bridge*. Captain R. Sidney. Hampton Roads to Richards Bay. Observer, Mr A. R. Ewins, 3rd Officer.

22 August 1981. At 0125 GMT the observer was in the chartroom and noticed through the side window five brilliant white flashes of light, of duration about 1 second and spaced about 2–3 seconds apart. On running out on to the bridge-wing he saw four brilliant white lights overhead travelling south-east. From overhead to the horizon and out of sight took about 3–4 seconds. About five seconds later, four distinct white 'pulses' of light were observed above the horizon, each of about one second's duration. Each of these pulses of light did not radiate, but appeared as a compact 'puff' of light which imploded in on itself. There were no trails of light, sparks, or sound throughout.

Position of ship: 13° 57' N, 40° 55' W.

Editorial Note. The observation of a freak wave reported on page 63 of the April 1982 issue of *The Marine Observer* (Volume LII, No. 276) was wrongly attributed to the *Pacific Crane* (Captain J. Lundberg). The observation was in fact made by the *Oriental Vanguard* (Captain K. Lehepuu). The error is regretted.

Some Characteristics of Atlantic Tropical Cyclone Forecast Errors*

BY CHARLES J. NEUMANN

(National Hurricane Center, Coral Gables, Fla)

Relevant to the responsibility of detecting, tracking, and forecasting tropical cyclones, the National Hurricane Center (NHC) continuously monitors the quality of its forecast products. Through computer technology, the hurricane specialists at NHC are kept constantly aware of errors as they develop following advisory issuances to various interests. Error summaries are prepared on individual forecasts as well as on a storm-by-storm basis. Finally, at the end of each hurricane season, an overall seasonal summary of errors is prepared.

Periodically, performance is examined over a number of hurricane seasons to identify any long-term biases, deficiencies in performance, trends or other patterns in the forecasts. In one such recent evaluation, Neumann and Pelissier (1981) examined approximately 1000 forecasts of tropical cyclone motion issued by NHC over the 10-year period 1970-79. Portions of that study which pertain to 12- and 24-h forecasts and are of interest to mariners are presented here.

Forecast errors

Marine advisories on tropical cyclones are issued every 6 hours whenever such storms are in existence. Along with other information these advisories contain 12- and 24-h forecast positions of the tropical cyclone centre (eye). It was these 12- and 24-h forecasts that were examined.

The usual measure of tropical cyclone forecast accuracy is given by the quantity forecast error or, if averaged over a number of events, as mean forecast error. This error is simply the distance in nautical miles, measured along a great circle, between the forecast and actual positions of a tropical cyclone centre. The actual position is obtained from a final storm track as determined by a postanalysis of all available satellite, aircraft, radar, ship, island, data buoy, and coastal reports. This final track is referred to as the 'best-track' of the storm. Maps of seasonal best-tracks appear annually in the *Mariners Weather Log*; the chart for 1980, for example, is contained in the summary article of 1980 tropical cyclones (Lawrence and Pelissier, 1981).

Over the 10-year period 1970-79, 82 tropical storms and hurricanes were recorded over the Atlantic basin. The tracks of these storms are shown in Figure 1. A total of 1113 12-h forecasts and 975 24-h forecasts on these tracks were issued routinely at 6-h intervals by NHC with average errors of 51 and 109 n. mile respectively. As would be expected, there were wide variations in individual errors, ranging from 0 to 208 n. mile for the 12-h and 0 to 449 n. mile for the 24-h forecast. The actual distribution of errors is depicted in Figure 2. The figure shows, particularly at 24 hours, that an otherwise reasonably acceptable pattern of error is marred by occasional errors of unacceptable magnitude. The remainder of this discussion will consider factors which relate to this large variation in error from one forecast to another.

* Previously published in *Mariners Weather Log*, July-August 1981, Volume 25, Number 4, pp. 231-236. Study partially supported by NOAA/ERL National Hurricane Research Laboratory (NHRRL).

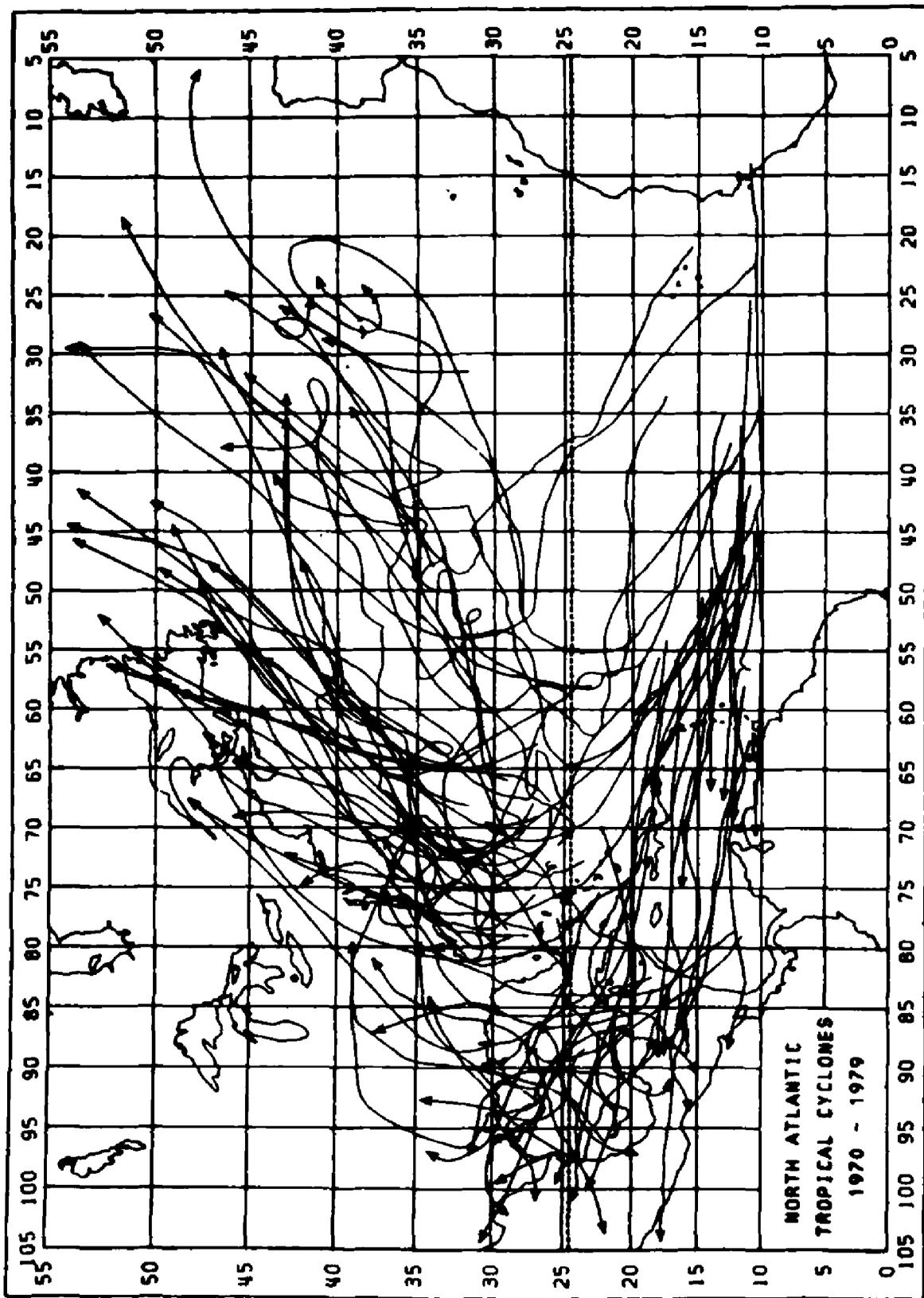


Figure 1. Tracks of Atlantic tropical cyclones, 1970-79. Horizontal dashed line along 24.5°N latitude separates north-zone from south-zone storms. (From Neumann and Peissier, 1981.)

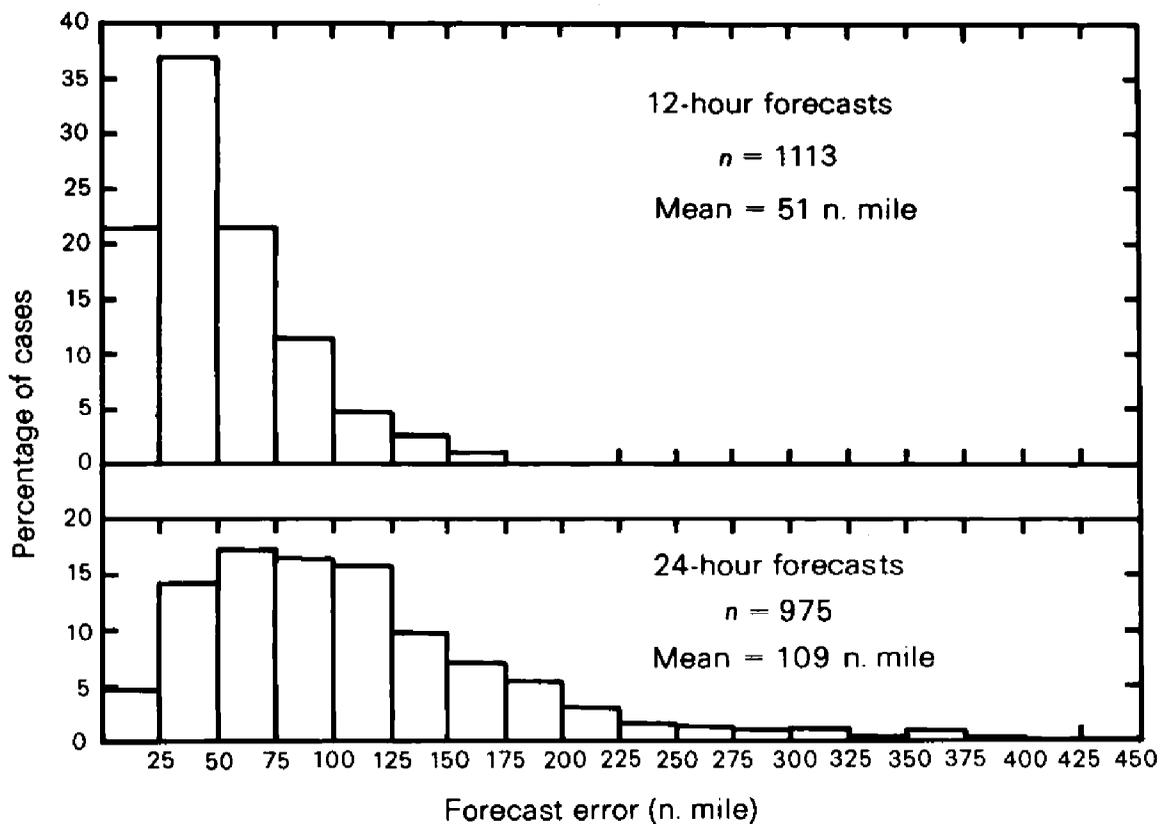


Figure 2. Distribution of magnitude of forecast errors, 1970–79. The quantity 'n' is sample size.

Factors which influence forecast error

Although 12- and 24-h tropical cyclone forecast errors averaged 51 and 109 n. mile respectively, there were wide geographical variations depending on a number of factors which relate to the difficulty of the forecast. One such factor is latitude. For example, 12- and 24-h errors on storms initially located (last known position for beginning of the forecast interval) in the south zone of Figure 1 were 43 and 88 n. mile respectively, whereas those initially in the north zone averaged 56 and 124 n. mile respectively. For the most part, storms located in the south zone were embedded in the easterly (trade wind) circulation, whereas those in the north zone had recurved into the westerlies or were in the process of doing so.

The difference in forecast error between storms in the south and those in the north zone reflects the fact that the former move more slowly, have a greater degree of motion steadiness (persistence) and adhere better to known climatological patterns than the latter. Most mariners are aware of the often erratic behaviour and accelerations of middle and high latitude tropical cyclones.

Although there is a marked difference in mean forecast error between south zone and north zone storms, Figure 3 shows that the 24-h forecast errors gradually increase from south to north rather than suddenly increasing at 24.5°N . On the average, the lower the latitude of the storm, the lower will be the forecast error. Exceptions to the rule will be noted later.

One reason for the poleward increase in mean forecast error is a similar poleward increase (Figure 4) in the mean translational speed of tropical cyclones beginning about latitude 29°N , which is also the average latitude of tropical recurvature. Thus, storms embedded in the easterlies (south of 29°N) exhibit

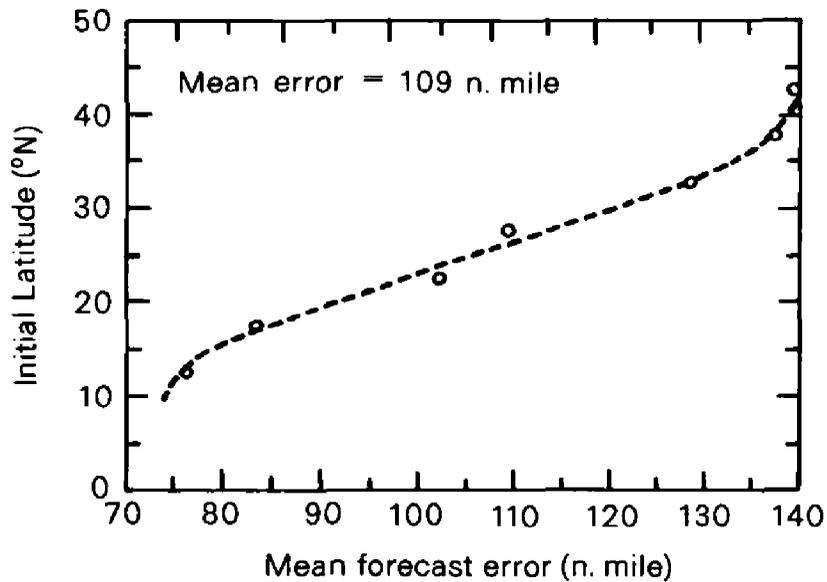


Figure 3. Latitudinal variation in mean forecast error, 1970-79.

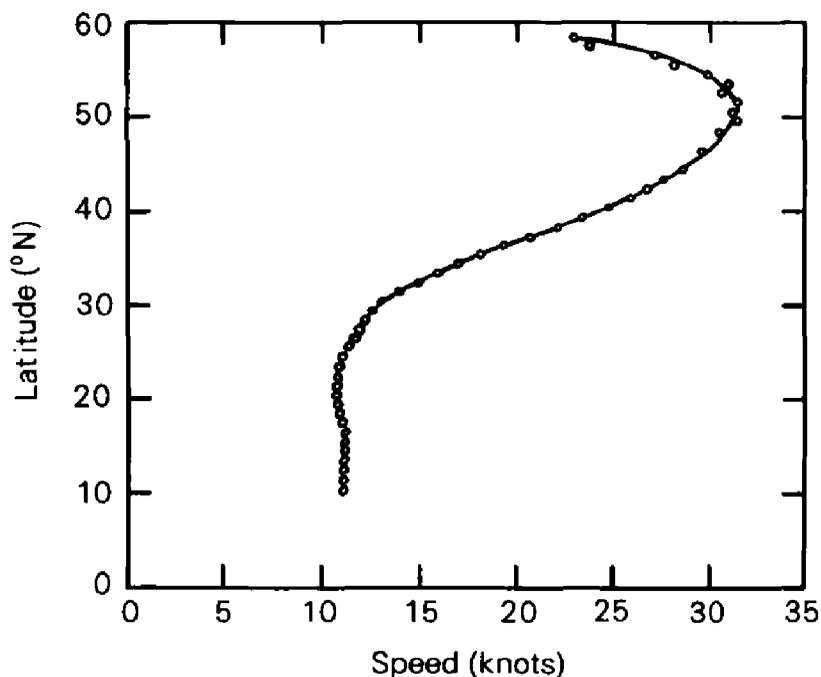


Figure 4. Latitudinal variability in the translational speeds of Atlantic tropical cyclones.
 Computations are based on 782 storms, 1886-1979.

reasonably steady speeds regardless of latitude whereas those storms embedded in the westerlies (north of 20°N) typically accelerate as they move poleward, at least up to latitude 50°N . For a given error in the forecast direction of a tropical cyclone, the total forecast error is proportional to the speed at which the forecast and observed tracks diverge. At low latitudes, large forecast errors are typically not observed since the slower speeds and lack of acceleration preclude excessively large forecast errors even with erroneous directional forecasts.

At mid-latitudes, directional forecasting becomes more difficult because of the interaction between easterly and westerly circulations. It is often difficult to predict if and when a storm, presently in the easterlies, will recurve into the westerlies. This is a particularly error-prone situation since the combination of direction and speed errors can lead to large total forecast errors. Most of the large errors depicted in Figure 2 were of this type; that is, a forecast of recurvature which did not occur or recurvature which was not forecast. Often, forecasters correctly identify recurvature situations but incorrectly assess the timing.

Another factor besides forecast difficulty which affects forecast error is the availability of weather observations in and around the storm area. It can be shown (George and Gray, 1976) that a storm moves in accordance with the large-scale, deep-layer (surface to 40 000 ft) environmental flow patterns in which it is embedded. A knowledge of these patterns and how they are changing will allow for a reasonably good prediction of the storm's future course. A lack of this information requires that the forecast be based on other information such as climatology and past motion. As previously pointed out, such forecasts are reasonably good at low latitudes where storms tend to adhere to climatological pattern and persistence of motion. However, in middle and high latitudes where steering forces are highly variable in time and space, poor forecasts can result.

There are numerous other factors which relate to forecast error but to a lesser degree than the two factors just discussed. These include the ability to initially locate the storm centre, which in turn depends somewhat on the intensity of the storm; more intense storms present a more definitive satellite image pattern. Also, multiple storms can interact in an often unpredictable way or compete for available forecaster or reconnaissance resources. Obviously, forecaster expertise also plays a role.

In summary, 12- and 24-h forecast errors through the decade of the 1970s were mainly dependent on two factors: forecast difficulty and knowledge of environmental steering forces. The interaction between these two factors produces an error pattern that is highly dependent on latitude but which shows other regional differences as well. These differences are discussed later.

Interannual variation in forecast error

As pointed out earlier, the average 24-h forecast error, 1970-79, was 109 n. mile. However, consistent with the concepts discussed in the previous section, wide variations from one year to the next would be expected depending on the character of a given season. Years with predominantly low-latitude storms would be expected to yield relatively low forecast errors, and years with predominantly mid-Atlantic storms would be expected to yield relatively high errors.

Forecast errors for each year, 1970 to 1979, are given in Table 1; errors are

Table 1. Average 24-h forecast errors, 1970-79

Year	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	Total 1970-79
Error (n. mile)	81	103	133	108	90	114	127	128	135	84	109
Number of Forecasts	33	186	51	84	86	122	144	30	101	138	975

seen to be highly variable, ranging from a low of 81 n. mile in 1970 to a high of 135 n. mile in 1978. Storm track charts for these 2 years are presented as Figures 5 and 6. In 1970 (Figure 5) it can be noted that regular season storms were, indeed, confined to the deep Tropics and the Gulf of Mexico, whereas in 1978, mid-Atlantic storms predominated.

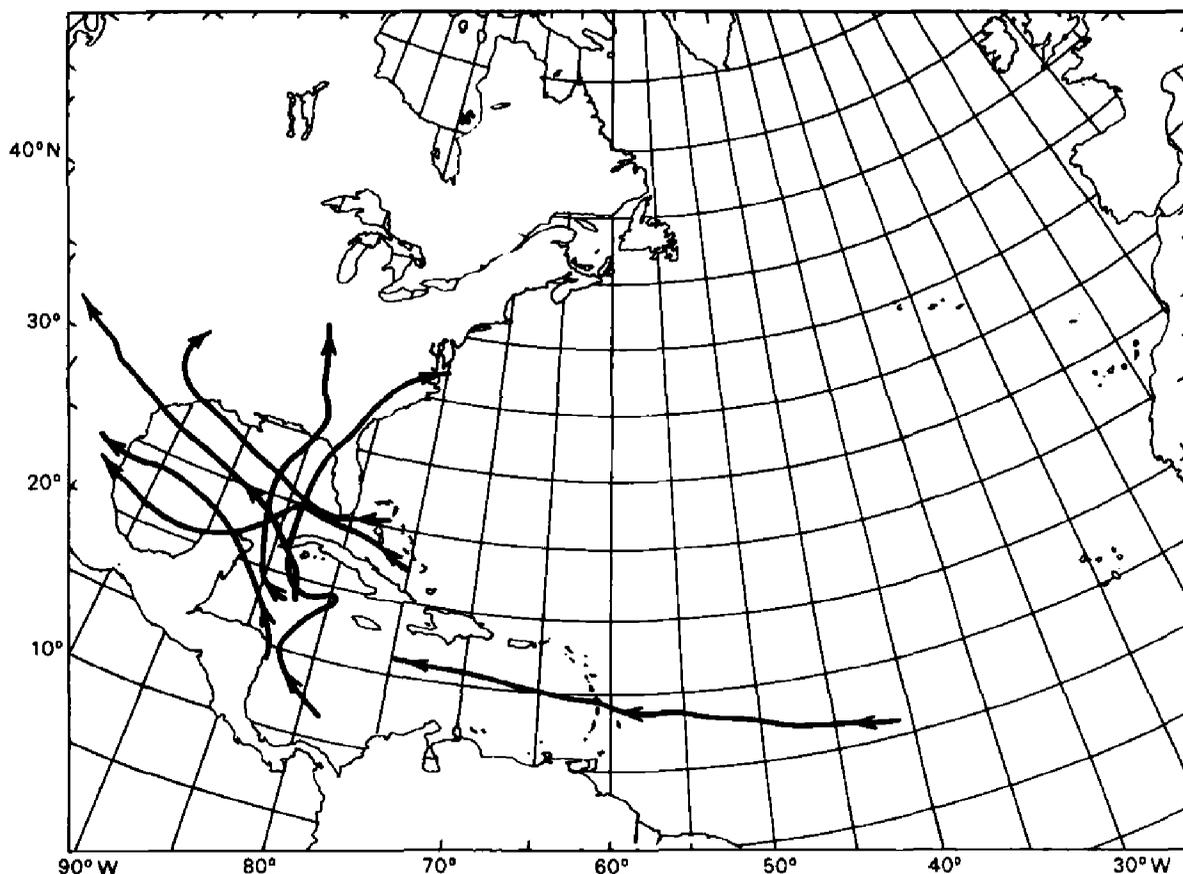


Figure 5. Atlantic tropical cyclones, 1970.

Because these differences in forecast errors from one year to the next are caused by factors other than differences in forecast skill, the data in Table 1 cannot be used to assess long-term changes in the state-of-the-art of Atlantic tropical cyclone forecasting. However, in the study by Neumann and Pelissier referred to in the first section, the authors have adjusted yearly errors according to forecast difficulty for that year, and it is shown that skill in Atlantic tropical cyclone forecasting, at least at the 24-h projection, remained relatively unchanged over the decade of the 1970s.

Regional differences in forecast error

The approximate increase in forecast difficulty from south to north together with the bulk of upper-air observing stations being located over the western and south-western portions of the Atlantic basin, as well as other circumstances, leads to a distribution of average 24-h forecast error as depicted in Figure 7. Here it can be noted that, although average overall error is 109 n. mile, regional errors averaged from a low of near 60 n. mile for storms initially located off South America near 60°W to more than 140 n. mile for those initially located 10 degrees of longitude east of the mid-Atlantic States.

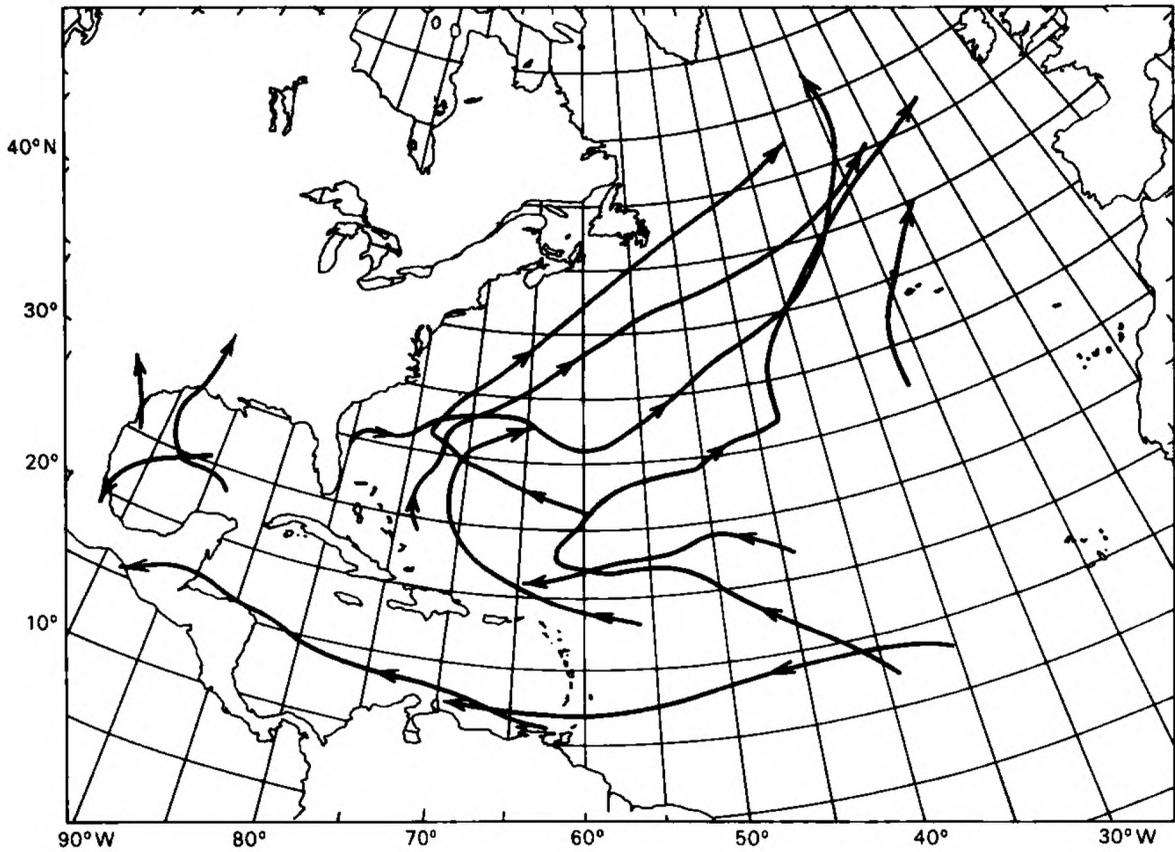


Figure 6. Atlantic tropical cyclones, 1978.

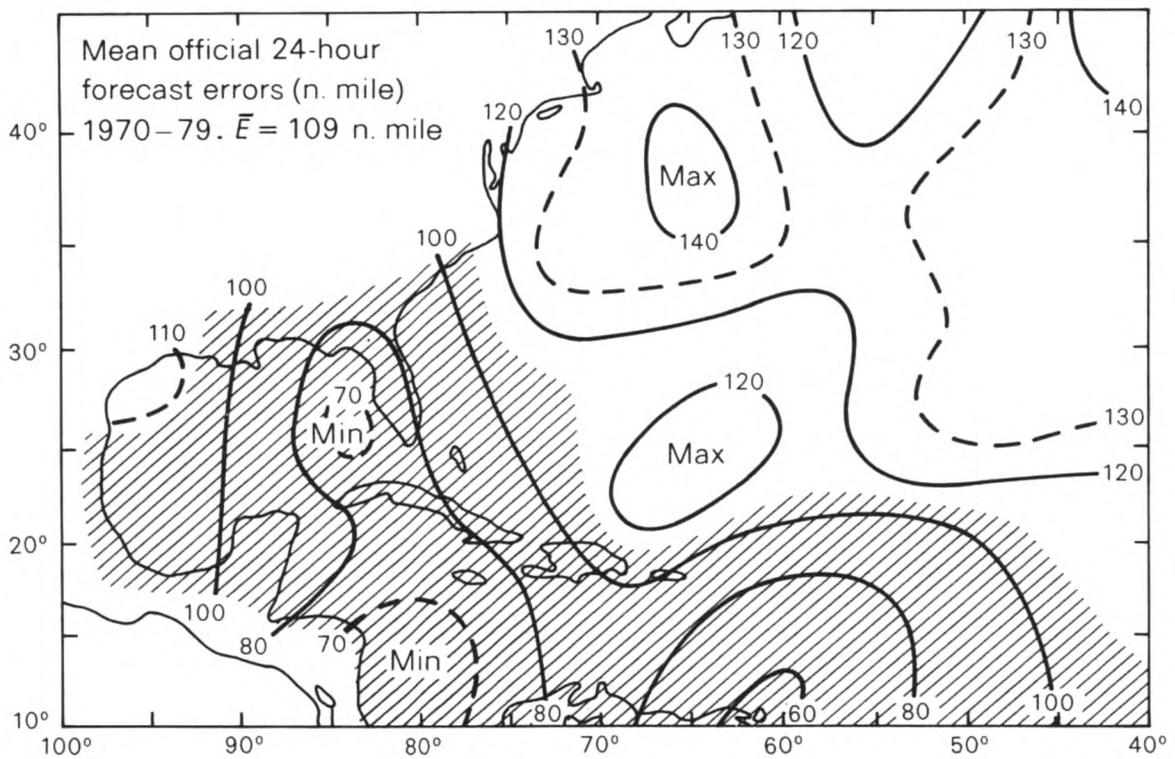


Figure 7. Geographical variation of 24-hour mean forecast errors (n. mile), 1970–79. Errors are relative to initial position of storm. \bar{E} gives overall mean error. Shading depicts areas where error is below average. (Adapted from Neumann and Pelissier, 1981.)

The minimum off the coast of South America results from storm motion being extremely persistent at these latitudes and the presence of a reasonable number of reporting stations. The maximum off the east coast of the United States corresponds to an area where sudden storm accelerations north-eastward are common and where there is a complete lack of rawinsonde stations which report upper-air wind and pressures. Atlantic Ocean Station Vessels, which did have this capability over at least some portions of the Atlantic, were decommissioned beginning in 1973.

Other features of Figure 7 are also significant. These include the minimum error over the north-eastern Gulf of Mexico and the maximum north of Puerto Rico. The reason for the minimum over the Gulf is not fully understood but is certainly related to the fact that storm motion is quite persistent in this area and there is a large amount of observational data including continuous aircraft reconnaissance. This enables the forecaster both to accurately determine initial storm motion and to assess future environmental steering forces. The maximum error north of Puerto Rico corresponds to an area where forecasts of recurvature are uncertain.

The shaded area in Figure 7 depicts the area where errors are below average. Here it can be noted that, with the exception of the extreme north-western Gulf of Mexico, errors over the Gulf of Mexico and the Caribbean are similar in magnitude and, for the most part, are less than 100 n. mile in 24 hours. This is, indeed, fortunate, since most of the encounters of tropical cyclones with populated land areas are within this zone. However, over most of the North Atlantic, 24-h tropical cyclone forecast errors typically exceed 120 n. mile.

Additional comments

In this study it has been shown that tropical cyclone forecast errors on the average are directly proportional to the initial latitude of a storm; that is, low-latitude storms tend to have low forecast error, and high-latitude storms tend to have high forecast error. However, a notable exception exists in the eastern Gulf of Mexico where forecast errors are less than one might expect for those latitudes. This condition reflects persistence of storm motion in this portion of the Gulf as well as a large amount of observational data. Mariner awareness of these error patterns should provide for a better interpretation of tropical cyclone advisories. Few significant changes in this pattern are expected during the decade of the 1980s.

Additional information on Atlantic tropical cyclone forecast errors over the decade of the 1970s can be found in Neumann and Pelissier, 1981. A similar study for the western Pacific is given by Jarrell *et al.* (1978).

REFERENCES

- George, G. E. and Gray, W. M., 1976. Tropical cyclone motion and surrounding parameter relationships. *J Appl Meteorol*, **25**, 1252-1264.
- Jarrell, J. D., Brand, S. and Nicklin, D. S., 1978. An analysis of western North Pacific tropical cyclone forecast errors. *Mon Weath Rev*, **106**, 925-937.
- Lawrence, M. B. and Pelissier, J. M., 1981. North Atlantic tropical cyclones, 1980. *Mar Weath Log*, **25**, 79-91.
- Neumann, C. J., Cry, G. W., Caso, E. L. and Jarvinen, B. R., 1978. Tropical Cyclones of the North Atlantic Ocean, 1871-1977. National Climatic Center, Asheville, N.C. and National Hurricane Center, Coral Gables, Fla, 170 pp.
- Neumann, C. J. and Pelissier, J. M., 1981. An analysis of Atlantic tropical cyclone forecast errors, 1970-1979. *Mon Weath Rev*, **109**, 1248-1266.



Aeneas (Ocean Transport & Trading P.L.C.) Captain A. J. Dyne



Dacebank (Bank Line Ltd) Captain T. D. Scott



Bransfield (British Antarctic Survey) Captain S. J. Lawrence

THE THREE SHIPS WHICH GAINED THE HIGHEST MARKINGS FOR THEIR METEOROLOGICAL LOGBOOKS DURING THE YEAR 1981 (see page 106).



Presentation of barographs on 24 March 1982 at Bracknell. Left to right: Captain A. R. Hill (on behalf of Captain B. Austen-Smith); Captain and Mrs W. G. Hunt; Sir John Mason; Captain and Mrs F. G. Bevis; Captain and Mrs M. J. Cole. (See facing page.)

PRESENTATION OF BAROGRAPHS

The presentation of Special Long-Service Awards in the form of barographs to officers of the Voluntary Observing Fleet was introduced in 1948 by the then Director of the Meteorological Office, Sir Nelson K. Johnson, K.C.B. Four of these awards are made annually to officers who have rendered considerable service to the Meteorological Office and who are selected in recognition of the quality and quantity of their meteorological observations over a long period of years.

As announced in the last January edition of this journal, the four Masters selected for the year ending December 1980 were: Captain B. Austen-Smith and Captain F. G. Bevis, both of P. & O. Deep Sea Cargo Division, Captain M. J. Cole of the British Antarctic Survey and Captain W. G. Hunt of F. T. Everard & Sons. The presentation ceremony took place at the Meteorological Office Headquarters in Bracknell on Wednesday, 24 March 1982. Unfortunately, Captain Austen-Smith, who lives in New Zealand, was unable to be present but we were pleased to welcome Captain and Mrs F. G. Bevis, Captain and Mrs M. J. Cole and Captain and Mrs W. G. Hunt together with Captain K. S. Garrett, Marine Superintendent of Everards and Mrs Garrett, Captain G. Marchant, General Manager of P. & O. Fleet and Nautical Department, Dr R. J. Adie, Deputy Director of British Antarctic Survey, Mr W. M. Sievwright, Assistant Establishment Officer of British Antarctic Survey and Captain A. R. Hill, Marine Manager of P. & O. Deep Sea Cargo Division, who accepted an award on behalf of Captain Austen-Smith.

In presenting the awards and congratulating the Masters, Sir John Mason, Director-General of the Meteorological Office, stressed the importance to the Office of the surface observations received from merchant ships. Their value was in no way diminished by the data now received by means of satellites and, although observations from aircraft were useful, they tended to be at about the same height and along the same tracks. As merchant ships had become larger and faster, there are fewer of them and hence fewer observations. This makes the observations which are received all the more valuable.

Sir John went on to mention that in the near future the Office would be preparing forecasts for aviation on a world-wide basis and, as there are large oceanic areas in the southern hemisphere, observations from ships would be of the utmost value and importance. He therefore urged the Management and Marine Superintendents of the Companies present and the Masters to impress upon their junior officers the high regard and usefulness that this Office places upon their voluntary meteorological efforts which, if anything, are of greater value now than ever.

The Masters were then invited to examine the first meteorological logbooks they had compiled which, as usual, evoked memories of ships and colleagues near-forgotten and much discussion. A photograph taken at the presentation appears opposite.

The guests were then entertained to luncheon by Sir John Mason and senior officers of the Meteorological Office, after which they were shown around the Telecommunications Centre and Central Forecasting Office.

C.R.D

AURORA NOTES JULY TO SEPTEMBER 1981

BY R. J. LIVESEY

(Co-ordinator of Auroral Observing, the Solar Section of the British Astronomical Association)

Observations sent in by ships are shown in the accompanying table. The five observations from m.v. *Solentbrook* are but part of a fine series of 17 nights of note-taking between 2 September and 31 October, many of which were made in the high latitudes of the auroral zone.

Marine Aurora Observations July to September 1981

DATE 1981	SHIP	GEOGRAPHIC POSITION	TIME (GMT)	FORMS
4 July	<i>Manchester Crusade</i>	49° 49'N 60° 23'W	0315-0340	RA, R, RA, RB
18	<i>Nosira Lin</i>	53° 41'N 49° 35'W	0235-0320	RB
24	<i>Star Blackford</i>	50° 15'N 125° 22'W	0710-0730	G, RB
26	<i>Zinnia</i>	51° 45'N 53° 20'W	0100-0600	G, HB, R, RB
27	<i>London Baron</i>	48° 25'N 89° 10'W	0602-0620	G, R, HB
16 Aug.	<i>Mairangi Bay</i>	23° 24'S 146° 12'W	1640-1720	QmR, mR
24	<i>British Patience</i>	57° 28'N 1° 12'W	2350-0038	RB, HA
24	<i>British Enterprise</i>	60° 52'N 20° 52'E		mV
27	<i>British Unity</i>	57° 30'N 8° 05'E	2200-2215	RA
30	<i>Mairangi Bay</i>	50° 10'S 179° 22'W	0930-1000	N
2 Sept.	<i>Solentbrook</i>	70° 31'N 19° 32'E	2105-2120	aR, RB
4	<i>Admiral Beaufort</i>	57° 07'N 19° 48'W	2340-0220	qHA, qHV, qHP, qHN
13	<i>Solentbrook</i>	71° 14'N 24° 48'E	2100-2120	aR
14	<i>Solentbrook</i>	69° 35'N 16° 00'E	1945-2040	aR, aCRB, HB
15	<i>Solentbrook</i>	66° 10'N 9° 33'E	2115-2145	aR, aRA, aRA
28	<i>Solentbrook</i>	64° 25'N 7° 20'E	2130	aN
30	<i>Solentbrook</i>	70° 22'N 18° 24'E	1930-2130	aR, amRB, HA

KEY: A=arc, a=active, B=band, C=corona, G=glow, H=homogeneous, m=multiple, N=unspecified form, P=patch, q=quiet, R=ray, RA=rayed arc, RB=rayed band, V=veil.

As might be expected in July, the summer light in the eastern Atlantic restricted observing, but the location of the geomagnetic field directs the aurora into more southerly latitudes at the entrance to the St Lawrence and hence into darker skies. On 4 July came an isolated report of rays, rayed arcs and rayed bands at that location from m.v. *Manchester Crusade*. A radio event was noted on the 23rd. On the 25th came an isolated land report from Australia coinciding with a massive magnetic and radio storm. On the 26th a British Airways pilot overflying New York reported an aurora visible to him.

In August there was an isolated report of rays on the 5th and a similar report from m.v. *Mairangi Bay* on the 16th. From the 20th to the 27th inclusive came reports of arcs, rays and rayed arcs from the Scottish Border northwards, Norway and the Baltic. The *Mairangi Bay* again sighted auroral activity on the 30th in the southern hemisphere. Radio aurorae were reported on the 4th, 18th, 23rd, 24th and 29th. Magnetic disturbances were noted on the 7th, 10th, 17th, 23rd, 24th, 27th and 31st.

In September there were rays reported on the 2nd followed by a report from o.w.s. *Admiral Beaufort* on the 4th. The *Solentbrook* encountered the aurora in high latitudes where one might expect to see the phenomenon in its usual location when undisturbed by storm conditions. A minor storm took place on the 18th which was observed northwards from Carlisle. In Figure 1 is shown the graph of magnetic-field activity taken from the continuous record derived from a fluxgate magnetometer constructed and operated by Mr David Pettitt at Carlisle. The storm commenced suddenly on the evening of 18 September when the magnetic field had been very quiet for a number of days. The

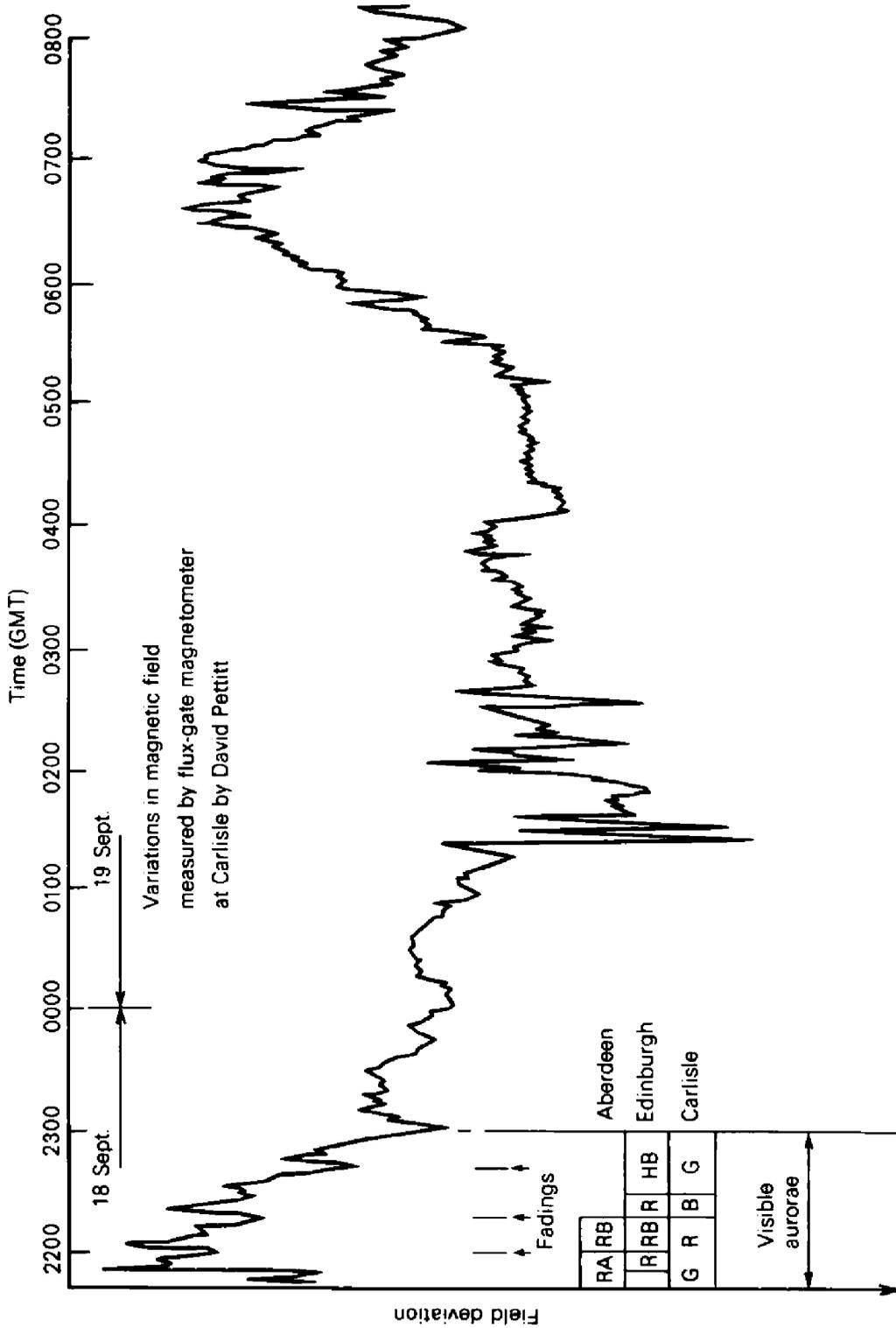


Figure 1. Magnetic storm of 18-19 September 1981.

corresponding visible aurorae are also indicated together with the times when the storm was seen to fade at Carlisle, when it will be noted that there were changes in the magnetic field. There were a number of auroral reports from the 28th to the 30th in high magnetic latitudes, including those from m.v. *Solentbrook*. Radio aurorae were reported on the 18th and 26th and magnetic disturbances on the 18th, 19th and 26th.

The magnetic storms and disturbances referred to in these reports relate to days when the value of the planetary magnetic index K_p reaches a value of 5 or more. The K_p scale runs from 0 to 9 and is approximately logarithmic in form. The alternative scale used in the A_p scale which is linear in form and runs from 0 to 400. The correlation of the two scales is as follows:

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

The scales relate to the range of variation in the magnetic field measured by a selected number of magnetic observatories throughout the world within a 3-hour period. This assessment is made every three hours on a continuous basis and published as the K_p index for each period and as the A_p index on a 24-hourly basis. The A_p index has a direct relationship to the deviation of the trace on the record of a magnetograph.

For the benefit of our observers reporting from the southern hemisphere the location of the Aurora Australis is shown in Figure 2, which is drawn in terms of the magnetic pole and geomagnetic latitudes and longitudes. It will be apparent why land observers who report the edges of large auroral storms are located principally in the southern parts of Australia and the South Island of New Zealand, for the zone lies nearest to Australia and away from South America and South Africa. In the past five years about half the ships reporting Aurora Australis were located in the area bounded by Sydney, Wellington, Auckland

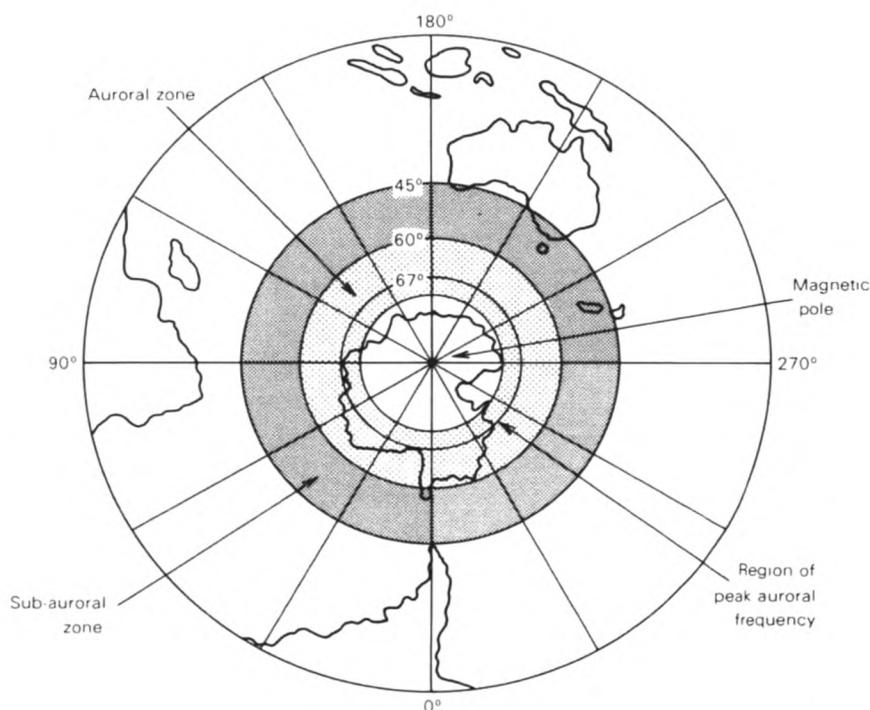


Figure 2. Southern hemisphere auroral zone (co-ordinates are geomagnetic latitude and longitude).

Island and Tasmania. The majority of the remainder were reported from the 40s latitudes between geographic longitudes 70° and 180° east. It has been calculated that given clear, dark nights auroral activity of some form might be sighted on an average of 18 nights per annum in southern Tasmania and Invercargill, New Zealand. A similar frequency holds good for latitude 40° south from about 70° to 130° eastern longitude, which is equivalent to the frequency of auroral visibility in the North of England.

ICE CONDITIONS IN AREAS ADJACENT TO THE NORTH ATLANTIC OCEAN FROM DECEMBER 1981 TO FEBRUARY 1982

The charts on pages 156 to 158 display the actual and 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).

DECEMBER

Pressure was higher than average over Greenland. Despite the anomaly for south-easterly winds over north-eastern Canada, Hudson Bay and Strait were completely ice-covered by the end of December although ice thickness was less than usual. Ice conditions through Davis Strait and over the Labrador Sea were near normal. South-easterly winds resulted in polar pack-ice drifting around southern Greenland earlier than usual. Ice conditions off East Greenland were near normal. There was a strong anomaly for north or north-easterly winds over the Barents Sea and Scandinavia. Ice extended much further south than usual and proved to be a hazard to navigation much earlier than usual, particularly along the eastern coasts of Sweden.

JANUARY

Pressure anomalies were weaker than during December. Some persistence for high pressure near Iceland maintained the previous anomalies for south-easterly winds over eastern Canada and cold northerly winds over Scandinavia. Ice was slow to form in the Gulf of St Lawrence where owing to the mild winter freezing degree-day totals were much below average. The continued anomaly for south-easterly winds off southern Greenland resulted in polar pack ice drifting northwards along the west coast of Greenland with some recession of ice in Davis Strait. Ice off east Greenland was again near normal with alternating areas of deficit and excess. The excess of ice in the Barents Sea continued. Severe ice conditions over the southern Baltic extended into the Kattegatt and restrictions to navigation were in force throughout much of January.

FEBRUARY

There was a marked contrast in pressure and temperature anomalies from previous months. Pressure was much lower than usual south-west of Iceland resulting in strong anomalies for cold north-westerly winds over south-eastern Canada (instead of south-easterly) and south-westerly winds (instead of northerly) over Scandinavia. Ice rapidly formed in the Gulf of St Lawrence and extended east of Nova Scotia with areas of excess ice east of Newfoundland and south-east of Davis Strait. Ice conditions off east Greenland were again near normal with little change in the position of the ice edge. The excess of ice over the Barents Sea was reduced and ice over the southern Baltic was much less severe than during January.

Baltic Ice Summary: December 1981 to February 1982

No ice was reported at the following station during the period: Visby.

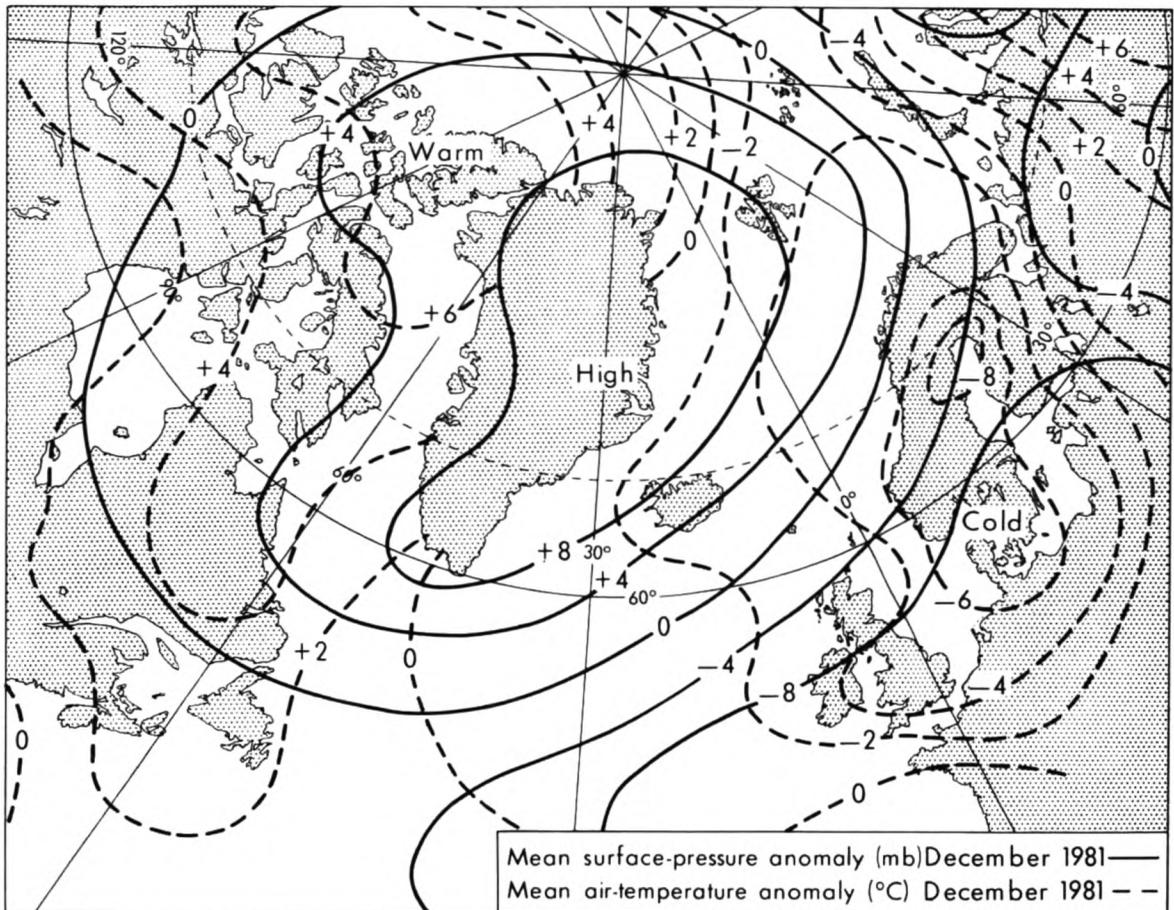
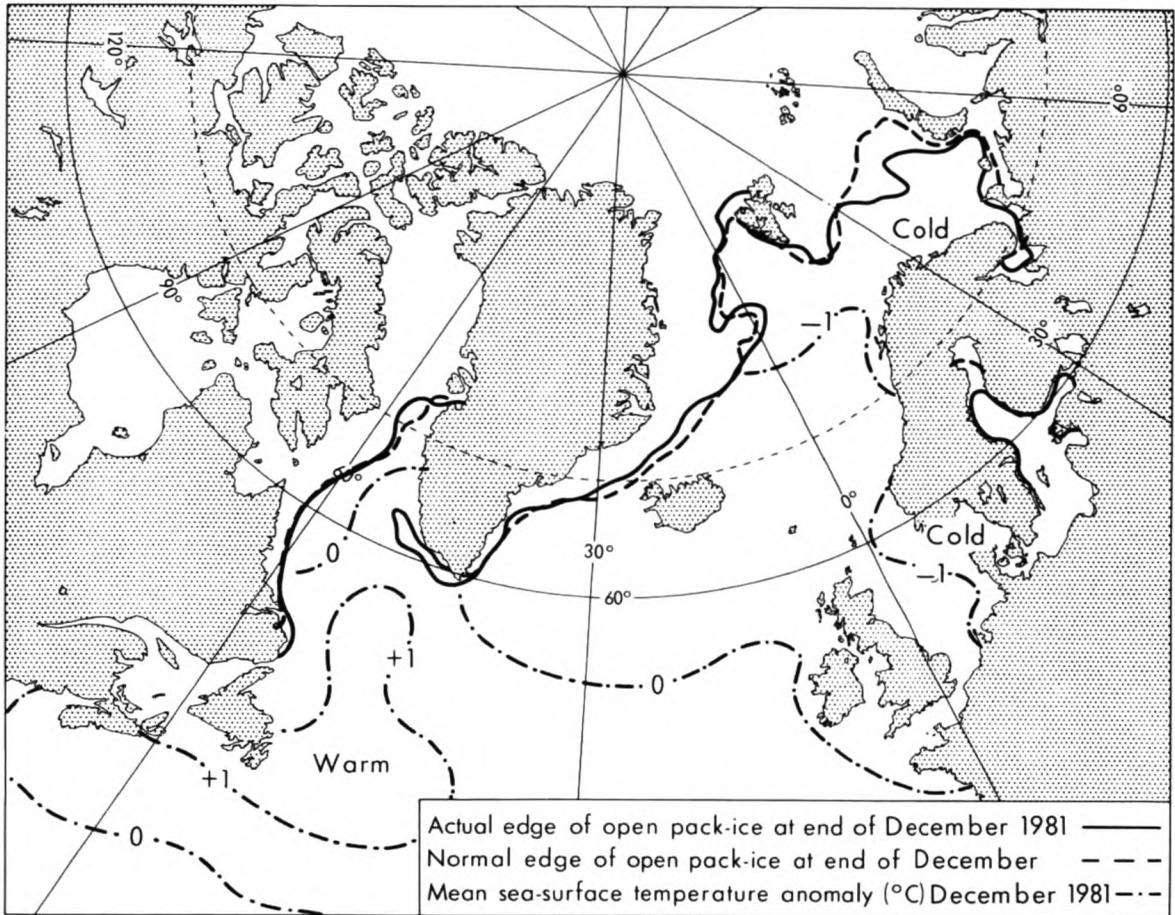
STATION	DECEMBER 1981						JANUARY 1982						FEBRUARY 1982					
	LENGTH OF SEASON		ICE DAYS		NAVIGATION CONDITIONS		ACCUMULATED DEGREE DAYS		LENGTH OF SEASON		ICE DAYS		NAVIGATION CONDITIONS		ACCUMULATED DEGREE DAYS			
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I
Luleå	3	31	29	29	0	13	16	0	—	1	31	31	31	0	0	31	0	—
Sikelfrå	8	31	24	22	2	7	17	0	—	1	31	31	31	0	0	31	0	—
Bredöstar (Vaktaren)	13	31	19	0	13	17	0	0	—	1	31	31	9	15	24	0	0	—
Sundsvall	0	0	0	0	0	0	0	0	—	2	31	30	0	30	27	3	0	—
Sandarne	28	31	4	0	4	4	0	0	—	1	31	31	25	6	31	0	0	—
Oxelösund	0	0	0	0	0	0	0	0	—	6	26	21	11	10	21	0	0	—
Kalmar	17	31	15	2	13	15	0	0	—	5	31	25	21	4	25	0	0	—
Göteborg	11	31	21	0	21	21	0	0	—	1	31	31	0	31	8	23	0	—
Stockholm	16	31	16	14	2	16	0	0	296	1	31	29	12	17	7	21	0	389
Helsinki	0	0	0	0	0	0	0	0	202	1	31	31	12	17	7	21	0	511
Turku	14	31	18	0	18	5	0	0	199	1	31	31	22	9	31	0	0	462
Mariehamn	0	0	0	0	0	0	0	0	136	6	31	26	0	26	26	0	0	316
Mäntyluoto	14	31	18	0	18	17	0	0	—	1	31	31	21	10	8	23	0	—
Vaasa	6	31	26	23	3	9	14	0	320	1	31	31	31	0	0	31	0	—
Norrskär	15	31	17	0	16	5	6	0	—	1	31	31	6	25	0	31	0	—
Oulu	2	31	30	0	14	16	0	0	—	1	31	31	31	0	0	31	0	—
Roytta	2	31	30	0	14	16	0	0	—	1	31	31	31	0	0	31	0	—
Leningrad	10	31	22	0	22	22	0	0	193	1	31	31	29	2	29	2	0	473
Vyborg	10	31	22	17	5	22	0	0	—	1	31	31	30	1	8	23	0	—
Tallin	0	0	0	0	0	0	0	0	—	13	15	3	0	3	0	3	0	—
Riga	14	31	18	6	5	11	0	0	—	1	31	31	13	9	22	0	0	—
Pärnu	12	31	20	16	4	11	9	0	—	1	31	29	29	0	0	29	0	—
Ventspils	15	27	13	0	13	1	0	0	—	7	31	24	0	21	17	0	0	—
Klaipeda	29	30	2	0	2	0	0	0	—	1	31	25	0	25	2	0	0	—
Emden	17	31	15	0	15	13	0	0	—	1	28	22	0	19	19	0	0	—
Bremerhaven	0	0	0	0	0	0	0	0	—	11	19	9	7	7	0	0	0	—
Hamburg	17	30	14	14	0	11	0	0	—	10	24	15	0	15	15	0	0	—
(Elbe)	21	21	1	0	1	0	0	0	—	7	31	25	15	10	24	0	0	—
Flensburg	0	0	0	0	0	0	0	0	—	8	24	15	0	12	4	0	0	—
Kiel	0	0	0	0	0	0	0	0	—	8	24	15	0	12	4	0	0	—

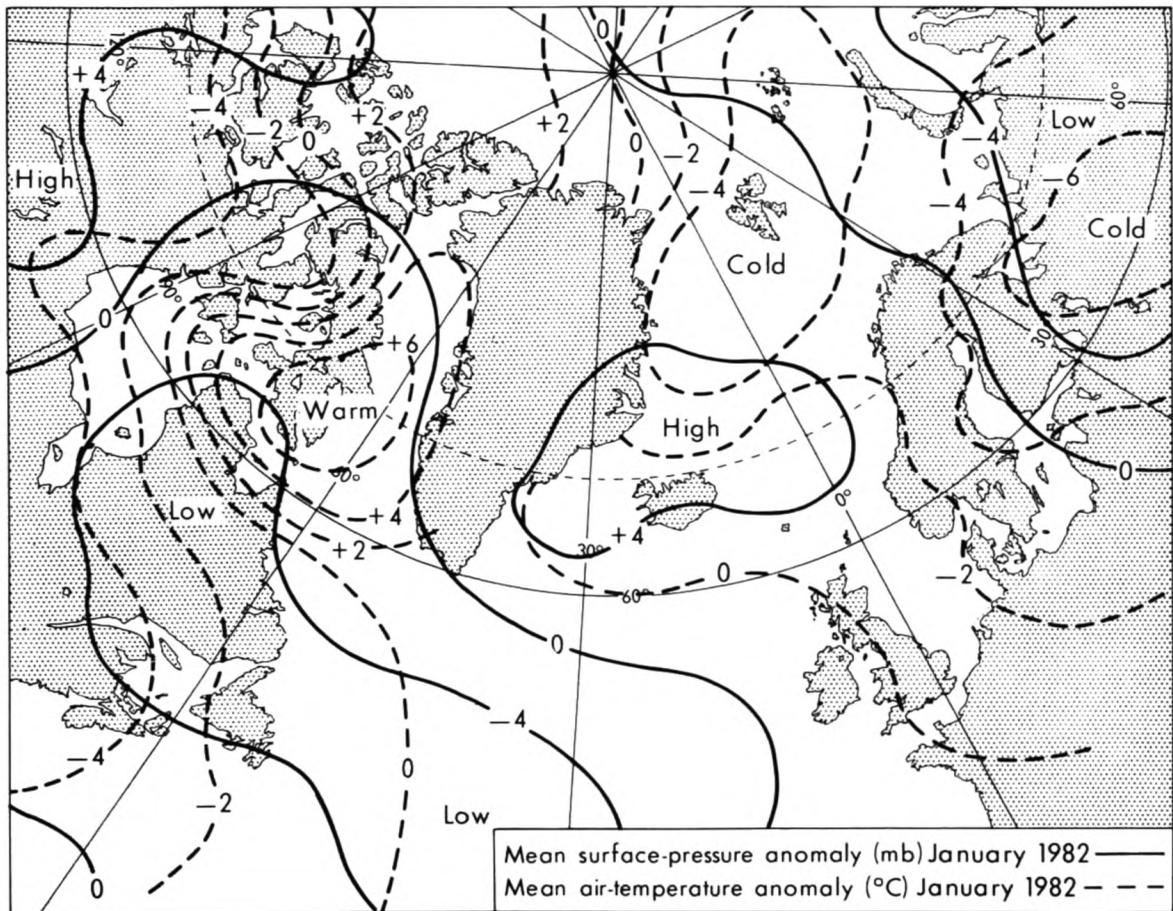
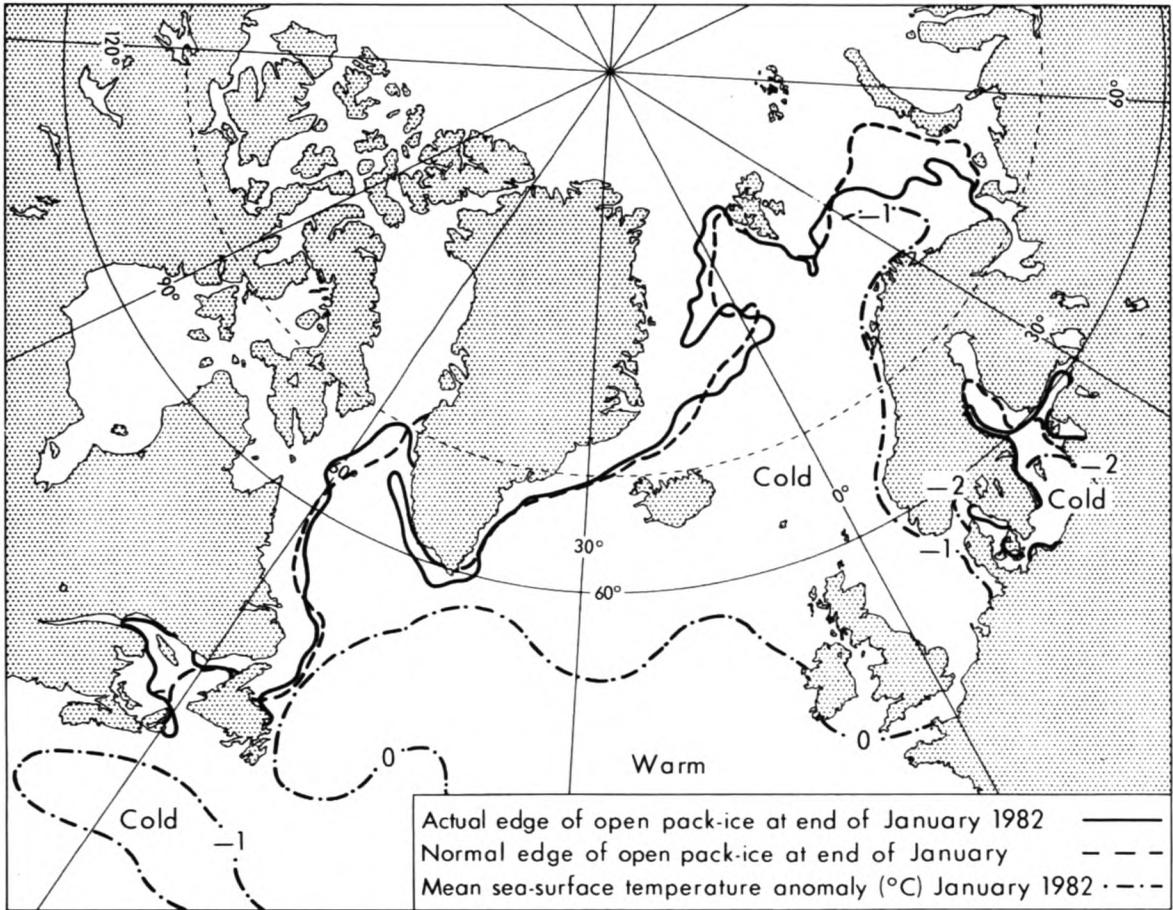
Lübeck	..	17	31	15	0	14	14	0	0	—	1	29	26	0	26	21	0	0	—	1	25	5	0	0	0	0	0	—
Rostock	..	21	27	4	4	0	1	0	0	—	9	31	23	0	23	23	0	0	—	1	1	1	0	1	0	0	0	—
Stralsund	..	15	27	13	2	11	0	0	0	—	4	24	18	11	7	18	0	0	—	4	28	9	0	9	0	0	0	—
Stettin	..	0	0	0	0	0	0	0	0	—	13	31	19	0	19	19	0	0	—	5	28	16	1	15	0	0	0	—
Gdansk	..	0	0	0	0	0	0	0	0	—	13	26	9	0	9	6	0	0	—	5	5	1	0	0	0	0	0	—
Aarhus	..	0	0	0	0	0	0	0	0	—	6	25	20	0	20	18	0	0	—	25	25	1	0	0	0	0	0	—
Copenhagen	..	0	0	0	0	0	0	0	0	—	7	25	19	0	16	16	0	0	—	2	28	9	0	8	0	0	0	—
Oslo	..	0	0	0	0	0	0	0	0	—	0	0	0	0	0	0	0	0	—	4	25	12	0	12	0	0	0	—
Kristiansand- fjorden	..	0	0	0	0	0	0	0	0	—	11	28	12	0	1	1	0	0	—	1	25	15	0	0	2	0	0	—

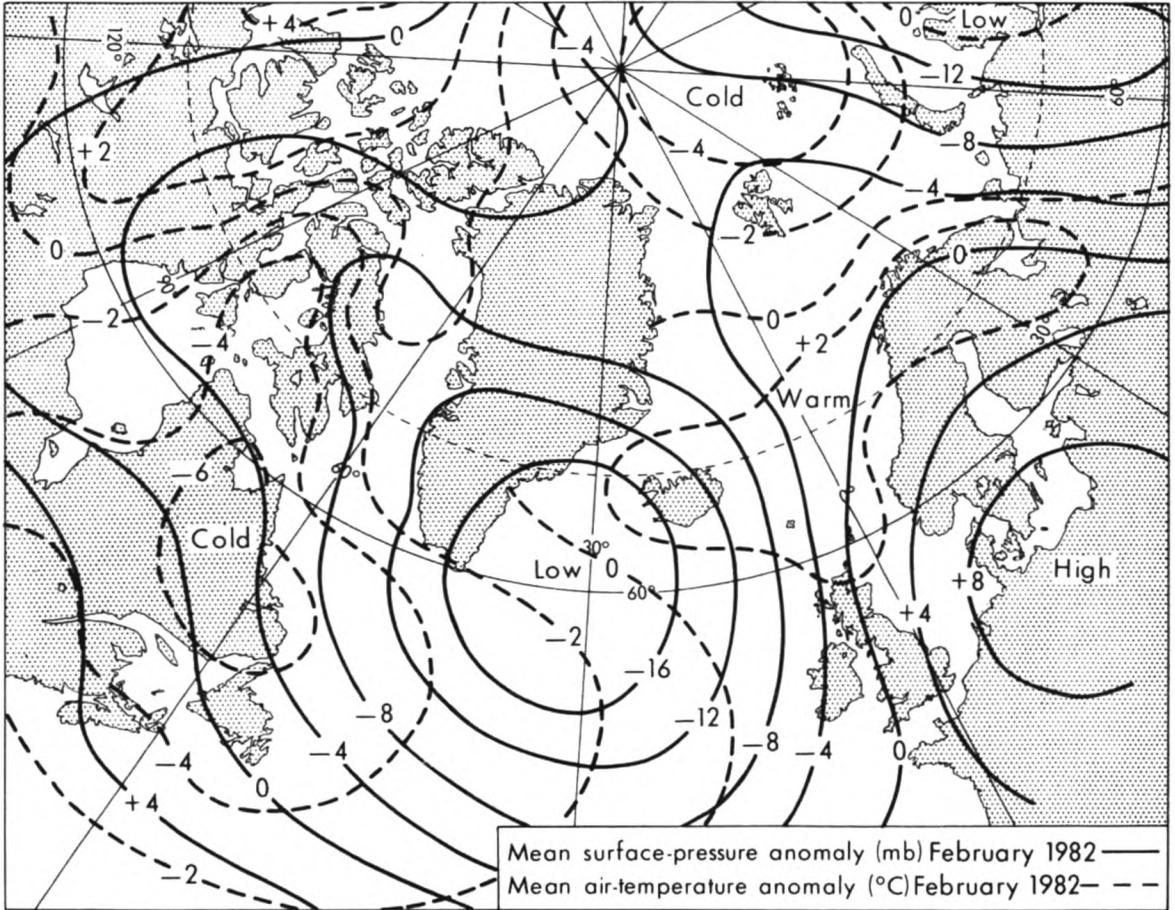
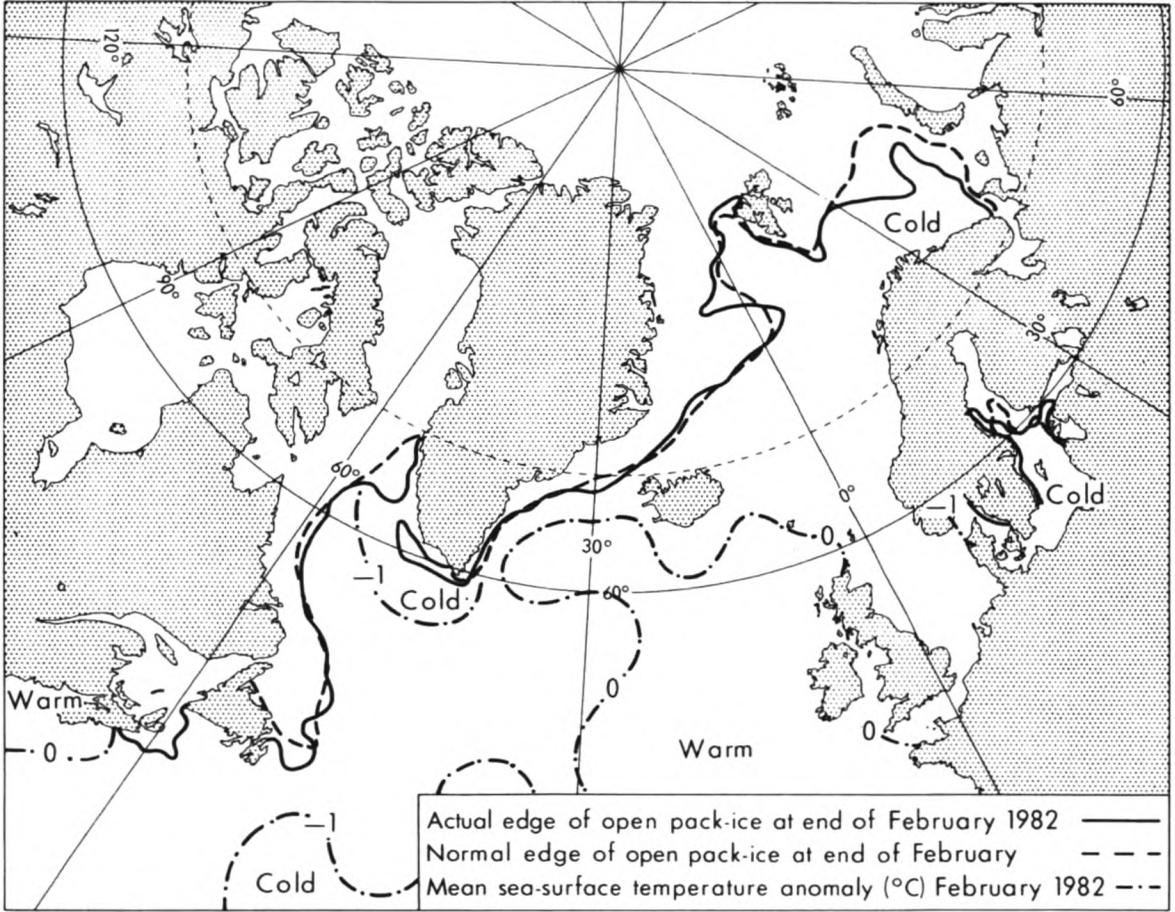
CODE

- A First day ice reported.
 B Last day ice reported.
 C No. of days when ice was reported.
 D No. of days continuous land-fast ice.
 E No. of days of pack ice.
 F No. of days dangerous to navigation, but assistance not required.
 G No. of days assistance required.
 H No. of days closed to navigation.
 I Accumulated degree-days of air temperature (°C) where known.*

* These figures give a rough measure of the first probability of the formation of sea ice, and later the progress of the growth and its thickness. They are derived from daily averages of temperature (00+06+12+18 GMT) and are the sum of the number of the degrees Celsius below zero experienced each day during the period of sustained frost.







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. |

Personalities

OBITUARY.—It was with deep regret that we recently learned of the death of CAPTAIN R. A. WILSON on 7 November 1981 aged 51 years.

Bob Wilson joined Trinity House in Hull as a Cadet in 1945 and on completion of his Cadetship served for 2 years with Clan Line before joining New Zealand Shipping Company in 1951 where he rose to the rank of Chief Officer. In 1969 he joined Container Fleets as 1st Officer (Navigating) and was promoted to command of *Flinders Bay* in May 1970. Thereafter he commanded *Encounter Bay*, *Moreton Bay*, *Discovery Bay*, *Botany Bay*, *Jervis Bay*, *Resolution Bay* and *Remuera Bay* before being again appointed to *Encounter Bay* from which ship he was landed sick at Marseilles on 25 September 1981.

A Service was held in the Missions to Seamen Church in Southampton attended by colleagues from Overseas Containers Ltd, and friends from Hull and Southampton. After cremation his ashes were scattered in the Solent.

Captain Wilson sent us his first meteorological logbook from the *Hinakura* in 1955. Since then we have received a further 35 logbooks bearing his name of which 23 were classed as Excellent. He received Excellent Awards in 1956, 1971, 1972, 1973, 1976, 1978, 1979 and 1981.

We extend our sincere condolences to his widow and daughters.

OBITUARY.—It is with deep regret that we have to record the sudden death of CAPTAIN J. FINDLAY on 10 January following an emergency operation in an Aberdeen hospital.

John Findlay joined Canadian Pacific Steamships Ltd in 1966 and was a well-liked and respected Master. He was taken ill on board the *Lord Strathcona* in the North Sea and was air-lifted ashore. His cremation at Seaham was attended by many relatives, friends and seafaring colleagues.

We received the first meteorological logbook bearing Captain Findlay's name from the *Empress of England* in 1969. Over the years he sent us a further 14 logbooks. He received Excellent Awards in 1979 and 1981.

We extend our sincere condolences to his family.

RETIREMENT.—CAPTAIN J. M. RUSHWORTH retired on 31 October 1981 after serving 39 years at sea.

John Michael Rushworth was educated at Warrington Grammar School before receiving his pre-sea training in H.M.S. *Conway* from 1940 to 1942.

In December 1942 he was apprenticed to Union Castle Mail Steamship Company and joined their *Rochester Castle*. He took part in the Normandy Beach-head landings in June 1944 whilst serving in *Llangibby Castle*.

Soon after completing his apprenticeship, Captain Rushworth joined Manchester Liners Ltd and remained with them for the remainder of his career. He obtained his Master's Certificate in 1955 and was appointed to his first command in 1961. During the last year of his career at sea he commanded *Manchester Crusade* and *Manchester Vanguard*.

Captain Rushworth sent us his first meteorological logbook from the *Caernarvon Castle* in 1947. Since then we have received no less than 64 logbooks of which 27 were classed as Excellent. He received an Excellent Award in 1973 and was presented with a barograph in 1976 in recognition of his long voluntary service.

We wish him a long, healthy and happy retirement.

RETIREMENT.—CAPTAIN J. D. JEAVONS retired from the sea on 15 December 1981 after serving 38 years with Canadian Pacific Steamships Limited.

Jocelyn David Jeavons was educated at Winchester and received his pre-sea training in H.M.S. *Worcester*. In July 1943 he was apprenticed to Canadian Pacific Steamships Ltd, and joined the *Empress of Australia*.

Captain Jeavons obtained his Master's Certificate in October 1951 and was promoted to Master in August 1963; his first command being the *Beaverelm*. Thereafter he commanded the 'Empress' passenger liners until they were sold in 1971. For the remainder of his career at sea he commanded the world-wide multi-purpose and North Atlantic container ships.

In 1969 Captain Jeavons took up farming and now raises horses, cattle, sheep and poultry on his property in Anglesey. He has recently been appointed an Auxiliary Coastguard. He runs a fishing boat off the Anglesey coast and has set up a miniature amateur weather station on his farm.

We received the first meteorological logbook bearing Captain Jeavons' name from the *Beaverghen* in 1946. Since then he has sent us a further 48 books.

We wish him a long happy retirement and success in his farming ventures.

Notices to Marine Observers

Met. O. 509 SHIPS' CODE AND DECODE BOOK (10th Edition)

Please make the following amendment:

Page 3, under 'Omission of Information in the Coded Groups' Para. 6, first sentence, delete 'may' and insert 'should'.

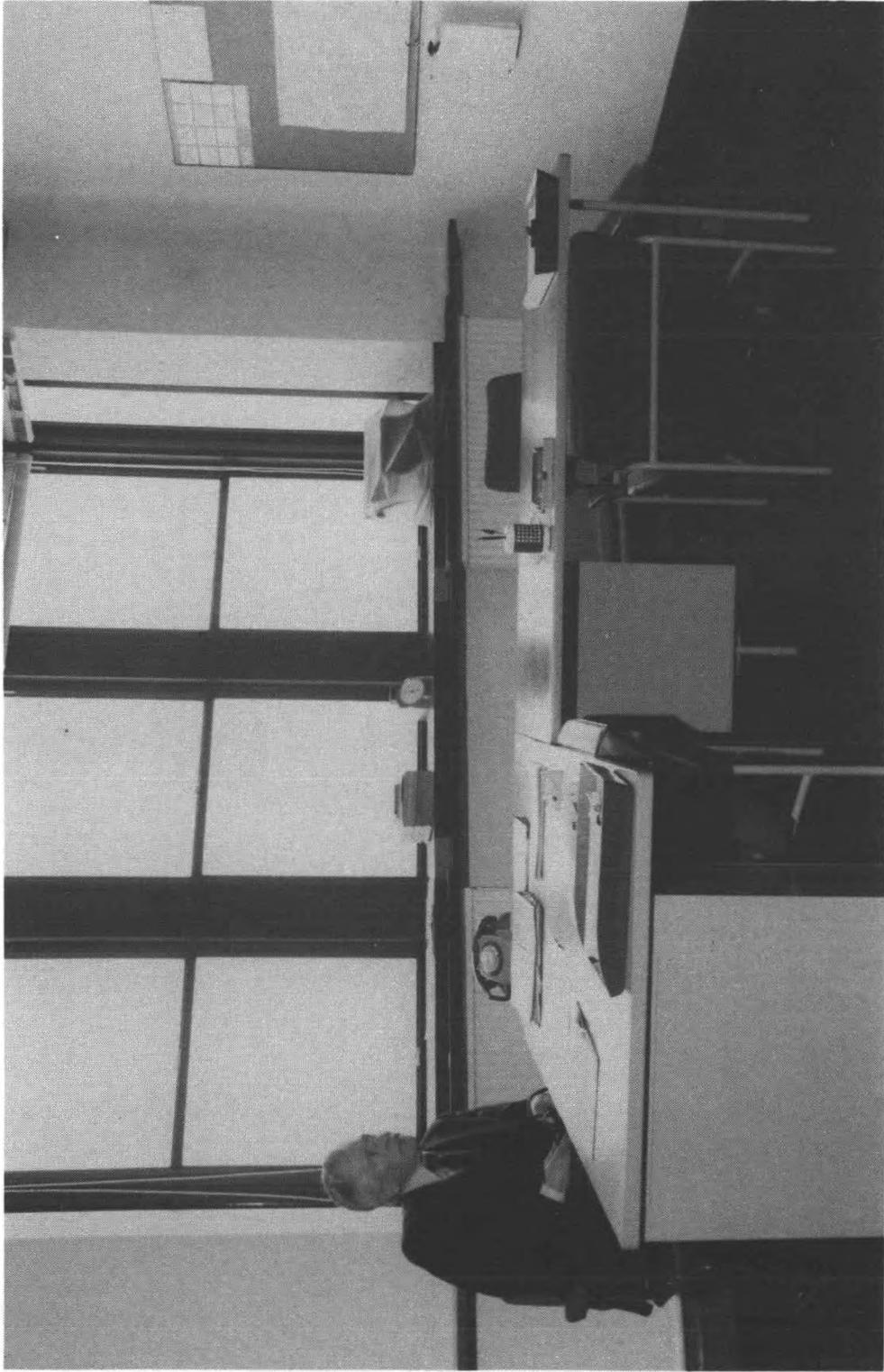
(*Explanatory Note:* the omission of this Group when there is no significant present or past weather to report reduces the length of the radio message and hence the charges for transmission.)

PORT METEOROLOGICAL OFFICE IN NORTH-EAST ENGLAND

Owing to the termination of the lease, the Port Meteorological Office in Newcastle has been closed. A new Office has been opened in Middlesbrough to serve ports in north-east England. The address and telephone number are: Captain D. H. Rutherford, Port Meteorological Officer, Room D622, Corporation House, 73-75 Albert Road, Middlesbrough, Cleveland TS1 2RU (Telephone: 0642-241144 Ext. 275).



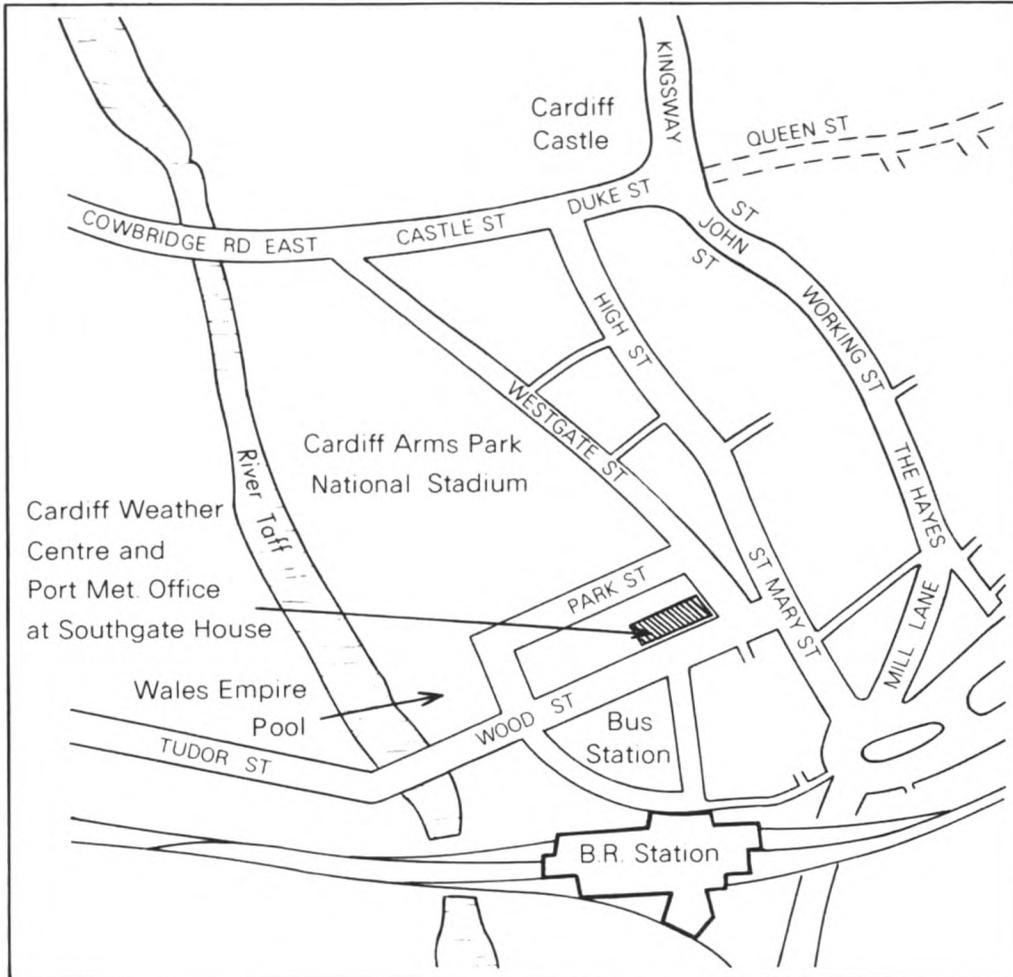
Captain R. C. Cameron, Port Meteorological Officer for South-east England, in his new Office in Grays near Tilbury in Essex. (See page 161.)



Captain J. H. Jones, Port Meteorological Officer for the Bristol Channel area, in his new Office at Southgate House in Cardiff. (See facing page.)

BRISTOL CHANNEL AND THAMES PORT METEOROLOGICAL OFFICES

Changes of address for these Offices were promulgated in recent editions of this journal. For interest, the location of the Office in Cardiff is indicated on the sketch map below and photographs of the interiors of both Offices are shown between pages 160 and 161.



NEW DESIGNATIONS FOR PORT METEOROLOGICAL OFFICES

As a result of the recent changes of address and to give a more precise indication of the areas for which Port Meteorological Officers are responsible, the designations of all but one of their Offices have been changed as follows:

OLD	NEW
Mersey	North-west England
Thames	South-east England
Bristol Channel	Bristol Channel (unchanged)
Humber	East England
Clyde	Scotland and Northern Ireland
Southampton	South-west England
Tyne	North-east England.

Fleet Lists

GREAT BRITAIN (Information dated 18.3.82)

The following is a list of British ships which have been equipped with instruments and which voluntarily co-operate with the Marine Division of the Meteorological Office. The names of the Masters, Observing Officers and Senior Radio Officers are given as ascertained from the last written returns received. The date of receipt of the last return is given in the second column. An asterisk indicates a new recruitment who has not yet set in a logbook.

All returns received from observing ships will be acknowledged, direct to the ship, by the Marine Superintendent of the Meteorological Office.

The Port Meteorological Officers will make personal calls on the Masters and Observing Officers as opportunity offers, or on notification from the ship at any time when their services are desired.

Excellent Awards are made at the end of each calendar year. The names of the Masters, Principal Observing Officers and Radio Officers gaining these awards are published each July in *The Marine Observer*.

It is requested that prior notification of changes of service, probable periods of lay-up, transfer of Master or other circumstances which may prevent the continuance of voluntary meteorological service at sea, may be made to a Port Meteorological Officer or to the Marine Superintendent of the Meteorological Office at Bracknell. Masters and Officers are invited to point out any errors or omissions which may occur in the list.

Selected Ships

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
Abbey	21.9.81	D. Craven	C. D. Spencer-Payne, D. Lyon, J. Tideswell	P. T. Fennelly	Furness Withy (Shipping) Ltd
Acavus	9.3.82	D. J. Sloan	J. F. Meredith, A. S. Burgess, R. W. Macleod	M. A. Ford	Shell Tankers (U.K.) Ltd
Achilles	7.12.81	M. Furlong	G. N. C. Hodges, G. Hamiton, C. D. G. Grahame	C. E. Butterworth	Ocean Transport & Trading P.L.C.
Act 1	18.3.82	C. P. Leighton	D. R. Johnston, G. Henderson, R. Hamilton		Blue Star Line Ltd
Act 2	22.12.81	J. Hart	J. A. Clart, A. P. Saxby		Cunard S.S. Co. Ltd
Act 6	17.12.81	R. Jenkins	D. M. Nicholson, D. John, I. D. Mace	M. C. Kitt	Cunard S.S. Co. Ltd
Act 7	11.2.82	D. M. McPhail	D. C. Hocking, M. Power, W. Copland	D. Reilly	Cunard S.S. Co. Ltd
Adviser	8.2.82	D. Skillander	R. Baboaram, R. Moore, P. Masters	K. Ellison	Blue Star Line Ltd
Aeneas	5.1.82	A. J. Dyne	P. I. Anderson, A. B. Johnson, D. K. Macleod	M. J. Shieldon	T. & J. Harrison Ltd
Africa Star	4.2.82	H. N. Owen	A. Wescott-Weaver, W. A. Burton, R. Henderson	C. D. Dewa	Ocean Transport & Trading P.L.C.
Africa Palm		W. Thompson	G. Broom	K. Davenport	Blue Star Line Ltd
Al Shamiah	23.10.78	T. Williams	P. Walley	R. Shepherd	Palm Line Ltd
Albright Explorer	12.2.82	P. Booker	R. J. Barnes, D. Thomas, W. J. Hutchings	L. Richard	United Arab Shipping Co. Ltd
Albright Pioneer	15.2.82	J. H. Kitching	P. Savery, J. Nixon, N. J. B. Fisher	R. Douglas	James Fisher & Sons Ltd
Alert	6.1.82	I. Lang	M. W. F. Phillips, G. Gbant, M. Hammond, I. Lewin	J. Vaughan	James Fisher & Sons Ltd
Algol	5.2.82	J. G. Riddell	A. S. Galbraith, B. T. Hingley		British Telecoms International
Alinda	22.1.82	M. T. John	A. T. Donaldson, S. Beadle	J. B. Grant	Silver Line Ltd
Almeda Star	3.7.81	A. J. Cheahure	M. J. McGilvray, R. J. Tucker, R. J. Gill	J. Dechant	Shell Tankers (U.K.) Ltd
Almeria Star	27.3.81	G. Round	P. Dixon, B. Luke, B. Liley	P. M. Haslam	Blue Star Line Ltd
				K. Brown	Blue Star Line Ltd

<i>Amastra</i> ..	28.9.81	J. Millar	M. Adams, M. MacDonald, D. J. Conway	N. May	Shell Tankers (L.K.) Ltd
<i>America Star</i> ..	6.5.81	H. Owen	D. Darlington, A. G. Gibb, R. Bakshi, J. M. Morgan	G. Bailey	Blue Star Line Ltd
<i>Anchises</i> ..	11.2.82	W. P. Goldie	D. Snell, J. P. H. Fischer, P. C. Thorngloe	K. Overson	Ocean Transport & Trading P.L.C.
<i>Anco Challenger</i> ..	28.10.81	J. A. Hagger			Panoccean-Anco Ltd
<i>Anco Champion</i> ..	18.12.81	D. Williams	R. G. Thomson, J. C. Gillis, R. M. Prowse	L. Vierke	Panoccean-Anco Ltd
<i>Anco Charger</i> ..	17.11.81	B. Hatton	A. H. Wright, A. Blore, C. Bordas	D. Banks	Panoccean-Anco Ltd
<i>Anco Chaser</i> ..	12.2.82	J. P. Frewer	P. M. Alty, M. J. Walker, M. Freegard	M. Dunn	Panoccean-Anco Ltd
<i>Anco Empress</i> ..	9.2.82	A. S. Banyard	T. W. Morgan, J. K. Husain, E. Jones	R. Wicks	Panoccean-Anco Ltd
<i>Anco Endeavour</i> ..	21.1.82	E. Hughes			Panoccean-Anco Ltd
<i>Anco Enterprise</i> ..	3.6.81	J. A. Hagger	P. R. Gray, A. T. Rowe	M. Furlong	Panoccean-Anco Ltd
<i>Anco Sceptre</i> ..	3.3.81	I. Finley	A. Brown, F. Heath, I. Wilkinson	P. Wimming	Panoccean-Anco Ltd
<i>Anco Sovereign</i> ..	22.12.81	H. Watson	J. Kennedy, K. Denney, A. Spooner	T. P. Bunce	Panoccean-Anco Ltd
<i>Anco Stane</i> ..	16.10.81	E. V. Kennard	T. W. Morgan, K. McKernan	T. P. Bunce	Panoccean-Anco Ltd
<i>Anco Templar</i> ..	5.2.82	D. G. Billing	D. J. Allen, E. P. Campion	M. J. Russell	Panoccean-Anco Ltd
<i>Andalucia Star</i> ..	3.11.81	I. Mackintosh	D. Turney, N. J. Barclay, P. Harding	M. Janor	Panoccean-Anco Ltd
<i>Annuity</i> ..	4.6.80	R. Strubshall	M. Kingsella		Blue Star Line Ltd
<i>Apapa Palm</i> ..	7.9.81	E. Thomson	W. K. Mutch, R. Whyte, D. J. Lewington		F. T. Everard & Sons Ltd
<i>Appleby</i> ..	8.2.82	T. F. Jones	G. J. Knowles, N. C. Newham, P. G. Dawkins, P. A. Barnett	J. V. Horsburgh	Palm Line Ltd
<i>Arctic Seal</i> ..	3.2.82				Sir R. Kopner & Co. Ltd
<i>Arctic Troll</i> ..	18.3.82	D. Perry	I. A. MacDonald, S. F. N. Lambert		Thalassa (Offshore) Scotland Ltd
<i>Astronomer</i> ..	26.1.82	R. B. Simmons	P. G. Wood, G. Walter, D. I. Caig		J. & J. Denholm Ltd
<i>Atlaman</i> ..	23.11.79	J. P. Wishart	W. J. Stoker, D. A. L. Best, R. J. Hughes	J. L. Donnan	T. & J. Harrison Ltd
<i>Atlantic Causeway</i> ..	30.11.81	J. Cooper	R. D. Clark, T. A. Turvey, J. K. Brocklehurst	B. L. Drake	Ocean Transport & Trading P.L.C.
<i>Atlantic Conveyor</i> ..	12.2.81	C. P. Margeson	C. Balls, D. Nicholson	R. F. Davies	Cunard S.S. Co. Ltd
<i>Atlantic Splendour</i> ..	11.1.82	J. Exley	J. Nutter, H. Samuel, D. G. Lyon	J. Guthrie	Cunard S.S. Co. Ltd
<i>Aurora</i> ..	1.3.82	E. Dwelly	C. Stuchbury, P. N. Karkarey, K. A. Stapleton	F. S. Fletcher	Furness Withy (Shipping) Ltd
<i>Author</i> ..	*	E. Maxwell	P. Wood, J. H. Brierley, C. B. Gibbs	A. R. Watt	P. & O. S.N. Co.
<i>Avelona Star</i> ..	9.3.82	H. Dyer	R. Day, G. Thorburn, M. Locke	C. R. Brown	T. & J. Harrison Ltd
<i>Avon Forest</i> ..	25.1.82	R. MacDougall		L. G. Burks	Blue Star Line Ltd
<i>Badagary Palm</i> ..	*	E. H. Thomson			Harrison (Clyde) Ltd
<i>Balder London</i> ..	*	J. E. Walmsley			Palm Line Ltd
<i>Balmoral Universal</i> ..	26.1.82	R. R. Cawdery	I. McClain, R. Bent, E. Mushing	J. Griffin	Ugland (U.K.) Ltd
<i>Baltic Eagle</i> ..	23.12.81	A. W. Wilford	R. Hood, J. W. Franklin, W. L. Collier	R. Hough	Cayzer Irvine Shipping Co. Ltd
<i>Baltic Enterprise</i> ..	20.1.82	G. J. Brazendale	M. Griffiths, R. Kendall, R. Thomas	O. H. W. Grimisdall	United Baltic Corp. Ltd
<i>Baltic Progress</i> ..	14.1.82	P. Hyde	R. M. Raybould, D. J. Sweet, D. C. Glass	I. A. Muschamp	United Baltic Corp. Ltd
<i>Bamenda Palm</i> ..	20.8.81	G. Holeyman	M. Kearney, B. Mullenger	B. Hazzard	United Baltic Corp. Ltd
<i>Banbury</i> ..	9.11.81	R. J. Sankey	P. V. N. Perry, J. C. Goble, D. W. Woods	L. W. H. Holt	Palm Line Ltd
<i>Barbara Weston</i> ..	23.2.82	D. Tricky	B. J. Goymer, I. Wright, T. Brant	G. S. Graham	Furness Withy (Shipping) Ltd
<i>Baron Belhaven</i> ..	22.2.82	N. Walsh	G. C. Holland, A. Lowe	C. C. Houston	Weston Shipping Co. Ltd
<i>Baron Kinnaid</i> ..	4.3.82	K. N. Dootson	M. S. G. Harnden, G. Gray, E. R. Williams		Scottish Ship Management Ltd
<i>Baron Napier</i> ..	19.10.81	J. McCally	J. O. Smyth, A. Logan, I. Waters	N. Smith	Scottish Ship Management Ltd
<i>Bay Fisher</i> ..	13.10.81	J. R. Milne	D. C. Reed, D. W. Little, E. P. Garbutt	M. J. Mitchell	Scottish Ship Management Ltd
<i>Ben Ocean Lancer</i> ..	*	A. Maclean	B. W. Wood, A. Glen, M. Wills, G. Day	S. Drinkwater	James Fisher & Sons Ltd
<i>Benalbanach</i> ..	25.2.81	W. D. Cowie	I. A. Marshall	P. Mannion	Ben Line Steamers Ltd
<i>Benalder</i> ..	16.10.81	P. J. Warren	G. J. Livingston, F. G. Anderson, C. Byers	P. Mannion	Ben Line Steamers Ltd
<i>Benavon</i> ..	*		R. Sharp, A. Kemp	M. Winter	Ben Line Containers Ltd
<i>Bendbran</i> ..					Atlantic Drilling Co. Ltd

Selected Ships (contd)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Benedict</i>	22.2.82	J. C. Harris	R. Owen, A. J. Brown, M. Walker	G. Fyall	Blue Star Line Ltd
<i>Benefactor</i>	16.10.81	N. Johnson	J. P. A. Billing	G. Ross	T. & J. Harrison Ltd
<i>Benhope</i>	21.12.81	R. E. Cowie	L. D. Thomson, C. J. A. Cladingbowl, J. I. Brown	F. J. Curran	Ben Line Steamers Ltd
<i>Benjamin Bowring</i>	10.12.81	C. F. Balaporia	D. Peck, A. Bowring, D. Hewett	N. Cox	Newgate Shipping Co. Ltd
<i>Benedi</i>	14.1.82	M. P. F. Tennant	T. W. Carr, J. D. P. Wells, I. G. Morrison	P. A. Barratt	Ben Line Steamers Ltd
<i>Benstar</i>	20.1.82	O. Henderson	A. D. R. Campbell, T. D. Corbett	P. J. Clery	Ben Line Steamers Ltd
<i>Benvorlich</i>	14.1.82	H. H. McIntosh	S. A. Renble, P. Thompson, R. S. Walker	J. P. Goddard	Ben Line Steamers Ltd
<i>Benvorloch</i>	11.1.82	J. Guthrie	G. McQuater, C. Harris, J. Whittaker		Atlantic Drilling Co. Ltd
<i>Berkshire</i>	12.8.81	K. Arthur	J. W. Mallett, C. N. Clark, M. S. Brocklesby	T. Robinson	Bibby Line Ltd
<i>Bon Entenle</i>		T. Sheehan	H. Skelton		Oil Search Marine Management
<i>Boniface</i>	26.2.82	D. J. Eckworth	I. M. Dawson, R. Corfield, N. Shillito	P. R. Webster	Blue Star Line Ltd
<i>Bonniety</i>	16.10.81	R. M. Bessant	J. H. Pook, F. H. Yeulett, E. Swale	G. Wright	Newgate Shipping Co. Ltd
<i>Booker Challenge</i>	28.4.81	W. Hill	J. W. Inch, D. Abbott, R. C. Palmer	D. A. C. Macrae	Booker Line Ltd
<i>Booker Courage</i>	2.3.82	R. McKechnie	R. Bell, A. W. Kitchen, C. J. Barnes	J. G. Hull	Booker Line Ltd
<i>Booker Crusade</i>	26.2.81	W. Hill	M. Tebay, C. Robinson	N. R. Smirk	Booker Line Ltd
<i>Border Falcon</i>	11.1.82	T. M. Y. Richards	A. M. Smith, D. J. Williamson	C. Roberts	B.P. Shipping Ltd
<i>Boston Sea Lance</i>	5.8.81	F. Surtees	W. Tebbott, M. T. Phillips		Klondyke Shipping Co. Ltd
<i>Boswell</i>	23.2.82	G. Round	A. N. McKean, A. J. Delaney, J. W. Bottwood	K. Brocon	Blue Star Line Ltd
<i>Botany Bay</i>	4.1.82	A. J. Fee	J. M. Dodworth, R. B. Gurney, A. Howe		Overseas Containers Ltd
<i>Bransfield</i>	29.5.81	M. J. Cole	A. M. T. Reading, R. C. Plumley, N. M. Bower	H. M. O'Gorman	British Antarctic Survey
<i>Bridgeman</i>	12.1.82	M. S. D. Pond	P. A. Harris, N. A. Lovesy	N. G. L. Johns	Rowbotham Tankships Ltd
<i>British Avon</i>	23.12.81	J. Guy	R. J. Bray, J. Whitelaw, A. J. McDonald	S. Slattery	B.P. Shipping Ltd
<i>British Beech</i>	26.1.82	D. C. Dalton	A. K. Birley, S. Cassidy	W. McKinley	B.P. Shipping Ltd
<i>British Centaur</i>	7.10.81	M. Searle	D. J. Sisson, T. Hardy, P. Walter	M. Hewitt	B.P. Shipping Ltd
<i>British Commerce</i>	15.1.82	M. Dunning	A. G. Morgan, A. L. C. Smith, M. Amos	I. M. Jenson	B.P. Shipping Ltd
<i>British Commodore</i>	12.1.82	H. J. Shields	J. Condie, T. Parker	R. Lodge	B.P. Shipping Ltd
<i>British Dart</i>	24.2.82	I. K. Miller	J. H. Brechin, B. Wilson, M. R. Mansbridge	Miss C. Roe	B.P. Shipping Ltd
<i>British Dragon</i>	12.1.82	T. Y. Marrs	I. C. Massey, P. Hebdon, M. Ramsbottom	I. P. Price	B.P. Shipping Ltd
<i>British Esk</i>	28.1.82	F. W. Lamb	J. G. Dixon, R. Nolan, J. Moloney	N. Stephens	B.P. Shipping Ltd
<i>British Fern</i>	6.5.81	R. F. Penfold	N. Howard, A. S. Kenyon	M. O. Williams	B.P. Shipping Ltd
<i>British Forth</i>	16.3.82	R. McVeigh	A. K. Cassels, R. L. Horne, R. Hawkes	A. Brown	B.P. Shipping Ltd
<i>British Hawthorn</i>	12.1.82	D. E. Mitchell	S. D. Puntton, C. R. Buckingham, A. L. Duffin	D. J. Angove	B.P. Shipping Ltd
<i>British Hazel</i>	1.2.82	G. Luff	M. Ramsbottom, T. Henderson, H. Conlon	P. H. Wales	B.P. Shipping Ltd
<i>British Holly</i>	2.2.82	K. Lewis	L. R. Lingham, J. W. Gough	D. E. Dale	B.P. Shipping Ltd
<i>British Humber</i>	4.2.82	D. R. Botting	M. S. Prest, N. Southan	P. A. Marson	B.P. Shipping Ltd
<i>British Ivy</i>	9.3.82	D. F. Faulkner	D. R. Robinson, R. McCracken, R. Tremlett	R. V. Crowley-Smith	B.P. Shipping Ltd
<i>British Kennet</i>	11.2.82	R. J. Nener	V. Brimble, A. J. Lockie	S. R. Calvert	B.P. Shipping Ltd
<i>British Normess</i>	27.11.81	M. Stephenson	C. J. Harding, P. A. B. Basey	A. P. Gurney	B.P. Shipping Ltd
<i>British Patience</i>	18.2.82	P. Mammen	J. D. Cawsey, A. S. Kenyon, P. F. Robinson	N. Richardson	B.P. Shipping Ltd
<i>British Poplar</i>	19.1.82	P. Hillier	J. G. Holland, M. J. Fordham, J. Kilby	M. A. Grant	B.P. Shipping Ltd

<i>British Pride</i>	25.1.82	H. Phillips	J. Shannon, D. S. Styles, G. B. Haynes	R. M. Wray	B. P. Shipping Ltd
<i>British Promise</i>	3.2.82	R. Hammond	P. Seaman, S. Reidy, C. P. Mullett	M. J. White	B. P. Shipping Ltd
<i>British Ranger</i>	12.2.82	R. S. Larking	M. K. Paradowski, T. Mackinnon, G. C. Belson	J. Smith	B. P. Shipping Ltd
<i>British Reliance</i>	21.1.82	D. Henderson	J. A. Robertson, I. Pellowe	D. Worthy	B. P. Shipping Ltd
<i>British Resolution</i>	11.1.82	M. Boyd	K. McVicar, K. Pickering, H. Nightingale	H. Sharkey	B. P. Shipping Ltd
<i>British Respect</i>	27.1.82	J. Graves	D. Smith, K. T. R. Litchfield	D. W. Bone	B. P. Shipping Ltd
<i>British Security</i>	13.11.81	R. Rickman	J. A. A. Bloys	P. Clemence	B. P. Shipping Ltd
<i>British Spex</i>	2.2.82	R. Rickman	R. A. Denyer, C. Gwilt	T. A. Strickland	B. P. Shipping Ltd
<i>British Tamar</i>	18.2.82	W. Hare	R. M. Heese, G. Hallett	J. C. Wadsworth	B. P. Shipping Ltd
<i>British Tay</i>	12.2.82	K. Meacock	P. F. Armitage, V. Radley		B. P. Shipping Ltd
<i>British Tenacity</i>	19.1.82	R. Longhorn	R. Whatmore, S. Bryant		B. P. Shipping Ltd
<i>British Test</i>	12.1.82	P. T. Morris	A. Wallace, K. Powick, W. Mathews	G. Jeremiah	B. P. Shipping Ltd
<i>British Trent</i>	21.8.81	P. D. Harrison	J. H. Miller, K. Gregg	A. Reed	B. P. Shipping Ltd
<i>British Trident</i>	15.1.82	A. J. Lockwood	L. J. Loftus, F. Abernithy, R. A. Squires	G. Jeremiah	B. P. Shipping Ltd
<i>British Vine</i>	18.1.82	M. Gouldings	H. N. Gates, D. C. Wood	I. D. Hamilton	B. P. Shipping Ltd
<i>British Voyager</i>	1.12.80	I. Johnston	P. W. Barber, H. Watson, F. Tait	R. J. Anson	Premier Shipping & Engineering Ltd
<i>Bronte</i>	13.8.81	W. Wilson	D. R. Johnston, C. Bufton, A. Johns	R. F. Collins	Blue Star Line Ltd
<i>Browning</i>	29.9.81	J. Gray	P. Dixon, N. Janson, K. Lumby	R. Collins	Blue Star Line Ltd
<i>C. P. Ambassador</i>	8.2.82	D. Greenhalgh	M. A. Beviss, M. R. Bleasde, P. Bland		Canadian Pacific Steamships Ltd
<i>C. P. Discoverer</i>	11.2.82	J. Waling	I. P. Denham, M. Brew, B. G. Hardy		Canadian Pacific Steamships Ltd
<i>C. P. Trader</i>	26.5.81	J. D. Jeavons	B. G. Alexander, P. Bland, N. C. W. Barham		Canadian Pacific Steamships Ltd
<i>C. P. Voyageur</i>	26.10.81	D. O. Ferrey	H. L. Kinns, D. A. Elliot, D. A. Bunce		Canadian Pacific Steamships Ltd
<i>Cable Venture</i>	19.2.82	J. H. Bates	D. H. Foster, P. R. Woodward		Cable & Wireless Ltd
<i>Cableman</i>	18.3.82	P. H. Daniel	M. O'Brien, K. Rysdale, G. Paterson		Rowbotham Tankships Ltd
<i>California Star</i>	24.2.82	E. Buckle	B. T. Cox, K. D. Pykett, D. Leech		Blue Star Line Ltd
<i>Canadian Explorer</i>	7.1.82	J. F. Wachter	M. A. Carter, P. Springett, P. Gilchrist		Furness Withy (Shipping) Ltd
<i>Canberra</i>	8.1.82		S. Beal		P. & O. S.N. Co.
<i>Cape Arnhem</i>	9.3.82	D. I. Jones	J. Hamilton, I. J. Waters, B. P. Andrew		Scottish Ship Management Ltd
<i>Cape Ortel</i>	3.2.82	G. Downie	R. Orange		Scottish Ship Management Ltd
<i>Cape Rodney</i>	3.2.82	J. A. Lefevre	C. R. Williamson, I. M. Taylor, D. Farrington		Scottish Ship Management Ltd
<i>Cape Trafalgar</i>	3.2.82	R. Safe	P. T. Holden, R. W. Barnes, P. F. Wood		Scottish Ship Management Ltd
<i>Carchester</i>	21.9.81	D. M. Belk	D. P. Worksnop, C. E. Howe, T. A. Meharry		Silver Line Ltd
<i>Cardigan Bay</i>	25.2.82	L. W. Crump	J. Dibben, D. M. Robinson, S. G. Millar		Ocean Transport & Trading P.L.C.
<i>Caruthia</i>	16.9.81	P. R. R. Ramsay	C. Balls, P. A. Pettitt, R. A. Critchlow		Cunard S.S. Co. Ltd
<i>Carnania</i>	19.1.82	J. G. P. Vanderham	S. L. Moorby, L. Clark, D. McPhail		Cunard S.S. Co. Ltd
<i>Caroline Weston</i>	6.1.82	P. Morgan	A. Beattie, R. Hanraads, M. P. Armstrong		Weston Shipping Co. Ltd
<i>Cast Fulmar</i>	2.3.82	H. Barber	I. K. Rew		J. & J. Denholm Ltd
<i>Cedarbank</i>	19.1.82	R. H. Rees	H. R. Bond, H. F. J. Fogarty, R. Flanagan		Bank Line Ltd
<i>Celtic Crusader</i>	9.3.82	H. Gray	H. W. Stewart, S. Duncan		F. T. Everard & Sons Ltd
<i>Celtic Endeavour</i>	18.2.82	R. Stephens	S. P. Johnson, P. Borley, P. G. Posey		Willie & Co. (Shipowners) Ltd
<i>Celtic Link</i>	9.2.82	G. H. Selby-Smith	J. K. Scymour, A. J. Brigden		Ben Line Steamers Ltd
<i>Celtic Venture</i>	2.2.82	J. Iliff	D. J. Capper, W. Stobie, A. Cartwright		Willie & Co. (Shipowners) Ltd
<i>Challenger</i>	12.2.82	K. McLeod	D. M. E. McGrath, D. Jenkinson, R. W. Hopkinson		Natural Environment Research Council
<i>Charnon</i>	30.12.81	M. J. Willcock	E. W. Pearson, E. Hall, R. Woodhouse		Ocean Transport & Trading P.L.C.
<i>Cheshire</i>					Bibby Line Ltd
<i>Croplana</i>					Ministry of Agriculture, Fisheries & Food

Selected Ships (contd)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>City of Durban</i>	16.2.82	J. W. Hodson	R. Jackson, M. Herring, D. Bamford	B. McCall	Ellerman Lines Ltd
<i>City of Edinburgh</i>	16.3.82	A. McKenzie	I. A. Marshall, F. G. Anderson, H. C. Miller	J. R. Crockett	Ben Line Containers Ltd
<i>City of London</i>	25.2.82	T. L. Watson	M. G. Cunningham	M. P. Atherton	Ocean Transport & Trading P.L.C.
<i>City of Plymouth</i>	11.3.82	J. McNab	K. F. Steven, R. A. Bloss		Ellerman Lines Ltd
<i>City of York</i>	17.12.81	J. A. Macleod	K. J. Littlewood, M. J. Fagan, S. A. Edmundson	M. Bell	Ellerman Lines Ltd
<i>Cisone</i>	25.2.81	B. A. Chapman	G. F. Lee, R. F. Graham		Ministry of Agriculture, Fisheries & Food
<i>Cluden</i>	14.5.81	G. Pereira	R. R. W. Smith, D. J. Cocker, P. Chartek	S. Moxey	Matheson Shipping Services Ltd
<i>Clydebank</i>	9.11.81	A. J. Hall	D. Bennett, C. Backhouse, P. T. Thompson	T. S. C. Kucharski	Bank Line Ltd
<i>Clytoneus</i>	2.2.82	H. B. Gobey	G. P. Benson, A. J. Cartwright	J. S. Evans	Ocean Transport & Trading P.L.C.
<i>Columbia Star</i>	3.3.82	A. J. Chivers	D. J. Dawson, C. E. Elms, P. Richards	D. Owen	Blue Star Line Ltd
<i>Corabank</i>	28.1.82	G. J. Tully	M. R. Lynam, P. G. H. Stapleton, A. M. Weale	- Lintzey	Bank Line Ltd
<i>Corolla</i>	13.11.81	G. R. Oliver			Ministry of Agriculture, Fisheries & Food
<i>Crestbank</i>	14.1.82	P. H. Grist	P. B. Moulds, B. F. Dewhurst, A. J. Dixon	D. Catterall	Bank Line Ltd
<i>Crown Prince</i>	22.1.82	H. G. N. Lloyd	N. C. Hope, M. G. Price		Furness Withy (Shipping) Ltd
<i>D. C. Coleman</i>	*	R. Raw	J. Morgan, J. Kemp, A. Williams	P. Moundson	Canadian Pacific Steamships Ltd
<i>Dacebank</i>	19.10.81	T. D. Scott	M. J. West, M. B. Hannon, G. G. Mattson	M. Hanraads	Bank Line Ltd
<i>Danah</i>	20.1.82	P. Pitcairn	R. Harris, M. Winterbottom, M. Young	D. Dalton	P. & O. S.N. Co.
<i>Darina</i>	2.10.81	I. R. Farnell	B. Palmer, I. Shields	A. Burns	Shell Tankers (U.K.) Ltd
<i>Dart Americana</i>	9.3.82	P. J. Roberts	N. S. Miller, A. J. L. Evans, N. C. Barham	R. Frank	Canadian Pacific Steamships Ltd
<i>Dart Atlantica</i>	5.1.82	P. Denham	A. K. Soward, A. C. Matthews, P. Bland	K. Rennison	Canadian Pacific Steamships Ltd
<i>Dart Britain</i>	18.1.82	T. R. Barton	S. P. Bryson, C. R. Reed, J. Howard	I. Conn	Furness Withy (Shipping) Ltd
<i>Derveni</i>	15.12.80	G. Spong	C. P. Brabban, J. Exley, P. T. Galea	K. H. Garlinge	Furness Withy (Shipping) Ltd
<i>Discovery</i>	14.9.81	P. J. MacDermott	G. P. Harries, T. Morse	R. L. Townsend-Rose	Natural Environment Research Council
<i>Discovery Bay</i>	3.3.82	J. H. Hutson	W. M. Winter, R. T. M. Whelan, S. Barraclough	W. Kay	Overseas Containers Ltd
<i>Dorsetshire</i>	4.2.82	D. G. Marsh	J. M. Molloy, K. N. Young, S. Harvey	J. Paethorpe	Bibby Line Ltd
<i>Drupa</i>	11.3.82	I. R. Farnell	O. S. Hunnu-Moiett, J. G. Tarling, K. J. Coleman	W. M. Greene	Shell Tankers (U.K.) Ltd
<i>Dryso</i>	9.3.82	J. Heimbald	K. Skaide, T. H. Rapp, R. Simonsen	P. Semundseth	Van Ommeren (U.K.) Ltd
<i>E. W. Beatty</i>	*	R. G. Headrick	B. Swain, S. Westcott, S. Syed	J. Steph	Canadian Pacific Steamships Ltd
<i>Edinburgh</i>	12.1.82	G. B. Charleson	J. D. Price, I. Cuthbertson, C. M. Turner	W. Latus	Cayzer Irvine Shipping Ltd
<i>Edinburgh Universal</i>					
<i>Elk</i>	23.2.82	B. Luke	N. Hardy, C. Burnett, G. Thwaites	R. J. Clayton	P. & O. S.N. Co.
<i>Encounter Bay</i>	21.12.81	R. V. Chipperfield	A. R. Petty, A. P. Talbot, R. J. Baldock	V. A. Gorny	Overseas Containers Ltd
<i>Erskine Bridge</i>	18.9.81	R. Sidney	C. R. Ewins, M. Sheldon, S. Chalk	D. Colwill	Silver Line Ltd
<i>Esso Aberdeen</i>	14.1.82	M. McMaster	D. S. Thetford, C. White, C. Walder	F. Jones	Esso Petroleum Co. Ltd
<i>Esso Calabria</i>	12.1.82	R. Hyam	P. B. Markides, A. D. Stuart, J. Browning	I. Brooks	Esso Petroleum Co. Ltd
<i>Esso Dabrida</i>	29.1.82	F. Verbiat	M. J. Wynne		Esso Petroleum Co. Ltd
<i>Esso Demetia</i>	9.2.82	D. Walker	P. K. Eaton, A. Dogherty	D. M. Sugden	Esso Petroleum Co. Ltd

<i>Esso Hibernia</i>	26.10.81	J. W. Aalen	G. S. Nixon, D. Bunker	A. West	Esso Petroleum Co. Ltd
<i>Esso Northumbria</i>	30.6.81	F. Stubbs	P. Whitehead, P. A. Joss	..	Esso Petroleum Co. Ltd
<i>Esso Ulidia</i>	9.2.82	I. D. Grigor	J. H. Kennedy, M. J. Lightbody	..	Esso Petroleum Co. Ltd
<i>Esso Warwickshire</i>	14.1.82	D. W. Templeman	K. E. Greendale, M. J. Knowles	I. Morgan	Esso Petroleum Co. Ltd
<i>Ethel Everard</i>	25.1.81	G. Hare	P. Bird, D. Watson	..	F. T. Everard & Sons Ltd
<i>Explorer</i>	19.8.77	J. Gillon	A. Murray, W. Ferguson	J. A. Main	Department of Agriculture & Fisheries for Scotland
<i>Eye of the Wind</i>	3.2.80	M. C. Kichenside	J. M. Torkington, K. W. S. Macmillan, L. J. Fletcher	P. Mathews	Overseas Containers Ltd
<i>Falmouth Bay</i>	19.1.82	P. J. R. Manson	J. Davies, E. F. Stewart, V. P. Stevens	P. K. Mahon	Bank Line Ltd
<i>Fenbank</i>	27.1.82	P. J. Elder	A. M. Kennedy, A. W. Curtis, N. G. Wan Chin	M. Mong	J. Swire & Sons Ltd
<i>Fengtien</i>	4.3.81	R. J. Shipp	I. P. MacCormac	..	Bank Line Ltd
<i>Firbank</i>	4.2.82	D. MacPhail	M. Leech, C. J. A. Hughes, D. R. Peel	D. Alcock	Overseas Containers Ltd
<i>Flinders Bay</i>	11.3.82	R. Brinkworth	M. J. Scanlon, R. Ashton, A. J. Bentley	R. C. J. Clay	Canadian Pacific Steamships Ltd
<i>Fort Assiniboine</i>	27.1.82	R. Smith	R. J. Arnot, P. B. Frost, I. A. Smith	R. E. G. Haviland	Canadian Pacific Steamships Ltd
<i>Fort Hamilton</i>	17.12.81	J. R. Brooks	R. Daya, M. G. Weir, R. F. Young	E. Connell	Canadian Pacific Steamships Ltd
<i>Fort Norman</i>	2.3.82	A. McGrail	J. Lock, K. Brothers, R. Stewart	R. Higgs	Canadian Pacific Steamships Ltd
<i>Fort Rouge</i>	*	J. Hume	A. Williams, K. Jackson, K. Elias	M. Dunkley	Canadian Pacific Steamships Ltd
<i>Fort Toronto</i>	28.1.82	P. Hill	C. C. L. Wales, A. C. McFadyen, B. F. Adams	P. D. Hartwell	Canadian Pacific Steamships Ltd
<i>Fort Victoria</i>	31.12.81	T. Nicholson	W. E. Lewis, N. F. Sharpe, D. R. Barlow	B. Neary	Bank Line Ltd
<i>Forthbank</i>	11.3.82	W. W. Davies	D. F. Archer, D. J. Ridgway	C. M. Taylor	B.P. Shipping Ltd
<i>Forties Kivi</i>	*	G. M. Coulson	M. S. Putman, E. Dowell	..	Natural Environment Research Council
<i>Frederick Russel</i>	..	P. H. Warne	..	..	..
<i>Galconda</i>	7.7.81	R. B. Reid	N. R. Fuller, M. T. Stafford, M. P. Chalk, R. G. Bull	R. Phillips	P. & O. S.N. Co.
<i>Gambada</i>	2.2.82	C. G. McKenzie	J. H. Adcock, S. J. Miller	M. Smith	P. & O. S.N. Co.
<i>Gandara</i>	11.1.82	R. J. Turney	M. F. Tibbles, K. R. Underhill, G. Ashworth	W. A. Boyle	P. & O. S.N. Co.
<i>Garala</i>	*	J. O. Spence	A. Batra, M. J. Curran, E. J. Hadfield	A. G. Thompson	P. & O. S.N. Co.
<i>Garbeta</i>	9.3.82	S. Harwood	R. Gains, R. Deyes, A. D. G. Bell	M. Bull	P. & O. S.N. Co.
<i>Gardline Locater</i>	24.2.81	A. Morrice	D. P. Hawkins, D. Bailey, I. P. Hurst	..	Gardline Shipping Ltd
<i>Gardline Tracker</i>	20.2.81	D. Bailey	R. S. James, J. Nickin, F. J. Mack	..	Gardline Shipping Ltd
<i>Garnada</i>	10.2.82	R. J. Turney	G. F. Penbarthy, J. B. Moulds, S. D. Bradley	D. A. Rice	P. & O. S.N. Co.
<i>Gas Enterprise</i>	*	H. E. Brown	R. Lanz, -, Massey, -, Pressit	- Hill-Heaton	B.P. Shipping Ltd
<i>Gazana</i>	17.6.81	C. G. McKenzie	M. F. Tibbles, J. L. Burton	G. R. Bailey	P. & O. S.N. Co.
<i>Geestbay</i>	5.1.82	O. Springett	C. M. Davies, T. D. Hogg, A. C. Jenkins	A. P. Austen	Geest Industries Ltd
<i>Geestland</i>	12.2.82	M. Wilks	J. H. Worwood, A. B. Ward, A. Gladman	M. McGregor	Geest Industries Ltd
<i>Geestport</i>	*	D. N. Boone	C. Morgan, N. Lewis, M. Davis	G. Selby	Geest Industries Ltd
<i>Geeststar</i>	23.2.82	K. M. R. Skinner	A. J. Gladman, P. J. Gaydon, W. A. Boddington	R. Knott	Geest Industries Ltd
<i>Gladstone Star</i>	2.2.82	E. C. Smith	K. G. Warmisham, J. K. Wilkinson, M. Moorhouse	M. Hoyes	Blue Star Line Ltd
<i>Glenpark</i>	7.8.81	W. McCrae	W. C. Grant, J. Morrison, I. McKendrick	A. P. Daff	J. & J. Denholm Ltd
<i>Gold Varda</i>	17.10.78	M. J. Wharf	D. J. Smith, G. C. Rautraya, J. J. Neill	G. W. Cunnane	Haverton Shipping Ltd
<i>Goth</i>	6.1.81	P. Wheeldon	R. Spall	R. Spall	British United Trawlers
<i>Grey Hunter</i>	21.8.81	T. Fyfe	J. M. Smith, J. D. Simpson, F. J. Rossiter	P. A. Barratt	Ben Line Steamers Ltd
<i>Gulf Hawk</i>	*	E. B. Daubeny	..	..	Gulf (Shipowners) Ltd
<i>Halifax Star</i>	12.1.82	P. A. Stevens	J. Barwis, S. Willis, P. R. Fawcett	D. Letcher	Blue Star Line Ltd
<i>Hampshire</i>	9.11.82	D. J. Creamer	R. F. Codie, S. N. Harris, G. N. Penry, R. P. Askew	C. Wade	Bibby Line Ltd
<i>Helenus</i>	8.2.82	J. R. Teare	S. J. Hollows, P. F. Noonan, T. J. Olsen	D. G. Holmes	Ocean Transport & Trading P.L.C.
<i>I. D. Sinclair</i>	*	F. K. Gordon	T. Robinson, A. Evans, P. K. Dobson	J. Woolian	Canadian Pacific Steamships Ltd

Selected Ships (contd)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Ibn Abdoun</i>	16.10.81	V. Swan	S. T. Curtis, G. A. Foster, P. M. Frost	J. N. Phipp	United Arab Shipping Co. Ltd
<i>Ibn Rushd</i>	28.10.80	J. Wilkie	R. J. Bialoszewski, B. R. Cox		United Arab Shipping Co. Ltd
<i>Ivybank</i>	2.3.82	I. M. Made	S. R. Deans, K. Berry, K. Scott	P. Ferguson	Bank Line Ltd
<i>Jack Wharton</i>	14.9.81	A. J. A. Richards	D. P. Crowley, K. H. Davie, R. A. Kenchington	J. Bridge	F. T. Everard & Sons Ltd
<i>Jedforest</i>	1.2.82	W. A. Miller	M. J. S. Burgan	R. Wade	P. & O. S.N. Co.
<i>Jervis Bay</i>	19.1.82	C. R. Short	R. W. Davis, W. G. Wood, D. P. Kirley	R. J. Preece	Overseas Containers Ltd
<i>John Biscoe</i>	5.3.81	C. R. Elliott	H. A. Mackenzie, P. M. Morgan		British Antarctic Survey
<i>Josefa</i>	3.12.81	R. I. Crawford			Sir Wm. Reardon Smith & Sons Ltd
<i>Jura</i>	3.2.82	D. L. Rattray			Department of Agriculture & Fisheries for Scotland
<i>King Alfred</i>	22.9.81	P. C. Byrne	C. R. Precious, H. Edwards, B. J. Daniel	G. L. Macindoe	Cayzer Irvine Shipping Co. Ltd
<i>King Charles</i>	15.1.82	K. Morton	A. J. McMaster, A. Flenley, A. Welcome	J. Blackwell	Cayzer Irvine Shipping Co. Ltd
<i>King George</i>	8.1.82	E. J. E. Owen	M. P. Hall, D. Innes, C. Neave	J. A. Tomlinson	Cayzer Irvine Shipping Co. Ltd
<i>King Richard</i>	2.2.82	R. Bessant	A. Dawson, J. Pink, R. Dobie	A. Campbell	Cayzer Irvine Shipping Co. Ltd
<i>King William</i>	2.6.81	S. M. Grant	K. C. Hoare, C. M. Turner, R. Milne	D. Colclough	Cayzer Irvine Shipping Co. Ltd
<i>Kingsnorth Fisher</i>	*	G. W. Watt	L. B. Fant, H. McWilliam	S. G. Price	James Fisher & Sons Ltd
<i>Kinpurne Universal</i>	5.1.82	R. A. G. Simmons	K. J. W. Ridgeway, A. Oxley, R. J. Lewis	J. Sharpley	Cayzer Irvine Shipping Co. Ltd
<i>Kowloon Bay</i>	19.10.81	W. P. Goldie	C. E. Howey, D. P. Worsnop, J. G. Dixon	W. C. A. Phillips	Ocean Transport & Trading P.L.C.
<i>Kubbar</i>	18.2.82	D. T. Hughes	A. N. Whinton, A. R. Innes, R. G. Tull	A. Fraser	P. & O. S.N. Co.
<i>La Costa</i>	23.2.82	R. D. M. Blair	R. J. Dockett, P. Weston, A. Cameron	M. Cawthorne	Buries Markes Ltd
<i>La Pampa</i>	4.2.82	- Gurk	R. N. Holroyd, - Burnham, - Hunt	- Lowe	Buries Markes Ltd
<i>Lackenby</i>	18.2.82	C. B. Tingle	R. H. Ward, D. Wallis		Sir R. Ropner & Co. Ltd
<i>Laeries</i>	18.2.82	H. T. Reid	M. S. Middlebrook, M. V. Hobbs, C. Tatham, C. Donnison	D. Stoker	Ocean Transport & Trading P.L.C.
<i>Lancashire</i>	19.1.82	D. R. Clayton	P. W. J. Wright, M. Brockleby, C. N. Clark	C. Wade	Bibby Line Ltd
<i>Lantau Trader</i>	12.1.82	R. A. Harvey	Chung Siu Man, P. Lau, P. Chon Sai Ming	Chuk Yuk Loy	Denholm Ship Management (Overseas) Ltd
<i>Lauderdale</i>	24.2.82	B. Kelly	R. G. Bull, E. S. Wilson, P. A. Edwards	P. M. Miller	P. & O. S.N. Co.
<i>Lincolnbrook</i>	23.2.82	J. K. Marchant	R. J. Bialoszewski, P. J. Miller		F. T. Everard & Sons Ltd
<i>Lincolnshire</i>	11.11.81	C. T. Allison	D. C. Morgan, R. P. Askew	C. L. Bolton-Heaton	Bibby Line Ltd
<i>Liverpool Bay</i>	13.1.82	W. A. Fitzgerald	L. W. Smith, R. J. Edmonds	A. G. Thomson	Ocean Transport & Trading P.L.C.
<i>London Baron</i>	7.1.82	R. C. Mortimer	C. R. Wood, G. R. Hicks	K. Stamp	London & Overseas Freighters P.L.C.
<i>London Earl</i>	15.1.82	W. S. Jaeger	A. P. Hilliard, I. Roberts, M. Weatherall	P. S. Melton	London & Overseas Freighters P.L.C.
<i>London Enterprise</i>	23.12.81	T. S. Nurcombe	M. B. Balls, C. A. Cornish, A. R. Follett	P. B. Killen	London & Overseas Freighters P.L.C.
<i>London Glory</i>	21.1.82	R. B. Tarbuck	A. T. R. Weale, D. L. Thomas, C. J. Hook, M. G. Evans	P. F. Barber	London & Overseas Freighters P.L.C.
<i>London Pride</i>	13.3.81	E. G. Kemp	A. R. Follett, I. Roberts	R. F. Smith	London & Overseas Freighters P.L.C.

<i>London Viscount</i>	A. C. Armstrong	M. P. O'Neill	N. R. Gibb	London & Overseas Freighters P.L.C.
<i>London Voyager</i>	P. Baxter	W. S. Payne, G. A. Paton, N. Childs	M. A. Jordan	London & Overseas Freighters P.L.C.
<i>Lord Curzon</i>	N. Storey	J. F. Hardy, M. W. Greaves, J. G. Mathew	A. Patterson	Liberty-Maritime Ltd
<i>Lord Mount Stephen</i>	R. B. Jones	J. A. Turner, D. W. Pooley, A. J. S. White	M. J. Corry	Canadian Pacific Steamships Ltd
<i>Lord Strathcona</i>	G. N. Gaunt	T. Fisher	F. Kilpatrick	Canadian Pacific Steamships Ltd
<i>Lucerna</i>	W. J. S. Flett	B. A. Palmer, H. R. Shuttleworth	S. Myland	Cunard S.S. Co. Ltd
<i>Lycan</i>	P. S. Carr	K. G. H. Trevanion, N. Salmon, S. G. Mason	K. W. Torr	Ocean Transport & Trading P.L.C.
<i>Lynston Grange</i>	N. Oddy	C. P. Brabban, B. L. Bass	G. S. Graham	Furness Withy (Shipping) Ltd
<i>Maersk Cadet</i>	G. Thompson	A. J. Gordon, G. N. Smith	O. Grimsdale	Maersk (U.K.) Co. Ltd
<i>Magdalena</i>	D. Mountford	M. G. Boylin, C. M. Renault, N. J. Elks	C. Grech	Fyffes Group Ltd
<i>Mairangi Bay</i>	J. Cosker	N. A. Escott, D. K. MacCorquodale, J. C. Hoy	D. Kelsall	Overseas Containers Ltd
<i>Makkah</i>	A. W. J. Reeves	P. W. Gibson, S. White, B. Caister	D. Winchester	Texaco Overseas Tankship (U.K.) Ltd
<i>Manaar</i>	T. G. S. Ward	P. R. Phibbs, S. Daniel, G. Bates, P. A. Fowler	M. Kitt	Cunard S.S. Co. Ltd
<i>Manchester</i>	J. McKay	D. Kennedy, C. D. Eke	J. Williams	Furness Withy (Shipping) Ltd
<i>Challenge</i>	K. Lehepuu	M. A. Carter, A. Wade, L. Mitchel	M. D. A. Walsh	Furness Withy (Shipping) Ltd
<i>Manchester Vanguard</i>	J. Ocroft	D. Craddock, M. Julier, A. Lloyd	A. G. Deane	Cunard S.S. Co. Ltd
<i>Masirah</i>	M. Bell	G. C. Kelly, G. B. Robinson, K. Dye	R. P. Skuse	Mobil Shipping Co. Ltd
<i>Matco Avon</i>	P. D. Kelly	B. Hartley, D. Hunston	M. Fernier	Mobil Shipping Co. Ltd
<i>Matco Thames</i>	P. Pinkerton	I. K. Bourne, A. G. Pritchard, K. M. Griffiths, M. J. Bashir	A. J. Dunn	Fyffes Group Ltd
<i>Matina</i>	M. Thwaite	D. E. Ginder, B. K. Ward	T. Kucharski	Cunard S.S. Co. Ltd
<i>Matra</i>	E. T. Reese	R. Flynn, J. N. Miller	James Fisher & Sons Ltd	Bank Line Ltd
<i>Meadowbank</i>	- Eggert	G. Griffiths, M. W. Osborne, D. W. Smith	P. Dolphin	Ocean Transport & Trading P.L.C.
<i>Mediterranean</i>	D. Howe	P. J. Fuller, A. Ford, D. M. Macleod	S. Myland	Denholm Maclay Co. Ltd
<i>Shearwater</i>	M. McGee	G. Miller, T. Turvey, J. Rogers	R. E. Macdermott	Denholm Maclay Co. Ltd
<i>Melampus</i>	J. B. Clemenson	R. A. Heather, S. D. Andrews, R. N. Beall	D. F. S. Moorhouse	Shell Tankers (U.K.) Ltd
<i>Merzario Grecia</i>	J. Baty	J. W. Sellick, C. J. Baker, P. C. Williams	D. J. MacInnes	Fyffes Group Ltd
<i>Merzario Hispania</i>	J. Sturgess	B. Stirling, M. Causon, N. Fleming	C. K. Thornalley	Bank Line Ltd
<i>Merihane Progress</i>	W. W. Davies	P. M. Beggs, B. L. Brietley, C. B. Walgate	R. A. Browne	Overseas Containers Ltd
<i>Morant</i>	J. W. Welch	A. Bucknole, J. Fielden, R. S. Hopkins	W. Macleod	Ocean Transport & Trading P.L.C.
<i>Moraybank</i>	H. K. Timbrell	D. Freeman	N. C. Sanders	Shell Tankers (U.K.) Ltd
<i>Moreton Bay</i>	C. G. Scarf	M. R. Sealey, J. M. Smith, I. Woolard	D. F. Olivant	Sir Wm. Reardon Smith & Sons Ltd
<i>Mymidon</i>	M. C. Hurst	R. Gillespie, B. Robertson	P. McVeigh	J. & J. Denholm Ltd
<i>Naticna</i>	J. H. Blaber	P. A. Ellacott, M. G. Phipps, M. J. Pinks	P. J. Griffin	Burnes Markes Ltd
<i>New Westminster City</i>	J. W. Murray	N. Stark, H. Syed	R. J. E. Chapman	Harrison (Clyde) Ltd
<i>Noradic Commander</i>	A. Barker	T. D. Beer, R. Auennin, N. Howarth	S. Shays	Bolton S.S. Co. Ltd
<i>Norman Lady</i>	J. Parsloe	M. A. Cumpstey, M. Cronie, N. Weller	C. Langley	Shell Tankers (U.K.) Ltd
<i>Norse Marshal</i>	R. G. Jeffery	J. F. Besch, P. P. Dennison, R. N. Palmer	W. C. Macartney	Furness Withy (Shipping) Ltd
<i>Nosira Lin</i>	S. D. Gibson	S. Jeffrey, P. J. Green		Furness Withy (Shipping) Ltd
<i>Opalia</i>	T. J. Sax	S. W. Douglas, P. Wilkins, S. J. F. D'Arcy		Furness Withy (Shipping) Ltd
<i>Orduna</i>	G. E. Turner			Furness Withy (Shipping) Ltd
<i>Oropesa</i>				
<i>Oroya</i>				

Selected Ships (contd)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Osaka Bay</i>	10.2.82	J. E. Webb	R. J. Hughes, A. E. Spencer	C. W. Knibb	Ocean Transport & Trading P.L.C.
<i>Overseas Argonaut</i>	14.9.81	E. G. Humby	R. MacGannon, J. W. W. Peters, T. A. Edwards	K. J. Steele	London & Overseas Freighters P.L.C.
<i>Pacific Crane</i>	4.8.81	J. L. Lundberg	A. W. Cheetham, J. Ross, D. Ilderton	R. C. Bruggs	James Fisher & Sons Ltd
<i>Pacific Fisher</i>	3.9.81	P. Hobson	K. M. Macdonald, P. Marcon, D. Farmer	E. L. Derbyshire	James Fisher & Sons Ltd
<i>Pacific Swan</i>	27.5.81	I. J. Groundwater	G. Proud, D. Marr, P. R. Clark	A. C. Catt	James Fisher & Sons Ltd
<i>Patriotus</i>	23.2.82	D. S. Walker	J. L. Jones, M. N. Baldwin, J. G. Lover	D. Gunning	Ocean Transport & Trading P.L.C.
<i>Pholas</i>	25.11.80	J. McKewon	I. C. Offland, B. D. Noble, Shahib Bin Haji Subak	P. M. S. Nee	Coe Metcalf Shipping Ltd
<i>Phronitis</i>	3.9.81	P. J. Broomfield	G. Boyce, A. P. Maytham, C. J. Butters	J. Bridge	Ocean Transport & Trading P.L.C.
<i>Pikebank</i>	4.2.82	A. N. Watson	W. Tullock, A. B. Welch	G. Randall	Bank Line Ltd
<i>Pole Star</i>	3.1.79	N. Morrison	J. S. Langdon, D. T. D'souza		Northern Lighthouse Board
<i>Pullenger</i>	18.1.82	R. J. Pillery	K. Watson, R. Whing, J. Redman	T. Searle	P. & O. S.N. Co.
<i>Pomella</i>	20.1.82	B. G. Calderwood	C. G. Everett, B. T. Hermeman, E. Walmsley	P. K. C. Spear	Shell Tankers (U.K.) Ltd
<i>Port Alberni City</i>	15.2.82	J. Pearsall	R. G. Tanner, A. P. Miller, N. Davies	V. F. Cullen	Sir Wm. Reardon Smith & Sons Ltd
<i>Prince Rupert City</i>	9.2.82	D. L. Bell	W. Jackson, J. P. Sankey, M. B. Wdowikowaki	B. B. Everett	Sir Wm. Reardon Smith & Sons Ltd
<i>Pulborough</i>	13.1.82	G. Young	G. Bliss, D. W. A. Cater	A. A. Campbell	Stephenson Clark Shipping Ltd
<i>Quarush</i>	23.11.81	A. B. Stalker	J. G. Scott, P. E. Jowett, J. Dunford	R. Wicks	P. & O. S.N. Co.
<i>Queen Elizabeth 2</i>	22.9.81	R. H. Arnott	P. Hamlin, B. Middleton, D. Cowel	D. Butterworth	Cunard S.S. Co. Ltd
<i>Ravenscrang</i>	23.2.82	F. Stuart	G. R. Nickerson, W. F. McCarthy, J. Constable	J. Fitzgerald	Sir R. Ropner & Co. Ltd
<i>Remuera Bay</i>	4.3.82	J. S. Thorpe		D. I. Fraser	Overseas Containers Ltd
<i>Resolution</i>	13.11.81	W. D. Howell			Gardline Shipping Ltd
<i>Resolution Bay</i>	12.3.82	W. A. Murison			Overseas Containers Ltd
<i>Retriever</i>	9.5.79	J. H. Killick			Cable & Wireless Ltd
<i>Reynolds</i>	13.10.81	M. J. Butcher	B. R. Tucker, C. Sheffield, C. Cooke	M. F. Lavan	Bolton S.S. Co. Ltd
<i>Ringnes</i>	7.7.81	M. J. Meyer	R. Claridge, P. Skelton, D. W. Clements	A. Hodson	Jebeens (U.K.) Ltd
<i>Riverbank</i>	18.2.82	W. Macdonald	S. J. Fair, A. G. Stevenson, S. Bland	K. Darwen	Bank Line Ltd
<i>Roachbank</i>	13.1.81	R. F. Whitehead	C. J. O'Donnell, W. Mather, C. N. Hardy	T. King	Bank Line Ltd
<i>Roches</i>	28.1.82	D. M. Roberts	M. R. Bailey, D. C. Walker, D. J. Miller	P. N. Graham	Jebeens (U.K.) Ltd
<i>Rollnes</i>	13.1.82	J. Apsey	R. Baker, I. C. Oke, S. Byczynski	D. P. Kennedy	Furness Withy (Shipping) Ltd
<i>Ronanston Grange</i>	14.5.81	R. Fairley	W. F. R. Whiting, G. Rager, T. L. Bovis	J. Hetherington	Furness Withy (Shipping) Ltd
<i>Royal Prince</i>	27.1.82	P. Strevens	R. M. Palmer, C. Fazakerly		Bolton S.S. Co. Ltd
<i>Ruibens</i>	15.1.82	W. Weldon	D. J. Williamson, S. Cannon, R. Gemmell	R. Garnham	Bank Line Ltd
<i>Ruddbank</i>	24.9.81	E. T. Rees	W. M. Esler, M. Wright, S. Bland	N. Marwood	Bank Line Ltd
<i>St Edmund</i>	11.2.82	K. C. Wood	M. D. Horn, L. O. Roakell, H. W. Ramsey	T. Plant	Sealink (U.K.) Ltd
<i>St George</i>	25.2.82	P. Backhouse	R. W. S. Barnes, P. Leason	R. Mallett	Sealink (U.K.) Ltd
<i>St Helena</i>	20.1.82	M. L. M. Smith	S. B. Quinn, M. Underwood, K. Stone	R. A. Wilson	Curnow Shipping Ltd
<i>St Jason</i>	30.4.80	A. Ball	H. G. Paak		T. Hamling & Co. Ltd
<i>Saltergate</i>	21.1.81	J. Maclean	I. F. Scurr, R. Morfitt, R. J. Hockham	A. Cheshire	Turnbull Scott Management Ltd
<i>Samarina</i>	26.1.82	L. Crump	B. J. Garasde, J. Lewis, J. A. Richardson	K. Gratton	Cunard S.S. Co. Ltd
<i>Sandgate</i>	20.1.82	J. Cormack	R. W. Bourton, S. T. Mundy, M. Drewery	C. Akyeampong	Turnbull Scott Management Ltd

<i>Sapphire Bounty</i>	11.6.81	M. R. Rutter	U. P. Singh Baveja, R. A. P. Hunt, Yip Siu Keung	Chan Shu Hong	Sea Containers (Chartering) Ltd
<i>Saxonia</i>	9.3.82	C. R. Knight	R. M. Walker, D. G. J. Atkinson, P. E. Bailey	J. J. Cooney	Cunard S.S. Co. Ltd
<i>Scotia</i>	3.3.82	G. M. Coull	J. E. Bannister, W. H. Laws, D. Dixon	J. Steven	Department of Agriculture & Fisheries for Scotland
<i>Scottish Eagle</i>	4.3.82	J. B. Caley	A. R. Wilson, R. G. Ward, I. A. Ross	J. N. Duckworth	Cayzer Irvine Shipping Co. Ltd
<i>Scottish Lion</i>	9.3.82	A. D. Terras	A. R. Wilson, P. M. Simpson, A. C. Webb	J. N. Duckworth	Cayzer Irvine Shipping Co. Ltd
<i>Scythia</i>	5.12.82	D. Moore	B. J. Garside, N. Hodgson, D. Percy	H. O. C. Grattan	Cunard S.S. Co. Ltd
<i>Seaforth Clansman</i>	3.12.80	J. Ritchie	J. Sabourn, G. Henderson	W. Hammerton	Seaforth Maritime Ltd
<i>Seilbydyke</i>	9.11.81	J. Gray	D. Turrill		Klondyke Shipping Co. Ltd
<i>Semac 1</i>	28.8.80	J. Dobson			Semac Services
<i>Serenia</i>	13.1.82	K. Bramley	A. T. Patience, M. T. McKellar, M. Gough	R. Moloney	Shell Tankers (U.K.) Ltd
<i>Servia</i>	27.8.81	W. H. Hicks	D. J. Coogans, R. A. Critchlow, P. A. Pettitt	A. E. Burbidge	Cunard S.S. Co. Ltd
<i>Shabonee</i>	24.2.82	P. Callaghan	O. G. Donaldson, J. Lees, I. Burt	M. Scanlon	Mobil Shipping Co. Ltd
<i>Shackleton</i>	24.2.82	M. A. Harding	W. D. Coverdale, V. Avery, P. T. Oldfield	J. R. Parkes	Natural Environment Research Council
<i>Sherbro</i>	2.3.82	S. F. Garside	G. C. Collin, J. A. Glover, C. M. Shaw	R. Buckles	Ocean Transport & Trading P.L.C.
<i>Shetland Service</i>	17.2.82	J. Sole	S. F. Whittingham, M. Hooson, J. Sweetman, J. Hutton		Offshore Marine Ltd
<i>Shonga</i>	15.1.82	D. Graham	M. Proud, T. J. Bayley	R. McSorley	Ocean Transport & Trading P.L.C.
<i>Silverford</i>	20.1.82	R. Jenkins	V. A. McAdam, J. Oxenham, G. Thomson	D. Wood	Silver Line Ltd
<i>Silvermain</i>	5.1.82	M. E. Guy	J. Hammond, R. J. Nigg, P. F. Wood	J. Minogue	Silver Line Ltd
<i>Sincerity</i>	4.2.81	J. Heavy	W. J. Trafford, J. Macdonald		F. T. Everard & Sons Ltd
<i>Singularity</i>	18.1.82	J. A. Moir	P. F. Bayliss, R. Wright-Turner		F. T. Everard & Sons Ltd
<i>Snowd</i>	23.2.82	J. Thomson	A. D. Gillman, R. H. Stone, K. M. Gregg	A. J. Bellamy	Irano British Ship Service Co. Ltd
<i>Snowd Hill</i>	11.1.82	G. Hogg	M. J. Beaumont, R. M. Jarrett, J. A. Freegard	K. D. Boyes	Salen (U.K.) Ship Management Ltd
<i>Sokoto</i>	8.2.82	I. D. Jackson			Ocean Transport & Trading P.L.C.
<i>Solentbrook</i>	13.1.82	C. T. Marchant	R. Hart, R. T. Volante		F. T. Everard & Sons Ltd
<i>Southgate</i>	18.11.81	H. Vane	A. Palmer, E. J. Potter, J. V. Davies	A. S. Green	Turnbull Scott Management Ltd
<i>Southland Star</i>	15.1.82	R. K. Bilton	A. Hillier, D. Craddock, P. C. French	P. G. Eason	Blue Star Line Ltd
<i>Speciality</i>	4.2.82	P. M. Gilks	C. J. Blane, J. H. Telfer, B. R. Cox		F. T. Everard & Sons Ltd
<i>Spey Bridge</i>	4.1.82	D. Sutherland	P. T. Holden, C. Dennis	B. Christie	Silver Line Ltd
<i>Spraynes</i>	3.2.82	A. Drury	D. J. Ayling, V. A. Adams	A. Hodson	Jebsons (U.K.) Ltd
<i>Stability</i>	19.2.82	J. A. Moir	D. Gilbert		F. T. Everard & Sons Ltd
<i>Staffordshire</i>	25.1.81	M. R. Nisbet	J. W. Millett, A. Set, D. Singh	G. J. Simpson	Bibby Line Ltd
<i>Star Blackford</i>	16.3.82	L. Street	S. Brookbanks, M. A. Szymura, J. G. Melrose	K. J. Harris	Blandford Shipping Co. Ltd
<i>Star Bulford</i>	15.12.81	D. Buckley	R. Roberts, K. Capes, F. T. Y. Wong	K. Matherson	Blandford Shipping Co. Ltd
<i>Star World</i>	21.1.82	E. R. Finch	D. R. Gear, A. K. Babbar	S. G. Karekar	Marine Navigation Co. Ltd
<i>Starman Anglia</i>	22.12.81	P. W. Hutchinson	H. J. Le Cornu, K. Pykett, M. Jenkins	R. Kit	Blue Star Line Ltd
<i>Starna Oceanica</i>	19.1.82	F. R. M. Best	D. Cuthill, S. Lee, R. T. C. Sneddon	E. Buggy	Blue Star Line Ltd
<i>Stirling Universal</i>	7.9.81	A. G. Cruickshank	C. J. Batty, A. J. Gorringe, M. Negus	P. Boyle	Denholm MacLay Co. Ltd
<i>Stratheden</i>	13.1.82	S. T. S. Household	R. B. Johnson, K. C. Riddick, D. J. Goodwin	E. Marks	Cayzer Irvine Shipping Ltd
<i>Strathelgin</i>	18.1.82	A. H. Aston	B. M. James, A. C. McCulloch, D. Warren	P. & O. S.N. Co.	P. & O. S.N. Co.
<i>Stratherron</i>	11.1.82	C. B. Cooke	R. Pritchard, K. Riddick, T. McLaren	P. Moore	P. & O. S.N. Co.
<i>Strathesk</i>	16.3.82	S. T. S. Household	R. Fritton, J. Appaurai, B. R. Hutchinson	L. Sutton	P. & O. S.N. Co.
<i>Strathetrack</i>	18.5.81	D. Blackman	A. J. Bairstow, A. R. Lindsay, J. Hamnath	W. Spears	P. & O. S.N. Co.
<i>Strathewe</i>	18.12.81	A. M. J. Jenkins	T. N. Smith, N. J. G. Blacker, D. Lemon	J. Noon	P. & O. S.N. Co.
<i>Streambank</i>	18.12.81	B. Z. Gerstel	G. J. Hoodless, D. P. Monks, I. D. Cumming	R. J. Harris	P. & O. S.N. Co.
<i>Strider Juno</i>		A. Mackinson	H. Thomas, J. Slatford, T. Oakley	P. A. Archer	Bank Line Ltd
				M. Mitchell	Sea Containers Ltd

Selected Ships (contd)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Sturland Bay</i>	19.1.82	H. K. Timbrell	A. L. Morris, E. J. Watterson, C. J. Todd	P. D. Stapleton	Ocean Transport & Trading P.L.C. Ministry of Agriculture, Fisheries & Food
<i>Sutisher</i>		D. R. Stevens	N. McInnes		
<i>Summit</i>	25.11.81	E. R. Lear	R. T. Volante, J. Henderson, J. K. Gray, C. Buckley		F. T. Everard & Sons Ltd
<i>Table Bay</i>	10.12.81	J. S. Catterall	A. J. A. Aston, T. G. Whittaker, J. Madge, N. C. Crockett	D. A. P. Galbraith	Overseas Containers Ltd
<i>Tacoma City</i>	4.11.81	O. L. J. Lindsay	J. C. Neale, I. M. Stewart, M. Hart	B. J. Carter	Sir Wm. Reardon Smith & Sons Ltd
<i>Tanjung Utara</i>	18.1.82	J. Wood	R. J. Sinclair, C. G. M. Dale, R. Keig	C. Ritchie	Scottish Ship Management Ltd
<i>Tantalus</i>	2.3.82	I. Webster	D. W. Smith, M. Harrison, A. V. Molina	B. Gallagher	Ocean Transport & Trading P.L.C.
<i>Tenchbank</i>	8.9.81	B. J. Peterson	C. C. Baines, M. A. Ranson	M. H. Stalker	Bank Line Ltd
<i>Texaco Brussels</i>	22.1.81	T. A. Page	N. E. S. Smith, D. J. Warner, G. J. Stevens	K. F. Kippen	Texaco Overseas Tankship (U.K.) Ltd
<i>Texaco Ghent</i>	8.1.82	D. C. Lumbard	R. F. Brass, R. C. T. Forshaw, S. Stone	J. C. Kelly	Texaco Overseas Tankship (U.K.) Ltd
<i>Texaco Sweden</i>	*	I. E. McVicar	L. H. Brown, T. Moore, C. T. Bland	D. Laybourne	Texaco Overseas Tankship (U.K.) Ltd
<i>Texaco Westminster</i>	10.2.82	J. C. Barr	J. Small, D. E. Kerrigan, J. B. Anderson	P. J. Kilbane	Texaco Overseas Tankship (U.K.) Ltd
<i>Thamesfield</i>	28.5.81	W. A. Crawford	D. Sim, M. Redding, K. W. Love	D. Morkan	Hunting Stag Management Ltd
<i>Timaru Star</i>	15.3.82	H. D. Windle	M. J. O'Keefe, D. Darlington, E. C. Lyon	R. B. Hall	Blue Star Line Ltd
<i>Tokyo Bay</i>	4.3.82	A. Austin Rundle	K. D. Campbell, E. D. Somes, G. Barba-Fonseca	P. A. Gooch	Ocean Transport & Trading P.L.C.
<i>Tor Calcedonia</i>		T. Miller	- Rodgers, - Normandale	R. Davies	Tor Line Ltd
<i>Trinculo</i>	4.2.82	K. Lyall	D. A. Young, N. R. Peckham, D. F. Cunningham	N. P. Tarrant	Newgate Shipping Co. Ltd
<i>Troll Lake</i>	8.1.82	M. Thorp	J. F. Fooks, F. J. Tulloch, E. G. Chandler	D. I. McLean	J. & J. Denholm Ltd
<i>Troll Park</i>	4.2.82	R. W. Cotter	C. J. Noonan, J. W. Holgate		J. & J. Denholm Ltd
<i>Trougate</i>	18.8.81	T. Price	P. J. Pannett, M. J. Bailey, M. G. Wood	I. Bolton	Turnbull Scott Management Ltd
<i>Trouthank</i>	21.1.82	T. D. Faithfull	G. J. Himsworth, B. Stirling	D. A. J. Nott	Bank Line Ltd
<i>Uganda</i>	24.9.81	B. Riddick	K. Parsons, A. Clark	F. Murphy	P. & O. S.N. Co.
<i>Valdivia</i>	18.1.82	E. A. Muir	W. J. Smillie	G. R. D. Watterson	Harrison (Clyde) Ltd
<i>Vendee</i>	27.1.82	C. Prescott	P. I. Hillman, C. A. Lewis, J. C. Holmes	M. McKenny	P. & O. S.N. Co.
<i>Victoria City</i>	27.11.81	K. Milburn	J. J. Hudson, K. J. Cribbin, J. C. Pagler	J. A. Heslop	Sir Wm. Reardon Smith & Sons Ltd
<i>Vosges</i>	7.10.81	M. A. Hill	T. P. Flower, D. Perry, D. Bowler	G. N. Darnsett	P. & O. S.N. Co.
<i>W. A. Mather</i>	10.2.82	E. C. Metham	T. Risebron, M. I. C. Kempston, D. Bishop	G. S. Devlin	Canadian Pacific Steamships Ltd
<i>W. M. Neal</i>	10.12.81	H. A. Ross	S. Carter, A. C. Day, R. Mackinnon	G. Burras	Canadian Pacific Steamships Ltd
<i>Wadhurst</i>	24.11.80	A. R. Soulsby	R. K. Serem, J. G. B. Tyler	P. J. Cormican	Stephenson Clark Ltd
<i>Wellington Star</i>	1.2.82	W. J. G. Jones	N. M. Bower, K. Lumby, D. J. Jones	D. Neave	Blue Star Line Ltd
<i>Wellpark</i>	18.1.82	D. Dickson	I. Watson, D. J. Kelley	T. J. C. Stevenson	J. & J. Denholm Ltd
<i>Welsh City</i>	2.3.81	R. Vanner	S. J. Kembery, T. Jowett, A. Abel	R. McInness	Sir Wm. Reardon Smith & Sons Ltd
<i>Westra</i>	23.11.81	R. Mill Irving	D. L. Beveridge, G. Tennant		D.A.F.S.
<i>Wild Flamingo</i>	22.1.82	H. C. Hynard	C. F. G. Crookshank, D. A. Foster, W. D. Phimister	R. W. Aldridge	P. & O. S.N. Co.

<i>Wild Fulmar</i>	..	P. Lay ..	A. W. Speed, S. R. Mathews, A. Dockeray ..	W. Blacklaws ..	P. & O. S.N. Co.
<i>Wild Gannet</i>	..	A. J. Hughes ..	C. J. Meadows, M. Pellett, R. H. Fisher ..	W. Grant ..	P. & O. S.N. Co.
<i>Wild Grebe</i>	..	A. J. Hughes ..	J. Mackenzie, S. Allen, G. F. Everitt ..	R. P. Murt ..	P. & O. S.N. Co.
<i>Willowbank</i>	..	P. Ireland ..	P. Anthony, A. L. Jeffrey, D. Morris ..	C. Waddicor ..	Bank Line Ltd
<i>Wiltshire</i>	..	J. A. Corcoran ..	C. Hillier, C. H. Marsh, L. P. Attard, Montalto ..	G. C. Tyrrel ..	Bibby Line Ltd
<i>Zinnia</i>	..	A. P. Collins ..	C. G. Brakenberry, E. A. Lamb, S. J. Andrucci ..	..	Hunting Stag Management Ltd

Supplementary Ships

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Ardmore</i>	1.2.82	M. J. Carter ..	R. C. West, N. Foster ..	..	P. & O. S.N. Co.
<i>Cairncarrrier</i>	•	G. W. Horn ..	A. Fischbacher, J. L. A. Robinson ..	..	Furness Withy (Shipping) Ltd
<i>Cast Petrel</i>	•	L. Vandenburgh ..	A. Horner, E. Benzie, R. Wallace, H. Johnston ..	M. Clishatt ..	J. & J. Denholm Ltd
<i>Chris Chenery</i>	13.1.82	J. C. Lilley ..	I. D. Brewell ..	..	International Drilling Co.
<i>Dane</i>	4.3.82	- Millward ..	P. A. Lloyd ..	..	British United Trawlers Ltd
<i>Earl Godwin</i>	13.1.82	J. Danes ..	J. Williams, C. Reeves ..	J. Ernest ..	Sealink (U.K.) Ltd
<i>Earl Granville</i>	•	N. Brown ..	L. Elms ..	..	Sealink (U.K.) Ltd
<i>Oil Hustler</i>	•	C. Cunningham ..	G. J. S. Ives, M. Kirk ..	..	Ocean Inchcape Ltd
<i>Oil Supplier</i>	10.2.82	R. Williams ..	D. G. Galbraith, D. J. Lloyd, J. D. Dawson ..	L. P. Greeve ..	Ocean Inchcape Ltd
<i>Regent's Park</i>	19.9.78	M. Blight ..	S. G. Turner, M. C. Jones ..	D. A. Thomas ..	Denholm Macley Co. Ltd
<i>Vegaman</i>	18.1.82	R. A. Shopland ..	J. Nixon, A. R. Froude, D. E. Knight ..	..	Rowbotham Tankships Ltd
<i>Viking Valiant</i>	7.1.82	R. H. Plant ..	D. A. Parsons, C. Walford, J. R. Adams, T. E. Nixon ..	..	Townsend Thoresen Car Ferries Ltd
<i>Viking Venturer</i>	..	..	..	..	Townsend Thoresen Car Ferries Ltd

'Marid' Ships

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

NAME OF VESSEL	MASTER	OWNER/MANAGER
<i>Arco Thames</i>	T. H. Hills	A. R. C. (Marine) Ltd
<i>Barra Head</i>	L. Miles	Christian Salvesen (Shipping) Ltd
<i>Beacon Point</i>	A. Alves	Christian Salvesen (Shipping) Ltd
<i>Benvenue</i>	E. P. Gibb	Ben Line Steamers Ltd
<i>Brenda</i>		Dept. of Agriculture & Fisheries for Scotland
<i>Brian Borosime</i>		Sealink (U.K.) Ltd
<i>Cairnfreighter</i>	D. Milburn	Furness Withy (Shipping) Ltd
<i>Clansman</i>	- Munro	Caledonian MacBrayne Ltd
<i>Claymore</i>	M. Kennedy	Caledonian MacBrayne Ltd
<i>Columba</i>	J. P. Gray	Caledonian MacBrayne Ltd
<i>Cymbeline</i>	J. Lobban	Furness Withy (Shipping) Ltd
<i>Dolphin Point</i>	S. Church	Christian Salvesen (Shipping) Ltd
<i>Dragon</i>	P. C. Woods	Southern Ferries Ltd
<i>Earl William</i>	J. Macmillan	Sealink (U.K.) Ltd
<i>Emerald</i>	F. T. Newbold	Stephenson Clark Shipping Co. Ltd
<i>Esso Clyde</i>	R. Rendell	Esso Petroleum Co. Ltd.
<i>Esso Fawley</i>	D. A. Tate	Esso Petroleum Co. Ltd
<i>Esso Humber</i>	P. O'Conner	Esso Petroleum Co. Ltd
<i>Esso Mersey</i>	S. McCollin	Esso Petroleum Co. Ltd
<i>Esso Milford Haven</i>	P. O'Conner	Esso Petroleum Co. Ltd
<i>Esso Severn</i>	W. L. Sinclair	Esso Petroleum Co. Ltd
<i>Fort Point</i>	D. Irvine	Christian Salvesen (Shipping) Ltd
<i>Garrison Point</i>	D. Sutherland	Hudson S.S. Co. Ltd
<i>Hebrides</i>		Caledonian MacBrayne Ltd
<i>Hilary Weston</i>	R. Whittle	Weston Shipping Ltd
<i>Kindrence</i>	J. A. Stapleford	Crescent Shipping Co. Ltd
<i>Mairi Everard</i>	V. Bloomfield	F. T. Everard & Sons Ltd
<i>Martindyke</i>	- Pingle	Klondyke Shipping Co. Ltd
<i>Mole Venture</i>	T. Pollit	C.M.S. Shipping Co. Ltd
<i>Oswestry Grange</i>	E. Williams	Furness Withy (Shipping) Ltd
<i>Penelope Everard</i>	M. P. Parker	F. T. Everard & Sons Ltd
<i>Rhodri Mawr</i>	F. Wilkins	Sealink (U.K.) Ltd
<i>Rora Head</i>	A. Alves	Christian Salvesen (Shipping) Ltd
<i>St Clair</i>	D. C. Gray	P. & O. S.N. Co.
<i>St Columba</i>	L. R. Evans	Sealink (U.K.) Ltd
<i>Suffolk Service</i>		Offshore Marine Ltd
<i>Suilven</i>	A. C. Free	Caledonian MacBrayne Ltd
<i>Sumburgh Head</i>	H. G. Mackay	Christian Salvesen (Shipping) Ltd
<i>Vigilant</i>		Dept. of Agriculture & Fisheries for Scotland
<i>Wendy Weston</i>	C. Cadogan	Weston Shipping Ltd
<i>Whitegate</i>	B. J. Scott	Turnbull Scott Management Ltd
<i>Wilmington</i>	D. Carlton	Stephenson Clarke Shipping Ltd

Light-vessels

NAME OF VESSEL	MASTER
<i>Channel</i>	R. J. Owen, A. Fowler
<i>Dowsing</i>	A. S. Richards, F. J. Turner
<i>East Goodwin</i>	A. Everett, W. Sheaf
<i>Falls</i>	A. H. Robinson, A. C. Catchpole
<i>Humber</i>	F. W. Grice, S. F. Goose
<i>Newarp</i>	G. A. Harris, L. R. Long
<i>Royal Sovereign (Lt. Tower)</i>	W. G. Trebilcock, V. S. Pearce
<i>St. Gowan</i>	M. J. Shearer, J. J. Spencer
<i>Seven Stones</i>	R. W. Goddard, C. R. Lawrence
<i>Smith's Knoll</i>	F. Harrison, G. D. Wright
<i>South Rock</i>	S. Mageen, C. Dunigan
<i>Tongue</i>	F. Allen, B. W. Mead
<i>Varne</i>	F. Betts, J. Rudd

BRITISH COMMONWEALTH

The following list gives the names of Selected and Supplementary Ships and the number of Auxiliary Ships where known (i.e. those which only report in 'sparse areas'), which voluntarily co-operate with meteorological services of the British Commonwealth.

Information for these lists is required by 31 March each year. Information for the January corrective lists is required by 30 September each year.

AUSTRALIA (Information dated 22.3.82)

NAME OF VESSEL	OWNER/MANAGER
<i>Advara</i>	Jumbo Line
<i>Al-Khaliq</i>	Kuwait Shipping Co.
<i>Al-Kuwait</i>	Kuwait Shipping Co.
<i>Al-Yassrah</i>	Rural Exporters & Traders Pty Ltd
<i>Andros</i>	Hoi Loong Nav. Ltd
<i>Anro Australia</i>	Australian National Line
<i>Arafura</i>	Australia Japan Container Line
<i>Ariake</i>	Australia Japan Container Line
<i>Australia Star</i>	Blue Star Line
<i>Australian Emblem</i>	Australian National Line
<i>Australian Endeavour</i>	Australian National Line
<i>Australian Enterprise</i>	Australian National Line
<i>Australian Escort</i>	Australian National Line
<i>Australian Explorer</i>	Australian National Line
<i>Australian Exporter</i>	Australian National Line
<i>Australian Pioneer</i>	Australian National Line
<i>Australian Progress</i>	Australian National Line
<i>Australian Prospector</i>	Australian National Line
<i>Australian Purpose</i>	Australian National Line
<i>Australian Venture</i>	Australian National Line
<i>Baron MacLay</i>	Scottish Ship Management Ltd
<i>Baron Pentland</i>	Scottish Ship Management Ltd
<i>Bass Trader</i>	Australian National Line
<i>BP Endeavour</i>	BP Tanker Co. Ltd
<i>BP Enterprise</i>	BP Tankers (Aust.) Pty Ltd
<i>Brisbane Trader</i>	Australian National Line
<i>Cambridgeshire</i>	Bibby Line
<i>Cape Don</i>	Department of Transport (Australia)
<i>Cape Hawke</i>	Australian National Line
<i>Cape Moreton</i>	Department of Transport (Australia)
<i>Cape Pillar</i>	Department of Transport (Australia)
<i>Centaur</i>	Blue Funnel Line
<i>Clearwater Bay</i>	Weeke Ship (Hong Kong) Ltd
<i>Coral Chief</i>	China Navigation Co. Ltd
<i>Curtis Capricorn</i>	Port Curtis Bulk Carriers Pty Ltd
<i>Curtis Oceanic</i>	Port Curtis Bulk Carriers Pty Ltd
<i>Danny 'F'</i>	Rachid Fares Enterprises Pty Ltd
<i>Darwin Trader</i>	Australian National Line
<i>Doha</i>	Patridis Agencies Pty Ltd
<i>Eastern Academy</i>	Burns Phillip Co.
<i>Eigamoiya</i>	Nauru Local Govt Council
<i>Ellsberg</i>	Weeke Ship (Hong Kong) Ltd
<i>Empress of Australia</i>	Australian National Line
<i>Eugene McDermott</i>	World Wide Surveys Ltd
<i>Fernanda 'F'</i>	Rachid Fares Enterprises Pty Ltd
<i>Flinders Range</i>	Australian National Line
<i>Fua Kavenga</i>	Pacific Forum Line
<i>Gerringong</i>	State Shipping Service
<i>Howard Smith</i>	Howard Smith Ltd
<i>Iron Arnhem</i>	BHP Co. Ltd
<i>Iron Baron</i>	BHP Co. Ltd
<i>Iron Bogong</i>	BHP Co. Ltd
<i>Iron Endeavour</i>	BHP Co. Ltd
<i>Iron Hunter</i>	BHP Co. Ltd
<i>Iron York</i>	BHP Co. Ltd
<i>John Burke</i>	John Burke Pty Ltd
<i>Koolinda</i>	State Shipping Service
<i>Kimberley</i>	State Shipping Service
<i>Khaliq Express</i>	Gulf Ship Lines
<i>Lalandia</i>	East Asiatic Co. Ltd
<i>Lake Hume</i>	Australian National Line
<i>Lake Barrine</i>	Australian National Line
<i>Mukairish Althani</i>	Kuwait Shipping Co.

Australia (contd)

NAME OF VESSEL	OWNER/MANAGER
<i>Melbourne Trader</i>	Australian National Line
<i>Nimos</i>	China Navigation Co. Ltd
<i>Nuigini Express</i>	J.M.K. Blumenthal
<i>Ormiston</i>	C.S.R. Ltd
<i>Ocean Prospector</i>	Ocean Nihon Drilling S.A.
<i>Papuan Chief</i>	China Navigation Co. Ltd
<i>Persia</i>	Rachid Fares Enterprises Pty Ltd
<i>Pilbara</i>	State Shipping Service
<i>Ravenswood</i>	Furness Withy Ltd
<i>Regional Endeavour</i>	Seltrust Mining Corp. Pty Ltd
<i>Sea Princess</i>	P. & O. (Australia) Ltd
<i>Selwyn Range</i>	Australian National Line
<i>Sid McGrath</i>	John Burke Shipping Pty Ltd
<i>Soela</i>	C.S.I.R.O.
<i>Sprightly</i>	T. Korevaar & Sons Pty Ltd
<i>Sydney Trader</i>	Australian National Line
<i>Tanjong Pasir</i>	Tanjong Shipping Line
<i>Tombarra</i>	Wilh. Wilhelmsen
<i>Tourcoing</i>	Scan Austral Asiatic Shipping Line
<i>Tropic Dawn</i>	Australia Mauritius Line
<i>Tropic Star</i>	Tropic Island Shipping Co.
<i>Wild Rover</i>	Singapore Strait Pilotage Co.
<i>Yarra River</i>	Australian National Line

CANADA (Information dated 1.1.82)

NAME OF VESSEL	OWNER/MANAGER
<i>A. T. Cameron</i>	Government of Canada
<i>Alert</i>	Government of Canada
<i>Allunga</i>	Australian National Line
<i>Baffin</i>	Government of Canada
<i>Bayfield</i>	Government of Canada
<i>Bibi</i>	Sir William Reardon Smith & Sons
<i>Bluenose</i>	Canadian National (Marine)
<i>Borgens</i>	Jebsens (U.K.) Ltd
<i>Bow Drill 1</i>	Bow Valley Offshore Drilling Ltd
<i>Camsell</i>	Government of Canada
<i>Canadian Ace</i>	Montreal Shipping Ltd
<i>Canadian Highlander</i>	Upper Lakes Shipping Co.
<i>Cape Breton Miner</i>	Upper Lakes Shipping Co.
<i>Cape Grenville</i>	Scottish Ship Management Ltd
<i>Cape Roger</i>	Government of Canada
<i>Cardiff City</i>	Sir William Reardon Smith & Sons
<i>Chebucto</i>	Government of Canada
<i>Cygnus</i>	Government of Canada
<i>Dawson</i>	Government of Canada
<i>Devon City</i>	Sir William Reardon Smith & Sons
<i>D'Iberville</i>	Government of Canada
<i>Dilkara</i>	ACTA Pty Ltd
<i>Eastern Alliance</i>	Whellock Marine Services Ltd
<i>Eastern Maid</i>	Indo China S.N. Co. Ltd
<i>Eastern Moon</i>	Indo China S.N. Co. Ltd
<i>Fort Calgary</i>	Canadian Pacific Steamships Ltd
<i>Fort Kamloops</i>	Canadian Pacific Steamships Ltd
<i>Fort Nanaimo</i>	Canadian Pacific Steamships Ltd
<i>Fort Nelson</i>	Canadian Pacific Steamships Ltd
<i>Fort Yale</i>	Canadian Pacific Steamships Ltd
<i>Furunes</i>	Jebsens (U.K.) Ltd
<i>G. B. Reed</i>	Government of Canada
<i>Grenfell</i>	Government of Canada
<i>Gulf Canada</i>	Gulf Canada Ltd
<i>Gulf MacKenzie</i>	Gulf Canada Ltd
<i>Gypsum Empress</i>	Fundy Gypsum Co.
<i>Hudson</i>	Government of Canada
<i>Irving Canada</i>	Kent Lines Ltd

Canada (contd)

NAME OF VESSEL	OWNER/MANAGER
<i>Irving Eskimo</i>	Kent Lines Ltd
<i>Irving Ocean</i>	Kent Lines Ltd
<i>Island Princess</i>	Princess Cruises
<i>Ixia</i>	Stag Lines Ltd
<i>J. E. Bernier</i>	Government of Canada
<i>Jackman</i>	Government of Canada
<i>John A. MacDonald</i>	Government of Canada
<i>John Cabot</i>	Government of Canada
<i>Kewatin</i>	Northern Transportation Co.
<i>Kemano</i>	Jardine Shipping Ltd
<i>Labrador</i>	Government of Canada
<i>La Primavera</i>	Buries Marques Ltd
<i>Limnos</i>	Government of Canada
<i>Louisburg</i>	Government of Canada
<i>Louis S. St. Laurent</i>	Government of Canada
<i>Malahat</i>	Indo China S.N. Co. Ltd
<i>Marine Evangeline</i>	Canadian National (Marine)
<i>Maxwell</i>	Government of Canada
<i>Montcalm</i>	Government of Canada
<i>Nahidik</i>	Government of Canada
<i>Namao</i>	Government of Canada
<i>Nordkap</i>	Norden Steamship Company Ltd
<i>Nordpol</i>	Norden Steamship Company Ltd
<i>Norman McLeod Rogers</i>	Government of Canada
<i>Northern Shell</i>	Shell Oil (Canada) Ltd
<i>Oriana</i>	P. & O. Lines Ltd
<i>Pacific Princess</i>	P. & O. Lines Ltd
<i>Pandora II</i>	Government of Canada
<i>Parizeau</i>	Government of Canada
<i>Pierre Radisson</i>	Government of Canada
<i>Port Vancouver</i>	Canadian Pacific Steamships Ltd
<i>Princess of Acadia</i>	Canadian National (Marine)
<i>Queen of Prince Rupert</i>	British Columbia Ferries
<i>Queen of the North</i>	British Columbia Ferries
<i>Rimba Maranti</i>	Malaysian International Shipping Corp.
<i>Rowan Juneau</i>	Mobil Oil (Canada) Ltd
<i>Sealnes</i>	Jebsens (U.K.) Ltd
<i>Sedco 706</i>	MacLaren Marex Ltd
<i>Shanta Rohan</i>	Hede Navigation Ltd
<i>Simon Fraser</i>	Government of Canada
<i>Sir Humphrey Gilbert</i>	Government of Canada
<i>Sir John Franklin</i>	Government of Canada
<i>Sir William Alexander</i>	Government of Canada
<i>St. Lawrence Navigator</i>	Leitch Transportation Ltd
<i>Star Boxford</i>	Star Shipping Ltd
<i>Sun Princess</i>	P. & O. Lines Ltd
<i>T. Akasaka</i>	Canadian Pacific Steamships Ltd
<i>Thomas Carleton</i>	Government of Canada
<i>Thor I</i>	Thor Dahl Lines
<i>Thorscape</i>	Thor Dahl Lines
<i>Thorswave</i>	Thor Dahl Lines
<i>Tupper</i>	Government of Canada
<i>Walter E. Roster</i>	Government of Canada
<i>W. C. van Horne</i>	Canadian Pacific Steamships Ltd
<i>Zapata Uglan</i>	MacLaren Marex Ltd

Auxiliary Ships:

Canada has 86 ocean-going Auxiliary Ships and 102 Auxiliary Ships operating on the Great Lakes and Inland Waters.

HONG KONG (Information dated 3.2.82)

NAME OF VESSEL	OWNER/MANAGER
<i>Aconcagua</i>	Everett Steamship Corp. S/A
<i>Asian Jade</i>	Swire Shipping (Agencies) Ltd
<i>Asian Pearl</i>	Swire Shipping (Agencies) Ltd
<i>Barber Memnon</i>	Barber Wilhelmsen Agencies Ltd
<i>Barber Menelaus</i>	Barber Wilhelmsen Agencies Ltd
<i>Barber Perseus</i>	Barber Wilhelmsen Agencies Ltd
<i>Barber Tonsberg</i>	Barber Wilhelmsen Agencies Ltd
<i>Chengtui</i>	Swire Shipping (Agencies) Ltd
<i>Cheongwind</i>	Shun Cheong S.N. Co. Ltd
<i>Coral Princess</i>	Swire Shipping (Agencies) Ltd
<i>Eastern Muse</i>	The Indo-China S.N. Co. (H.K.) Ltd
<i>Funing</i>	Swire Shipping (Agencies) Ltd
<i>Halldis</i>	Thoresen & Co. Ltd
<i>Hongkong Container</i>	Hongkong Export Lines Ltd
<i>Hugheverett</i>	Everett Steamship Corp. S/A
<i>Ibn Malik</i>	United Arab Shipping Co.
<i>Kwangsi</i>	Swire Shipping (Agencies) Ltd
<i>Kweichow</i>	Swire Shipping (Agencies) Ltd
<i>Lamma Island</i>	Hong Kong Islands Shipping Co. Ltd
<i>Maersk Tempo</i>	Maersk Line (H.K.) Ltd
<i>Malmros Monsoon</i>	Denholm Ship Management (Overseas) Ltd
<i>Manoloverett</i>	Everett Steamship Corp. S/A
<i>Mui Kim</i>	Hong Kong Borneo Shipping Co. Ltd
<i>Oriental Ambassador</i>	Hongkong Export Lines Ltd
<i>Oriental Chief</i>	Hongkong Export Lines Ltd
<i>Oriental Expert</i>	Hongkong Export Lines Ltd
<i>Pabloeverett</i>	Everett Steamship Corp. S/A
<i>Ramoneverett</i>	Everett Steamship Corp. S/A
<i>Rhein Express</i>	Jebsen & Co. Ltd
<i>Singwind</i>	Shun Cheong S.N. Co. Ltd
<i>Strathfife</i>	Swire Shipping (Agencies) Ltd
<i>Strathfyne</i>	Swire Shipping (Agencies) Ltd
<i>Tai Shun</i>	Agriculture & Fisheries Dept., H.K. Govt.
<i>Taronga</i>	Barber Ship Management Ltd
<i>Thai Pailin</i>	Hongkong Export Lines Ltd
<i>Thomaseverett</i>	Everett Steamship Corp. S/A
<i>Torrens</i>	Barber Ship Management Ltd
<i>Victoria I</i>	Magallanes Investment Inc.
<i>Willine Taro</i>	Barber Ship Management Ltd
<i>Willine Toyo</i>	Barber Ship Management Ltd

INDIA (Information dated 1.1.82)

NAME OF VESSEL	OWNER
Selected Ships:	
<i>Akbar</i>	Mogul Line Ltd
<i>Andamans</i>	Shipping Corporation of India
<i>Chidambaram</i>	Shipping Corporation of India
<i>Dwarka</i>	British India Steam Navigation Co.
<i>Gaveshani</i>	National Institute of Oceanography, Goa
<i>Harshavardhan</i>	Shipping Corporation of India
<i>Indian Security</i>	India Steamship Co.
<i>Jalazad</i>	Scindia Steam Navigation Co.
<i>Jaladharna</i>	Scindia Steam Navigation Co.
<i>Jaladhruv</i>	Scindia Steam Navigation Co.
<i>Jalagirija</i>	Scindia Steam Navigation Co.
<i>Jalayoti</i>	Scindia Steam Navigation Co.
<i>Jalakanta</i>	Scindia Steam Navigation Co.
<i>Jalakirti</i>	Scindia Steam Navigation Co.

India (contd)

NAME OF VESSEL	OWNER
<i>Jalakrishna</i>	Scindia Steam Navigation Co.
<i>Jalamangala</i>	Scindia Steam Navigation Co.
<i>Jalamoti</i>	Scindia Steam Navigation Co.
<i>Jalarajan</i>	Scindia Steam Navigation Co.
<i>Jalayamini</i>	Scindia Steam Navigation Co.
<i>Lok Sevak</i>	Mogul Line Ltd
<i>Nancowry</i>	Shipping Corporation of India
<i>Ratna Nandini</i>	Ratnakar Shipping Co.
<i>Shompen</i>	Shipping Corporation of India
<i>State of Assam</i>	Shipping Corporation of India
<i>State of Andhra Pradesh</i>	Shipping Corporation of India
<i>State of Maharashtra</i>	Shipping Corporation of India
<i>State of Nagaland</i>	Shipping Corporation of India
<i>State of Punjab</i>	Shipping Corporation of India
<i>State of Tamil Nadu</i>	Shipping Corporation of India
<i>State of Tr. Cochin</i>	Shipping Corporation of India
<i>State of Uttar Pradesh</i>	Shipping Corporation of India
<i>Vishva Anurag</i>	Shipping Corporation of India
<i>Vishva Maya</i>	Shipping Corporation of India
<i>Vishva Prabha</i>	Shipping Corporation of India
<i>Vishnu Sagar</i>	Parekh Ocean Carriers
<i>Vishva Sudha</i>	Shipping Corporation of India
Supplementary Ships:	
<i>Ayanta</i>	Shipping Corporation of India
<i>Al Gilani</i>	Allanna Line Ltd
<i>Annapoorna</i>	Shipping Corporation of India
<i>Anupama</i>	Shipping Corporation of India
<i>Apj Ambika</i>	Apeejay Lines Ltd
<i>Apj Anand</i>	Apeejay Lines Ltd
<i>Apj Priya</i>	Apeejay Lines Ltd
<i>Arunachala Pradesh</i>	Shipping Corporation of India
<i>Aradhana</i>	Shipping Corporation of India
<i>Archana</i>	Shipping Corporation of India
<i>Bailadila</i>	Shipping Corporation of India
<i>Bellary</i>	Shipping Corporation of India
<i>Barauni</i>	Shipping Corporation of India
<i>Bhagat Singh</i>	Shipping Corporation of India
<i>Bhaskar</i>	Shipping Corporation of India
<i>Bharatendu</i>	Shipping Corporation of India
<i>Bhavabhuti</i>	Shipping Corporation of India
<i>B.R. Ambedkar</i>	Shipping Corporation of India
<i>Chanakya</i>	Shipping Corporation of India
<i>Chatrapati Shivaji</i>	Shipping Corporation of India
<i>Chennai Jayam</i>	South India Shipping Corporation
<i>Chennai Muyarshi</i>	South India Shipping Corporation
<i>Chennai Perumai</i>	South India Shipping Corporation
<i>Chennai Ookkam</i>	South India Shipping Corporation
<i>Chennai Selvam</i>	South India Shipping Corporation
<i>Desh Bandhu</i>	Shipping Corporation of India
<i>Desh Deep</i>	Shipping Corporation of India
<i>Digilpur</i>	Shipping Corporation of India
<i>Devaraya</i>	Shipping Corporation of India
<i>Faulad Sardar</i>	Faulad Line Ltd
<i>Indian Endurance</i>	India Steamship Co.
<i>Indian Explorer</i>	India Steamship Co.
<i>Indian Faith</i>	India Steamship Co.
<i>Indian Fame</i>	India Steamship Co.
<i>Indian Fraternity</i>	India Steamship Co.
<i>Indian Freedom</i>	India Steamship Co.
<i>Indian Grace</i>	India Steamship Co.
<i>Indian Progress</i>	India Steamship Co.
<i>Indian Prosperity</i>	India Steamship Co.
<i>Indian Triumph</i>	India Steamship Co.
<i>Indian Tribune</i>	India Steamship Co.
<i>Indian Trust</i>	India Steamship Co.
<i>Indian Valour</i>	India Steamship Co.
<i>Indian Venture</i>	India Steamship Co.
<i>Jag Anjali</i>	Great Eastern Shipping Co.
<i>Jag Dev</i>	Great Eastern Shipping Co.
<i>Jag Dharma</i>	Great Eastern Shipping Co.
<i>Jag Doot</i>	Great Eastern Shipping Co.
<i>Jag Jitwan</i>	Great Eastern Shipping Co.
<i>Jag Jyoti</i>	Great Eastern Shipping Co.

India (contd)

NAME OF VESSEL	OWNER
<i>Jag Manek</i>	Great Eastern Shipping Co.
<i>Jag Prakash</i>	Great Eastern Shipping Co.
<i>Jag Rekha</i>	Great Eastern Shipping Co.
<i>Jag Shakti</i>	Great Eastern Shipping Co.
<i>Jag Shanti</i>	Great Eastern Shipping Co.
<i>Jagat Kirti</i>	Dempo Steamship Co.
<i>Jagat Neta</i>	Dempo Steamship Co.
<i>Jagat Swamini</i>	Dempo Steamship Co.
<i>Jagat Samrat</i>	Dempo Steamship Co.
<i>Jagat Vijeta</i>	Dempo Steamship Co.
<i>Jaynarayan Vyas</i>	Shipping Corporation of India
<i>Jameela</i>	Kerala Lines Ltd
<i>Jalabala</i>	Scindia Steam Navigation Co.
<i>Jaladharati</i>	Scindia Steam Navigation Co.
<i>Jaladurga</i>	Scindia Steam Navigation Co.
<i>Jaladuta</i>	Scindia Steam Navigation Co.
<i>Jala Godavari</i>	Scindia Steam Navigation Co.
<i>Jalagomati</i>	Scindia Steam Navigation Co.
<i>Jala Govind</i>	Scindia Steam Navigation Co.
<i>Jalavijaya</i>	Scindia Steam Navigation Co.
<i>Jalakala</i>	Scindia Steam Navigation Co.
<i>Jalakendra</i>	Scindia Steam Navigation Co.
<i>Jalamani</i>	Scindia Steam Navigation Co.
<i>Jalamurugan</i>	Scindia Steam Navigation Co.
<i>Jalamatsya</i>	Scindia Steam Navigation Co.
<i>Jaamayur</i>	Scindia Steam Navigation Co.
<i>Jalamohan</i>	Scindia Steam Navigation Co.
<i>Jalamokambi</i>	Scindia Steam Navigation Co.
<i>Jalamoran</i>	Scindia Steam Navigation Co.
<i>Jalamudra</i>	Scindia Steam Navigation Co.
<i>Jalapankhi</i>	Scindia Steam Navigation Co.
<i>Jalarashmi</i>	Scindia Steam Navigation Co.
<i>Jalaratna</i>	Scindia Steam Navigation Co.
<i>Jalatarang</i>	Scindia Steam Navigation Co.
<i>Jalatapi</i>	Scindia Steam Navigation Co.
<i>Jalavijaya</i>	Scindia Steam Navigation Co.
<i>Jalayamuna</i>	Scindia Steam Navigation Co.
<i>Jalavallabh</i>	Scindia Steam Navigation Co.
<i>Janapriya</i>	Mogul Line Ltd
<i>Jana Vijaya</i>	Mogul Line Ltd
<i>Jawaharlal Nehru</i>	Shipping Corporation of India
<i>Jay Ambika</i>	Jayashree Shipping Co.
<i>Kanchan Junga</i>	Shipping Corporation of India
<i>Kamishka</i>	Shipping Corporation of India
<i>Karnataka</i>	Karnataka Shipping Co.
<i>Kedarnath</i>	Himalaya Shipping Co.
<i>Lal Bahadur Shastri</i>	Shipping Corporation of India
<i>Laxmi</i>	Shipping Corporation of India
<i>Lokamanya Tilak</i>	Shipping Corporation of India
<i>Lok Nayak</i>	Mogul Line Ltd
<i>Lok Manya</i>	Mogul Line Ltd
<i>Lok Palak</i>	Mogul Line Ltd
<i>Lok Sahayyak</i>	Mogul Line Ltd
<i>Lok Vaibhav</i>	Mogul Line Ltd
<i>Lok Vihar</i>	Mogul Line Ltd
<i>Lok Vinay</i>	Mogul Line Ltd
<i>Lok Vivek</i>	Mogul Line Ltd
<i>Mahabhakti</i>	South East Asia Shipping Co.
<i>Mahabir</i>	South East Asia Shipping Co.
<i>Maharashmi</i>	South East Asia Shipping Co.
<i>Mahavijay</i>	South East Asia Shipping Co.
<i>Maratha Elegance</i>	Chowgule Shipping Co.
<i>Maratha Melody</i>	Chowgule Shipping Co.
<i>Maratha Progress</i>	Chowgule Shipping Co.
<i>Marjan</i>	Indo Oceanic Shipping Co.
<i>Meghdoot</i>	Varuna Shipping Co.
<i>Meghrab</i>	Indo Oceanic Shipping Co.
<i>Mot Dredge</i>	Shipping Corporation of India
<i>Mizoram</i>	Shipping Corporation of India
<i>Nandkala</i>	Essar Constructions and Carriers
<i>Netaji Subhash Bose</i>	Shipping Corporation of India
<i>Nitya Amar</i>	Mainini Shipping Co.
<i>Onge</i>	Shipping Corporation of India
<i>Prabhu Gopal</i>	Tolani Shipping Co.

India (contd)

NAME OF VESSEL	OWNER
<i>Pranhu Satram</i>	Tolani Shipping Co.
<i>Rafi Ahmed Kidwai</i>	Shipping Corporation of India
<i>Ramdas</i>	Shipping Corporation of India
<i>Ratna Kirti</i>	Ratnakar Shipping Co.
<i>Ratna Shobhana</i>	Ratnakar Shipping Co.
<i>Ratna Vandana</i>	Ratnakar Shipping Co.
<i>Rishi Vishva Mitra</i>	Garware Shipping Corporation
<i>Sagar Deep</i>	Shipping Corporation of India
<i>Sagar Samarat</i>	Oil and Natural Gas Corporation
<i>Samudra Gupta</i>	Shipping Corporation of India
<i>Samudra Jyoti</i>	Pent Ocean Carriers
<i>Sanchi</i>	Shipping Corporation of India
<i>Sarojini Naidu</i>	Shipping Corporation of India
<i>Sai Nanak</i>	TPS Shipping Co.
<i>Satya Kamal</i>	Seven Seas Shipping Trans.
<i>Satya Murthi</i>	Shipping Corporation of India
<i>Satya Padam</i>	Seven Seas Shipping Trans.
<i>Satya Sohan</i>	Seven Seas Shipping Trans.
<i>Sahajahan</i>	Shipping Corporation of India
<i>State of Himachala Pradesh</i>	Shipping Corporation of India
<i>State of Kerala</i>	Shipping Corporation of India
<i>State of Meghalaya</i>	Shipping Corporation of India
<i>State of Manipur</i>	Shipping Corporation of India
<i>State of Madhya Pradesh</i>	Shipping Corporation of India
<i>State of Mysore</i>	Shipping Corporation of India
<i>State of Rajasthan</i>	Shipping Corporation of India
<i>State of West Bengal</i>	Shipping Corporation of India
<i>Teesta</i>	Shipping Corporation of India
<i>Tulsidas</i>	Shipping Corporation of India
<i>Unibaksha</i>	Universal Shipping Co.
<i>Vallabhabhai Patel</i>	Shipping Corporation of India
<i>Varun Yan</i>	Thakur Shipping Co.
<i>Varuna Adhar</i>	Thakur Shipping Co.
<i>Vishva Abha</i>	Shipping Corporation of India
<i>Vishva Aditya</i>	Shipping Corporation of India
<i>Vishva Ambhar</i>	Shipping Corporation of India
<i>Vishva Amitabh</i>	Shipping Corporation of India
<i>Vishva Apurva</i>	Shipping Corporation of India
<i>Vishva Ajay</i>	Shipping Corporation of India
<i>Vishva Asha</i>	Shipping Corporation of India
<i>Vishva Bandhan</i>	Shipping Corporation of India
<i>Vishva Bhakti</i>	Shipping Corporation of India
<i>Vishva Bindu</i>	Shipping Corporation of India
<i>Vishva Chetana</i>	Shipping Corporation of India
<i>Vishva Dharma</i>	Shipping Corporation of India
<i>Vishva Jyoti</i>	Shipping Corporation of India
<i>Vishva Kaumudi</i>	Shipping Corporation of India
<i>Vishva Karuna</i>	Shipping Corporation of India
<i>Vishva Kaushal</i>	Shipping Corporation of India
<i>Vishva Kirti</i>	Shipping Corporation of India
<i>Vishva Kalyan</i>	Shipping Corporation of India
<i>Vishva Madhuri</i>	Shipping Corporation of India
<i>Vijaya Jyoti</i>	West Asia Shipping Co.
<i>Vishva Mahima</i>	Shipping Corporation of India
<i>Vishva Mamta</i>	Shipping Corporation of India
<i>Vishva Mangal</i>	Shipping Corporation of India
<i>Vishva Mahima</i>	Shipping Corporation of India
<i>Vishva Nayak</i>	Shipping Corporation of India
<i>Vishva Nandini</i>	Shipping Corporation of India
<i>Vishva Nidhi</i>	Shipping Corporation of India
<i>Vishva Pallav</i>	Shipping Corporation of India
<i>Vishva Parag</i>	Shipping Corporation of India
<i>Vishva Parajit</i>	Shipping Corporation of India
<i>Vishva Parimal</i>	Shipping Corporation of India
<i>Vishva Pankaj</i>	Shipping Corporation of India
<i>Vishva Pratibha</i>	Shipping Corporation of India
<i>Vishva Prayas</i>	Shipping Corporation of India
<i>Vishva Prem</i>	Shipping Corporation of India
<i>Vishva Raksha</i>	Shipping Corporation of India
<i>Vishva Sandesh</i>	Shipping Corporation of India
<i>Vishva Seva</i>	Shipping Corporation of India
<i>Vishva Shakti</i>	Shipping Corporation of India
<i>Vishva Shobha</i>	Shipping Corporation of India
<i>Vishva Sidhi</i>	Shipping Corporation of India

India (contd)

NAME OF VESSEL	OWNER
<i>Vishva Tarang</i>	Shipping Corporation of India
<i>Vishva Tej</i>	Shipping Corporation of India
<i>Vishva Tirth</i>	Shipping Corporation of India
<i>Vishva Umang</i>	Shipping Corporation of India
<i>Vishva Vibhuti</i>	Shipping Corporation of India
<i>Vishva Vijay</i>	Shipping Corporation of India
<i>Vishva Vikas</i>	Shipping Corporation of India
<i>Vishva Vivek</i>	Shipping Corporation of India
<i>Vishva Yash</i>	Shipping Corporation of India
<i>Vivekananda</i>	Shipping Corporation of India
<i>Vishveshwarayya</i>	Shipping Corporation of India
<i>Yerewa</i>	Shipping Corporation of India
<i>Zakir Hussain</i>	Shipping Corporation of India

Auxiliary Ships:
India has 32 Auxiliary Ships.

NEW ZEALAND (Information dated 1.2.82)

NAME OF VESSEL	OWNER/MANAGER
Selected Ships:	
<i>Act 3</i>	Blue Port Act (N.Z.) Ltd
<i>Act 4</i>	Blue Port Act (N.Z.) Ltd
<i>Act 5</i>	Blue Port Act (N.Z.) Ltd
<i>Adi Viti</i>	Reef Shipping Agencies
<i>Amokura</i>	Union Steamship Co. (N.Z.) Ltd
<i>Aotea</i>	Container Fleets (N.Z.) Ltd
<i>Bounty III</i>	Pacific Lines
<i>Bulknes</i>	Shipping Corporation of N.Z.
<i>Capitaine Cook</i>	Pacific Lines
<i>Coastal Trader</i>	Shipping Corporation of N.Z.
<i>Dunedin</i>	Maritime Carriers Ltd
<i>Dunedin</i>	Bank and Savill Line
<i>Eagle Arrow</i>	Gearbulk Ltd
<i>Erne</i>	Union Steamship Co. (N.Z.) Ltd
<i>Fetu Moana</i>	Shipping Corporation of N.Z.
<i>Forum New Zealand</i>	Pacific Forum Line
<i>Forum Samoa</i>	Pacific Forum Line
<i>Golden Bay</i>	Tarakohe Shipping Co.
<i>Holmdale</i>	Union Steamship Co. (N.Z.) Ltd
<i>James Cook</i>	N.Z. Govt (Fisheries Research)
<i>Kolle D.</i>	Nauru Pacific Line
<i>Kotoku</i>	Union Steamship Co. (N.Z.) Ltd
<i>Kuaka</i>	Union Steamship Co. (N.Z.) Ltd
<i>Lake Eyre</i>	Australian National Line
<i>Marama</i>	Union Steamship Co. (N.Z.) Ltd
<i>N.Z. Caribbean</i>	Shipping Corporation of N.Z.
<i>N.Z. Pacific</i>	Shipping Corporation of N.Z.
<i>New Zealand Star</i>	Blue Port Act (N.Z.) Ltd
<i>Ngahere</i>	Union Steamship Co. (N.Z.) Ltd
<i>Ngakuta</i>	Union Steamship Co. (N.Z.) Ltd
<i>Ngapara</i>	Union Steamship Co. (N.Z.) Ltd
<i>Nuivakai</i>	Dolphin Shipping Co. Ltd
<i>Onehanga</i>	Reef Shipping Agencies
<i>Stena Constructor</i>	Stena Line
<i>Tangoroa</i>	N.Z. Govt (Oceanographic Research)
<i>Tasman Enterprise</i>	Tasman Pulp & Paper Co. Ltd
<i>Tasman Venture</i>	Development Finance Co.
<i>Tiare Moana</i>	Shipping Corporation of N.Z.
<i>Totara</i>	Maritime Carriers Ltd
<i>Tui Cakau II</i>	Pacific Lines
<i>Union Auckland</i>	Union Steamship Co. (N.Z.) Ltd
<i>Union Hobart</i>	Union Steamship Co. (N.Z.) Ltd
<i>Union Lyttelton</i>	Union Steamship Co. (N.Z.) Ltd
<i>Union Rotoiti</i>	Union Steamship Co. (N.Z.) Ltd
<i>Union Rotorua</i>	Union Steamship Co. (N.Z.) Ltd
<i>Waitaki</i>	Maritime Carriers Ltd
<i>Westport</i>	N.Z. Cement Holdings Ltd
Supplementary Ships:	
<i>Arahanga</i>	New Zealand Railways
<i>Aramoana</i>	New Zealand Railways
<i>Aranui</i>	New Zealand Railways
<i>Aratika</i>	New Zealand Railways

Auxiliary Ships:

New Zealand also has a fleet of 15 Auxiliary Ships currently reporting.

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