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*Letters to the Editor, and books for review, should be sent to the Editor 'The Marine Observer',
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EXCELLENT AWARDS 1978

Continuing the practice started in 1924 of making awards to Masters, Principal Observing Officers and Radio Officers who have sent in the 100 most outstanding meteorological logbooks for the year, we once again publish the names and shipping companies of the Masters and Officers involved. To these gentlemen, and some ladies, we again offer our congratulations and gratitude for the excellent voluntary services they have undertaken on behalf of the Meteorological Office. It must, however, be emphasized again that a further large number of meteorological logbooks reached the required excellent assessment but we were not able to include them in the list owing to the limited number of award books available. To these latter Masters and Officers we extend our commiserations.

Assessing the books is a fairly complex procedure and we try to consider all the circumstances involved for each ship including number of observing officers, type of vessel and trading area. Allowances must be made for coasting vessels, ships without a radio officer, ships trading across the North Atlantic in winter and many other factors. As in previous years we have so many radio officers who have reached the required standard that their awards have been based largely on the period covered by the logbook. The full list of award winners appears on pages 103 to 108.

By virtue of the exceptional quality of their records, the six ships heading the 1978 awards are as follows:

1. m.v. *Viking Venturer* (Townsend Thoresen Ferries), Captain R. H. Plant.
2. m.v. *Anchises* (Ocean Transport & Trading Limited), Captain A. J. Palmer.
3. m.v. *King George* (Cayzer Irvine Shipping Limited), Captain T. D. Young.
4. m.v. *Mayfield* (Shaw Savill & Albion Company Limited), Captain T. R. Barton.
5. m.v. *Mairangi Bay* (Container Fleets Limited), Captain L. E. Howell.
6. m.v. *Clan Macgillivray* (Cayzer Irvine Shipping Limited), Captain R. A. G. Simmons.

These six ships deserve our special congratulations, in particular m.v. *Mayfield* appearing in our short list for the third time in the past four years. Also Captain A. J. Palmer who has commanded one of the top six ships in 1975, 1977 and 1978. The customary photographs of the first three ships appear opposite page 116.

Also deserving special mention are the Skippers and Radio Officers from eight deep-water trawlers whose names are included in our list. Awards to the only trawler skipper and radio officer who have made non-instrumental observations, together with awards to four MARID ships—vessels engaged in short sea trades taking sea temperatures only—appear in the main list. Their contributions are of considerable value in preparing forecasts for shipping and coastal areas.

The recipients of the awards will be notified by post and requested to provide an address to which the award may be sent. Any Master or Officer seeing his name in this list, or in any other list published by his Company before hearing directly from us, is requested to write and claim his award, giving us a forwarding address.

The initial award is normally *The University Atlas* followed as a second award by *Cassell's English Dictionary*. The book selected this year as the third award is *The History of Ships* by Peter Kemp. The Atlas still appears to be very popular with the Dictionary a close second. When an officer's name comes up for the third time, he receives the book of the year which has been selected by the Marine Division of the Meteorological Office. If any first or second award officer does not require either the Atlas or Dictionary, we would endeavour to send him the selected book as an alternative.

J.D.B.

EXCELLENT AWARDS (Year ended 31 December 1978)

CAPTAIN	COMPANY	CAPTAIN	COMPANY
T. Aitchison	Cayzer Irvine Shipping Co. Ltd.	S. D. Gibson	Furness Withy (General Shipping) Ltd.
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B. Austen-Smith	P. & O. S.N. Co.	G. M. Gough	B.P. Tanker Co. Ltd.
A. Ball	T. Hamling & Co. Ltd.	S. M. Grant	Cayzer Irvine Shipping Co. Ltd.
J. Banna	Ocean Transport & Trading Ltd.	M. Grigor	British Rail
G. C. Barrett	Container Fleets Ltd.	J. W. Guy	B.P. Tanker Co. Ltd.
T. R. Barton	Furness Withy (General Shipping) Ltd.	M. A. Harding	Natural Environment Research Council
I. Y. Batley	P. & O. S.N. Co.	M. C. Harper	Jamaica Producer Marketing Co. Ltd.
R. Bell	Ellerman Lines Ltd.	D. V. Harradine	P. & O. S.N. Co.
R. K. Bilton	Lampport & Holt Line Ltd.	W. E. Harris	Northern Trawlers Ltd.
J. Bold	Ocean Transport & Trading Ltd.	J. F. Hobbs	B.P. Tanker Co. Ltd.
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A. C. P. Brading	British Rail	S. T. S. Household	P. & O. S.N. Co.
K. Bramley	Shell Tankers (U.K.) Ltd.	L. E. Howell	Container Fleets Ltd.
W. Brettell	Newington Trawlers Ltd.	H. E. Hoyle	Furness Withy (General Shipping) Ltd.
D. G. Brown	Ocean Transport & Trading Ltd.	W. G. Hunt	F. T. Everard & Sons Ltd.
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T. K. Dawson	F. T. Everard & Sons Ltd.	D. T. MacLachlan	Ocean Transport & Trading Ltd.
S. W. Dean	Shell Tankers (U.K.) Ltd.	D. A. McCaffrey	Ocean Transport & Trading Ltd.
J. M. Dick	Ocean Transport & Trading Ltd.	D. M. McPhail	Blue Star Line Ltd.
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Excellent Awards (contd.)

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N. C. Bowman ..	Furness Withy (General Shipping) Ltd.	P. E. Martin ..	P. & O. S.N. Co.
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Ismail Bin Wan Chik	..	Ocean Transport & Trading Ltd.	M. J. Pinder	..	Salen (U.K.) Ship Management Ltd.
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L. I. Dawson	..	Ellerman Lines Ltd.	P. G. Powell	..	F. T. Everard & Sons Ltd.
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A. Fischbacher	..	Jamaica Producer Marketing Co. Ltd.	I. J. Sarjeant	..	F. T. Everard & Sons Ltd.
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D. Freeman	..	Shell Tankers (U.K.) Ltd.	D. J. Smyth	..	James Fisher & Sons Ltd.
D. W. Gilzean	..	Furness Withy (General Shipping) Ltd.	C. Spink	B.P. Tanker Co. Ltd.
M. R. Gould	..	P. & O. S.N. Co.	M. C. Stallard	..	Furness Withy (General Shipping) Ltd.
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K. S. Hardy	..	Ocean Transport & Trading Ltd.	G. Stratton	..	Panocean-Anco Ltd.
P. W. Harris	..	P. & O. S.N. Co.	M. Taxis	Container Fleets Ltd.
R. P. Haxell	..	British Antarctic Survey	G. W. Taylor	..	Hellyer Bros. Ltd.
D. L. Haynes	..	Container Fleets Ltd.	D. S. Thetford	..	Esso Petroleum Co. Ltd.
P. J. M. Hickmott	..	Cayzer Irvine Shipping Co. Ltd.	S. Thomas	Bibby Line Ltd.
S. T. Houldsworth	..	Ocean Transport & Trading Ltd.	R. Tucker	Blue Star Line Ltd.
J. C. Hoy	Container Fleets Ltd.	V. Vijayapalan	..	Ocean Transport & Trading Ltd.
R. James	Gardline Shipping Ltd.	J. Wells	British United Trawlers Ltd.
J. T. Jamieson	..	P. & O. S.N. Co.	P. L. White	..	Cayzer Irvine Shipping Co. Ltd.
H. D. Johnson	..	Sir Wm. Reardon Smith & Sons Ltd.	P. S. Whyte	..	Cayzer Irvine Shipping Co. Ltd.
A. W. Jones	..	Jamaica Producer Marketing Co. Ltd.	S. K. Wong	..	Ocean Transport & Trading Ltd.
J. A. Kent	..	P. & O. S.N. Co.	A. R. Woodhouse	..	P. & O. S.N. Co.
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Excellent Awards (contd.)

RADIO OFFICER	COMPANY	RADIO OFFICER	COMPANY
C. Adkin ..	P. & O. S.N. Co.	R. R. N. Laing**	Marconi International Marine Co. Ltd.
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A. Archibald	P. & O. S.N. Co.	D. Leeson ..	Marconi International Marine Co. Ltd.
C. D. Arnold	Townsend-Thoresen Car Ferries Ltd.	D. H. Letcher	International Marine Radio Co. Ltd.
K. Batty** ..	Marconi International Marine Co. Ltd.	J. J. Lucey	Marconi International Marine Co. Ltd.
I. E. Bissel ..	P. & O. S.N. Co.	R. A. M. Lynn	Marconi International Marine Co. Ltd.
W. Blacklaws	P. & O. S.N. Co.	M. G. Maclean	Marconi International Marine Co. Ltd.
D. W. Bone	B.P. Tanker Co. Ltd.	D. McCallum	Cunard S.S. Co. Ltd.
W. A. Boyle	P. & O. S.N. Co.	M. McGregor	Shell Tankers (U.K.) Ltd.
B. Bradley	International Marine Radio Co. Ltd.	M. S. McLaren	International Marine Radio Co. Ltd.
P. Brievik	Silver Line Ltd.	R. Mallett ..	Ocean Transport & Trading Ltd.
B. C. Bull ..	Townsend-Thoresen Car Ferries Ltd.	Chan Shui Man	British Rail
B. Cameron	B.P. Tanker Co. Ltd.	P. Mannion	John Swire & Sons Ltd.
J. B. Carr ..	Ocean Transport & Trading Ltd.	I. Morgan ..	Marconi International Marine Co. Ltd.
M. P. Carter	James Fisher & Sons Ltd.	M. Morgan..	Marconi International Marine Co. Ltd.
P. Cooper ..	Container Fleets Ltd.	P. Morris ..	International Marine Radio Co. Ltd.
M. J. Corry	Canadian Pacific Steamships Ltd.	B. Mullally	Townsend-Thoresen Car Ferries Ltd.
A. J. L. Cottle	Sir Wm. Reardon Smith & Sons Ltd.	B. A. Mullan	Shell Tankers (U.K.) Ltd.
D. L. Davies	Ocean Transport & Trading Ltd.	W. D. Mullan	Container Fleets Ltd.
R. F. Davies	Cunard S.S. Co. Ltd.	H. M. O'Gorman	Marconi International Marine Co. Ltd.
J. C. Dawson	Cayzer Irvine Shipping Co. Ltd.	D. O'Shaughnessy	British Antarctic Survey
R. J. Deakin	P. & O. S.N. Co.	K. Parkin* ..	B.P. Tanker Co. Ltd.
T. M. Elson	P. & O. S.N. Co.	W. C. Paterson*	Bristol S.N. Co. Ltd.
D. English ..	P. & O. S.N. Co.	S. A. Potter	F. T. Everard & Sons Ltd.
J. Evans ..	P. & O. S.N. Co.	P. Price ..	B.P. Tanker Co. Ltd.
B. B. Everett	Sir Wm. Reardon Smith & Sons Ltd.	B. Priddis*	Shell Tankers (U.K.) Ltd.
P. Ferguson	P. & O. S.N. Co.	R. Prole ..	F. T. Everard & Sons Ltd.
B. J. Foley ..	Bibby Line Ltd.	J. Ramsay ..	Lampport & Holt Line Ltd.
L. Footring	British Rail	D. A. Rice ..	International Marine Radio Co. Ltd.
R. I. Forrer	United Marine Electronics (U.K.) Ltd.	N. R. Richardson	P. & O. S.N. Co.
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A. Fulcher**	British United Trawlers Ltd.	G. Robinson	P. & O. S.N. Co.
W. E. Gell ..	Ocean Transport & Trading Ltd.	A. J. Rose ..	Marconi International Marine Co. Ltd.

D. Gibbs ..	..	Newgate Shipping Co. Ltd.	..	R. J. Scarff	..	Marconi International Marine Co. Ltd.
D. A. Gowans ..	..	P. & O. S.N. Co.	..	P. Sheehy ..	..	Redifon Telecommunications Ltd.
W. Grant ..	..	P. & O. S.N. Co.	..	G. Smith ..	..	International Marine Radio Co. Ltd.
H. O. C. Grattan ..	..	Cunard S.S. Co. Ltd.	..	I. H. Snowden	..	Houlder Bros. & Co. Ltd.
T. J. Graves ..	..	Canadian Pacific Steamships Ltd.	..	D. Spurling*	..	F. T. Everard & Sons Ltd.
W. M. Greig ..	..	P. & O. S.N. Co.	..	R. Stevens	..	Ocean Transport & Trading Ltd.
A. M. Guest ..	..	P. & O. S.N. Co.	..	G. F. Stone	..	Cayzer Irvine Shipping Co. Ltd.
A. Gurney ..	..	B.P. Tanker Co. Ltd.	..	K. C. Stone**	..	T. Hamling & Co. Ltd.
T. J. Harris ..	..	Marconi International Marine Co. Ltd.	..	R. L. Swinstead	..	Marconi International Marine Co. Ltd.
J. Hartley ..	..	Marconi International Marine Co. Ltd.	..	J. C. Thompson	..	P. & O. S.N. Co.
R. Hough ..	..	Cayzer Irvine Shipping Co. Ltd.	..	A. G. Thomson	..	Ocean Transport & Trading Ltd.
R. C. J. Humby ..	..	Redifon Telecommunications Ltd.	..	C. K. Thornalley	..	Container Fleets Ltd.
N. R. Huntley ..	..	B.P. Tanker Co. Ltd.	..	C. Titheridge	..	International Marine Radio Co. Ltd.
R. T. Jolliffe ..	..	International Marine Radio Co. Ltd.	..	R. Wade**	..	British Antarctic Survey
P. Keen ..	..	Redifon Telecommunications Ltd.	..	N. J. Walsh	..	B.P. Tanker Co. Ltd.
J. J. Kennedy ..	..	International Marine Radio Co. Ltd.	..	A. S. Warman**	..	Marconi International Marine Co. Ltd.
C. W. Knibb ..	..	Ocean Transport & Trading Ltd.	..	N. R. Wood*	..	F. T. Everard & Sons Ltd.
G. Kraus ..	..	P. & O. S.N. Co.	..	J. Yates ..	..	B.P. Tanker Co. Ltd.

'MARID' SHIPS†

CAPTAIN	PRINCIPAL OBSERVING OFFICER	RADIO OFFICER	OWNER/MANAGER
J. Costain ..	P. Barlow-Morris ..	B. Davidson ..	Atlantic S.N. Co. Ltd.
P. Barker ..	P. Goode ..	B. Davies ..	British Rail
H. L. Jackson ..	G. Grout ..	I. Thomas ..	Houlder Bros. Ltd.
C. Jorgensen ..	J. A. Dunlop ..	P. Hornby ..	Esso Petroleum Co. Ltd.

* Deck Officers.

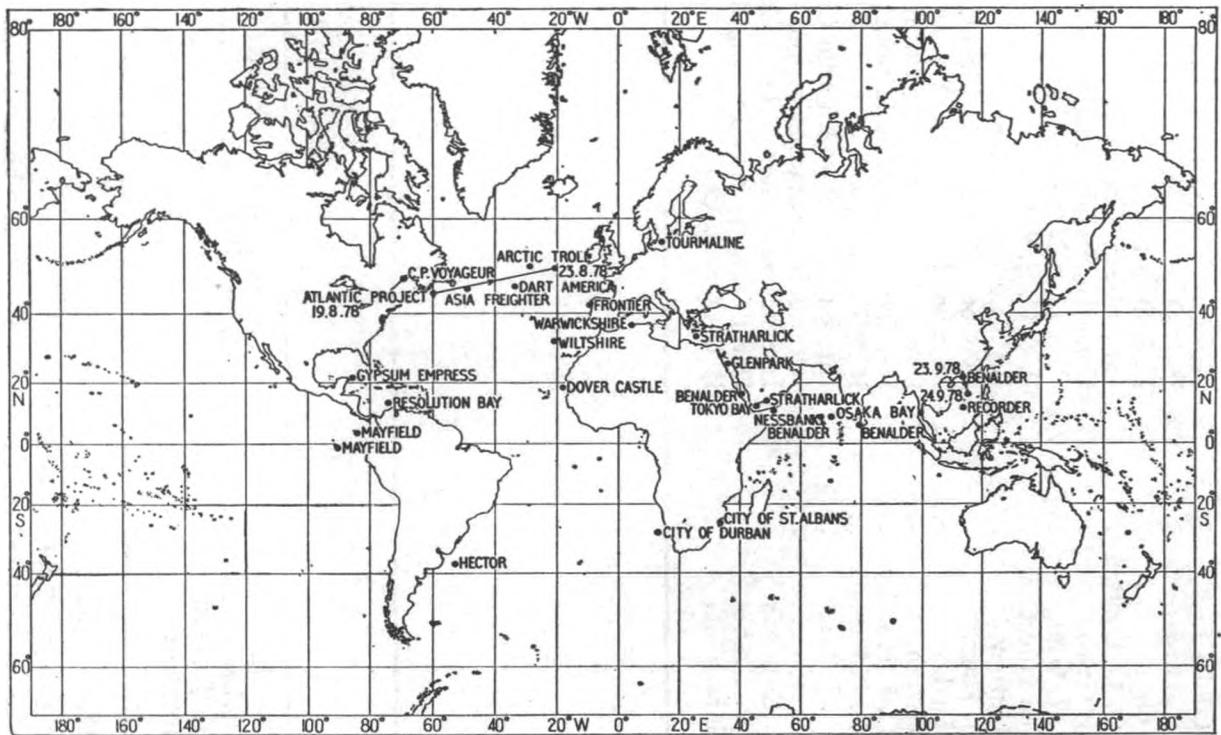
** Also Principal Observing Officer.

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

Excellent Awards (contd.)

TRAWLERS (non-instrumental)

SKIPPER	RADIO OPERATOR	TRAWLER OWNERS
G. Kent	N. H. Willis	Boyd Line Ltd.



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



July, August, September

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

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

SEVERE TROPICAL STORM 'KIT'

South China Sea

s.s. *Benalder*. Captain A. McKenzie. Hong Kong to Singapore. Observers, the Master and ship's company.

23-24 September 1978. The vessel encountered severe tropical storm 'Kit' and the following are extracts from the meteorological logbook.

	GMT	
23 Sept.	0426	Vessel sailed from Hong Kong.
	0600	Warning received from Hong Kong Radio to the effect that the storm lay within 60 n. mile of position $15\cdot7^{\circ}\text{N}$, $117\cdot5^{\circ}\text{E}$, forecast to move WNW at 10 knots.
	0900	Further warning received from Hong Kong Radio, storm now centred within 60 n. mile of position $15\cdot6^{\circ}\text{N}$, $114\cdot8^{\circ}\text{E}$, forecast to move W or WNW at 7 knots.
	1000	Wind NE'ly, force 5, barometer reading 1006.5 mb falling steadily.
	1200	Wind ENE'ly, force 5, barometer reading 1005.9 mb, temp. $27\cdot6^{\circ}\text{C}$, sea moderate to rough, cloudy.
	1300	Wind NE'ly, force 7.
	1600	Wind NE'ly, force 7, barometer reading 1003.7 mb falling steadily.
	1800	Wind E'ly, force 7, barometer reading 999.8 mb falling rapidly.
	2000	Wind ESE'ly, force 9-10, barometer reading 996.6 mb, very rough sea and heavy swell, cloudy with rain showers.
	2100	Warning from Hong Kong Radio, storm centred within 60 n. mile of position $16\cdot3^{\circ}\text{N}$, $113\cdot7^{\circ}\text{E}$, forecast to move NW at 7 knots. Observed wind now ESE'ly, force 10, barometer reading 997.1 mb, falling.
24 Sept.	0000	Wind SE'ly, force 8, barometer reading 1001.9 mb, rising steadily. Warning from Guam at this time showed the storm to be in position at $15\cdot4^{\circ}\text{N}$, $113\cdot5^{\circ}\text{E}$, moving west at 11 knots.

- 0035 Squall with heavy rain, visibility nil, wind reaching force 8.
- 0230 Squall with heavy rain, visibility nil, wind reaching force 8.
- 0300 Wind SSE'ly, force 7, barometer reading 1003·8, rising then falling.
- 0600 Wind SSW'ly, force 6, barometer reading 1003·7 mb.

Hereafter the wind veered and decreased gradually to become WSW'ly, force 5 by 1800. The barometric pressure maintained a steady rise.

Position of ship at 0918 on the 23rd: $21^{\circ} 15' N$, $114^{\circ} 05' E$.

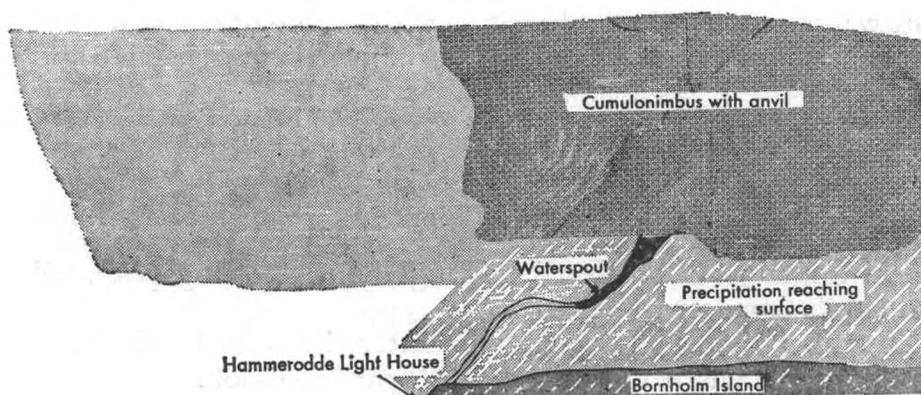
Position of ship at 0230 on the 24th: $16^{\circ} 01' N$, $115^{\circ} 43' E$.

WATERSPOUT

Baltic Sea

m.v. *Tourmaline*. Captain P. R. Thompson. Odda (Norway) to Riga (USSR). Observers, the Master and Mr C. R. Goddard, Chief Officer.

27 August 1978. At 1138 GMT a waterspout was observed extending apparently over the northern end of Bornholm Island, see sketch; the spout was observed for about three minutes.



Weather conditions at the time were as follows: dry bulb temp. $16.0^{\circ} C$, wet bulb 13.0 , sea temp. 16.2 , barometer reading 1003·6 mb, wind WNW, force 5, seven oktas of cumulonimbus cloud, precipitation reaching surface as shown in the sketch. Static was frequent during the time of the observation affecting the R/T set.

Position of ship: $55^{\circ} 18' N$, $14^{\circ} 13' E$.

SEA TEMPERATURE CHANGES

South Atlantic Ocean

m.v. *Hector*. Captain H. K. Timbrell. Los Angeles to Santos (Brazil). Observer, Mr M. S. C. Wild, 3rd Officer.

10-11 July 1978. At 1930 GMT on the 10th when the vessel was in position $37^{\circ} 31' S$, $52^{\circ} 34' W$, the sea temperature was $14^{\circ} C$ and the air temperature 10. At 2330 the vessel was in position $36^{\circ} 40' S$, $52^{\circ} 06' W$ and 20 minutes later the sea temperature was found to have fallen to 7 whilst the air temperature had risen to 13. By 0020 on the 11th the sea temperature had risen to 13, the air temperature remained constant at 13. At 0330 in position $35^{\circ} 49' S$, $51^{\circ} 37' W$ the sea temperature had risen further to 19 and the air temperature to 18. Thereafter, the sea temperature remained constant. All sea temperatures were taken by means of the engine room intake.

Weather conditions at the time were: sea slight, low swell, wind variable, force 3, fog at times.

Position of ship at 1930 on the 10th: $37^{\circ} 31'S$, $52^{\circ} 34'W$.

Note. Observations, such as this, of abrupt changes in sea-surface temperature are of considerable interest since they often denote the boundary between water masses of different systems of currents. On a specific occasion such a boundary is likely to be much more complex than might be thought from the mean pattern of currents as shown in atlases, with wide meanders often developing into cut-off features such as eddies of cold water within the generally warmer water mass so that passage on a constant course might well lead to changes from warm to cold water and back to warm again. The complexity of the boundaries between water masses has been well demonstrated in recent years by the detailed patterns of sea-surface temperature obtained by satellite observations—especially with regard to the Gulf Stream.

It is thought possible that the temperature changes observed by the *Hector* were at the boundary between the cold Falkland Current (flowing north-north-east near the coast of South America) and the warm Brazil Current (further offshore and flowing south-south-west). The general pattern of currents in this area is shown in the *South American Pilot*, Volume 1, diagram 3. A similar observation of abrupt changes in sea-surface temperature was recorded on page 163 of the October 1974 edition of *The Marine Observer* although on that occasion the position was further north.

The satellite photograph opposite page 36 of the January 1979 edition of *The Marine Observer* shows the eddy pattern caused by the inter-action of the Falkland Current and the Brazil Current east of Argentina. The sharp eastern boundary of the northward-moving cold Falkland Current is clearly depicted in this Very High Resolution Radiometer image.

RADAR ECHOES

Arabian Sea

m.v. *Nessbank*. Captain T. D. Scott. Hong Kong to Suez. Observer, Mr P. N. Hill, 3rd Officer.

13 August 1978. At 1700 GMT an unusual phenomenon was observed on the radar screen at a distance of 20 n. mile from the vessel; the phenomenon, which was rippled in appearance, was believed to be sand particles.

The radar echoes, which were one n. mile in depth initially, stretched from Cape Guardafui for a distance of 16 n. mile in a NW'W direction. They then turned north for 24 n. mile and increased in depth to 8 n. mile, the intensity, however, decreased with distance.

The echoes off Cape Guardafui moved in a north-easterly direction and the more northern particles changed to a south-easterly direction until the phenomenon formed a circle 12 n. mile in diameter. Once the circle was complete, the outer edge began to move into the centre, reducing the size of the circle but increasing its intensity. The approximate position of the centre was $12^{\circ} 04'N$, $51^{\circ} 09'E$. The phenomenon was observed until about 1900.

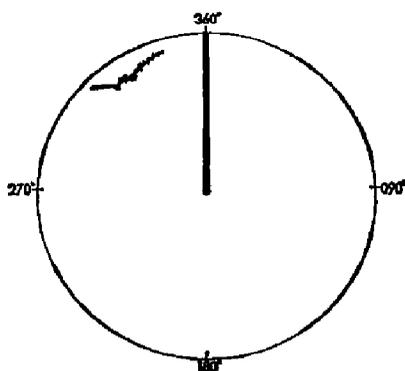
Position of ship at 1800: $12^{\circ} 00'N$, $51^{\circ} 06'E$.

Red Sea

m.v. *Glenpark*. Captain I. C. Campbell. Samil (S. Korea) to Iskenderun (Turkey). Observer, Mr R. G. MacDonald, Chief Officer.

26 September 1978. At 1515 GMT what was believed to be clear air turbulence was observed for a period of 20 minutes on the radar screen, see sketch.

Mr MacDonald adds that the radar echoes were basically the same in character as those observed by him on 14 August 1975 when he was in command of the *Jupiter Moon*, see *The Marine Observer*, July 1976 edition, page 108.



Weather conditions at the time of the observation were: dry bulb temp. 27.5°C , wet bulb 25.5 , sea temp. 26.5 , wind NNW, force 3, barometer reading 1011.6 mb, cloud nil.

Position of ship: $25^{\circ} 31' \text{N}$, $35^{\circ} 31' \text{E}$.

Note. The following is an extract from the *Meteorological Glossary*:

Clear air turbulence is air turbulence of a type other than that associated with air flow over rough ground and also that encountered in or near cumulonimbus clouds.

Clear air turbulence has been observed mainly in the high troposphere and low stratosphere, especially in the vicinity of jet streams. Its chief practical significance lies in the accelerations, varying in intensity up to several times the acceleration of gravity, which may be imparted to high-speed aircraft. Investigation of the horizontal and vertical anomalies in the flow pattern that constitute the turbulence is made difficult by their small scale. Evidence suggests, however, that favourable conditions for the development of such anomalies include high static stability and large horizontal and vertical wind shear. Orographic effects may also be an important contributory factor.

WHALES

St Lawrence River

m.v. *C. P. Voyageur*. Captain D. Forbes. Le Havre to Quebec. Observers, the Master and his family and Mr C. A. Blackford, 3rd Officer.

7 August 1978. As the vessel was steaming up the St Lawrence River on a calm and sunny morning, a school of white whales was observed in the region of the Saguenay River; the pilot informed us that they were named Belugas.

There were approximately 30 in the school, all seemed to be pure white and varied in length from 3 to 4 metres. They all seemed to be enjoying the sunshine and, unlike the more common whales, they did not blow. As the vessel approached the school some sounded whilst others were indifferent to us and obviously undisturbed by our presence.

The pilot also told us that the Belugas were to be found in the St Lawrence anytime between the spring and the time when the River begins to ice up and, to the best of his knowledge, the only other place in the world where they are to be found is the White Sea.

Along with the Belugas was a small number of whales, black in colour and 5 to 7 metres in length, blowing and basking in the sunshine.

Position of ship at 1200 GMT: $48^{\circ} 10' \text{N}$, $69^{\circ} 32' \text{W}$.

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

'Belugas, or white whales, are toothed whales as are porpoises. They are most closely related to narwhale (the "unicorn" whale) and, like them, have been much hunted in the past. There are records of Belugas from most of the high Arctic, including Alaska, and abundantly from the White Sea; there are even a few UK records.'

'Two specimens brought from Labrador and Newfoundland in the last century lived for a short time in a London aquarium. One of the unfortunate beasts had spent five weeks in a seaweed-filled box on the transatlantic journey.'

South Pacific Ocean

m.v. *Mayfield*. Captain S. C. Carr. Auckland to Balboa. Observers, Mr. McKechnie, Chief Officer and Mr S. Thair, 3rd Officer.

15 September 1978. Between 1430 and 1830 GMT a group of 12 Humpback whales were observed heading north. Later 5-6 similar whales were observed, also heading north. Some time afterwards 3 sealions and a large school of dolphins were observed.

Position of ship at 1430: $01^{\circ} 15'S$, $91^{\circ} 00'W$.

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

'Humpbacks have very definite migration patterns, these would have travelled all the way up the coast of South America from the feeding grounds in the Bellingshausen Sea and would now be at their northern limit. The Humpback whale is interesting in that it is the most vocal of the large whales. They produce organized sounds of repeating patterns for as long as 30 minutes at a time and all members of a pod will produce the same "song", but the animals are said to improvise and change the song over a period until it is quite different from that of four or five years earlier. Humpbacks are also extremely agile and are able to heave their huge 30-ton frame out of the sea in an enormous back flip.'

Mozambique Channel

m.v. *City of St Albans*. Captain H. P. Wharton. Maputo to Tanga (Tanzania). Observers, Mr P. W. Underhill, 2nd Officer and Mrs Underhill.

28 July 1978. At 1248 GMT whilst 21 n. mile off the Mozambique coast, two large whales were observed. They passed the vessel at a distance of about 100 metres and as only one whale at a time lifted its tail or flipper out of the water, the impression given was that they were rolling over and around each other.

Both whales were black on the upperside; the underside of one was silver-grey and the other snow-white. One appeared to have numerous large white discs on the leading edge of the flippers; these were thought to be a form of barnacle. The movement of the whales was at all times slow, even graceful; tails and flippers made little or no splash as they re-entered the water.

Position of ship: $25^{\circ} 34'S$, $33^{\circ} 36'E$.

Note. Dr Evans comments:

'These were Humpback whales. The tubercles on the leading edge of the flippers (and on the head) are a characteristic of this species.

'This appears to have been a courting session.'

Mediterranean Sea

m.v. *Warwickshire*. Captain S. H. Gledhill. Dagenham to Port Said. Observers, the Master and ship's company.

26 August 1978. A lone albino mammal was observed at a distance of about 200 metres from the vessel moving in an easterly direction; the creature was three metres long. Approximately 80 per cent of the creature that could be seen was white in colour, the remainder, around the dorsal fin and blow hole area, was light grey.

Position of ship: $37^{\circ} 01'N$, $03^{\circ} 55'E$.

Note. Mr. McBrearty comments:

'This is interesting. Cetaceans, like other mammals, occasionally produce albino specimens, but I wonder if this is the case here. I think it is more likely to be a specimen of Cuvier's whale *Ziphius cavirostris*. This beaked whale has often been stranded on the Mediterranean coast. The animal is creamy white from under the lower jaw to the area of the dorsal fin and much of the rest of the dark skin is usually covered with long white linear streaks. An adult animal would probably be in the region of 5½ metres.'

DOLPHIN FISH

Eastern North Pacific

m.v. *Mayfield*. Captain S. C. Carr. Auckland to Balboa. Observers, Mr J. S. McKechnie, Chief Officer, Mr S. Thair, 3rd Officer and other members of the ship's company.

16 September 1978. At 1725 GMT a flock of birds was observed circling over a shoal of fish. As the vessel approached some were identified as flying-fish, which, as they broke the surface of the water, were being attacked by larger fish and the birds. The larger fish, which had angular mouths and were blue-green in colour, were observed to jump 2-3 metres out of the water.

Position of ship: 3° 32'N, 84° 50'W.

Note. Dr Evans comments:

'The blue-green predators were dolphin fish, *Coryphaena hippurus*. In the great oceans they live largely on flying-fish, pursuing them at high speed and sometimes hurling themselves through the air in the excitement of the chase. These beautiful and powerful fish are found world-wide in tropical and sub-tropical regions.'

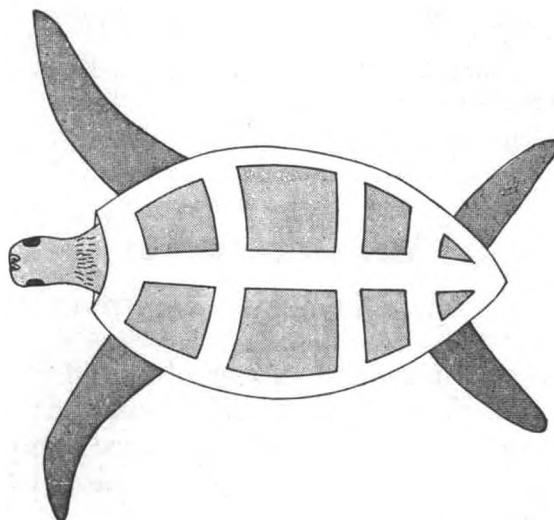
TURTLES

Eastern North Atlantic

m.v. *Wiltshire*. Captain R. C. Middleton. Puerto La Cruz (Venezuela) to Livorno (Italy). Observer, Mr G. Penry, 2nd Officer.

4 August 1978. Between 1600 and 1800 GMT the vessel passed upwards of 30 large turtles varying in length from 1-1½ metres, see sketch. The weather at the time was calm with clear skies and it appeared that they were basking in the sunshine.

As the vessel approached some of the turtles dived and swam away, only a few remained motionless as the vessel passed by. Those observed at close quarters were of differing shades of brown and were accompanied by a number of black and white striped pilot fish.



A number of officers were querying the migratory habits of the turtles as, at the time of observation, the vessel was 180 n. mile west of Madeira and it was thought the creatures had come from elsewhere.

Position of ship at 1800: $32^{\circ} 37'N$, $20^{\circ} 31'W$.

Note. Mr E. N. Arnold of the Department of Zoology, the British Museum (Natural History), comments:

'From their size these may well have been Green Turtles (*Chelonia mydas*) or Loggerheads (*Caretta caretta*), but it is not possible to tell which.

'Their occurrence well away from land is not surprising as turtles migrate over long distances—for instance—some Green Turtles feed near the coast of Brazil but breed on Ascension Island.'

BIRDS

North Atlantic Ocean

m.v. *Frontier*. Captain G. Shadbolt. Valletta to Dublin. Observer, Mr R. A. Eades, 3rd Officer.

18 September 1978. During the afternoon watch the vessel was visited by an increasing number of passerines until by 1800 GMT there were on board a number of Whinchats, Pied Flycatchers and Whitethroats, six Turtle Doves, two Juvenile Kestrels and one Meadow Pipit. The birds settled down for the night on top of containers and during the 2000–2400 watch the Meadow Pipit went into the wheel-house and was placed in a cardboard box. Later three small birds were reported in the vessel's accommodation.

The surprising feature of this visitation was that the vessel was in a position 45 n. mile west of Islas de Ons off the coast of Portugal, for in this position any bird migrating on a south-westerly heading would fly on into the Atlantic without making land and would eventually perish. There was at the time no easterly wind which might have accounted for the birds being so far to the west.

On the following morning, however, by which time most of the birds had departed and the vessel had entered the Bay of Biscay, fresh easterly winds were experienced and the synoptic weather chart revealed fog patches along the Spanish coast. It was, therefore, assumed that the birds had taken a more westerly course than intended and with fog along the north coast of Spain, it was thought possible that they had missed their landfall and had continued to fly out seawards.

Position of ship at 1800 on the 18th: $42^{\circ} 18'N$, $9^{\circ} 57'W$.

Note. This observation was selected from 19 made between the 19th of August and the 18th of September by members of the ship's company. The observations prompted Captain G. S. Tuck, Chairman of the Royal Naval Birdwatching Society, to comment:

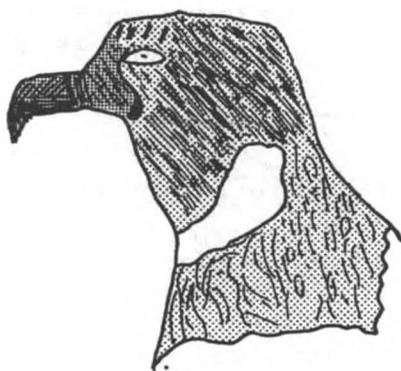
'This is an exceptionally detailed seabird and landbird report of great accuracy.'

North Atlantic Ocean

m.v. *Arctic Troll*. Captain J. A. Jackson. Emden to New York. Observer, Mr A. Wallace, 2nd Officer.

18 July 1978. At 1200 GMT a bird, thought to be a hawk or eagle, see sketch, was observed resting on one of the vessel's cranes.

The main plumage was dark brown with a small ringed pattern on the feathers. The underside was yellow and white, the head was flat-topped with a cruel-looking hooked beak. The beak was brown in colour and behind it, extending to the eyes, were yellow feathers. There appeared to be small black tufted feathers above the eyes. There was also a white mark on the throat which widened around the neck. The bird's wing-span was about one metre and it had large talons.



The bird, which appeared to be in a poor condition, stayed with us for only a few hours.

Position of ship: $51^{\circ} 00'N$, $28^{\circ} 27'W$.

North Atlantic Ocean

m.v. *Atlantic Project*. Captain J. Oscroft. Halifax (Nova Scotia) to Southampton. Observers, Mr I. S. Ramage, 2nd Officer and Mr R. D. Clark, 3rd Officer.

18 September 1978. As the vessel sailed from Halifax on the evening of the 18th a bird, similar in shape and characteristics to the hawk or kestrel, was observed perched on one of the containers.

The bird was about 25 cm tall, the back and wings were dark brown in colour and the breast and underside of the body were light brown with many dark-brown streaks.

Frequently the bird would fly from the vessel and return with small birds. When in flight the bird flapped its wings in quick jerky movements. On some occasions it would drop onto its prey from above and, on others, would chase small birds between the containers before finally swooping and catching them in its claws. It would then sit on a container and take its meal, frequently sharpening or cleaning its beak on the edge of the container. On the afternoon of the 20th another similar bird had joined the vessel. Both birds were last seen on the morning of the 23rd when the vessel was some 200 n. mile from Bishop Rock.

Position of ship at 0600 on the 19th: $45^{\circ} 00'N$, $60^{\circ} 00'W$.

Position of ship at 0600 on the 23rd: $50^{\circ} 48'N$, $20^{\circ} 18'W$.

Note. Captain Tuck comments:

'These are female Merlins, *Falco columbarius*. These birds are known as Pigeon Hawks off the east coast of the USA.

'Merlins are found on both sides of the North Atlantic, mostly breeding in the high north. They frequently settle on our Ocean Weather Ships in the eastern North Atlantic and hunt and capture small birds about the vessels as described in the narrative. This is probably why they might readily accept an assisted passage across the Atlantic.'

South China Sea

c.s. *Recorder*. Captain E. J. Reilly. Singapore to Subic Bay (Philippine Islands). Observers, Mr D. Wilson, 3rd Officer and Mr M. Davies, Submarine Cable Technician.

30 September 1978. Two birds similar to that illustrated in the sketch were observed flying around the vessel and eventually to land on the foredeck and wing of the bridge.

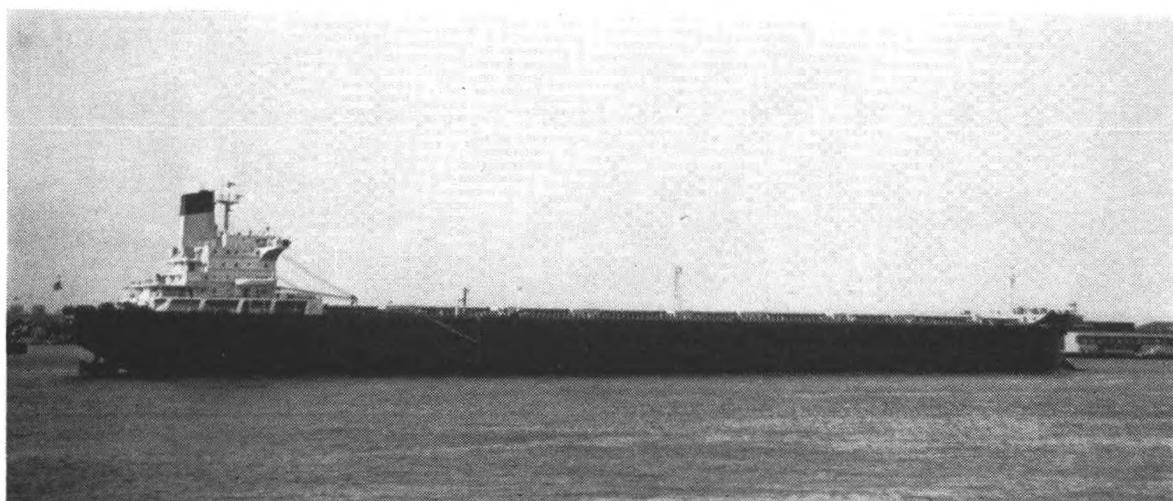
Each bird was about 22 cm in length and 15 cm in height. They were light brown in colour with dark flecks on the back, chest and crown. Along the edge of each



Viking Venturer (Townsend Thoresen Ferries) Captain R. H. Plant



Anchises (Ocean Transport & Trading Limited) Captain A. J. Palmer



King George (Cayzer Irvine Shipping Limited) Captain T. D. Young

THE THREE SHIPS WHICH GAINED THE HIGHEST MARKINGS FOR THEIR METEOROLOGICAL LOGBOOKS DURING THE YEAR 1978 (see page 102)

MO-B

opposite page 117



Esa Meteosat 1. First raw visible image, 9 December 1977 (*see page 124*)



wing was a broad black band followed by a second very narrow and white band. The undersides were light fawn and the bills, legs and eyes were black.

The birds were heard to call each other with short whistling notes.

Position of ship: $11^{\circ} 55'N$, $114^{\circ} 41'E$.

Note. Captain Tuck comments:

'These birds were either Greater Sand Plovers, *Charadrius leschenaultii* or, more probably, Oriental Plovers, *Charadrius asiaticus*. Both species are common winter migrants from the north and frequent mud flats on borders of the Philippine Islands'.

Arabian Sea

s.s. *Benalder*. Captain A. Maclean. Port Said to Port Kelang. Observers, the Master and ship's company.

10 July 1978. During the morning a bird was found on the funnel deck, its head was pointing upwards and it appeared to be exhausted, asleep or unconscious. The bird remained in this position for at least three hours until it was lifted into a box—even this action produced little reaction—just a slight sign of fear. It appeared to have been injured and it was thought it may have hit one of the vessel's aerials; no external injury was obvious but it was incapable of walking although its swimming was not impaired. The bird was placed in the care of two passengers and during its stay on board it made no attempt to fly away.

Minnie, as the bird was called, was predominantly white with black markings around the eyes, wing-tips and top of the wings near the roots. All the white plumage was quite noticeably tinged a golden orange. The beak was yellow and quite long. Two very long narrow feathers extended from the centre of the tail fan and all tail feathers had a thin black line along their centre.

On arrival in Singapore, Minnie was handed over to the Island's Bird Sanctuary. After reference to back numbers of *The Marine Observer* it was concluded that the bird was a Christmas Island Tropic-bird or possibly a white-tailed Tropic-bird.

Position of ship: $6^{\circ} 12'N$, $78^{\circ} 48'E$.

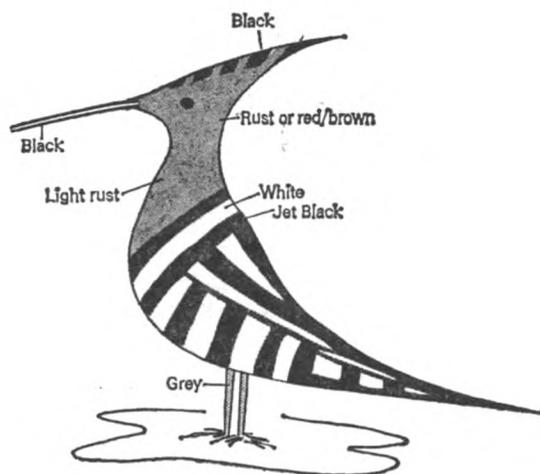
Note. Captain Tuck comments:

'Judging by the golden hue of the plumage the bird was probably a Christmas Island Tropic-bird, *phaethon lepturus lepturus*.'

Red Sea

s.s. *Benalder*. Captain A. McKenzie. Port Suez to Port Kelang. Observers, the Master, Mrs McKenzie and Mr W. M. Kay, Chief Officer.

4 September 1978. At 1600 GMT a bird with very distinctive markings, see sketch, was observed on the fore deck of the vessel.



Position of ship: 16° 07'N, 41° 13'E.

Note. Captain Tuck comments:

'This is a very good sketch of the Hoopoe, *Upupa epops*. The bird is frequently seen in the Red Sea.'

LOCUSTS

Mediterranean Sea

m.v. *Stratharlick*. Captain C. B. Cooke. Port Said to Spain. Observers, the Master and ship's company.

14 July 1978. At 2100 GMT an insect was found on the bridge-wing, later it was handed over to the Port Meteorological Officer, Tyne who passed it on to the British Museum for identification purposes.

Weather details at the time were : wind NW'N, force 2, temp. 26°C and sky clear.

Position of ship: 33° 33'N, 25° 39'E.

Note. Mr Jeremy Roffey, Head of the Desert Locust Information Section of the Centre for Overseas Pest Research, to whom the insect was sent, comments:

'The specimen is an immature gregarious desert locust.

'This particular finding is of considerable interest for there have been no other reports of desert locusts within a radius of some 1300 kilometres in 1978, the nearest sighting being of groups of scattered adults on the eastern side of Lake Nasser in Upper Egypt on 25 and 28 May.

'At the time of the sighting there were northerly winds over the Mediterranean between Crete and North Africa so that North Africa cannot have been the source. One possible source is northern Arabia where scattered locusts had been seen in May and June. Preliminary examination of relevant wind-fields suggests that the locust could have drifted north and then west from northern Arabia on 13 and 14 July, but, as indicated earlier, we have not received any reports of locusts from Middle Eastern countries which could add credence to this hypothesis. An alternative suggestion is that the locust landed on board during its passage through the Red Sea on about 8-9 July but was not sighted until some days later. There have been

numerous reports of swarms on both sides of the Red Sea during the first six months of 1978 and there have been many sightings of locusts on ships in the Red Sea, particularly at times of high locust activity. On balance it seems most likely that the locust came on board during the *Stratharlick's* passage through the Red Sea.'

Gulf of Aden

s.s. *Tokyo Bay*. Captain D. T. Maclachlan. Suez to Port Kelang. Observers, Cadets A. F. Ure and M. G. Mottram.

1 July 1978. At 0800 GMT locusts, estimated to be several dozen in number, were found on board. All were yellow in colour and varied between five and eight centimetres in length.

A specimen was taken for identification purposes.

Position of ship: 12° 29'N, 45° 42'E.

Note. Mr Jeremy Roffey comments:

'The specimen forwarded to us was a tree locust whose scientific name is *Anacridium melanorhodon arabafrum*, Dirsh. It is widely distributed in the Sahelian and Sudanese vegetation zones in Africa and it also extends into the south-west Arabian peninsula.

'We have received several sightings of this species and of the desert locust during the last three months from ships in the Gulf of Aden and Arabian Sea and these have provided very clear evidence of an invasion of Pakistan and India by desert locusts from the Red Sea-Gulf of Aden area, where an important upsurge commenced in October 1977. We are most grateful for your help.'

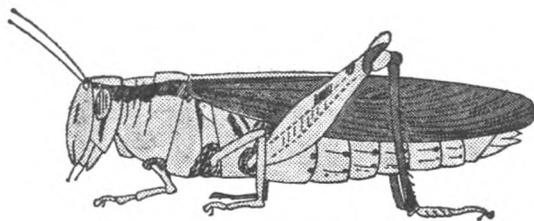
GRASSHOPPERS

Western North Atlantic

G.T.V. *Asiafreighter*. Captain N. A. MacDonald. New York to Greenock. Observer, Mr A. Chestnut, 3rd Officer.

16 September 1978. The insect shown in the sketch was caught by the Master's wife when the vessel was three days out from New York, having previously taken on cargo in various ports on the east coast of the United States. It was not known how long the insect had been on board.

Position of ship: 46° 00'N, 48° 50'W.



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

'The sketch is of a grasshopper, probably a species of the North American genus *Melanoplus*.'

Caribbean Sea

m.v. *Resolution Bay*. Captain R. A. Wilson. Cristobal to Flushing. Observers, Mr N. J. Shearman, 2nd Officer and Cadet D. W. Saunders.

12 July 1978. At 1700 GMT a large insect was sighted on the starboard bridge-wing; it was found to measure 125 mm in length and to have a wing-span of 197 mm.

The head was light brown in colour, the body a much darker brown, almost black, but becoming lighter again towards the rear. Yellow markings in the form of spots along the upper parts of the appendages were a prominent feature. The wings were semi-transparent and light brown in colour. Because of the gradual deterioration of the insect's body over the ensuing days, it was disposed of.

Some doubt arose as to where the insect had come from—whether it had been blown with the wind from land or whether it had come on board the previous day during the vessel's passage through the Panama Canal. At the time of discovery the nearest land was some 150 n. mile south-east of the vessel.

Position of ship: $13^{\circ} 27'N$, $74^{\circ} 46'W$.

Note. Dr N. D. Jago, Head of the Taxonomy Section of the Centre for Overseas Pest Research, comments:

'This is the *Tropidacris cristatus*, L. It is one of two largest species of grasshopper and is widely distributed in South America. It lives in dense forests, mainly on foliage and in thickets and has frequently been reported as a pest of various crops (coconut palms, bananas, cotton, fruit trees, sugar cane and maize). Because of its large size it is roasted and eaten by Amerindians.

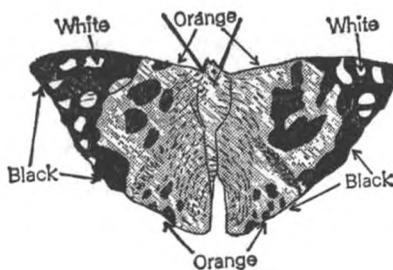
'It is known to be a strong flier so its appearance on board 150 n. mile out to sea is not surprising although I have not yet been able to ascertain whether there have been any other records of the species so far out to sea.'

BUTTERFLY

Eastern North Atlantic

m.v. *Dover Castle*. Captain R. R. Will. Cape Town to Trieste. Observer, Mr P. A. Monks, 3rd Officer.

24 July 1978. At 1000 GMT the butterfly shown in the sketch was found on board the vessel. It had rich, brightly coloured wings the total span of which was 6 cm. The body was bulbous but tapered off to become cone-shaped at the rear. Long brown hairs protected the body and part of the wings.



Position of ship: $18^{\circ} 35'N$, $17^{\circ} 48'W$.

Note. Mr R. L. Smiles of the Department of Entomology, British Museum (Natural History), comments:

'This is a "Painted Lady", *Cynthia cardui*, Linnaeus, a highly migratory butterfly distributed widely throughout much of the Old World.'

BIOLUMINESCENCE

North Atlantic Ocean

m.v. *Dart America*. Captain K. W. Keithley. Le Havre to Halifax (Nova Scotia). Observers, Mr J. E. Brown, 3rd Officer and Mr A. Conry, A.B.

29 August 1978. Between 2200 and 2300 GMT bioluminescence was observed glowing strongly in the bow wave, white caps were visible to a distance of about three cables from the vessel. Some patches were flashing rapidly with an unusual intensity. No effect on the bioluminescence was observed when lights were directed onto it.

During this time there had been occasional rain showers and echoes were observed on the radar screen; when the vessel entered one of these patches, however, no rain was observed.

Position of ship: $46^{\circ} 30'N$, $33^{\circ} 35'W$.

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

'Flashing patches are unusual phenomena and there is no obvious explanation for this type of luminescence. Flashing by comb-jellies is well known but I presume much larger patches are inferred by this report.'

Arabian Sea

s.s. *Osaka Bay*. Captain W. P. Goldie. Port Kelang to Suez. Observers, Mr K. S. Hardy and Mr J. D. G. Williams, 2nd Officers.

25 August 1978. At 1850 GMT small balls of bioluminescence were observed to 'explode' on the surface of the sea. The balls appeared to rise to the sea surface and upon 'exploding' formed bright-green discs of about 25–37 metres in diameter; this was assumed to be caused by upwelling of sub-surface water. The time between the sighting of each ball until the 'explosion' varied from 2–5 seconds. Small speckles of luminosity were observed in the water disturbed by the movement of the vessel. The phenomenon was observed for about five minutes.

Weather conditions at the time were: dry with clear skies overhead but rain was observed at a distance all around, wind w'ly, force 3, wave height about one metre. No apparent change was observed in the sea temperature, this was $24.5^{\circ}C$.

Position of ship: $8^{\circ} 43'N$, $70^{\circ} 25'E$.

Note. Dr Herring comments:

'A classic report of what has been described as "erupting" bioluminescence. This has been attributed to underwater seismic activity and is most frequently observed in the Indian Ocean.

'It is presumed that the shock wave stimulates luminescence in the plankton through which it passes on its passage to the surface.'

Arabian Sea

s.s. *Benalder*. Captain A. McLean. Port Suez to Port Keland. Observers, Mr M. H. Burbridge and Mr M. Simpson, 1st Officers and Cadets R. Sherwood and A. Stewart.

8 July 1978. At 1930 GMT it was observed that the sea was illuminated where the bright accommodation lights were reflected. When the light from the Aldis lamp was directed across the sea surface the whole area became illuminated. The bioluminescence seemed to absorb light and hold it for two minutes or so. The effect was observed continuously for about three hours.

Position of ship: $9^{\circ} 30'N$, $67^{\circ} 08'E$.

Note. Dr Herring comments:

'This report of light-induced luminescence may have been due to the presence of very large numbers of ostracod crustaceans. These small (2-3 mm) animals will squirt luminous material into the water when illuminated and are known to occur in the Indian Ocean in dense swarms.'

Gulf of Aden

m.v. *Stratharlick*. Captain P. W. Price. Port Said to Abadan. Observer, Mr N. D. Maclean, 3rd Officer.

30 August 1978. Between 1800 and 2100 GMT several patches of bioluminescence were observed to rise to the surface of the sea and, upon reaching the surface, to spread out and increase in intensity. The patches, which measured about five metres in diameter, were either round or oval in shape. The ship's wake appeared to have a dim glow and, at intervals, small bright spots were observed in it.

A sample of sea water was taken and, when stirred vigorously, small 'sparks' were produced. No effect was observed when the sample was shaken or when a bright light was directed onto it.

The sample contained small particles—similar in appearance to dust particles—each measuring about one tenth of a millimetre in diameter. An ozone smell was particularly noticeable during the period of the observation.

Position of ship at 1800: 13° 48'N, 48° 36'E.

Note. Dr Herring comments:

'These patches may have been caused by shoals of fish coming to the surface in waters containing large numbers of luminous dinoflagellates. Certainly the "sparks" and the same particles indicate the presence of these organisms.'

IRIDESCENCE

Caribbean Sea

s.s. *Gypsum Empress*. Captain A. M. Jones. Kingston (Jamaica) to Houston. Observers, the Master and Mr E. T. Peers, Chief Officer.

5 July 1978. At 0000 GMT when the vessel was 10 n. mile south-west of Cap San Antonio, Cuba a brilliant display of colour was observed on the fibrous top of a cumulonimbus cloud.

Weather conditions at the time of the observation were: dry bulb temp. 29.6°C, wet bulb 26.3, sea temp. 31, wind ENE, force 3, barometer reading 1014.3 mb, 3 oktas of cumulus and decaying cumulonimbus with anvil and 3 oktas of cirrus, most of which was the remains of the decaying cumulonimbus.

The iridescence was observed for 30 minutes but had begun to fade after 24 minutes as the sun set.

Position of ship: 21° 42'N, 85° 06'W.

Note 1. The *Gypsum Empress* is a Canadian Selected Ship.

Note 2. The following is an extract from the *Meteorological Glossary*:

Iridescence in the form of tinted patches of red and green, sometimes of blue and yellow, is occasionally observed on high clouds, generally within about 30° of the sun. The boundaries of the tints are not circles with the sun as centre but tend to follow the outlines of the cloud. Iridescent clouds are considered to be parts of coronae, the coloration being caused by diffraction of sunlight by very small cloud particles.

GREEN FLASH

Eastern South Atlantic

m.v. *City of Durban*. Captain R. Bell. Cape Town to Southampton. Observer, Cadet D. Watkins.

7 August 1978. At 1800 GMT, as the upper limb of the sun was about to disappear below the horizon, a green flash was observed. The flash took the form of a small spot which increased in size to about half the diameter of the sun and then vanished.

Weather conditions at the time of the observation were: dry bulb 15°C, wet bulb 13, wind NW'W, force 3, visibility in excess of 19 n. mile, three oktas of cumulus and stratocumulus.

Position of ship: 28° 42'S, 13° 36'E.

Note. The following is an extract from the *Meteorological Glossary*:

On some occasions the last glimpse obtained of the sun at sunset, or the first glimpse at sunrise, is a brilliant green—the 'green segment'—lasting a few seconds. On still rarer occasions a 'green flash' or green ray, also lasting a few seconds, shoots above the horizon from the upper limb.

The explanation is the greater refraction of the short waves (violet, blue, green) than of the long waves (red) of white sunlight, coupled with the greater degree of Rayleigh Scattering (scattering of electro-magnetic radiation effected by spherical particles of radius less than about one-tenth the wavelength of the incident radiation) experienced by the violet and blue rays. In a hazy atmosphere such differential scattering may not be appreciable and the flash may then appear blue or violet. It is probable, though not yet confirmed, that an unusual degree of refraction, such as occurs with a low-level inversion of temperature, is required for the phenomenon.

Differential refraction of white light is also the cause of the analogous very rare phenomenon of the 'red flash' which may occur when the sun's disk appears just below a bank of cloud near the horizon.

The green flash has been observed in association with the moon and planets on rare occasions.

The Significance of Meteosat for Meteorology

BY K. H. STEWART

Director of Research, Meteorological Office, Bracknell

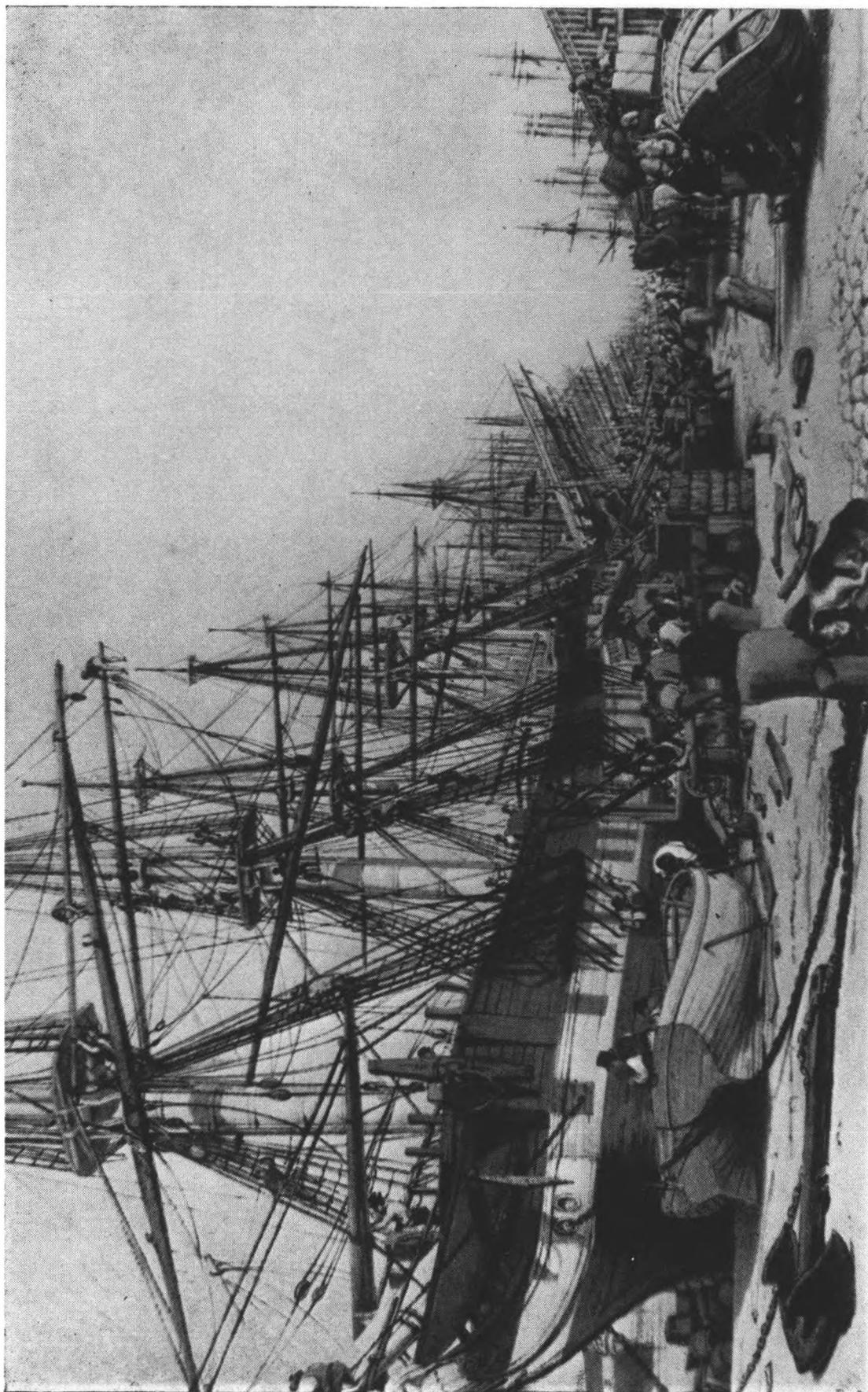
(Reprinted by kind permission of the Editor of the *European Space Agency Bulletin*)

The paper that follows was written in response to a request from the European Space Agency for an article for a special issue of their *Bulletin* designed to celebrate the launch of Meteosat. The satellite came into operation during 1978 after its successful launch on 23 November 1977 and *The Marine Observer* hopes to publish a further article describing the satellite more fully and discussing the products and services being obtained from it.

Meteorology is both a pure and an applied science. As pure scientists meteorologists try to understand and explain the phenomena of weather and climate. As applied scientists they use their knowledge to give advice on the effects of weather on agriculture, industry, transport and daily life. The main practical demand is for forecasts of what the weather will be like in the future—from a few hours ahead to many centuries ahead—but information on past and present weather and its effects can be very important too. Observations provide the essential foundation for both the understanding and the prediction of weather and the appetite of meteorologists for observations is almost insatiable. Ideally, the observations should measure the state of the atmosphere—its composition, temperature, pressure and velocity—at all heights all over the globe. The space and time resolution required depend on the phenomenon being studied and are closely linked together, because small-scale phenomena tend to have short life-cycles, and large ones long ones. Local weather forecasts for a few hours ahead require a resolution of a few kilometres in the horizontal and less than an hour in time. Forecasts for a few days ahead require a horizontal resolution of a few hundred kilometres and time-resolution better than a day. For purposes of pure science it might be enough to collect such observations for a limited period only, long enough to obtain a sample of all the important phenomena of meteorology. For the applied science of forecasting, however, there is no limit to the time for which observations are required. This is because we are trying to predict the behaviour of an inherently unstable system. However well we can predict the future development of the flow patterns existing at one time, there will always be new disturbances to the pattern which grow from below the threshold of detectability and have to be taken into account in making later predictions.

Although meteorologists have always been hungry for observations it is only in the last decade or two, with the development of large computers, that they have had the capacity to digest them in the large quantities they know to be necessary. In the last few years the capacity of computers to model the behaviour of the atmosphere, both globally and on more local scales, has far outstripped the capacity of conventional observing systems to provide data for testing, developing and using the numerical models. The problem is not that conventional methods are in principle incapable of providing the data required, it is simply that the cost of operating the thousands of stations needed (mostly in the oceans) would be quite prohibitive. It is no wonder, then, that meteorologists are eager to exploit to the full the possibilities of satellites in providing a world-wide observing system at reasonable cost.

Satellites have been used in meteorology for over 15 years. The first glamour and excitement has faded, leaving the conviction that satellites can make an enormous contribution to meteorology but also the realization that it is not a simple matter to make full use of their potential contribution. Satellites do not observe directly the quantities meteorologists most need to know and much ingenuity and



19th Century scene in West India Dock from a painting in the P.L.A.'s collection (see page 129)

Port of London Authority photograph



The Pool of London viewed from London Bridge, circa 1870, from a print in the P.L.A.'s collection (see page 129)

effort have to be expended to plan the satellite system to best advantage and to extract the maximum of useful information from its data. The first and strongest reason European meteorologists have for welcoming Meteosat is that it enables them to play a really active part in exploring and extending the ways of using satellites in their science. Of course, much work has already been done using data from American satellites, but the full understanding of the limitations and possibilities of satellite techniques that is needed to exploit them fully comes only from working in close and interactive contact with the system and its data. During the development of Meteosat only a rather small circle of meteorologists has benefited from this contact, but the circle widened as the day of launch approached and once the data began to flow in, the challenge and the opportunity were open to the whole community of European meteorologists.

Meteosat has been planned to complement rather than duplicate existing weather satellites. For many years the USA has provided satellites in fairly low near-polar orbits which give coverage of the whole earth once or twice per day. The observations from these satellites have improved gradually over the years and took a big step forward in 1978 when the first of the TIROS N series was introduced. The satellites provide images at several different visible and infra-red wavelengths and 'soundings' of the vertical distribution of temperature and humidity. The images give valuable data on conditions at the earth's surface—the distribution of snow and ice and of sea-surface temperature—as well as showing the cloud patterns and thus determining in a qualitative way the main features of the weather systems. The sounding data, in principle, give comprehensive quantitative information about the state of the atmosphere. Although it is only the temperature and humidity that are measured, the pressure can be inferred at all levels (provided it is known at one reference level, such as the earth's surface) through the hydrostatic relation and the wind can be inferred through its relationship to pressure gradient. In practice, there are still serious limitations to the accuracy and vertical resolution of the sounding data. Apart from this technical and, we hope, temporary difficulty, the polar satellites fall short of providing comprehensive data in two important respects. The first is that their coverage is only intermittent—twice per day for most places. This means that the satellites do not provide a satisfactory sample of weather observations for long-term studies, because weather in the afternoons, for example, may be systematically different from that in the mornings. It also means that they do not provide adequate data for short-term forecasts; if we are to predict the development and movement of the small-scale phenomena such as thunderstorms, which often give weather its most dramatic impact, we must have observations at least once an hour. The second, more technical inadequacy is that the familiar relationship between pressure gradient and wind is too weak near the equator to allow us to infer wind from the temperature-sounding data. Air movements within the tropics play a vital part in the evolution of global weather and we therefore need some other method of measuring wind there.

These two deficiencies of the polar satellite system can largely be made good by use of geostationary satellites. These can provide quasi-continuous coverage of the whole area within their field of view, which is what is needed for short-range forecasts, and the wind measuring problem can then also be solved by tracking the motion of clouds over an hour or two and assuming that they move with the wind. The method only works, of course, where clouds are present and care has to be taken to avoid clouds of types which might not move with the wind, but experience has shown that reasonably adequate sets of data can be obtained. Four of five geostationary satellites are needed to cover all longitudes and these are being provided by a natural geographical division of responsibility, with the European Meteosat located at 0° longitude.

Although the system of polar and geostationary satellites can cover the whole earth adequately, there are several important quantities which cannot yet be measured properly by remote sensors on satellites, atmospheric pressure at the

surface, rainfall amounts and river flow being the notable examples. It is not very difficult to devise automatic stations to measure these quantities in remote or inaccessible areas, but the transmission of data from them is often difficult or costly and the satellites can play a very useful role as a data link.

As a geostationary satellite in the African-European sector, then, the role of Meteosat is not to supersede other satellites or the existing network of meteorological stations but to complement them so that, if all systems play their part, the Global Observing System will for the first time give to meteorologists a truly world-wide set of the data they need. The contributions of Meteosat may be discussed more specifically under the four headings: short-range local forecasting, global forecasting, climatological studies and research.

Local forecasting

As already stated, the unique contribution of Meteosat to local forecasting is the quasi-continuous coverage it provides. Images of the clouds are available every half hour. Images by visible light will only be available in daylight hours, of course, but those at infra-red wavelengths (10–12 μm) are available day and night and are valuable because they indicate the temperature of the cloud tops (or of the sea surface, in clear conditions) as well as showing the distribution of clouds. The vast amount of detail in these images is beyond the power of any central station to analyse in relation to local conditions, so use is made of Meteosat's capacity to relay information to broadcast the images to local forecasting stations; before doing so the images are put into a readily usable form at the central station by adding latitude-longitude grids and other information. On receipt, the images are examined by the forecasters. They look first to see how well the latest images confirm the ideas they have already formed about the development of the weather from other evidence, then for signs of any new or unexpected developments, particularly in areas not well covered by ordinary observations, then in more detail at features of special interest to their own locality—the spread of fog from the sea to land, for example, or the movement of shower clouds. It is in the field of local forecasting that there is probably most to learn, most room for ingenuity and most likelihood of surprises. We know that in some conditions the new information will be of great value; in other conditions it is not yet obvious how the information can be used but we can hope that experience will teach us. One of the most important uses will certainly be in giving warnings of dangerous conditions such as heavy rainfall or floods. Meteosat can help here not only by its images but also by its capacity to act as a data relay for warning messages from ground stations. One powerful technique whose use is being planned in several countries is that of making a succession of images into a motion-picture of the cloud development; this can give an immediate apprehension of features which may not be obvious from a sequence of still pictures. Another technique that will be used is to combine Meteosat images with those obtained from ground-based radars; these will show the actively raining parts of clouds within the general cloud structure.

Global forecasting

The unique contribution of Meteosat to global forecasting (and it must be remembered that if we are to forecast for any one region for more than a few days ahead, the forecast must necessarily consider the globe as a whole) is the provision of information on winds in the tropical belt. This is one of the most exacting applications of satellite data, demanding great precision in finding the position of the clouds (and therefore in finding the position and orientation of the satellite) and following the motion from one image to the next. The necessary data processing is done at the central station and the results are disseminated by the usual meteorological channels. Other important contributions to large-scale forecasting are the

use of the cloud patterns to delineate weather features and the use of the infra-red image channel to give data on sea-surface temperature. In addition to providing images in the visible and infra-red 'windows' at wavelengths of about 0.7 and 11 μm , Meteosat gives images at about 6.3 μm , a region of emission and absorption by water vapour. This is a new feature, not included in the geostationary satellites of the USA. The 'water vapour' images give valuable information on the distribution of water vapour in the upper troposphere (6–8 km above the earth) and may also allow winds to be estimated even when no clouds are visible, by tracking invisible clouds of vapour. The analysis of the images to produce simplified maps of the distribution of cloud, water vapour and sea-surface temperature is carried out at the central station and the products are distributed both by land-line and via the satellite itself. The data-relay powers of Meteosat are brought into play in two ways in the large-scale forecasting field, first by relaying weather information from remote automatic stations (DCPs), for example in Greenland or on ships at sea, secondly by relaying images obtained from the American geostationary satellite GOES 1 and showing conditions in the west Atlantic and Caribbean otherwise invisible from Meteosat.

These contributions from Meteosat are vital to the success of the important international project known as the First GARP Global Experiment. This project has been planned to obtain the maximum possible global coverage of meteorological data during 1979 and to use the data in numerical experiments designed to explore future possibilities and requirements for the prediction of weather. The Experiment leans heavily on satellite data as well as the conventional observing network, but various supplementary 'special observing systems' will be used too.

Climatology

The role of Meteosat in climatological studies will be primarily to provide statistics on cloud coverage within its field of view; most importance is attached to ocean areas where data are scarce. Climate is determined by the balance between the radiation received from the sun and that re-radiated by the earth. Clouds have a considerable effect on this re-radiated energy and a comprehensive picture of their distribution and its changes will greatly help our understanding of climate. Although much information has already been obtained from polar-orbiting satellites, it is seriously incomplete because the observations are made only at a few, more or less fixed, times a day. The continuous coverage of the geostationary satellite will allow much more satisfactory estimates of true daily averages to be obtained. As well as giving data on the presence or absence of cloud, the central station will process the data to give estimates of the net 'radiation balance' for each area seen from Meteosat. Other climatological uses of Meteosat may well appear in the future; its use to measure snow cover and to estimate aerosol content are possible examples.

Research

The boundary between research and applications in meteorology is not a distinct one; a forecaster may be described as a researcher who is never allowed the time to complete his research. All of the applications of Meteosat data just described have their research aspects too. The most important is probably the contribution Meteosat will make to the data set of the First GARP Global Experiment. The possession, for the first time, of a truly comprehensive set of data on the world's weather will make possible a great variety of research projects on large-scale atmospheric processes, particularly the fundamental processes that transfer energy from low to high latitudes. On a more local scale, Meteosat will be used to clarify the factors governing African weather—those controlling rain in semi-arid regions being particularly important—to study the local storms that affect the Mediterranean region and to investigate the effects of hills and coastlines on cloud development, to name but a few of the possible projects.

No doubt many small research projects will be carried out by using the images received at local forecasting stations, but the major projects will require access to larger amounts of data and it is here that the comprehensive archiving and data processing facilities provided at the central station will be of great value. Most research will probably be done by requesting the appropriate data sets from the archives but for projects requiring access to and manipulation of really large amounts of data it may be possible for the researcher actually to work at the central station, using its computers during the off-peak period.

This article has tried to show how Meteosat fits into the general scheme of observations for meteorology and what the significance of its contribution in various specific fields will be. In the long run, the Meteosat project may be even more important as a prototype of the techniques and organization that will be needed if meteorology is to make full use of modern technology in the future. Meteorology inevitably uses vast amounts of data, and the problems of collecting the data, processing them to reduce their bulk without destroying their value and then distributing them to the point of use are formidable—particularly when it is remembered that they have to be dealt with continuously and in real-time. The Meteosat satellite provides an advanced means of acquiring data but it was early realized that it would lose much of its value unless supported by adequate data-handling facilities. These have been provided and the basic scheme for their use worked out, but the total system—the satellite as an observing platform, the computers on the ground and the satellite as a data relay station—has enormous flexibility and possibilities of development and adaption to meet new needs or take advantage of unforeseen opportunities. It is the task of those who use Meteosat to develop its possibilities to the full and to learn from it the lessons that will lead to a still better system in the future. To end on a personal note, the experience I have been privileged to have of the far-sightedness of the original French designers of Meteosat, the skill and professionalism of the European teams that have carried the project forward and the co-operativeness and enthusiasm of the meteorologists who have planned how to use the satellite leave no doubt that the task will be done well.

A Short History of the Port of London

By J. W. Howe

(External Affairs Department, Port of London Authority)

Origins

London, both as a city and a port, owes its origins to three geographical features. The first is the Thames itself. To our ancestors, rivers afforded the obvious means of movement for themselves, their goods and their chattels, and most early settlements were made on their banks. Thus the earliest trade was waterborne between riverside settlements and the position of the Thames, with its estuary opposite the mouths of the Rhine, Elbe and Scheldt, naturally provided the highway for the beginnings of international trade which was well established before the coming of the Romans.

Whilst providing the highways, rivers formed natural barriers to cross-country movement. The art of bridge building on any large scale was unknown and, apart from ferries, the only means of large-scale movement across a river was by a ford. Close to the present site of London Bridge a gravel out-crop ran across the Thames forming the first ford to be reached on the journey from the mouth of the river. It was, therefore, natural for a settlement to grow up where the various cross-country trade routes joined together to cross the river.

The advent of inter-tribal communication and trade brought war in its wake; security was first a prime consideration in the siting of a settlement. On the north bank of the Thames, by the ford, there was an area of ground that stood above the wide-spread marshes that flanked the river. This high ground was protected on the west by two small tributaries of the Thames (which were later to be known as the Fleet River and the Walbrook) on the north by dense forests, on the east by the marshes and on the south by the Thames itself whose ford could be defended. With all these natural advantages and, beyond the natural barriers already mentioned, surrounded by large areas of fertile land which supported a considerable agrarian population, it is not surprising that a large and prosperous settlement grew up on the site and thrived. Eventually, stories of the richness of the island to the north of Gaul, evidenced by the volume of trade with that country, persuaded the Romans to invade 'Britannicus'.

Early development

The Romans, with their great powers of organization, transformed the city of Londinium and the port. Remains of the quays that they built have been uncovered in archaeological 'digs' adjacent to the Tower of London, and, although there are only scant written records, there is ample evidence that Londinium was already a very busy port. Although quays had been built it was the common practice that ships were moored in the river and their cargoes transferred to the shore in small boats. In this can be discerned the beginnings of the lighterage industry which was to play such a vital part in the port's development. After the departure of the Romans there came long gaps in recorded history, but such records as exist make it clear that London and its trade continued to flourish under the Saxons.

In the reign of King Alfred a 'hithe'—meaning wharf or landing place—was built, this later became known as Queenhithe. To this day merchandise passes over a modern quay still bearing this name which stands on the same site. Shortly after his death appear records of tolls levied upon goods landed at Billingsgate which for

centuries remained the principal quay in the port. Alfred was also responsible for having warships built on the River Lea, a north-bank tributary of the Thames to the east of the city, thus becoming known as 'the Father of the English Navy'. This was the foundation of the Thames-side shipbuilding industry which expanded greatly and lasted for more than a thousand years. Alfred's initiative also ensured that for many centuries London was the headquarters of the Navy.

An upward surge in the port's trade followed the Norman Conquest when large numbers of merchants from many European countries settled in London which they found 'fitted for their trading'. In the twelfth century the Hanseatic League, a commercial combination of a number of German cities, established a headquarters in London, obtained many privileges and threatened several times to monopolize London's foreign trade. Eventually the powers of the League declined and its privileges were withdrawn by Elizabeth I.

The incessant wars of the next 300/400 years, whilst causing great alarms among the citizens, provided the means whereby the trade of the port increased greatly through the import of war materials and this war trading brought with it a concomitant increase in general trade. Of great benefit to the shipbuilding industry were the Navigation Laws, the first of which was passed in 1390 and enacted that all imported and exported goods should be carried in English ships. As an interesting aside, it is worth mentioning that, around this time, Geoffrey Chaucer of *Canterbury Tales* fame was a very senior Customs official.

Further charters were granted to the City of London by successive monarchs which increased the rights and privileges of the merchants and gave considerable political and financial control to the local government of the day over the port's trade, thus increasing the city's prosperity.

The Elizabethan Era and the Merchant Adventurers

The late fifteenth and sixteenth centuries may fairly be said to be the age of discovery. Explorers were extending the boundaries of the known world and the traders followed hard behind the explorers. To take advantage of the great new opportunities offered and encouraged by the promises of trading monopolies, numbers of merchants combined into 'Companies' to take part in 'adventures'. The most famous of the early companies were the Russia Company, the Turkey Company and the East India Company. Later came the West India Company and the Hudson's Bay Company. It was another company of merchant adventurers which was responsible for the successful establishment of the Colony of Virginia. The departure point of the colonists is marked by a monument erected by the north bank of the Thames at Blackwall Point. The activities of these companies provided an enormous stimulus to the trade of the Port of London and this was further enhanced by the sack of Antwerp in 1576, which city had until then been the great port of Europe. The extent of the prominence of London as a result of all this can be measured by the fact that over half of the Crown's revenue from Customs duties was raised in the port.

The immediate result of this enormous upsurge in trade was the realization that the port's facilities for the loading and unloading of goods were totally inadequate. This in turn gave rise to great difficulty in the satisfactory collection of Customs duties. Consequently, Elizabeth appointed a Commission to select 'legal quays' at which all foreign goods were to be landed between sunrise and sunset. The 20 quays selected lay between London Bridge and the Tower, the area now known as the Upper Pool. It was not long before congestion and the clamour of merchants led to the establishment of further 'sufferance wharves' with restricted privileges. These legal quays and sufferance wharves remained for 200 years the only places where foreign goods were permitted to be landed and the difficulties that arose from this situation were the direct cause of the shape of the Port of London that we know today.

A Pause—Empire—the Docks

After the great surge of the sixteenth century which extended into the early part of the seventeenth, there came a pause in the expansion of trade. In 1665 and 1666 the Plague and the Great Fire put a temporary stop to trade altogether, but the Fire at least provided an opportunity for the port's outdated facilities to be improved.

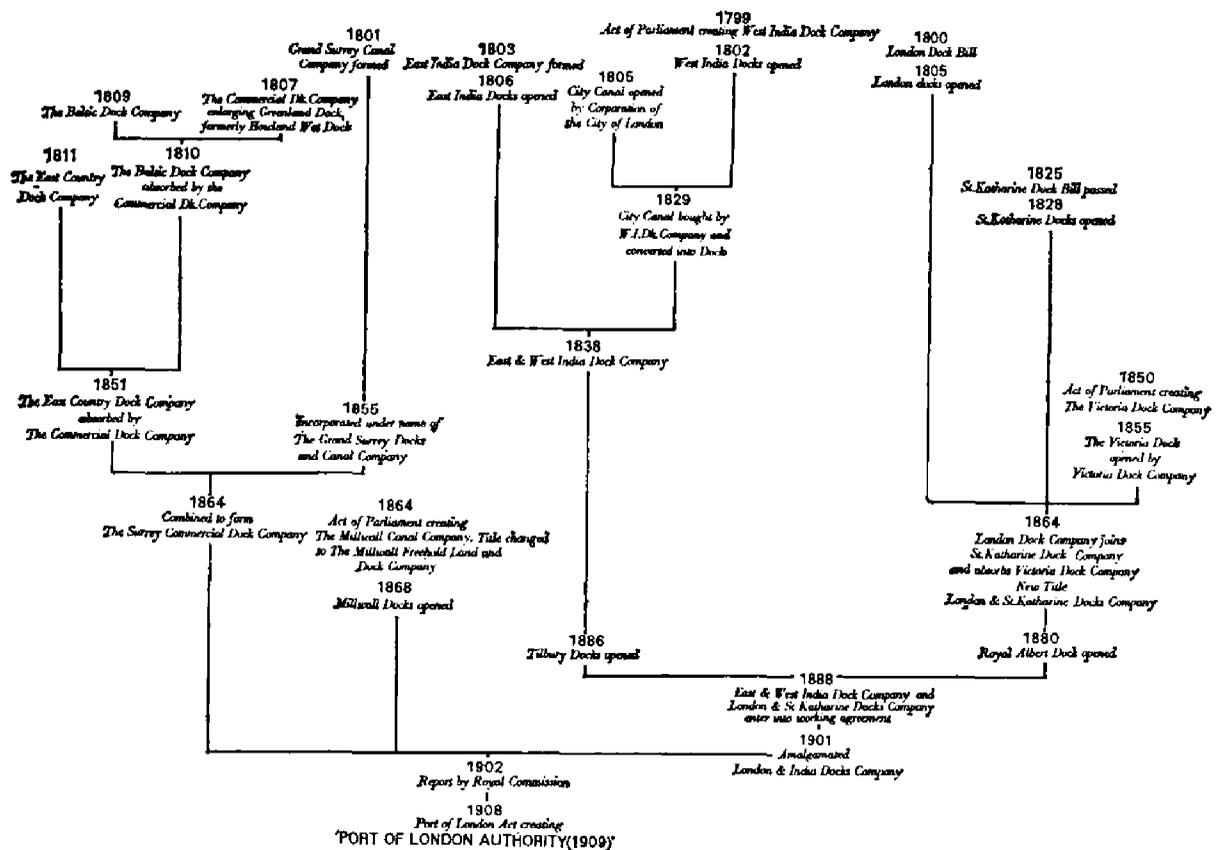
The wars of the Spanish Succession brought into being what has been called the first British Empire which caused London's trade to double between 1700 and 1770, and from this base there came a tremendous leap that saw the volume of trade double again in the next 25 years. The eighteenth and nineteenth centuries were the ages of Empire and Industrial Revolution. Merchants followed the flag and exploited the world in the quest for trade and Britain became the world's wealthiest and most powerful nation.

By the late eighteenth century the port of London was, literally, packed with shipping and associated craft. Owing to the fact that there was only limited landing accommodation, goods were of necessity left in lighters for lengthy periods. Crime and congestion flourished and the port stood in great danger of losing a great deal of its trade. Repeated efforts were made to improve matters but vested interests forestalled action. Eventually, a Bill promoted by the West India Merchants in conjunction with the Corporation of London was passed by Parliament in 1799 authorizing the construction of an enclosed dock on the Isle of Dogs to the east of London.

Around 1650 the East India Company constructed a small dock at Blackwall, the first to have lock gates impounding water at a constant level, for fitting out its vessels after their launching from a neighbouring yard. In 1690 a second enclosed dock, the Howland Great Wet Dock, was constructed on the south, Surrey, bank of the river. This was also built for the fitting out of ships (masting was a great problem in tidal waters) and no attempt was made to use either of these docks for commercial trading purposes. Both were later incorporated into commercial dock systems.

The opening of the West India Dock launched an era of dock building that continued throughout the nineteenth century, a succession of Dock Companies being formed for the purpose as the accompanying chart will show. Incorporated into the West India Dock Bill was a clause which gave the right to wharf-owners and lightermen to send lighters and craft into the dock to collect goods for the riverside wharves or to deliver exports to ships in the dock without payment of dues. This became known as the 'Free Water Clause' and was retained in all subsequent legislation relating to dock construction. The clause was the salvation of the independent lighterage industry which might otherwise have been priced out of existence by the Dock Companies, and it also enabled the wharf-owners to continue in business on more or less even terms with the Dock Companies.

By the 1890s the loss of certain monopolistic privileges by the Dock Companies, which increased the competition from riverside wharves, and the over-provision of shipping facilities led to a price-cutting war. The Dock Companies fell into a poor financial situation which was reflected on the riverside and, co-incidentally, money was not available from public sources. The coming of the iron steamship had caused problems and the rapid increase in size of these ships meant that many of the facilities were rendered obsolete and that navigation channels needed to be considerably enlarged and deepened. For lack of money the port's maintenance and improvement suffered greatly. The problem grew to be so serious as to be regarded by Parliament as a matter of national concern. A Royal Commission was set up in 1900 to inquire into the state of affairs in the Port of London. In 1902 the Commission presented a report containing recommendations for the creation of a central authority to take over the affairs of the port, but a Bill presented in 1903 was not accepted. The Commission sat again and eventually the Port of London Act 1908 was passed and the Port of London Authority came into being.



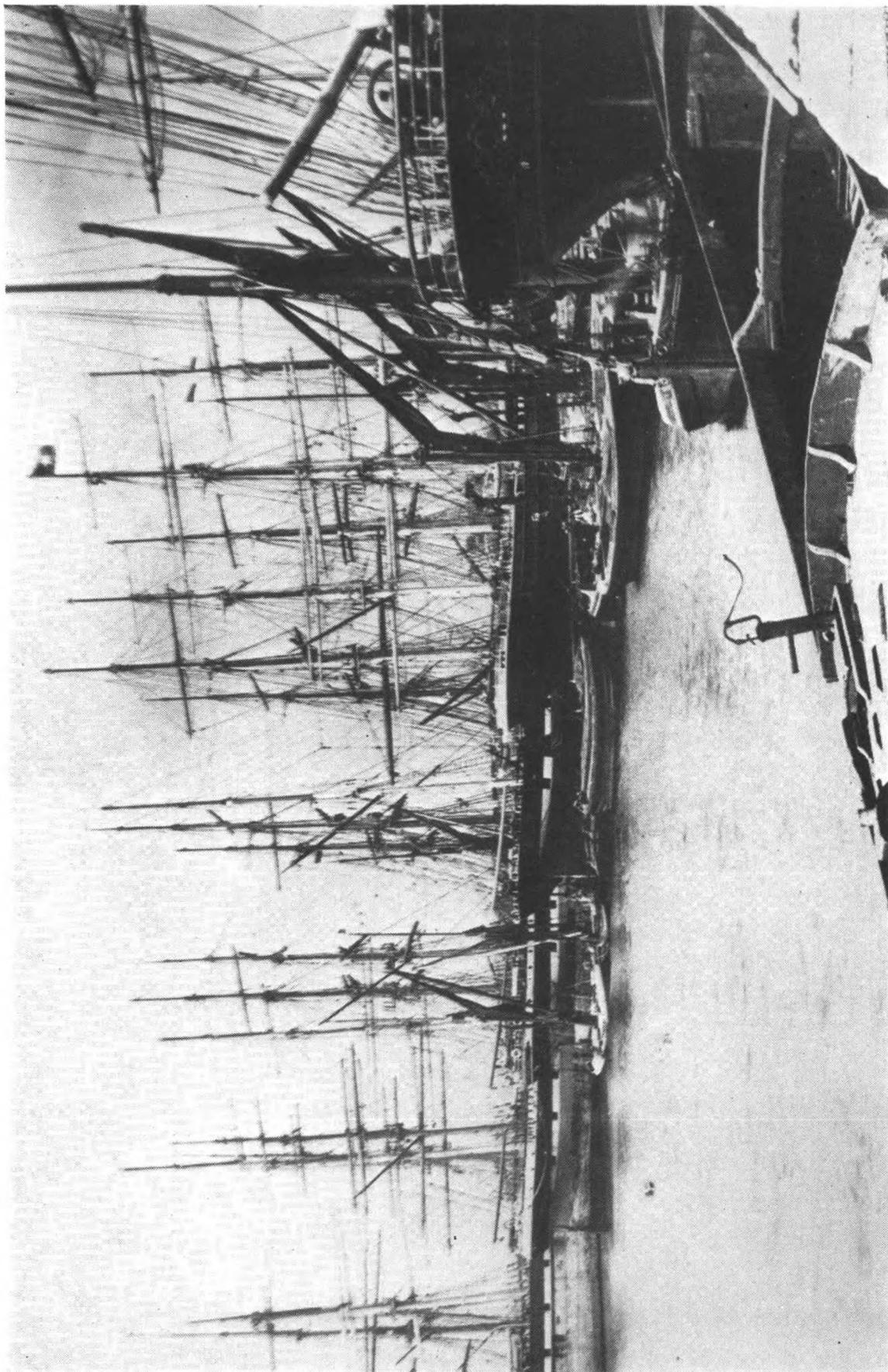
The era of dock development

The Port of London Authority

Upon the passing of the Act the Authority was set up and commenced its activities on 31 March 1909. Its responsibilities were the improvement, administration and operation of the enclosed docks—the function and powers hitherto vested in the Thames Conservancy Board as applicable to the stretch of the Thames from Teddington to the sea, i.e. the whole of the tidal Thames, the maintenance of a deep-water channel from the estuary to the heart of London and the licensing of craft, boats, lightermen and watermen which had been vested in the Watermen’s Company.

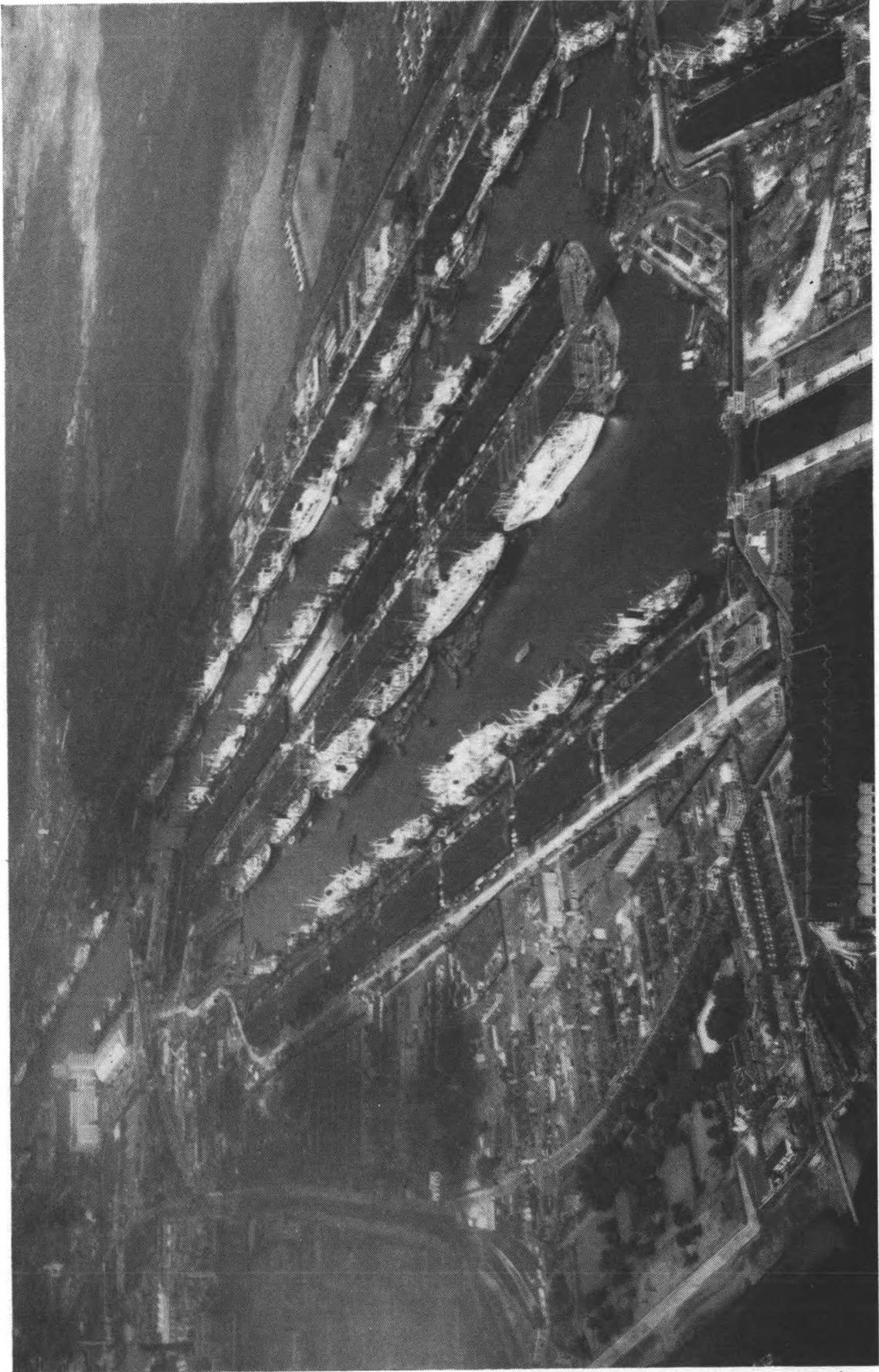
The Constitution of the Authority has changed several times since its inception to meet changing needs and will probably do so again to meet future challenges. Under the current Constitution, which came into effect on 1 February 1976, the Board must comprise not less than 9 and not more than 17 members. The Secretary of State for Transport is required to appoint a Chairman and not less than 7 or more than 10 other members not being officers of the Port of London Authority. Members are selected from amongst persons appearing to the Secretary of State to have wide experience of, and to have shown capacity in, one or more of business management, financial matters, sea transport, inland transport, international commerce, the organization of workers, riverside activities, environmental matters and navigation. The Chairman and other members appointed by the Secretary of State are required to appoint at least one but not more than six officers of the Port of London Authority to serve as members of the Board.

Despite the appearance to the contrary suggested by the preceding paragraph, the Port of London Authority is not a nationalized body. It is a public trust,



Tea Clippers in East India Dock, 1892 (see page 129)

Port of London Authority photograph



The Royal Group of Docks in their heyday, circa 1957. Centre: King George V dock; right-centre: Royal Albert Dock; in distance: Royal Victoria Dock (see page 129)

Aerofilms Limited photograph

independent of both national and local government and is entirely responsible for its own viability in the same way as any other business, receiving no government subsidies or assistance other than the opportunity to raise loans under the 1964 Harbour Loans Act, which assistance is available to all major port operators. (Recently publicized grants are to finance the severance of redundant workers, not to be used in the financing of day-to-day operations).

Under the Board the business of the Port of London Authority is conducted by a Board of Management consisting of the Chief Officers of the Authority each being responsible for a particular aspect of the undertaking, e.g. the river, the docks, finance, engineering, manpower, real estate and administration.

The Port of London Authority has no direct control over the many privately owned businesses that together with it comprise the Port of London, but, conscious of its role and responsibilities, takes a leading part in such organizations as the Joint Port Trade Development Committee, Port Users' Consultative Committee, London Riverside and Docks Trade Promotion Committee and the National and London Port Employers' Associations.

The Modern Era

The establishment and initial operations of the Port of London Authority quickly renewed confidence in the port. Work was commenced on the construction of a large, new dock, the King George V Dock, which was planned to be able to berth the world's largest dry-cargo liners. The out-break of war in 1914 delayed the opening of this dock until 1921 and also caused a set-back in the port's trade, but this recovered quickly upon the cessation of hostilities. The face of the port changed. New industries such as the Ford Motor Company appeared, enormous oil installations were developed and the giant fingers of power station stacks grew along the Thames banks. The increasing prosperity of the population of south-east England created an ever-growing demand for consumer goods and more and larger ships sailed into London from all over the world. In general terms the depressions of the 'thirties' did not affect the south-east as much as the rest of the country and the Port of London thrived.

War came again in 1939 and this time, as a result of the 'improvements' in weaponry, the trade of the port was drastically reduced. Many facilities in the port were badly damaged by bombing. With the advantage of hindsight it could be said to be almost a pity that the damage was not even greater so that after the war was over there would have been less repair and more reconstruction. Recovery from the 1939-45 war and the subsequent years of austerity was much slower than had been the case in 1919. However, by the 1950s more shipping and a greater volume of cargo was moving through the Port of London than ever before. It looked as though the halcyon days had returned, but there were clouds on the horizon.

The graph of world-wide technological progress was rising rapidly and patterns of trade were beginning to change from the old traditional methods. Economic influences were at work which demanded a new and much higher degree of capital expenditure on facilities to meet these changing patterns. The Port of London Authority and many riverside operators had to examine their facilities with a view to planning obsolescence and phasing out of those which could not be expected to meet future needs. The new words were palletization, bulk-handling, pre-packaging, unitization and, finally, containerization. Co-incidental with these changes it was becoming Government policy to persuade industry to move away from London to less-prosperous areas of the country or to 'New Towns', and the big change-over from coal to oil was under way. To add to the upheaval, some European ports, notably Rotterdam, were expanding rapidly with the advent of the Common Market. There was an explosion in the use of road transport and to meet this there was set up a nation-wide road improvement program which gave an impetus to the expansion of port facilities in what, until then, had been little more than coastwise

or short sea-trading out-ports. Finally there was political and economic turmoil throughout the world which led to enormous changes in the patterns of international trade and the effects of these were felt most strongly by the traditional maritime trading nations such as Britain.

The consequences of all these cross-currents and upheavals were apparent to far-sighted managements in the Port of London. Reconstruction costs were by now so high that small companies either merged or went out of business whilst others on the riverside moved to other locations. Also it was plain that the port was going to suffer a reduction in trade which would vary according to the success or otherwise of the measures taken. The first requirement was that whatever was done must be successful financially and the second was that reconstruction had to take into account the new forms of cargoes to be handled and the new and larger types of ships that would carry them. A program of rationalization was begun that continues today and which has had far-reaching effects.

Closures and Openings

Many of the Port's facilities, for both financial and physical reasons, could not be adapted to meet the changing needs and were, therefore, discarded. The Port of London Authority decided that several of its docks should be closed and sold, the revenue obtained being used for redevelopment elsewhere. These were the East India Dock, closed 1967, the London and St Katherine Docks, closed 1968 and the Surrey Docks, closed in 1970. Later, because of the declining requirement for conventional cargo handling facilities, some berths in the West India, Millwall and Royal Group of docks were moth-balled. Concurrent with the dock closures a number of riverside wharves in London, particularly in the area round the Pool, also closed and ocean-going shipping is no longer seen in the city reaches of the Thames.

During this period, large, ultra-modern wharves were built down-river from the Pool, Express Wharf and Victoria Deep Water Terminal in the Millwall/Greenwich area, Phoenix Wharf at Dagenham and Purfleet Deep Wharf at Purfleet being typical examples. The Port of London Authority's principal site for major developments was at Tilbury. An enormous extension to Tilbury Dock was constructed which received its first ship in 1967. Primarily this dock extension is given over to huge container and forest products terminals through which several millions of tonnes of cargo pass annually. In 1969 the Authority opened a giant grain terminal on the riverside at Tilbury, the largest in Britain, which can receive ships in excess of 80 000 tonnes.

To meet the ever-growing demand for container operation facilities, a huge new berth was constructed on the riverside as an extension to an in-dock terminal at Tilbury. Known as the Northfleet Hope development it was financed by a consortium of two major users of the port, Overseas Containers Ltd and Associated Container Transportation Ltd and the Port of London Authority, and is capable of servicing the largest container vessels afloat; this berth was opened in 1978. In addition to the physical and financial considerations involved in this major reorganization of the port, the human factor was also a major consideration. The new technology of cargo handling has demanded a change from a labour-intensive industry to a capital-intensive one and, in the Port of London, this has resulted in the loss of some 25 000 jobs over the last 10 years or so. Also the eastward movement of the centre of activity in the port away from London has left large areas of 'port land' in east London bereft of its traditional port and port-associated industry.

The vast and complex problems caused by these drastic changes in the port industry have not arisen solely in London; all the old, traditional ports have also experienced them. However, it is London, by far Britain's largest port that has suffered the most in physical, financial and human terms, and it will need the greatest determination to overcome the current challenges.

ENCOUNTER WITH HURRICANE 'FLOSSIE'

BY N. A. MILLER

(2nd Officer, m.v. *Manistee*)

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The first warning came at 1700 GMT on Monday, September 11 1978 that a tropical revolving storm (TRS) named Flossie was developing in the area $31\frac{1}{2}^{\circ}\text{N}$, $45\frac{1}{2}^{\circ}\text{W}$. At this time we were on a course of 242° just north-east of Flores Island in the Azores experiencing the usual fine and settled weather associated with the Azores high pressure system. The hurricane, about 900 n. mile away, seemed a long way off and far from threatening. We duly plotted the position and subsequent forecast positions of the storm centre. Its movement, apparently, was in an east-north-easterly direction at 18 knots with maximum sustained winds of 55 knots with gusts to 70 knots.

The next warning was received at 0900 on Tuesday morning. According to this, the hurricane had slowed down considerably, its movement still in an easterly direction but at eight knots—maximum sustained winds of 65 knots with gusts to 80 knots.

Our course from Flores Island to the Mona Passage was 237° and we could see that we would pass fairly close to the hurricane although at that time we were still 600 n. mile away. The weather at the ship was still fine with no hint of the bad weather to come.

The 3rd Officer and I having both just completed 2nd Mate's and 1st Mate's Certificate exams respectively, were by now avidly discussing all the facts we had learnt at college concerning TRSs, their origin, development, characteristic movement, warning signs, avoiding procedure and many other aspects, not really expecting to have to put it all into practice.

Morning sights were taken in clear skies but by noon the cloud was building up and we only just managed to get a meridian altitude before the sky clouded over.

The next report came at 1500. Clearly the hurricane was doing anything but following the predicted pattern. It was still moving east-north-eastwards but had slowed down to six knots and was filling—maximum sustained winds of 70 knots with gusts to 90.

With each warning came a forecast of the radius of 35-knot winds and the radius of 5-metre seas or higher from the storm centre. The forecast for the 0900 report read as follows: Radius of 35-knot winds—150 (nautical miles) NE, 125 SE, 100 SW of 5-metre seas or higher from the storm centre. The forecast for the 0900 report 100 NW. Radius of seas of 5 metres or higher 150 NE, 150 SE, 100 NW.

At 1530 the master decided it would be prudent to pass at least 50 n. mile outside these forecast radii, putting at least 200 n. mile between us and the storm centre, so we altered course to 242° .

By this time the weather was deteriorating with a lot of high cirrus cloud and a swell developing, though, not as expected, from the direction of the storm centre.

At 2100 a further report came in. The hurricane was still moving east-north-eastwards, had again slowed down to five knots and was still filling—maximum sustained winds of 75 knots with gusts to 90. Still, if it carried on in its predicted path eastwards, it would pass well to the south of us.

Relieving the 3rd Officer at midnight, we again talked about various aspects of Flossie especially the unpleasant possibilities of it turning northward and speeding up, thereby crossing our course line and hitting us fair and square, though we secretly thought it could never happen to us.

By the time the Chief Officer took over from me at 0400 the sky was completely overcast with still not much wind but a confused swell with one coming in from the direction of the storm centre trying to predominate.

We received the next report at 0900 on Thursday morning and sure enough our worst fears were realized in that the storm centre had turned north and still moving at five knots was still filling—maximum sustained winds of 80 knots with gusts to 100. The forecast position of the centre at 1500 would be at our closest approach of 60 n. mile.

By noon the weather was really deteriorating with a force 8 to 9 wind and fairly heavy swell from the direction of the storm centre, heavily overcast, low stratus clouds and frequent rain squalls. The ship was rolling and pitching moderately going over 10 to 15 degrees. The pressure had fallen from 1015.5 mb at 1000 to 1011 mb at noon and the barograph trace began to show typical signs of an approaching TRS, that is, a marked trace with clear diurnal variation followed by a rapid fall with no indication of diurnal variation at all. It was the sort of trace one reads about in textbooks but rarely has the chance to experience.

The wind was increasing as well as the swell height and the rain squalls were becoming more frequent and dense. The visibility which had been about one n. mile at noon, was soon reduced to 5 cables, then to 2½ cables to a point where it was difficult to make out the fo'c'stle in the driving rain. The wind was whipping up the wave crests and spewing them over the surface in long white streaks while the ship's rolling was increasing to 20 and occasionally 25 degrees. All loose gear having been stowed, it was a case of hanging on to the nearest fixed object when the ship tilted at these crazy angles.

We anxiously awaited the next report due at 1500 which would give an update of the storm centre, which, by now we knew, must be quite close.

At 1430 I recorded a wind force of 10 and a pressure of 999 mb—a drop of 12 mb in 2½ hrs. However, the wind had begun to back which was a point in our favour, putting us in the navigable semi-circle of the hurricane if it did pass very close.

At 1500 the next forecast was received. As if it was sniffing us out, Flossie had actually moved in a north-west direction and had increased in speed in the previous six hours, which put the storm centre only some 40 n. mile distant to the south of us.

At this point I would mention that although at the storm centre or 'eye' the winds are light and variable with clear skies, it is the huge mountainous confused seas that cause all the damage to ships and must be avoided if at all possible.

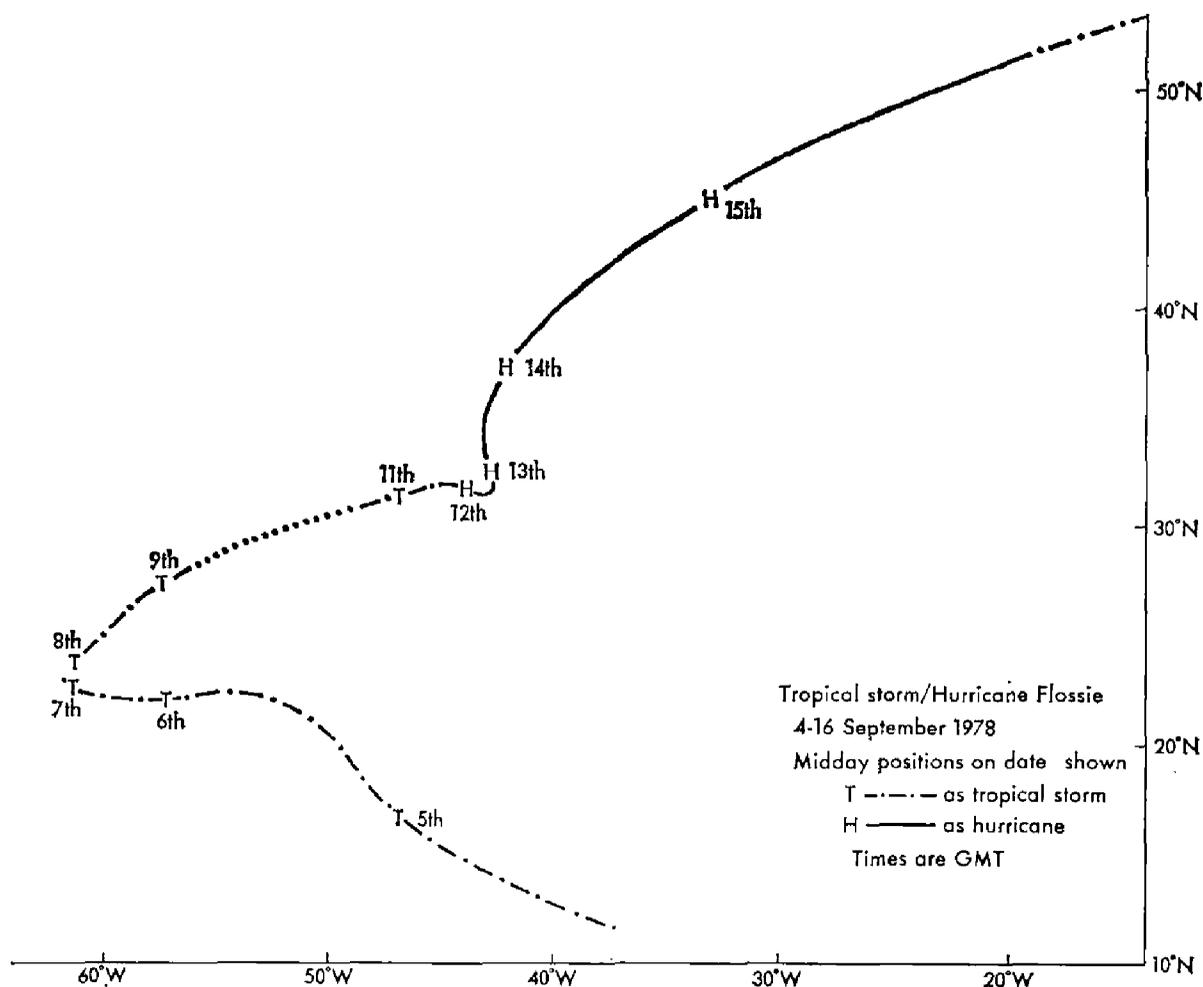
Armed with the 1500 information the master decided to alter course to 270° to put the wind on the starboard quarter. The pressure had plummeted another 4 mb to 995 mb in just 30 minutes and the swell had increased in height to about five metres, although probably more, being difficult to judge in the prevailing circumstances.

After about 20 minutes on the new course, the wind and swell, having backed considerably on the starboard beam, were rolling the ship over to some incredible angles, the worst being 38° to port. Looking out at the angle the forward cranes made with the sea, it was difficult to imagine anything of this size ever returning to upright. If one leaned out over the port bridge-wing one could quite easily have touched the sea.

The course was quickly adjusted again to get the wind back onto the starboard quarter which eased the rolling a fraction. With the incredible pitching and rolling the propellor was at times coming completely clear of the water and racing.

In order to protect the engine against the huge stresses imposed on it by the racing of the propellor in heavy seas, a cut-out device is incorporated into the sophisticated engine control system. Not wanting to be left wallowing at the mercy of the sea and swell in the path of the approaching hurricane it was decided to reduce speed to a level where the risk of the engine stopping was eliminated, but we were still moving away.

The pressure had finally stopped falling at 995 mb and was just as rapidly rising again. Although the wind was still force 10 and still backing, by 1600 the pressure



had risen to 997 mb so clearly the worst was over as we were now putting some distance between us and the storm centre.

When I went on the bridge at midnight, it was difficult to imagine that a hurricane had existed at all. The sky was clear with light and variable winds, the sea rippled and with a long swell from the general direction of the storm, the only indication that only 8 hours previously we had passed just 40 n. mile from hurricane Flossie's centre.

Note 1. m.v. *Manistree* is a US Selected Ship.

Note 2. Flossie was first identified as a tropical storm on 4 September in approximate position 12°N, 37°W. The storm was thought to have dissipated late on the 9th but came to life again on the 11th and was upgraded to hurricane on the 12th. She persisted until early on the 16th after which she quickly dissipated.

The sketch map shows the track of Flossie and her midday (GMT) positions and is derived, largely, from satellite pictures.

PRESENTATION OF BAROGRAPHS

As announced in the January 1979 issue of *The Marine Observer* the following four shipmasters were selected for the 1977 Barograph Awards: Captain J. D. Hellings, late of P. & O. Lines, now serving with World-Wide Shipping Group, Captain N. W. Cockshoot, Manchester Liners Limited, Captain J. H. Hutson, Container Fleets Limited (formerly of New Zealand Shipping Company) and Captain V. A. Hunt, Cunard Shipping Services Limited (formerly of Port Line).

This year the ceremony took place at Meteorological Office Headquarters in Bracknell on 12 February 1979 when the presentations were made to three of the Masters by the Director of Services of the Meteorological Office, Mr F. H. Bushby, see photograph opposite page 141.

Assembling the three shipmasters together at the same time provided more than unusually difficult this year, two of the recipients being on the verge of 'making ready for sea' and the third having just arrived home. The fourth Master, Captain J. D. Hellings, was unfortunately at sea and consequently unable to attend. Arrangements will be made to present Captain Hellings with his award on his return home.

Notwithstanding the absence of Captain Hellings, it was with a great deal of pleasure that we were able to welcome Captains Cockshoot, Hutson and Hunt together with Mrs Cockshoot and Mrs Hutson. The managerial side of two of the Companies were represented by Captain H. J. Holdrup, Marine Superintendent of Cunard Shipping Services and Mr P. M. Pennell, Assistant Operations Manager of Container Fleets.

Before making the presentations, Mr Bushby expressed his appreciation for the long and valuable services rendered by these three Masters and for the enthusiasm of the Voluntary Observing Fleet in general. He also emphasized the continuing importance of surface observations from ships, both now and in the future, despite the number of meteorological satellites in orbit, moored and drifting data buoys and other techniques.

Following the presentations the Masters were invited to examine their first meteorological logbooks and record cards.

The visitors were then entertained to luncheon by Mr Bushby and other senior officers of the Meteorological Office, afterwards the party was conducted through the Central Forecasting Office and the Telecommunications Centre and were also shown the Computer Laboratory.

J. D. B.

AURORA NOTES—JULY TO SEPTEMBER 1978

BY R. J. LIVESEY

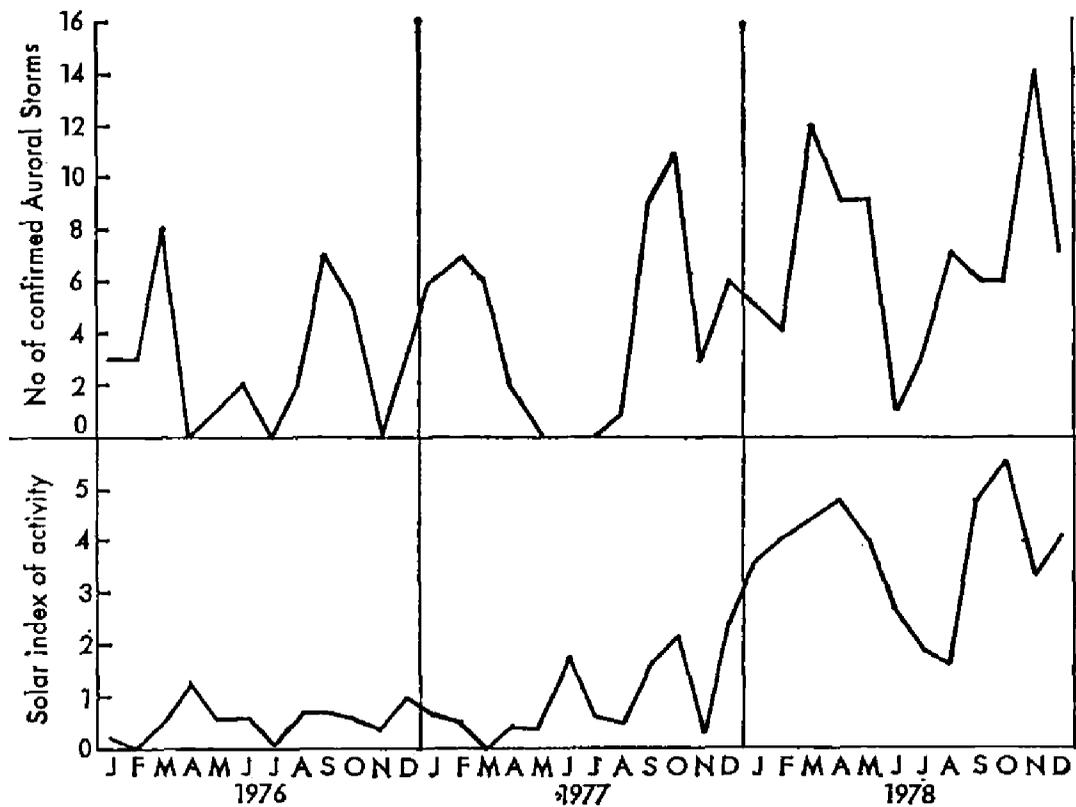
(Co-ordinator of Auroral Observing, the Solar Section of the British Astronomical Association)

Details of marine aurora observed during the period under review are given in the table at the end of these notes. Of particular interest are observations from the southern hemisphere which amplify the activity observed in the northern hemisphere. The fact that dates and times are related to Greenwich Mean Time cause the event reported by m.v. *Tongariro* to appear as two entries.

No activity was reported by mariners during July and summer conditions in the northern hemisphere limited observations by land observers; some aurora was, however, observed by the latter on the nights of the 4th, 6th, 9th, 13th, 14th, 28th, 29th and 30th. Radio-detected aurora was noted on five nights between the 14th and the 22nd. None of this activity appears to have been of an intense variety.

During August some activity was reported on the nights of the 4th, 5th, 11th and 12th. Intense activity, developing on the 26th and 28th as glows, was followed by active storms leading to corona conditions on the 29th. This activity, seen by a number of observers, reverted to simple arcs on the 30th and 31st. Radio auroral echoes were reported during the period 27th to the 31st.

During September there was low-key activity on the 1st, 3rd and 19th. This was followed by a build-up of activity from the evening of the 25th to that of the 29th with all-sky activity and active ray structures reported according to the location of the observer. Radio echoes were reported from the 25th to the 29th.



Comparison of solar and auroral activity

It must be stressed that all activity is that which has been notified to the writer and may omit activity which has either not been seen due to climatic conditions or not reported.

During the period sunspot activity reached a minimum after the upsurge in the spring and then, from September, started to climb rapidly towards the end of the year. Considerable cloud cover severely hampered land observers in the United Kingdom from the summer onwards so that marine observations became all the more valuable as a cross-check on event nights. Of importance was a series of recurring aurora on the 4th, 29th and 31st of August, the 26th and 28th of September also the 22nd and 26th of October—this series represented three rotations of the sun when the same sunspot group was in the same position on the solar disc relative to the earth and presumably sprayed the earth, like a revolving garden hose, with electrically charged particles.

Marine observers are encouraged to send in their observations. Each storm report is analysed by working out the location of the activity both geographically and in relation to the earth's magnetic field. The intensity of the storm activity is coded and compared with other reports. Where adequate information is available for a storm in north-west Europe, the locations of the auroral forms are plotted on a chart relative to the time of occurrence. Where available, the changes in form are also plotted against a magnetogram which records against time the fluctuations in the earth's magnetic field. Finally, the data are fed with all other available information onto a diagram representing the rotation of the sun and recurrence periods are determined.

Please accept the sincere thanks of the investigating team, your contributions, however small, are greatly appreciated.

DATE 1978	SHIP	GEOGRAPHIC POSITION		TIME (GMT)	FORMS
12 Aug.	<i>Muirfield</i>	51° 50'N	54° 00'W	0400-0600	dA, R
28	<i>Maersk Commander</i>	40° 42'N	67° 57'W	0600-0800	G, pR, A
31	<i>Asialiner</i>	41° 00'N	63° 00'W	0525-0555	aHA
2 Sept.	<i>Sugar Crystal</i>	56° 30'N	25° 15'W	0245-0330	R
3	<i>Sugar Crystal</i>	55° 42'N	37° 05'W	0300-0500	G, R
27	<i>Vickers Viscount</i>	60° 52'N	00° 00'E	0130-0150	mR, mR all sky
28	<i>Tongariro</i>	37° 12'S	120° 18'E	1100-1159	aHB
29	<i>Tongariro</i>	37° 12'S	120° 18'E	1200-1600	pR, G
29	<i>Jervis Bay</i>	38° 00'S	149° 35'E	1100-1300	aR, aG
29	<i>British Centaur</i>	position unknown		1130-1530	R

KEY: m = multiple, d = double, a = active, p = pulsating, R = rays, G = glow, A = arc, B = band, H = homogenous.

Marine Aurora Observations July-September 1978

ICE CONDITIONS IN AREAS ADJACENT TO THE NORTH ATLANTIC OCEAN—JANUARY TO MARCH 1979

The charts on pages 142 to 144 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).

JANUARY

There was considerable excess of ice in the Barents and Baltic Seas and in the Kattegat. Ice fringed the Skagerrak and the north-west coast of Germany. The Kiel Canal was closed on account of ice for much of the month. The anomaly for low temperatures that was a feature over the Barents Sea and northern Europe during December was extended west in January as far as Greenland. South-west of Greenland the ice edge resumed a position near normal after the deficits of December.

Over north-east Canada air temperatures during January were higher than normal. Deficits of ice increased during the month in Baffin Bay and large deficits appeared off the coast of Labrador and in the Gulf of St Lawrence—where towards the end of the month new and young ice was broken by easterly gales and driven towards the coast.

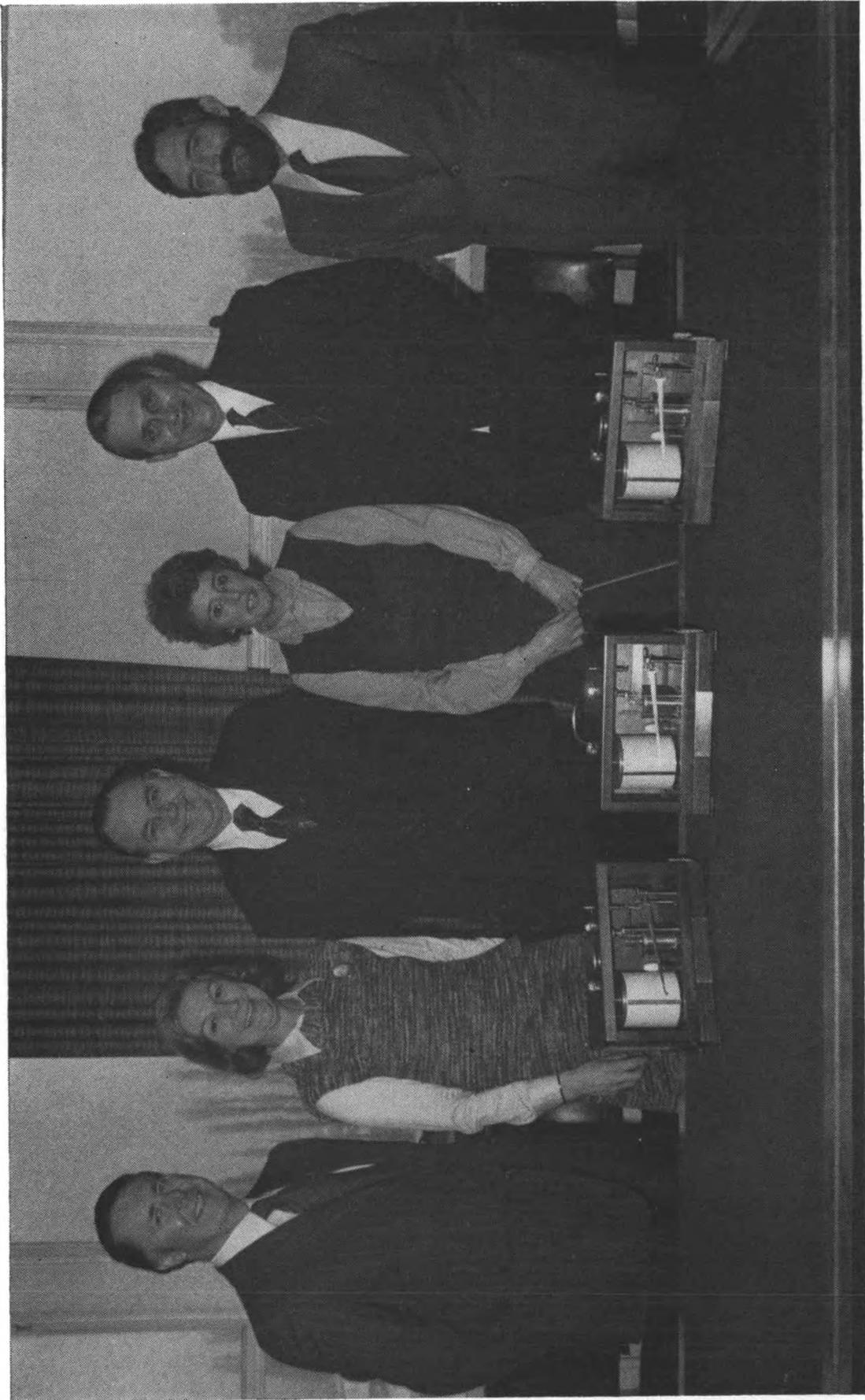
FEBRUARY

Over the Barents Sea the abnormally cold weather and considerable excess of ice persisted during February. Excesses of ice in the Baltic and Skagerrak continued to be a hazard to navigation. A considerable change took place over north-east Canada where the anomaly for higher-than-normal temperatures during January was reversed by strong cold winds from the north during February; deficits of ice in Baffin Bay and off Labrador and Newfoundland were drastically reduced.



Northfleet Hope development and Tilbury Dock extension. Centre-foreground: Europe's largest refrigerated container stack; in dock: containers left, forest products right; background: P.L.A. grain terminal and privately owned silo and mill complex (see page 129)

Handford photograph



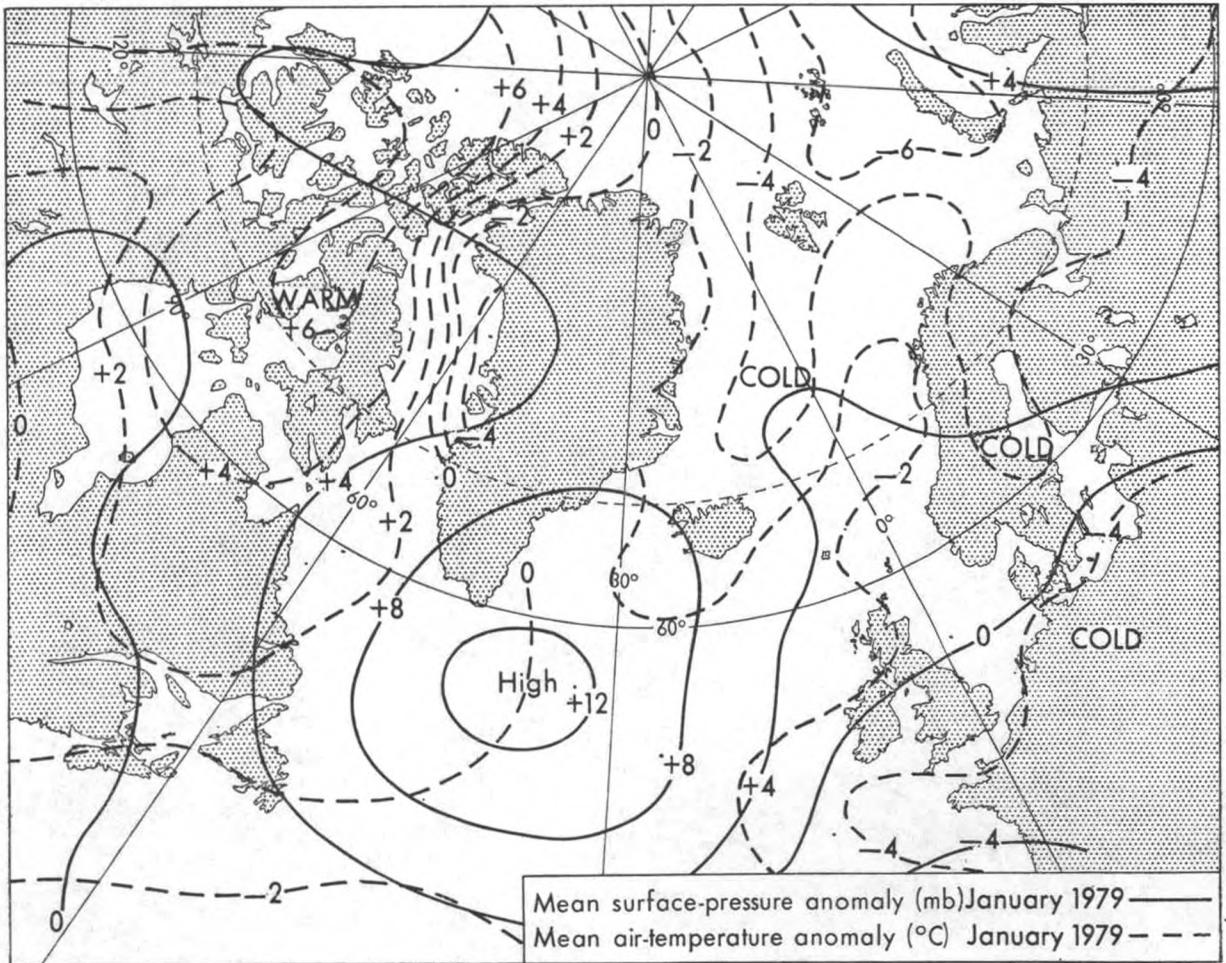
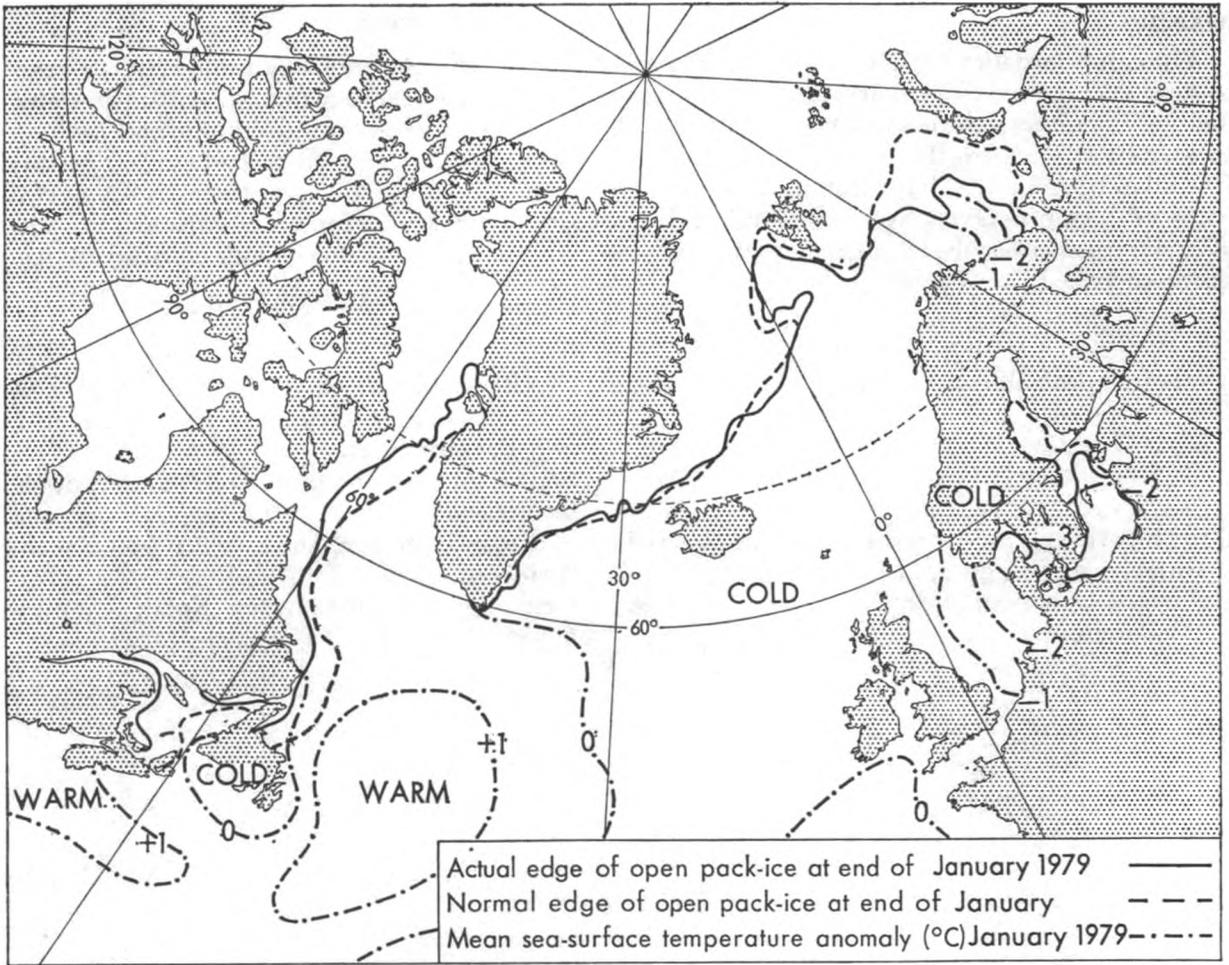
Presentation of barographs on 12 February 1979 at Bracknell. Left to right: Captain and Mrs N. W. Cockshoot, Mr F. H. Bushby, Captain and Mrs J. H. Hutson and Captain V. A. Hunt (see page 137)

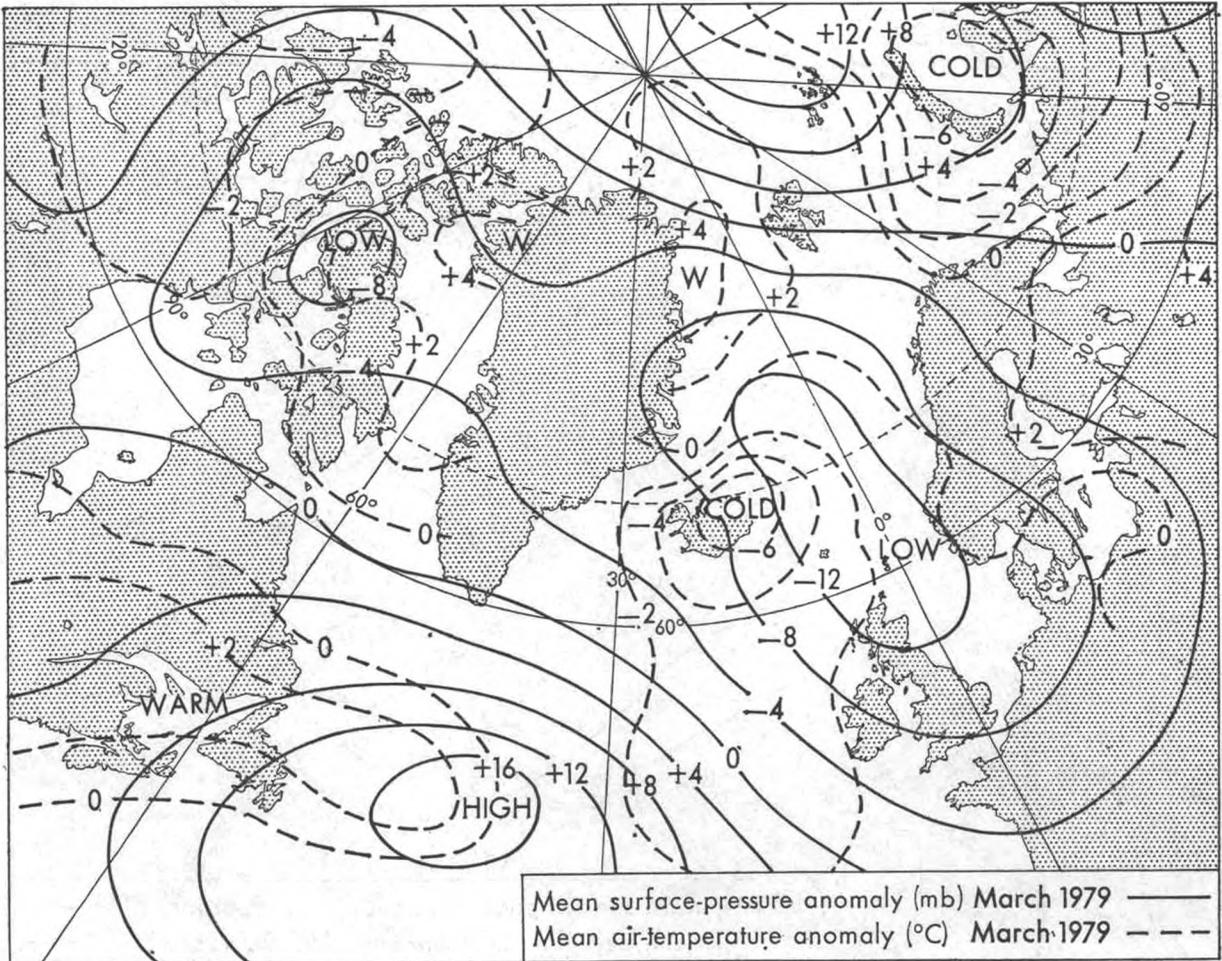
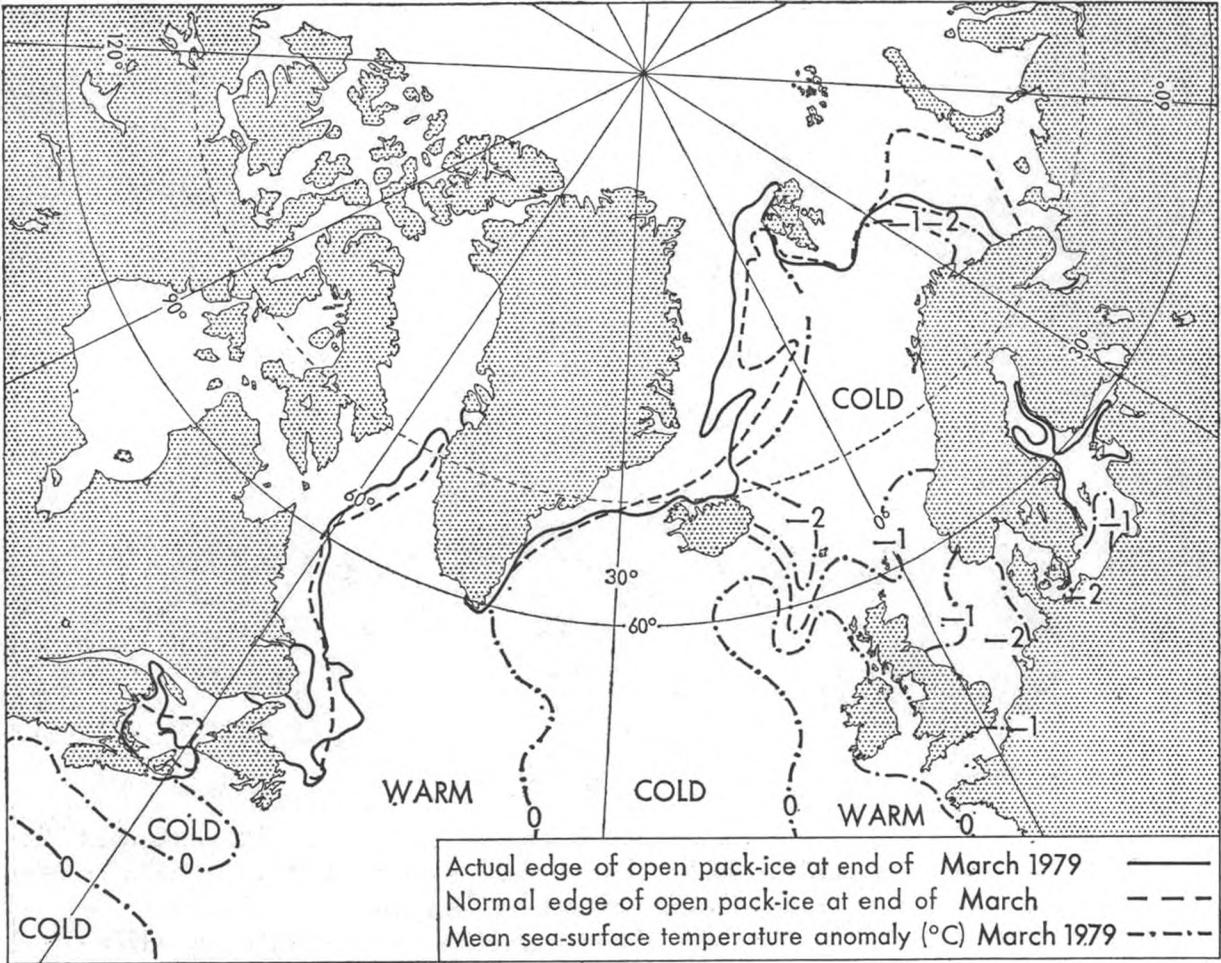
MARCH

Though anomalies for low temperature persisted over the Barents Sea temperatures rose to near average over the Baltic and above average over north-east Greenland. In the Barents Sea ice remained in excess of normal. In the Baltic the ice disintegrated rapidly and melted so that by the end of the month conditions were near normal. Ice also disintegrated in the Greenland Sea but drifted south in the current to give a considerable excess towards the north coast of Iceland. Over Newfoundland and Labrador a tendency for south-westerly winds gave temperatures above normal with some clearances near the coast and drifting of ice north-eastwards.

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. |





Baltic Ice Summary: January-March 1979

STATION	JANUARY						FEBRUARY						MARCH															
	LENGTH OF SEASON		ICE DAYS		NAVIGATION CONDITIONS		ACCUMULATED DEGREE DAYS		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	A	B	C	D	E	F	G	H	I	
Lulea	1	31	31	31	0	0	31	0	1128	1	28	28	28	0	0	27	1	1464	1	31	31	31	0	0	31	0	1593	
Skelleftea	1	31	31	31	0	6	25	0	—	1	28	28	28	0	5	23	0	—	1	31	31	31	0	0	31	0	—	
Bredskar	1	31	31	4	27	26	5	0	—	1	28	28	4	24	28	0	—	—	—	1	31	31	7	24	30	1	0	—
Sundsvall	1	31	31	31	0	31	0	0	—	1	28	28	28	0	27	1	0	—	—	1	31	31	31	0	31	0	0	—
Sandarne	1	31	31	18	13	30	1	0	—	1	28	28	28	0	8	20	0	—	—	1	31	31	0	31	12	19	0	—
Oxelsud	7	31	10	4	15	19	0	0	—	1	28	27	21	4	27	0	0	331	1	24	19	13	2	19	0	0	362	
Visby	0	0	0	0	0	0	0	0	222	25	28	4	0	3	4	0	0	—	—	1	11	10	0	7	0	0	—	
Kalmar	6	31	25	3	19	25	0	0	—	1	28	28	0	28	26	2	0	—	—	1	31	31	0	31	0	0	—	
Goteburg	17	31	12	0	9	11	0	0	—	1	28	17	0	15	14	0	0	—	—	1	9	5	0	5	0	0	—	
Stockholm	1	31	31	31	0	31	0	0	425	1	28	28	28	0	28	0	0	607	1	31	31	0	0	31	0	0	620	
Helsinki	1	31	31	31	0	27	4	0	660	1	28	28	28	0	0	28	0	948	1	31	31	31	0	0	31	0	1000	
Turku	1	31	31	31	0	31	0	0	632	1	28	28	28	0	28	0	0	882	1	31	31	31	0	31	0	0	928	
Mariehamn	1	31	31	27	0	29	0	0	—	1	28	28	28	0	28	0	0	—	—	1	31	31	31	0	31	0	—	
Mantylouto	1	31	29	10	15	29	0	0	—	1	28	28	8	20	3	25	0	—	—	1	30	30	30	0	0	0	—	
Vaasa	1	31	31	31	0	27	4	0	796	1	28	28	28	0	0	28	0	1094	1	31	31	31	0	0	31	0	1151	
Norskar	1	31	20	0	19	12	7	0	—	1	28	28	28	0	0	28	0	—	—	1	31	31	0	28	0	0	—	
Oulu	1	31	31	31	0	1	30	0	—	1	28	28	28	0	0	28	0	—	—	1	31	31	0	0	31	0	—	
Rovaa	1	31	31	22	9	2	29	0	—	1	28	28	28	0	0	28	0	—	—	1	31	31	0	0	31	0	—	
Leningrad	1	31	31	31	0	0	31	0	767	1	28	28	28	0	0	28	0	1073	1	31	31	31	0	0	31	0	1110	
Viborg	1	31	31	31	0	0	31	0	—	1	28	28	28	0	0	28	0	—	—	1	31	31	31	0	0	31	0	—
Tallin	1	31	28	0	26	6	12	0	—	1	28	28	0	28	7	21	0	—	—	1	31	31	0	31	0	0	—	
Riga	1	31	31	15	12	25	1	0	565	1	28	28	17	9	5	17	1	766	1	31	31	26	2	24	11	3	0	779
Pyarnu	1	31	31	31	0	0	0	31	—	1	28	28	28	0	0	3	25	—	—	1	31	31	0	0	0	0	—	
Ventspils	1	31	31	2	21	22	0	0	—	1	28	28	0	27	22	1	0	—	—	1	21	17	0	12	12	0	—	
Klaipeda	1	31	23	0	21	20	0	0	—	1	28	25	0	25	24	0	0	—	—	1	22	16	0	11	3	0	—	
Emden	3	31	29	0	27	26	0	0	—	1	28	28	0	28	28	0	0	—	—	1	6	6	0	6	0	0	—	
Bremerhaven	4	27	12	1	11	10	0	0	—	16	24	8	0	7	6	0	0	—	—	0	0	0	0	0	0	0	—	
Hamburg	3	31	29	0	29	29	0	0	171	1	28	22	0	18	18	0	0	254	1	16	16	3	3	0	2	0	168	
Flensburg	4	31	26	2	24	26	0	0	—	1	28	28	0	28	13	8	6	—	—	1	3	3	0	3	0	0	—	
Kiel	4	31	10	3	5	8	0	0	—	12	28	13	1	12	5	8	0	—	—	1	3	3	0	3	0	2	—	
Lubeck	3	31	26	0	25	23	0	0	191	1	28	26	1	19	24	0	0	—	—	1	12	8	0	8	0	0	—	
Stettin	1	31	28	0	28	28	0	0	310	1	28	28	0	28	24	0	0	310	1	12	8	0	8	0	0	0	232	
Gdansk	2	23	9	0	6	3	0	0	338	9	28	19	0	0	14	0	0	496	1	19	4	0	4	0	0	1	488	
Copenhagen	3	31	14	0	10	10	0	0	132	1	28	19	0	19	11	6	0	228	15	27	12	0	12	6	0	0	197	
Aarhus	3	31	24	0	23	20	0	0	—	1	28	18	0	18	18	0	0	—	—	1	23	14	0	14	0	0	—	
Oslo	24	24	1	0	0	0	0	0	544	12	14	3	0	0	3	0	0	750	0	0	0	0	0	0	0	0	761	
Kristiansand	29	29	1	0	0	0	0	0	—	12	14	3	1	0	3	0	0	—	—	0	0	0	0	0	0	0	—	
fjord	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

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.

Book Review

A Field Guide to Seabirds of Britain and the World, by G. S. Tuck, illustrated by Herman Heinzel, 200 mm × 130 mm, pp. 292. Collins, St James's Place, London. Price £5.25.

This comprehensive and handsomely illustrated book, expertly indexed with common English as well as scientific names of seabirds, is the work of Captain G. S. Tuck, D.S.O., R.N., Chairman of the Royal Naval Birdwatching Society, who has devoted a great many years to the compilation of the work.

Captain Tuck's name will be familiar, not only to members of the Society, but also to the large number of mariners on merchant ships who have sent in seabird reports to him, either directly or included in their Meteorological Office logbooks. Such reports have been forwarded to Captain Tuck for his information and identification for many years and the information provided so willingly by him is then passed back to the ships concerned and, on occasions, in the case of the more-interesting ones, published in this journal.

The book is robustly bound, as indeed it needs to be when used aboard ship perhaps in the open air for identification purposes, and will, no doubt, be used as a frequent reference judging by the number of bird reports received in the Meteorological Office every month.

As the author remarks in the preface: 'This is a practical handbook not a work of systematics. Awesome numbers of sub-specific titles have been assigned in works covering the seabirds of different countries. Many of these may well be justified. But in a book such as this the main object is to provide a guide to those seabirds which can be identified by field observation. Sub-specific titles, based on small taxonomic and plumage distinctions, have been reduced in general to a minimum to embrace only those races whose variations are observable in the field'.

This volume contains everything a seabird watcher needs to know—sizes, measurements, plumage and markings, flight and points of behaviour useful for identification, range of flights and breeding areas. There are 781 birds painted in colour and 138 line-drawings together with 313 maps indicating the breeding, non-breeding and migratory distributions world-wide. It also includes a general outline of the kinds of food consumed by the various groups in their natural environment and recommends the care and feeding of sea and landbirds which appear on board a ship either by accident or design.

The book is a mine of information for anyone interested in this subject and will be of inestimable benefit to the experienced watcher or the enthusiastic beginner who has yet to learn the topography of a seabird.

J. D. B.

Personalities

OBITUARY.—It was with deep regret that we learned of the sudden death of CAPTAIN G. GARRETT, Port Meteorological Agent in Brisbane for the Australian Bureau of Meteorology on 10 November 1978.

Prior to his appointment in Brisbane, 'Paddy' Garrett served for 31 years with Cable and Wireless Limited of which 16 were spent in command. For the last 7 years of his sea-going career he commanded the cable ship based in the South Pacific.

We received the first meteorological logbook bearing Captain Garrett's name from the *Norseman* in 1958 and thereafter he sent us a further 7 books of which 3 were classed as Excellent. He received an Excellent Award in 1961. During his appointment as Port Meteorological Agent for Queensland, Captain Garrett liaised on numerous occasions with the Meteorological Office in Bracknell.

We extend our sincere condolences to his family.

RETIREMENT.—CAPTAIN J. E. PALMER retired on 31 March 1979 after completing nearly 34 years service with Shell Tankers (UK) Limited.

James Eric Palmer joined Anglo Saxon Petroleum Company in September 1945 as 2nd Officer and was appointed to the *Loma Novia*. He gained his Master's Certificate in July 1950 and was promoted to Master in February 1960—his first command being the *Gastrana*.

Whilst in command of the *Mactra*, the vessel was severely damaged by an internal explosion during tank cleaning operations, but he successfully navigated the vessel to Beira after the explosion.

Captain Palmer served in many vessels of the Shell Tanker's fleet and his last command was the *Limopsis*.

Captain Palmer sent us his first meteorological logbook from the *Velletia* in 1956. Since then we have received a further 9 books bearing his name.

We wish him a long and healthy retirement.

RETIREMENT.—CAPTAIN R. A. HOLMES retired recently after serving over 43 years with the various subsidiaries of the Cunard Group.

Roger Anthony Holmes was educated at Pocklington Grammar School in Yorkshire before receiving his pre-sea training in HMS *Conway* from 1932–35.

In September 1935 he was indentured to the Commonwealth and Dominion Line—which subsequently became Port Line—and joined the *Port Alma* as Apprentice.

Captain Holmes obtained his Master's Certificate in October 1945 and was promoted to Master in 1957—his first command being the *Port Macquarie*.

Apart from a year in the Mediterranean as 2nd Officer of a 'Sam' vessel, he spent the whole of the war years in Port Line vessels on the Australasian trade with the occasional voyage to the River Plate.

Post war he continued in Port Line vessels on the Australasian trade until that trade became containerized in 1971. Thereafter, he spent two years in ACT vessels followed by a spell in Brocklebank's and finished his sea-going service in the ACL ships on the North Atlantic trade.

Captain Holmes sent us his first meteorological logbook from the *Port Phillip* in 1950. Since then we have received a further 39 logbooks bearing his name of which no less than 24 were classed as Excellent. He received Excellent Awards in 1967, 1968, 1970, 1972, 1978 and 1979.

We wish him a long, healthy and happy retirement.

Fleet Lists

GREAT BRITAIN (Information dated 20.3.79)

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 received is given in the second column. An asterisk indicates a new recruitment who has not yet sent 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 Senior 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
<i>Acacus</i>	28.2.79	A. W. Atken	S. Barber, K. Watson	I. S. Proudlock	Shell Tankers (U.K.) Ltd.
<i>Act 1</i>	15.2.79	D. R. MacKillop	C. Poulter, N. B. Meeke, R. Seth	D. Owen	Blue Star Line Ltd.
<i>Act 2</i>	27.2.79	L. J. Brown	N. Hodgson, V. R. Bridges	R. E. Tucker	Cunard S.S. Co. Ltd.
<i>Act 6</i>	7.3.79	M. H. C. Twomey	N. Fillingham, G. K. C. Smith, S. G. Millar	P. W. Eccleson	Cunard S.S. Co. Ltd.
<i>Act 7</i>	1.2.79	D. M. McPhail	B. P. Stockdale, E. Buick, R. A. Hamilton	N. R. Smirk	Blue Star Line Ltd.
<i>Adventurer</i>	29.11.78	J. A. Fletcher	R. P. Green, N. J. Bevan, M. E. Stoddart	A. P. G. Gray	T. & J. Harrison Ltd.
<i>Aeneas</i>	10.11.78	R. B. Simmons	P. B. Mimmack, P. Masters, S. Watson, G. Dixon	M. J. Sheldon	T. & J. Harrison Ltd.
<i>Affhamstan</i>	14.2.78	G. F. Williams	G. R. Illingworth, B. Hallim, S. Ogdén, G. Kernick	A. Thompson	Ocean Transport & Trading Ltd.
<i>Afric Star</i>	22.11.78	W. Woodman	R. J. Johnston	P. H. Crowe	Common Brothers Ltd.
<i>Ajana</i>	5.12.77	G. D. Easton	J. A. Dick, K. Kharas, G. Round	A. Clarke	Blue Star Line Ltd.
<i>Albright Explorer</i>	5.2.79	A. R. Wood	P. D. Orman, S. T. Comfort, W. E. Kimberley	A. Bridger	Trinder Anderson & Co. Ltd.
<i>Albright Pioneer</i>	20.2.79	J. Kitching	C. R. Alkman, R. E. Jackson	H. A. Chambers	James Fisher & Sons Ltd.
<i>Alert</i>	8.1.78	J. Wood	J. C. Warmingham, N. J. B. Fisher, D. Goulding	W. D. Brown	James Fisher & Sons Ltd.
<i>Algol</i>	22.2.78	J. Lofts	J. Coughlan, A. Robinson, W. Ellis	A. R. Carr	Post Office
<i>Alinda</i>	23.6.78	A. J. Cattell	J. E. Graham, A. J. Younger, B. T. Hingley	M. A. Carpenter	Silver Line Ltd.
<i>Almeida Star</i>	26.2.79	A. B. Percir	G. S. Robertson, A. F. Devanney, D. A. Wheal	C. Keeping	Shell Tankers (U.K.) Ltd.
<i>Almeria Star</i>	8.2.78	D. Van Der Merwe	P. S. Cotgrove, P. M. Stacey, J. H. Mockett	I. Acland-Martin	Blue Star Line Ltd.
<i>Alsatia</i>	22.2.79	D. M. Kissane	A. J. Purcell, J. H. Corse, D. Robinson	I. Cooney	Blue Star Line Ltd.
<i>Amasira</i>	16.10.78	R. Palmer	G. J. Franklin, I. R. Salter, P. C. Writer	T. Slater	Cunard S.S. Co. Ltd.
<i>America Star</i>	17.7.78	P. Mathews	I. H. Venables, C. J. Robuliard	W. R. Harrison	Shell Tankers (U.K.) Ltd.
<i>America</i>	15.1.79	A. B. Percir			Shell Tankers (U.K.) Ltd.
<i>Anchises</i>	6.12.78	A. J. Palmer	B. M. N. A. Zainal, D. W. Bunyan, P. Truscott	D. Griffith	Ocean Transport & Trading Ltd.
<i>Anco Challenger</i>	27.9.78	P. Bennison	P. Russi, M. Knight, C. Beatty	E. J. Pollard	Panocean-Anco Ltd.
<i>Anco Charger</i>	29.1.79	A. F. Ainscough	G. Stratton, J. Thomson, R. P. Anderson	F. J. Glynn	Panocean-Anco Ltd.
<i>Anco Empress</i>	30.6.78	T. Luke			Panocean-Anco Ltd.
<i>Anco Endeavour</i>	15.2.79	P. Bennison	N. J. Benson, P. Smith	E. J. Pollard	Panocean-Anco Ltd.
<i>Anco Enterprise</i>	1.3.79	K. Lewis	D. Bell, R. Thorn	M. Amos	Panocean-Anco Ltd.

Selected Ships (contd.)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
British Avon	6.11.78	I. M. Peterson	J. P. Q. Waller, C. R. White, P. Robinson	N. Stephens	B.P. Tanker Co. Ltd.
British Beech	29.12.78	R. G. Twist	C. Roberts, J. A. Hofton, A. K. Woodward	S. Philpott	B.P. Tanker Co. Ltd.
British Centaur	2.3.79	R. Jarrett	M. J. Fordham, N. McNees, J. F. Coyne	A. W. Sadler	B.P. Tanker Co. Ltd.
British Commerce	8.11.78	M. Dunning	D. J. L. Wickes, P. M. O'Rourke	L. M. Pratt	B.P. Tanker Co. Ltd.
British Commodore	2.11.78	R. F. Shaw	D. Horsburgh, G. W. Harman	N. Richardson	B.P. Tanker Co. Ltd.
British Dragoon	7.3.79	R. Towell	A. K. Woodward, W. Tate, D. Archer	A. Bateman	B.P. Tanker Co. Ltd.
British Esk	11.7.78	J. Cliffe	C. Parry, D. Scutty	R. Bragg	B.P. Tanker Co. Ltd.
British Explorer	2.1.79	H. Brown	C. N. Mee, J. A. Bloys, P. Sharples	M. White	B.P. Tanker Co. Ltd.
British Fern	5.3.79	I. Black	D. Shield	C. J. Ellery	B.P. Tanker Co. Ltd.
British Forth	1.8.78	C. G. Jones	M. Percival, M. Carrington	T. Cook	B.P. Tanker Co. Ltd.
British Hazel	12.2.79	H. Phillips	J. Condie, D. Morrison, L. J. Minor	C. Kemp	B.P. Tanker Co. Ltd.
British Holly	8.3.79	E. Twemlow	G. J. Greensmith, N. E. Pomicter, P. J. Smith	A. M. Wood	B.P. Tanker Co. Ltd.
British Ivy	6.7.78	T. M. Y. Richards	K. B. MacInnes, J. P. Rumsby, W. Young	C. Kelly	B.P. Tanker Co. Ltd.
British Kennel	5.1.79	R. J. Nener	R. W. Hendry, A. T. Cross, G. R. Ticehurst	T. Cook	B.P. Tanker Co. Ltd.
British Laurel	26.10.78	D. C. Goodwin	J. C. Nicoll, R. Sharman, S. Tuck	R. Lodge	B.P. Tanker Co. Ltd.
British Liberty	18.7.78	W. O. Burns	F. E. Uren, S. MacDonald, N. S. Hulise	R. MacDonald	B.P. Tanker Co. Ltd.
British Loyalty	6.3.79	J. Shields	D. A. Brown, C. J. Davison, M. H. Reed	T. R. Holter	B.P. Tanker Co. Ltd.
British Maple	1.3.79	A. N. Smith	M. Ramsbottom, S. Pickard, R. McVeigh	R. Williamson	B.P. Tanker Co. Ltd.
British Patience	26.1.79	P. Edmonson	D. J. L. Wickes, S. Allibone	C. F. Handel	B.P. Tanker Co. Ltd.
British Pioneer	12.3.79	D. Dalton			
British Poplar	27.2.79	S. C. Davies			
British Promise	5.1.79	J. Lambert	R. Raeburn, R. D. Mead, D. M. Allan	T. R. Huntley	B.P. Tanker Co. Ltd.
British Respect	7.9.78	R. Payne	M. W. Greiner, J. M. Ronald, G. J. Salmon	J. G. Saphier	B.P. Tanker Co. Ltd.
British Security	1.2.79	I. B. McNaughton	H. C. Patience, J. Galloway	D. Pheusey	B.P. Tanker Co. Ltd.
British Spay	4.1.79	M. J. Searle	C. B. Amos, P. V. Goddard	J. Sutherland	B.P. Tanker Co. Ltd.
British Tamar	16.11.78	M. T. Gordon	S. N. White, N. Pomirter, J. A. Coccozza	S. McHugh	B.P. Tanker Co. Ltd.
British Tay	12.10.78	N. Roberts	D. Thwaites, R. N. A. Lees	W. K. Ryan	B.P. Tanker Co. Ltd.
British Tenacity	26.2.79	A. E. Marshal	J. E. Howe, W. C. McGabzean, C. S. Adams	G. H. Roe	B.P. Tanker Co. Ltd.
British Trent	1.12.78	J. W. Graves	R. Massingham, C. Soanes, C. Pettey	B. Matten	B.P. Tanker Co. Ltd.
British Trident	23.1.79	R. Taylor	R. Sharman, A. R. Wilkinson, D. Scutt	B. Muirhead	B.P. Tanker Co. Ltd.
British Unity	16.2.79	M. Stephenson	K. B. MacInnes, D. F. Campbell, A. D. Haworth	P. J. Clemence	B.P. Tanker Co. Ltd.
British Vine	26.2.79	L. V. McGeoch	D. W. Lister, R. D. Wallace, A. C. Croker	H. J. McGrory	Canadian Pacific Steamships Ltd.
C.P. Discoverer	26.2.79	A. R. Whyte	C. T. Hentley, A. C. Mathews	P. J. Curran	Canadian Pacific Steamships Ltd.
C.P. Trader	7.1.79	J. Waling	C. P. M. Lucas-Goudie, M. Russell, C. R. Harding		Canadian Pacific Steamships Ltd.
C.P. Voyager	11.12.78	J. D. Jeavons	P. A. Mosley, G. B. Ivens		Canadian Pacific Steamships Ltd.
C.S. Forester	6.7.78	W. Brettell	R. R. N. Laing	R. R. N. Laing	Newington Trawlers Ltd.
Cable Venture	13.3.79	J. Fenwick	P. R. Woodward	K. C. Jackson	Cable & Wireless Ltd.
Calabria	24.1.79	E. Howlett	A. G. Murray, A. J. McVicar, I. Swan	M. J. Mitchell	Walter Runciman & Co. Ltd.
California Star	5.3.79	D. Newlin	P. Lewis, W. R. Houghton-Boreham, P. Tann	D. C. Millar	Blue Star Line Ltd.
Cambera	15.1.79	F. B. Woolley	I. J. Jerman, J. T. Marden, R. W. Borwick	M. White	P. & O. S.N. Co.
Canterbury Star	10.5.77	G. J. A. Seaye	T. Orrell, C. E. Elms, C. A. F. Ledsam	A. Cruden	Blue Star Line Ltd.
Capalanga	8.3.79	D. Taylor	C. R. Gouldthorpe, P. P. Simkins, I. C. Murray	M. J. Dunne	Thalassa (Offshore) Scotland Ltd.
Cape Horn	25.11.77	I. H. Tyrrell	C. A. Campbell, J. MacCuskie, A. C. Henderson	C. Ritchie	Lyle Shipping Co. Ltd.
Cape Leucuin	10.8.77	D. White	R. Abercrombie, R. Mullen, P. Dyson	A. Macallum	Lyle Shipping Co. Ltd.
Cape Ortega	20.2.79	A. M. Fraser	A. Logan, L. C. Spindloe	N. Smith	Lyle Shipping Co. Ltd.
Cape Rodney	30.11.77	N. Corkill	C. J. Pyper, P. Smart, R. F. Simpson	D. F. Wilson	Lyle Shipping Co. Ltd.
Carchester	2.1.79		C. G. Beresford, A. Lucas	M. H. Baig	Ellerman Lines Ltd.

<i>Cardigan Bay</i>	20.3.79	D. M. Belk	I. S. Cairns, H. B. Gobey, D. L. Batchelor	K. Bent	Ocean Transport & Trading Ltd.
<i>Carintia</i>	13.2.79	P. Sherriff	B. J. Amstad, J. B. Montgomery, M. D. Samant	W. Taylor	Cunard S.S. Co. Ltd.
<i>Carmaria</i>	20.2.79	G. Carling	R. J. Williams, A. Turner, J. Lewis	P. Berridge	Cunard S.S. Co. Ltd.
<i>Cast Beaver</i>	30.10.78	H. R. Forrester	M. Wight, A. Brown, B. Hughes	P. J. Kelly	Denholm Maclay Co. Ltd.
<i>Cast Otter</i>	7.2.79	F. R. N. Best	B. R. G. Tasker, J. G. M. Morrison, S. H. M. Lee	S. Martin	Denholm Maclay Co. Ltd.
<i>Cedarbank</i>	28.4.78	J. Townsley	B. M. Bennett, W. E. Lewis, S. Crowther		Bank Line Ltd.
<i>Challenger</i>	22.11.78	G. Long	S. P. Tilbury, P. Coombs, S. Jackson		Natural Environment Research Council
<i>Choctaw II</i>	25.8.78	N. J. W. Middlehurst	W. J. Saxby, F. W. Brown, M. Tyrell	R. F. Horsley	Santa Fe (U.K.) Ltd.
<i>Cirolana</i>	30.12.77	R. A. Taylor			Ministry of Agriculture, Fisheries & Food
<i>City of Canterbury</i>	20.6.78	T. Mallory	R. Bagnall, J. Hewitt, N. Davidson	R. E. Collins	Ellerman Lines Ltd.
<i>City of Durban</i>	8.3.79	H. Bell	G. S. A. Rasmussen	C. Brown	Ellerman Lines Ltd.
<i>City of Edinburgh</i>	5.3.79	K. R. Wilson	M. J. Simpson, D. D. Sutherland, H. A. R. Nicoll	J. J. Lucey	Ben Line Containers Ltd.
<i>City of Exeter</i>	5.3.79	A. S. Matheson	R. E. Niven, W. M. Murphy, D. E. C. Stevenson	J. G. Kennedy	Ellerman Lines Ltd.
<i>City of Gloucester</i>	6.2.79	B. E. Torrance	J. Macpherson, P. H. Winstanley, P. N. Stott	G. D. French	Ellerman Lines Ltd.
<i>City of Guildford</i>	12.2.79	A. J. Evans	S. W. Ponter, D. P. Monk, C. W. Rapley	J. C. Byrne	Ellerman Lines Ltd.
<i>City of Hull</i>	28.11.78	F. Smith	F. P. Coenen, P. M. S. Turner, T. Gwynne	M. H. Curran	Ellerman Lines Ltd.
<i>City of Lancaster</i>	5.12.78	A. W. Forrest	K. Stone	J. P. Munnally	Ellerman Lines Ltd.
<i>City of Liverpool</i>	28.12.78	N. A. Perry	S. G. Mortimer, N. Frampton, M. Fagan	E. M. Kosciw	Ellerman Lines Ltd.
<i>City of London</i>	8.11.78	K. G. Maclean	R. E. Barrtram	A. W. T. Camp	Ellerman Lines Ltd.
<i>City of Plymouth</i>	*	S. M. Thredkeld	M. Molyneux, M. McDowell		Ellerman Lines Ltd.
<i>City of St. Albans</i>	4.10.78	H. P. Wharton	D. F. Balaporia, M. de Silva, P. Underhill	S. G. Price	Ellerman Lines Ltd.
<i>City of Winchester</i>	18.1.78	H. Swinney	J. J. Duncan, N. F. Ellison, P. A. Marcon	G. Smith	Ellerman Lines Ltd.
<i>City of York</i>	1.11.78	E. G. George	G. Lewis, W. Macritchie, P. Hancock	J. V. Horseburgh	Ellerman Lines Ltd.
<i>Clan Alpine</i>	16.10.78	T. Aitchison	A. R. Wilson, P. W. Brown, I. E. Walker-Spicer	W. Latus	Cayzer Irvine Shipping Co. Ltd.
<i>Clan Graham</i>	5.12.78	C. R. Parsons	F. M. Murray, P. J. Godding, R. H. Matthews	K. Paterson	Cayzer Irvine Shipping Co. Ltd.
<i>Clan Grant</i>	16.5.78	T. G. Gowans	H. M. Wasigalah, P. J. MacArthur, G. Koch	D. Wakeford	Cayzer Irvine Shipping Co. Ltd.
<i>Clan Macgillivray</i>	6.2.79	T. E. Roberts	P. J. Hooper, A. J. Blackler	I. C. Dawson	Cayzer Irvine Shipping Co. Ltd.
<i>Clan Macgregor</i>	11.12.78	J. K. Currie	R. E. Heeley, W. M. Ouko, R. M. Thomas	M. Macdonald	Cayzer Irvine Shipping Co. Ltd.
<i>Clan Macleod</i>	3.10.78	O. Barnsley	R. R. Watkins, M. Gardner	A. P. L. Hall	Cayzer Irvine Shipping Co. Ltd.
<i>Clan Macindoe</i>	13.3.79	A. G. Cruickshank	P. D. Hall, N. L. Smith, C. J. Parkinson	E. F. Banach	Cayzer Irvine Shipping Co. Ltd.
<i>Clan Maciver</i>	15.1.79	F. R. Fullarton	M. P. Stevens, C. R. Finch, J. B. Harbord	K. Watkins	Cayzer Irvine Shipping Co. Ltd.
<i>Clan Macnab</i>	12.1.79	W. J. Howson	R. G. Head, P. M. J. O'Sullivan, P. Campbell	R. Taylor	Cayzer Irvine Shipping Co. Ltd.
<i>Clan Macnair</i>	20.4.78	R. E. Todd	I. Thorburgh, P. Simpson, R. G. Ward	F. Wallace	Cayzer Irvine Shipping Co. Ltd.
<i>Clone</i>	28.2.79	G. Oliver	G. F. Lee, R. Graham		Ministry of Agriculture, Fisheries & Food
<i>Clonbank</i>	*	H. J. Taylor	D. J. Collins	V. Y. F. Li	Bank Line Ltd.
<i>Cluden</i>	*	C. A. Morrison	D. C. Pickling, A. Anning	L. M. Sells	Matheson Shipping Services Ltd.
<i>Clytonus</i>	6.11.78	C. S. Mackinnon	B. Pollock, Z. B. Ardullah		Ocean Transport & Trading Ltd.
<i>Columbia Star</i>	1.3.79	T. D. Brewster	M. MacDonald, P. Richards		Blue Star Line Ltd.
<i>Conon Forest</i>	1.9.78	J. A. Dumpace	D. J. Glenn, C. R. Irvine, N. D. I. MacDonald	J. Baldwin	J. & J. Denholm Ltd.
<i>Corella</i>	1.12.77	J. E. M. Balfour			Ministry of Agriculture, Fisheries & Food
<i>Coriolanus</i>	7.11.78	D. Paterson	A. S. Warman	A. S. Warman	British United Trawlers Ltd.
<i>Crestbank</i>	6.11.78	C. B. Davies	P. D. Hull, P. J. Nance, P. M. Lovett	B. Neary	Bank Line Ltd.
<i>Cumbria</i>	1.2.79	K. R. James	H. J. Barton, J. Lawrence, J. Exley	P. Lloyd	Hadley Shipping Co. Ltd.
<i>Custodian</i>	*	C. Wilde	J. A. Cook, E. P. Oddy, P. R. Walton	A. I. Thomson	T. & J. Harrison Ltd.
<i>Dalesman</i>	14.6.78	J. Mitchell	A. M. Powell, F. G. Bissett, R. M. Armstrong	G. A. Ferrand	T. & J. Harrison Ltd.
<i>Darina</i>	*	B. Bowtell	P. Markland, P. J. Mensink, R. Price	D. Yelland	Shell Tankers (U.K.) Ltd.
<i>Dart America</i>	14.3.79	K. W. Keithley	I. E. Brown, A. Poynder	M. P. O'Gorman	Associated Maritime Co. Ltd.
<i>Dart Atlantic</i>	23.2.79	C. O. Thomas	D. J. Richards, P. A. Brown, D. W. McCluskey	G. F. Glover	Bibby Line Ltd.
<i>Dart Canada</i>	5.3.79	N. R. Pryke	D. J. Read, M. J. Tansley, P. F. Wright	S. P. M. McEntee	Associated Maritime Co. Ltd.
<i>Deseado</i>	12.2.79	M. Larrive	A. V. Macan, P. Reynolds	E. Connolly	Furness Withy (General Shipping) Ltd.

Selected Ships (contd.)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Discovery</i>	5.10.78	J. J. Moran ..	S. Jackson, T. N. Gray ..	R. Draper ..	Natural Environment Research Council
<i>Discovery Bay</i>	14.3.78	J. S. Thorpe ..	D. W. Thompson, M. Watts, A. J. Ball	P. A. Mathews ..	Container Fleets Ltd.
<i>Donga</i>	25.1.79	H. McCole ..	I. B. W. Cluk, W. S. Payne, I. H. Boothroyd	D. F. Murray ..	Ocean Transport & Trading Ltd.
<i>Donington</i>	15.9.77	G. B. Panes ..	G. A. Hunter, P. Barratt, D. Matthews ..	M. Berrisford ..	Stephenson Clark Ltd.
<i>Dover Castle</i>	18.8.78	R. Ross-Will ..	P. A. Monks, A. Oxley, S. Renfree ..	M. Toogood ..	Cayzer Irvine Shipping Co. Ltd.
<i>Drupa</i>	4.8.78	J. D. T. Price ..	J. M. Rose, K. Daubner ..	H. Fisher ..	Shell Tankers (U.K.) Ltd.
<i>Dumbaba</i>	18.1.79	J. C. Cox ..	M. G. Lock, S. J. Waters, A. A. M. Sawadi	B. C. Murgatroyd ..	Ocean Transport & Trading Ltd.
<i>Dunelmia</i>	22.12.78	A. Stuart ..	C. J. Burt, W. Rankine, T. M. Scott-Thomas	C. Branthwaite ..	J. & J. Denholm Ltd.
<i>Dunluva</i>	9.1.78	I. D. Jackson ..	S. J. Ackland, E. L. McFadyen ..	D. Warner ..	Ocean Transport & Trading Ltd.
<i>Dunstanburgh Castle</i>	10.5.77	T. Wilson ..	J. Greig, S. Sowerby ..	C. Warner ..	Ben Line Steamers Ltd.
<i>Durhambrook</i>	12.3.79	M. Murphy ..	T. Hooper, D. Anderson, G. Shearer ..	J. McFarland ..	Comben Longstaff & Co. Ltd.
<i>Egádia</i>	22.1.79	D. Lamont ..	A. D. Mackenzie, K. Hunter, R. Hargreaves	I. Hanly ..	Walter Runciman & Co. Ltd.
<i>Elk</i>	2.1.79	M. R. Godfrey ..	F. A. Pearson, B. N. Beckley, B. Luke ..	E. Jennings ..	P. & O. S.N. Co.
<i>Encounter Bay</i>	5.1.79	M. J. Heron ..	D. Parrish, K. W. S. Macmillan, D. C. Thomson	V. A. Gorny ..	Container Fleets Ltd.
<i>Eravan</i>	5.1.79	G. A. Brewery ..	Liu Hon Por, J. C. Granger, C. C. MacDonald	Sajid Ali ..	John Swire & Sons Ltd.
<i>Erskine Bridge</i>	5.1.79	J. Tew ..	D. Gale, T. Upson, D. C. Tinton ..	B. Christie ..	Silver Line Ltd.
<i>Esso Aberdeen</i>	13.2.79	T. C. Ramsey ..	D. S. Theford, J. C. Weeden, J. F. Pykett	C. J. Delahunty ..	Esso Petroleum Co. Ltd.
<i>Esso Caledonia</i>	30.1.79	W. McMaster ..	J. Browning, W. E. Hardy, V. Harcourt-Smith	D. Leeson ..	Esso Petroleum Co. Ltd.
<i>Esso Cambria</i>	15.8.78	G. T. Rymer ..	T. J. Lowe, N. Watkins, J. E. Turner ..	B. M. Bradley ..	Esso Petroleum Co. Ltd.
<i>Esso Dabrida</i>	16.5.78	F. Verbist ..	A. M. McGill, I. M. Scott ..	N. E. Scott ..	Esso Petroleum Co. Ltd.
<i>Esso Demetia</i>	16.5.78	R. W. Noakes ..	A. A. Barnes, P. Joss, M. Barnett ..	R. J. Evans ..	Esso Petroleum Co. Ltd.
<i>Esso Hibernia</i>	23.8.78	G. Barnes ..	W. G. Vale, I. Halsall, K. J. Lightbody	P. N. A. Strickland ..	Esso Petroleum Co. Ltd.
<i>Esso Northumbria</i>	8.3.79	K. Hebdon ..	T. J. Lowe, R. Breese ..	P. Chadwick ..	Esso Petroleum Co. Ltd.
<i>Esso Scotia</i>	18.1.79	W. D. B. Boler ..	R. Law, R. M. Cole, D. S. Rowley ..	R. T. Jolliffe ..	Esso Petroleum Co. Ltd.
<i>Esso Ulicka</i>	18.1.79	F. Verbist ..	S. P. Crawley, C. Starr, G. Pritchard ..	R. Kimberley ..	Esso Petroleum Co. Ltd.
<i>Esso Warwickshire</i>	18.12.78	W. D. Templeman ..	T. Kee, D. McIntosh, N. Macleod ..	S. J. Drinkwater ..	Esso Petroleum Co. Ltd.
<i>Ethel Everard</i>	19.3.79	J. Twisleton ..	L. Hunter, J. Aynsley, J. Paton ..	M. Farrell ..	F. T. Everard & Sons Ltd.
<i>Eucadia</i>	12.7.78	D. Lamont ..	J. D. C. Martin, D. Marshall, E. Griffin ..	D. Varly ..	Walter Runciman & Co. Ltd.
<i>Eurofreighter</i>	2.1.79	D. Dickson ..	D. C. Haggart, J. N. McEusnic, W. J. Forster ..	J. & J. Denholm Ltd.	J. & J. Denholm Ltd.
<i>Euroliner</i>	12.2.79	J. McVicar ..	A. Murray, W. Ferguson ..	J. A. Main ..	Department of Agriculture & Fisheries for Scotland
<i>Explorer (F.R.S.)</i>	19.8.77	J. Gillon ..	S. D. Crowther, T. N. Morris, W. Esler	L. C. Robinson ..	Bank Line Ltd.
<i>Fenbank</i>	*	A. Brodie ..	J. Freegard, V. Kapoor, W. Crook ..	J. Emmot ..	Salen (U.K.) Ship Management Ltd.
<i>Finnish Wasa</i>	*	D. W. Howell ..	S. J. Messruther, C. Medlicott, J. D. Lorking	R. Millne ..	Bank Line Ltd.
<i>Fleetbank</i>	21.2.78	I. C. N. Shrubsole ..	D. W. Saunders, C. W. Laycock, K. Worthington	P. Cook ..	Container Fleets Ltd.
<i>Flianders Bay</i>	1.2.79	K. E. Howard ..	C. K. Jung, Y. S. Keung ..	C. S. Man ..	John Swire & Sons Ltd.
<i>Foochow</i>	7.11.78	O. A. Overland ..	L. N. Paul, M. E. Baggaley, D. Pooley ..	J. M. Pass ..	Canadian Pacific Steamships Ltd.
<i>Fort Hamilton</i>	11.12.78	D. L. Burt ..	M. E. Harrington, H. L. Kinns, C. Riches	J. Hartley ..	Canadian Pacific Steamships Ltd.
<i>Fort Victoria</i>	15.1.79	P. J. Swift ..	A. A. Beattie, D. Coombes, C. Spink ..	H. D. Hopkins ..	B.P. Tanker Co. Ltd.
<i>Forties Kiwi</i>	20.2.79	J. Hobbs ..	P. Earley, P. J. Rutter ..	A. Steel ..	Blue Star Line Ltd.
<i>Fremantle Star</i>	7.6.78	A. H. White ..	J. G. O'Connor, I. Steward, D. W. Ellis	V. F. Cullen ..	Sir Wm. Reardon Smith & Sons Ltd.
<i>Fresno City</i>	12.7.78	L. R. Staines ..	R. V. Hanson, A. E. Joss, C. R. Darnley	P. A. Byrne ..	Manchester Liners Ltd.
<i>Frontier</i>	23.1.79	A. G. Lacey ..	C. W. Raymond, B. McLeod, G. Ashworth	R. E. Goring ..	P. & O. S.N. Co.
<i>Gambada</i>	8.1.79	R. J. Turney ..	D. C. Dastur, J. D. Owen ..	I. Spiden ..	P. & O. S.N. Co.
<i>Gandara</i>	26.2.79	R. Bailey ..			

Selected Ships (contd.)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Lindfield</i> ..	30.1.79	J. A. Williams	M. Kelly, A. W. Jones, D. J. Hewitt ..	I. Bolton ..	Furness Withy (General Shipping) Ltd.
<i>Linguist</i> ..	13.9.78	C. D. Riley	W. L. Hailoo, K. Lancaster, D. Rimmer	J. Rowsell ..	T. & J. Harrison Ltd.
<i>Liverpool Bay</i> ..	1.2.79	J. Bold	R. J. Baily, D. E. Sones	E. H. R. Jones ..	Ocean Transport & Trading Ltd.
<i>Loch Lamond</i> ..	20.3.79	D. Perry	D. I. MacKenzie, A. Reid, D. L. Pereira	A. H. R. Dickson ..	J. & J. Denholm Ltd.
<i>Loch Maree</i> ..	22.2.79	C. W. Harvey	R. I. Stewart, J. R. Corrin, M. A. W. Brown	J. G. Aherne ..	J. & J. Denholm Ltd.
<i>London Baron</i> ..	21.4.78	W. W. Brown	J. L. Atkins, J. R. Lonsdale, R. Crawford	P. S. Melton ..	London & Overseas Freighters Ltd.
<i>London Bombarدير</i>	20.3.79	D. Scourfield	A. P. Finiels, G. Knight, J. B. Dunsmore	R. F. Smith ..	London & Overseas Freighters Ltd.
<i>London Cavalier</i> ..	30.1.79	G. Jacobs	M. Littlewood, W. Carmody	F. R. Grestner ..	London & Overseas Freighters Ltd.
<i>London Earl</i> ..	15.1.79	J. Munday	J. S. Blamires, S. J. Hyams, D. McDonald	E. C. Crowley ..	London & Overseas Freighters Ltd.
<i>London Fusilier</i> ..	5.3.79	R. C. Morrison	G. A. Cole, J. A. Atwater	N. Gibb ..	London & Overseas Freighters Ltd.
<i>London Grenadier</i> ..	..	P. J. Wright	K. Bryant, K. Horsley, J. Morrison	E. C. Crowley ..	London & Overseas Freighters Ltd.
<i>London Viscount</i> ..	30.1.79	F. Hewlett	P. G. I. Rogers-Gray, S. P. R. MacDonnell, P. Davidson	C. Stewart ..	London & Overseas Freighters Ltd.
<i>Lord Strathcona</i> ..	27.2.79	T. L. Simpson	P. Brabban, P. T. Galea	D. Casey ..	Canadian Pacific (Bermuda) Ltd.
<i>Lynton Grange</i> ..	8.3.79	T. W. V. Woodcott	R. W. Miller, A. M. Hooper, M. S. Rippon	K. Mutimear ..	Houlder Bros. & Co. Ltd.
<i>Maersk Cadet</i> ..	26.2.79	R. T. Eynon	G. M. Kenrick, J. P. Evanson	J. D. Walsh ..	Maersk (U.K.) Co. Ltd.
<i>Maersk Commander</i>	29.1.79	G. Thompson	D. B. Wassell, M. Claery, B. V. Mercer	P. A. Bowen ..	Maersk (U.K.) Co. Ltd.
<i>Magdalena</i> ..	10.10.78	D. A. Hamilton, R. D.	M. Taxis, J. Fee, C. C. Young	L. Taylor ..	Fyffes Group Ltd.
<i>Maivangi Bay</i> ..	2.3.79	J. Welch	A. M. Wright, P. Bonney, D. M. Oliver	J. D. Percival ..	Container Fleets Ltd.
<i>Manchester Challenge</i>	19.3.79	M. W. Cockshott	K. C. Highfield, W. Moss, B. Frost	M. D. A. Walsh ..	Manchester Liners Ltd.
<i>Manchester Concept</i>	9.3.79	D. R. Llewellyn	N. P. Sherry, D. McKay	M. E. Harrison ..	Manchester Liners Ltd.
<i>Manchester Concorde</i>	19.3.79	P. M. Fielding	W. S. Enright, S. K. Watson, J. L. Mitchell	M. D. A. Walsh ..	Manchester Liners Ltd.
<i>Manchester Crusade</i>	8.1.79	J. Rushworth	J. T. Snee, B. Larcombe, R. Brown	M. E. Harrison ..	Manchester Liners Ltd.
<i>Manchester Renown</i>	3.4.78	A. Cookson	J. A. P. Hall, A. Bond, D. J. Bancroft	J. Lamb ..	Manchester Liners Ltd.
<i>Manchester Reward</i>	19.1.79	G. Dodsworth	W. S. Enright, B. Larcombe, N. Halliwell	P. D. Price ..	Manchester Liners Ltd.
<i>Manchester Vigour</i>	30.5.78	J. Baker	J. A. Williams, P. Devenport	J. J. McRory ..	Manchester Liners Ltd.
<i>Manseville</i> ..	28.12.78	D. Gregson	S. Daniel, P. R. Fawcett, D. Stone	D. Gregan ..	Manchester Liners Ltd.
<i>Masirah</i> ..	14.10.77	D. Sinclair	G. R. Green, R. Waterton, A. Talbot	M. V. Bushnell ..	Manchester Liners Ltd.
<i>Matco Avon</i> ..	30.11.78	G. Cram	R. Fish, K. E. Harmer, R. J. Macleod	A. R. King ..	Cunard S.S. Co. Ltd.
<i>Matco Thames</i> ..	12.2.79	P. Kelly	K. Greendale, M. Avery, C. W. Pierce	J. W. Hurd ..	Mobil Shipping Co. Ltd.
<i>Mayfield</i> ..	19.3.79	E. H. Hoyle	B. Hickey, A. Ross, D. McCambridge	J. F. Vinal ..	Mobil Shipping Co. Ltd.
<i>Medic</i> ..	3.1.79	W. Newport	D. L. Haynes, A. T. Turner, C. H. Bostock	J. F. Vinal ..	Furness Withy (General Shipping) Ltd.
<i>Megantic</i> ..	20.3.79	K. L. Row	C. J. Dennis, S. J. Crawford, R. W. Mitchell	C. M. Dunwoody ..	Furness Withy (General Shipping) Ltd.
<i>Merchant</i> ..	28.7.78	B. Crook	P. G. Wood, K. I. Milton, A. J. B. Gunner	W. C. Doyle ..	T. & J. Harrison Ltd.
<i>Mitranda</i> ..	13.3.79	D. Y. Roberts	M. Ruane	N. Hadley ..	Department of Trade
<i>Montreal Star</i> ..	25.11.77	J. Atkins	M. Goodfellow	W. Ward ..	Blue Star Line Ltd.
<i>Moraybank</i> ..	8.1.78	D. MacPhail	K. Mills, M. E. Turner, D. E. Ginder	I. A. Nuttall ..	Bank Line Ltd.
<i>Moreton Bay</i> ..	1.12.78	G. C. Barrett	N. A. Cooke, C. Woodward, M. J. W. Baker	D. Fraser ..	Container Fleets Ltd.
<i>Nairnbank</i> ..	18.12.78	B. J. Masey	B. F. Dewhurst, F. W. Mouat, C. J. Butters	G. P. M. Kelly ..	Bank Line Ltd.
<i>Nessbank</i> ..	6.9.78	T. D. Scott	D. W. Evans, S. C. Collier, P. N. Hill	W. P. Cameron ..	Bank Line Ltd.
<i>New Westminster City</i>	12.7.78	R. I. Crawford	H. D. Johnson, N. Jerrum, R. E. Baker	..	Sir Wm. Reardon Smith & Sons Ltd.

<i>New York Star</i>	18.12.78	G. Ferriday	C. G. Burling, C. D. Brown, A. G. Gibb	P. L. Prophet	Blue Star Line Ltd.
<i>Nordic Breeze</i>	7.2.79	E. F. H. Lamb	D. A. Hore, S. R. Lyons, P. A. Lush	T. Gilmour	Walleim Ship Management (U.K.) Ltd.
<i>Nordic Commander</i>	3.10.78	M. Maclean	T. Poplewell, B. G. Roberts	K. Mutinear	J. & J. Denholm Ltd.
<i>Norman Lady</i>	7.9.78	J. W. Murray	A. D. Lewis, M. D. Cummins		Burris Marks Ltd.
<i>Norse Marshal</i>	24.1.75	A. Barker	N. Stark, H. Syed		Harrisons (Clyde) Ltd.
<i>Norse Viking</i>	13.1.077	H. W. Finn	B. G. Arnott, P. G. Ramm, H. Towers	J. Scarr	Cardigan Shipping Co. Ltd.
<i>Northamptonshire</i>	3.10.78	A. S. Young	P. Hardy, I. Ali, K. W. Reynolds	T. J. King	Bibby Line Ltd.
<i>Ocean Transport</i>	27.11.78	M. Mortimer	P. M. Steel, J. F. Peard, P. Barry	M. Black	Houlder Bros. & Co. Ltd.
<i>Opalia</i>	18.8.78	W. Snowdon	G. Read, W. Head, S. Anderson	M. M. B. Philpott	Shell Tanker (U.K.) Ltd.
<i>Orbita</i>	23.10.78	F. M. Dickenson	D. G. Outen, S. P. Snow	M. Morgan	Furness Withy (General Shipping) Ltd.
<i>Orcoma</i>	8.1.79	T. J. Sax	G. M. Baron, P. Quayle, J. Tidswell	R. R. Mills	Furness Withy (General Shipping) Ltd.
<i>Ordana</i>	19.9.78	J. Chester	G. Baron, M. Greenwood, P. Green	M. Davies	Furness Withy (General Shipping) Ltd.
<i>Oropesa</i>	5.2.79	R. T. Riley	C. Hall, S. Szaroleta	T. O'Connell	Furness Withy (General Shipping) Ltd.
<i>Oroya</i>	20.3.79	G. E. Turner	G. Dyson, P. M. Gregson, J. A. Hayes	W. Macartney	Furness Withy (General Shipping) Ltd.
<i>Ortega</i>	13.12.78	C. W. Alison	T. M. O'Driscoll, N. Aldridge, A. D. Dawson	C. Scrimshaw	Furness Withy (General Shipping) Ltd.
<i>Osaka Bay</i>	15.1.79	W. P. Goldie	G. J. Roberts, I. W. Collister, K. S. Hardy	W. C. Phillips	Ocean Transport & Trading Ltd.
<i>Overseas Argonaut</i>	9.3.79	E. G. Humby	R. A. Pemberton, C. Delisle, A. C. Wells	I. F. Alexander	London & Overseas Freighters Ltd.
<i>Pacific Fisher</i>	4.1.79	I. J. Groundwater	M. Grimshaw, A. J. Eaton, J. M. Miller	R. Briggs	James Fisher & Sons Ltd.
<i>Pacific Wasa</i>	9.3.79	R. A. Reay	M. J. Pinder, I. Drysdale, H. Goodrick	J. Laird	Safen (U.K.) Ship Management Ltd.
<i>Partula</i>	16.1.79	L. J. Walton	G. Denny, M. Blease	A. Burns	Shell Tankers (U.K.) Ltd.
<i>Pegu</i>	11.12.78	S. F. Garside	Razak Bin Alias	B. C. Murgatroyd	Ocean Transport & Trading Ltd.
<i>Phronitis</i>	3.1.79	J. M. Dick	S. F. Gallimore, F. R. Jackson, R. I. Sime	T. Flatley	Ocean Transport & Trading Ltd.
<i>Plainsman</i>	19.2.79	D. Skillander	A. A. Dunn, R. Cape, T. R. Grieg	D. C. Elsey	T. & J. Harrison Ltd.
<i>Pole Star</i>	3.1.79	N. Morrison	W. Tullock, A. D. Welsh		Northern Lighthouse Board
<i>Pollenger</i>	12.6.75	G. Hepple	R. Turner, A. Hesselde, P. Frewer	N. Bull	P. & O. S.N. Co.
<i>Pomella</i>	*	A. Charlesworth	B. D. Limmack, G. W. Kelly, M. F. T. McKellar	S. R. Robinson	Shell Tankers (U.K.) Ltd.
<i>Port Alberni City</i>	5.3.79	D. L. G. Jones	R. J. Elliott, T. J. Hunter, K. Jones	D. P. Bibmead	Sir Wm. Reardon Smith & Sons Ltd.
<i>Port Caroline</i>	8.1.79	W. J. Williams	M. J. S. Hartnell, M. G. Lange	N. L. Jenner	Port Line Ltd.
<i>Port Chalmers</i>	21.8.78	I. A. McManus	P. T. Corbet, M. Thwaite, A. P. Haxby	M. Winn	Port Line Ltd.
<i>Port New Plymouth</i>	27.7.78	T. G. S. Ward	I. S. Ramage	A. J. Dunn	Port Line Ltd.
<i>Port Nicholson</i>	13.9.78	A. J. L. Smith	N. D. Cleave, P. R. Kaye, D. F. Woodrow-Stone	S. J. Ashcroft	Port Line Ltd.
<i>Post Champion</i>	2.1.79	D. O. Williams	D. Webb, A. Blore, N. Finkins	S. Williamson	Panoccean-Anco Ltd.
<i>Post Chaser</i>	17.10.78	W. Kirman	M. Champion, W. Ferns, B. Kweichein	J. A. Heslop	Panoccean-Anco Ltd.
<i>Prince Rupert City</i>	9.11.78	K. B. Whiting	A. P. Morris, K. Milburn, E. Bingley		Sir Wm. Reardon Smith & Sons Ltd.
<i>Queen Elizabeth 2</i>	13.12.78	L. Portet		W. C. Davies	Cunard S.S. Co. Ltd.
<i>Recorder</i>	4.1.79	E. J. Reilly	D. Wilson, P. H. Hare	J. A. McKay	Cable & Wireless Ltd.
<i>Remuera Bay</i>	13.2.79	W. A. Murison	P. G. Posey, R. J. McLarty, D. J. Izzard	W. F. Shepherd	Container Fleets Ltd.
<i>Resolution Bay</i>	9.3.79	J. K. Blackburn	A. M. Boyd, J. L. Peterson, C. M. Croome	K. Jackson	Container Fleets Ltd.
<i>Retriever</i>	*	A. W. Henderson	P. S. Warrall, D. MacFarlane	E. Hughes	Cables & Wireless Ltd.
<i>Reynolds</i>	*	M. A. Gater	J. Meier, T. Bailey, E. Miles	R. Sewell	Bolton Steam Shipping Co. Ltd.
<i>Ringsnes</i>	*	M. Meyer	- Dole, A. McClymont, S. Murray	J. O'Connell	Jebsens (U.K.) Ltd.
<i>Ripon Grange</i>	14.3.79	B. Ditchburn	P. V. Marshall, G. Dean, R. M. Frederick	S. W. Dunn	Houlder Bros. & Co. Ltd.
<i>Riverbank</i>	27.2.79	T. Smith	M. E. T. Turner, G. G. Mattson, M. Lynam	T. J. Bailey	Bank Line Ltd.
<i>Riverina</i>	27.2.79	N. R. Land	D. G. Lyon, M. C. Warrior, A. M. Lee		Furness Withy (General Shipping) Ltd.
<i>Roachbank</i>	*	J. A. Appleby	N. Allen, M. Goldsmith, R. Crowther	J. Lawry	Bank Line Ltd.

Selected Ships (contd.)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Rockhampton Star</i>	1-3-79	W. A. Wilson	J. Rendle, A. Singh, A. Herbert	C. Young	Blue Star Line Ltd.
<i>Roebuck</i>	19-3-79	E. W. Foxworthy	I. Smallshaw, D. Stewart-Taylor, R. K. Taylor	R. Smith	Furness Withy (General Shipping) Ltd.
<i>Ronsard</i>	6-3-79	N. F. Sharp	D. R. Morgan, P. S. Cotgrove, B. C. Penrose	S. N. Downs	Blue Star Line Ltd.
<i>Ros Castle</i>	3-1-79	J. S. Schofield	R. W. Lawrie, A. W. Morrison	R. Sadler	Ben Line Steamers Ltd.
<i>Rubens</i>	7-11-78	S. F. Williams	R. C. Kennett, J. H. Guy, R. C. Avenon	P. Dempsey	Bolton Steam Shipping Co. Ltd.
<i>Rudby</i>	25-10-78	T. F. Jones	J. A. Roberts, N. H. Cooper, H. Watson	G. S. Thomson	Sir R. Ropner & Co. Ltd.
<i>St. Benedict</i>	18-10-77	T. Doyle	T. P. Barrett	N. Abbott	T. Hamling & Co. Ltd.
<i>St. Helena</i>	5-2-79	M. L. M. Smith	D. A. Wheel, R. J. Murray, M. R. E. Underwood		Curnow Shipping Ltd.
<i>St. Jason</i>	20-3-79	A. Ball	H. G. Pask	B. McCall	T. Hamling & Co. Ltd.
<i>Samaria</i>	22-11-78	J. B. Watson	D. Knight, B. Argent, C. Kingston	P. Fieldhouse	Cunard S.S. Co. Ltd.
<i>Sapphire Bounty</i>	*	A. I. McKinnon	A. Morris, M. Masters, M. L. Russell	P. Bradley	Sea Containers (Chartering) Ltd.
<i>Sara Lupe</i>	25-10-77	K. W. Fulker	K. F. Ballard, D. Ellis, J. Shirley		Sir Wm. Reardon Smith & Son, Ltd.
<i>Saxonia</i>	18-8-78	C. R. Knight	J. Billing, B. J. Illingworth	P. J. McGill	Cunard S.S. Co. Ltd.
<i>Scholar</i>	1-9-78	A. F. Perry	I. C. McLeod	L. Keeson	T. & J. Harrison Ltd.
<i>Scotia</i>	8-1-79	J. McBride			Department of Agriculture & Fisheries for Scotland
<i>Scotspark</i>	16-12-77	G. Motley	D. J. Arnald, D. MacNair		J. & J. Denholm Ltd.
<i>Scythia</i>	8-3-79	M. S. Polson	I. M. Percival, R. Lloyd, L. A. Bridgemount	H. O. C. Grattan	Cunard S.S. Co. Ltd.
<i>Seaforth Clansman</i>	6-3-79	J. Ritchie	G. J. Lawson, C. Wilnot, J. M. Hughes	M. H. Stalker	Seaforth Maritime Ltd.
<i>Semac 1</i>	*	J. M. Dobeson	M. J. Wiggott, D. Laycock, P. Nellany, J. McConville	G. Bowels	Semac Services
<i>Serenia</i>	8-2-79	K. Bramley	P. M. Taylor, P. P. Breeley		Shell Tankers (U.K.) Ltd.
<i>Seruta</i>	*	D. L. des Landes	N. D. Walker, J. B. Hooper, D. Peers	H. Jefferson	Cunard S.S. Co. Ltd.
<i>Shackleton</i>	9-1-79	G. H. Selby-Smith	A. R. Louch, P. T. Oldfield, N. A. C. Jonas	R. I. Hammerton	Natural Environment Research Council
<i>Sherbro</i>	5-1-78	S. A. McInnes	M. S. Bagley, D. Robertson	J. J. Crotty	Ocean Transport & Trading Ltd.
<i>Shetland Shore</i>	22-12-78	K. Churchouse	G. M. Prout, B. Button, A. M. Daly		Offshore Marine Ltd.
<i>Shurrabank</i>	2-11-77	G. D. Scott	M. J. Banks		Bank Line Ltd.
<i>Shonga</i>	1-12-78	R. Wild	R. Cooper, J. M. Wood, J. R. Seymour	P. Gooch	Ocean Transport & Trading Ltd.
<i>Sibonga</i>	3-1-79	G. J. Tully	L. J. Mayer, B. T. Woodcock, D. Lorimer	R. T. Graham	Bank Line Ltd.
<i>Sig Ragne</i>	11-1-78	K. Swinburne	D. L. Pereira, M. A. Gough	L. Taylor	J. & J. Denholm Ltd.
<i>Silverford</i>	8-12-76	N. Tuddenham	S. A. Telford, A. M. Huntington, A. G. Tester	C. G. A. Turner	Silver Line Ltd.
<i>Silvermain</i>	25-10-78	M. E. Harris	J. W. Malham, A. G. Morcam, A. P. Montgomery	B. Wilkinson	Silver Line Ltd.
<i>Simonburn</i>	1-3-79	B. Crombie	B. L. Thorne	D. R. Hibberd	Common Bros. Ltd.
<i>Sincerity</i>	10-5-78	H. D. Brown	S. McGilivray		F. T. Everard & Sons Ltd.
<i>Singularity</i>	19-2-79	G. Brown	S. Ross, A. I. Morrison		F. T. Everard & Sons Ltd.
<i>Sivand</i>	*	J. A. M. Taylor	S. Viney, J. Zwart, A. Noraz Alina Colviar	D. J. Tulloch	Irano-British Ship Service Co. Ltd.
<i>Somerset</i>	16-1-78	A. B. Stalker	S. J. Pressly, D. A. Dornom, W. Londesborough	J. C. Thompson	P. & O. S.N. Co.
<i>Southland Star</i>	21-3-79	W. Pitcher	R. A. Somerville, E. Barrimond, M. Power	A. Steel	Blue Star Line Ltd.
<i>Speciality</i>	8-2-78	P. L. Whitehouse	G. Brown, C. Mahon		F. T. Everard & Sons Ltd.
<i>Spraynes</i>	31-1-78	P. B. Bagley	J. Edkins	P. Dredge	Jebsens (U.K.) Ltd.
<i>Star Bullford</i>	13-2-79	M. F. Haley	C. H. Prior-Willeard, D. S. Ritchie, R. M. MacLure	L. K. Moreton	Blandford Shipping Co. Ltd.
<i>Star World</i>	13-9-78	J. A. Cullen	D. R. Gear, C. T. Tong, K. C. Lam	B. D'Souza	Marine Navigation Co. Ltd.
<i>Starman Anglia</i>	*	C. B. Suddes	J. Spencer, D. Barnicoat	R. Kitt	Blue Star Line Ltd.
<i>Stonepool</i>	9-3-79	J. E. Tingle	S. Honey, B. F. Middleton, E. Cooper	W. Beverley	Sir R. Ropner & Co. Ltd.
<i>Strathaird</i>	18-1-79	J. M. Burn	J. T. Jamieson, S. Chandhury, K. Kamat	R. Lownsborough	P. & O. S.N. Co.

<i>Strathardle</i> ..	6.12.78	D. J. Harrison	K. W. Mulholland	..	D. J. Taylor	P. & O. S.N. Co.
<i>Strathbrova</i> ..	19.2.79	G. Savage	K. Lumbers, D. Henry	..	G. Bradshaw	P. & O. S.N. Co.
<i>Strathconon</i> ..	4.1.79	H. E. Wrightson	E. N. Hardy, K. Milnes, B. Aga	..	A. J. Forbes	P. & O. S.N. Co.
<i>Strathdeven</i> ..	6.6.78	A. J. Hughes	H. Dumont, J. T. Jenkins, D. Gates	..	R. Shone	P. & O. S.N. Co.
<i>Strathdirk</i> ..	17.11.78	D. H. Roberts	M. Ross, S. Venner, S. K. Sharma	..	G. Palmer	P. & O. S.N. Co.
<i>Strathdoon</i> ..	16.5.78	A. H. Aston	J. W. C. Phillips, R. M. Wood, A. Adams	..	R. G. Heath	P. & O. S.N. Co.
<i>Strathduins</i> ..	30.6.78	D. J. Harrison	J. Apradurai, P. E. Thompson, S. Horsburgh	..	J. Smyth	P. & O. S.N. Co.
<i>Strathdyce</i> ..	7.8.78	E. G. Dixon	S. P. Johnson, A. J. Wilson, C. V. Umrigar	..	T. M. Elson	P. & O. S.N. Co.
<i>Stratheden</i> ..	6.12.78	M. H. Wilson	B. N. Odeamba, R. O. McD Wilson, J. Savur	..	I. E. Bissell	P. & O. S.N. Co.
<i>Strathelgin</i> ..	*	B. Penman	I. Crane, A. Barker, J. Spange	..	F. E. Marks	P. & O. S.N. Co.
<i>Stratherrhol</i> ..	*	M. Robinson	S. Matthews, M. Cook, R. Loranes	..	W. Spire	P. & O. S.N. Co.
<i>Strathewe</i> ..	*	A. M. J. Jenkins	C. J. Tilley, W. G. Poole, P. Cowdell	..	M. Charlton	P. & O. S.N. Co.
<i>Streambank</i> ..	6.7.78	D. Foster	S. Matthews, J. Jewell, D. Skentelbury	..	G. England	P. & O. S.N. Co.
<i>Sugar Carrier</i> ..	12.1.79	A. Brodie	F. Smith, M. R. Lynam	..	R. Scobie	Bank Line Ltd.
<i>Sugar Crystal</i> ..	30.1.79	J. E. Leaver	J. C. Mason, W. H. Graham, F. Brown	..	S. Martin	Sugar Line Ltd.
<i>Sugar Producer</i> ..	26.9.78	D. Patrickson	J. Clarke, M. Harris, R. J. Davies	..	D. Geoghegan	Sugar Line Ltd.
<i>Sugar Refiner</i> ..	30.1.79	N. L. Thomson	P. B. Hill, R. E. Shore, O. T. Stephenson	..	W. G. Bishop	Sugar Line Ltd.
<i>Sugar Transporter</i> ..	13.11.78	P. Sutcliffe	A. E. Longbottom, A. J. Stirling, P. J. Leech	..	J. S. Wood	Sugar Line Ltd.
<i>Sunnivy</i> ..	25.9.78	W. Shirreff	S. W. Robinson, J. H. Clark, R. E. Shore	..	A. L. Holt	Sugar Line Ltd.
<i>Supremity</i> ..	13.2.79	E. V. Bloomfield	G. M. Hunt, R. P. Willis, A. MacIntyre	..	M. Hearle	F. T. Everard & Sons Ltd.
<i>Swedish Wasa</i> ..	27.10.78	G. Trowsdale	S. R. E. Wainwright, E. E. Talbot, C. R. Jones	..	P. J. Linnett	F. T. Everard & Sons Ltd.
<i>Table Bay</i> ..	26.1.79	L. A. Davis	B. Hollywood	..	I. Pegg	Cayzer Irvine Shipping Co. Ltd.
<i>Tacoma City</i> ..	21.9.78	M. MacLeod	A. C. Malpas, T. G. Geesin, K. Ford-Ramsden	..	K. H. Sellar	Sir Wm. Reardon Smith & Sons Ltd.
	19.2.79	J. S. Catterall	D. J. Mercer, P. Evans	..	A. I. Thompson	T. & J. Harrison Ltd.
	8.3.79	A. Lightfoot	P. Lewis, A. C. Prosser, I. C. Statt	..	S. R. Cloutte	Ocean Transport & Trading Ltd.
<i>Tactician</i> ..	16.8.78	M. Watson	P. N. Humphreys, J. Lowe, R. Jackson	..	D. Barlow	P. & O. S.N. Co.
<i>Tantalus</i> ..	6.12.77	G. F. Williams	A. Othman, L. J. Drummond	..	E. Smartt	P. & O. S.N. Co.
<i>Taupo</i> ..	23.1.79	C. M. Gibbs	R. P. Swinney, G. W. Weaver, I. Anderson	..	E. M. U. Jackson	Bank Line Ltd.
<i>Tekoa</i> ..	2.3.79	F. S. Angus	N. Langrish, L. G. Copeman, B. S. Dean	..	F. Kirk	Texaco Overseas Tankship (U.K.) Ltd.
<i>Teutoibank</i> ..	7.8.78	B. J. Masey	A. Clifford, B. D. Miller	..	R. M. Arnold	Texaco Overseas Tankship (U.K.) Ltd.
<i>Texaco Brussels</i> ..	26.1.78	J. D. Wilkinson	P. G. Darton, P. Turner, V. Golding	..	P. Harris	Texaco Overseas Tankship (U.K.) Ltd.
<i>Texaco Gloucester</i> ..	21.2.78	K. F. R. Holding	T. Stone, A. Garner, T. R. Burke	..	D. Laybourn	Hunting & Sons Ltd.
<i>Texaco Singapore</i> ..	2.2.79	J. C. Barr	J. P. Evans, M. G. M. Boyd, R. D. Pearse	..	W. T. Ashley	Blue Star Line Ltd.
<i>Thamesfield</i> ..	6.7.78	I. Thain	K. W. Love, P. Munro, J. Caizley	..	R. D. Cause	Ocean Transport & Trading Ltd.
<i>Timaru Star</i> ..	7.11.78	H. Windle	B. E. Newbery, J. R. Webber, J. Willis-Richards	..	C. Adkin	P. & O. S.N. Co.
<i>Tokyo Bay</i> ..	6.3.79	J. E. Webb	A. E. Spencer, A. I. Leslie, C. J. A. Hughes	..	R. Dawson	Wm. Robertson & Co. Ltd.
<i>Tongarro</i> ..	1.12.78	D. C. Blackman	R. Fitton, J. F. Farquharson, M. J. Stares	..	F. Murrant	Blue Star Line Ltd.
<i>Tourmaline</i> ..	28.11.78	P. R. Thompson	P. E. Cormican	..	R. L. Swinthead	Blue Star Line Ltd.
<i>Townsville Star</i> ..	14.12.78	A. J. Cheshire	M. A. Barker, J. Saunders, N. Colling	..	A. Catt	J. & J. Denholm Ltd.
<i>Trader</i> ..	6.3.79	A. Perry	W. L. Hailoo, P. Ellis, A. Pugh	..	A. T. Bickford	J. & J. Denholm Ltd.
<i>Trinculo</i> ..	12.9.78	M. L. Ogden	J. O. James, B. G. Bridge, G. Amos	..	B. Donaldson	Turnbull, Scott Management Ltd.
<i>Trojan Star</i> ..	15.1.79	E. C. Smith	A. J. Wilson, P. M. Moore, B. Luke	..	P. & O. S.N. Co.	Blue Star Line Ltd.
<i>Troll Lake</i> ..	14.12.78	J. D. Gray	J. P. Martlew, R. J. Byles, K. O. Boneham	..	E. Connell	Blue Star Line Ltd.
<i>Troll Park</i> ..	21.3.79	C. P. White	S. E. Blake, K. Macleod, L. Kruszins	..	B. B. Everett	Sir Wm. Reardon Smith & Sons Ltd.
<i>Trongate</i> ..	*	P. M. Cooper	D. W. Mathews, W. Alexander, R. Sloggett	..	P. N. Brandram	J. & J. Denholm Ltd.
<i>Uganda</i> ..	6.10.78	D. P. Blois	R. E. Wilson, R. J. A. Brook-Harr, C. A. H. Blake	..	M. L. Davies	J. & J. Denholm Ltd.
<i>Ulster Star</i> ..	6.12.78	J. Atkins	N. Macdonald, P. Farley	..		
<i>Vancouver City</i> ..	6.9.78	T. W. D. John	W. C. Kavanagh, T. Haxel, P. A. Bullard	..		
<i>Vancouver Forest</i> ..	18.12.78	R. J. M. Frater	R. H. Carson, G. B. McConachie, D. Pollock	..		
<i>Vancouver Trader</i> ..	11.10.77	W. D. Beattie	J. Martlew, A. Sekhar, A. MacPherson	..		

Selected Ships (contd.)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Varda</i> ..	17.10.78	M. J. Wharf ..	D. J. Smith, G. C. Rautraya, J. J. Neill ..	G. W. Cunnane ..	Haverton Shipping Ltd.
<i>Vendee</i> ..	8.1.78	T. E. Kelso ..	A. W. Christie, N. L. Blacker, D. J. Perry ..	R. Harris ..	P. & O. S.N. Co.
<i>Victoria City</i> ..	2.11.78	R. E. Skinner ..	A. Abel, J. Pearsall, N. Davies ..	I. F. Bullock ..	Sir Wm. Reardon Smith & Sons Ltd.
<i>Vimeira</i> ..	16.5.77	H. Churchill ..	D. J. McIntosh, P. Breslin, A. Stoddart ..	E. Smith ..	Harrisons (Clyde) Ltd.
<i>Vosges</i> ..	24.1.79	C. Prescott ..	T. U. Owen, L. J. Hesketh ..	J. Bilton ..	P. & O. S.N. Co.
<i>W. M. Neal</i> ..	..	P. Atkinson ..	P. Kirkman, S. Coles ..	P. Mansden ..	Canadian Pacific Steamships Ltd.
<i>Warwickshire</i> ..	12.12.78	K. McLeod ..	P. R. McDowell, A. Kachno, M. S. Brocklesby ..	J. Makin ..	Bibby Line Ltd.
<i>Wellington Star</i> ..	9.1.79	P. Mathews ..	M. Goodfellow, P. Stacey, A. Van Wijnigarden ..	J. Ramsay ..	Blue Star Line Ltd.
<i>Wellpark</i> ..	8.1.79	H. Cornell ..	K. MacLeod, J. Davidson, R. O. C. Smith ..	P. Hughes ..	J. & J. Denholm Ltd.
<i>Welsh City</i> ..	6.12.78	A. L. G. Gossett ..	D. D. Codd, W. G. Wood ..	D. R. Wilkinson ..	Sir Wm. Reardon Smith & Sons Ltd.
<i>Welsh Voyager</i> ..	11.4.78	J. G. Tunncliffe ..	N. Childs, A. Coxon, R. B. Ibalio ..	A. G. Deans ..	Welsh Overseas Freighters Ltd.
<i>Westmorland</i> ..	22.2.79	J. F. Milner ..	P. W. Harris, A. Adams, D. C. Winter ..	J. Evans ..	P. & O. S.N. Co.
<i>Westra</i> ..	18.4.78	D. R. G. Stephen ..	..	..	Department of Agriculture & Fisheries for Scotland
<i>Wild Auk</i> ..	1.12.78	J. C. Fullbrook ..	P. B. Marsh ..	N. W. Harrison ..	P. & O. S.N. Co.
<i>Wild Avocet</i> ..	18.10.78	A. J. Hughes ..	D. Carpenter, B. R. Hutchinson, P. C. Hornett ..	D. M. Williams ..	P. & O. S.N. Co.
<i>Wild Cormorant</i> ..	25.9.78	T. Rowland ..	C. C. Parks, H. M. Munro, W. D. Phumister ..	W. Grant ..	P. & O. S.N. Co.
<i>Wild Curlew</i> ..	10.8.78	M. A. Hill ..	R. P. Swinney, A. D. G. Bell ..	C. Anderson ..	P. & O. S.N. Co.
<i>Wild Flamingo</i> ..	24.1.79	P. Lay ..	M. B. J. Byford, M. J. Fletcher, M. J. Ball ..	D. J. Taylor ..	P. & O. S.N. Co.
<i>Wild Fulmar</i> ..	21.3.79	A. J. Field ..	N. Stephenson, D. W. A. Cater, G. Woolnough ..	A. Hutchinson ..	P. & O. S.N. Co.
<i>Wild Gannet</i> ..	8.1.79	I. Batley ..	J. M. Stafford, S. Parker, P. Cowdell ..	A. D. MacGillvray ..	P. & O. S.N. Co.
<i>Wild Grebe</i> ..	23.2.79	L. E. Quigley ..	P. Phillips, J. R. Mace, C. T. J. Baitey ..	G. K. Valentine ..	P. & O. S.N. Co.
<i>Wild Mallard</i> ..	13.3.79	F. C. Taylor ..	..	P. Dixon-Carter ..	Bibby Line Ltd.
<i>Wiltshire</i> ..	1.9.78	R. C. Middleton ..	B. J. King, G. N. Penry ..	P. T. Bourke ..	Cayzer Irvine Shipping Co. Ltd.
<i>Winchester Castle</i> ..	19.9.78	K. Morton ..	R. A. East, G. Mobbs, J. Millar ..	..	Furness Withy (General Shipping) Ltd.
<i>Zealandic</i> ..	5.2.79	J. Chester ..	I. K. Hutchings, I. D. Cull ..	..	..
<i>Zinnia</i> ..	•	B. Rowlands ..	N. Reid, J. Wright, B. Hildred ..	D. G. Priestland ..	Stag Line Ltd.

Supplementary Ships

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Apollo</i>	1.2.77	J. Earl	H. Bond, A. M. Jones	D. W. Hirone	Bristol S.N. Co. Ltd.
<i>Ardmore</i>	30.12.77	W. J. Perkins	T. Chandler, J. Adcock, R. B. Spencer		P. & O. S.N. Co.
<i>Caroline Western</i>	15.3.79	T. G. P. Van der Ham	L. Clark, S. L. Moorby		Weston Shipping Ltd.
<i>Decca Surveyor</i>		T. Sheehan	H. Skelton		Oil Search Marine Management
<i>Echo</i>	6.3.78	W. R. Kays	K. Parkin, R. D. Smithson	M. M. Kinsella	Bristol S.N. Co. Ltd.
<i>Eden Bridge</i>	4.5.77	L. Bell	R. I. Gibson, N. Stewart, C. V. Gnana-Lone	P. D. Hill	Silver Line Ltd.
<i>Esso Severn</i>	3.7.78	G. R. Rowe	I. H. Holmes	O. H. W. Grimmsdal	Esso Petroleum Co. Ltd.
<i>Goya</i>		F. Merino	K. Lee, A. Dewar, D. Glass	A. L. Dobson	United Baltic Corporation Ltd.
<i>Ilorin Palm</i>	5.1.79	D. Brand	W. Day, R. Wilson	H. Bryant	Palm Line Ltd.
<i>Kurd</i>	13.6.77	C. Thresh	H. Bryant	H. Bryant	British United Trawlers Ltd.
<i>Lord Mount Stephen</i>	16.6.78	G. Waterson	A. Simpson, R. Smith, M. G. Weir	M. J. Corry	Canadian Pacific Steamships Ltd.
<i>Lord Nelson</i>	1.11.78	A. Start	G. W. Taylor	P. Coffe	Hellyer Bros. Ltd.
<i>Methane Princess</i>	25.1.79	R. Smith	J. G. R. Williams, J. C. Oag		Shell Tankers (U.K.) Ltd.
<i>Methane Progress</i>	21.3.79	M. Goddard	P. I. Jameson, A. D. Urwin, L. J. Hill		Shell Tankers (U.K.) Ltd.
<i>Oil Hustler</i>	*	N. Brown	L. Elms		Ocean Inchcape Ltd.
<i>Princess Anne</i>	5.7.77	C. Cunningham	G. I. S. Ives, M. Kirk		Ocean Inchcape Ltd.
<i>Raider</i>		P. E. Craven	C. Sheen	P. J. Linnett	Boston Deep Sea Fisheries Ltd.
<i>Rockes</i>	13.12.77	J. Wheeler	W. Buckland, J. Wheeler, R. Wheeler		J. Wheeler
<i>St. Edmund</i>	24.7.78	J. G. Sleight	W. Brackenbridge, D. P. Platt, E. G. Everingham		Jebsen (U.K.) Ltd.
<i>St. George</i>	7.2.79	M. Grigor	L. Roskell, M. Goochin	R. Mallett	British Rail
<i>St. Jasper</i>	19.7.78	M. T. Morton		K. Batty	T. Hamling & Co. Ltd.
<i>St. Jerome</i>	13.6.78	E. J. Johnson	K. C. Stone		T. Hamling & Co. Ltd.
<i>Tor Belgia</i>	21.11.77	T. Sawyers	S. R. Dowler, J. J. M. Beggs, A. R. Hudson	R. J. Clayton	Tor Line Ltd.
<i>Tor Gothia</i>	7.2.79	P. J. Miller	R. J. Wells, R. J. Hibbing	T. W. Lawson	Tor Line Ltd.
<i>Vegaman</i>	19.9.78	G. J. C. Harper	S. G. Turner, M. C. Jones	L. P. Greeve	C. Rowbotham & Sons Management Ltd.
<i>Viking Valiant</i>	22.1.79	M. Blight	D. Parsons, C. E. Walford	C. D. Arnold	Townsend-Thoresen Car Ferries Ltd.
<i>Viking Venturer</i>	15.11.78	A. Bonehill	W. J. C. Clarke, D. J. Pearce	C. D. Arnold	Townsend-Thoresen Car Ferries Ltd.

Light-vessels

NAME OF VESSEL	MASTER
<i>Chammel</i>	R. Owen, E. Jaeger
<i>Dowsing</i>	A. S. Richards, F. J. Turner
<i>East Goodwin</i>	L. Mortimer, F. J. Shilling
<i>Falls</i>	A. H. Robinson, W. Semple
<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. E. J. Ellis, M. O'Sullivan
<i>St. Gowan</i>	M. F. Roche, P. Roche
<i>Seven Stones</i>	T. G. Northcott, R. Goddard
<i>Shipwash</i>	R. Cadman, W. F. Dalby
<i>Smith's Knoll</i>	F. Harrison
<i>South Rock</i>	C. Dunigan, J. Scanhian
<i>Tongue</i>	J. H. Wilson, -. Brasled
<i>Varne</i>	F. Betts, J. Rudd

‘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>Anglezark</i>	B. Smith	Effluent Services
<i>Arco Scheldt</i>	C. Proctor	A.B.C. (Marine) Ltd.
<i>Arco Severn</i>	I. J. Constance	A.B.C. (Marine) Ltd.
<i>Arco Thames</i>	T. H. Hills	A.B.C. (Marine) Ltd.
<i>Arlington</i>	J. Pitt	Stephenson Clarke Shipping Ltd.
<i>Avalon</i>	R. M. Lidgate	British Rail
<i>Bass Shore</i>	S. Sage	Offshore Marine Ltd.
<i>Beacon Point</i>	A. Alves	Christian Salvesen (Shipping) Ltd.
<i>Brenda</i>	R. Mill-Irving	Dept. of Agriculture & Fisheries for Scotland
<i>Brian Boroime</i>	J. Bakewell	British Rail
<i>Caesarea</i>	M. E. Bodiam	British Rail
<i>Caledonian Princess</i>	J. D. MacMillan	British Rail
<i>Castle Point</i>	J. Gibbons	Hudson S.S. Co. Ltd.
<i>Clansman</i>	D. McLean	Caledonia MacBrayne Ltd.
<i>Claymore</i>	M. Kennedy	Caledonia MacBrayne Ltd.
<i>Columba</i>	J. P. Gray	Caledonia MacBrayne Ltd.
<i>Cymbeline</i>	J. Potter	Houlder Bros. Ltd.
<i>Dolphin Point</i>	C. Wood	Ocean Transport & Trading Ltd.
<i>Doric Ferry</i>	J. Costain	Atlantic S.N. Co. Ltd.
<i>Dragon</i>	I. H. Leggatt	Southern Ferries Ltd.
<i>Duke of Lancaster</i>	J. A. Mason	British Rail
<i>Earl Godwin</i>	M. Hurd-Wood	British Rail
<i>Earl William</i>	P. Baker	British Rail
<i>Esso Clyde</i>	J. Smith	Esso Petroleum Co. Ltd.
<i>Esso Fawley</i>	F. Dogherty	Esso Petroleum Co. Ltd.
<i>Esso Mersey</i>	G. Allport	Esso Petroleum Co. Ltd.
<i>Esso Milford Haven</i>	W. L. Lowndes	Esso Petroleum Co. Ltd.
<i>Ferryhill II</i>	J. Watt	Aberdeen Coal & Shipping Co. Ltd.
<i>Fort Point</i>	S. Church	Christian Salvesen (Shipping) Ltd.
<i>Garrison Point</i>	- Horsley	Hudson S.S. Co. Ltd.
<i>Hebrides</i>	J. M. McQueen	Caledonia MacBrayne Ltd.
<i>Helmsdale</i>	A. F. Ross	Northern Trading Co. Ltd.
<i>Hilary Weston</i>	J. K. Schofield	Weston Shipping Ltd.
<i>Inganess Bay</i>	E. Bailey	Elwick Bay Shipping Co. Ltd.
<i>L. M. Odin</i>	D. Thompson	Land & Marine Engineering Ltd.
<i>Moler Venture</i>	T. Pollitt	C.M.S. Shipping Co. Ltd.
<i>Navigator</i>	B. D. Davidson	Decca Navigator Co. Ltd.
<i>Oswestry Grange</i>	W. Backhouse	Houlder Bros. Ltd.
<i>Penelope Everard</i>	D. Stewart	F. T. Everard & Sons Ltd.
<i>Pharos</i>	F. K. Davidson	Northern Lighthouse Board
<i>Rhodri Mawr</i>	F. Wilkins	British Rail
<i>St. Clair</i>	J. Gifford	P. & O. S.N. Co.
<i>St. Columba</i>	J. E. Milburn	British Rail
<i>St. Modan</i>	R. Stewart	J. & A. Gardner Co. Ltd.
<i>Shell Refiner</i>	N. McLeod	Shell U.K. Ltd.
<i>Somersetbrook</i>	D. Hill	Comben Longstaff & Co. Ltd.
<i>Suavity</i>	B. Maitchell	F. T. Everard & Sons Ltd.
<i>Suffolk Shore</i>	R. Dawson	Offshore Marine Ltd.
<i>Sumburgh Head</i>	H. Mackay	Christian Salvesen (Shipping) Ltd.
<i>Sussexbrook</i>	J. McCormack	Comben Longstaff & Co. Ltd.
<i>Ulster Queen</i>	R. E. Wildgoose	Belfast S.S. Co. Ltd.
<i>Vigilant</i>	D. Rattary	Dept. of Agriculture & Fisheries for Scotland
<i>Wendy Weston</i>	A. G. Agnew	Weston Shipping Ltd.
<i>Whitegate</i>	C. H. Roberts	Turnbull Scott Management Ltd.
<i>Whitehorn</i>	H. S. Cully	Sir William Coe Ltd.
<i>Wilmington</i>	A. Hanson	Stephenson Clarke Shipping Ltd.

BRITISH COMMONWEALTH

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

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

AUSTRALIA (Information dated 12.2.79)

NAME OF VESSEL	OWNER/MANAGER
<i>Advara</i>	Southern Shipping Line
<i>Al Khaaleej</i>	Kuwait Shipping Co.
<i>Al Kuwait</i>	Kuwait Shipping Co.
<i>Al Shuwaikh</i>	Kuwait Shipping Co.
<i>Andros</i>	Australia-West Pacific Line
<i>Anna Prestheus</i>	John Prestheus Rederi
<i>Anro Australia</i>	Australian National Line
<i>Arafura</i>	Overseas Containers Australia Pty Ltd.
<i>Ariake</i>	Australia-Japan Container Line
<i>Ariane</i>	Overseas Containers Australia Pty Ltd.
<i>Australia Star</i>	Blue Star Line
<i>Aurore</i>	Weeke Ship Hong Kong Ltd.
<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 Prospector</i>	Australian National Line
<i>Australian Venture</i>	Australian National Line
<i>Baron Maclay</i>	Scottish Ship Management Ltd.
<i>Baron Wemyss</i>	Scottish Ship Management Ltd.
<i>Bass Trader</i>	Australian National Line
<i>Boogalla</i>	W.A. State Shipping Service
<i>B.P. Endeavour</i>	B.P. Tankers Pty Ltd.
<i>B.P. Enterprise</i>	B.P. Tankers Pty Ltd.
<i>Cape Don</i>	Department of Transport
<i>Cape Grafton</i>	Scottish Ship Management Ltd.
<i>Cape Hawke</i>	British Phosphate Commission
<i>Cape Moreton</i>	Department of Transport
<i>Cape Pillar</i>	Department of Transport
<i>Centaur</i>	Blue Funnel Line
<i>Curtis Capricorn</i>	Clutha Development Pty Ltd.
<i>Curtis Oceanic</i>	Clutha Development Pty Ltd.
<i>Clydebank</i>	Bank Line Ltd.
<i>Corabank</i>	Bank Line Ltd.
<i>Coral Chief</i>	New Guinea-Australia Line Pty Ltd.
<i>Darwin Trader</i>	Australian National Line
<i>Diana Clausen</i>	Clausen Shipping Co.
<i>Doha</i>	Patridis Agencies Pty Ltd.
<i>Dona Clausen</i>	Clausen Shipping Line
<i>Eastern Academy</i>	Burns Phillip Co.
<i>Edward Wilshaw</i>	Cable and Wireless Pty Ltd.
<i>Eigamoiya</i>	Naura Pacific Shipping Line
<i>Empress of Australia</i>	Australian National Line
<i>Eugene McDermott</i>	Geophysical Services International
<i>Forthbank</i>	Bank Line Ltd.
<i>Iron Arnhem</i>	Broken Hill Pty Co. Ltd.
<i>Iron Bogong</i>	Broken Hill Pty Co. Ltd.
<i>Iron Cavalier</i>	Broken Hill Pty Co. Ltd.
<i>Iron Dampier</i>	Broken Hill Pty Co. Ltd.
<i>Iron Endeavour</i>	Broken Hill Pty Co. Ltd.
<i>Iron Hunter</i>	Broken Hill Pty Co. Ltd.
<i>Iron York</i>	Broken Hill Pty Co. Ltd.
<i>Ivybank</i>	Bank Line Ltd.
<i>Jeparit</i>	Australian National Line
<i>John Burke</i>	John Burke Pty Ltd.
<i>Kota Bali</i>	Pacific International
<i>Khalij Express</i>	Gulf Ship Lines Ltd.
<i>Kota Singapura</i>	Pacific International
<i>Kristinbakke</i>	Knutson Line
<i>Lake Sorell</i>	Australian National Line
<i>Lalandia</i>	Scan Austral East Asiatic Shipping Co.
<i>Linda Clausen</i>	Clausen Shipping Co.
<i>Malmos Monsoon</i>	Australia West Pacific Line
<i>Meadowbank</i>	Bank Line Ltd.
<i>Melbourne Trader</i>	Australian National Line
<i>Mashaalah</i>	Cunard Steam Ship Co. Ltd.
<i>Mount Newman</i>	Broken Hill Pty Co. Ltd.
<i>Myarra</i>	Union Bulkships Pty Ltd.
<i>Nimos</i>	Common Brothers Management Ltd.
<i>Nuigini Express</i>	New Guinea Australia Line Ltd.
<i>Nyanda</i>	W.A. State Shipping Service
<i>Opal Bounty</i>	Sea Containers Services Ltd.

Australia (contd.)

NAME OF VESSEL	OWNER/MANAGER
<i>Papuan Chief</i>	Nedlloyd Swire Pty Ltd.
<i>Ravenswood</i>	Furness Withy (Aust.) Pty Ltd.
<i>Regional Endeavour</i>	Drillships Ltd.
<i>Sprightly</i>	T. Korrevaar and Sons Pty Ltd.
<i>Stirling Range</i>	Wilmores Ltd.
<i>Strathmay</i>	P. & O. Australia Ltd.
<i>Strathmeigle</i>	P. & O. Australia Ltd.
<i>Strathmore</i>	P. & O. Australia Ltd.
<i>Sid McGrath</i>	John Burke Pty Ltd.
<i>Strathmuir</i>	P. & O. Australia Ltd.
<i>Surenes</i>	Jebsen Line
<i>Sydney Trader</i>	Australian National Line
<i>Tamara</i>	Southern Shipping Line
<i>Tambo River</i>	Australian National Line
<i>Tarago</i>	Scan Austral East Asiatic Shipping Lane
<i>Tombarra</i>	Scan Austral East Asiatic Shipping Line
<i>Turquoise Bounty</i>	Sea Containers Services Ltd.
<i>Tricolour</i>	Scan Austral East Asiatic Shipping Line
<i>Tropic Fury</i>	Tropic Island Shipping Pty Ltd.
<i>Wambiri</i>	W.A. State Shipping Service
<i>Yarra River</i>	Australian National Line

CANADA (Information dated 1.1.79)

NAME OF VESSEL	OWNER/MANAGER
<i>A. T. Cameron</i>	Government of Canada
<i>Achilles</i>	Ocean Transport & Trading Ltd.
<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>Bernes</i>	Jebsen (U.K.) Ltd.
<i>Bluenose</i>	Canadian National (Marine)
<i>Bolnes</i>	Jebsen (U.K.) Ltd.
<i>Borgnes</i>	Jebsen (U.K.) Ltd.
<i>Camsell</i>	Government of Canada
<i>Cape Harrison</i>	Government of Canada
<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>D'Iberville</i>	Government of Canada
<i>Dilkara</i>	ACTA Pty Ltd.
<i>Dumurra</i>	Ocean Transport & Trading Ltd.
<i>Eastern Maid</i>	Indo China S.N. Co. Ltd.
<i>Eastern Moon</i>	Indo China S.N. Co. Ltd.
<i>Fjellnes</i>	Reederei J. Jost (Germany)
<i>Fort Kamloops</i>	Canadian Pacific Steamships Ltd.
<i>Fort Nelson</i>	Canadian Pacific Steamships Ltd.
<i>Fort Walsh</i>	Canadian Pacific Steamships Ltd.
<i>Fort Yale</i>	Canadian Pacific Steamships Ltd.
<i>G. B. Reed</i>	Government of Canada
<i>Grenfell</i>	Government of Canada
<i>Gulf Canada</i>	Gulf Canada Ltd.
<i>Gulf Gatineau</i>	Gulf Canada Ltd.
<i>Gulf MacKenzie</i>	Gulf Canada Ltd.
<i>Gulf Tide</i>	Mobile Oil Ltd.
<i>Gypsum Empress</i>	Fundy Gypsum Co.
<i>H 1060</i>	Kent Lines Ltd.
<i>H 1070</i>	Kent Lines Ltd.
<i>Harfleet</i>	J. & C. Harrison Ltd.
<i>Harfleur</i>	J. & C. Harrison Ltd.
<i>Hudson</i>	Government of Canada
<i>Irving Glen</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>John A. MacDonald</i>	Government of Canada
<i>John Cabot</i>	Government of Canada
<i>J. V. Clyde</i>	Canadian Pacific Steamships Ltd.
<i>Keewatin</i>	Northern Transportation Co.
<i>Labrador</i>	Government of Canada
<i>Leda</i>	Seaboard Shipping Ltd.
<i>Limnos</i>	Government of Canada
<i>Louisburg</i>	Government of Canada
<i>Louis S. St. Laurent</i>	Government of Canada
<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>N. B. McLean</i>	Government of Canada
<i>Nonia</i>	Canadian National (Marine)
<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>N. R. Crump</i>	Canadian Pacific Steamships 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>Phosphore Conveyor</i>	Leitch Transportation Ltd.
<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>Silvercove</i>	Silver Lines Ltd.
<i>Sir Humphrey Gilbert</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>Temple Inn</i>	Scottish Ship Management
<i>Thomas Carleton</i>	Government of Canada
<i>Thor I</i>	Thor Dahl Lines
<i>Thorscape</i>	Thor Dahl Lines
<i>Thorswage</i>	Thor Dahl Lines

Canada (contd.)

NAME OF VESSEL	OWNER/MANAGER
<i>Tupper</i>	Government of Canada
<i>Walter E. Foster</i>	Government of Canada
<i>W. C. Van Horne</i>	Canadian Pacific Steamships Ltd.
<i>Westocean</i>	Jardine Matheson Ship Management

Auxiliary Ships:

Canada has 80 ocean-going Auxiliary Ships and 82 Auxiliary Ships operating on the Great Lakes and Inland Waters.

HONG KONG (Information dated 2.3.79)

NAME OF VESSEL	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>American Career</i>	Wu Kam Fat	Lui Sheung Cho, Wong Fook Ching, Expedito C. Butaslac	Tsui Po Ming	United States Lines
<i>American Mohawk</i>	Wu Yuan	Yan Mu Shen, Chih Ting Ho, Long Fa Hai	Lin Kuei Yen	United States Lines
<i>Asian Jade</i>	D. R. Groves	R. C. Dundas, Chan Kwok Wai, N. J. Brierley, M. P. Lee	Hsu Yeh Chung	Mercury Shipping Co. Ltd.
<i>Asian Pearl</i>	R. I. Shipp	F. P. Fairbrother, S. J. Harris, J. Poulter	Yam Siu Ning	Swire Pacific Ship Management Ltd.
<i>Bertrims</i>	O. Henderson	F. I. Hogg, T. D. Corbett, M. Pears	D. J. Murray	The Ben Line Steamers Ltd.
<i>Cape St. Mary</i>	H. M. Chan	Y. S. Kwok, M. S. Ngau	K. H. Li	Agriculture & Fisheries Dept., H. K. Govt.
<i>Coral Princess</i>	M. T. Anderson	D. B. Cooper, S. W. Prescott, D. W. Tew, G. P. Van Uden	Chan Hak Wai	Swire Pacific Ship Management Ltd.
<i>D. F. Fatimirokun</i>	M. Hansen	Løber Bent, Pajor Jan, Schultz Steffen	Simonsen Jørgen	The East Asiatic Co. Ltd.
<i>Eastern Muse</i>	N. J. Lane	K. M. Lines, A. L. Crosthwaite, Godfrey G. C. Lim	Kam Sui Ki	The Indo-China S.N. Co., (H.K.) Ltd.
<i>Funing</i>	D. A. Hansing	L. Findlay, P. Midgley, J. G. Noakes	Chan Leung	Swire Shipping (Agencies) Ltd.
<i>Hallads</i>	Aa. Sjøberg	R. Nilsen, S. Holland, B. Aarø	Wong Chin Man	Thoresen & Co. Ltd.
<i>Hermelin</i>	E. F. Andreassen	K. Henriksen, J. Gustu, N. R. Christensen	Lai Kwong Yin	Thoresen & Co. Ltd.
<i>Hongkong Containor</i>	F. G. Dagger	K. Y. Lee, K. L. Yip, W. Tsai, P. K. Wong	K. L. Ng	Hongkong Export Lines, Ltd.
<i>Hupei</i>	B. Keeble	M. A. J. Dawes, M. Baker, R. Daniel, Mak Wai Yin	Chan Kam Yin	Swire Pacific Ship Management Ltd.
<i>Kwangsi</i>	J. R. Kidd	P. Barton, D. H. Morgan, Lo Chun Bui, T. Torna	G. C. A. Freeman	Swire Pacific Ship Management Ltd.
<i>Kwaichow</i>	J. W. G. Wilby	P. D. Clarke, G. C. A. Hofton, R. P. Winthrop	Kwok Man Wai	Swire Pacific Ship Management Ltd.
<i>Laertes</i>	C. V. Windsor	W. J. Byard, G. S. Ghuman, C. B. Noon	J. S. Evans	Swire Pacific Ship Management Ltd.
<i>Lamma Island</i>	Man Kam Yan	Tsui Kun Hing, Cheng Chau Seng, Sharon Galhena	Tso Kwong Chung	Hong Kong Islands Shipping Co. Ltd.
<i>Lycan</i>	Leslie Pound	I. Mountain, T. C. G. Goh, Michael Cramond	D. Davis	Swire Pacific Ship Management Ltd.
<i>Maersk Tempo</i>	Fraim Joseph Leo	Buchan Ian Stuart, Reuten Francis, Abd Karim Mohd Mukhtar	Chong Nee Fee	Maersk Line (Hong Kong) Ltd.
<i>Manoelverett</i>	Ariston D. Roxas	Ignacio G. Daco, Jesulito G. Gelvero, Rufo T. Mendoza	Romulo P. Poblete	Everett Steamship Corporation S/A
<i>Melampus</i>	C. M. Sandy	J. A. Dyne, W. J. Martin, C. J. Stone, J. J. F. Braddock	B. Oldroyd	Barber Lines Hong Kong Ltd.
<i>Mennon</i>	R. M. Williams	J. L. Fielden, B. G. Lloyd, M. P. James	J. B. Sergeant	Barber Lines Hong Kong Ltd.
<i>Menelaus</i>	John C. Morris	D. J. H. Custance, J. W. Ashworth, S. R. Jenkins, K. G. H. Trevanion	Edward E. Milburn	Barber Lines Hong Kong Ltd.
<i>Mui Kim</i>	James Keates	K. P. Ray, J. E. De Souza, L. D. Dordas	Chau Wing	Hongkong Borneo Shipping Co. Ltd.
<i>Oriental Ambassador</i>	A. R. Dyason	P. S. Yeung, T. H. Shin, C. Hung	C. Y. Leung	Hongkong Export Lines, Ltd.
<i>Oriental Chief</i>	G. Mitchell	H. L. Tong, C. K. Yeung, K. W. Poon	C. S. Ow	Hongkong Export Lines, Ltd.
<i>Oriental Expert</i>	A. C. Ingles	K. S. Lo, Y. F. Chung, C. M. Kwong	W. K. Tang	Hongkong Export Lines, Ltd.
<i>Pabloverett</i>	C. G. Villanueva	A. A. Olavar, Quirino V. Diesta, D. P. Nepomuceno	R. B. Tablada	Everett Steamship Corporation S/A
<i>Pampa Argentina</i>	Carlos A. Bianchi	Oscar Accetta, Claudio A. Arcagni	A. R. Benitez	Everett Steamship Corporation S/A
<i>Patagonia Argentina</i>	G. Cornforth	H. H. W. Oestreich, I. F. Hammond, S. J. Hall	Ho Tat Shing	Everett Steamship Corporation S/A
<i>Poyang</i>	A. L. Carter	Siu Wai Lum, H. C. Ratcliff, Lee Lye Eng	Hsu Yeh Chung	Swire Pacific Ship Management Ltd.
<i>Sinkang</i>	A. D. Johnston	R. M. Wilson, R. McNeill, M. Ross	A. J. Forbes	Swire Shipping (Agencies) Ltd.
<i>Sirathiffe</i>	H. J. D. Sladen			Sirath Services, P. & O./Swire Shipping (Agencies) Ltd.
<i>Strathfyme</i>				
<i>Tai Ping</i>	V. S. Patwardhan	D. J. F. D'Souza, S. F. Lambey, U. B. Palsule, F. M. Thein	S. S. Parkhi	Barber Lines Hong Kong Ltd.
<i>Taichungshan</i>	P. D. Nicoll	Woo Shui Ping, Kai Chi Keung, Ong Kim Heng	Tam Chick	Shun Cheong S.N. Co. Ltd.
<i>Taihookshan</i>	T. W. Duncan	Lai Kwok Keung, Ng Kwok Tung, Kumar Krishna	Cheung Kam Tim	Shun Cheong S.N. Co. Ltd.
<i>Taipoosek</i>	Ko Keng Jen	Chan Wing Lok, Alam Didarul, EE Tian Koon	Cheung Hon Hung	Shun Cheong S.N. Co. Ltd.
<i>Tanaro</i>	P. M. Abraham	G. R. Keltar, A. G. Fadra, R. M. D'Souza	F. Umrigar	Barber Lines Hong Kong Ltd.
<i>Tenia</i>	I. M. Narang	S. S. Sodhi, S. K. Mongia, V. R. Manjeshwar, B. S. Chatha	S. L. Silveria	Barber Lines Hong Kong Ltd.
<i>Thomasverett</i>	Juanito S. Vapor	F. F. Tobojan, R. D. Mercado Jr, F. P. Anchuelo	P. B. Salvador	Everett Steamship Corporation S/A

INDIA (Information dated 1.1.79)

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
<i>Indian Security</i>	India Steamship Co.
<i>Indian Success</i>	India Steamship Co.
<i>Jal Azad</i>	Scindia Steam Navigation Co.
<i>Jaladhanya</i>	Scindia Steam Navigation Co.
<i>Jaladharma</i>	Scindia Steam Navigation Co.
<i>Jaladhruv</i>	Scindia Steam Navigation Co.
<i>Jaladhukita</i>	Scindia Steam Navigation Co.
<i>Jalaganga</i>	Scindia Steam Navigation Co.
<i>Jalagiriya</i>	Scindia Steam Navigation Co.
<i>Jalagouri</i>	Scindia Steam Navigation Co.
<i>Jalajyoti</i>	Scindia Steam Navigation Co.
<i>Jalakanta</i>	Scindia Steam Navigation Co.
<i>Jalakrishna</i>	Scindia Steam Navigation Co.
<i>Jalamangala</i>	Scindia Steam Navigation Co.
<i>Jalamoti</i>	Scindia Steam Navigation Co.
<i>Jalapalaka</i>	Scindia Steam Navigation Co.
<i>Laxmi Sagar</i>	Parekh Ocean Carriers
<i>Lok Sevak</i>	Mogul Line Ltd.
<i>State of Assam</i>	Shipping Corporation of India
<i>State of Bihar</i>	Shipping Corporation of India
<i>State of Gujarat</i>	Shipping Corporation of India
<i>State of Kutch</i>	Shipping Corporation of India
<i>State of Maharashtra</i>	Shipping Corporation of India
<i>State of Orissa</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>Vishnu Sagar</i>	Parekh Ocean Carriers
<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>Vishva Sudha</i>	Shipping Corporation of India
<i>Vishva Vir</i>	Shipping Corporation of India
Supplementary Ships:	
<i>Ajanta</i>	Shipping Corporation of India
<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 Sushma</i>	Apeejay Lines Ltd.
<i>Apja Anyali</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>Barauni</i>	Shipping Corporation of India
<i>Bellary</i>	Shipping Corporation of India
<i>Bhagat Singh</i>	Shipping Corporation of India
<i>Bhaskar</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 Muyarchi</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>Devaraya</i>	Shipping Corporation of India
<i>Diglipur</i>	Shipping Corporation of India
<i>Harshavardhana</i>	Shipping Corporation of India
<i>Indian Endurance</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 Industry</i>	India Steamship Co.
<i>Indian Prestige</i>	India Steamship Co.
<i>Indian Progress</i>	India Steamship Co.
<i>Indian Prosperity</i>	India Steamship Co.
<i>Indian Splendour</i>	India Steamship Co.
<i>Indian Strength</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.

India (contd.)

NAME OF VESSEL	OWNER
Jag Anjali	Great Eastern Shipping Co.
Jag Dev	Great Eastern Shipping Co.
Jag Dharma	Great Eastern Shipping Co.
Jag Doot	Great Eastern Shipping Co.
Jag Jiwan	Great Eastern Shipping Co.
Jag Jyoti	Great Eastern Shipping Co.
Jag Manek	Great Eastern Shipping Co.
Jag Prakash	Great Eastern Shipping Co.
Jag Ravi	Great Eastern Shipping Co.
Jag Rekha	Great Eastern Shipping Co.
Jag Shakti	Great Eastern Shipping Co.
Jag Shanti	Great Eastern Shipping Co.
Jagat Neta	Dempo Steamship Co. Ltd.
Jagat Swamini	Dempo Steamship Co. Ltd.
Jagat Samrat	Dempo Steamship Co. Ltd.
Jagat Vijeta	Dempo Steamship Co. Ltd.
Jalabala	Scindia Steam Navigation Co.
Jaladharati	Scindia Steam Navigation Co.
Jaladhir	Scindia Steam Navigation Co.
Jaladurga	Scindia Steam Navigation Co.
Jaladuta	Scindia Steam Navigation Co.
Jalagomati	Scindia Steam Navigation Co.
Jalavijaya	Scindia Steam Navigation Co.
Jalakala	Scindia Steam Navigation Co.
Jalakendra	Scindia Steam Navigation Co.
Jalakirti	Scindia Steam Navigation Co.
Jalamani	Scindia Steam Navigation Co.
Jalamatsya	Scindia Steam Navigation Co.
Jalamayur	Scindia Steam Navigation Co.
Jalamohan	Scindia Steam Navigation Co.
Jalamokambi	Scindia Steam Navigation Co.
Jalamorari	Scindia Steam Navigation Co.
Jalapankhi	Scindia Steam Navigation Co.
Jalarajan	Scindia Steam Navigation Co.
Jalarashmi	Scindia Steam Navigation Co.
Jalaratna	Scindia Steam Navigation Co.
Jalatarang	Scindia Steam Navigation Co.
Jalaveera	Scindia Steam Navigation Co.
Jalavijaya	Scindia Steam Navigation Co.
Jalayamini	Scindia Steam Navigation Co.
Jalayamuna	Scindia Steam Navigation Co.
Jalavallabh	Scindia Steam Navigation Co.
Jana Priya	Mogul Line Ltd.
Jana Vijaya	Mogul Line Ltd.
Jawaharlal Nehru	Shipping Corporation of India
Jay Ambika	Jayashree Shipping Co.
Jaynarayan Vyas	Shipping Corporation of India
Kanishka	Shipping Corporation of India
Karnataka	Karnataka Shipping Co.
Kairali	Kerala Shipping Co.
Kedarnath	Himalaya Shipping Co.
Lal Bahadur Shastri	Shipping Corporation of India
Laxmi	Shipping Corporation of India
Lokamanya Tilak	Shipping Corporation of India
Lok Nayak	Mogul Line Ltd.
Lok Palak	Mogul Line Ltd.
Lok Sahayyak	Mogul Line Ltd.
Lok Vihar	Mogul Line Ltd.
Lok Vinay	Mogul Line Ltd.
Lok Vivek	Mogul Line Ltd.
Mahabharat	South East Asia Shipping Co.
Mahabhakti	South East Asia Shipping Co.
Mahabir	South East Asia Shipping Co.
Maharashmi	South East Asia Shipping Co.
Mahavijay	South East Asia Shipping Co.
Maratha Melody	Chowgule Shipping
Maratha Progress	Chowgule Shipping
Maratha Providence	Chowgule Shipping
Meghreb	Indo Oceanic Shipping Co.
Mizoram	Shipping Corporation of India
Nandkala	Essar Constructions & Carriers
Netaji Subhash Bose	Shipping Corporation of India
Noncowery	Shipping Corporation of India
Onge	Shipping Corporation of India
Prabhu Daya	Tolani Shipping Co.
Prabhu Gopal	Tolani Shipping Co.
Prabhu Satram	Tolani Shipping Co.
Rafi Ahmed Kidwai	Shipping Corporation of India
Ratna Kirti	Ratnakar Shipping Co.
Ratna Nandini	Ratnakar Shipping Co.
Ratna Shobhana	Ratnakar Shipping Co.
Ratna Usha	Ratnakar Shipping Co.
Rishi Vishva Mitra	Shipping Corporation of India
Sagar Deep	Shipping Corporation of India
Sagar Samrat	Shipping Corporation of India
Samudra Gupta	Shipping Corporation of India

India (contd.)

NAME OF VESSEL	OWNER
<i>Sanchi</i>	Shipping Corporation of India
<i>Sarojini Naidu</i>	Shipping Corporation of India
<i>Satya Kamal</i>	Seven Seas Transportation Ltd.
<i>Satya Murti</i>	Seven Seas Transportation Ltd.
<i>Satya Padam</i>	Seven Seas Transportation Ltd.
<i>Satya Sohan</i>	Seven Seas Transportation Ltd.
<i>Sahajahan</i>	Shipping Corporation of India
<i>Shompen</i>	Shipping Corporation of India
<i>State of Andhra Pradesh</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 Madhya Pradesh</i>	Shipping Corporation of India
<i>State of Mysore</i>	Shipping Corporation of India
<i>State of Nagaland</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>Tamilanna</i>	Pompoohar Shipping Co.
<i>Teesta</i>	Mackinnon MacKenzie & Co.
<i>Vallabha Bhai Patel</i>	Shipping Corporation of India
<i>Varun Yan</i>	Thakur Shipping Co.
<i>Vishva Abha</i>	Shipping Corporation of India
<i>Vishva Aditya</i>	Shipping Corporation of India
<i>Vishva Ambar</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 Kalyan</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 Lalita</i>	Shipping Corporation of India
<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 Marg</i>	Shipping Corporation of India
<i>Vishva Mohini</i>	Shipping Corporation of India
<i>Vishva Nayak</i>	Shipping Corporation of India
<i>Vishva Nidhi</i>	Shipping Corporation of India
<i>Vishva Pratap</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 Rekha</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
<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 Usha</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 Vinay</i>	Shipping Corporation of India
<i>Vishva Vivek</i>	Shipping Corporation of India
<i>Vishva Yash</i>	Shipping Corporation of India
<i>Vivekanand</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 1.2.79)

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>Amokura</i>	Union S.S. Co. N.Z. Ltd.
<i>Aotea</i>	Container Fleets N.Z. Ltd.
<i>Bulknes</i>	Shipping Corporation of N.Z.
<i>Capitaine Kermadec</i>	Sofrana Uniline
<i>Capitaine La Perouse</i>	Sofrana Uniline
<i>Coastal Trader</i>	Shipping Corporation of N.Z.
<i>Dunedin</i>	Maritime Carriers Ltd.
<i>Eagle Arrow</i>	Gearbulk Ltd.
<i>Erne</i>	Union S.S. Co. N.Z. Ltd.
<i>Fetu Moana</i>	Shipping Corporation of N.Z.
<i>Holmdale</i>	Union S.S. Co. N.Z. Ltd.
<i>James Cook</i>	N.Z. Government (Fisheries Research)
<i>John Wilson</i>	Tarakohe Shipping Co. Ltd.
<i>Karetu</i>	Union S.S. Co. N.Z. Ltd.
<i>Kolle D.</i>	Nauru Pacific Line
<i>Kotuku</i>	Union S.S. Co. N.Z. Ltd.
<i>Kuaka</i>	Union S.S. Co. N.Z. Ltd.
<i>La Bonita</i>	Reef Shipping Co.
<i>Ligar Bay</i>	Tarakohe Shipping Co. Ltd.
<i>Marama</i>	Union S.S. Co. N.Z. Ltd.
<i>N.Z. Pacific</i>	Shipping Corporation of N.Z.
<i>N.Z. Waitangi</i>	Shipping Corporation of N.Z.
<i>Ngahere</i>	Union S.S. Co. N.Z. Ltd.
<i>Ngakuta</i>	Union S.S. Co. N.Z. Ltd.
<i>Ngapara</i>	Union S.S. Co. N.Z. Ltd.
<i>Pacific Installer</i>	Swire Northern Offshore
<i>Tangaroa</i>	N.Z. Government (Oceanographic Research)
<i>Tasman Enterprise</i>	Tasman Pulp & Paper Co. Ltd.
<i>Tasman Venture</i>	Development Finance Co.
<i>Tauloto II</i>	Pacific Forum Line
<i>Tiare Moana</i>	Shipping Corporation of N.Z.
<i>Titoki</i>	Anchor-Dorman Ltd.
<i>Toa Moana</i>	Pacific Forum Line
<i>Tui Cahau II</i>	Pacific Lines Ltd.
<i>Union Auckland</i>	Union S.S. Co. N.Z. Ltd.
<i>Union Hobart</i>	Union S.S. Co. N.Z. Ltd.
<i>Union Lyttelton</i>	Union S.S. Co. N.Z. Ltd.
<i>Union Rotoiti</i>	Union S.S. Co. N.Z. Ltd.
<i>Union Rotorua</i>	Union S.S. Co. N.Z. Ltd.
<i>Valetta</i>	British Phosphate Commission
<i>Waitaki</i>	Maritime Carriers Ltd.
<i>Westport</i>	N.Z. Cement Holding Ltd.
Supplementary Ships:	
<i>Arahanga</i>	N.Z. Railways
<i>Aramoana</i>	N.Z. Railways
<i>Aramui</i>	N.Z. Railways
<i>Aratika</i>	N.Z. Railways
<i>Columbus Victoria</i>	Columbus Line
<i>Columbus Virginia</i>	Columbus Line
<i>Columbus Wellington</i>	Columbus Line
<i>Wesermunde</i>	Hanseatische Hochseefischerei AG

Auxiliary Ships:

New Zealand also has a fleet of 19 Auxiliary Ships currently reporting.

SINGAPORE (Information dated 12.3.79)

NAME OF VESSEL	MASTER	OBSERVING OFFICERS	RADIO OFFICERS	OWNER/AGENT
<i>Anro Asia</i>	W. F. Rockett	E. Waterson, Rouffaer	S. R. Bharuchah	Straits Shipping Pte. Ltd.
<i>Anro Femasek</i>	S. K. Menon	Chan Yew Meng, Tan Lian Huat, Mohd Iqbal, Rajeev Khanna, Ho Kun Kok	Lim Kek Khian	Neptune Lines Ltd.
<i>Golar Buatan</i>	A. I. Juvale	Pushkarna Vinod Kumar, A. O. Malate, D. S. Sunartu	Yip Siu Keung	Inter-Marine Management Pte. Ltd.
<i>Golden Season</i>	S. E. Merchant	F. Sumampow, Niang Hla Min, Koko Win	Ng Ba Cho	Guan Guan Shipping Pte. Ltd.
<i>Kim Ann</i>	J. K. Wyles	Walter Colloqboun, Cornelius Rompis, Nang Hadi Mohd Kamen Ismail	Edward Ba Ays, Ismail Hiyat	Guan Guan Shipping Pte. Ltd.
<i>Kimanis</i>	R. C. Barker	Othman B. Omar, Jamaludin B. Buang, Amir B. Ahmad, Sari Ismail, Mohd Ahmad, Armaidt Singh	Mr. Phua	Straits Shipping Pte. Ltd.
<i>Kota Cahaya</i>	Kul Bhushab Malhorta	Djoko Sugiono, Colman Kyaw Do, Gopinath Vijayan	Sujith Pitigala	Pacific International Lines
<i>Neptune Agate</i>	H. F. L. Hossell	Tan Chor Khoo, V. F. Sinha, Lim Tauw Tok	M. V. Rajendran	Neptune Orient Lines Ltd.
<i>Neptune Aries</i>	Ng Gim Leong	Kooi Yeok Huat, Nanda Jeeris, P. Gandadharan	Chen Chin Aik	Neptune Orient Lines Ltd.
<i>Neptune Beryl</i>	R. S. Perera	Chong Kok Man, Jose Copuco, Ismail Bin Tahar	Kirpal Singh	Neptune Orient Lines Ltd.
<i>Neptune Coral</i>	Han Tuck Kong	Ng Yew Choon, Rajan Samudai, Hon Yoke Kuan, John Than Tut	N. Sivaraman	Neptune Orient Lines Ltd.
<i>Neptune Cyprine</i>	M. Lubinski	Jasmire Singh, D. J. Oriatto, Qahar Bin Karim	Ba Myaing	Neptune Orient Lines Ltd.
<i>Neptune Emerald</i>	S. M. Berry	G. H. W. Backwell, Tan Hiang Chyi, Ho You Onn, R. Wurata	David Lange	Neptune Orient Lines Ltd.
<i>Neptune Iris</i>	Tay Juet Hui	Yeo Seh Sye, Bovan Chen, Ahmad Bin Sultanali, Mohd Jnah	Teo Seow Heng	Neptune Orient Lines Ltd.
<i>Neptune Jasper</i>	R. M. Kapoor	Mohd Quamrul Hossain, P. S. Sekhon, Low Chong Lim	Sew Chen Pen	Neptune Orient Lines Ltd.
<i>Neptune Orion</i>	P. L. French	S. S. Hallikeri, R. K. M. Krishnan, Lim Khim Seng, V. Hary	Foo Peng Fatt	Neptune Orient Lines Ltd.
<i>Neptune Pearl</i>	Teddy Yap	Lee Teng Yaw, Ashok Batura, Soh Keng Beng, Rohani Bin Sidek	Ng Ah Song	Neptune Orient Lines Ltd.
<i>Neptune Peridot</i>	P. D. Low	S. M. Ithikaruddin, Mohd N. A. Abbassi, Lee Buay Nguin	Julies C. De Hamel	Neptune Orient Lines Ltd.
<i>Neptune Ruby</i>	U. Z. Ahmad	S. R. Hasan, S. K. Pal, Mohd Rosli B. Roslan	Lee Wee Jing	Neptune Orient Lines Ltd.
<i>Neptune Sapphire</i>	D. E. Blazey	S. Dutt, M. I. A. Wahid, Darwin, H. Maithara	Khin Mg. Htay	Neptune Orient Lines Ltd.
<i>Neptune Sardonyx</i>	M. James	Pratesh B. Prabhavalkar, Lau Kay Hoe, Ong Wee Hoe	Woo Kai Keong	Neptune Orient Lines Ltd.
<i>Neptune Topaz</i>	Kwok Pak Kwong	M. Swaminathan, P. Madharan, Tan Hee Song	Bernardus J. Chandran	Neptune Orient Lines Ltd.
<i>Neptune Zircon</i>	Tey Yoh Huat	A. P. Kale, Lim Bock Kee, Chiam Heng Leong	Jackie Dharmawidjara	Neptune Orient Lines Ltd.
<i>Straits Enterprise</i>	Peter Ho	P. Aspeiga, Naziaro	Tan Chong Huan	Straits Shipping Pte Ltd.

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