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

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EXCELLENT AWARDS 1980

The method of selecting annual Excellent Awards remains as it has been since 1975 when the procedure was slightly modified in an endeavour to ensure a fairer distribution of the allocation of the books. In some cases the Masters and Principal Observing Officers have been given awards where the Radio Officer has not and, alternatively, there are other instances when only the Radio Officer is the recipient.

In these days with longer leave allowances, faster ships and consequently shorter voyages, it is still difficult in some cases to decide which Master and Officers are entitled to the award. It frequently occurs that we have logbooks with, perhaps, 3 or 4 Masters and a similar number of Principal Observing Officers and Radio Officers over a period of, for instance, only 70 observing days. Some will give dates of joining and leaving, others either one or the other and sometimes no dates whatever. These latter books have to be discarded in the nominations for awards.

From the 1118 books received in 1980, all carefully scrutinized, no less than 300 Masters and Principal Observing Officers and 334 Radio Officers were nominated for awards, some several times over. Therefore, it has not been an easy task to select 300 names from the 664 nominees and the number of observations in a book is frequently the deciding factor although all other considerations are taken into account.

I can do no better than reiterate my comments of last year when I said: 'There are so many books where the observations themselves are first class, but without any extra material, that the inclusion of ocean current data and reports made in the Additional Remarks pages play a major part in boosting the marks to the required award standard'. However, no matter how good this extra material is (and it frequently is extremely good) a book will not reach the award zone unless the observations are up to scratch.

From all the logbooks received during 1980 the following ships were considered to be those most worthy of occupying the top six places in our award list.

1. m.v. *Cape Leeuwin* (Scottish Ship Management Ltd.), Captain J. G. Jones.
2. m.v. *City of Durban* (Ellerman Lines Ltd.), Captain N. B. Airey.
3. s.s. *Atlantic Causeway* (Cunard Shipping Services Ltd.), Captain J. K. Cooper.
4. s.s. *Kowloon Bay* (Ocean Transport and Trading Ltd.), Captain W. P. Goldie.
5. m.v. *Pacific Wasa* (Salen (U.K.) Ship Management Ltd.), Captain R. A. Reay.
6. m.v. *Aeneas* (Ocean Transport and Trading Ltd.), Captain A. J. Palmer.

Our particular congratulations are due to these 6 ships which have achieved their positions. Special mention should be made of Captain A. J. Palmer who is appearing in this list for the fourth time since 1975. Photographs of the first 3 ships appear opposite page 130. Once again our commiserations go to the many Masters and Officers whose logbooks received the required award assessment but who have not qualified for an award.

Only 3 trawlers have gained awards this time from our very much reduced fishing fleet, plus one award to the only non-instrumental trawler still observing for us. This latter award together with awards to the 4 MARID ships—vessels engaged on short sea voyages taking sea temperatures only—appear separately after the main list.

The initial award is the *New World Atlas* followed as a second award by

EXCELLENT AWARDS (Year ended 31 December 1980)

CAPTAIN		COMPANY	CAPTAIN		COMPANY
N. B. Airey	..	Ellerman Lines Ltd.	S. Hay	..	Cayzer Irvine Shipping Co. Ltd.
G. A. Anderson	..	J. & J. Denholm Ltd.	M. J. Heron	..	Container Fleets Ltd.
A. Ball	..	T. Hamling & Co. Ltd.	W. H. C. Hicks	..	Cunard S.S. Co. Ltd.
J. Barclay	..	B.P. Shipping Co. Ltd.	M. A. Hill	..	P. & O. S.N. Co.
G. C. Barrett	..	Container Fleets Ltd.	J. F. Hobbs	..	B.P. Shipping Co. Ltd.
E. G. Bee	..	Blue Star Line Ltd.	K. E. Howard	..	Container Fleets Ltd.
D. M. Belk	..	Ocean Transport & Trading Ltd.	L. E. Howell	..	Container Fleets Ltd.
R. Bell	..	Ellerman Lines Ltd.	W. G. Hart	..	F. T. Everard & Sons Ltd.
F. G. Bevis	..	P. & O. S.N. Co.	R. Hyam	..	Esso Petroleum Co. Ltd.
J. K. Blackburn	..	Container Fleets Ltd.	D. W. Jackson	..	Offshore Marine Ltd.
K. Bramley	..	Shell Tankers (U.K.) Ltd.	E. L. Jackson	..	Cunard S.S. Co. Ltd.
B. Bowtell	..	Shell Tankers (U.K.) Ltd.	J. M. Johnston	..	Ocean Transport & Trading Ltd.
D. G. Brown	..	Ocean Transport & Trading Ltd.	J. G. Jones	..	Scottish Ship Management Ltd.
E. Buckle	..	Furness Withy (General Shipping) Ltd.	J. O. Jones	..	Ocean Transport & Trading Ltd.
D. Buckley	..	B.P. Shipping Co. Ltd.	M. E. Jones	..	Sir Wm. Reardon Smith & Sons Ltd.
A. T. Campbell	..	Cayzer Irvine Shipping Ltd.	J. N. Kerr	..	British United Trawlers Ltd.
R. R. Cawdery	..	Cayzer Irvine Shipping Ltd.	C. R. Knight	..	Cunard S.S. Co. Ltd.
P. J. Clark	..	Container Fleets Ltd.	M. Larrivee	..	Furness Withy (General Shipping) Ltd.
J. B. Clemenson	..	Cunard S.S. Co. Ltd.	S. J. Lawrence	..	British Antarctic Survey
J. G. Collins	..	United Baltic Corp. Ltd.	G. F. Lee	..	Ministry of Agriculture, Fisheries & Food
J. K. Cooper	..	Cunard S.S. Co. Ltd.	K. Lehepuu	..	Manchester Liners Ltd.
J. Cosker	..	Container Fleets Ltd.	O. J. T. Lindsay	..	Sir Wm. Reardon Smith & Sons Ltd.
R. E. Cowie	..	Ben Line Steamers Ltd.	K. McLeod	..	Bibby Line Ltd.
P. E. Craven	..	Boston Deep Sea Fisheries Ltd.	D. M. McPhail	..	Blue Star Line Ltd.
T. K. Dawson	..	F. T. Everard & Sons Ltd.	W. A. Murison	..	Container Fleets Ltd.
R. D. Dinnie	..	Ocean Transport & Trading Ltd.	B. A. Nelson	..	Manchester Liners Ltd.
E. Dunn	..	Sir R. Ropner & Co. Ltd.	G. R. Oliver	..	Ministry of Agriculture, Fisheries & Food
C. R. Elliott	..	British Antarctic Survey	A. J. Palmer	..	Ocean Transport & Trading Ltd.
J. Findlay	..	Canadian Pacific Steamships Ltd.	E. M. S. Phelps	..	British Antarctic Survey
W. A. Fitzgerald	..	Ocean Transport & Trading Ltd.	J. M. Phillips	..	Esso Petroleum Co. Ltd.
J. R. French	..	Ministry of Agriculture, Fisheries & Food	R. H. Plant	..	Townsend-Thoresen Car Ferries Ltd.
T. Fyfe	..	Ben Line Steamers Ltd.	E. A. Reay	..	Salen (U.K.) Ship Management Ltd.
J. S. Gavin	..	Bibby Line Ltd.	E. T. Rees	..	Bank Line Ltd.
W. P. Goldie	..	Ocean Transport & Trading Ltd.	J. G. Reeve	..	Blue Star Line Ltd.
G. M. Gough	..	B.P. Shipping Co. Ltd.	A. J. A. Richards	..	F. T. Everard & Sons Ltd.

Excellent Awards (contd.)

CAPTAIN	COMPANY	CAPTAIN	COMPANY
D. H. Roberts	P. & O. S.N. Co.	A. A. Walker	Silver Line Ltd.
J. F. Rowe	Cunard S.S. Co. Ltd.	D. S. Walker	Ocean Transport & Trading Ltd.
E. T. Rowland	P. & O. S.N. Co.	W. H. Walker	Maersk (U.K.) Ltd.
A. A. Rundle	Ocean Transport & Trading Ltd.	P. R. Walker	B.P. Shipping Co. Ltd.
C. M. Sandy	Ocean Transport & Trading Ltd.	P. H. Warne	Natural Environment Research Council
T. D. Scott	Bank Line Ltd.	J. E. Webb	Ocean Transport & Trading Ltd.
P. P. Simkins	Thalassa (Offshore) Scotland Ltd.	I. Webster	Ocean Transport & Trading Ltd.
R. J. Smith	T. & J. Harrison Ltd.	P. L. Whitehouse	F. T. Everard & Sons Ltd.
D. Spargo	Shell Tankers (U.K.) Ltd.	R. R. Will	Cayzer Irvine Shipping Co. Ltd.
D. F. Steer	Ellerman Lines Ltd.	T. W. Willows	Ocean Transport & Trading Ltd.
E. D. Stewart	P. & O. S.N. Co.	K. R. Wilson	Ben Line Containers Ltd.
A. Sugden	P. & O. S.N. Co.	R. A. Wilson	Container Fleets Ltd.
W. D. Templeman	Esso Petroleum Co. Ltd.	R. T. Wood	Container Fleets Ltd.
M. P. Tennant	Ben Line Steamers Ltd.	D. M. Woolfenden	Cunard S.S. Co. Ltd.
C. O. Thomas	Bibby Line Ltd.	P. G. Young	Ocean Transport & Trading Ltd.
R. Towell	B.P. Shipping Co. Ltd.	T. D. Young	Cayzer Irvine Shipping Co. Ltd.

PRINCIPAL OBSERVING OFFICER	COMPANY	PRINCIPAL OBSERVING OFFICER	COMPANY
M. Aldrich	Maersk (U.K.) Co. Ltd.	J. G. Holland	B.P. Shipping Co. Ltd.
R. M. Aldridge	Ocean Transport & Trading Ltd.	T. J. Illingworth	Ocean Transport & Trading Ltd.
B. G. Alexander	Canadian Pacific Steamships Ltd.	S. J. Kitchen	Bibby Line Ltd.
G. Amos	F. T. Everard & Sons Ltd.	D. Knight	Cunard S.S. Co. Ltd.
R. D. Anderson	Container Fleets Ltd.	G. J. Knowles	Thalassa (Offshore) Scotland Ltd.
B. P. Andrew	Scottish Ship Management Ltd.	A. G. Knox	Ben Line Steamers Ltd.
K. N. Athureliya	Ocean Transport & Trading Ltd.	M. Leech	Container Fleets Ltd.
J. E. Atkins	Cunard S.S. Co. Ltd.	D. R. Lewis	Container Fleets Ltd.
P. E. Bailey	Cunard S.S. Co. Ltd.	A. C. W. Lipscombe	Container Fleets Ltd.
A. P. Baker	Container Fleets Ltd.	R. E. Lough	Blue Star Line Ltd.
R. S. Basford	Ben Line Steamers Ltd.	K. P. Macinnes	J. & J. Denholm Ltd.
M. L. Bechley	Townsend-Thorsen Car Ferries Ltd.	A. McCulloch	Cayzer Irvine Shipping Co. Ltd.

P. M. Beggs	...	...	...	D. I. McIntosh	...	Esso Petroleum Co. Ltd.
R. C. Bloomfield	...	...	...	B. T. Marks	...	Cayzer Irvine Shipping Co. Ltd.
A. S. Bolton	...	...	...	S. D. Mayl ..	...	Natural Environment Research Council
I. K. Bourne	...	...	...	J. F. Millican	...	Cayzer Irvine Shipping Co. Ltd.
J. H. Brechin	...	...	...	P. B. Mimmack	...	T. & J. Harrison Ltd.
D. A. Brown	...	...	...	S. R. Mitchell	...	B.P. Shipping Co. Ltd.
I. Buckley ..	...	...	...	M. D. Moore	...	Ocean Transport & Trading Ltd.
B. C. Bull ..	...	...	...	R. E. Niven	...	Ellerman Liners Ltd.
M. B. J. Byford	...	...	...	P. A. Owen	...	Blue Star Line Ltd.
I. S. Cairns	...	...	...	M. J. Pinder	...	Salen (U.K.) Ship Management Ltd.
P. C. Campbell	...	...	...	P. G. Posey	...	Container Fleets Ltd.
I. M. Chadney	...	...	...	P. G. Powell	...	F. T. Everard & Sons Ltd.
B. A. Chapman	...	...	...	M. J. Power	...	Container Fleets Ltd.
C. A. Clague	...	...	...	A. T. Ray ..	...	F. T. Everard & Sons Ltd.
C. N. Clark	...	...	...	J. F. Reeder	...	Shell Tankers (U.K.) Ltd.
N. D. Cleave	...	...	...	P. A. Rickard	...	Furness Withy (General Shipping) Ltd.
P. D. Codd	...	...	...	K. J. Ridgeway	...	Cayzer Irvine Shipping Co. Ltd.
G. M. Coulson	...	...	...	J. M. Rigden	...	Shell Tankers (U.K.) Ltd.
P. B. Cunningham	...	...	...	T. W. Roberts	...	Ocean Transport & Trading Ltd.
P. C. D'Arcy	...	...	...	B. Robinson	...	Cunard S.S. Co. Ltd.
S. J. Davies	...	...	...	J. M. Ronald	...	B.P. Shipping Co. Ltd.
J. G. W. Dixon	...	...	...	C. Sheen ..	...	Boston Deep Sea Fisheries Ltd.
P. B. Doyle	...	...	...	N. B. H. Skinner	...	F. T. Everard & Sons Ltd.
W. M. Esler	...	...	...	J. C. Smart	...	British Antarctic Survey
P. H. Evans	...	...	...	H. J. Sparkhall	...	Ocean Transport & Trading Ltd.
M. Forder ..	...	...	...	D. R. Spurling	...	F. T. Everard & Sons Ltd.
N. R. Foster	...	...	...	C. L. Stevenson	...	Ben Line Steamers Ltd.
R. G. Fowler	...	...	...	M. J. F. Swann	...	Furness Withy (General Shipping) Ltd.
C. E. Greenall	...	...	...	A. V. Thomson	...	Ben Line Containers Ltd.
R. Griffiths	...	...	...	K. G. H. Trevanion	...	Ocean Transport & Trading Ltd.
A. D. Guillaume	...	...	...	B. R. Tucker	...	Ellerman Lines Ltd.
G. B. Hall ..	...	...	...	C. K. Urwin	...	Container Fleets Ltd.
M. W. Hannah	...	...	...	P. P. Van Bergen	...	Ocean Transport & Trading Ltd.
P. C. Harding	...	...	...	N. D. Walker	...	Cunard S.S. Co. Ltd.
K. S. Hardy	...	...	...	W. G. C. Wallace	...	Ocean Transport & Trading Ltd.
F. A. M. Hayes	...	...	...	P. R. Walton	...	Ellerman Lines Ltd.
D. L. Hayes	...	...	...	D. G. Wilcockson	...	Sir R. Ropner & Co. Ltd.
A. Hillier ..	...	...	...	S. M. Wilkie	...	Bank Line Ltd.
P. L. Hobson	...	...	...	J. A. Williams	...	Ocean Transport & Trading Ltd.

Excellent Awards (contd.)

RADIO OFFICER		COMPANY		RADIO OFFICER		COMPANY	
D. Alcock ..	..	Container Fleets Ltd.	..	D. Leeson ..	..	Marconi International Marine Co. Ltd.	..
M. P. Atherton ..	..	Ocean Transport & Trading Ltd.	..	P. A. Lloyd**	..	British Rail	..
R. P. Bate ..	..	Container Fleets Ltd.	..	J. E. T. Lodge	..	International Marine Radio Co. Ltd.	..
K. Bent ..	..	Ocean Transport & Trading Ltd.	..	I. MacDonald	..	International Marine Radio Co. Ltd.	..
J. Blackwell ..	..	Cayzer Irvine Shipping Co. Ltd.	..	G. L. Macindoe	..	Cayzer Irvine Shipping Co. Ltd.	..
C. J. Blane*	..	F. T. Everard & Sons Ltd.	..	D. Macintyre	..	United Marine Electronics (U.K.) Ltd.	..
D. Bone ..	..	B.P. Shipping Co. Ltd.	..	I. M. Macleod	..	B.P. Shipping Co. Ltd.	..
C. Booth ..	..	International Marine Radio Co. Ltd.	..	M. I. McGregor	..	International Marine Radio Co. Ltd.	..
P. A. Braxton ..	..	Marconi International Marine Co. Ltd.	..	J. A. McKay	..	Container Fleets Ltd.	..
C. R. Brown ..	..	Marconi International Marine Co. Ltd.	..	M. S. McLaren	..	Ocean Transport & Trading Ltd.	..
B. Cameron ..	..	B.P. Shipping Co. Ltd.	..	E. Marks ..	..	P. & O. S.N. Co.	..
N. S. J. Carter ..	..	Cunard S.S. Co. Ltd.	..	R. J. Middleton*	..	F. T. Everard & Sons Ltd.	..
A. H. Clark*	..	Furness Withy (General Shipping) Ltd.	..	E. E. Milburn	..	Ocean Transport & Trading Ltd.	..
P. Cooper ..	..	Container Fleets Ltd.	..	M. D. A. Mitchell*	..	F. T. Everard & Sons Ltd.	..
B. R. Cox* ..	..	F. T. Everard & Sons Ltd.	..	F. C. Morris	..	Townsend-Thoresen Car Ferries Ltd.	..
J. R. Crockett ..	..	Ben Line Containers Ltd.	..	B. A. Mullin	..	Container Fleets Ltd.	..
E. Crossin*	..	F. T. Everard & Sons Ltd.	..	J. Murray ..	..	International Marine Radio Co. Ltd.	..
R. F. Davies ..	..	Cunard S.S. Co. Ltd.	..	D. Neave ..	..	International Marine Radio Co. Ltd.	..
B. T. Davis ..	..	P. & O. S.N. Co.	..	P. M. Nee ..	..	International Marine Radio Co. Ltd.	..
P. G. Dawkins†	..	Thalassa (Offshore) Scotland Ltd.	..	D. M. Nichols	..	B.P. Shipping Co. Ltd.	..
P. Dempsey ..	..	International Marine Radio Co. Ltd.	..	R. Nourse ..	..	British Rail	..
G. S. Devlin ..	..	Canadian Pacific Steamships Ltd.	..	H. M. O'Gorman	..	British Antarctic Survey	..
M. Donaldson ..	..	Marconi International Marine Co. Ltd.	..	H. G. Pask**	..	T. Hamling and Co. Ltd.	..
A. C. Emmett ..	..	Marconi International Marine Co. Ltd.	..	R. B. Phillips	..	P. & O. S.N. Co.	..
J. S. Evans ..	..	Ocean Transport & Trading Ltd.	..	W. C. Phillips	..	Ocean Transport & Trading Ltd.	..
D. L. Feetham ..	..	B.P. Shipping Co. Ltd.	..	G. E. C. Pratt	..	Cunard S.S. Co. Ltd.	..
A. E. Fell ..	..	Bibby Line Ltd.	..	M. S. Ricketts*	..	F. T. Everard & Sons Ltd.	..
G. A. Ferrand ..	..	Marconi International Marine Co. Ltd.	..	P. J. Robertson	..	Ocean Transport & Trading Ltd.	..
W. J. Ferry ..	..	Bibby Line Ltd.	..	P. J. Robinson	..	Marconi International Marine Co. Ltd.	..
M. G. Finn ..	..	Redifon Telecommunications Ltd.	..	P. A. Roper	..	British Rail	..
D. S. Flemington ..	..	Container Fleets Ltd.	..	D. M. Rutter	..	Silver Line Ltd.	..
D. I. Fraser ..	..	Container Fleets Ltd.	..	N. C. Sanders	..	Sir Wm. Reardon Smith & Sons Ltd.	..
M. D. Fraser ..	..	Kelvin Hughes Ltd.	..	J. Sharpley ..	..	Newgate Shipping Co. Ltd.	..
D. A. P. Galbraith ..	..	Cayzer Irvine Shipping Co. Ltd.	..	R. Spall*	..	British United Trawlers Ltd.	..
A. J. Gordon ..	..	Marconi International Marine Co. Ltd.	..	D. H. Storar	..	Ocean Transport & Trading Ltd.	..
R. F. Graham*	..	Ministry of Agriculture, Fisheries and Food	..	T. F. Strickland	..	Marconi International Marine Co. Ltd.	..

W. Grant ..	..	P. & O. S.N. Co.	..	D. A. Tait ..	..	B. P. Shipping Co. Ltd.
P. J. Hall ..	..	Irano-British Ship Service Co. Ltd.	..	A. G. Thomson	..	Ocean Transport & Trading Ltd.
M. Hanraads	..	International Marine Radio Co. Ltd.	..	A. Titley ..	..	Container Fleets Ltd.
C. Hawkrigde	..	Marconi International Marine Co. Ltd.	..	D. B. Utting	..	International Marine Radio Co. Ltd.
G. Hobbs* ..	..	F. T. Everard & Sons Ltd.	..	T. A. Verling	..	Canadian Pacific Steamships Ltd.
N. C. D. Hope*	..	Furness Withy (General Shipping) Ltd.	..	R. Wade** ..	..	British Antarctic Survey
C. E. Hughes	..	Container Fleets Ltd.	..	D. Wakeford	..	Cayzer Irvine Shipping Co. Ltd.
E. Hughes ..	..	Cunard S.S. Co. Ltd.	..	J. A. R. Walker	..	Cayzer Irvine Shipping Co. Ltd.
M. R. Irwin*	..	F. T. Everard & Sons Ltd.	..	T. Walker ..	..	Kelvin Hughes Ltd.
E. Jennings	..	P. & O. S.N. Co.	..	P. Wallington	..	Marconi International Marine Co. Ltd.
W. Kay ..	..	Container Fleets Ltd.	..	P. R. Webster	..	International Marine Radio Co. Ltd.
D. A. Kelsall	..	Container Fleets Ltd.	..	B. C. Whiteford	..	Cayzer Irvine Shipping Co. Ltd.
S. Kirkwood	..	Marconi International Marine Co. Ltd.	..	S. F. Whittingham*	..	Offshore Marine Ltd.
C. W. Knibb	..	Ocean Transport & Trading Ltd.	..	D. F. Wilson	..	Scottish Ship Management Ltd.
W. Latus ..	..	Cayzer Irvine Shipping Co. Ltd.	..	J. Woodman	..	Marconi International Marine Co. Ltd.

'MARID' SHIPS††

CAPTAIN	PRINCIPAL OBSERVING OFFICER	RADIO OFFICER	OWNER/MANAGER
F. W. Dogherty	Esso Petroleum Co. Ltd.
T. J. Gifford	P. & O. Ferries
W. L. Lowndes	Esso Petroleum Co. Ltd.
P. C. T. C. Woods	P. & O. Ferries

* Deck Officer.

** Also Principal Observing Officer.

† Surveyor.

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

Excellent Awards(contd.)

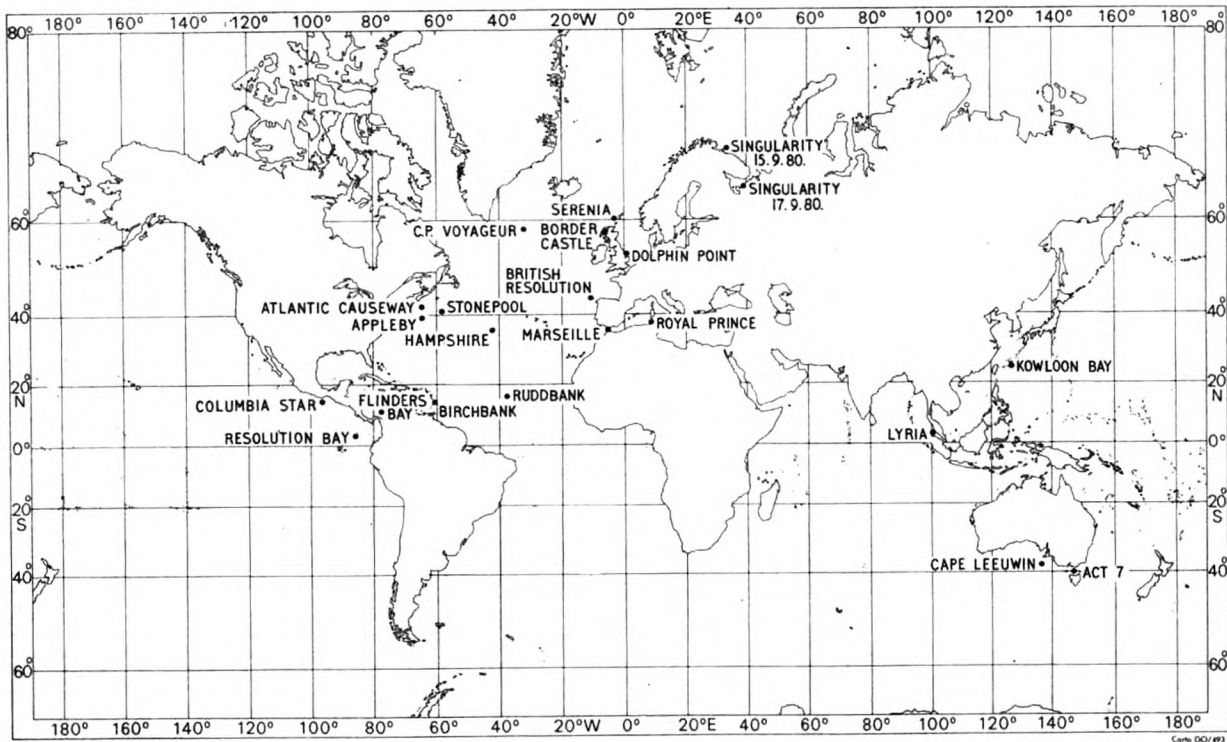
TRAWLER (non-instrumental)

SKIPPER	RADIO OFFICER	TRAWLER OWNERS
G. Kent	J. Outwaite	Boyd Line Ltd.

Cassell's English Dictionary. The chosen book for this year's third award is *The Spy Who Came In From The Cold and Other Stories* by John Le Carré.

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.

J.D.B.



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



July, August, September

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

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

HURRICANE 'BONNIE'

North Atlantic Ocean

m.v. *Ruddbank*. Captain P. M. Ireland. New York to Durban. Observers, the Master, Mr G. A. Foster, 2nd Officer and Cadet R. A. Brown.

14 August 1980. At 1430 GMT a significant decrease of barometric pressure was noticed on the barogram. Our suspicions of an impending tropical cyclone arose prior to the fall in pressure by a marked worsening of the weather and the increase in strength of the NE'ly wind. A detailed study of the North Atlantic weather analysis revealed a depression of 1012 mb located west of the Cape Verde Islands, moving westwards.

The following observations were recorded.

	GMT	
14 Aug.	1430	Wind NE, force 7, barometric pressure 1010.4 mb.
	1500	Wind NE, force 8, barometric pressure 1007.7 mb.
	1600	Wind ENE, force 7, barometric pressure 1003.6 mb.
	1700	Wind SE, force 8, barometric pressure 1000.0 mb.
	1730	Wind S, force 9, barometric pressure 1001.5 mb.
	1800	Wind SSW, force 10, barometric pressure 1002.5 mb.
	1830	Wind SW'S, force 10, barometric pressure 1005.3 mb.
	1900	Wind SW'S, force 9, barometric pressure 1007.0 mb.
	2000	Wind SW'S, force 7, barometric pressure 1009.3 mb.

Thereafter conditions improved rapidly.

There had been no warnings of the storm's presence and, in consequence, the Master ordered that a Safety Message be transmitted by radio at 1630. The presence of the hurricane was later confirmed by the US Meteorological Bureau who named it Bonnie and issued warnings of gusts up to 95 knots in its vicinity.

Endeavours were made to fix the position of the storm's centre using the method described in *Meteorology for Mariners* and these, for the most part, were successful. It was apparent that the ship was very close to the centre and by the

time the wind began to veer through East a spiralling of the clouds characteristic of that of a tropical cyclone was clearly visible on the radar screen to the south of the vessel. The Master decided that, under the circumstances, the best evasive action was to maintain a course of SE and make best speed out of the storm field as there was little or no swell.

Position of ship at 1430 on the 14th: $16^{\circ} 03' N$, $37^{\circ} 42' W$.

HURRICANE 'FRANCES'

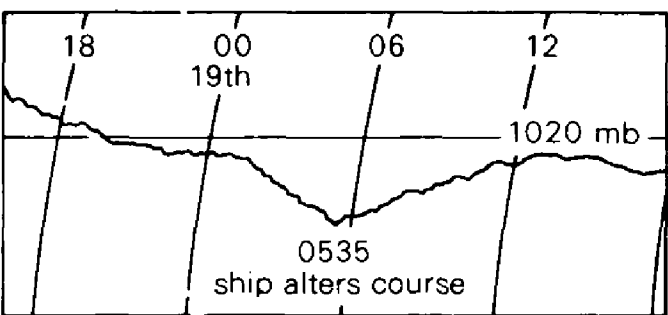
North Atlantic

m.v. *Stonepool*. Captain W. G. Mitchell. Norfolk (Va.) to Vado (Italy). Observers, the Master, Mr N. H. Cooper, Chief Officer, Mr J. E. Quain, 2nd Officer, Mr N. G. Thomas, 3rd Officer, Mr D. Keohane, Radio Officer and ship's company.

17–20 September 1980. Whilst the vessel was at anchor in Hampton Roads, it was heard via the pilots that a tropical depression was forming in the Cape Verde vicinity. The vessel sailed from Norfolk on the 14th and the progress of Frances (now given hurricane status) was plotted. The following are extracts from the deck and meteorological logs.

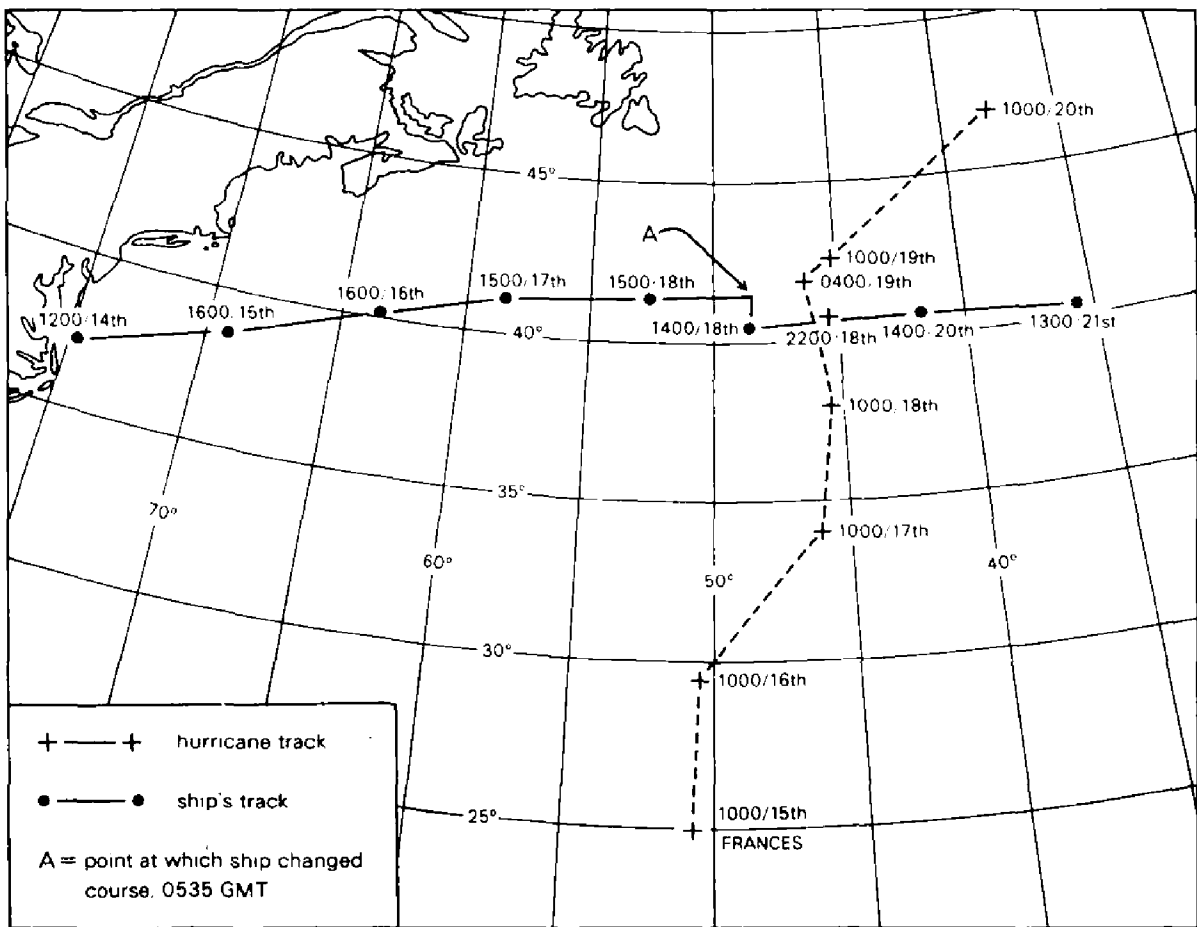
	GMT	
17 Sept.	1500	Wind ENE, force 5, barometric pressure 1024.4 mb, moderate sea and moderate E'ly swell. Frances approximately 700 n. mile to the south-east, moving $030^{\circ}(T)$ at 8 knots. It was hoped that the storm's movement would be maintained thereby enabling the vessel to remain on course with a clearance margin of more than 300 n. mile. However by 2200 it was seen that Frances had moved to a more northerly track.
18 Sept.	1500	Wind E'ly, force 5, barometric pressure 1023.7 mb, moderate sea and moderate E'ly swell. Frances approximately 360 n. mile to the south-east.
	2300	Wind NE, force 5, barometric pressure 1019.9 mb, moderate to rough sea and moderate to heavy SE'ly swell. Speed reduced due to the heavy SE'ly swell being encountered. Frances now estimated to be 240 n. mile away in a south-easterly direction and closing all the time.
19 Sept.	0300	Wind N'ly, force 4–5, barometric pressure 1018.8 mb. Vessel rolling and pitching moderately, heavily at times, to moderate beam sea and heavy (SE'ly) swell. Vessel sending 3-hourly weather reports as requested by the National Weather Service, Miami.
	0535	Barometric pressure 1016.4 mb and falling, indicating that the vessel was still closing on Frances. Course altered to $180^{\circ}(T)$ to avoid hurricane-force winds. Wind N'W, force 5–6.
	0700	Vessel offered assistance to <i>Biscay Star</i> , a tug which had not given Frances a wide enough berth, and at 0715 a message was received from Halifax radio that 'assistance not required, another vessel in immediate vicinity'.
	0945	Vessel altered back to original course because weather reports and the vessel's own observations indicated that the hurricane had passed.
	1000	Wind NNW, force 5–6, barometric pressure 1018.7 mb. Vessel rolling and pitching moderately at times to the heavy swell and rough sea.

20 Sept. 0200 Wind NW, force 5, barometric pressure 1018.6 mb. Vessel rolling and pitching moderately at times to slight sea and moderate se'y swell. The vessel experienced a moderate swell until 1800 on the 20th.



It was noticed that there was a great variance in the reported positions of Frances given by the various authorities, sometimes greater than 100 n. mile for the same time of report.

- Position of ship at 1200 on the 17th: 41° 00' N, 58° 18' W.
- Position of ship at 1200 on the 19th: 41° 00' N, 48° 48' W.



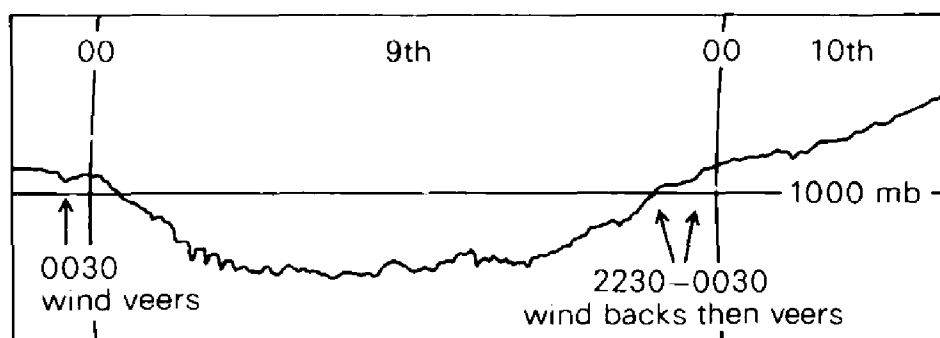
TYPHOON 'ORCHID'

North Pacific Ocean

s.s. *Kowloon Bay*. Captain W. P. Goldie. Singapore to Tokyo. Observers, the Master and ship's company.

8–10 September 1980. The first indication that the vessel was entering the proximity of the tropical cyclone came at 1800 GMT on the 8th when the barometric pressure had fallen 0.3 mb over 3 hours. This showed as part of the usual diurnal variation pattern, but then the pressure continued to fall. The wind was N'yly, force 5. At 2000 the cloud cover of 2 oktas began to increase and the wind freshened.

PASS OF TYPHOON ORCHID



The vessel entered an area of widespread rain showers between 2355 on the 8th and 0100 on the 9th, with the wind veering at 0030 to 020° (T), force 7. The cloud cover continued to increase with the cumulonimbus clouds associated with the showers merging into one layer. Following the shift in wind direction, the pressure rose by 0.3 mb before continuing its downward trend. This trend was not as steep as may have been expected as the vessel was running north of the advancing storm and clearing its predicted path. Orchid's position at 0000 on the 9th was given as 23° 06' N, 134° 00' E by Tokyo, the predicted course and speed being NW'yly, 13 knots. For the next 6 hours, the wind remained relatively steady veering only to 030° (T) but increasing to force 8. Between 0100 and 0500 there was no precipitation, but by 0600 frequent rain squalls were again being experienced. Shortly after this, the pressure levelled off at 995 mb and this was maintained for 7 hours before beginning a rather erratic rise. The wind veered again and was 058° (T), force 8 by 0730. Very frequent and heavy rain squalls occurred until 1200; after this they began to merge and from 1300–1600 the rain was continuous although of varying intensity. Towards the end of the period, sheet lightning was visible, mainly to the SE. The wind continued to veer and was 135° (T), force 8 by 2300, having eased to force 7 from 1800–2000, a phase which coincided with a clear period free from rain. From 2000 onwards only occasional isolated showers occurred lasting for a few minutes and of slight or moderate intensity.

At 0000 on the 10th, the wind backed to 120° (T) from 130° (T) and increased to force 9 before veering again to its former direction and easing to force 8 by 0100. The pressure had risen to 1000.3 mb by 0500 and from this time onwards the wind eased and veered slowly to 160° (T), force 5. From 1000 the clouds dissolved leaving a clear sky in 2 hours. Throughout the entire period a heavy, long swell was present, initially from a direction of 100° (T) although it gradually changed to 160° (T); a shorter swell was also present later, mainly in conjunction with the wind direction.

Position of ship at 1800 on the 8th: $24^{\circ} 47' \text{N}$, $126^{\circ} 35' \text{E}$.

Position of ship at 0800 on the 10th: $32^{\circ} 53' \text{N}$, $137^{\circ} 06' \text{E}$.

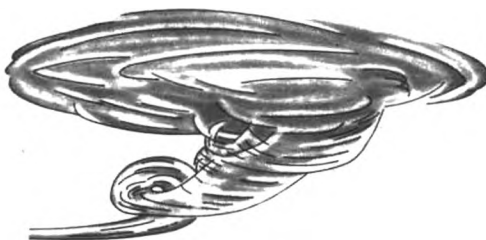
Note. Typhoon Orchid is the storm in which the *Derbyshire* was lost on the 9th. The centre is thought to have passed right over the last reported position of this vessel. The storm developed to the north of Guam on the 6th and moved to the north-west as it rapidly deepened. She was upgraded to 'typhoon' on the 9th and had already started turning to the north to move over the Ryuku Islands. She decreased to tropical storm strength on the 11th crossing Kyushu and later became extra-tropical over the Sea of Japan.

CLOUD

North Atlantic

m.v. *C. P. Voyageur*. Captain P. J. Roberts. Montreal to Hamburg. Observers, Mr P. C. H. Adair, Chief Officer and Mr A. Dyson, A.B.

13 July 1980. At approximately 0630 GMT a funnel-like cloud having the appearance of a column of smoke was first seen. On later inspection it turned out to be a cloud formation 'hanging' from beneath a uniform layer of stratocumulus cloud. The sketch shows a curling formation similar to a croissant or pig's tail, for want of a better description. The vessel passed about 2 n. mile from the formation, the lowest point of which was approximately 90 metres above the sea surface.



The weather conditions at 0730 on the 13th were: dry bulb 10.0°C , wet bulb 9.4 , sea temp. 13.5 , barometric pressure 1020.1 mb, wind ENE, force 3.

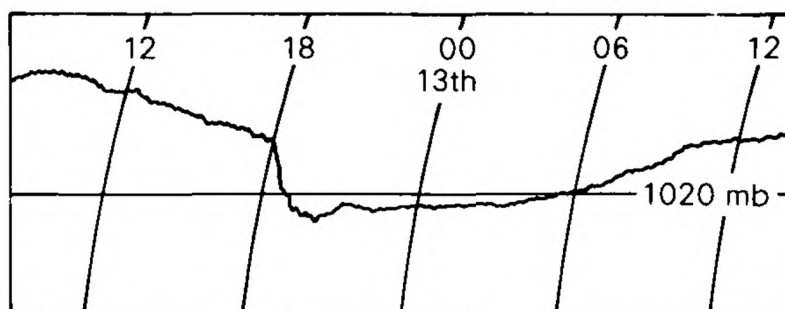
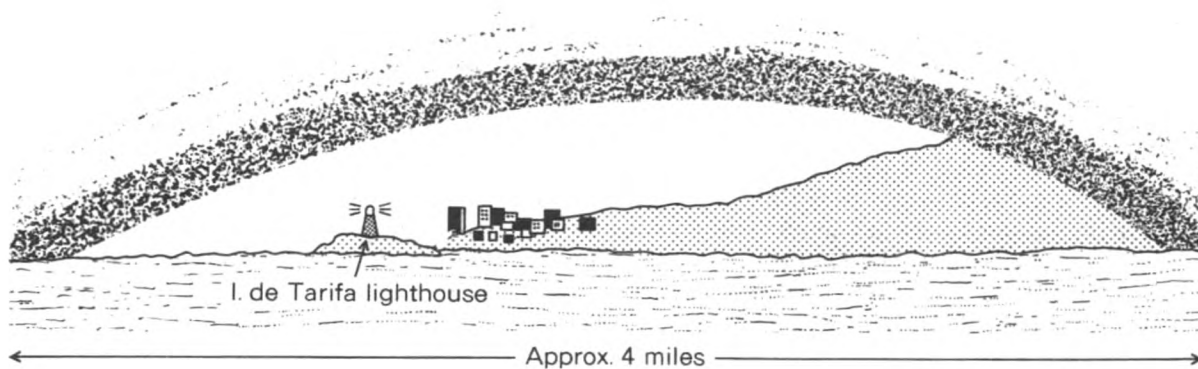
Position of ship: $58^{\circ} 00' \text{N}$, $31^{\circ} 45' \text{W}$.

Strait of Gibraltar

m.v. *Marseille*. Captain F. Shepherd. Barcelona to New York. Observers, the Master, Mr S. W. Douglas, 3rd Officer and Cadet M. McGuire.

12 July 1980. At 1825 GMT whilst the vessel was transiting the Strait of Gibraltar, a line of low cloud was observed in an otherwise cloudless sky, see sketch. The cloud was in the form of an arc in an east-west line, reaching the surface approximately 2 n. mile ahead and astern of the vessel. Visibility under the cloud was about 10 n. mile in the north-south direction and 2 n. mile to the east and west. Once the vessel reached the point where the cloud touched the surface, the visibility was reduced to approximately 1.5 n. mile.

Whilst the vessel was passing the cloud, the barograph trace fell almost vertically and both the air and sea temperatures dropped several degrees.



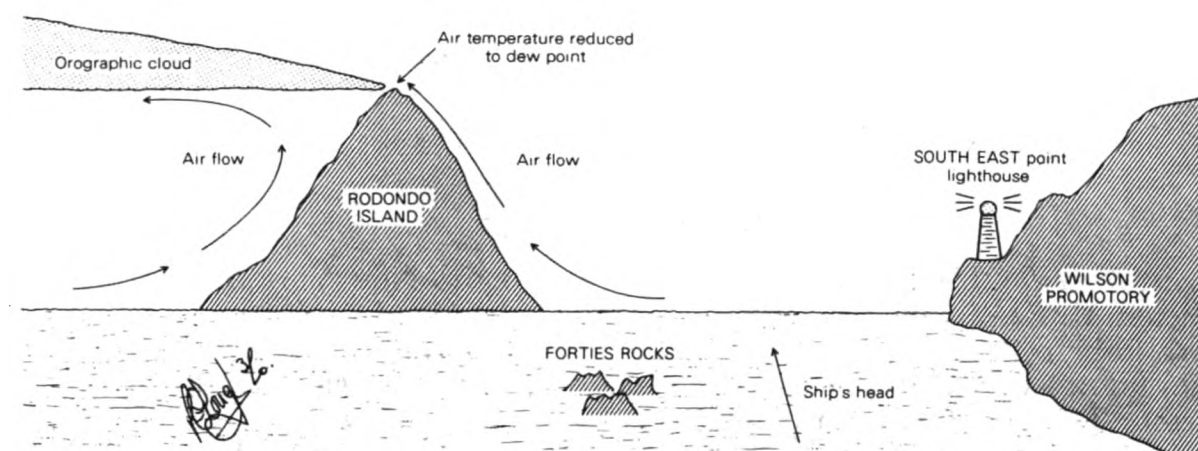
Weather conditions at the time of observation were: dry bulb 18.5°C , wet bulb 18.0 , sea temp. 16.5 , barometric pressure 1019.5 mb, wind NE, force 4.
Position of ship: $35^{\circ} 58' \text{N}$, $5^{\circ} 35' \text{W}$.

OROGRAPHIC CLOUD

Bass Strait

m.v. *Act 7*. Captain J. G. Reeve. Botany Bay to Melbourne. Observers, Mr R. E. Lough, 3rd Officer and Cadet P. Dransfield.

8 September 1980. While passing through the Bass Strait off Wilson's Promontory, orographic cloud was observed forming from the peak of Rodondo Island. The rest of the sky was clear of any cloud, see sketch.



Weather conditions at the time of observation were: dry bulb 13.7°C , wet bulb 10.9 , barometric pressure 1000.6 mb, wind WNW, force 4.
Position of ship: $39^{\circ} 11' \text{S}$, $146^{\circ} 25' \text{E}$.

CURRENT RIP

Western North Atlantic

s.s. *Atlantic Causeway*. Captain J. K. Cooper. New York to Southampton. Observer, Mr M. G. Lange, 2nd Officer.

24 August 1980. Shortly after 1900 GMT whilst the ship's company were enjoying calm conditions with good visibility, the attention of the watch-keeping officer was drawn to a disturbance on the surface of the sea approximately 3 n. mile distant on the starboard bow. As the vessel approached the disturbance, which took the form of a stretch of rough sea about 45 metres wide, it was anticipated that the vessel would sheer off to starboard and a close watch was, in consequence, kept on the course.

As the vessel entered the current rip a 12 degree change in course was experienced before the automatic pilot steadied her by using 10 degrees of port rudder. The current was estimated to be running in a southerly direction at about 5 knots.

It may be worth mentioning that, at the time of the observation, the northern edge of the Gulf Stream was approximately 250 n. mile to the south and hurricane Charley was in position $38^{\circ}\text{N } 59^{\circ}\text{W}$, some 400 n. mile to the south-east.

Position of ship: $42^{\circ} 02' \text{N}$, $64^{\circ} 34' \text{W}$.

Note. The *Atlantic Causeway* was within the convergence zone between the Gulf Stream and the Labrador Current. Most reports of current rips come from areas such as these where large eddies, between currents flowing in opposite directions, are likely to occur.

CETACEA

North Atlantic Ocean

s.s. *British Resolution*. Captain M. Boyd. Forcados (Nigeria) to Le Havre. Observer, Mr G. P. Hunt, 2nd Officer.

3 July 1980. At about 1325 GMT a small number of whales was observed for a period of 2 or 3 minutes after which they sank out of sight.

They were not considered to be Sperm whales since the blow-holes were too far aft. Although each had a back fin, these were thought to be too small for Biscay Right whales and, since the flippers were not especially long and narrow and no barnacles were seen, they were not considered to be Humpback whales. After further consideration they were thought to be one of the larger rorquals, either Blue, Fin or Sei.

The largest whale measured 18 metres or over in length, the remainder measured 12 metres or over.

Position of ship: $44^{\circ} 00' \text{N}$, $10^{\circ} 06' \text{W}$.

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

'I agree, these would be one of the larger rorquals. The observer is correct in his method of eliminating the possibilities one by one. However, he has forgotten to mention the colour of these animals.

'The Blue whale has a basically bluish colour with a pale mottling effect over all and, if the baleen can be seen, it will be black. The head forward of the blow-hole is very flat and has a broad U shape. Occasionally the animal raises its fluke clear of the water prior to diving.

'A Fin whale is dark brownish grey in colour on the upper or dorsal surface and white on the ventral surface. The white colour is asymmetrical, being higher up the right-hand side than the left. There is frequently a lighter colour chevron across the back just behind the head. On diving, the flukes are unlikely to be raised. The head is V-shaped and has a single distinctive ridge along the centre to the blow-hole.

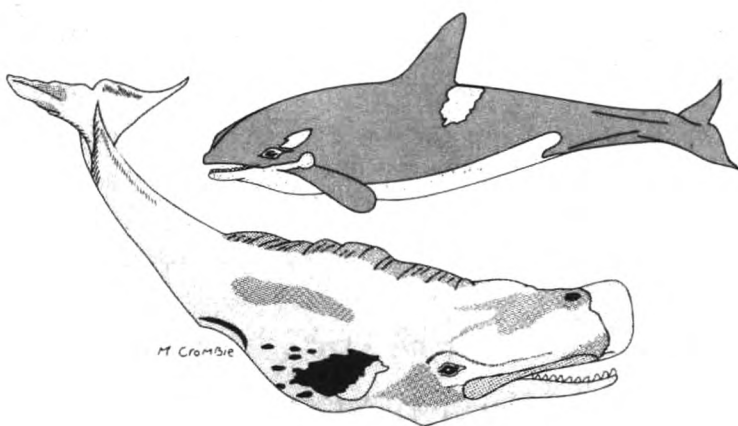
'A Sei whale is usually a dark shiny grey on the dorsal surface with the throat and chest area white. The baleen will be seen to be dark grey with occasional lighter grey interposed. Head shape may be said to be similar to the Fin whale but not so pointed. Again, there is a single central pronounced head ridge. As in the Fin whale, the flukes are not shown in diving.

'As the observer says, these animals "sank" out of sight rather than that they dived. I would think that the probability is that these were Sei whales. The other rorquals have a noticeable roll when diving.'

Eastern North Pacific

m.v. *Resolution Bay*. Captain W. A. Murison. Port Chalmers (NZ) to Panama. Observers, Mr S. E. Bligh, 2nd Officer and Mr M. Crombie.

12 July 1980. During the early afternoon a number of whales was observed about 2 n. mile from the vessel. As we approached the animals we identified 2 adult Killer whales, see upper sketch, and several young; in company with them were 4 Sperm whales, see lower sketch.



The adult Killer whales were about 6 metres long, each with dorsal fins about one metre high. The young, about 2 metres long, were very active jumping in and out of the water in the wake of the vessel. They came to within 3 metres of the vessel thus making identification very easy.

The Sperm whales, each about 12 metres long, basked on the surface of the water unconcerned by the close proximity of the vessel and the antics of the young Killer whales. They had very large and square-shaped heads and, although none carried a dorsal fin, what appeared to be ridges on the animals' backs created the impression of small fins. A spout some 2 metres high at an apparent angle to the body was emitted from the blow-hole situated just behind the head of one of the creatures.

The sketches were drawn by Mr M. Crombie.

Position of ship at 1800 GMT: 2° 30' N, 86° 00' W.

Note. Mr D. A. McBrearty comments:

'These are excellent drawings of a male Killer whale and a Sperm whale.

'Young Killer whales are always very active, even more so than the parent animal; this is something which makes them very popular in captive displays. It is most unlikely that the adults would attempt to attack fully grown Sperm whales, they may have a go at a calf or injured animal but a fully grown active adult would probably be too much.

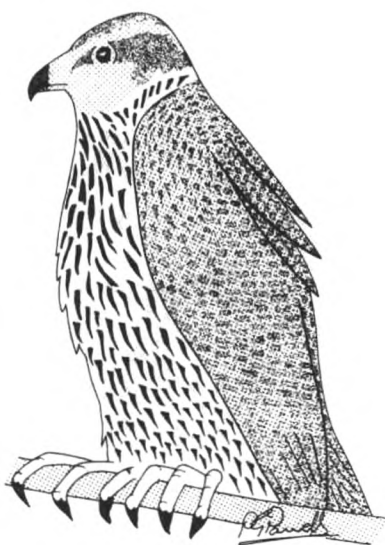
'The blow-hole in the Sperm whale is not behind the head of the animal but is S-shaped and is at the furthest point forward at the top left-hand side of the head. The "blow" is projected forward as the observer indicates. The head accounts for about one third of the animal's length.'

BIRDS

Barents Sea

m.v. *Singularity*. Captain A. J. Richards. Amsterdam to Archangel. Observers, the Master, Mr P. G. Powell, Chief Officer and Mr C. Blane 2nd Officer.

15 September 1980. At 1340 GMT a large falcon was observed. The wings and back were grey-brown and light brown with white barring on the wings. The head and cheeks were also grey-brown and there were black and fawn markings around the eyes. It had a blue-grey beak which became black at the tip while the breast was white and speckled with dark brown spots like that of a thrush. This colouring continued to the back of the neck where it formed a distinctive 'v' shape, see sketch.



The falcon remained around the vessel for the rest of the afternoon and evening, usually perching on the top of the foremast or midship crane. It was seen again in the early morning twilight of the 16th but soon flew off at sunrise.

Position of ship at 1200: 70° 00' N, 33° 18' E.

Note. Captain Tuck, of the Royal Naval Birdwatching Society, comments:

'From the detailed sketch, good description and high latitude, I consider the bird to be a Gyrfalcon (*Falco rusticolus*).'

White Sea

m.v. *Singularity*. Captain A. J. A. Richards. Amsterdam to Archangel. Observer, Mr P. G. Powell, Chief Officer.

17 September 1980. A small owl approximately 25–30 cm high was seen either perched on or flying around the ship. The owl had a dark grey back with light grey markings and a mainly white or light grey face and underside. There were grey markings on the face like a sunburst pattern centred at the eyes and dark grey or black speckles on the breast. The head appeared to be quite large with big, staring yellow eyes, see photograph between pages 130 and 131.

The owl stayed mainly close to the deck, never perching higher than about 2 m and also appeared very docile as it could be approached quite closely before flying away. It was last seen as the ship proceeded into Archangel.

Position of ship approximately: 65° 00' N, 39° 30' E.

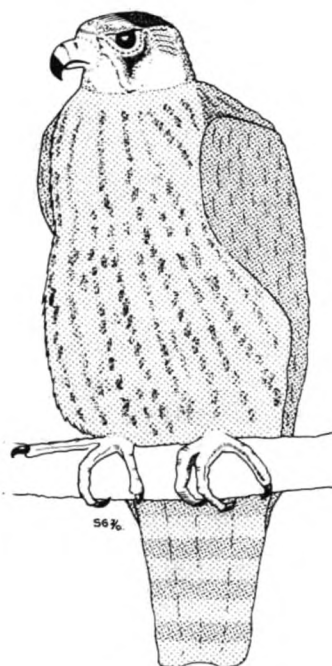
Note. Commander M. B. Casement, R.N., Chairman of the Royal Naval Birdwatching Society, comments:

'This is Tangmalm's owl, *Aegolius fumereus*. Only slightly larger than the Little owl, it has a very large, whiter rounded head and large yellow eyes. The photograph gives excellent details of the plumage pattern. This owl breeds from northern Scandinavia to western Siberia and principally in mountain ranges in parts of Russia.

North Atlantic

s.s. *Serenia*. Captain K. Bramley. Tranmere to Sullom Voe. Observers, Mr S. Galloway, 2nd Officer, and Mr R. W. Moloney, Senior Radio Officer.

29 September 1980. Just after noon GMT this day, my cadet stated that he'd 'just seen an 'awk'. As the ship was to the west of the Shetland Isles, I pointed out that the presence of an auk among the gannets and skuas was no reason to get as excited as he was. About an hour later, this small bird of prey was seen to alight on the main aerial, apparently unhampered by the accommodation wind turbulence, and the difference between an auk and an 'awk became readily apparent. With the aid of the revised edition of the *Hamlyn Guide to Birds of Britain and Europe*, the Radio Officer, the cadet and myself were able to identify the bird in question as a juvenile Peregrine Falcon, see sketch.



It appeared to be larger than a sparrowhawk, did not have the 'rounded ends' to its wings, lacked the distinctive white eyebrow marking but had a pronounced 'moustachial streak' from the bridge of the beak to the underside of each eye. The plumage was brown across the back with brown and cream speckles on the breast and banded lines on the tail feathers.

The presence of this bird was a source of interest to us in view of its flight control in the gusty wind, but a cause of panic to our smaller feathered passengers (believed to be Dunnocks), and after a time, the falcon was seen spreading feathers over the fo'c'sle in a random manner and then tearing lumps of flesh off the corpse of some unfortunate victim. To quote the Radio Officer, 'Met logs should read, "Page 86 observed dining off page 220!"' The falcon was unmoved by this and remained on board for a total of two days, but where he roosted at night was not known.

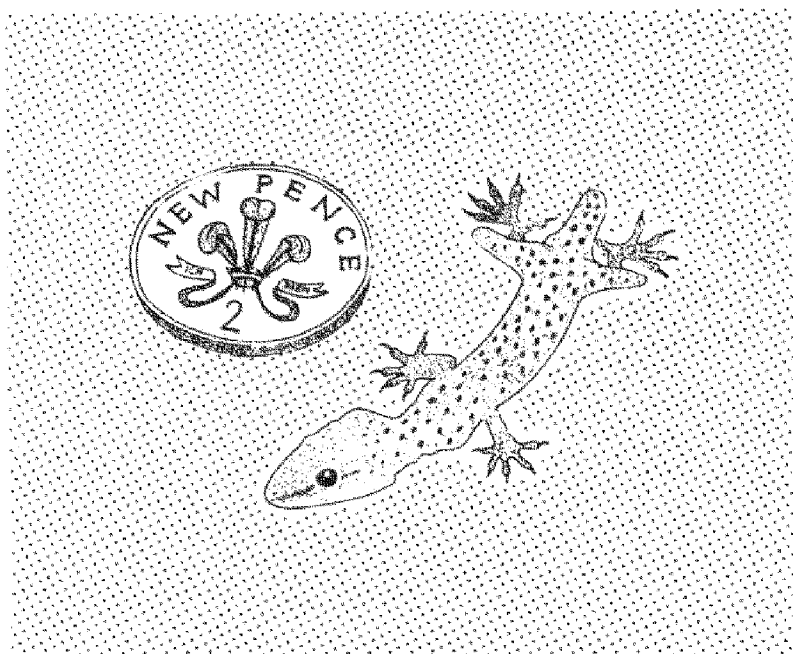
Position of ship: 60° 24' N, 2° 32' W.

LIZARD

Caribbean Sea

s.s. *Flinders Bay*. Captain M. J. Heron. Rotterdam to Cristobal. Observers, Mr I. M. Chadney, 3rd Officer and Mr G. Wheeler, 2nd Cook.

21 September 1980. At 0400 GMT a small lizard was discovered in a crew bathroom. It had only recently died and part of its tail was missing, see sketch.



The creature was about 4 cm long, had 4 legs each with 5 claws and its head was large in comparison to its body. The basic colour of the animal was pale brown, it was scaly and covered with dark green dots. Its stomach area was a plain creamy colour and there were remnants of sloughed skin around its legs. Was it a gecko?

Our last port of call was Rotterdam and we had been at sea for 9 days.

Position of ship: 10° 45' N, 78° 00' W.

Note. The Keeper of Zoology, British Museum (Natural History), comments:

'This is the Turkish gecko, *Hemidactylus turcicus* L. It is found in the Mediterranean area, north and north-eastern Africa, and from south-west Asia to India. In the "new world", the species has been recorded from Louisiana, Texas, Florida, Cuba, Tamaulipar to Yucatan, Mexico and Chile. This distribution seems mainly due to human agency.'

INSECTS

North Sea

m.v. *Dolphin Point*. Captain G. H. Cubbon. River Thames to River Tyne. Observer, the Master.

7 September 1980. Whilst on passage and in a position about 20 n. mile east of the Humber estuary, very large numbers of flies appeared onboard and landed on the upper-works on the lee side of the vessel. They appeared listless, and, after about an hour, began to die off in quite large numbers. Very few actually came into the accommodation.

Position of ship: 53° 36' N, 0° 46' E.

Note. Mr Peter S. Cranston of the British Museum (Natural History), comments:

'The flies are *Bibionidae* belonging to the species *Dilophus febrilis*.

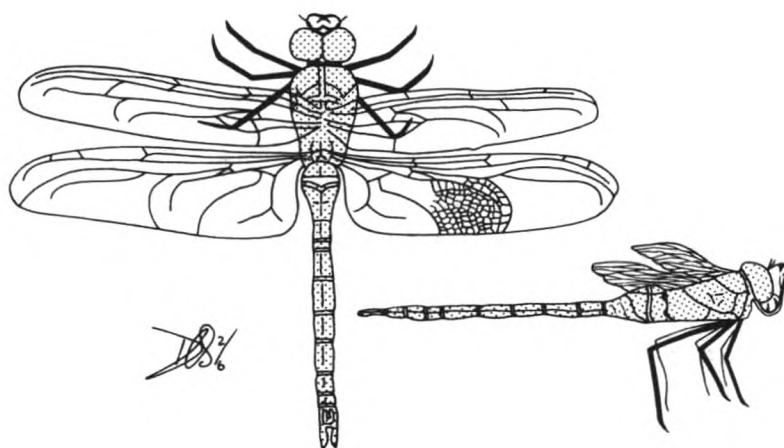
'On 15 September I was on the beach at Blakeney in Norfolk and can confirm that there were large numbers of adults emerging from the coastal grasslands and many of these were being blown by the gusting southerly winds towards the Wash. The usual late summer emergence of this species seemed rather heavier than usual this year and this is perhaps also confirmed by the increased number of enquiries we have handled this autumn.

'I am not clear whether the adults do attempt a migration or if they are always simply wind blown. Perhaps in a year with heavy emergence normal dispersal will take increased numbers out to sea.'

Western Mediterranean

m.v. *Royal Prince*. Captain E. Buckle. Manchester to Piraeus. Observers, Mr M. J. F. Swann, Chief Officer, Mr D. Smith, 2nd Officer and Mr J. Park, Boatswain.

15 September 1980. At 1415 GMT whilst the vessel was off Tunisia, a dragonfly as shown in the sketches was found on board. It was 73 mm long and had a 95 mm wing-span. The tail or abdomen measured 50 mm, was forked at the end



and was brown in colour with light bands, leading to a bright blue after-part marked with a white ring. The dragonfly's main body was an iridescent green with a tint of brown on top and black markings. Its head consisted of 2 large green eyes which had an almost transparent look to them and a front part of white with a brown mouth.

Position of ship: 37° 25' N, 9° 15' E.

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

'This is a member of the family *Libellulidae*.'

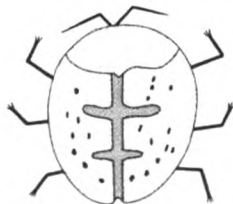
North Pacific

m.v. *Columbia Star*. Captain A. J. Chivers. Balboa to Los Angeles. Observer, Miss E. Milligan aged 11½ years, Chief Officer's daughter.

20 August 1980. At 1718 GMT a small beetle-like insect was found near the ship's swimming pool. The forepart of the back was similar to tortoiseshell in colour, whilst the remainder of the back and wing casing was golden-green with

brown cross-like markings down the centre, see sketch. The beetle measured approximately 1.0 cm by 0.75 cm and was possibly blown on board by the strong local wind, the 'Tehuantepecer'.

Position of ship: 15° 20' N, 96° 06' W.



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

'The drawing appears to be that of a cassid beetle belonging to the family *Chrysomelidae*. Beetles of this sub-family, *Cassidinae*, are commonly known as Tortoise beetles because of their appearance and habit of drawing in their legs etc. when disturbed. All the beetles of this group are plant-feeders both in the larval and adult stages. Unfortunately there is insufficient detail on the drawing to make further determination possible. It is most probably that the beetle is of Mexican or Central American origin.'

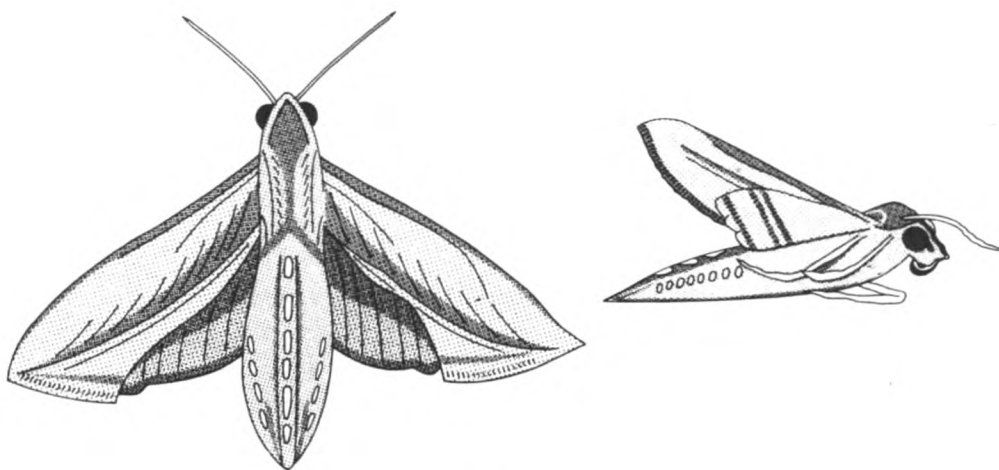
Great Australian Bight

m.v. *Cape Leeuwin*. Captain J. G. Jones. Geelong to Chittagong. Observers, the Master and Mrs Jones, Mr B. P. Andrew, 2nd Officer and Mr J. O. Smith, 3rd Officer.

24 September 1980. During the morning, the moth illustrated in the sketch made by Mrs Jones was found in the wheel-house. On the previous day the vessel had sailed from Geelong and the moth was presumed to have boarded there.

The dimensions of the insect were about twice those of the sketch.

Position of ship: 37° 57' S, 136° 20' E.

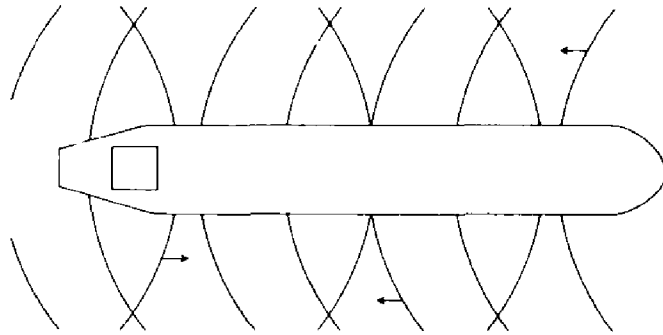


BIOLUMINESCENCE

Malacca Strait

s.s. *Lyria*. Captain D. A. Lardler. Pulo Bukom (Singapore) to Dubai. Observers, the Master, Mr J. Murphy, 2nd Officer, Mr E. T. Mullin, 3rd Officer, Cadet D. M. MacIntyre, Cadet C. D. Kemp and Mr M. S. Pietrzycki.

11 July 1980. At approximately 2200 GMT a phenomenon similar to phosphorescent wheels was observed. The phenomenon did not seem to build up slowly, but just appeared. It took the form of curved lines of uniform crescent shape which were horizontal to the sea surface, moving in a circular path around the ship starting from just forward of the bow, see diagram. The speed of the lines was hard to estimate but was in the order of three lines passing a point every second. This high speed gave the impression of pulsating light. The lines were about 100 metres long, 0.5 metres wide and appeared to some to be light green in colour although to the others they appeared silvery-white. There was some disagreement about the position of the phenomenon as to whether the lines were on the surface of the sea or above it. The phenomenon seemed to be centred about the ship and could not be seen for more than 100 metres on either side and astern, also the whole system appeared to be moving along with the ship. After about 5 minutes the lines faded away over a period of $\frac{1}{2}$ –1 minute.



Unfortunately, no one thought of shining a light on to the sea to see if this would have an effect. Nothing unusual was visible on the radar either before or during the sighting, and no 'normal' phosphorescence was seen at the time or afterwards.

Weather conditions at the time were: air temp. 28.0°C, sea temp. 31.0, barometric pressure 1006.0 mb, wind N'W, force 2, cloudy with visibility of 25 n. mile, height of eye 35 metres above sea level.

Position of ship: 3° 14' N, 100° 37' E.

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

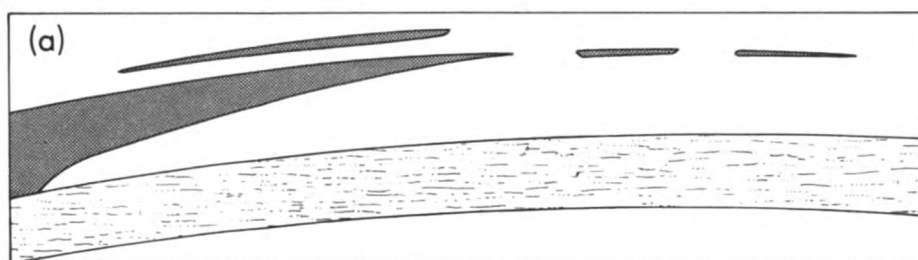
'An interesting account of "phosphorescent wheels". The different views of the various observers as to whether it was above or on the surface indicates how deceptive some of these phenomena can be and how easy it is for a single observer to be uncertain of precisely what is happening. The association of the wheels with the vessel as it moved is an unusual feature of the report and is difficult to reconcile with the hypothesis that these wheels reflect seismic activity on the sea bed'.

ABNORMAL REFRACTION

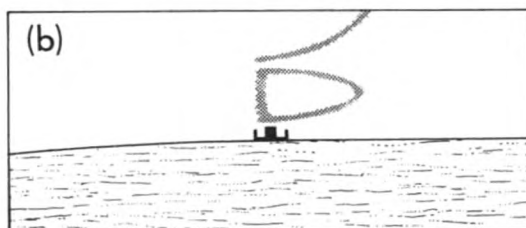
Little Minch

m.v. *Border Castle*. Captain R. Twist. Grangemouth to Cork. Observer, Mr I. O. Williams, 3rd Officer.

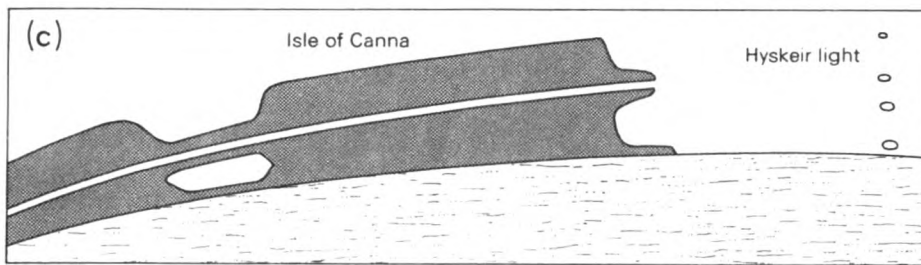
15 August 1980. About 1 hour before sunset a superior mirage was observed from the port bow to the starboard bow. On the port side was the sea horizon, to starboard was the island of South Uist, but the latter was so different from normal island outlines that it took several minutes to realize how the shapes were formed. Sketch (a) shows the view off the port bow very roughly. Following the horizon round from the port side, it appeared to climb into the sky and slowly broke up, but although no sea could be seen above the real horizon beyond this, there was a difference of shading measured by sextant at $51'$ altitude, which followed round to the starboard bow. For a time there was also a second section of sea—easily seen as such by the waves on it—above the second horizon, but this did not extend round more than about 20° of the horizon.



The phenomenon started to break up ahead and to starboard about 25 minutes before sunset. One interesting aspect during this main session was the ship sighted 1 point to starboard at a range of 17 n. mile as indicated by radar. Only the funnel and the top of the masts could be seen but as the ship was making smoke she was easily visible to the naked eye. The ship was never observed upside-down or even the correct way up on the second horizon, however the reflections of the funnel smoke could be clearly seen, as shown in sketch (b). Although the reflections were breaking up, the phenomenon was seen over three-quarters of the horizon from the port bow, round the starboard side to the port quarter, for about 10 minutes before sunset.



The last images seen and perhaps the most spectacular, occurred about 2 minutes before visible sunset and ended 2 minutes afterwards. On the port bow we saw 3 images of the Isle of Canna as shown in sketch (c). Both correct-way-up images and the inverted one were very clear even though the lower two were joined together. What was also striking was the image of the Hyskeir light.



With the naked eye this appeared to be a vertical column of light, but with binoculars was resolved for a time not only into 3 lights of similar intensity but also into a dimmer fourth one. The latter lasted for only 3 cycles of the light, about $1\frac{1}{2}$ minutes and the remaining images lasted for about 2 minutes more than this. The phenomenon then rapidly disappeared leaving a normal, slightly misty horizon and a visibility of less than 16 n. mile as the ship ahead could no longer be seen.

Weather conditions 20 minutes after the phenomenon was first seen were: dry bulb 14.0°C , wet bulb 13.5 , sea temp 13.4 , wind NE'N, force 4, patches of mackerel sky above and astern but only a very slight amount of cirrus ahead.

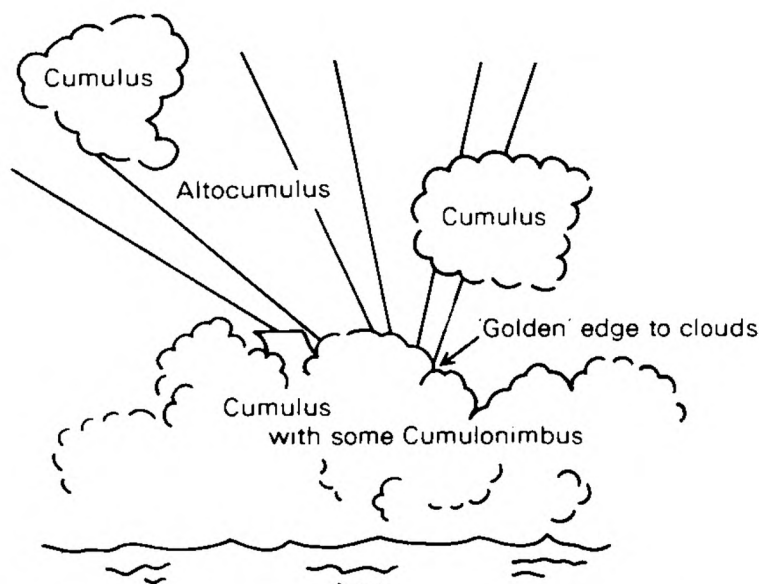
Position of ship at 1800 on the 15th: $57^{\circ} 42' \text{N}$, $6^{\circ} 36' \text{W}$.

ANTICREPUSCULAR RAYS

North Atlantic

m.v. *Hampshire*. Captain M. M. Reeves. Mississippi River to Gemlik (Turkey). Observers, the Master and Mr W. J. M. Hargreaves, 2nd Officer.

9 September 1980. At 0915 GMT, about 45 minutes after sunrise, 3 rays were observed radiating from behind a bank of cloud. At first glance they were put down merely to shadows thrown across the sky by the clouds on the horizon. It was then realised that this phenomenon was in the west. As mentioned, the rays of what appeared to be shadows cast across high level altocumulus emanated from behind a bank of cumulus cloud which had a golden edge as if obscuring the sun. Isolated cumulus clouds were not affected which would indicate that



Looking west

the shadows were at a higher level. The rays were clear and had definite edges and were of approximately the same width as shown in the sketch. They spanned the sky from an elevation of 7° to 35° where they were lost behind a heavy bank of cumulus and stratocumulus clouds. No movement of the rays was observed and the phenomenon lasted for about 5 minutes after which time further observation was obscured by 8 oktas of cloud.

All that can be suggested is that a cloud to the west was acting as a very efficient mirror and it is thought that perhaps some refraction must also have been responsible since sunrise had been less than 1 hour before.

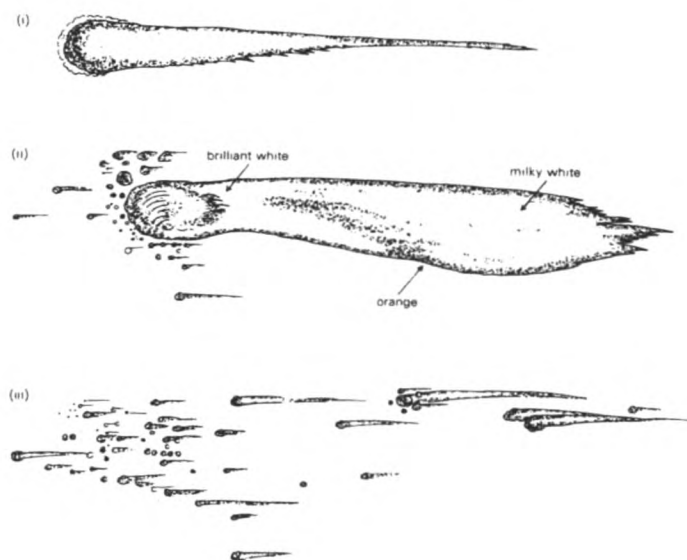
Position of ship: $36^{\circ} 35' N$, $42^{\circ} 35' W$.

METEOR

North Atlantic

m.v. *Appleby*. Captain T. F. Jones. Redcar to Norfolk (Va.). Observers, Mr P. R. Hamlin, 3rd Officer and Mr H. Bruce, A.B.

21 September 1980. At 0344 GMT a meteor was first seen at an altitude of 20° and bearing $330^{\circ}(T)$. It appeared as a brilliant white ball with a tail extending uniformly behind it, as in sketch (i). As the meteor moved across the bow it began breaking up and spreading out in all directions. At first the tail grew very wide, and then individual tails formed from the fragments as they moved away from the larger mass, see sketch (ii). The leading edge of the main mass still glowed brilliant white, but large parts of the tail became pale orange and then milky white just before disappearing. At this point, the altitude of the body was estimated to be 45° . By the time the mass had reached a bearing of $235^{\circ}(T)$, none of the original large meteor remained as it was entirely fragmented, see sketch (iii). Whilst the fragments themselves continued to glow white, their tails changed colour with quick flashes for 1 to 2 seconds before fading out, the colours ranging from bright green, yellow and white through to light blue and purple.



By the time the fragments had reached a bearing of $208^{\circ}(T)$ and altitude of 15° they were all burnt up. The whole phenomenon lasted approximately 90 seconds during which time the tail covered an arc of about 15° at its widest point while the diameter of the meteor appeared to be the same as that of the sun although there was never a clear outline to observe.

Throughout, it has been assumed that this was a meteor or large meteorite, but it would be of great interest to find out whether it was perhaps space debris such as a satellite or rocket.

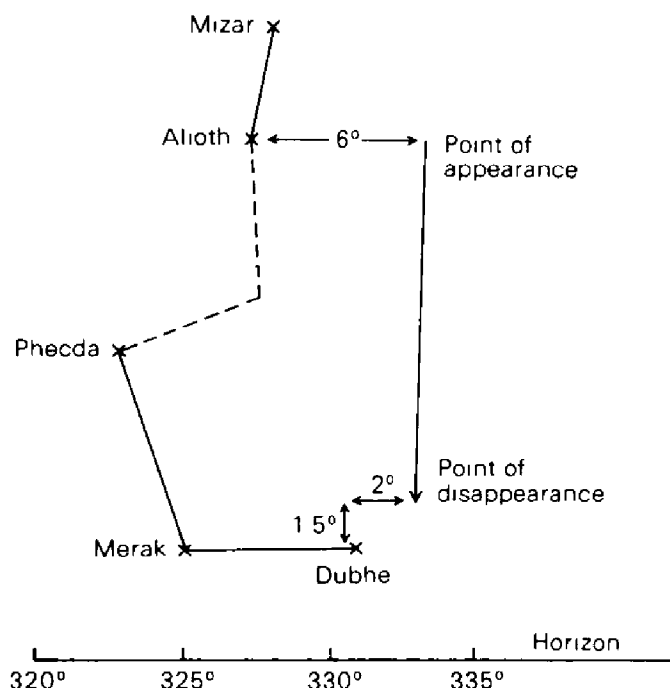
Position of ship: $39^{\circ} 10' \text{N}$, $64^{\circ} 34' \text{W}$.

UNIDENTIFIED FLYING OBJECT

North Atlantic

m.v. *Birchbank*. Captain A. B. Osborne. La Pallice to La Guaira. Observers, the Master, Mr S. Rabbet, Chief Officer and Mr P. M. Lovett, 3rd Officer.

26 July 1980. At 0016 GMT whilst approaching Martinique, what was assumed to be a very large meteor was observed, although it may have been a space vehicle or satellite re-entering the atmosphere, see diagram.



The ship at the time was bathed in brilliant moonlight from an almost full moon in a cloudless sky. However, the phenomenon was so intense that it further brightened the ship's structure and wheel-house. The Master did, in fact, call to Mr Lovett on the starboard bridge-wing to ask whether the flash observed was lightning.

The object appeared some 6° west of star Alioth and travelled to a point about 2° west and $1\frac{1}{2}^{\circ}$ north of star Dubhe leaving a brilliant white trail and culminating in a round ball before apparently disintegrating in a shower of bright white and orange sparks lighting up a large portion of the northern sky for $1\frac{1}{2}$ –2 seconds.

Position of ship: $14^{\circ} 25' \text{N}$, $60^{\circ} 35' \text{W}$.

Weather Routeing of Ships

BY CAPTAIN G. V. MACKIE, M.N.I.

(Deputy Marine Superintendent, Meteorological Office)

In general, one can say that there are two methods of weather routeing of ships. The first method can be called 'climatological routeing' which uses climatological information about wind, currents, wave height and direction. The data have been compiled for many years for ocean areas and are made available to users via publications such as atlases and books. One may say that climatological routeing will be definitely very successful in ocean areas where the weather and wave conditions are in a settled state for a long time, mainly within the tropics when there are no tropical cyclones (formerly known as tropical revolving storms) in the region. The routes recommended in the well-known publication *Ocean Passages of the World* are also based on climatological data.

From experience, however, we know that outside the tropics the difference between the present weather and the climatological conditions can be quite considerable in certain periods. Better weather will not necessarily be encountered on a climatologically favourable southerly route in the Northern Hemisphere. For instance, the weather in the Atlantic near the Azores can be much worse than at higher latitudes at the same time. The second method, therefore, uses actual wave and weather charts together with computer prognoses for 500-millibar, surface and wave charts for up to 72 and 96 hours ahead for recommending a specific route and is nowadays called 'weather routeing', 'optimal routeing' or 'least-time routeing'. The term 'tactical routeing' is more appropriate, however, as will be explained later.

Weather Routeing is generally most effective on westerly or easterly ocean crossings outside the tropics. Accordingly, there are five main areas where Weather Routeing may be of benefit to the user. These are the North Atlantic, the North Pacific, the South Indian, the South Atlantic and the South Pacific Oceans. Generally speaking, meteorological organizations specializing in weather routeing issue only recommendations for three of them, namely the North Atlantic, the North Pacific and the South Indian Oceans.

In the UK Meteorological Office a Weather Routeing Service specializing in the North Atlantic, was set up on an experimental basis in 1967 in close collaboration with the Cunard, Furness Withy and Sugar Line companies. This has gradually become a regular service and route recommendations and meteorological guidance are given to ships of all nationalities wishing to cross the oceans of the world in any direction. Ships under British, Swedish, Norwegian, Danish, American, German, Irish, Italian and Israeli flags are regularly routed by the Service.

There are three routeing officers engaged on the operation of the Service, each of whom holds a Foreign-going Master's Certificate and all have had command experience. When the Routeing Service was first set up, it was agreed that whoever issued a route recommendation or gave a shipmaster guidance should be fully acquainted with procedures on board, understand all the jargon, speak it and be capable of interpreting it. The task of selecting routes is entrusted to this team of Master Mariners, who devote their whole time to selecting the most advantageous routes for ships which use the Service. They are provided with a continuous flow of analysis and forecast charts, ice information, warnings, bulletins and satellite pictures and are briefed on the meteorological situation by experienced forecasters.

The cost for the Routeing Service is £150 per North Atlantic crossing, £225 for a North Pacific passage and about £75 per day for advice to structures under tow. Preferential rates are given for regular custom. Telegram costs are extra and these vary between £35 in summer and about £60 in winter. For these charges the following services are rendered:

- (a) Advice on the recommended route to be followed, information on the meteorological conditions which led to the advised route and a wave forecast for the first 48 hours along the route. When the ship carries a heavy or sensitive deck cargo and is sailing from a UK port the Routeing Officer usually goes on board and briefs the ship's master, explaining to him the procedures and aims of the Service.
- (b) At intervals of at least two days, a new forecast of wave conditions and the synoptic situation along the route for the next 48 hours.
- (c) Deviation from the advised route if the meteorological conditions along the first route become unfavourable.
- (d) Information about icebergs and, if applicable, advice regarding the best route to avoid tropical cyclones.
- (e) A hindcast of the weather and wave conditions which occurred during the crossing and a comparison in crossing time of the hindcast computed optimal route, advised route and a standard route (usually the great circle). From the hindcast, the master and shipowner can see how successful the routeing has been.

The term 'tactical routeing' is considered to be more appropriate than 'optimal' because it is not yet possible for any of the ship routeing organizations to select a real optimal route for the whole crossing prior to departure. What is really required to route a ship over, say, the North Atlantic optimally is an accurate forecast of the wind speed and direction together with sea-wave and swell conditions for a week to ten days ahead, which is the normal time for an Atlantic crossing plus an accurate speed performance curve of the ship at sea. This procedure may become possible in the future, but the Service has to manage with a good deal less at the moment.

The same thing applies to the speed performance of a ship and performance curves are used which represent graphically the speed of the ship in various sea heights, see Figure 1. The curves can easily be used if it is desired to compute the advised route numerically, see Figure 2, but this is not done on an operational basis. The final advice is still checked by the Routeing Officer manually when other aspects such as navigation, fog, ice, stability and load-line are also considered.

Shipowners and masters may ask, 'Are your recommendations of any benefit to the ships to whom they are given?' The answer is that they are, although they are not spectacular from a meteorological point of view. It is not usually possible to tell a shipowner what his real profits are when he has his ships regularly routed because the Service is not in a position to know anything about the cost of repairing damage to ships caused by bad weather, the yearly amount of claims which had to be paid before the ship was routed, the penalty which has to be paid to shippers because the ship is not on schedule, et cetera.

The results are calculated as follows. After completion of the crossing the route is always evaluated and this involves:

- (a) Preparing a chart showing the optimal route (minimal time route) made up from the actual wave analysis charts of 0001 and 1200 GMT during the crossing.
- (b) Calculating the differences in time between the duration of the actual passage, the great circle or one or more standard routes, and the optimal

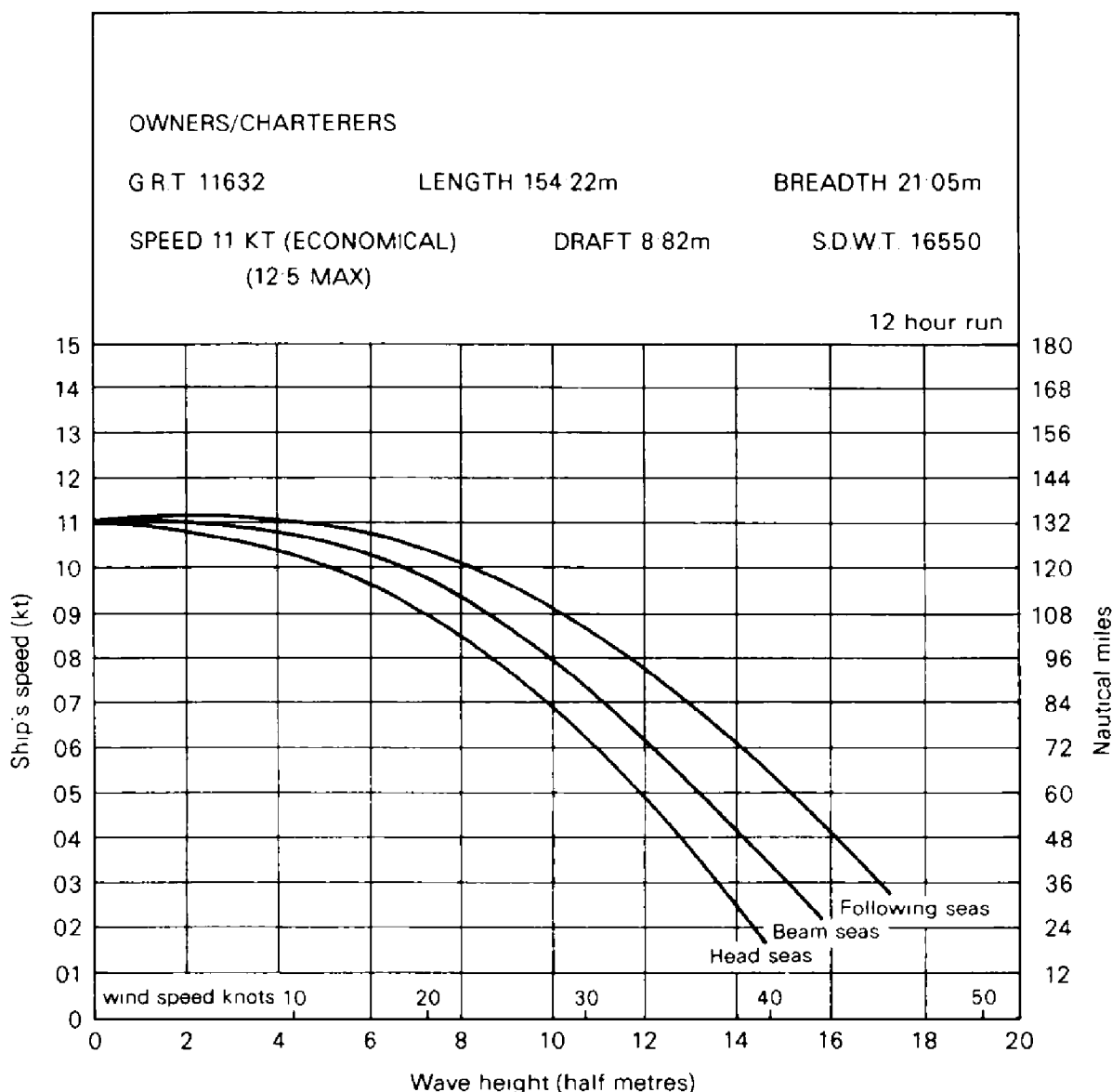


Figure 1. Example of a performance curve graph

route. The average rate of ocean currents are always considered in these calculations.

- (c) Calculating the extra distance (if applicable) made by the alternative routes compared with the geographically shortest route, the extra distance being expressed in nautical miles, see Figure 3.

Calculation of a large number of crossings from Europe to the Panama Canal shows that the average gain in time using the advised route compared with the great circle was 4.3 hours so the average 'optimal' gain could have been 6.2 hours.

For the route from Europe to the Gulf of Mexico the average gain in time of the advised route compared with the great circle was 3.4 hours so the average 'optimal' gain could have been 7.0 hours.

For the route Europe to Charleston, the crossing time of the advised route was equal to the great circle so the average 'optimal' gain could have been 3.2 hours.

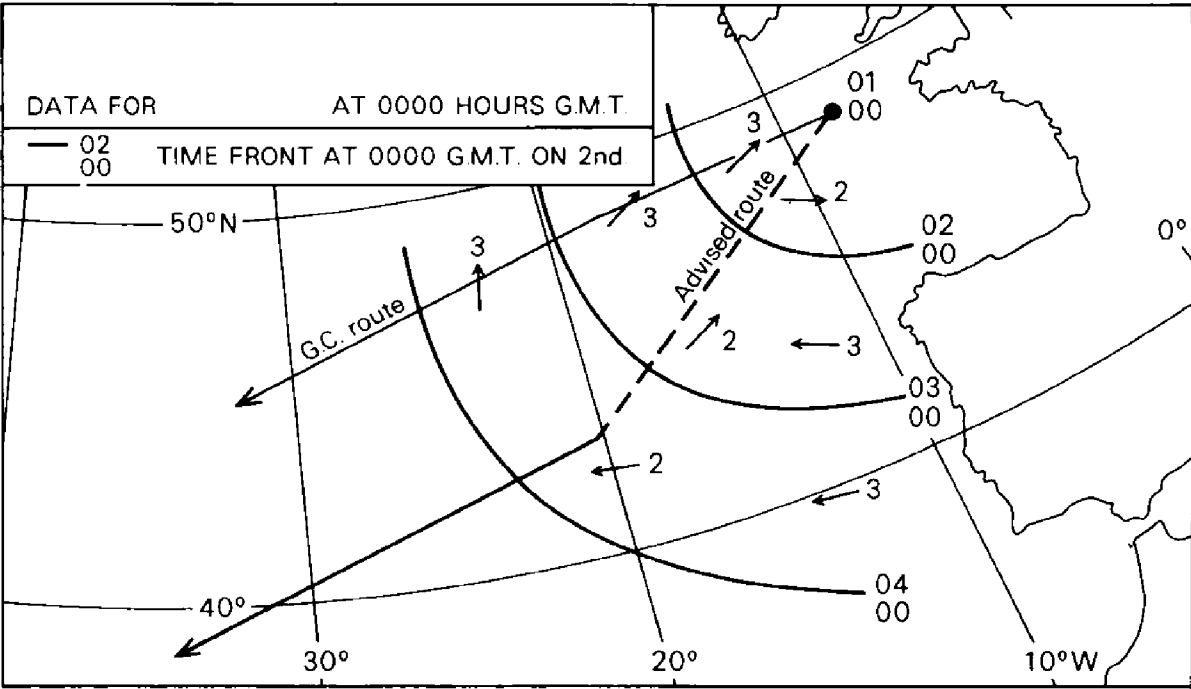


Figure 2. Calculation of least time track

It will be noted that the average North Atlantic gains are not spectacular. However, this is not always the most important item of ship routeing; at times it is more important for shipowners, especially nowadays with the very specialized ships which are used, to know that the ships leave and arrive on schedule. Nevertheless, savings in fuel are important these days and the following illustrates how such economies can be made by the use of ship routeing. The table below was obtained from one of the major UK shipping companies, which operates a very large fleet of UK flag and chartered vessels, and illustrates that substantial savings can be made in bunker fuel consumption and, therefore, in costs.

	Time Saved (Lost)	Equivalent Fuel Saving (Loss)	
Pacific Westbound	77.5 hours	£24 758	} Net, i.e. cost of routeing has been deducted from the full calculated bunker savings.
Pacific Eastbound	(8) hours	(£2 156)	
S. Indian Ocean	36 hours	£5 802	
Atlantic Westbound	148 hours	£10 053	
Atlantic Eastbound	40 hours	£3 060	

Overall net saving for North Pacific Routeings was £19 427. There is, however, one aspect which cannot be calculated and this is: How would the master have chosen his route and what would it actually have been if he were not routed?

During 13 years' experience of routeing ships across the North Atlantic, the Service has changed the attitude of mind of some masters towards crossing the North Atlantic Ocean. For generations they had been taught by their older colleagues, that it was unthinkable to sail the North Atlantic, especially during the winter months, north of the rhumb line from Bishop Rock to say 42°N, 50°W. North of this line it was thought that the weather was so bad that it was out of the question to deviate to the north. When bad weather occurred during the passage in winter only one thing could be done—deviate to the south. This attitude has changed completely. When a ship is bound for the Gulf of Mexico, even in winter-time with a heavy deck cargo, and the Routeing Officer advises

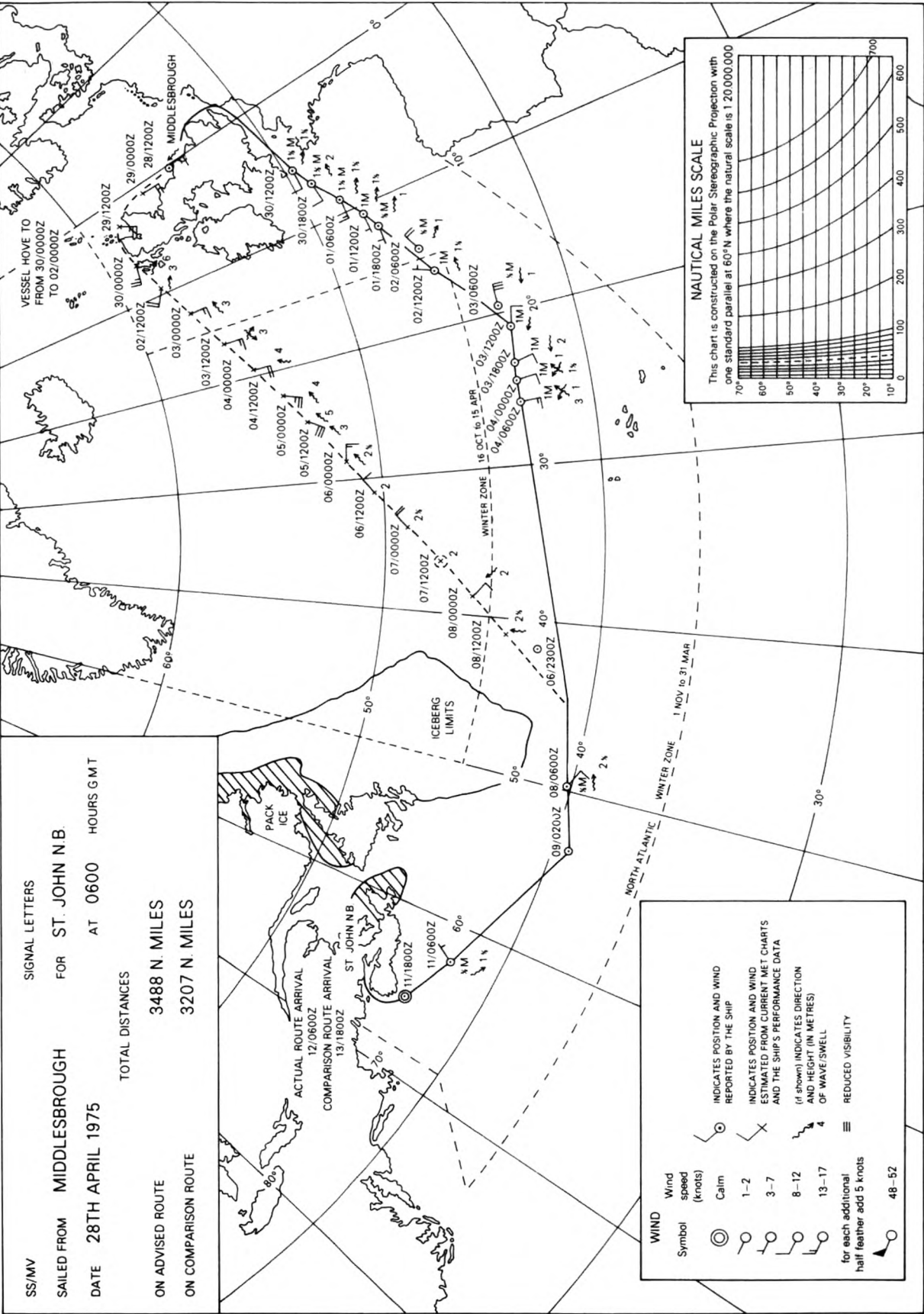


Figure 3. Example of a ship routing chart

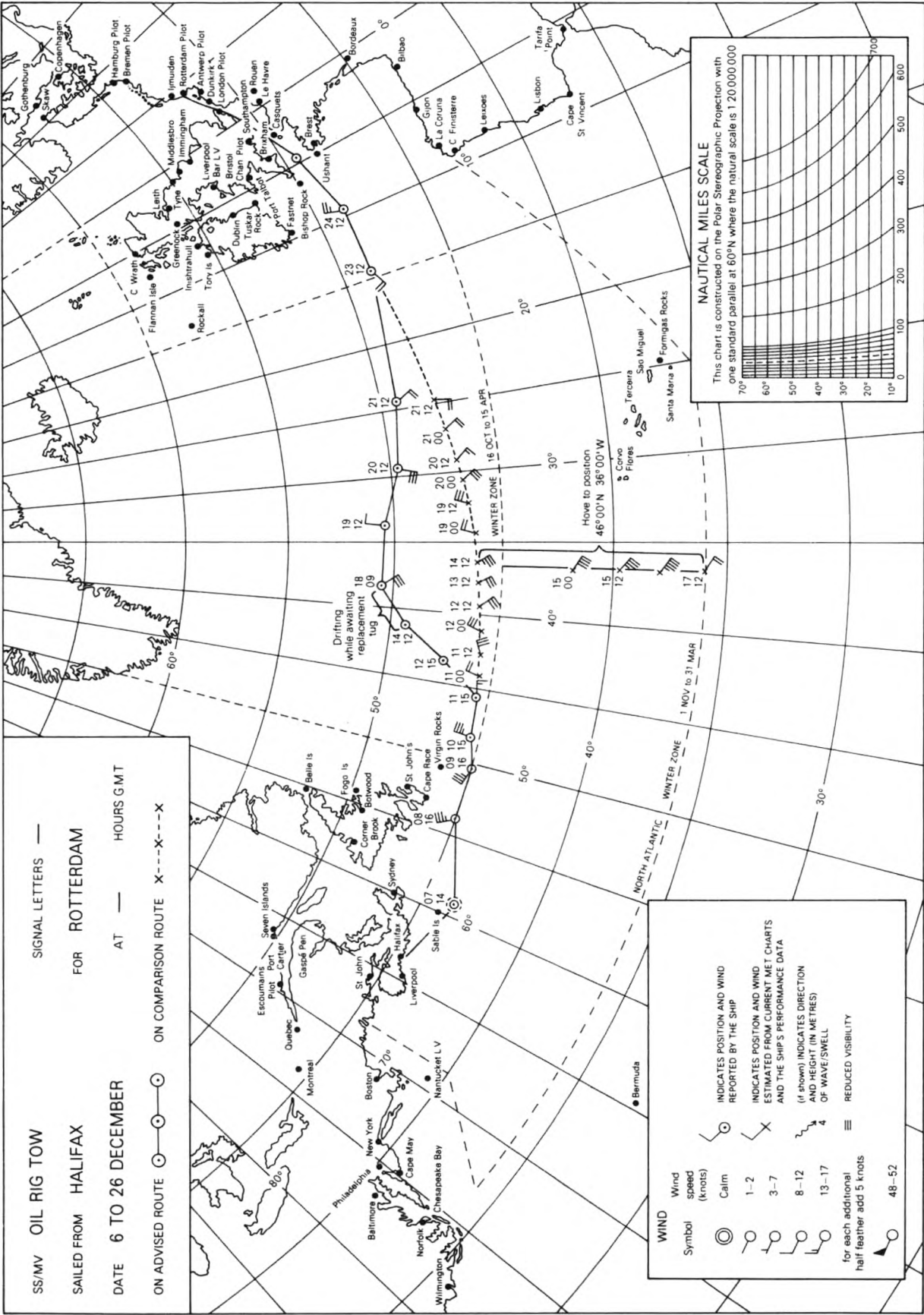


Figure 4. Example of a routing for the oil industry

the master to deviate to the north after passing Fastnet, to sight Cape Race and thence proceed coastwise to Florida, most masters are agreed that this is the best route in the circumstances and will usually follow the advice. However, it has taken many years of operational experience even for the Routeing Officers to issue this advice.

The many weather forecasts issued by the Meteorological Office at Bracknell, including those for the Press, Radio and Television, as well as the Weather Bulletins for shipping and the North Atlantic Weather Bulletin which is broadcast from Portishead Radio, are based on guidance from a numerical model of the atmosphere produced by computer. In spite of its sophisticated nature, however, the numerical model has certain shortcomings with the result that a human forecaster can often effect significant improvements. The forecast that is finally issued is thus an amalgamation of the products of man and machine.

The present Meteorological Office computer system comprises an IBM 360/195 linked to an IBM 370/158 and is known as the 10-level primitive equation model. The 10 levels are spaced vertically at 100-millibar intervals between 1000 millibars and 100 millibars and the primitive equations comprise the general equations of motion, continuity and thermodynamic energy appropriate to the atmosphere.

Two versions of the model are used—a 'coarse' mesh version with about 3000 horizontal grid points, spaced 300 kilometres apart at 60°N having an octagonally-shaped boundary and covering much of the Northern Hemisphere, and nesting within it a 'fine' mesh version called the rectangle, covering Europe and part of the North Atlantic, also with about 3000 grid points but spaced 100 kilometres apart at 60°N. Twice a day the octagon model produces forecast charts for the greater part of the Northern Hemisphere down to about 15°N for up to 3 days ahead, with forecasts for up to 6 days ahead once a day. Three times a day the rectangle produces 36-hour forecast charts which, because of their fine mesh, are able to give greater detail in the vicinity of the British Isles.

As all these data are compiled at Bracknell and are available to the forecasters who brief the Ship Routeing Officers, it can be readily seen that the combination of meteorologist and mariner working together on the same project offers the best from both professional disciplines.

In recent years the Ship Routeing team at Bracknell has become increasingly involved in issuing weather and routeing advice to the offshore oil industry in the form of recommendations to structures under tow, such as rigs, barges and even parts of the new Thames barrier which were constructed on the River Tees and had to be taken under tow to the River Thames. An example of a routeing for the oil industry is shown at Figure 4. This illustrates how, by the constant surveillance of the weather situation, the Routeing Officers were able to advise the tug to deviate from the original direct route to the English Channel and thus avoid an area of extremely adverse weather with accompanying high seas.

The value of ship routeing, be it advice for conventional ships or to structures under tow, depends in the first place on the existence of adverse weather conditions and, secondly, whether such conditions can be avoided. The potential economic benefits such as the saving on fuel costs and heavy weather damage can be realized only if the conditions along the shortest route are adverse and there is a choice of a more favourable alternative route.

A Global Look at the World's Weather

BY N. E. DAVIS

(European Space Agency)

(This article is reproduced from *Weather*, December 1980, by kind permission of the Editor)

Introduction

The five photographs (Plates 1–5 between pages 130 and 131) are views of the Earth taken on the same day, 15 March 1979, by the five geostationary weather satellites that orbited the Earth during the year of the First GARP (Global Atmospheric Research Programme) Global Experiment (FGGE). Each photograph shows the view of the Earth as seen by sensors in the visible wavelengths ($0.4\text{--}1.1\ \mu\text{m}$). In such images, clouds are white, the sea is dark and the land masses are various shades of grey.

In order to obtain the maximum illumination and hence the greatest contrast between clouds, land and sea, the images were scanned at around local noon for each satellite. In all the photographs except the first, the fuzzy area over the sea near the centre of the picture is the result of sunglint—the reflection of sunlight from the sea to the satellite.

Because of the scanning procedures in force for some of the satellites, they do not all show a complete disc. Parts of the north and/or south polar regions were not scanned.

The field of view of the Japanese satellite—GMS

The first photograph (Plate 1) was taken by the Japanese satellite GMS, stationed near 140°E , at about 0300 GMT. This satellite was launched in June 1977 and is controlled and operated by the Japanese Weather Service.

The major weather system shown in the Northern Hemisphere is an occluded depression near the International Date Line (IDL) in the top right of the photograph, with a weak cold front trailing south-west to the Philippines. Major waves with extensive cloud masses are centred south-east of Japan and over central China. The peninsula of Kamchatka is clearly visible near the top of the photograph.

In the tropical belt, the Intertropical Convergence Zone (ITCZ) runs east to west at about 5°N on the right of the photograph. Three broad bands of cloud cover the tropics in the centre from northern Australia across New Guinea to about 10°N . Local convection is apparent over Borneo and the east coast of Sumatra.

South of Australia, the weather systems of middle and high latitudes show a confused pattern associated with the generally weak developments of late summer. The long black streak is a clear area in the rear of a cold front.

The field of view of the Indian Ocean satellite—GOES I

The second photograph (Plate 2) was taken by the American satellite GOES I stationed near 58°E , at about 0800 GMT. This satellite was originally a stand-by satellite for the two American geostationary satellites GOES E and W. It was

moved late in 1978 to the Indian Ocean to support FGGE, enabling the determination of winds over the Indian Ocean. This satellite was controlled and operated by the European Space Agency (ESA) through their tracking station at Villafranca in Spain which collected the data for the winds to be extracted later by the University of Wisconsin in the USA.

The ESA tracking station also re-formatted and re-transmitted the image data back through the satellite. These re-transmitted data were received by a satellite tracking station at Lannion in north-west France, which further re-formatted the image data into standard automatic picture transmission (APT) format and re-transmitted them to users through the METEOSAT satellite. All in all this represented a considerable international co-operative effort in support of FGGE.

The major weather system in the Northern Hemisphere consists of the cold front from the wave over China (compare the cloud masses of this wave in Plates 1 and 2) extending across Tibet to a disturbance over Afghanistan and Iran. The central Himalaya are snow-covered but mostly clear of cloud.

The cold front from the disturbance over Afghanistan extends south-west across Arabia and the southern Red Sea to the Equator over Uganda. In the tropics, the ITCZ extends across the Indian Ocean at about 5°S but it is less marked than the ITCZ in Plate 1 except for an active area about 90°E. To the south of this active area and to the west of Australia, a 'mackerel' sky shows the cumulus of the south-east trades. These cumuli grow larger and become organized into a long curved line as they advance north-westward over warmer water.

As in the previous photograph, the pattern is confused in the late summer of the middle and high latitudes of the Southern Hemisphere. The long black streaks are clear areas in the rear of cold fronts.

The field of view of the European Space Agency's satellite—METEOSAT

The third photograph (Plate 3) was taken by the European Space Agency's satellite METEOSAT, stationed near the Greenwich meridian, at about 1200 GMT. This satellite was launched in November 1977 and is controlled and operated by ESA through their operations centre in Darmstadt, West Germany.

The major weather system in the Northern Hemisphere shown here is a depression over France with a secondary centre over the Gulf of Genoa. To the north of the main cloud mass Ireland, Scotland, all Scandinavia and the central Baltic can be seen. Scotland and Scandinavia appear to be mostly snow covered. The cold front of this disturbance extends south and south-west across the Sahara into the tropics in mid-Atlantic. To the west of Ireland and Spain widespread small-scale cumulus convection is taking place, divided by a weak frontal system. In the north-east trades of the sub-tropical part of the North Atlantic lines of large cumulonimbus extend westwards.

Over the Sahara the mountainous areas are dark against the bright sand. Lake Chad on the southern edge of the Sahara lies on the line which runs east to west dividing the desert (light reflection) from the jungle (dark reflection) of west and central Africa. Cumulonimbus activity over tropical Africa north of the Equator has probably been damped out by the burst of cold dry air in the rear of the cold front noted in Plate 2 stretching from southern Arabia to Uganda. Most of the convective activity is around 10°S. Much of lakes Victoria, Tanganyika and Malawi are visible. The ITCZ is apparent only in the Atlantic between Africa and South America. There is little activity between 0° and 20°W.

In the Southern Hemisphere, the cumulus activity in the south-east trades is on a very fine scale and not (on this date) organized in lines. The main cold front of middle and high latitudes extends from just south of the Cape of Good Hope westwards and north-westwards to southern Brazil. The weather systems

of the middle and high latitudes of the Southern Hemisphere in this (and the following) photograph are more organized, due to the effect of the land mass of South America.

The field of view of the American satellite—GOES E

The fourth photograph (Plate 4) was taken by the American satellite GOES E, stationed near 75°W , at about 1700 GMT. This satellite is controlled and operated by the National Environmental Satellite Service (NESS) from their tracking station at Wallops Island, Virginia, USA.

The major weather systems in the Northern Hemisphere show a cold front extending southwards from a disturbance over northern Quebec to the Windward Passage between Cuba and Hispaniola, with a secondary cold front across northern Cuba and Yucatán curving north-west to a wave developing over Texas. Lake Michigan is partly visible whilst Lake Superior and all of Hudson Bay appear to be ice covered.

In the tropics the Atlantic ITCZ extends to the mouth of the Amazon. In the Pacific, the ITCZ has two branches about 5°N and 5°S . The convective cloud activity over most of South America is not organized in any way which can be explained by a single image.

Lines of large cumulus and cumulonimbus occur in the south-east trades over the eastern South Pacific and in the north-east trades of the central Atlantic.

As in Plate 3, cold fronts extend north and north-west from the activity of high latitudes of the Southern Ocean.

The field of view of the American satellite—GOES W

The fifth photograph (Plate 5) was taken by the American satellite GOES W, stationed near 135°W , at about 2100 GMT. This satellite is controlled and operated in the same way as GOES E.

The major system in the Northern Hemisphere is the depression near the IDL which was shown in Plate 1 some 18 hours earlier. A front covers the west coast of the USA turning westwards from California into the Pacific as a weak feature. A weak disturbance is shown just off the coast of the USA.

The tropics show the two ITCZ extending across most of the image at about 5°N and 5°S . A most interesting feature is the apparent streaming of cloud away north-eastwards from the Northern Hemisphere ITCZ over most of the central tropical Pacific.

In the Southern Hemisphere the high latitude patterns run west to east. Large masses of cloud, whose origin cannot be explained by a single image, are seen in the sub-tropics.

Surface analysis at 0000 GMT on 15 March 1979 for the Northern Hemisphere

Plate 6 shows a real-time surface analysis for the Northern Hemisphere for 0000 GMT on 15 March 1979 (made by the Deutscher Wetterdienst). It is not intended that the detailed station plots should be clearly legible but they are retained to indicate to the reader, the areas of the hemisphere where surface information is scanty. It is evident that the satellite images confirm the frontal analysis as far as it has been carried out. The satellite images, however, show features which the conventional analysis has not been able to locate. The wave over China or its associated cold fronts are not indicated at all. The low over Iran is shown but its frontal structure is not. Even over the USA the extent of the wave over the Rocky Mountains is not easy to infer from the surface analysis. Satellite images are essential for a complete analysis.



Cape Leeuwin (Scottish Ship Management Ltd.) Captain J. G. Jones



City of Durban (Ellerman Lines Ltd.) Captain N. B. Airey



Atlantic Causeway (Cunard S.S. Co. Ltd.) Captain J. K. Cooper

THE THREE SHIPS WHICH GAINED THE HIGHEST MARKINGS FOR THEIR
METEOROLOGICAL LOGBOOKS DURING THE YEAR 1980 (see page 96)



Owl seen on board the *Singularity* (see page 111)

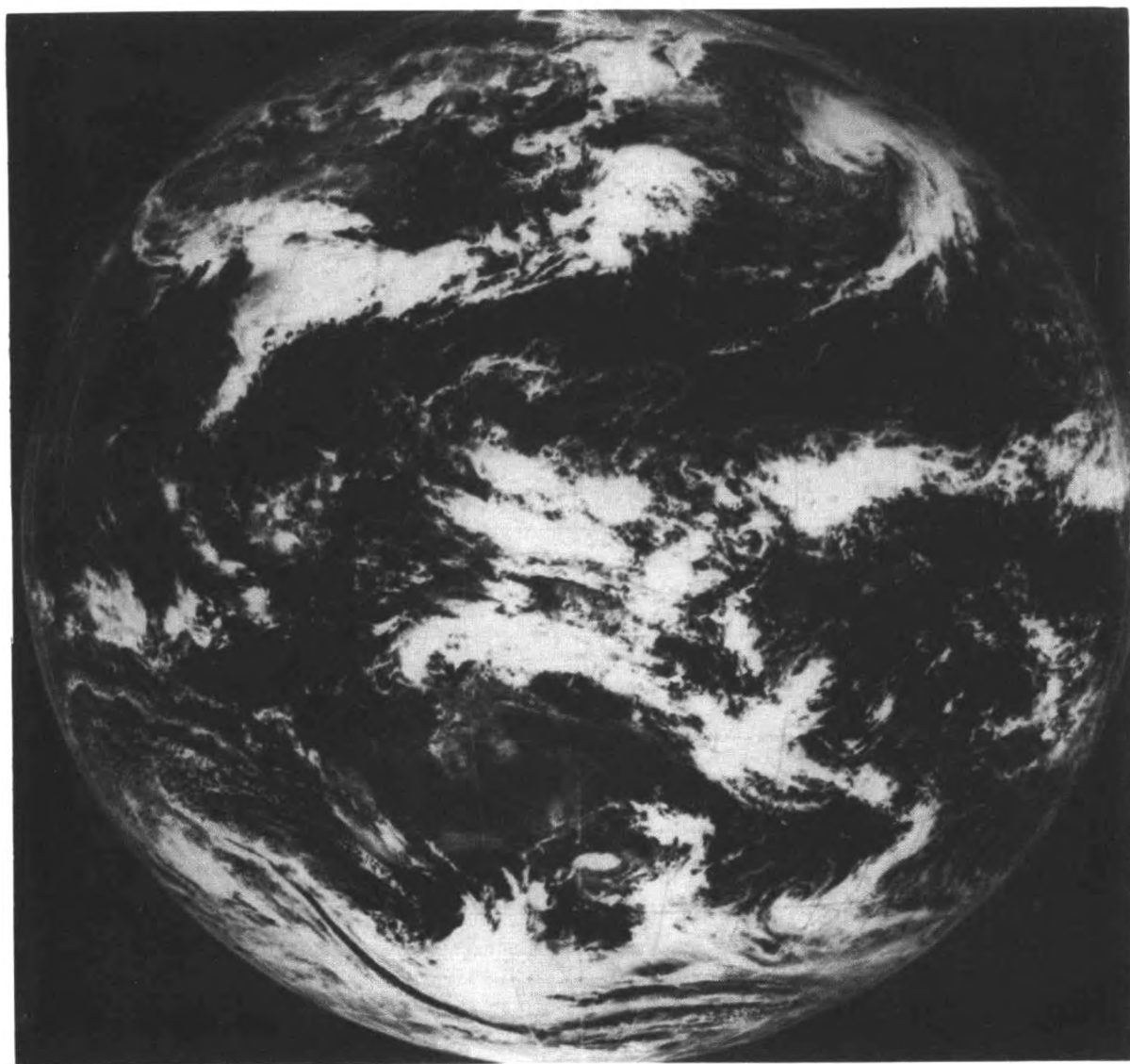


Plate 1. Visible image at about 0300 GMT on 15 March 1979 from the Japanese geostationary satellite GMS over the Equator at 140°E (*see* page 128)

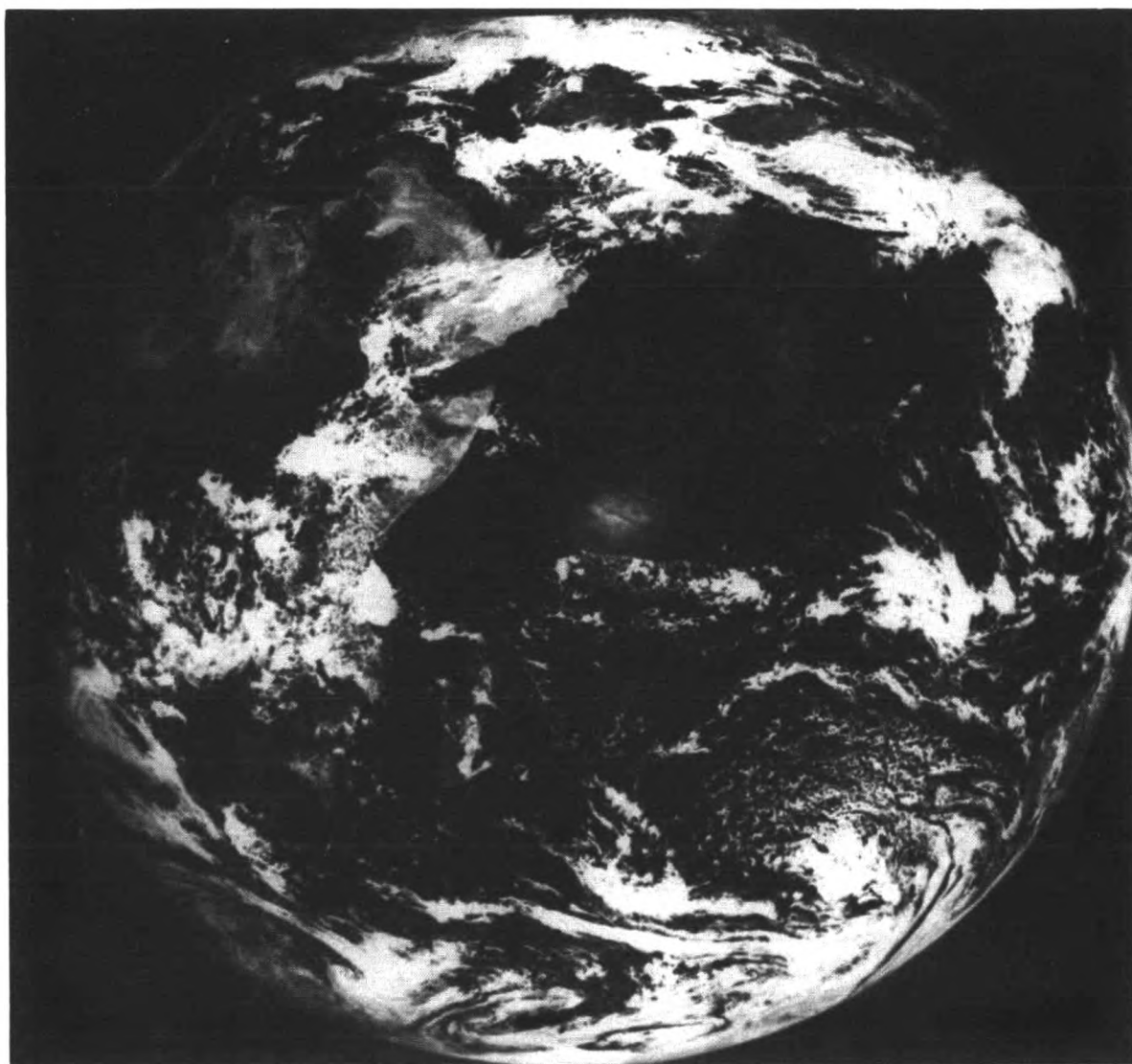


Plate 2. Visible image at about 0800 GMT on 15 March 1979 from the Indian Ocean geostationary satellite GOES 1 over the Equator at 58°E (*see* page 128)



Plate 3. Visible image at about 1200 GMT on 15 March 1979 from the ESA geostationary satellite METEOSAT over the Equator and the Greenwich meridian (*see* page 129)

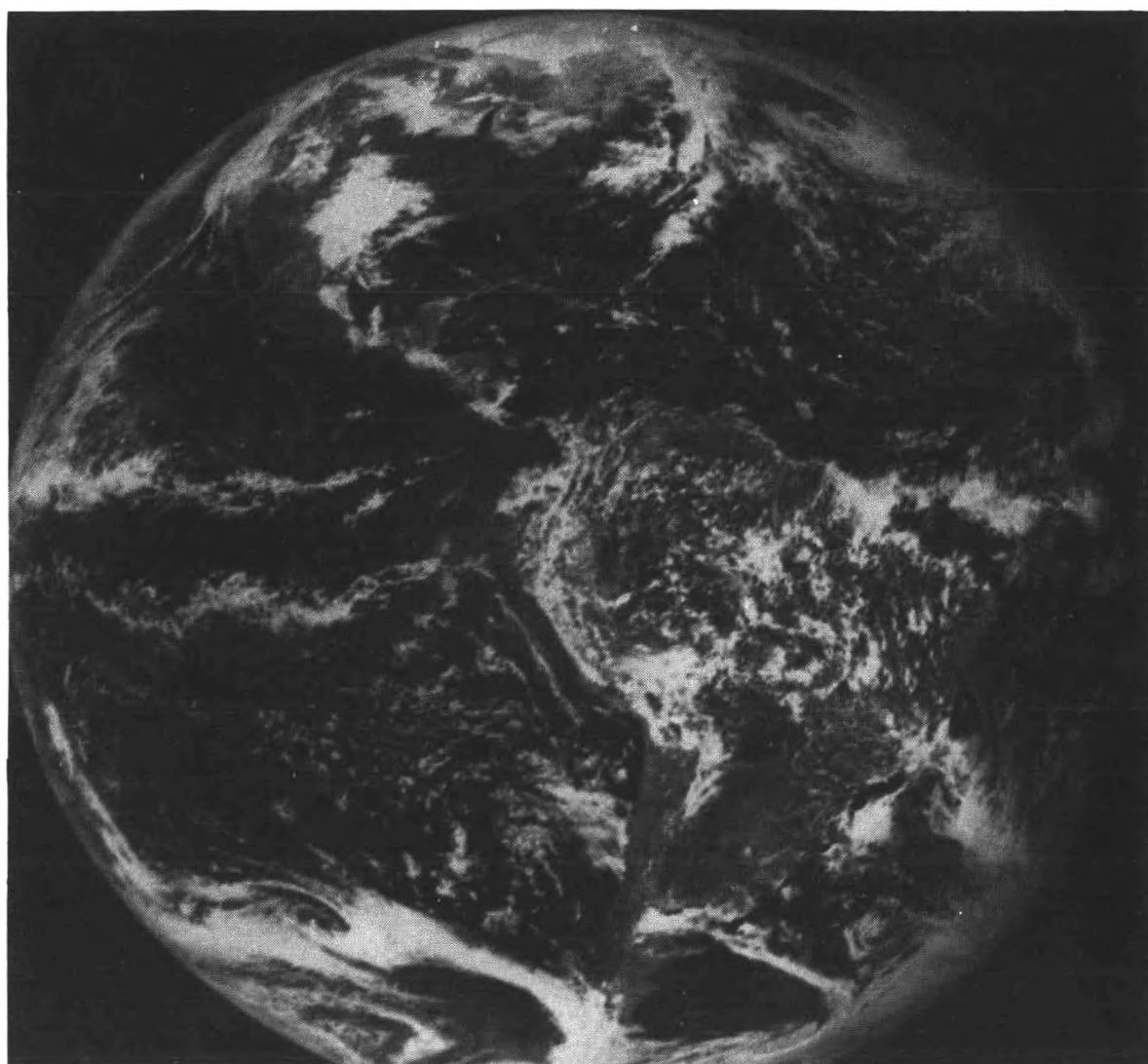


Plate 4. Visible image at about 1700 GMT on 15 March 1979 from the USA geostationary satellite GOES E over the Equator at 75°W (*see* page 130)

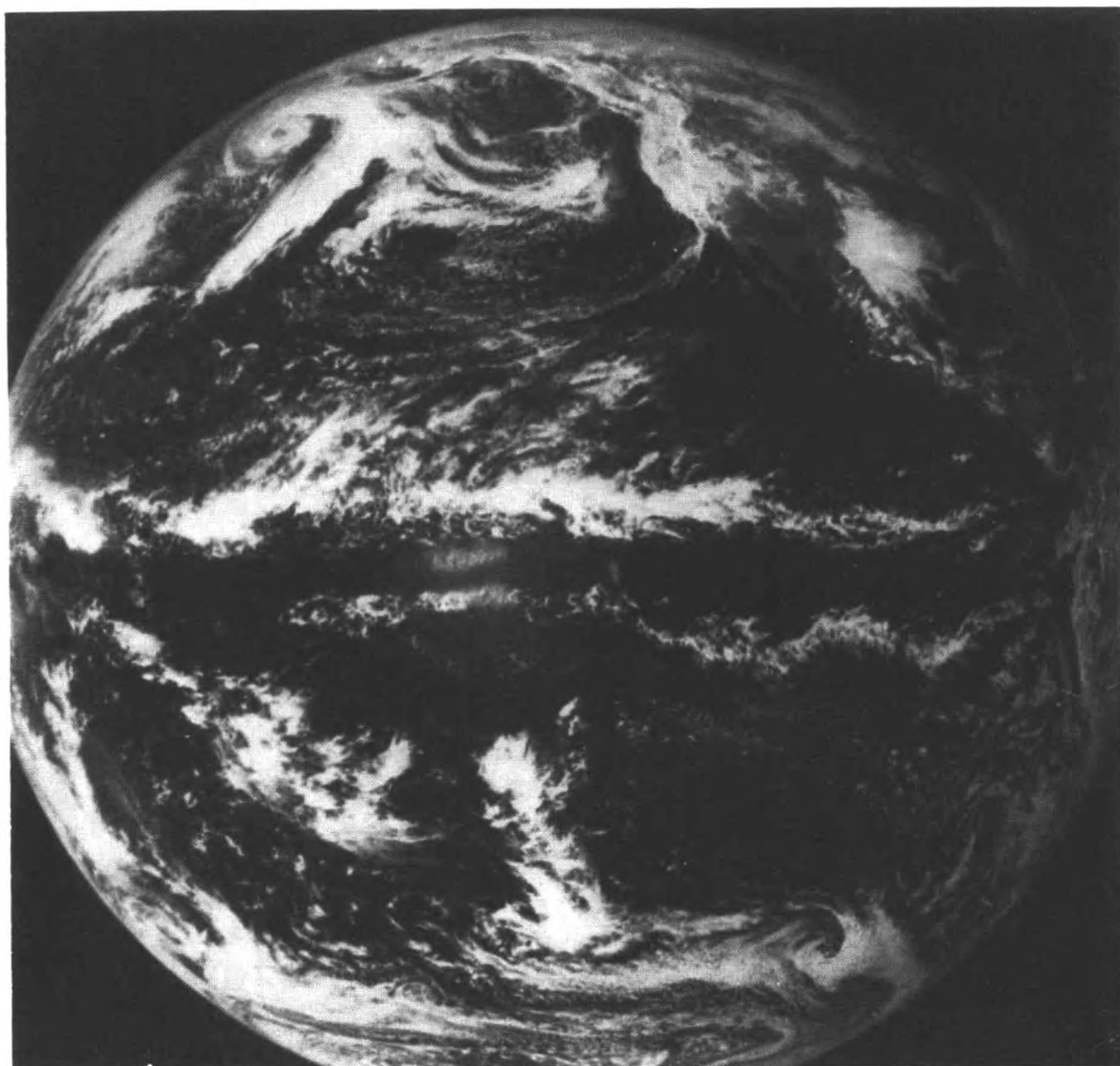


Plate 5. Visible image at about 2100 GMT on 15 March 1979 from the USA geostationary satellite GOES W over the Equator at 135°W (*see* page 130)

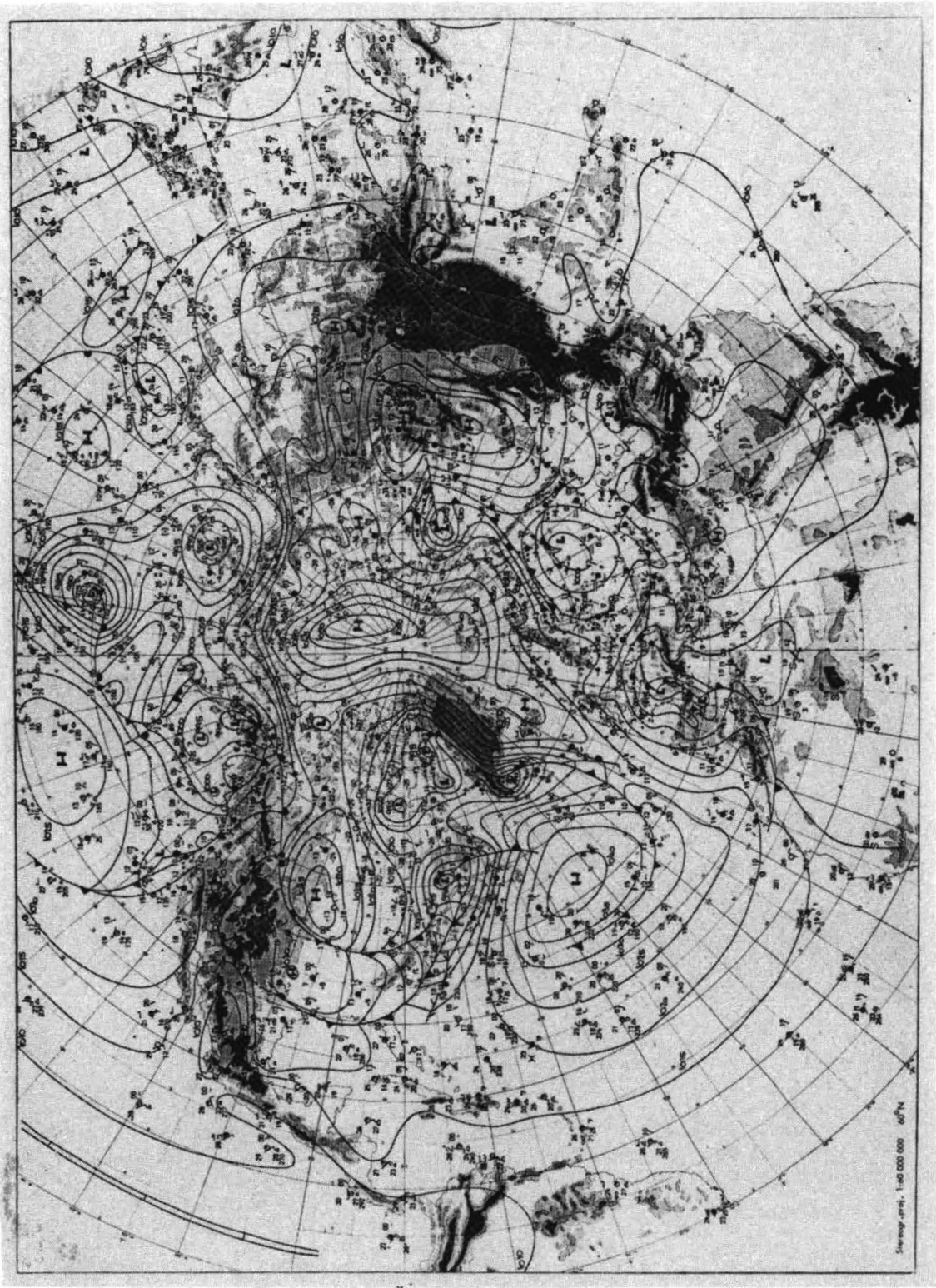


Plate 6. Surface analysis at 0000 GMT on 15 March 1979 for the Northern Hemisphere (from the European Bulletin of the Deutscher Wetterdienst) (see page 130)

Conclusion

This near-simultaneous view of the world's weather reveals the considerable differences in tropical meteorology between the various oceans and in middle and high latitude meteorology between the Northern and Southern Hemispheres.

The Southern Hemisphere shows a mainly zonal flow except east and west of Cape Horn. The Northern Hemisphere shows meridionality and over Africa and the Atlantic this meridional flow extends into the tropics. These flow patterns are not surprising. The Southern Hemisphere is depicted at the end of summer/beginning of autumn when, in the climatic mean, mainly zonal flow occurs. The Northern Hemisphere is depicted at the end of winter/beginning of spring when there is normally a high incidence of meridional flow.

In the tropics, the eastern Pacific shows a steady zonal (east to west) flow, with two ITCZ in existence. The Indian Ocean is relatively quiet under the influence of the north-east monsoon but the western Pacific shows much weather activity. The tropical Atlantic and Africa appear to be closely affected by happenings in higher latitudes, more particularly by cold front penetrations from the Northern Hemisphere.

AURORA NOTES JULY TO SEPTEMBER 1980

BY R. J. LIVESEY

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

Auroral observations made by British ships for the period and received at the time of writing are shown in the accompanying table. To date, mariners have contributed some 22 per cent of the auroral observations for 1980. Again we must record our appreciation of these efforts for it is the shipborne observer who must be relied upon to bridge the gaps between the land observers on the various continents. This is especially important when auroral activity is less violent and tends to stay further north towards the auroral zone at geomagnetic latitude 67° . This was certainly the case in 1976 and to some extent true at the present time.

The period under review began quietly with isolated auroral reports coming in for the 18th and 25th July which were associated with magnetic storms. Radio aurora effects were also reported for the 25th.

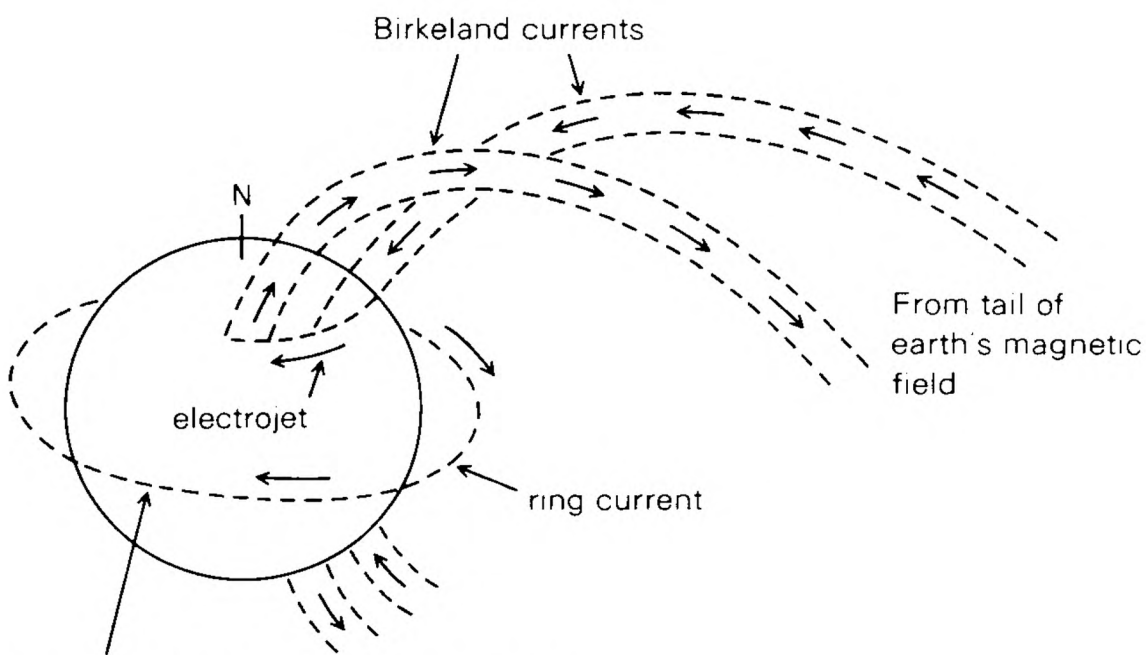
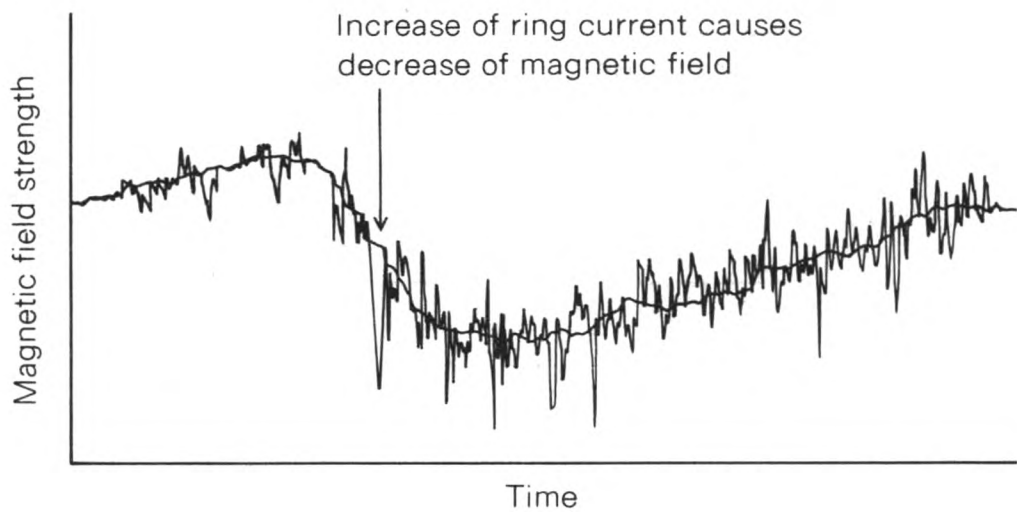
In August there were isolated reports of visual aurorae on the 11th, 17th, 21st, 25th and 29th. There was magnetic disturbance on the 16th which was associated with radio aurorae.

There were several reports of auroral activity on the 5th September followed by isolated reports on the 6th, 11th, 12th, 13th, 15th and 17th. There were radio auroral echoes on the 12th but throughout the month magnetic disturbance was quiet. It was not surprising to note that the *Singularity* observed aurorae nightly while sailing round North Cape and close to the auroral zone, where the probability of seeing aurorae is a maximum. This is because in normal conditions when the earth's magnetic field and upper atmosphere are not being highly disturbed by solar activity there is a normal infall of atomic particles which cause aurorae nightly at these latitudes. Looking through the Auroral Notes from 1976 onwards it will be clear from the reports of similar voyages that this is so.

The period has shown a continuation of the general pattern of activity experienced since October 1979 when the frequency and intensity of auroral activity subsided and the number of magnetic storms recorded has likewise reduced. Land observers have tended to think that the bad weather was obscuring visual aurorae from them but the overall analysis of auroral and magnetic phenomena clearly shows that the weather was not to blame for the lack of sightings, while the marine observations have been doubly valuable to this investigation. The indications suggest that while the current sunspot cycle was building up in intensity the sun was particularly active in throwing off clouds of particles which generated aurorae. Since sunspot maximum, it would appear that this activity has subsided to be superseded by the alternative type of particle discharge associated with the special areas of the sun's corona called 'coronal holes', which provide steady streams of less violent activity leading to the quieter type of auroral activity.

Associated with the change in conditions since October 1979 there have been periods when the polar areas have been bombarded with solar protons, and in the daytime, with intense ultra-violet radiation, leading to high ionization levels which have effectively blotted out certain radio communications. Weather pictures transmitted from satellites have shown interference markings where their signal paths have been disturbed by passing through clouds of electrified particles in the upper atmosphere.

In this age of energy conservation it may be of interest to note that aurorae are associated with a number of electrical currents generated in the upper atmosphere due to the incoming electrified particles and to the ionization that



Increase of electrified particle density
in ring current is caused by solar activity

'Degaussing' the Earth (not to scale)

these cause. These are the Birkeland currents which cause a net flow of electricity downwards into the auroral zone on the morning side and a net outflow of current from the zone on the evening side upwards, to the tail of the earth's magnetic field. One investigator has worked out the strength of the current at 3.5 million amperes. There is the electrojet current, which is a hypothetical current along the auroral activity related to the Birkeland currents which gives the equivalent magnetic effect observed at ground level similar to a current flowing from east to west along the auroral arc. There is the ring current observed by its magnetic effect at lower latitudes, which circles the earth. As the number of electrified particles in the ring current increases with the arrival of new particles due to solar activity, the ring current effectively forms a natural degaussing system which reduces the strength of the earth's magnetic field. It has been calculated by investigators that when the magnetic energy

in the earth's magnetic tail is discharged in an auroral storm lasting some 20 minutes the electrical energy available may be operating at the rate of about 100 million kilowatts. If only we could find an economic system for tapping this energy!

DATE 1980	SHIP	GEOGRAPHIC POSITION		TIME (GMT)	FORMS
5 July	<i>Manchester Reward</i>	50° 41' N	57° 26' W	0330	Rda
19	<i>Andalucia Star</i>	49° 30' N	66° 11' W	0150-0400	R,mR,CmR,RP,aRA,RB, P
18 Aug.	<i>C. P. Trader</i>	50° 30' N	58° 17' W	0400-0715	N,mR,RA,RB,P,mP,HA, mP,HB,N
3-4 Sept	<i>British Commerce</i>	59° 42' N	3° 36' W	2315-0150	RA,HA
5	<i>Shackleton</i>	58° 30' N	1° 20' W	2100-2300	N,RA,RB
6-7	<i>Shackleton</i>	56° 36' N	1° 24' W	2301-0125	N,RB
10	<i>Manchester Renown</i>	52° 05' N	54° 14' W	0635-0650	pRA
12	<i>Queen Elizabeth 2</i>	45° 06' N	54° 48' W	0652	RB
18	<i>Carchester</i>	47° 30' N	59° 00' W	0000-0400	N,HA,RA
20	<i>Singularity</i>	68° 07' N	40° 27' E	2100	P,HB
21	<i>Singularity</i>	69° 55' N	33° 33' E	2012-2120	N,RB,pN,RA
22	<i>Singularity</i>	71° 03' N	23° 04' E	2130-2204	R,RB,R
23	<i>Singularity</i>	69° 00' N	14° 00' E	2018-2300	RB,RB,RA,RB,R,RB
30	<i>C. P. Voyageur</i>	52° 20' N	54° 00' W	0115-0320	N,HA,pRA,N

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

Marine Aurora Observations July to September 1980

ICE CONDITIONS IN AREAS ADJACENT TO THE NORTH ATLANTIC OCEAN FROM DECEMBER 1980 TO FEBRUARY 1981

The charts on pages 138 to 140 display the actual and normal ice edges (4/10 cover), sea-surface and air temperatures and surface-pressure anomalies (departures from the mean) so that the abnormality of any month may be readily observed. (The wind anomaly bears the same relationship to lines of equal pressure anomaly as wind does to isobars. Buys Ballot's law can therefore be applied to determine the direction of the wind anomaly). Southern and eastern iceberg limits will be displayed during the iceberg season (roughly February to July). In any month when sightings have been abnormally frequent (or infrequent) this will be discussed briefly in the text.

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

DECEMBER

Pressure remained very low in the vicinity of the White Sea leading to a persistence of the anomalies of November for easterly winds and unusually low temperatures over the Barents and Greenland Seas. Previous excesses of ice over the Barents Sea were maintained and deficits over the Greenland Sea were converted to small excesses. Ice formed earlier than usual around the coasts of the Gulf of Bothnia and Finland. Over eastern Canada temperatures were well below normal and ice formed much earlier than usual in the St. Lawrence River (where some ports had near-record low temperatures), in the western part of the Gulf of St. Lawrence and off Labrador.

JANUARY

Pressure was much below normal from Scandinavia to the North Pole and over south-east Canada. As a result of the anomaly for cold north-westerly winds east of Greenland, ice extended farther south-east than usual in the Denmark Strait and in the Greenland Sea. The previous excess of ice in the Barents Sea continued. Over the north-east Baltic temperatures were a little above normal and winds tended to be more westerly than usual so that, despite the early formation of ice around the coasts of the Gulfs of Bothnia and Finland during December, there was little extension of this ice during January. Over northern Canada temperatures were well above normal and deficits of ice became general in Baffin Bay and Davis Strait. Farther south, though, it remained colder than normal and ice extended further than is usual, through Cabot Strait and north-east of Newfoundland.

FEBRUARY

The main anomaly was for comparatively warm south-westerly winds over Canada. Break up of ice in the Gulf of St. Lawrence and east of Newfoundland was much earlier than usual despite the excesses at the end of January. Anomalies of temperature were small over the Greenland and Barents Seas but previous excesses were reduced and a surprisingly large deficit had developed over the Greenland Sea by the end of February.

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: December 1980 to February 1981

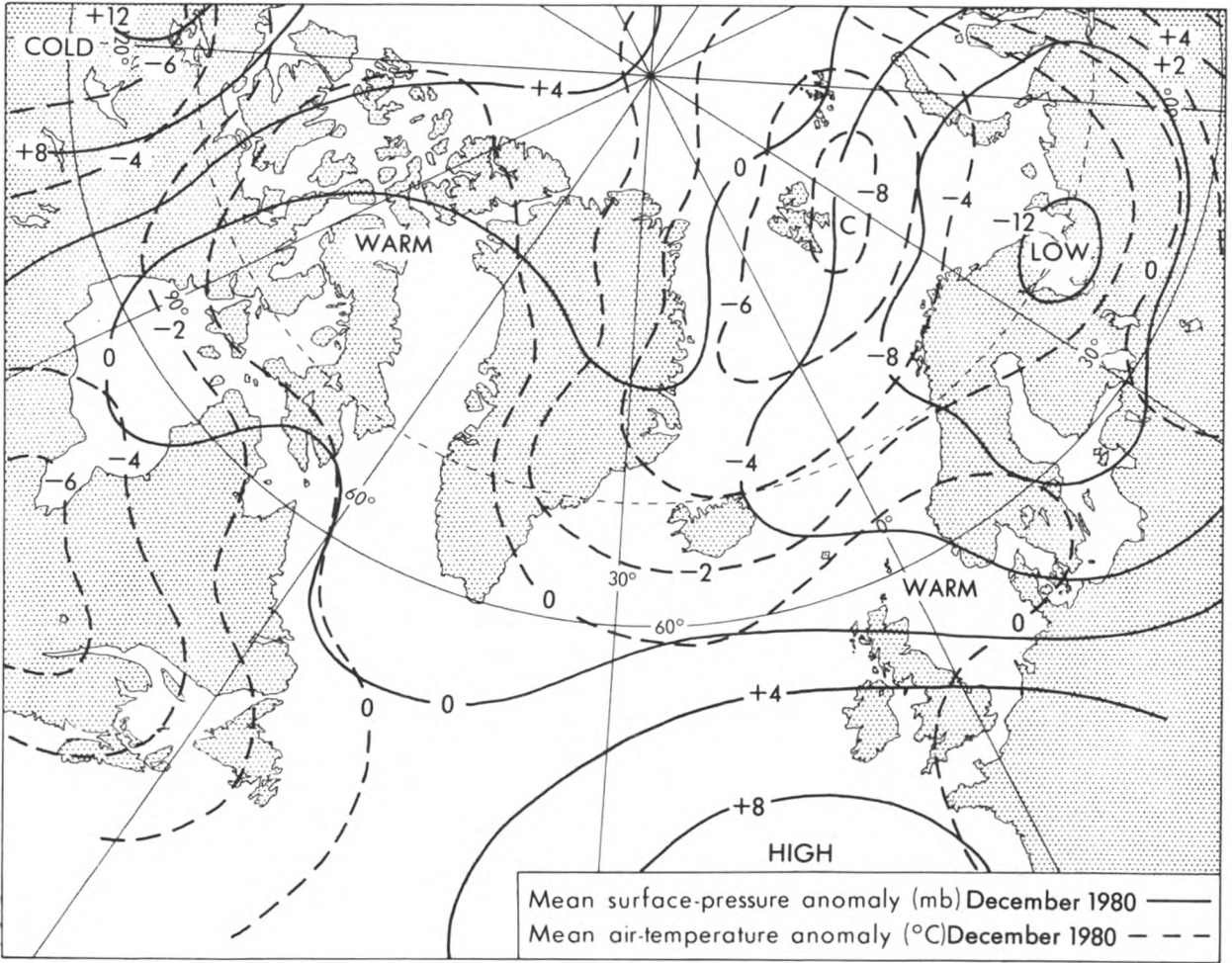
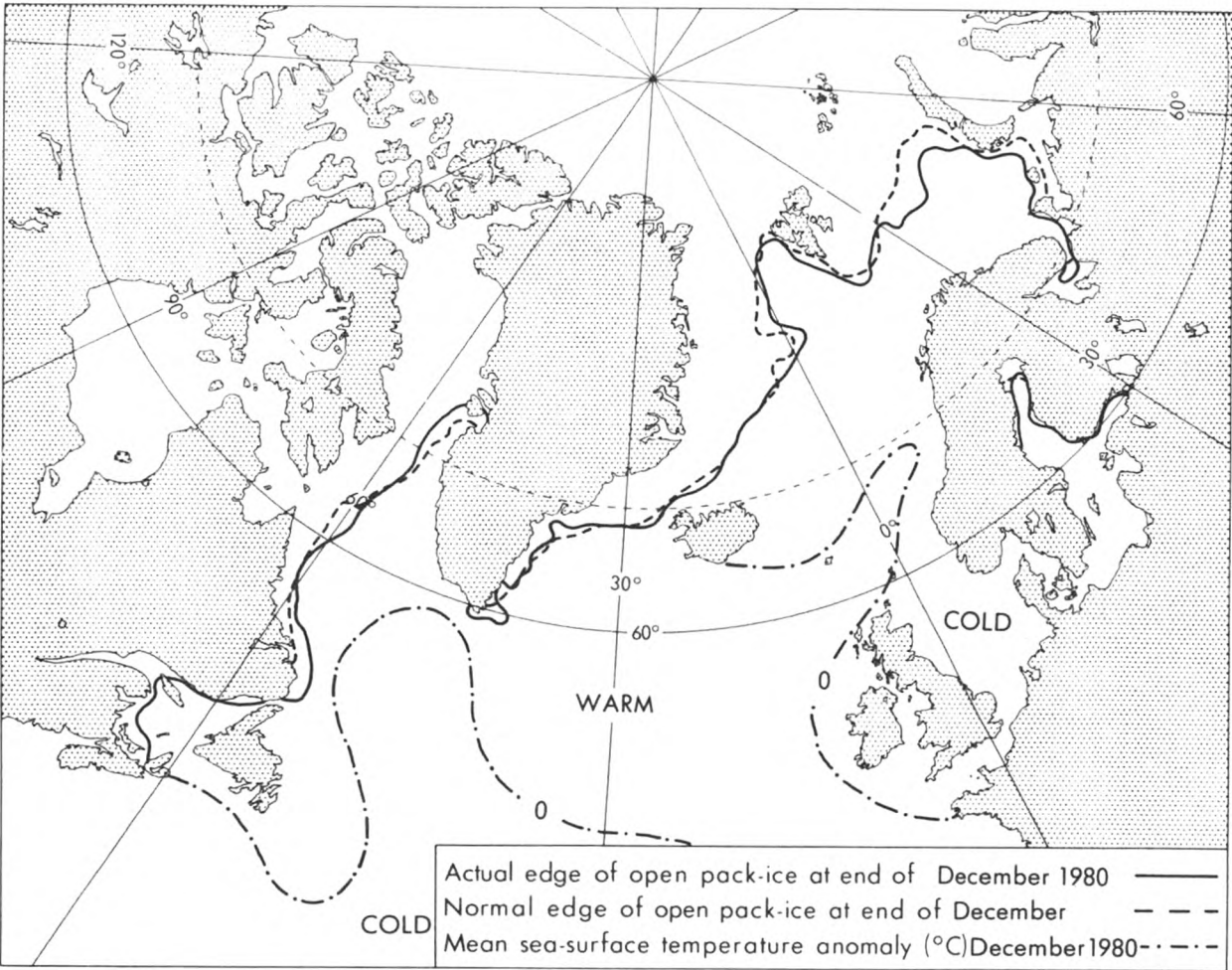
No ice was reported at the following stations during the period: Visby, Göteborg, Emden, Bremerhaven, Flensburg, Gdansk, Copenhagen, Aarhus, Oslo, Kristiansandfjord.

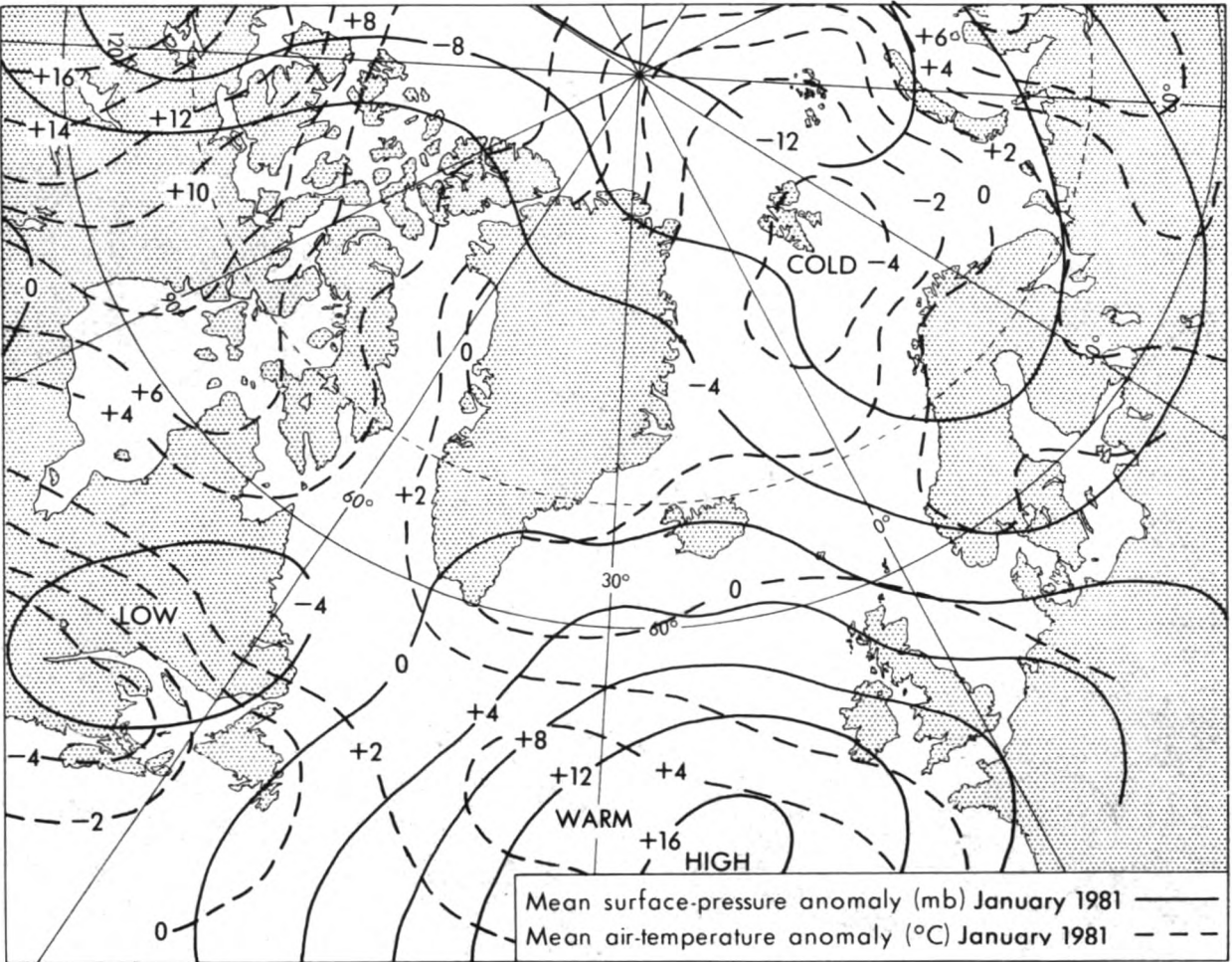
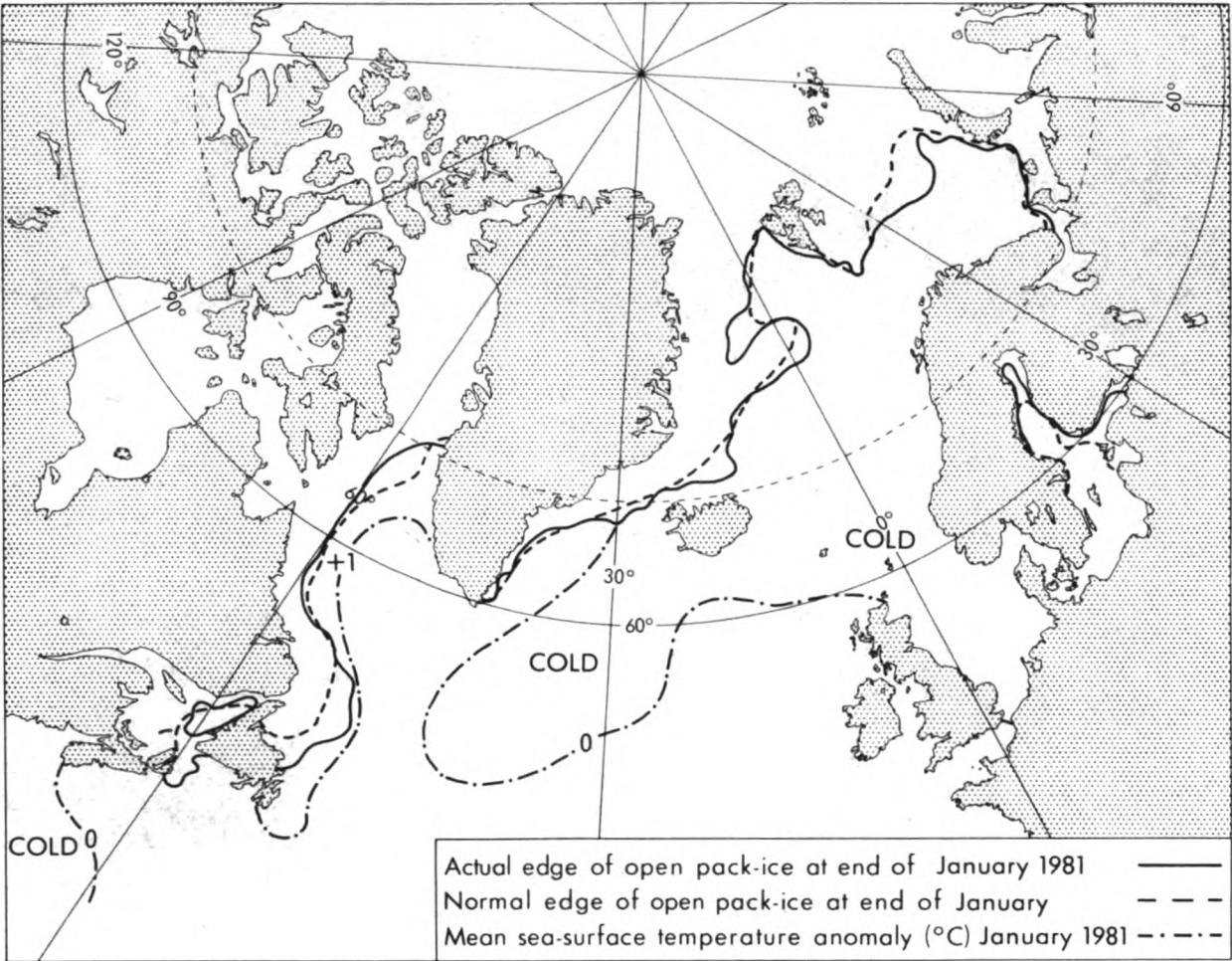
STATION	DECEMBER				JANUARY				FEBRUARY										
	LENGTH OF SEASON		ICE DAYS		NAVIGATION CONDITIONS		ACCUMULATED DEGREE DAYS	LENGTH OF SEASON		ICE DAYS		NAVIGATION CONDITIONS		ACCUMULATED DEGREE DAYS					
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I	
Lulea	1	31	31	31	0	14	17	0	694	1	31	31	31	0	31	0	28	0	1330
Skelleftea	1	31	31	26	0	9	18	0	—	1	31	29	0	31	0	28	0	—	—
Bredskar	13	29	11	0	0	11	0	0	—	3	31	28	5	0	25	0	28	0	—
Sundsvall	23	31	9	2	0	9	0	0	—	1	31	31	20	0	29	0	4	7	—
Sandarne	1	31	31	26	0	30	0	0	—	1	31	30	30	0	30	0	20	8	—
Oxelsud	0	0	0	0	0	0	0	0	—	21	25	5	3	0	2	0	0	0	—
Kalmar	0	0	0	0	0	0	0	0	—	18	31	14	1	0	14	0	0	0	—
Stockholm	8	31	24	0	0	24	0	0	124	1	31	31	24	0	31	0	28	0	310
Helsinki	6	12	7	0	0	3	0	0	214	3	31	29	14	10	26	0	20	7	500
Turku	6	13	8	0	0	0	0	0	186	6	31	26	7	7	25	0	13	0	413
Mariehamn	0	0	0	0	0	0	0	0	—	0	0	0	0	0	0	0	5	0	—
Mantylouto	1	31	14	4	0	7	0	0	—	1	31	29	0	10	20	8	0	28	—
Vaasa	1	31	31	30	0	10	21	0	324	1	31	31	31	0	31	0	0	28	709
Norskar	0	0	0	0	0	0	0	0	—	3	31	15	0	0	4	7	0	14	—
Oulu	1	31	31	31	0	0	31	0	—	1	31	31	31	0	31	0	0	28	—
Roytta	1	31	31	4	18	9	22	0	—	1	31	31	16	14	0	31	0	28	—
Leningrad	1	31	31	18	13	7	24	0	222	1	31	31	26	4	0	31	0	28	542
Viborg	1	31	31	31	0	2	29	0	—	1	31	31	28	1	0	31	0	28	—
Tallin	0	0	0	0	0	0	0	0	—	0	0	0	0	0	0	0	5	1	—
Riga	4	21	12	2	0	7	0	0	111	4	28	25	4	1	11	0	11	0	298
Ryarnu	1	31	31	27	1	21	0	10	114	1	31	31	31	0	2	29	0	28	319
Ventspils	0	0	0	0	0	0	0	0	—	8	28	15	0	0	2	0	0	0	—
Klaipeda	1	31	15	0	0	4	0	0	—	1	31	31	4	0	4	0	4	0	—
Hamburg	0	0	0	0	0	0	0	0	53	21	22	2	0	0	0	0	0	0	109
Kiel	0	0	0	0	0	0	0	0	—	27	27	1	0	0	0	0	0	0	—
Lübeck	0	0	0	0	0	0	0	0	—	21	27	7	0	0	0	0	0	0	—
Rostock	0	0	0	0	0	0	0	0	—	22	22	1	0	0	0	0	0	0	—
Stralsund	0	0	0	0	0	0	0	0	—	22	30	8	0	1	5	0	0	0	—
Stettin	0	0	0	0	0	0	0	0	49	20	28	5	1	0	2	0	0	0	118

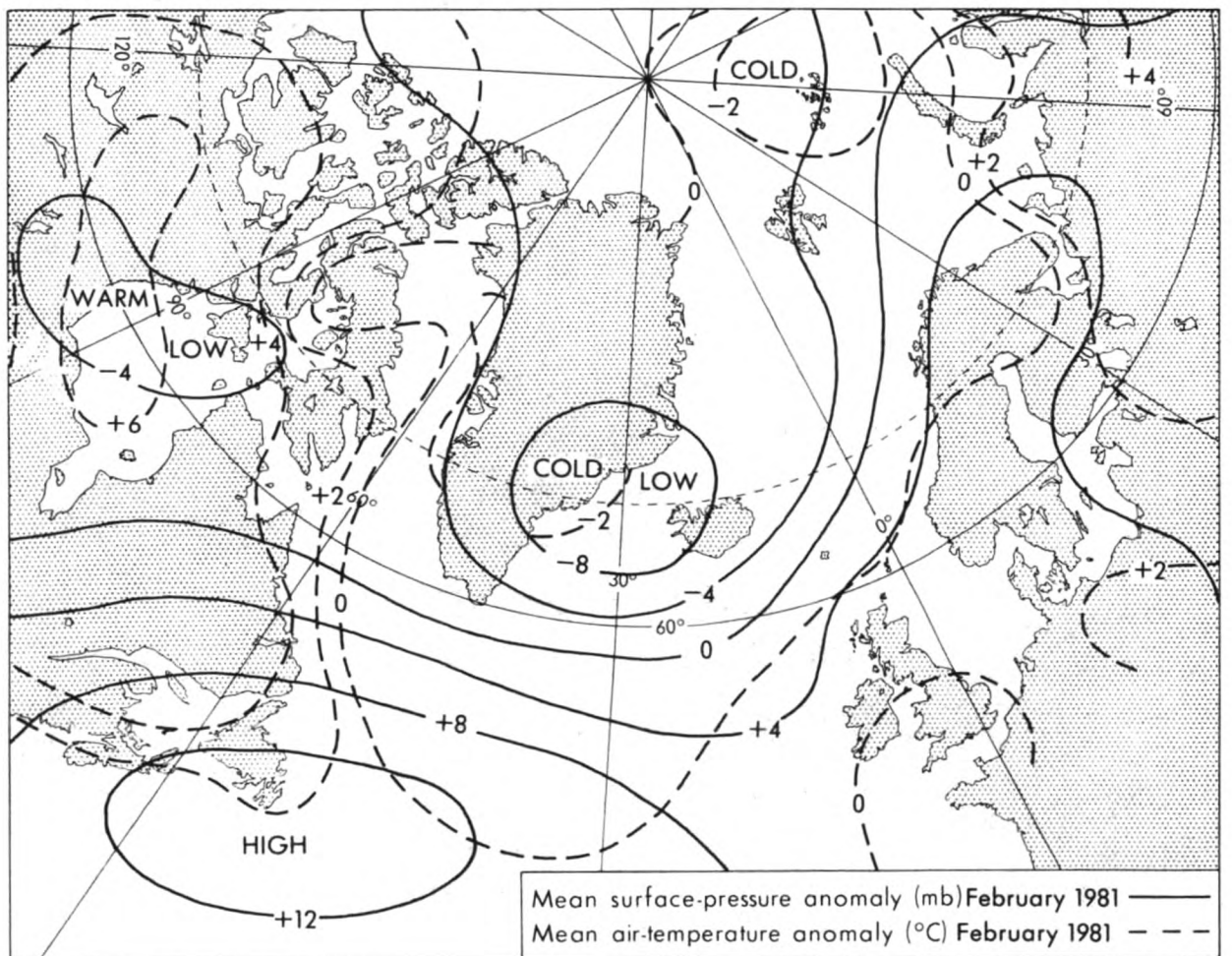
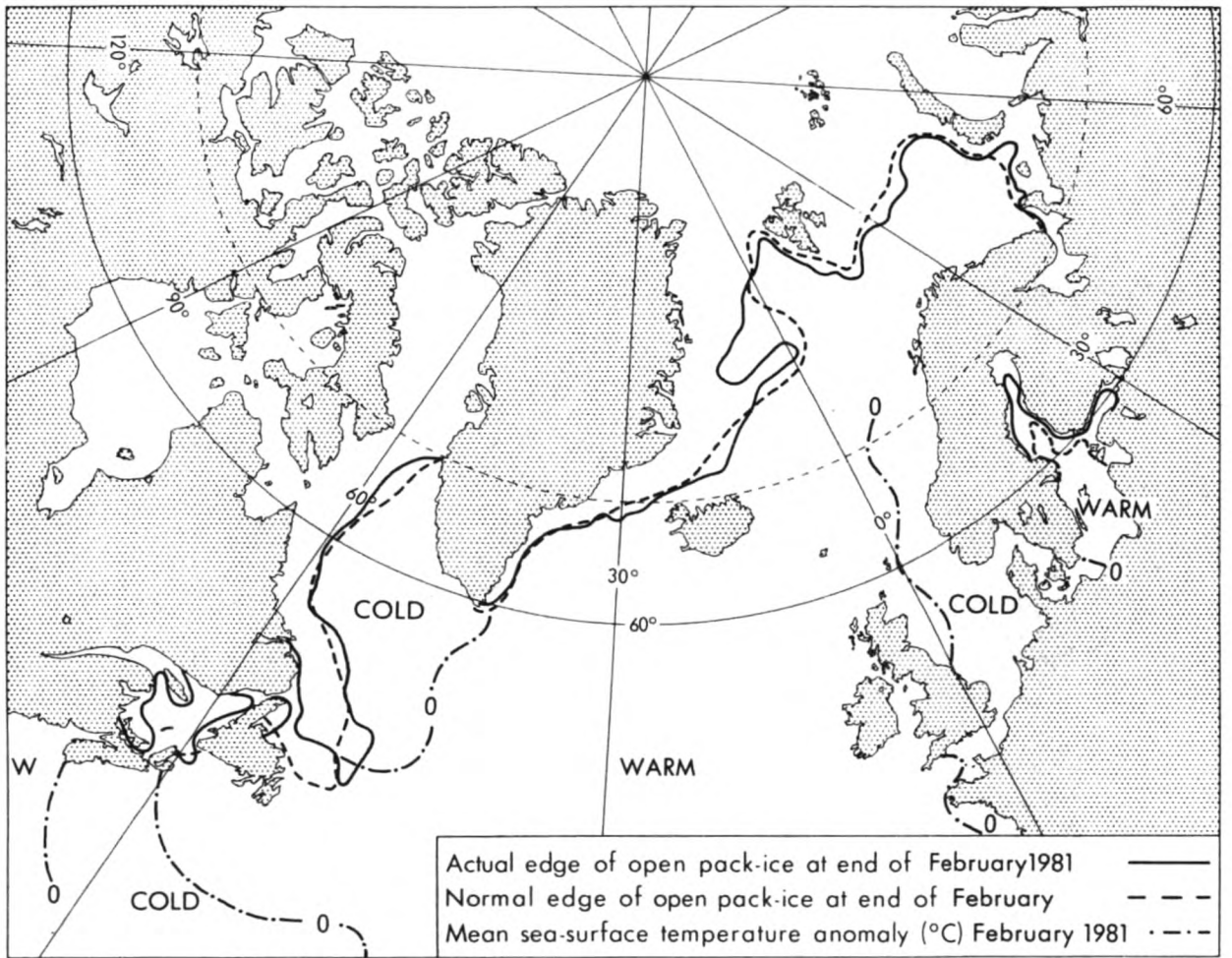
CODE

- | | | | |
|---|---------------------------------------|---|---|
| A | First day ice reported. | E | No. of days of pack ice. |
| B | Last day ice reported. | F | No. of days dangerous to navigation, but assistance not required. |
| C | No. of days when ice was reported. | G | No. of days assistance required. |
| D | No. of days continuous land-fast ice. | 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 Reviews

The End of the Sailing Navy by Colin White. 250 mm × 190 mm, 160 pp., *illus.* Kenneth Mason Publications Ltd, 13-14 Homewell, Havant, Hampshire PO9 1EE. Price: £9.95.

Of all the periods in British naval history, the Victorian era saw greater change than any that have occurred before or since. This change was, of course, the transition from sail to steam and the demise of the wooden warship. This is the subject of Colin White's study and in this, the first of a two-part history he examines, nostalgically but factually, the developments which saw the modernization of the Victorian Navy during the period 1830 to 1870. As techniques advanced, wooden walls gave way to armour plating and these, in turn, brought changes in the Royal Navy's attitude to personnel. Naval service became a full-time career and a new breed of specialist officers was encouraged and developed.

The book is profusely illustrated with prints, paintings and photographs—many of them published for the first time—taken from the collections of the Royal Naval Museum, Portsmouth. The woodcuts and line engravings were originally published in the *Illustrated London News*.

In his Foreword, Admiral of the Fleet Sir Terence Lewin, Chief of the Defence Staff, concludes with the words: 'In our own time the Royal Navy has been facing up to as great a change as our Victorian predecessors . . . Colin White helps us to look back and check that we have learnt the lessons of history'.

Altogether, this is a fascinating book though rather expensive for its size.

C. R. D.

Soviet Merchant Ships by Ambrose Greenway. 250 mm × 165 mm, 226 pp., including approximately 347 photographs. Kenneth Mason Publications Ltd, 13-14 Homewell, Havant, Hampshire PO9 1EE. Price: £6.95.

The second edition of this book was reviewed in the July 1977 edition of this journal. This, the fourth edition, has been extensively revised according to the latest available information and more than 270 ships have been added to the 1978 edition. Since the first edition was published in 1969 at least 2000 new ships have been built for the Russian merchant navy and this volume provides a concise, practical recognition manual of Soviet merchant ships, fish-factory vessels, research vessels, icebreakers and tugs which exceed 1000 gross tons.

The book contains a large number of photographs depicting a representative of each type or class of ship. The captions to the photographs include information such as the builders, tonnage, dates of delivery, main dimensions, engine details and other known facts. The main sources for this information were Lloyd's *Register of Shipping* and *Fairplay Shipping Journal*.

Admiral Gorshkov said: 'A strong merchant fleet is an important element in the overall build up of Soviet sea power' and it would appear that following its rapid expansion over the past 20 years the Soviet merchant fleet is now entering a period of consolidation. Older, uneconomic ships are being replaced with modern sophisticated tonnage, generally more than twice the size, with greater emphasis being placed on ro-ro and bulk carriers.

This latest edition is available either as a cloth-bound book or in loose-leaf form contained within a ring binder. Enclosed with the second edition, which was in loose-leaf form only, there was an application form by means of which supplementary information could be obtained as it became available. It is not clear whether this practice is to continue with the present edition. Nevertheless, the book remains a valuable and informative reference for those interested and, as the price has only risen by 95 pence in 4½ years, must be considered good value for money.

C. R. D.

Comecon Merchant Ships by Ambrose Greenway, 250 mm × 165 mm, pp. 180, including approximately 303 photographs. Kenneth Mason Publications Ltd, 13-14 Homewell, Havant, Hampshire PO9 1EE. Price: £6.95.

This is the second edition of the book of the same title reviewed in this journal in October 1978 and is complementary to *Soviet Merchant Ships* reviewed above.

This very much expanded volume is a comprehensive illustrated guide to the ships of Bulgaria, Czechoslovakia, East Germany, Hungary, Poland and Romania and now includes, for the first time, those of Cuba and Vietnam. The book follows closely the format of *Soviet Merchant Ships* but the vessels are grouped according to type and, in the main, are listed in descending order of size. Except in the index, countries have not been treated separately in order to present a better idea of the total merchant tonnage available to the Comecon Bloc.

There appears to have been little overall change in the fleets of Poland and East Germany where disposals have almost kept up with new tonnage. The chief area of expansion would seem to be centred on Romania and Bulgaria who have produced a steady stream of bulk carriers and general cargo ships.

As with *Soviet Merchant Ships*, this edition is available either cloth-bound or in a loose-leaf version within a ring binder and again represents good value for money.

C. R. D.

Personalities

RETIREMENT.—CAPTAIN J. J. RUTTER retired recently after serving nearly 38 years with the Furness Withy group.

John Rutter was born in Wanstead, Essex and was educated at Taunton School, Southampton and Chichester High School for Boys. In 1942 he was indentured as Apprentice to Royal Mail Lines and sailed on his first voyage in the *Potaro*.

Whilst serving as 4th Officer in the troopship *Highland Brigade* in 1946, the ship struck a mine in the Singapore Strait but fortunately there was no loss of life.

Captain Rutter obtained his Master's Certificate in May 1953 and was promoted to Master in November 1961—his first command being the *Parima*. For some years after 1971 he commanded various Shaw Savill Line ships including *Laurentic*, *Cretic*, *Iberic* and *Ionic*. More recently he commanded the *Deseado* in the South American trade.

We received the first meteorological logbook bearing Captain Rutter's name from the *Highland Brigade* in 1946. Since then he has sent us a further 33 logbooks of which 9 were classed as Excellent. He received an Excellent Award in 1975.

We wish him a long, healthy and happy retirement.

RETIREMENT.—CAPTAIN I. M. SHEARER, M.N.I., retired on 19 August 1980 after serving 43 years at sea.

Ian Shearer was educated at the Purley County Grammar School and, in late 1937, was indentured as Apprentice with the British Tanker Company and sailed in the *British Integrity*. However, in 1939 he terminated his service with that Company and became indentured as Apprentice with Clan Line joining the *Clan Murdoch* a week after war was declared.

In May 1941, whilst serving in the *Clan Macdougall*, the ship was torpedoed off the Cape Verde Islands. After several months in St Vincent, Captain Shearer managed to get to Freetown where he joined the *John Holt* for return to the UK.

Shortly after sailing, when the ship was south of the Canary Islands, the *John Holt* was torpedoed and Captain Shearer completed the voyage in a Royal Navy escort. Later, whilst serving as 4th officer in the *Clan Matheson* lying alongside at Kiddepore Dock in Calcutta, the ship received several direct hits as a result of a Japanese air raid and suffered severe casualties and damage.

Captain Shearer obtained his Master's Certificate in April 1949. He was promoted Master in January 1965 and appointed to command the *Nina Bowater*. For the last 6 years of his career he commanded bulk carriers of Cayzer Irvine Shipping Company mainly in the North Atlantic trade, his last command being that of the *King Charles*.

Captain Shearer sent us his first meteorological logbook from the *Clan Macaulay* in 1946. Since then we have received a further 28 logbooks bearing his name of which 12 were classed as Excellent.

Since retirement, Captain Shearer has taken up a part-time appointment with a firm of Marine Consultants, is a Deputy Launching Authority for the Eastbourne Lifeboat, an Auxiliary Coastguard at the Birling Gap C.G. station, a committee member of the London branch of the Nautical Institute and is heavily involved with his local Royal British Legion. He says that life was much quieter at sea!

We wish him a long and happy retirement.

RETIREMENT.—Mr W. PATERSON, Radio Officer, retired last January after serving nearly 33 years at sea.

William Paterson was born in Glasgow in 1919 but was brought up on the Island of Islay, Argyllshire, and was educated at the local school. On leaving school he joined the Royal Air Force as an apprentice Wireless Operator/Mechanic and was trained at the Electrical and Wireless School at R.A.F. Cranwell, Lincolnshire. In 1938 he was posted to India where he served on the North West Frontier and at the Air H.Q., India, in New Delhi. On his return to the UK in 1944 he served on the continent with the 2nd Tactical Air Force and the Occupational Forces in Germany. After demobilization, he attended the James Watt College in Greenock and obtained his P.M.G. Certificate.

Mr Paterson joined the Marconi International Marine Company as Radio Officer in February 1948 and was appointed to the P. & O. passenger liner *Strathmore*. Thereafter, he served in ships belonging to various companies, including 3 years in Port Line ships, and for the past 25 years exclusively with ships of the Ben Line by whom he was held in high esteem. His last ship, prior to his retirement, was the *City of Edinburgh*.

We received the first meteorological logbook bearing Mr Paterson's name from the *Bennevis* in 1956. Thereafter, we received a further 47 books of which 19 were classed as Excellent. He received Excellent Awards in 1966, 1967, 1968, 1971 and 1978.

We wish him a long, healthy and happy retirement in his home in East Lothian.

Fleet Lists

GREAT BRITAIN (Information dated 9.3.81)

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 Officers gaining these awards are published each July in *The Marine Observer*.

It is requested that prior notification of changes of service, probable periods of lay-up, transfer of Master or other circumstances which may prevent the continuance of voluntary meteorological service at sea, may be made to a Port Meteorological Officer or to the Marine Superintendent of the Meteorological Office at Bracknell.

Masters and Officers are invited to point out any errors or omissions which may occur in the list.

Selected Ships

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
Abbey	3.10.80	R. B. Leach	D. Spurrell, D. Lyon, P. Barry	M. Gibbs	Furness Withy (General Shipping) Ltd.
Acacus	5.3.81	J. Atkinson	M. M. MacDonald, I. C. Reed, J. Weir	L. Millington	Shell Tankers (U.K.) Ltd.
Achilles	*	A. J. Palmer	M. J. May, G. R. Illingworth, C. D. G. Grahame	D. Griffith	Ocean Transport & Trading Ltd.
Act 1	12.2.81	C. P. Leighton	A. W. Reader, P. Holtby, N. B. Meek	C. Curtis	Blue Star Line Ltd.
Act 2	9.12.80	L. Brown	M. Binnie, G. K. C. Smith, I. D. Mace	T. D. Tims	Cunard S.S. Co. Ltd.
Act 6	13.10.80	M. H. C. Twomey	V. Garisan, N. Hodgson, W. Olsen	C. Clarke	Cunard S.S. Co. Ltd.
Act 7	19.1.81	D. M. McPhail	R. E. Lough, J. Webber, D. Waddingham	P. Dempsey	Blue Star Line Ltd.
Adriatic	15.8.79	R. Smith	E. Hanson, N. A. Jardine	C. Brown	T. & J. Harrison Ltd.
Aeneas	4.2.81	J. P. Wishart	A. B. Simpson, S. C. Westrip	R. Stevens	Ocean Transport & Trading Ltd.
Afric Star	18.11.80	P. Mathews	J. H. Barwis, P. Callaghan, S. Pelecanos	M. Hoyes	Blue Star Line Ltd.
Al Shamiah	23.10.78	T. Williams	P. Walley	M. Newton	United Arab Shipping Co. Ltd.
Alaunia	19.2.81	A. G. Asplet	R. D. Clark, P. McManaway, J. Lewis	H. A. Chambers	Cunard S.S. Co. Ltd.
Albright Explorer	12.2.80	J. H. Kitching	T. Wright, W. Hutchings, D. A. MacLean	J. Callaghan	James Fisher & Sons Ltd.
Albright Pioneer	21.1.80	H. Thompson	W. J. Hutchinson, J. G. Nixon, G. D. Goulding	A. R. Carr	James Fisher & Sons Ltd.
Alert	12.8.80	J. Loftis	M. W. F. Phillips, I. A. D. Acland, L. E. McDowell	D. Wood	Post Office
Algol	26.3.80	I. J. Tait	B. Course, M. Hamer, G. Aledy-Cole	T. W. Slater	Silver Line Ltd.
Alinda	21.3.80	W. Brierly	T. M. Armstrong, N. J. Griffiths, D. J. Seabrooke	R. Dawson	Shell Tankers (U.K.) Ltd.
Almeda Star	20.1.80	A. J. Cheshire	C. J. Brook, B. Campbell, M. McGilvray	D. MacNaughton	Blue Star Line Ltd.
Almeria Star	16.5.80	P. Hurlock	M. Finney, N. Colling, N. B. Meek	E. Hughes	Blue Star Line Ltd.
Alsatia	11.7.80	D. M. Kissane	S. J. Daniel, C. Newman, F. E. Beer	W. MacLeod	Cunard S.S. Co. Ltd.
Amatra	24.2.81	G. C. Turnbull	A. J. Gurney, S. M. Kowalski, C. J. Doe	B. Inglis	Shell Tankers (U.K.) Ltd.
America Star	29.8.80	C. I. Mackillop	E. Betts, R. Bakshi, H. H. Trompert	W. H. Williams	Blue Star Line Ltd.
Anchises	25.7.80	G. D. Johnson	P. B. Cunningham, D. A. L. Best, J. L. Wilson		Ocean Transport & Trading Ltd.

<i>Anco Challenger</i>	5.12.80	R. E. Sawers	B. Hanlon, J. Kennedy, A. H. Wright	M. Russell	Panocean-Anco Ltd.
<i>Anco Champion</i>	15.1.81	M. Hayward	J. H. Dipple, G. Waller, C. P. Bordas	M. J. Russell	Panocean-Anco Ltd.
<i>Anco Charger</i>	8.12.80	K. Lewis	D. J. Williams, R. M. Thorley, S. J. Thackeray	L. M. Jones	Panocean-Anco Ltd.
<i>Anco Chaser</i>	22.1.81	R. March	K. McKernan, A. T. Rowe, R. G. Thomson	T. P. Bunce	Panocean-Anco Ltd.
<i>Anco Empress</i>	12.1.81	P. Messenger	D. Dipple, M. Quain, I. Heywood	S. Lines	Panocean-Anco Ltd.
<i>Anco Endeavour</i>	11.12.80	D. Owen	F. Heath, G. W. McKenzie, S. Pickard	M. J. Furlong	Panocean-Anco Ltd.
<i>Anco Enterprise</i>	2.2.81	J. Hagger	R. M. Thorley, I. Simpson, C. Dixon	P. A. C. Winning	Panocean-Anco Ltd.
<i>Anco Princess</i>	21.1.81	K. Richmond	E. P. Campion, P. R. H. Antill	R. C. J. Humby	Panocean-Anco Ltd.
<i>Anco Sceptre</i>	15.10.80	A. S. Banyard	A. G. Marits, J. Kennedy, H. Finlay	R. P. Billett	Panocean-Anco Ltd.
<i>Anco Sovereign</i>	10.2.81	T. Luke	T. W. Morgan, D. Watkins, D. Finlay	P. Gunner	Panocean-Anco Ltd.
<i>Anco Stane</i>	19.11.80	E. V. Kennard	S. J. Thackeray, R. C. Turrell	L. D. McCabe	Panocean-Anco Ltd.
<i>Anco Templar</i>	2.3.81	J. Frewer	S. M. Ross, J. P. Readman, K. D. Pykett	R. B. Hall	Panocean-Anco Ltd.
<i>Andalucia Star</i>	13.8.80	J. Gray	C. J. Parvin, J. Richardson, I. Tranter	D. Beech	Blue Star Line Ltd.
<i>Andamia</i>	25.2.81	L. Crump	P. M. Smith, P. Quayle, A. Macan	N. Beech	Cunard S.S. Co. Ltd.
<i>Andes</i>	8.12.80	C. W. Allison			Furness Withy (General Shipping) Ltd.
<i>Andria</i>	14.10.80	J. H. Dit-Leschery	P. C. Youe, D. W. Lax, P. G. Moore	P. R. Berridge	Cunard S.S. Co. Ltd.
<i>Annuity</i>	4.6.80	R. Shrubshall	M. Kingsella		F. T. Everard & Sons Ltd.
<i>Apapa Palm</i>	5.2.81	E. Thomson			Palm Line Ltd.
<i>Appleby</i>	2.2.81	R. W. Henderson	P. R. Hamlin, B. Middleton, R. Whyte	K. R. Berry	Sir R. Ropner & Co. Ltd.
<i>Arctic Seal</i>	•		P. P. Simkins		Thalassa (Offshore) Scotland Ltd.
<i>Arctic Troll</i>	20.11.80	T. H. Turner	W. M. Muir, C. R. Irvine, J. D. Cameron	A. J. Pampling	J. & J. Denholm Ltd.
<i>Asprella</i>	11.6.79	G. Turnbull	D. L. Gillies, C. S. Bull, S. K. M. Turnbull	M. J. Brimacombe	Shell Tankers (U.K.) Ltd.
<i>Astronomer</i>	14.5.80	E. J. Maxwell	P. B. Mimmack, M. H. Farmer, D. J. Caig	M. Donaldson	T. & J. Harrison Ltd.
<i>Ataman</i>	23.11.79	J. P. Wishart	W. J. Stoker, D. A. L. Best, R. J. Hughes	B. L. Drake	Ocean Transport & Trading Ltd.
<i>Atlantic Caiseway</i>	2.12.80	J. K. Cooper	N. D. Cleave, M. G. Lange, J. K. Brocklehurst	R. F. Davies	Cunard S.S. Co. Ltd.
<i>Atlantic Conveyor</i>	12.2.81	C. P. Margeson	C. Balls, D. Nicholson	J. Guthrie	Cunard S.S. Co. Ltd.
<i>Atlantic Prosper</i>	10.12.80	J. A. Oscroft	J. P. Collins, I. M. Stubev, J. Clark	M. J. Fitzgerald	Denholm MacLay Co. Ltd.
<i>Atlantic Splendour</i>	•	J. Exeley	H. Samuel, C. Gilberthorpe, E. Evans	M. Greene	Furness Withy (General Shipping) Ltd.
<i>Aurora</i>	9.12.80	W. E. N. Dwelly	G. P. D. Combe, J. T. Cleaver, N. Vause	R. B. Phillips	P. & O. S.N. Co.
<i>Avelona Star</i>	23.2.81	R. Brownbill	D. P. Ashton, T. Green, B. Luke	A. Shelley	Blue Star Line Ltd.
<i>Avon Forest</i>	13.1.81	A. E. F. Taylor	C. H. Wood, K. L. Cormack, J. Cripps	D. S. Mayall	Harrisons (Clyde) Ltd.
<i>Balder London</i>	•	J. E. Walmsley	R. Hood, J. W. Franklin, W. L. Collier	J. Griffith	Ugland (U.K.) Ltd.
<i>Balmoral Universal</i>	5.12.80	G. B. Charleson	K. C. Hoare, P. L. White, A. Oxley	D. Wakeford	Cayzer Irvine Shipping Co. Ltd.
<i>Baltic Eagle</i>	•	A. Wilford	P. E. Scott, K. W. Henson	T. Walker	United Baltic Corp. Ltd.
<i>Baltic Enterprise</i>	10.10.80	C. Hunter	J. Carmichael, B. Mullenger, D. J. Sweet	G. Smith	United Baltic Corp. Ltd.
<i>Baltic Progress</i>	•	— Kremer	R. Barker, D. Torr, N. Murphy	R. Hollows	United Baltic Corp. Ltd.
<i>Baltic Valiant</i>	27.11.80	D. E. Sufield	B. S. Elworthy, D. R. Cripps	O. H. W. Grimsdall	United Baltic Corp. Ltd.
<i>Bamenda Palm</i>	12.12.80	M. Hurley	R. W. Fitzsimon, J. C. Goble, R. O. Lysons	P. C. Barnard	United Baltic Corp. Ltd.
<i>Banbury</i>	14.4.80	W. Backhouse	A. Henderson, I. M. Wright, G. W. Broughton	D. Waddington	Palm Line Ltd.
<i>Barcelona</i>	19.2.81	R. P. Royan	A. C. Neville, D. B. C. Morris	D. A. P. Galbraith	Furness Withy (General Shipping) Ltd.
<i>Baron Belhaven</i>	11.9.80	S. J. Readman	I. R. Wemyss, D. Haughey, D. Farrington	A. W. MacCallum	Cayzer Irvine Shipping Co. Ltd.
<i>Baron Napier</i>	19.2.81	G. Downie	I. W. Warner, I. D. MacLeod, R. C. Johnston	D. E. Gudgeon	Scottish Ship Management Ltd.
<i>Bay Fisher</i>	•	W. H. Eggert	D. Reed, D. W. Little	R. C. Lee	Scottish Ship Management Ltd.
<i>Belloc</i>	25.2.81	I. L. Hughes	J. Owens, N. A. Wright, E. Betts	D. Neave	James Fisher & Sons Ltd.

Selected Ships (contd.)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Ben Ocean Lancer</i>	2.3.81	A. S. Rankin	B. W. Wood, I. Morrison, G. Day	S. Drinkwater	Ben Line Steamers Ltd.
<i>Benalder</i>	25.2.81	A. MacLean	I. A. Marshall	P. Mannion	Ben Line Steamers Ltd.
<i>Benaton</i>	5.1.81	K. R. Wilson	W. A. Horsburgh	A. J. Gordon	Ben Line Steamers Ltd.
<i>Bendoran</i>		P. J. Warren	R. Sharp, A. Kemp	M. Winter	Atlantic Drilling Co. Ltd.
<i>Benedict</i>	19.1.81	P. Hullock	D. R. Morgan, J. K. Wilkinson, P. R. Fawcett	J. V. Horsburgh	Blue Star Line Ltd.
<i>Benefactor</i>	18.12.80	B. W. Jones	D. Selvan, F. G. Bissett, J. B. Gething	M. J. Sheldon	T. & J. Harrison Ltd.
<i>Benhope</i>	29.12.80	A. S. Hamilton	T. C. L. Rowe, D. B. Blair, J. U. Steel	G. R. Lemon	Ben Line Steamers Ltd.
<i>Benledi</i>	23.7.80	L. G. Powell	R. L. Sutherland, N. C. McEwan, J. M. Campbell	P. A. Barratt	Ben Line Steamers Ltd.
<i>Benjamin Bowring</i>	9.12.80	D. A. R. Ramsay	C. F. Balaporia, D. Peck, M. O. Jones	N. Cox	Bowring S.S. Co. Ltd.
<i>Bennevis</i>	29.7.80	W. C. Watson	J. Fleming, J. H. Gibson, K. A. Polson	E. Jackson	Ben Line Steamers Ltd.
<i>Benstac</i>	4.9.79	G. Reid	J. D. P. Wells, I. Morrison, A. W. Burnie	J. Daly	Ben Line Steamers Ltd.
<i>Benvorlich</i>	21.10.80	H. H. McIntosh	C. Harris, G. McQuar	J. Garrick	Ben Line Steamers Ltd.
<i>Benwrackie</i>	6.1.81	M. R. Green	D. M. Orr, R. W. Hide, A. J. Weller		Atlantic Drilling Co. Ltd.
<i>Blenheim</i>	3.2.81	J. Smethurst	H. Skelton		Fred Olsen Ltd.
<i>Bon Entente</i>		T. Sheehan	A. Tibbott, S. G. Willis, C. P. R. Clarke	N. MacLean	Oil Search Marine Management
<i>Boniface</i>	30.12.80	D. J. Eckworth	S. W. Jeckells, E. Swale, F. Yeulet	M. J. Hearle	Blue Star Line Ltd.
<i>Bonneway</i>	15.12.80	B. Biggs	J. Inch, B. Woodcock, R. Grant	M. A. C. MacRae	Newgate Shipping Co. Ltd.
<i>Booker Challenge</i>	19.12.80	J. Pearson	- Grant, - Woodward	D. A. C. MacRae	Booker Line Ltd.
<i>Booker Courage</i>		E. G. Puddifer	M. Tebay, C. Robinson	N. R. Smirk	Booker Line Ltd.
<i>Booker Crusade</i>	26.2.81	W. Hill	D. W. Price, P. Farmitage, I. D. Williamson	M. Ferrier	B.P. Shipping Co. Ltd.
<i>Border Castle</i>	13.1.81	T. L. W. Dwight	G. Scutt, M. C. Porter, G. English	D. Pheasey	B.P. Shipping Co. Ltd.
<i>Border Falcon</i>	16.2.81	D. Campbell	J. Reid, J. Bottomley	M. O. Williams	B.P. Shipping Co. Ltd.
<i>Border Pele</i>	22.10.80	D. O. W. Jones	R. A. Alty, M. Bedford		Klondyke Shipping Co. Ltd.
<i>Boston Sea Lance</i>		F. Surtees	P. C. Mitchell, R. C. Corfield, R. C. Paterson	G. S. Martin	Blue Star Line Ltd.
<i>Boswell</i>	8.12.80	P. Mathews	W. A. Wren, D. C. Thomson, S. E. Bligh	D. I. Fraser	Container Fleets Ltd.
<i>Botany Bay</i>	17.2.81	W. A. Murison	J. C. Smart, R. C. Plumley, P. A. Herschell	H. M. O'Gorman	British Antarctic Survey
<i>Bransfield</i>	20.5.80	M. J. Cole	G. J. Greensmith, N. R. Mogg	S. Slattery	B.P. Shipping Co. Ltd.
<i>British Avon</i>	27.1.81	E. K. Williams	J. M. Bamfield, J. J. Whitelaw, P. G. Walter	A. Brown	B.P. Shipping Co. Ltd.
<i>British Beech</i>	31.12.80	I. Peterson	M. A. Watson, A. S. Kenyon, A. J. Lockie	V. Salkeld	B.P. Shipping Co. Ltd.
<i>British Centaur</i>	16.9.80	R. Dinsmore	R. C. McAleese, S. P. Weston, C. Richards	J. R. Bruce	B.P. Shipping Co. Ltd.
<i>British Commerce</i>	30.12.80	J. A. Gillan	D. Thomas, P. Chavda	P. Swire	B.P. Shipping Co. Ltd.
<i>British Commodore</i>	27.10.80	J. Bruce	P. Hebdon, J. C. Patterson, K. Lorimer	P. J. Hall	B.P. Shipping Co. Ltd.
<i>British Dart</i>	23.10.80	G. Waite	P. J. Giffen, C. N. W. Roberts, J. Fidler	R. C. Williamson	B.P. Shipping Co. Ltd.
<i>British Dragon</i>	22.1.81	R. Towell	M. Smith, H. J. Conlon		B.P. Shipping Co. Ltd.
<i>British Esk</i>	6.3.81	K. V. Meacock	R. Raeburn, M. Mason, S. Cassidy	R. Kellett	B.P. Shipping Co. Ltd.
<i>British Explorer</i>	23.2.81	J. Wilson	N. P. Henderson, K. Scott, F. C. Gwilt	C. J. Ellery	B.P. Shipping Co. Ltd.
<i>British Fern</i>	12.11.80	I. Black	I. L. Sutherland, C. Harding, T. Henderson	P. K. Kiehlthy	B.P. Shipping Co. Ltd.
<i>British Forth</i>	27.1.81	E. Twemlow	M. J. Aldred, M. C. Porter	H. F. Sharkey	B.P. Shipping Co. Ltd.
<i>British Hawthorn</i>	4.3.81	D. E. Mitchell	F. O'Neill, R. A. Marsh, V. R. Lindsay	N. Gill	B.P. Shipping Co. Ltd.
<i>British Hazel</i>	12.6.80	E. Coates			

<i>British Holly</i>	..	J. Hill	..	R. I. Gibson, C. P. Mullett, P. P. Akers	..	D. E. Dale	..	B.P. Shipping Co. Ltd.
<i>British Ivy</i>	13.1.81	T. V. Watkins	..	K. W. Bainbridge, D. C. Wood	..	..	..	B.P. Shipping Co. Ltd.
<i>British Kennel</i>	24.11.80	R. J. Newer	..	J. Mellish, P. J. Giffen	..	..	..	B.P. Shipping Co. Ltd.
<i>British Laurel</i>	9.9.80	A. H. Skellern	..	G. M. Hopkins, J. A. Carrick	..	D. M. Nicholls	..	B.P. Shipping Co. Ltd.
<i>British Liberty</i>	23.10.80	W. Callaghan	..	A. D. Gillam, D. Moore, S. Chapman	..	D. Pheasey	..	B.P. Shipping Co. Ltd.
<i>British Loyalty</i>	14.10.80	D. Coombes	..	D. W. Lister, A. D. Haworth, K. P. Pickering	..	R. King	..	B.P. Shipping Co. Ltd.
<i>British Maple</i>	2.12.80	L. A. Woodward	..	..	..	D. L. Feetham	..	B.P. Shipping Co. Ltd.
<i>British Norriss</i>	18.11.80	M. C. Stephenson	..	..	..	..	..	B.P. Shipping Co. Ltd.
	18.12.80	..	..	I. C. Warner, M. J. Openshaw, P. S. N. Chatterton	D.	A. Gurney	..	B.P. Shipping Co. Ltd.
<i>British Patience</i>	19.12.80	N. W. C. Rutherford	..	A. T. Cross, C. R. Schoolbraud	..	P. H. Wales	..	B.P. Shipping Co. Ltd.
<i>British Pioneer</i>	12.1.81	J. Dwight	..	J. H. Brechin, C. J. Spink, C. W. B. McQueen	..	M. J. White	..	B.P. Shipping Co. Ltd.
<i>British Poplar</i>	12.2.81	F. M. Fowles	..	R. E. Taylor, C. J. Coxhead	..	V. Salkeld	..	B.P. Shipping Co. Ltd.
<i>British Pride</i>	18.11.80	M. Dunning	..	P. Goddard, R. M. Dick	..	P. E. Davies	..	B.P. Shipping Co. Ltd.
<i>British Promise</i>	31.12.80	J. S. Allen	..	J. F. Harding, C. Soanes	..	G. Collins	..	B.P. Shipping Co. Ltd.
<i>British Ranger</i>	22.7.80	C. E. Hayward	..	A. R. Wilkinson, H. J. Conlon, P. Hullah	..	D. Bone	..	B.P. Shipping Co. Ltd.
<i>British Reliance</i>	•	..	..	..	..	..	..	B.P. Shipping Co. Ltd.
<i>British Resolution</i>	25.11.80	M. Boyd	..	..	..	D. Worthy	..	B.P. Shipping Co. Ltd.
<i>British Respect</i>	2.12.80	D. Buckley	..	..	..	..	..	B.P. Shipping Co. Ltd.
<i>British Security</i>	29.10.80	S. Plumb	..	R. L. Horne, L. J. Loftus, S. D. Clegg	..	A. C. Harris	..	B.P. Shipping Co. Ltd.
<i>British Spey</i>	27.1.81	R. Jarrett	..	R. D. Nicholls, T. Henderson	..	T. R. Holter	..	B.P. Shipping Co. Ltd.
<i>British Tamar</i>	21.12.79	C. Evans	..	R. A. Denyer, C. Southwell, R. McCracken	..	J. C. Wadsworth	..	B.P. Shipping Co. Ltd.
<i>British Tay</i>	4.11.80	N. H. Roberts	..	R. Scutt, M. A. Blamires	..	A. Redford	..	B.P. Shipping Co. Ltd.
<i>British Tenacity</i>	19.2.80	J. Lambert	..	M. K. Paradowski, A. Feltham	..	R. Lodge	..	B.P. Shipping Co. Ltd.
<i>British Test</i>	29.12.80	I. A. Oliphant	..	W. McFadzean, G. P. Meadow	..	R. Quinn	..	B.P. Shipping Co. Ltd.
<i>British Trent</i>	4.2.81	P. D. Harrison	..	J. A. Robertson, R. Hawkes, P. A. Martin	..	A. Riordan	..	B.P. Shipping Co. Ltd.
<i>British Trident</i>	21.10.80	R. F. Adams	..	I. Sloan, S. H. McNiven, J. P. J. McNeil	..	K. R. Jones	..	B.P. Shipping Co. Ltd.
<i>British Unity</i>	1.10.80	M. Goulding	..	G. Cleary, J. S. Parkin	..	R. I. Gow	..	B.P. Shipping Co. Ltd.
<i>British Vine</i>	16.1.81	F. W. Lamb	..	J. H. Scobie, J. L. Sharpe	..	A. D. Read	..	B.P. Shipping Co. Ltd.
<i>British Voyager</i>	1.12.80	I. Johnston	..	A. P. Poulton, T. L. Cullen, S. A. Chadwick	..	R. I'Anson	..	Premier Shipping & Engineering Ltd.
	..	..	..	P. W. Barber, H. Watson, F. Tait	..	..	..	..
<i>Bronte</i>	11.12.80	M. J. MacNeill	..	C. R. Bartlett, C. D. Waddingham, A. Milligan	..	R. F. Collins	..	Blue Star Line Ltd.
<i>Browning</i>	3.2.81	T. C. Black	..	R. Owen, N. A. Ianson, S. J. Cutler	..	R. E. Garnham	..	Blue Star Line Ltd.
<i>C.P. Discoverer</i>	19.12.80	A. R. Whyte	..	N. C. W. Barham, P. R. Kirkman	..	..	..	Canadian Pacific Steamships Ltd.
<i>C.P. Trader</i>	25.11.80	K. Hyde	..	P. Bland, K. D. Lee, M. B. Lawley	..	D. J. Atkinson	..	Canadian Pacific Steamships Ltd.
<i>C.P. Voyageur</i>	15.12.80	J. Hooley	..	M. Wedge, R. I. Shepherd, P. C. Adair	..	..	..	Canadian Pacific Steamships Ltd.
<i>Cable Venture</i>	13.3.79	J. Fenwick	..	P. R. Woodward	..	K. C. Jackson	..	Cable & Wireless Ltd.
<i>California Star</i>	4.12.80	D. Newlin	..	S. M. Scott, P. R. Fawcett, C. Mundy	..	D. O'Halloran	..	Blue Star Line Ltd.
<i>Canberra</i>	12.1.81	J. F. Wachter	..	N. J. Matthews, M. Barrie, D. Pembroke	..	J. Morrison	..	P. & O. S.N. Co.
<i>Cape Horn</i>	1.10.80	L. M. Hocking	..	J. O. Smyth, J. Gillespie, A. Logan	..	J. R. Tomlinson	..	Scottish Ship Management Ltd.
<i>Cape Leeuwin</i>	20.11.80	J. G. Jones	..	B. P. Andrew, C. J. Pyper, D. C. C. Bryce	..	D. F. Wilson	..	Scottish Ship Management Ltd.
<i>Cape Ortelgal</i>	4.12.80	S. J. Readman	..	W. J. Esler, A. R. Mackie, L. G. Morison	..	S. R. Tomlinson	..	Scottish Ship Management Ltd.
<i>Cape Rodney</i>	3.10.80	C. MacLean	..	S. Hayward, C. R. Williamson, R. C. Bucknall	..	D. Poole	..	Silver Line Ltd.
<i>Carchester</i>	30.10.80	N. A. Perry	..	B. R. Tucker, T. Gwynne, N. Ellison	..	C. M. Jackson	..	Ocean Transport & Trading Ltd.
<i>Cardigan Bay</i>	24.10.80	D. M. Belk	..	W. G. C. Wallace	..	A. G. Thomson	..	Cunard S.S. Co. Ltd.
<i>Carnithia</i>	31.12.80	P. J. Sheriff	..	D. M. Craddock, A. P. Haxby, J. Lewis	..	F. Tordoff	..	Cunard S.S. Co. Ltd.
<i>Carmania</i>	5.2.81	G. Carling	..	S. J. Daniel, R. A. Critchlow, W. Meadow	..	J. Barlow	..	..
<i>Cast Tern</i>	•	C. M. Schiller	..	K. Summers, A. Dunning, J. Lacy	..	R. Durston	..	J. & J. Denholm Ltd.

Selected Ships (contd.)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Cedarbank</i> ..	4.9.80	K. J. Wallace	M. J. Clark, D. Billyard	D. R. Morkan	Bank Line Ltd.
<i>Celtic Crusader</i> ..	29.7.80	F. Duffin	H. Prigg	..	C. M. Willie & Co. (Shipowners) Ltd.
<i>Celtic Endeavour</i> ..	18.6.80	J. R. Stephens	P. G. Posey, P. R. Devenish	..	C. M. Willie & Co. (Shipowners) Ltd.
<i>Challenger</i> ..	19.8.80	G. H. Selby-Smith	G. M. Long, S. Jackson, A. Bridgen	..	Natural Environment Research Council
<i>Choctaw II</i> ..	25.8.78	N. J. W. Middlehurst	C. Mitchell, P. D. Meyerholt, M. Johnson	..	Santa Fe (U.K.) Ltd.
<i>Cicero</i> ..	24.2.81	J. Coggin	E. Pearson, F. W. Brown, E. Hall	..	Ellerman Wilson Line Ltd.
<i>Cirolana</i> ..	24.2.81	T. H. Finn	..	..	Ministry of Agriculture Fisheries & Food
<i>City of Canterbury</i> ..	24.11.80	T. J. Seeman	K. J. Littlewood, T. Oliver, M. Fagen	..	Ellerman Lines Ltd.
<i>City of Durban</i> ..	19.1.81	J. W. Hodson	P. R. Walton, G. Laird, M. Kinnear	..	Ellerman Lines Ltd.
<i>City of Edinburgh</i> ..	29.10.80	J. E. Pritchard	J. H. Clark, D. I. Walker	..	Ben Line Containers Ltd.
<i>City of Plymouth</i> ..	28.8.80	J. McNab	G. R. Christian, A. R. Lucas, S. A. Edmundson, M. McDowell	..	Ellerman Lines Ltd.
<i>City of Winchester</i> ..	11.8.80	I. C. Dorse	S. A. Mortimer, W. Stewart, M. Herring	..	Ellerman Lines Ltd.
<i>City of York</i> ..	12.1.81	D. D. Jamieson	H. M. Ray, G. M. Ralston, S. C. Martin	..	Ellerman Lines Ltd.
<i>Clan MacGillivray</i> ..	1.12.80	R. E. Todd	..	..	Cayzer Irvine Shipping Co. Ltd.
<i>Clan MacGregor</i> ..	18.11.80	M. Brackenridge	D. Leboutillier, A. J. Blackler	..	Cayzer Irvine Shipping Co. Ltd.
<i>Clione</i> ..	30.12.80	G. R. Oliver	B. A. Chapman, G. F. Lee, R. Graham	..	Ministry of Agriculture, Fisheries & Food
<i>Cluden</i> ..	12.8.80	C. Clarke	Chung Chong Hing, J. K. Coughlan, M. Fuchs	..	Matheson Shipping Services Ltd.
<i>Clydebank</i> ..	..	G. A. Davies	K. A. F. Palmer, R. Snape, S. C. Braund, J. K. Ward	..	Bank Line Ltd.
<i>Clytaneus</i> ..	29.10.79	J. K. Winn	D. J. Capper, P. W. B. Ankers, K. Gibson	..	Ocean Transport & Trading Ltd.
<i>Columbia Star</i> ..	16.12.80	J. R. Howorth	P. Dixon, J. Mockert, K. Lumby	..	Blue Star Line Ltd.
<i>Corabank</i> ..	24.1.80	B. Z. Gerstel	W. J. McFadyen, N. D. Hosegood, R. G. Humby	..	Bank Line Ltd.
<i>Corella</i> ..	30.12.80	G. R. Oliver	..	..	Ministry of Agriculture, Fisheries & Food
<i>Crestbank</i> ..	10.2.81	D. Young	R. Sneddon, B. M. Bennett, S. J. Messruther	..	Bank Line Ltd.
<i>Crown Prince</i> ..	12.2.81	H. G. N. Lloyd	M. J. F. Swann, D. Smith	..	Furness Withy (General Shipping) Ltd.
<i>Dacebank</i> ..	31.3.80	J. A. Appleby	S. M. Walkie, N. J. G. Allen	..	Bank Line Ltd.
<i>Darina</i> ..	24.1.80	J. Price	I. C. McKay, N. B. Campbell	..	Shell Tankers (U.K.) Ltd.
<i>Dart America</i> ..	25.2.81	A. G. Pound	J. R. Hollamby, D. Kennedy, P. Springett	..	Furness Withy (General Shipping) Ltd.
<i>Dart Atlantic</i> ..	29.12.80	K. McLeod	C. S. Gaukroger, R. A. Copeland, B. Holcombe	..	Furness Withy (General Shipping) Ltd.

<i>Dart Canada</i>	14.11.80	M. Winter	C. D. Eke, P. Springett, D. Kennedy	M. O'Gorman	Furness Withy (General Shipping) Ltd.
<i>Derwent</i>	15.12.80	G. Spong	C. P. Brabban, J. Exley, P. T. Galea	K. H. Garlinge	Furness Withy (General Shipping) Ltd.
<i>Deseado</i>	10.12.80	D. T. Mouldley		R. Tourtec	Furness Withy (General Shipping) Ltd.
<i>Discovery</i>	4-9.80	M. Bowen	M. Putman, G. P. Harries, N. Jonas	R. S. Bell	Natural Environment Research Council
<i>Donga</i>	19.1.81	F. M. Howe	R. G. Daley, M. Browning, D. H. Scruton	P. J. Robertson	Ocean Transport & Trading Ltd.
<i>Dover Universal</i>	19.9.80	C. W. Gowans	S. Johnson, G. R. Paxton, B. Dalziel	J. Sharpley	Cayzer Irvine Shipping Co. Ltd.
<i>Drupa</i>	3.2.81	P. Blackshaw	N. D. F. Roberts, J. Y. Simpson, S. K. M. Turnbull	A. Cook	Shell Tankers (U.K.) Ltd.
<i>Dunster Grange</i>		J. S. Rutherford	R. S. Gaukrodger, G. E. Stout, D. Bowman	J. P. J. Goldsmith	Furness Withy (General Shipping) Ltd.
<i>Elk</i>	20.11.80	M. R. Godfrey	R. Blacklock, A. Pearson, C. Burnett		P. & O. S.N. Co.
<i>Encounter Bay</i>	27.1.81	J. Cosker	J. C. Hoy, R. J. McLarty	D. K. Alcock	Container Fleets Ltd.
<i>Eredine</i>		J. M. K. Kelly	F. A. Wright, H. C. Ratcliffe, R. Goodwin	Kan Kai Chuen	John Swire & Sons Ltd.
<i>Erskine Bridge</i>	27.1.81	N. Sandes	R. G. McGilvray, J. P. Mawson, M. L. Miller	C. Turner	Silver Line Ltd.
<i>Esso Aberdeen</i>	27.1.81	T. C. Ramsey	A. Meeds, G. Stratton, M. J. Halle	J. D. Rennie	Esso Petroleum Co. Ltd.
<i>Esso Caledonia</i>	19.2.81	R. Hyam	C. G. Starr, J. Browning, W. A. Gundry	D. Leeson	Esso Petroleum Co. Ltd.
<i>Esso Cambria</i>	5-3.81	A. Washbourne	E. G. Calder, P. Whitehead, P. J. Devos	J. Lees	Esso Petroleum Co. Ltd.
<i>Esso Dalriada</i>	23-5.80	I. D. Smith	S. McIntosh, C. Starr, G. Haig-Brown	G. M. Robinson	Esso Petroleum Co. Ltd.
<i>Esso Demetia</i>	19.6.79	T. F. Harper	G. S. Nixon, M. Adams	R. E. Byng	Esso Petroleum Co. Ltd.
<i>Esso Hibernia</i>	16.2.81	K. Hebden	T. D. Lester, R. McLellan, A. A. Barnes	B. Holness	Esso Petroleum Co. Ltd.
<i>Esso Northumbria</i>	12.1.80	M. Berryman	M. J. Wise, J. H. Donaldson, A. G. Pompa	T. F. Strickland	Esso Petroleum Co. Ltd.
<i>Esso Scotia</i>	21.11.80	R. W. Noakes	G. Lockwood, M. George, T. Jackson	W. Black	Esso Petroleum Co. Ltd.
<i>Esso Ulidia</i>	4.2.81	I. Grigor	M. J. Knowles, G. S. Nixon, I. R. Halshall	H. M. S. Cherry	Esso Petroleum Co. Ltd.
<i>Esso Warwickshire</i>	6.1.81	W. D. Templeman	C. M. Notman, J. S. Mandley	I. Morgan	Esso Petroleum Co. Ltd.
<i>Ethel Everard</i>	1.4.80	G. R. Hare	D. R. Spurling, F. MacCormack, J. W. C. Phillips		F. T. Everard & Sons Ltd.
<i>Explorer (F.R.S.)</i>	19.8.77	J. Gillon	A. Murray, W. Ferguson	J. A. Main	Department of Agriculture & Fisheries for Scotland
<i>Eye of the Wind</i>					
<i>Falmouth Bay</i>	3.2.80	M. C. Kitchenside			Container Fleets Ltd.
<i>Fenbank</i>		P. J. Clarke	P. N. Beggs, K. MacMillan, P. D'Arcy	S. Braithwaite	Bank Line Ltd.
<i>Fengtien</i>	19.4.79	W. W. Davies	S. D. Crowther, T. N. Morris, W. M. Esler	L. C. Robinson	J. Swire & Sons Ltd.
<i>Firbank</i>	4-3.81	R. J. Shipp	A. M. Kennedy, A. W. Curtis, N. G. Wan Chin	M. Mong	Bank Line Ltd.
<i>Flinders Bay</i>	3.12.79	N. J. Munro	V. P. Stevens, R. J. Pritchard, A. L. Watson	R. Dallimore	Container Fleets Ltd.
<i>Fort Hamilton</i>	8.12.80	M. J. Heron	I. M. Chadney, R. Brinkworth, N. Kelleher	D. Kelsall	Canadian Pacific Steamships Ltd.
<i>Fort Victoria</i>	10.10.80	G. A. Jenkins	W. A. Levett, C. M. Goddard, J. W. Dickie	R. I. Robson	Canadian Pacific Steamships Ltd.
<i>Forties Kiwi</i>	18.11.80	J. Barton	D. W. Atkinson, B. Martin, S. A. Syed		B. P. Shipping Co. Ltd.
<i>Fresno City</i>	5.2.81	G. M. Gough	D. W. Palmer, T. J. Maxted, G. M. Coulson	C. M. Taylor	Sir Wm. Reardon Smith & Sons Ltd.
<i>Galconda</i>	10.2.81	L. R. Staines	J. C. Neale, T. J. Fuller, A. P. Jagers	R. H. Smith	P. & O. S.N. Co.
<i>Gambada</i>		C. Walker	D. Renton, J. B. Moulds, T. Napper, R. Jenkin		P. & O. S.N. Co.
<i>Gandara</i>	29.12.80	G. W. McDermott	G. R. Phillips, M. J. Curran, C. J. Grewar	P. C. A. Enrico	P. & O. S.N. Co.
<i>Garbeta</i>	12.1.81	R. Turney	J. H. Adcock, T. H. Goldsmith	M. Bull	Gardline Shipping Ltd.
<i>Gardline Locater</i>	24.2.81	S. Harwood	P. Jenner, S. Hybe, J. Birch		P. & O. S.N. Co.
<i>Gardline Tracker</i>	20.2.81	A. Morrice	D. P. Hawkins, D. Bailey, I. P. Hurst		P. & O. S.N. Co.
<i>Garinda</i>	31.12.80	D. Bailey	R. S. James, J. Nickin, F. J. Mack	B. Boyle	P. & O. S.N. Co.

Selected Ships (contd.)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Gazana</i> ..	12.2.81	J. A. Smeeton	J. N. Balkwill, K. R. Underhill, K. P. Berry	A. Watson	P. & O. S.N. Co.
<i>Geestcrest</i> ..	7.7.80	R. Skinner	C. Morgan, D. Roberts, W. A. Boddington	T. Howells	Geest Industries Ltd.
<i>Geestland</i> ..	31.12.80	P. W. Groves	P. J. Gaydon, A. B. Ward, C. Morgan	M. I. McGregor	Geest Industries Ltd.
<i>Geeststar</i> ..	16.2.81	A. Cole	W. Boddington, P. J. Gaydon, M. Holden	G. Selby	Geest Industries Ltd.
<i>Geest-tide</i> ..	19.11.80	G. McDonald	R. E. Hawkins, N. P. Lewis, D. Roberts	C. A. Greenway	Geest Industries Ltd.
<i>Gladstone Star</i> ..	27.1.81	E. C. Smith	R. J. Gill, J. Willis-Richards, F. Wilkinson	D. C. Millar	Blue Star Line Ltd.
<i>Glenpark</i> ..	5.2.81	N. Maciver	W. Manson, E. McKendrick, J. Miller	T. J. C. Stevenson	J. & J. Denholm Ltd.
<i>Gold Varda</i> ..	17.10.78	M. J. Wharf	D. J. Smith, G. C. Rautraya, J. J. Neill	G. W. Cunnane	Haverton Shipping Ltd.
<i>Goth</i> ..	6.1.81	P. Wheeldon	R. Spall	R. Spall	British United Trawlers Ltd.
<i>Gothia Team</i> ..	17.1.80	J. M. Gatherer	M. Gough, R. Kelly, J. E. Tirl	K. A. Ellison	J. & J. Denholm Ltd.
<i>Grey Hunter</i> ..	12.1.81	S. A. Walker	S. A. Larkin, H. G. Gray, J. Simpson	R. Sadler	Ben Line Steamers Ltd.
<i>Grey Warrior</i> ..	10.12.80	I. F. Mackay	A. G. Knox, C. E. Simcox, A. J. Smith	F. J. Curran	Ben Line Steamers Ltd.
<i>Gulf Hawk</i> ..	•	E. B. Daubeny			Gulf (Shipowners) Ltd.
<i>Halifax Star</i> ..	25.3.80	J. F. Rowe	A. Littleton, J. H. Barwis, T. J. Burleton	E. Smith	Blue Star Line Ltd.
<i>Hampshire</i> ..	29.1.81	M. M. Reeves	A. G. Smith, W. J. M. Hargreaves	G. Simpson	Bibby Line Ltd.
<i>Helens</i> ..	12.1.81	P. G. Young	R. I. Sime, W. Stobie, P. V. Moore	G. C. Freeman	Ocean Transport & Trading Ltd.
<i>Herefordshire</i> ..	7.8.80	R. Weir	R. F. Coolie, S. Harvey, J. H. Lowe	L. Lynn	Bibby Line Ltd.
<i>Ibn Abdoun</i> ..	21.8.79	R. Owens	J. R. Wilson, A. N. Zewan	T. B. Byrne	United Arab Shipping Co. Ltd.
<i>Ibn Rushd</i> ..	28.10.80	J. Wilkie			United Arab Shipping Co. Ltd.
<i>Irish Wasa</i> ..	4.7.80	J. Adams	D. Stockley, M. M. Gregor, I. Drysdale	K. Brown	Salen (U.K.) Ship Management Ltd.
<i>Ivybank</i> ..	•	J. F. Beckett	E. R. Mainland, M. Lynham, A. Sommerstone	- Grant	Bank Line Ltd.
<i>Jack Wharton</i> ..	5.3.81	A. J. A. Richards	P. L. G. Wolledge, P. F. Bayliss, W. M. Marshall		F. T. Everard & Sons Ltd.
<i>Jedforest</i> ..	28.8.80	M. Hanna	G. J. Crosby, K. Scott	A. Watson	P. & O. S.N. Co.
<i>Jervis Bay</i> ..	10.11.80	K. E. Howard	I. S. Norris, A. J. Fee, A. Kirkham	R. B. Redhead	Container Fleets Ltd.
<i>John Biscoe</i> ..	5.3.81	C. R. Elliott	M. J. S. Burgan	R. Wade	British Antarctic Survey
<i>John Murray</i> ..	17.2.80	M. A. Harding	J. K. Seymour, P. T. Oldfield, N. A. C. Jonas		Natural Environment Research Council
<i>Josefa</i> ..	27.8.80	L. R. Staines	J. R. Ashley, J. S. Pearshall, M. R. Lovibond	R. J. Preece	Sir Wm. Reardon Smith & Sons Ltd.
<i>Jura</i> ..	19.8.80	D. L. Rattray	H. A. Mackenzie, R. P. Pollock, D. L. Bevridge		Department of Agriculture & Fisheries for Scotland
<i>King Alfred</i> ..	25.6.80	M. N. Ure	S. P. Harris, D. J. Innes, N. Jones	J. A. Maxwell	Cayzer Irvine Shipping Co. Ltd.
<i>King Charles</i> ..	12.6.80	P. C. Byrne	G. A. McEwan, M. Gardner, P. M. J. O'Sullivan	J. Tomlinson	Cayzer Irvine Shipping Co. Ltd.
<i>King George</i> ..	20.11.80	R. R. Will	J. F. Millican, P. J. Ward	D. W. Fletcher	Cayzer Irvine Shipping Co. Ltd.
<i>King Richard</i> ..	3.11.80	C. De F. Hedges	P. H. Evans, K. R. Bennett, B. T. Dalziel	D. W. Fletcher	Cayzer Irvine Shipping Co. Ltd.
<i>King William</i> ..	29.1.81	A. T. Campbell	L. B. Fant, M. McWilliam	J. Wright	Cayzer Irvine Shipping Co. Ltd.
<i>Kingsnorth Fisher</i> ..	•	G. W. Watt	K. J. Ridgeway, R. Head, C. Turner	S. G. Price	James Fisher & Sons Ltd.
<i>Kinburnie Universal</i> ..	8.7.80	R. R. Cawdery	M. D. Moore, M. J. Godbehear	J. A. R. Walker	Cayzer Irvine Shipping Co. Ltd.
<i>Kouloon Bay</i> ..	24.2.81	W. P. Goldie	R. K. Walker, R. A. Bird, P. N. J. Cowdell	A. J. Thomson	Ocean Transport & Trading Ltd.
<i>Kubbar</i> ..	•	A. B. Stalker	D. G. Wilcockson, S. C. Liddle, S. Michel	K. D. MacBrayne	P. & O. S.N. Co.
<i>Lackenby</i> ..	17.2.81	J. E. Jennings		T. Sutton	Sir R. Ropner & Co. Ltd.

<i>Lady Lucienne</i>	•	G. A. Parks	M. H. Hart, R. M. Corlet, J. R. Hughes	P. Brevik	Denholm MacLay Co. Ltd.
<i>Lancashire</i>	12.1.81	R. Weir	C. Y. Tsang, C. W. Chow, R. S. Wing	J. C. Cottier	Bibby Line Ltd.
<i>Langtau Trader</i>	•	R. A. Harvey			Denholm Ship Management (Overseas) Ltd.
<i>Lauderdale</i>	4.11.80	I. Denholm	R. P. Leedham, G. J. Crosby, S. J. Cribb	B. R. Elding	P. & O. S.N. Co.
<i>Lincolnbrook</i>	•	C. T. Marchant	M. J. Penn, D. Rudway		F. T. Everard & Sons Ltd.
<i>Lincolnshire</i>	•	D. Creamer	R. Hodgson, S. Hines, S. Walker, D. Singh	B. J. Foley	Bibby Line Ltd.
<i>Liverpool Bay</i>	5.1.81	W. A. Fitzgerald	T. J. Illingworth, D. J. Baily, I. N. Collister	W. C. A. Phillips	Ocean Transport & Trading Ltd.
<i>Loch Lomond</i>	14.5.80	D. Perry	G. W. Morrison, D. Duff, H. R. Niblock	K. Scott	J. & J. Denholm Ltd.
<i>Loch Maree</i>	10.9.80	C. W. Harvey	D. L. Pereira, A. S. Ingram, B. T. Train	K. Ball	J. & J. Denholm Ltd.
<i>London Baron</i>	27.11.80	A. C. Armstrong	R. Fullagar, D. Yorke, P. J. Hudson	H. Nolan	London & Overseas Freighters Ltd.
<i>London Confidence</i>	11.12.80	F. G. B. Hewlett	K. T. Cederholm, R. M. Patmore, J. Dunsmore	I. F. Alexander	London & Overseas Freighters Ltd.
<i>London Earl</i>	1.9.80	J. A. McCulloch	W. G. Pirie, K. Ferries, K. McClymont	K. Stamp	London & Overseas Freighters Ltd.
<i>London Enterprise</i>	•	J. Clark	S. C. MacPole, P. Wade, D. S. Wylie	P. B. Killean	London & Overseas Freighters Ltd.
<i>London Glory</i>	•	R. B. Tarbuck	J. L. David, C. R. Ingham, J. D. Whitney	D. G. Gavin	London & Overseas Freighters Ltd.
<i>London Pride</i>	20.8.80	E. G. Kemp	B. Woodward, G. A. Cole, G. Harris	R. F. Smith	London & Overseas Freighters Ltd.
<i>London Viscount</i>	5.3.81	J. McCulloch	R. Patmore, D. Dimock, N. Boys	P. O'Neill	London & Overseas Freighters Ltd.
<i>Lord Mount Stephen</i>	2.12.80	G. W. Waterson	C. T. Hentley, D. C. West-Watson, A. J. S. White	M. J. Corry	Canadian Pacific Steamships Ltd.
<i>Lord Strathcona</i>	28.10.80	D. Tipping	P. Robinson, T. Fisher	D. I. Anson	Canadian Pacific Steamships Ltd.
<i>Lucerna</i>	•	W. J. S. Flett	B. Dodd, B. Moon, J. Laing	B. McCall	Cunard S.S. Co. Ltd.
<i>Lycaon</i>	21.10.80	G. Owen	S. R. Furness, L. Drummond, I. J. Roemmele	T. J. Flatley	Ocean Transport & Trading Ltd.
<i>Lynton Grange</i>	5.7.79	N. Oddy	C. P. Brabban, B. L. Bass	G. S. Graham	Houlder Bros. & Co. Ltd.
<i>Maersk Cadet</i>	30.1.81	W. H. Walker	G. N. Smith	C. Wicks	Maersk (U.K.) Co. Ltd.
<i>Maersk Commander</i>	1.8.80	W. H. Walker	M. Aldrich, A. M. Hooper, C. A. Calver	M. D. Fraser	Maersk (U.K.) Co. Ltd.
<i>Magdalena</i>	25.11.80	P. G. Pinkerton	A. M. L. Murray, T. C. J. Martins	P. J. Clery	Fyffes Group Ltd.
<i>Mairangi Bay</i>	10.11.80	R. T. Wood	P. C. D'Arcy, D. B. Gunn, R. B. Gurney	A. Titley	Container Fleets Ltd.
<i>Manchester</i>					Manchester Liners Ltd.
<i>Concorde</i>	15.1.81	J. Turnbull	W. S. Enwright, W. Porter, B. Larcombe	J. P. McMahon	Manchester Liners Ltd.
<i>Manchester Crusade</i>	31.12.80	D. Smith	A. Ellis, D. Conell, G. R. Green	J. Lamb	Manchester Liners Ltd.
<i>Manchester Renown</i>	31.12.80	J. Rushworth	M. A. Carter, C. R. Darnelev, M. Broadhead	J. Lamb	Manchester Liners Ltd.
<i>Manchester Reward</i>	5.2.81	R. Llewellyn	R. Leather, N. F. Edwards, S. Douglas	C. J. Johnson	Manchester Liners Ltd.
<i>Manchester Zeal</i>	1.5.80	J. Baker	N. Halliwell, M. Broadhead, R. Leather	H. Holdridge	Manchester Liners Ltd.
<i>Markhor</i>	•		M. Butler, J. D. Cook, M. Coleman	P. Lavery	Cunard S.S. Co. Ltd.
<i>Maron</i>	3.2.81	T. L. Watson	P. G. Doering, R. Moxon, D. Pluck	G. Scullion	Ocean Transport & Trading Ltd.
<i>Masirah</i>	6.10.80	M. Polson	W. J. Headon, R. A. Brindle	P. D. Hartwell	Cunard S.S. Co. Ltd.
<i>Matangi</i>	17.12.80	M. Thwaite	M. Stenzel, C. Ward	M. J. Price	Cunard S.S. Co. Ltd.
<i>Matco Aton</i>	12.12.80	J. M. Bell	R. J. MacLeod, S. A. Jose, G. B. Robinson	I. R. Francis	Mobil Shipping Co. Ltd.
<i>Matco Thames</i>	10.6.80	J. M. Bell	A. G. Lane, C. W. Pierce, M. Elvin	E. W. Harle	Mobil Shipping Co. Ltd.
<i>Meadowbank</i>	•	E. T. Reese	D. E. Ginder, B. K. Ward	T. Kucharski	Bank Line Ltd.
<i>Melampus</i>	2.3.81	D. Howe	S. M. Regan, P. A. G. Sambrook, M. G. Robson	P. D. Stapleton	Ocean Transport & Trading Ltd.
<i>Mentor</i>	14.1.81	S. A. McInnes	G. Russell, D. Morrison	D. MacKay	Ocean Transport & Trading Ltd.
<i>Merzario Hispania</i>	25.2.81	J. B. Clemenson		S. Myland	Denholm MacLay Co. Ltd.
<i>Methane Princess</i>	24.2.81	M. J. Goddard			Shell Tankers (U.K.) Ltd.
<i>Methane Progress</i>	22.1.81	C. Oxley			Shell Tankers (U.K.) Ltd.
<i>Morant</i>	4.12.80	G. Spikins			Fyffes Group Ltd.
<i>Moraybank</i>	27.11.80	W. W. Davies			Bank Line Ltd.
<i>Myrmidon</i>	•	- Timbrell			Ocean Transport & Trading Ltd.

Selected Ships (contd.)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Naticina</i> ..	25.9.80	D. Evans ..	S. J. Hailwood ..	D. McCallum ..	Shell Tankers (U.K.) Ltd.
<i>Nedlloyd Bounty</i> ..	..	A. I. McKinnon ..	A. Morris, M. Masters, M. L. Russell ..	P. Fieldhouse ..	Sea Containers (Chartering) Ltd.
<i>New Westminster City</i> ..	26.6.80	D. C. Griffith-Jones ..	H. D. Johnson, E. Bingley, D. J. A. Nicholl ..	R. McInnes ..	Sir Wm. Reardon Smith & Sons Ltd.
<i>Nordic Commander</i> ..	16.10.80	J. Blaber ..	D. M. Russell, R. O. C. Smith ..	G. B. Randall ..	J. & J. Denholm Ltd.
<i>Norman Lady</i> ..	22.1.81	J. W. Murray ..	C. K. Finch, G. C. Durward-Akhurst, H. J. Norton ..	P. B. Conboy ..	Burries Marks Ltd.
<i>Norse Marshal</i> ..	24.1.75	A. Barker ..	N. Stark, H. Syed ..	G. C. Graham ..	Harrison (Clyde) Ltd.
<i>Opalia</i> ..	28.11.80	R. Jeffrey ..	M. J. Honey, D. R. Salmon ..	M. Davies ..	Shell Tankers (U.K.) Ltd.
<i>Orduna</i> ..	21.8.80	S. D. Gibson ..	C. L. Chilcott, K. Thompson, M. Eden-Smith ..	..	Furness Withy (General Shipping) Ltd.
<i>Oropesa</i> ..	27.1.81	T. J. Sax ..	S. Clarke, P. Green ..	W. Macartney ..	Furness Withy (General Shipping) Ltd.
<i>Oroya</i> ..	19.11.80	G. E. Turner ..	M. P. Brooks, T. F. Hill, P. M. Gregson ..	J. Sheehan ..	Furness Withy (General Shipping) Ltd.
<i>Osaka Bay</i> ..	31.12.80	J. E. Webb ..	K. D. Campbell, K. J. Owen ..	D. H. Storar ..	Ocean Transport & Trading Ltd.
<i>Overseas Adventurer</i> ..	5.3.81	D. G. Scourfield ..	M. Pitt ..	D. Jakobauderstroht ..	London & Overseas Freighters Ltd.
<i>Overseas Argonaut</i> ..	5.2.81	E. G. Humby ..	M. C. Littlewood, S. Tierny ..	R. C. Briggs ..	London & Overseas Freighters Ltd.
<i>Pacific Crane</i> ..	10.2.81	T. Langstaff ..	J. M. Petty, P. A. Booker, J. M. Miller ..	G. O. Auld ..	James Fisher & Sons Ltd.
<i>Pacific Fisher</i> ..	14.1.81	I. J. Groundwater ..	A. W. Cheetham, D. Farmer, P. G. Hobson ..	D. R. Woods ..	James Fisher & Sons Ltd.
<i>Pacific Swan</i> ..	17.12.80	J. T. Langstaff ..	E. J. Dumazel, M. Grimshaw, D. Marr ..	A. Price ..	James Fisher & Sons Ltd.
<i>Partula</i> ..	9.7.79	L. J. Walton ..	D. M. Jones, G. Dunlop, A. Smith ..	D. Gunning ..	Shell Tankers (U.K.) Ltd.
<i>Patroclus</i> ..	17.2.81	D. Hayward ..	A. R. Porter, S. Ackland ..	P. M. S. Nee ..	Ocean Transport & Trading Ltd.
<i>Pholas</i> ..	25.11.80	J. McKeown ..	K. G. H. Trevanion, R. J. Hughes ..	R. J. Ashworth ..	Coe-Metcalf Shipping Ltd.
<i>Phronitis</i> ..	31.12.80	D. S. Walker ..	I. Cumming, V. L. Mitchell, I. P. MacCormac ..	J. D. C. Lawrie ..	Ocean Transport & Trading Ltd.
<i>Pikebank</i> ..	6.3.81	R. F. Whitehead ..	W. Tullock, A. D. Welch ..	..	Bank Line Ltd.
<i>Pole Star</i> ..	3.1.79	N. Morrison ..	G. Nicholls, S. Lister ..	..	Northern Lighthouse Board
<i>Pollenger</i> ..	4.11.80	R. J. Pilley ..	A. D. Urwin, A. J. Howe, N. A. D. Wilson ..	J. L. Spanner ..	P. & O. S.N. Co.
<i>Pomella</i> ..	9.2.81	S. J. Cutler ..	R. J. Elliott, M. Clarke ..	T. M. Summers ..	Shell Tankers (U.K.) Ltd.
<i>Port Alberni City</i> ..	17.2.81	T. R. McNulty ..	J. H. Howe, P. A. Pettitt, J. A. Richardson ..	I. F. Bullock ..	Sir Wm. Reardon Smith & Sons Ltd.
<i>Port Caroline</i> ..	16.10.80	A. J. L. Smith ..	D. R. Moody, M. S. Hughes, J. R. Hooper ..	P. Henry ..	Cunard S.S. Co. Ltd.
<i>Port Chalmers</i> ..	29.12.80	C. D. Croall ..	L. A. Prescott, A. A. Field, P. Bullard ..	D. Reilly ..	Cunard S.S. Co. Ltd.
<i>Prince Rupert City</i> ..	12.2.81	D. Jack ..	S. Trundle, P. Rentell, W. McKay ..	R. Miller ..	Sir Wm. Reardon Smith & Sons Ltd.
<i>Queen Elizabeth 2</i> ..	4.12.80	R. H. Arnott ..	..	D. Butterworth ..	Cunard S.S. Co. Ltd.
<i>Ravenscraig</i> ..	29.10.80	F. Stuart ..	P. M. Beggs, C. C. Woodward, L. J. Fletcher ..	J. A. McKay ..	Sir R. Ropner & Co. Ltd.
<i>Remuera Bay</i> ..	31.12.80	J. S. Thorpe ..	D. L. Haynes, D. J. R. Manson, N. D. R. Mitchell ..	W. Kay ..	Container Fleets Ltd.
<i>Resolution Bay</i> ..	10.11.80	G. C. Barrett ..	P. S. D. Worrall, D. S. MacFarlane ..	D. Steel ..	Container Fleets Ltd.
<i>Retriever</i> ..	9.5.79	J. H. Killick ..	A. Cobain, D. Armstrong, E. H. Dillen ..	A. W. T. Camp ..	Cable & Wireless Ltd.
<i>Reynolds</i> ..	25.11.80	G. Murray ..	J. Wilson ..	..	Bolton S.S. Co. Ltd.
<i>Ringnes</i> ..	20.11.80	M. Meyer ..	..	..	Jebsons (U.K.) Ltd.

<i>Riverbank</i>	..	..	..	P. H. Grist	..	..	M. J. West, M. Waight, N. R. Barnaby	..	..	M. Price	..	Bank Line Ltd.
<i>Riverina</i>	..	..	..	D. Luff	..	..	T. Bowis, M. Warrior, J. G. Sapsford	..	..	M. F. Lavan	..	Furness Withy (General Shipping) Ltd.
<i>Roachbank</i>	..	..	..	W. H. Martin	..	..	M. J. Norris, N. J. Harvey	..	..	R. E. Tucker	..	Bank Line Ltd.
<i>Rockhampton Star</i>	..	..	..	H. Owen	..	..	D. Darlington, T. Green	..	..	J. A. Foreman	..	Blue Star Line Ltd.
<i>Roebuck</i>	..	..	..	W. Newport	..	..	J. D. Clark, P. Quayle, M. Bishop	..	..	J. R. Dekieffe	..	Furness Withy (General Shipping) Ltd.
<i>Rounton Grange</i>	..	..	..	H. E. Hoyle	..	..	R. M. Frederick, J. D. Gray, M. A. Smith	..	..	J. T. Miller	..	Furness Withy (General Shipping) Ltd.
<i>Royal Prince</i>	..	..	..	H. Nixon	..	..	M. Swann, A. H. Clark, D. Smith	..	..	E. Armitage	..	Furness Withy (General Shipping) Ltd.
<i>Rubens</i>	..	..	..	I. Woodier	..	..	A. Watkins, R. Avenin, E. Miles	..	..	J. G. Hull	..	Bolton Steam Shipping Co. Ltd.
<i>Ruddbank</i>	..	..	..	J. Steel	..	..	G. A. Foster, M. B. Hannon, A. M. Weale, B. W. Watson	..	..		..	Bank Line Ltd.
<i>St. Edmund</i>	..	..	..	W. A. King	..	..	D. Coombs, M. J. Collins, L. Roskell	..	..	M. D. Horn	..	British Rail
<i>St. George</i>	..	..	..	H. Keeble	..	..	M. D. Horn, P. J. Kelley, R. J. May	..	..	K. Parsons	..	British Rail
<i>St. Helena</i>	..	..	..	R. W. Wyatt	..	..	J. G. Pearce, D. A. Whcal, D. N. R. Roberts	..	..	R. A. Wilson	..	Curnow Shipping Ltd.
<i>St. Jason</i>	..	..	..	A. Ball	..	..	H. G. Pask	..	..	D. R. Egerton	..	T. Hamling & Co. Ltd.
<i>Samaria</i>	..	..	..	J. G. Rosie	..	..	G. H. Rees, J. D. Cook, C. S. Kingston	..	..	R. Holmes	..	Cunard S.S. Co. Ltd.
<i>Saxonia</i>	..	..	..	C. R. Knight	..	..	K. E. Eunson, P. J. Hyde-Linaker, D. Knight	..	..	L. Kesson	..	Cunard S.S. Co. Ltd.
<i>Scotia</i>	..	..	..	J. McBride	..	..	I. C. McLeod	..	..		..	Department of Agriculture & Fisheries for Scotland
<i>Scottish Eagle</i>	..	..	..	O. Barnsley	..	..	P. D. Hall, J. C. Smith, J. E. Dingle	..	..	P. Boyle	..	Cayzer Irvine Shipping Co. Ltd.
<i>Scottish Lion</i>	..	..	..	A. Terras	..	..	A. McCulloch, I. Ross, H. Cameron	..	..	J. Dawson	..	Cayzer Irvine Shipping Co. Ltd.
<i>Scythia</i>	..	..	..	D. Moore	..	..	J. J. Dibben, S. G. Millar	..	..	M. Kitt	..	Cunard S.S. Co. Ltd.
<i>Seaforth Clansman</i>	..	..	..	J. Ritchie	..	..	J. Sabourn, G. Henderson	..	..	W. Hamerton	..	Seaforth Maritime Ltd.
<i>Semac I</i>	..	..	..	J. Dobson	..	..	J. M. Rigden, T. M. Armstrong	..	..	J. Mercer	..	Seamac Services
<i>Serenia</i>	..	..	..	K. Bramley	..	..	I. W. Spikings, L. P. V. Des Landes, B. F. Hawkins	..	..	R. Holmes	..	Shell Tankers (U.K.) Ltd.
<i>Servia</i>	..	..	..	J. G. Whyte	..	..	R. B. Chambelein, J. T. Morse, P. Coombs	..	..		..	Cunard S.S. Co. Ltd.
<i>Shackleton</i>	..	..	..	S. D. Mayl	..	..		..	..		..	Natural Environment Research Council
<i>Sherbro</i>	..	..	..	S. F. Garside	..	..	P. A. Cripps, J. D. Mountain	..	..	R. Buckles	..	Ocean Transport & Trading Ltd.
<i>Shetland Service</i>	..	..	..	T. Orford	..	..	J. Lock, G. B. Hall, E. Pringle	..	..		..	Offshore Marine Ltd.
<i>Shonga</i>	..	..	..	D. Graham	..	..	M. S. Middlebrook, D. K. MacLeod, J. Summerill	..	..	R. McSorley	..	Ocean Transport & Trading Ltd.
<i>Silverford</i>	..	..	..	N. Tuddenham	..	..	N. R. Telfer, M. Holbrook, D. Mathews	..	..	E. Fair	..	Silver Line Ltd.
<i>Silvermain</i>	..	..	..	M. J. Crawford	..	..	G. S. Rolls, J. J. Millar, J. D. Bector	..	..	P. Dierden	..	Silver Line Ltd.
<i>Sincerity</i>	..	..	..	J. J. Myles	..	..	N. B. H. Skinner, R. C. Ross	..	..		..	F. T. Everard & Sons Ltd.
<i>Singularity</i>	..	..	..	D. W. Anderson	..	..	P. G. Powell, C. J. Blane	..	..		..	F. T. Everard & Sons Ltd.
<i>Strand</i>	..	..	..	W. Hare	..	..	A. P. Yates, R. M. Kempson, G. M. Gardner	..	..	D. J. Tulloch	..	Irano-British Ship Service Co. Ltd.
<i>Snow Ball</i>	..	..	..	R. Reay	..	..	A. W. Humber	..	..	T. Bridger	..	Salen (U.K.) Ship Management Ltd.
<i>Snow Hill</i>	..	..	..	W. Lockie	..	..	J. Pryce, E. Allison, R. Hughes	..	..	R. W. Thirlby	..	Salen (U.K.) Ship Management Ltd.
<i>Sokolo</i>	..	..	..	D. Graham	..	..	M. M. A. Evans, R. I. Smart, J. Calvin	..	..	W. H. Cartwright	..	Ocean Transport & Trading Ltd.
<i>Southgate</i>	..	..	..	F. H. Woolias	..	..	A. Palmer, P. A. Brown, P. R. Tait	..	..	C. M. Jackson	..	Turnbull Scott Management Ltd.
<i>Southland Star</i>	..	..	..	A. J. Cheshire	..	..	D. Turney, E. Lyon, D. Craddock	..	..	G. Waller	..	Blue Star Line Ltd.
<i>Speciality</i>	..	..	..	A. C. Duncan	..	..	P. V. Lowery, B. R. Cox, T. B. Healey	..	..		..	F. T. Everard & Sons Ltd.
<i>Spey Bridge</i>	..	..	..	J. D. Robinson	..	..	P. M. Fowler, M. G. Hancock, J. M. Gibbs	..	..		..	Silver Line Ltd.
<i>Spraynes</i>	..	..	..	A. M. Smart	..	..	P. Skelton	..	..	S. R. Chalkley	..	Jebsens (U.K.) Ltd.

Selected Ships (*contd.*)

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Staffordshire</i>	•	R. C. Middleton	J. Mallett, A. Mortinsen, M. E. Ashcroft	L. T. Lynn	Bibby Line Ltd.
<i>Star Blackford</i>	31.12.80	R. B. Middleton	P. M. S. Turner, T. Kent, R. McLure	D. W. MacIntyre	Blandford Shipping Co. Ltd.
<i>Star Bulford</i>	16.10.80	R. S. Beswick	B. P. Sinden, R. Burns, R. G. Lovegrove	J. Meaker	Blandford Shipping Co. Ltd.
<i>Star World</i>	2.12.80	P. A. Chadwick	P. Cooney, K. W. Kwan, C. Y. Lit	S. A. Mehdi	Marine Navigation Co. Ltd.
<i>Starman Anglia</i>	31.12.80	P. W. Hutchinson	C. Holmes, C. O. Brown, D. Leech	F. G. Huggett	Blue Star Line Ltd.
<i>Stena Oceanica</i>	•	T. Rowat		- Sheridan	Denholm MacLay Co. Ltd.
<i>Stonegate</i>	28.1.81	S. B. Briggs	R. J. Hockham, N. J. White, C. E. Mamprin	S. Fallow	Turnbull Scott Management Ltd.
<i>Stonepool</i>	3.2.81	R. Gatiss	N. G. Thomas, J. Baxter, D. Wallis	J. Anderson	Sir R. Ropner & Co. Ltd.
<i>Strathdevon</i>	25.9.80	R. O. M. Wilson	M. S. Roberts, I. T. Blackley, C. Shelbourn	J. L. Kelly	P. & O. S.N. Co.
<i>Strathdink</i>	10.2.81	J. F. Milner	C. Bell, W. G. Hughes, E. G. Aitken		P. & O. S.N. Co.
<i>Strathdoon</i>	31.12.80	C. B. Cooke	J. C. Holmes, N. Davidson, C. Baker	D. M. Matheson	P. & O. S.N. Co.
<i>Strathduns</i>	29.10.80	I. McAllister	A. C. N. Wedge, J. Appadurai, S. White	N. W. Harrison	P. & O. S.N. Co.
<i>Stratheden</i>	16.12.80	M. H. Wilson	D. C. Skentelbery, A. Mackenzie, F. McGuire	A. M. Guest	P. & O. S.N. Co.
<i>Strathelgin</i>	10.12.80	A. Dorkins	N. T. L. Parkinson, C. Baker, D. Daniel	E. A. McKenny	P. & O. S.N. Co.
<i>Stratherron</i>	14.11.80	M. Robinson	D. Goodwin, H. T. Kyi, K. C. Riddick	M. McKenny	P. & O. S.N. Co.
<i>Strathesk</i>	16.7.80	A. M. Barker	A. J. Bairstow, A. R. Lindsay, I. F. Hannath	T. C. Baldwin	P. & O. S.N. Co.
<i>Strathetrick</i>	1.8.80	D. Foster	N. Maclean, T. U. Owen, N. W. Stephenson	G. C. England	P. & O. S.N. Co.
<i>Strathewe</i>	4.12.80	D. H. Roberts	J. B. Weston, R. C. Bloomfield	E. Marks	P. & O. S.N. Co.
<i>Streambank</i>	29.11.79	H. Barber	J. L. Edens	J. L. Baker	Bank Line Ltd.
<i>Sulisker</i>	•	D. R. Stevens	N. McInnes		Ministry of Agriculture, Fisheries & Food
<i>Summit</i>	23.7.80	J. S. Armitage	G. Amos, M. R. Irwin		F. T. Everard & Sons Ltd.
<i>Surrey</i>	10.10.80	P. Ramsay	A. K. Humphrey, D. Morton, C. Mitchell	A. L. Dobson	Ellerman Wilson Line Ltd.
<i>T. F. L. Jefferson</i>	30.5.80	N. A. MacDonald	F. C. Maciver, R. B. Kelly, D. McGregor	R. S. Bell	J. & J. Denholm Ltd.
<i>Tacoma City</i>	9.9.80	D. L. Bell	D. C. Toon, P. A. Bullard, H. D. Johnson	D. P. Bidmead	Sir Wm. Reardon Smith & Sons Ltd.
<i>Tantalus</i>	18.11.80	I. Webster	T. W. Roberts, W. Jemson, J. W. Stewart	A. D. Siggs	Ocean Transport & Trading Ltd.
<i>Tenchbank</i>	31.12.80	T. D. Scott	S. M. Wilkie, A. F. Drury, M. J. Sullivan	M. Hamraads	Bank Line Ltd.
<i>Texaco Brussels</i>	22.1.81	T. A. Page	N. E. S. Smith, D. J. Warner, G. J. Stevens	K. F. Kippen	Texaco Overseas Tankship (U.K.) Ltd.
<i>Texaco Gloucester</i>	14.1.80	J. Barr	K. Hazen, R. C. White	A. G. Cope	Texaco Overseas Tankship (U.K.) Ltd.
<i>Texaco Singapore</i>	16.4.80	H. D. East	T. P. Evans, M. C. M. Boyd, M. W. Bruce	S. R. Blackmore	Texaco Overseas Tankship (U.K.) Ltd.
<i>Thamesfield</i>	15.12.80	P. Hansen	D. Sim, E. W. Lyons	W. Beverley	Hunting & Sons Ltd.
<i>Timaru Star</i>	19.2.81	W. T. Pitcher	C. J. Furness, M. B. Roberts, A. T. Johns	E. Smith	Blue Star Line Ltd.
<i>Tokyo Bay</i>	31.12.80	J. M. Johnston	P. P. Van Bergen, E. D. Somes	P. A. Gooch	Ocean Transport & Trading Ltd.
<i>Tor Felicia</i>	•	M. McGee	D. McIver, D. Anderson	A. Rance	Tor Line Ltd.
<i>Tourmaline</i>	28.11.78	P. R. Thompson	P. E. Cormican		Wm. Robertson & Co. Ltd.
<i>Trinculo</i>	6.10.80	J. H. Russell		R. Milner	Bowring S.S. Co. Ltd.

<i>Troll Lake</i> ..	..	..	M. Thorp ..	D. McGregor, D. Duff ..	..	T. Warburton ..	J. & J. Denholm Ltd.
<i>Troll Park</i> ..	..	31.12.80	R. W. Cotter ..	E. W. Lauritsen, T. J. Puse, C. B. MacNiven ..	..	B. J. Dunniece ..	J. & J. Denholm Ltd.
<i>Trongate</i> ..	..	30.12.80	P. M. Cooper ..	F. N. T. Freeman, I. Foulkes ..	..	M. H. Stalker ..	Turnbull Scott Management Ltd.
<i>Troutbank</i> ..	..	3.3.81	B. J. Peterson ..	M. P. Donnelly, A. Watson, A. L. Jeffrey ..	..	K. Gibson ..	Bank Line Ltd.
<i>Uganda</i> ..	..	9.2.81	J. Clark ..	G. Goodway, P. J. Thornthwaite, R. M. Oliver ..	..	..	P. & O. S.N. Co.
<i>Valdria</i> ..	..	1.10.80	C. Kerr ..	I. Hutchinson, W. Barnes, J. Kirk ..	..	..	Harrisons (Clyde) Ltd.
<i>Vancouver Forest</i> ..	..	•	A. W. Blackie ..	F. Miller, F. C. McIver ..	..	A. J. Christopher ..	J. & J. Denholm Ltd.
<i>Vendee</i> ..	..	20.5.80	C. Prescott ..	R. R. Gemmell, D. J. Perry, G. Woolnough ..	..	M. J. A. McKenny ..	P. & O. S.N. Co.
<i>Victoria City</i> ..	..	19.2.81	G. Garlick ..	P. A. Bullard, J. Henderson ..	..	D. S. H. Thomson ..	J. & J. Denholm Ltd.
<i>Vosges</i> ..	..	17.1.80	A. Sugden ..	I. M. Overton, D. Morton, S. Monks ..	..	R. M. Clifford ..	Sir Wm. Reardon Smith & Sons Ltd.
<i>W. A. Mather</i> ..	..	13.2.81	T. L. Simpson ..	J. Small, M. R. Blease, P. K. Dobson ..	..	W. Handley ..	P. & O. S.N. Co.
<i>W. M. Neal</i> ..	..	9.2.81	P. Atkinson ..	L. N. Paul, J. H. Arton, M. Duce ..	..	R. V. Quennell ..	Canadian Pacific Steamships Ltd.
<i>Wadhurst</i> ..	..	6.10.80	A. R. Soulsby ..	R. K. Serem, J. G. B. Tyler ..	..	P. J. Cormican ..	Canadian Pacific Steamships Ltd.
<i>Wellington Star</i> ..	..	24.11.80	W. J. G. Jones ..	L. M. Colam, L. Henderson, M. Goodfellow ..	..	R. Thorburn ..	Stephenson Clark Ltd.
<i>Wellpark</i> ..	..	18.2.81	D. Dickson ..	K. P. Macinnes, H. O'Neill, P. Kilvington ..	..	M. C. Walsh ..	Blue Star Line Ltd.
<i>Welsh City</i> ..	..	4.12.80	O. J. T. Lindsay ..	R. K. Villars, I. C. Stutt, D. P. Kirley ..	..	N. C. Sanders ..	J. & J. Denholm Ltd.
<i>Welsh Voyager</i> ..	..	14.1.81	P. Baxter ..	N. Woodcock, G. Morgan, T. A. C. Baker ..	..	S. A. Potter ..	Sir Wm. Reardon Smith & Sons Ltd.
<i>Westra</i> ..	..	15.1.81	R. M. Mill-Irving ..	A. C. O'Riordan, J. Barkess ..	..	..	Welsh Overseas Freighters Ltd.
<i>Wild Cormorant</i> ..	..	29.7.80	..	..	..	..	Department of Agriculture & Fisheries for Scotland
<i>Wild Curlew</i> ..	..	20.11.80	J. S. Laidlaw ..	C. J. Duncan, B. J. Kirtley, P. C. Dyer ..	..	M. J. Ellis ..	P. & O. S.N. Co.
<i>Wild Flamingo</i> ..	..	22.1.81	R. Hodgson ..	C. J. Campbell, G. F. Everitt, M. Fowler ..	..	A. D. MacGillivray ..	P. & O. S.N. Co.
<i>Wild Fulmar</i> ..	..	12.1.81	R. C. Lister ..	R. M. Gonn, R. W. Gordon, R. G. Tull ..	..	D. Williams ..	P. & O. S.N. Co.
<i>Wild Gannet</i> ..	..	19.11.80	F. S. Angus ..	D. W. Jones, K. K. Sood, G. Lack ..	..	C. Anderson ..	P. & O. S.N. Co.
<i>Wild Grebe</i> ..	..	1.12.80	R. E. Lowther ..	K. W. Mulholland, P. Hornett ..	..	G. N. Basnett ..	P. & O. S.N. Co.
<i>Wild Mallard</i> ..	..	21.11.80	B. Austen-Smith ..	J. A. Kent, J. Potter, A. McCulloch ..	..	T. Clark ..	P. & O. S.N. Co.
<i>Wild Marlin</i> ..	..	29.7.80	F. S. Angus ..	G. F. Everitt, M. A. Cook, J. Mackenzie ..	..	E. Banham ..	P. & O. S.N. Co.
<i>Willine Toyo</i> ..	..	31.12.80	M. Thomson ..	N. R. Foster, D. Carpenter, A. D. G. Bell ..	..	M. P. Frankland ..	P. & O. S.N. Co.
<i>Willowbank</i> ..	..	12.1.81	P. Simpson ..	D. M. Russell, F. J. Tulloch ..	..	R. Marn ..	J. & J. Denholm Ltd.
<i>Wiltshire</i> ..	..	•	P. Blythway ..	J. D. Corking, J. P. Anthony, M. Blair ..	..	C. Penhaglion ..	Bank Line Ltd.
<i>Yorkshire</i> ..	..	10.2.81	W. A. D. Davies ..	J. W. Mallett, D. M. E. McGrath, G. D. Thomas, J. D. Akeroyd ..	..	P. Thomas ..	Bibby Line Ltd.
<i>Zinnia</i> ..	..	27.11.80	B. Rowlings ..	D. C. Morgan, A. D. Burnett, C. J. Slade ..	..	P. Stanway ..	Bibby Line Ltd.
	..	8.4.80	..	S. Alderson, M. Ainsley, H. Gates ..	..	J. E. B. Sams ..	Stag Line Ltd.

Supplementary Ships

NAME OF VESSEL	LAST RETURN RECEIVED	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Ardmore</i> ..	18.9.80	P. Leaver ..	T. Collins, D. Thurston, A. D. Price ..	T. Searle ..	P. & O. S.N. Co.
<i>Baltic Viking</i> ..	29.1.81	M. De Lacy ..	B. J. Saffery, J. Telfer, R. Woodford ..	J. Collins ..	United Baltic Corp. Ltd.
<i>Barbara Weston</i> ..	•	J. K. Schofield ..	G. C. Holland, R. Sangston ..		Weston Shipping Co. Ltd.
<i>Cairncarrrier</i> ..	•	G. W. Horn ..	A. Fischbacher, J. L. A. Robinson ..		Furness Withy (General Shipping) Ltd.
<i>Caroline Weston</i> ..	25.2.81	J. P. K. Van Der Ham ..	D. J. McPhail, E. D. O. Van Lennep ..		Weston Shipping Co. Ltd.
<i>Cast Petrel</i> ..	•				J. & J. Denholm Ltd.
<i>Dane</i> ..	•	J. Lilley ..	I. Brewell ..		British United Trawlers Ltd.
<i>Earl Godwin</i> ..	11.9.80	M. Mills ..	P. Durkin, J. Wallbridge ..		British Rail
<i>Kirkella</i> ..	•	W. Brettal ..	T. Scannel ..	P. A. Lloyd ..	J. Marr & Sons Ltd.
<i>Oil Hustler</i> ..	•	N. Brown ..	L. Elms ..		Ocean Incheape Ltd.
<i>Oil Supplier</i> ..	•	C. Cunningham ..	G. J. S. Ives, M. Kirk ..		Ocean Incheape Ltd.
<i>Princess Anne</i> ..	24.6.80	P. E. Craven ..	C. Sheen ..		Boston Deep Sea Fisheries Ltd.
<i>Regents Park</i> ..	•	A. MacKinnon ..	D. Galbraith, W. Taylor ..		Denholm MacLay Co. Ltd.
<i>Rocknes</i> ..	13.12.77	J. G. Sleight ..	W. Brackenbridge, D. P. Platt, E. G. Everingham ..	P. J. Linnett ..	Jebsons (U.K.) Ltd.
<i>St. Jasper</i> ..	10.9.79	E. Johnson ..	K. Batty ..		T. Hamling & Co. Ltd.
<i>Selbydyke</i> ..	3.3.81	J. Gray ..	G. D. Goulding, M. H. C. Lunn, S. P. Harrison ..		Klondyke Shipping Co. Ltd.
<i>Tor Caledonia</i> ..	•	T. Miller ..	- Rodgers, - Normandale ..	R. Davies ..	Tor Line Ltd.
<i>Vegaman</i> ..	19.9.78	M. Blight ..	S. G. Turner, M. C. Jones ..	L. P. Greeve ..	Rowbotham Tankships Ltd.
<i>Viking Valiant</i> ..	5.11.80	C. E. Walford ..	D. Knight, J. Milner ..	G. I. Petrie ..	Townsend-Thoresen Car Ferries Ltd.
<i>Viking Venturer</i> ..	7.1.81	A. F. Bonehill ..	B. C. Bull, D. E. Beresford, W. T. Field ..	P. C. Morris ..	Townsend-Thoresen Car Ferries Ltd.

Light-vessels

NAME OF VESSEL	MASTER
<i>Channel</i>	R. J. Owen, A. Fowler
<i>Dowsing</i>	A. S. Richards, F. T. Turner
<i>East Goodwin</i>	A. Everett, L. A. Horn
<i>Falls</i>	A. H. Robinson, C. E. Woods
<i>Humber</i>	F. W. Grice, S. F. Goose
<i>Newarp</i>	L. R. Long, G. A. Harris
<i>Royal Sovereign (Lt. Tower)</i>	R. N. P. Jeffers, W. G. Trebilcock
<i>St. Gowan</i>	W. J. Shearer, J. J. Spencer
<i>Seven Stones</i>	T. G. Northcott, R. W. Goddard
<i>Shipwash</i>	W. F. Dalby, R. Cadman
<i>Smith's Knoll</i>	J. Cockrill, F. Harrison
<i>South Rock</i>	
<i>Tongue</i>	F. Allen, B. W. Mead
<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>Arco Thames</i>	P. H. Phillips	A.B.C. (Marine) Ltd.
<i>Avalon</i>	R. M. Lidgate	British Rail
<i>Barra Head</i>	A. Alvis	Christian Salvesen (Shipping) Ltd.
<i>Beacon Point</i>	G. H. Cubbon	Christian Salvesen (Shipping) Ltd.
<i>Benvenue</i>	E. P. Gibb	Ben Line Steamers Ltd.
<i>Brenda</i>	R. Mill-Irving	Dept. of Agriculture & Fisheries for Scotland
<i>Brian Boroime</i>	J. Bakewell	British Rail
<i>Caledonian Princess</i>	E. M. Scott	British Rail
<i>Clansman</i>	— Ferrier	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	Furness Withy (General Shipping) Ltd.
<i>Dolphin Point</i>	J. Rendall	Ocean Transport & Trading Ltd.
<i>Dragon</i>	I. H. Leggatt	Southern Ferries Ltd.
<i>Earl William</i>	M. C. Mills	British Rail
<i>Emerald</i>	A. F. Wigham	Stephenson Clarke Shipping Ltd.
<i>Esso Clyde</i>	R. Rendell	Esso Petroleum Co. Ltd.
<i>Esso Fawley</i>	S. McCollin	Esso Petroleum Co. Ltd.
<i>Esso Mersey</i>	J. Smith	Esso Petroleum Co. Ltd.
<i>Esso Milford Haven</i>	J. Anderson	Esso Petroleum Co. Ltd.
<i>Esso Severn</i>	G. R. Rowe	Esso Petroleum Co. Ltd.
<i>Fort Point</i>	L. Buchanan	Christian Salvesen (Shipping) Ltd.
<i>Garrison Point</i>	L. Relton	Hudson S.S. Co. Ltd.
<i>Hebrides</i>	J. M. McQueen	Caledonia MacBrayne Ltd.
<i>Hilary Weston</i>	S. Pollock	Weston Shipping Ltd.
<i>L. M. Odin</i>	D. Thompson	Land & Marine Engineering Ltd.
<i>Mairi Everard</i>	— Mallon	F. T. Everard & Sons Ltd.
<i>Martindyke</i>	J. McCullough	Klondyke Shipping Co. Ltd.
<i>Midhurst</i>	B. J. Pratt	Stephenson Clarke Shipping Ltd.
<i>Modan</i>	J. Bott	Wm. Lindsay (Shipowners) Ltd.
<i>Mole Venture</i>	T. Pollit	C.M.S. Shipping Co. Ltd.
<i>Oswestry Grange</i>	A. Millie	Furness Withy (General Shipping) Ltd.
<i>Penelope Everard</i>	D. Stewart	F. T. Everard & Sons Ltd.
<i>Rhodri Mawr</i>	M. Morton	British Rail
<i>Rora Head</i>	G. MacKay	Christian Salvesen (Shipping) Ltd.
<i>St. Clair</i>	J. Gifford	P. & O. S.N. Co.
<i>St. Columba</i>	L. R. Evans	British Rail
<i>Shell Refiner</i>	S. Soady	Shell U.K. Ltd.
<i>Suavity</i>	J. A. Chapman	F. T. Everard & Sons Ltd.
<i>Suffolk Service</i>	R. Dawson	Offshore Marine Ltd.
<i>Sulven</i>	A. C. Free	Caledonia MacBrayne Ltd.
<i>Sumburgh Head</i>	A. Alvis	Christian Salvesen (Shipping) Ltd.
<i>Ulster Queen</i>	L. Broughton	Belfast S.S. Co. Ltd.
<i>Vigilant</i>	D. Rattary	Dept. of Agriculture & Fisheries for Scotland
<i>Wendy Weston</i>	P. Warberton	Weston Shipping Ltd.
<i>Whitegate</i>	G. A. Davidson	Turnbull Scott Management Ltd.
<i>Wilmington</i>	N. Ramsay	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 9.2.81)

NAME OF VESSEL	OWNER/MANAGER
<i>Advara</i>	Australia-West Pacific Line
<i>Al Khaleej</i>	Kuwait Shipping Co.
<i>Al Kuwait</i>	Kuwait Shipping Co.
<i>Al Yassrah</i>	Rural Exporters and Traders Pty. Ltd.
<i>Andros</i>	Jumbo Line
<i>Anro Australia</i>	Australian National Line
<i>Arafura</i>	Australia-Japan Container Line
<i>Ariake</i>	Australia-Japan Container Line
<i>Aurore</i>	Weeks Ship Hong Kong Ltd.
<i>Australia Star</i>	Blue Star Line
<i>Australian Emblem</i>	Australian National Line
<i>Australian Endeavour</i>	Australian National Line
<i>Australian Enterprise</i>	Australian National Line
<i>Australian Escort</i>	Australian National Line
<i>Australian Explorer</i>	Australian National Line
<i>Australian Exporter</i>	Australian National Line
<i>Australian Pioneer</i>	Australian National Line
<i>Australian Progress</i>	Australian National Line
<i>Australian Prospector</i>	Australian National Line
<i>Australian Venture</i>	Australian National Line
<i>Baron MacLay</i>	Scottish Ship Management Ltd.
<i>Baron Pentland</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>Brisbane Trader</i>	Australian National Line
<i>Cambridgeshire</i>	Bibby Line
<i>Cape Don</i>	Department of Transport
<i>Cape Hawke</i>	British Phosphate Commission
<i>Cape Moreton</i>	Department of Transport
<i>Cape Pillar</i>	Department of Transport
<i>Centaur</i>	Eastern Fleets Ltd.
<i>Coral Chief</i>	China Navigation Co. Ltd.
<i>Curtis Capricorn</i>	Clutha Development Pty Ltd.
<i>Curtis Oceanic</i>	Clutha Development Pty Ltd.
<i>Danny 'F'</i>	Rachrid Fares Enterprises Pty Ltd.
<i>Darwin Trader</i>	Australian National Line
<i>Doha</i>	Patridis Agencies Pty Ltd.
<i>Eastern Academy</i>	Burns Phillip Co.
<i>Eigamoiya</i>	Nauru Pacific Shipping Line
<i>Empress of Australia</i>	Australian National Line
<i>Eugene McDermott</i>	World Wide Surveys Ltd.
<i>Forthbank</i>	Bank Line Ltd.
<i>Flinders Range</i>	Australian National Line
<i>Gerrigong</i>	W.A. State Shipping Co. Ltd.
<i>Iron Arnhem</i>	Broken Hill Pty Co. Ltd.
<i>Iron Baron</i>	Broken Hill Pty Co. Ltd.
<i>Iron Bogong</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>John Burke</i>	John Burke Pty Ltd.
<i>Kimberley</i>	W.A. State Shipping Service
<i>Khalij Express</i>	Gulf Ship Lines
<i>Kota Bali</i>	Pacific International
<i>Kristinbakke</i>	Knutsen Line
<i>Karunda</i>	Elder Prince Marine
<i>Lalandia</i>	Scan Austral East Asiatic Shipping
<i>Lake Hume</i>	Australian National Line
<i>Linda Clausen</i>	Clausen Shipping Co.
<i>Meadowbank</i>	Bank Line Ltd.

Australia (contd.)

NAME OF VESSEL	OWNER/MANAGER *
Mount Newman	Australian National Line
Melbourne Trader	Australian National Line
Mukarish Althani	Kuwait Shipping Co.
Nimos	New Guinea Australia Line
Nuigini Express	New Guinea Express Lines Ltd.
Nyanda	W.A. State Shipping Service
Ormiston	C.S.R. Co. Ltd.
Papuan Chief	Swire Pacific Ship Management Ltd.
Persia	Rachrid Fares Enterprises Pty Ltd.
Ravenswood	Furness Withy Ltd.
Regional Endeavour	Seltrust Mining Co. Pty Ltd.
Sea Princess	P. & O. Australia Pty Ltd.
Sedco 471	Phillips Australia Oil Co.
Sid McGrath	John Burke Pty Ltd.
Soela	C.S.I.R.O.
Sprightly	T. Kerrevar & Son Pty Ltd.
Strathmay	P. & O. Australia Pty Ltd.
Strathmeigle	P. & O. Australia Pty Ltd.
Strathmore	P. & O. Australia Pty Ltd.
Strathmuir	P. & O. Australia Pty Ltd.
Surenes	Jebsen Line
Sydney Trader	Australian National Line
Tombarra	Scan Austral Asiatic Shipping
Tropic Star	Tropic Island Shipping Co.
Tourcoing	Scan Austral Asiatic Shipping
Wild Rover	Singapore Strait Pilotage Co.
Yarra River	Australian National Line

HONG KONG (Information dated 4.3.81)

NAME OF VESSEL	OWNER/MANAGER
<i>Asian Jade</i>	Swire Shipping (Agencies) Ltd.
<i>Asian Pearl</i>	Swire Shipping (Agencies) Ltd.
<i>Barber Perseus</i>	Barber Wilhelmsen Agencies Ltd.
<i>Barber Tonsberg</i>	Barber Wilhelmsen Agencies Ltd.
<i>Chengtui</i>	Swire Shipping (Agencies) Ltd.
<i>Cheongwind</i>	Shun Cheong S.N. Co. Ltd.
<i>Coral Princess</i>	Swire Shipping (Agencies) Ltd.
<i>Eastern Muse</i>	The Indo-China S.N. Co. (H.K.) Ltd.
<i>Funing</i>	Swire Shipping (Agencies) Ltd.
<i>Halldis</i>	Thoresen & Co. Ltd.
<i>Hongkong Container</i>	Hong Kong Export Lines Ltd.
<i>Hugheverett</i>	Everett Steamship Corp. S/A
<i>IBN Malik</i>	United Arab Shipping Co.
<i>Kwangsi</i>	Swire Shipping (Agencies) Ltd.
<i>Kweichow</i>	Swire Shipping (Agencies) Ltd.
<i>Lamma Island</i>	Hong Kong Islands Shipping Co. Ltd.
<i>Maersk Tempo</i>	Maersk Line (H.K.) Ltd.
<i>Manoloeverett</i>	Everett Steamship Corp. S/A
<i>Melampus</i>	Barber Wilhelmsen Agencies Ltd.
<i>Memnon</i>	Barber Wilhelmsen Agencies Ltd.
<i>Menelaus</i>	Barber Wilhelmsen Agencies Ltd.
<i>Mui Kim</i>	Hong Kong Borneo Shipping Co. Ltd.
<i>Oriental Ambassador</i>	Hong Kong Export Lines Ltd.
<i>Oriental Chief</i>	Hong Kong Export Lines Ltd.
<i>Oriental Expert</i>	Hong Kong Export Lines Ltd.
<i>Oriental Venture</i>	Hong Kong Export Lines Ltd.
<i>Pabloeverett</i>	Everett Steamship Corp. S/A
<i>Pacific Courier</i>	Hong Kong Export Lines Ltd.
<i>Poyang</i>	Swire Shipping (Agencies) Ltd.
<i>Ramoneverett</i>	Everett Steamship Corp. S/A
<i>Singwind</i>	Shun Cheong S.N. Co. Ltd.
<i>Strathfife</i>	P. & O. Strath Services
<i>Strathfyne</i>	P. & O. Strath Services
<i>Tai Shun</i>	Agriculture & Fisheries Dept., H.K. Govt.
<i>Taronga</i>	Barber Ship Management Ltd.
<i>Thomaseverett</i>	Everett Steamship Corp. S/A
<i>Torrens</i>	Barber Ship Management Ltd.
<i>Victoria I</i>	Magallanes Investment Inc.
<i>Willine Taru</i>	Barber Ship Management Ltd.

INDIA (Information dated 1.1.81)

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>Harshavardhan</i>	Shipping Corporation of India
<i>Indian Security</i>	India Steamship Co.
<i>Jalazad</i>	Scindia Steam Navigation Co.
<i>Jaladharna</i>	Scindia Steam Navigation Co.
<i>Jaladhanya</i>	Scindia Steam Navigation Co.
<i>Jaladhruv</i>	Scindia Steam Navigation Co.
<i>Jalagirja</i>	Scindia Steam Navigation Co.
<i>Jalayoti</i>	Scindia Steam Navigation Co.
<i>Jalakanta</i>	Scindia Steam Navigation Co.
<i>Jalakirti</i>	Scindia Steam Navigation Co.
<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>Jalarajan</i>	Scindia Steam Navigation Co.
<i>Jalayamini</i>	Scindia Steam Navigation Co.
<i>Laxmi Sagar</i>	Parekh Ocean Carriers
<i>Lok Sevak</i>	Mogul Line Ltd.
<i>Nancowry</i>	Shipping Corporation of India
<i>Ratna Nandini</i>	Ratnakar Shipping Co.
<i>Shompen</i>	Shipping Corporation of India
<i>State of Assam</i>	Shipping Corporation of India
<i>State of Andhra Pradesh</i>	Shipping Corporation of India
<i>State of Bihar</i>	Shipping Corporation of India
<i>State of Maharashtra</i>	Shipping Corporation of India
<i>State of Nagaland</i>	Shipping Corporation of India
<i>State of Punjab</i>	Shipping Corporation of India
<i>State of Tamil Nadu</i>	Shipping Corporation of India
<i>State of Tr. Cochin</i>	Shipping Corporation of India
<i>State of Uttar Pradesh</i>	Shipping Corporation of India
<i>Vishva Anurag</i>	Shipping Corporation of India
<i>Vishva Maya</i>	Shipping Corporation of India
<i>Vishva Prabha</i>	Shipping Corporation of India
<i>Vishva Sudha</i>	Shipping Corporation of India
<i>Vishnu Sagar</i>	Parekh Ocean Carriers
Supplementary Ships:	
<i>Ajanta</i>	Shipping Corporation of India
<i>Al Gilani</i>	Allanna Line Ltd.
<i>Annapoorna</i>	Shipping Corporation of India
<i>Anupama</i>	Shipping Corporation of India
<i>Apj Ambika</i>	Apeejay Lines Ltd.
<i>Apj Anand</i>	Apeejay Lines Ltd.
<i>Arunachala Pradesh</i>	Shipping Corporation of India
<i>Aradhana</i>	Shipping Corporation of India
<i>Archana</i>	Shipping Corporation of India
<i>Bailadila</i>	Shipping Corporation of India
<i>Bellary</i>	Shipping Corporation of India
<i>Barauni</i>	Shipping Corporation of India
<i>Bhagat Singh</i>	Shipping Corporation of India
<i>Bhaskar</i>	Shipping Corporation of India
<i>B.R. Ambedkar</i>	Shipping Corporation of India
<i>Chanakya</i>	Shipping Corporation of India
<i>Chatrapati Shivaji</i>	Shipping Corporation of India
<i>Chennai Jayam</i>	South India Shipping Corporation
<i>Chennai Muyarshi</i>	South India Shipping Corporation
<i>Chennai Perumai</i>	South India Shipping Corporation
<i>Chennai Ookkam</i>	South India Shipping Corporation
<i>Chennai Selvam</i>	South India Shipping Corporation
<i>Desh Bandhu</i>	Shipping Corporation of India
<i>Desh Deep</i>	Shipping Corporation of India
<i>Diglipur</i>	Shipping Corporation of India
<i>Devaraya</i>	Shipping Corporation of India
<i>Faulad Sardar</i>	Faulad Line Ltd.
<i>Indian Endurance</i>	India Steamship Co.

India (contd.)

NAME OF VESSEL	OWNER
<i>Indian Explorer</i>	India Steamship Co.
<i>Indian Faith</i>	India Steamship Co.
<i>Indian Fame</i>	India Steamship Co.
<i>Indian Fraternity</i>	India Steamship Co.
<i>Indian Freedom</i>	India Steamship Co.
<i>Indian Grace</i>	India Steamship Co.
<i>Indian Industry</i>	India Steamship Co.
<i>Indian Progress</i>	India Steamship Co.
<i>Indian Prosperity</i>	India Steamship Co.
<i>Indian Triumph</i>	India Steamship Co.
<i>Indian Tribune</i>	India Steamship Co.
<i>Indian Trust</i>	India Steamship Co.
<i>Indian Valour</i>	India Steamship Co.
<i>Indian Venture</i>	India Steamship Co.
<i>Jag Anjali</i>	Great Eastern Shipping Co.
<i>Jag Dev</i>	Great Eastern Shipping Co.
<i>Jag Dharma</i>	Great Eastern Shipping Co.
<i>Jag Doot</i>	Great Eastern Shipping Co.
<i>Jag Jiwan</i>	Great Eastern Shipping Co.
<i>Jag Jyoti</i>	Great Eastern Shipping Co.
<i>Jag Manek</i>	Great Eastern Shipping Co.
<i>Jag Prakash</i>	Great Eastern Shipping Co.
<i>Jag Rekha</i>	Great Eastern Shipping Co.
<i>Jag Shakti</i>	Great Eastern Shipping Co.
<i>Jag Shanti</i>	Great Eastern Shipping Co.
<i>Jagat Neta</i>	Dempo Steamship Co.
<i>Jagat Swamini</i>	Dempo Steamship Co.
<i>Jagat Samrat</i>	Dempo Steamship Co.
<i>Jagat Vijeta</i>	Dempo Steamship Co.
<i>Jaynarayan Vyas</i>	Shipping Corporation of India
<i>Jameela</i>	Kerala Lines Ltd.
<i>Jalabala</i>	Scindia Steam Navigation Co.
<i>Jaladharati</i>	Scindia Steam Navigation Co.
<i>Jaladhir</i>	Scindia Steam Navigation Co.
<i>Jaladurga</i>	Scindia Steam Navigation Co.
<i>Jaladuta</i>	Scindia Steam Navigation Co.
<i>Jalagodavari</i>	Scindia Steam Navigation Co.
<i>Jalagomati</i>	Scindia Steam Navigation Co.
<i>Jalavijaya</i>	Scindia Steam Navigation Co.
<i>Jalakala</i>	Scindia Steam Navigation Co.
<i>Jalakendra</i>	Scindia Steam Navigation Co.
<i>Jalamani</i>	Scindia Steam Navigation Co.
<i>Jalamurugan</i>	Scindia Steam Navigation Co.
<i>Jalamatsya</i>	Scindia Steam Navigation Co.
<i>Jalamayur</i>	Scindia Steam Navigation Co.
<i>Jalamohan</i>	Scindia Steam Navigation Co.
<i>Jalamokambi</i>	Scindia Steam Navigation Co.
<i>Jalamorari</i>	Scindia Steam Navigation Co.
<i>Jalapankhi</i>	Scindia Steam Navigation Co.
<i>Jalarashmi</i>	Scindia Steam Navigation Co.
<i>Jalaratna</i>	Scindia Steam Navigation Co.
<i>Jalatarang</i>	Scindia Steam Navigation Co.
<i>Jalatapi</i>	Scindia Steam Navigation Co.
<i>Jalavijaya</i>	Scindia Steam Navigation Co.
<i>Jalayamuna</i>	Scindia Steam Navigation Co.
<i>Jalavallabh</i>	Scindia Steam Navigation Co.
<i>Janapriya</i>	Mogul Line Ltd.
<i>Jana Vijaya</i>	Mogul Line Ltd.
<i>Jawaharlal Nehru</i>	Shipping Corporation of India
<i>Jay Ambika</i>	Jayashree Shipping Co.
<i>Kanchan Junga</i>	Shipping Corporation of India
<i>Kamishka</i>	Shipping Corporation of India
<i>Karnataka</i>	Karnataka Shipping Co.
<i>Kedarnath</i>	Himalaya Shipping Co.
<i>Lal Bahadur Shastri</i>	Shipping Corporation of India
<i>Laxmi</i>	Shipping Corporation of India
<i>Lokamanya Tilak</i>	Shipping Corporation of India
<i>Lok Nayak</i>	Mogul Line Ltd.
<i>Lok Manya</i>	Mogul Line Ltd.
<i>Lok Palak</i>	Mogul Line Ltd.
<i>Lok Sahayyak</i>	Mogul Line Ltd.
<i>Lok Vaibhav</i>	Mogul Line Ltd.
<i>Lok Vihar</i>	Mogul Line Ltd.

India (contd.)

NAME OF VESSEL	OWNER
<i>Lok Vinay</i>	Mogul Line Ltd.
<i>Mahabhakti</i>	South East Asia Shipping Co.
<i>Mahabir</i>	South East Asia Shipping Co.
<i>Maharashmi</i>	South East Asia Shipping Co.
<i>Mahavijay</i>	South East Asia Shipping Co.
<i>Maratha Melody</i>	Chowgule Shipping Co.
<i>Maratha Progress</i>	Chowgule Shipping Co.
<i>Marjan</i>	Indo Oceanic Shipping Co.
<i>Meghrab</i>	Indo Oceanic Shipping Co.
<i>Mot Dredge</i>	Shipping Corporation of India
<i>Mizoram</i>	Shipping Corporation of India
<i>Nandkala</i>	Essar Constructions and Carriers
<i>Netaji Subhash Bose</i>	Shipping Corporation of India
<i>Onge</i>	Shipping Corporation of India
<i>Prabhu Gopal</i>	Tolani Shipping Co.
<i>Pranhu Satram</i>	Tolani Shipping Co.
<i>Rafi Ahmed Kidwai</i>	Shipping Corporation of India
<i>Ramdas</i>	Shipping Corporation of India
<i>Ratna Kirti</i>	Ratnakar Shipping Co.
<i>Ratna Shobhana</i>	Ratnakar Shipping Co.
<i>Ratna Vandana</i>	Ratnakar Shipping Co.
<i>Ratna Usha</i>	Ratnakar Shipping Co.
<i>Rishi Vishva Mitra</i>	Garware Shipping Corporation
<i>Sagar Deep</i>	Shipping Corporation of India
<i>Sagar Samrat</i>	Oil and Natural Gas Corporation
<i>Samudra Gupta</i>	Shipping Corporation of India
<i>Sanchi</i>	Shipping Corporation of India
<i>Sarojini Naidu</i>	Shipping Corporation of India
<i>Sai Nanak</i>	TPS Shipping Co.
<i>Satya Kamal</i>	Seven Seas Shipping Trans.
<i>Satya Murti</i>	Shipping Corporation of India
<i>Satya Padam</i>	Seven Seas Shipping Trans.
<i>Satya Sohan</i>	Seven Seas Shipping Trans.
<i>Sahajahan</i>	Shipping Corporation of India
<i>State of Himachala Pradesh</i>	Shipping Corporation of India
<i>State of Kerala</i>	Shipping Corporation of India
<i>State of Meghalaya</i>	Shipping Corporation of India
<i>State of Manipur</i>	Shipping Corporation of India
<i>State of Madhya Pradesh</i>	Shipping Corporation of India
<i>State of Mysore</i>	Shipping Corporation of India
<i>State of Rajasthan</i>	Shipping Corporation of India
<i>State of West Bengal</i>	Shipping Corporation of India
<i>Teesta</i>	Shipping Corporation of India
<i>Tulsidas</i>	Shipping Corporation of India
<i>Unibaksha</i>	Universal Shipping Co.
<i>Vallabhabhai Patel</i>	Shipping Corporation of India
<i>Varun Yan</i>	Thakur Shipping Co.
<i>Varuna Adhar</i>	Thakur Shipping Co.
<i>Vishva Abha</i>	Shipping Corporation of India
<i>Vishva Aditya</i>	Shipping Corporation of India
<i>Vishva Ambhar</i>	Shipping Corporation of India
<i>Vishva Amitabh</i>	Shipping Corporation of India
<i>Vishva Apurva</i>	Shipping Corporation of India
<i>Vishva Ayay</i>	Shipping Corporation of India
<i>Vishva Asha</i>	Shipping Corporation of India
<i>Vishva Bandhan</i>	Shipping Corporation of India
<i>Vishva Bhakti</i>	Shipping Corporation of India
<i>Vishva Bindu</i>	Shipping Corporation of India
<i>Vishva Chetana</i>	Shipping Corporation of India
<i>Vishva Dharma</i>	Shipping Corporation of India
<i>Vishva Jyoti</i>	Shipping Corporation of India
<i>Vishva Kaumudi</i>	Shipping Corporation of India
<i>Vishva Karuna</i>	Shipping Corporation of India
<i>Vishva Kaushal</i>	Shipping Corporation of India
<i>Vishva Kirti</i>	Shipping Corporation of India
<i>Vishva Kalyan</i>	Shipping Corporation of India
<i>Vishva Madhuri</i>	Shipping Corporation of India
<i>Vijaya Jyoti</i>	West Asia Shipping Co.
<i>Vishva Mahima</i>	Shipping Corporation of India
<i>Vishva Mamta</i>	Shipping Corporation of India
<i>Vishva Mangal</i>	Shipping Corporation of India
<i>Vishva Mahima</i>	Shipping Corporation of India
<i>Vishva Nayak</i>	Shipping Corporation of India
<i>Vishva Nandini</i>	Shipping Corporation of India

India (contd.)

NAME OF VESSEL	OWNER
Vishva Nidhi	Shipping Corporation of India
Vishva Pallav	Shipping Corporation of India
Vishva Parajit	Shipping Corporation of India
Vishva Pankaj	Shipping Corporation of India
Vishva Pratap	Shipping Corporation of India
Vishva Pratibha	Shipping Corporation of India
Vishva Prayas	Shipping Corporation of India
Vishva Prem	Shipping Corporation of India
Vishva Raksha	Shipping Corporation of India
Vishva Sandesh	Shipping Corporation of India
Vishva Seva	Shipping Corporation of India
Vishva Shakti	Shipping Corporation of India
Vishva Shobha	Shipping Corporation of India
Vishva Sidhi	Shipping Corporation of India
Vishva Tarang	Shipping Corporation of India
Vishva Tej	Shipping Corporation of India
Vishva Tirth	Shipping Corporation of India
Vishva Umang	Shipping Corporation of India
Vishva Vibhuti	Shipping Corporation of India
Vishva Vijay	Shipping Corporation of India
Vishva Vikas	Shipping Corporation of India
Vishva Vinay	Shipping Corporation of India
Vishva Vivek	Shipping Corporation of India
Vishva Yash	Shipping Corporation of India
Vivekananda	Shipping Corporation of India
Vishveshwarayya	Shipping Corporation of India
Yerewa	Shipping Corporation of India
Zakir Hussain	Shipping Corporation of India

Auxiliary Ships:
India has 32 Auxiliary Ships.

NEW ZEALAND (Information dated 1.2.81)

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 Steam Ship Co. (N.Z.) Ltd.
<i>Aotea</i>	Container Fleets (N.Z.) Ltd.
<i>Bounty II</i>	Sofrana Uniline
<i>Bulknes</i>	Shipping Corporation of N.Z.
<i>Capitaine Kermadec</i>	Sofrana Uniline
<i>Coastal Trader</i>	Shipping Corporation of N.Z.
<i>Dunedin</i>	Maritime Carriers Ltd.
<i>Dunedin</i>	Bank and Savill Line
<i>Eagle Arrow</i>	Gearbulk Ltd.
<i>Erne</i>	Union Steam Ship Co. (N.Z.) Ltd.
<i>Fetu Moana</i>	Shipping Corporation of N.Z.
<i>Fijian</i>	Reef Shipping Agencies
<i>Forum New Zealand</i>	Pacific Forum Line
<i>Forum Samoa</i>	Pacific Forum Line
<i>Fua Kavenga</i>	Shipping Corporation of Polynesia
<i>Golden Bay</i>	Tarakohe Shipping Co.
<i>Holmdale</i>	Union Steam Ship Co. (N.Z.) Ltd.
<i>James Cook</i>	New Zealand Govt. (Fisheries Res.)
<i>Kolle D.</i>	Nauru Pacific Line
<i>Kotuku</i>	Union Steam Ship Co. (N.Z.) Ltd.
<i>Kuaka</i>	Union Steam Ship Co. (N.Z.) Ltd.
<i>Lake Eyre</i>	Australian National Line
<i>Marama</i>	Union Steam Ship Co. (N.Z.) Ltd.
<i>N.Z. Caribbean</i>	Shipping Corporation of N.Z.
<i>N.Z. Pacific</i>	Shipping Corporation of N.Z.
<i>New Zealand Star</i>	Blue Port Act (N.Z.) Ltd.
<i>Ngahere</i>	Union Steam Ship Co. (N.Z.) Ltd.
<i>Ngakata</i>	Union Steam Ship Co. (N.Z.) Ltd.
<i>Ngapara</i>	Union Steam Ship Co. (N.Z.) Ltd.
<i>Nuigini Chief</i>	Shipping Corporation of P.N.G. Pty Ltd.
<i>Nuivakai</i>	Dolphin Shipping Co. Ltd.
<i>Sedco 445</i>	Sedco International
<i>Stena Constructor</i>	Stena Line
<i>Tangaroa</i>	New Zealand Govt. (Oceanographic Res.)
<i>Tasman Enterprise</i>	Tasman Pulp and Paper Co. Ltd.
<i>Tasman Venture</i>	Development Finance Co.
<i>Tiare Moana</i>	Shipping Corporation of N.Z.
<i>Titoki</i>	Anchor-Dorman Ltd.
<i>Tui Cakau II</i>	Pacific Lines Ltd.
<i>Union Auckland</i>	Union Steam Ship Co. (N.Z.) Ltd.
<i>Union Hobart</i>	Union Steam Ship Co. (N.Z.) Ltd.
<i>Union Lyttelton</i>	Union Steam Ship Co. (N.Z.) Ltd.
<i>Union Rotoiti</i>	Union Steam Ship Co. (N.Z.) Ltd.
<i>Union Rotorua</i>	Union Steam Ship Co. (N.Z.) Ltd.
<i>Valetta</i>	British Phosphate Commission
<i>Waitaki</i>	Maritime Carriers Ltd.
<i>Westport</i>	N.Z. Cement Holdings Ltd.
Supplementary Ships:	
<i>Arahanga</i>	N.Z. Railways
<i>Aramoana</i>	N.Z. Railways
<i>Aranui</i>	N.Z. Railways
<i>Aratika</i>	N.Z. Railways

Auxiliary Ships:
New Zealand also has a fleet of 14 Auxiliary Ships currently reporting.

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