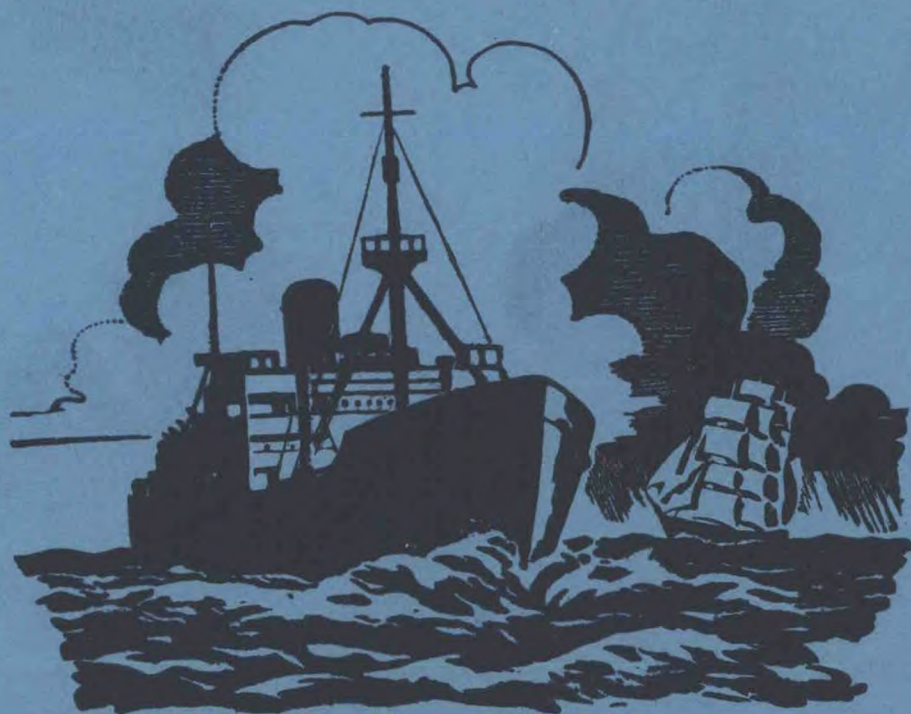


M.O. 624

The Marine Observer

*A quarterly journal of Maritime
Meteorology*



Volume XXVII No. 177

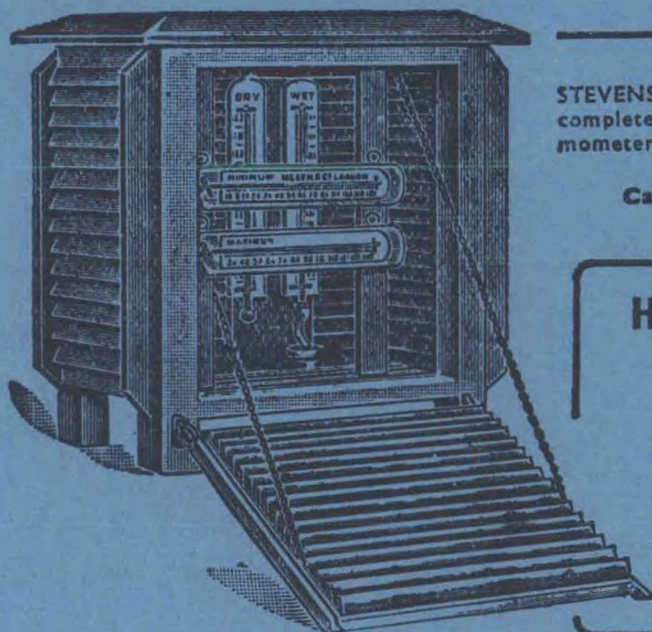
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THE MARINE OBSERVER

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

VOL. XXVII

No. 177

JULY, 1957

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*Letters to the Editor, and books for review, should be sent to the Editor, "The Marine Observer,
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Editorial

In March this year the Institute of Navigation celebrated the tenth anniversary of its foundation. This Institute is a private technical body, the purpose of which is to gather together those who are interested in navigation in all its aspects and to do whatever is possible in the way of encouraging and improving the science and art of navigation. Among the founder members and among those who have been honoured by election to the Fellowship of the the Institute since its foundation, are a number of Master Mariners. It is perhaps inevitable that most of these have now "swallowed the anchor", as it is difficult for sea-going members to attend the Institute's meetings. Out of a total of 97 Fellows, 26 hold Master's Certificates. From time to time in *The Marine Observer* we have given accounts of interesting subjects which have been discussed at meetings of this Institute and have reviewed books and pamphlets produced under the Institute's auspices. The subjects discussed cover a very wide field and many of them have a meteorological background, for the Council of the Institute rightly appreciates the important part which meteorology necessarily plays in all forms of navigation, whether it be on or under the sea, in the air or on the land. Interplanetary navigation has also been among the subjects seriously discussed at the Institute, so its interests are very wide.

The tenth birthday celebrations took the form of a lecture, illustrated by coloured slides, by Mr. A. Hiscock, concerning his voyage round the world in the 30 ft. sloop *Wanderer III*, and the lecture was followed by a cocktail party.

Mr. Hiscock's lecture was a departure from the rather more technical matters which are usually discussed at the Institute's meetings, and with the aid of the magnificent coloured photographs, his graphic account of this economical and adventurous, though sometimes uncomfortable, method of seeing the world so roused the interest of his audience that there were few present who did not wish to follow his example. The lecturer disclosed that for his wife and himself the cost worked out at about £500 a year and they were away for three years.

It is obvious that such a voyage in a small sailing vessel teaches many meteorological lessons. The first is that nobody but an experienced yachtsman should attempt such a voyage; the lecturer inferred that as a navigator he was very amateur, but he seems to have done extremely well with the aid of a sextant and watch in making his landfalls. During the voyage three long sea passages were undertaken; 2,700 miles (26 days) from the Canary Islands to Barbados, 4,000 miles (37 days) from the Panama to the Marquesas Islands and 3,400 miles (51 days) from Ascension to the Azores. On this last "leg" they crossed the Equator in longitude 20°W. and were in the doldrums for two weeks (650 miles). During none of these passages did they sight any shipping or any steamer smoke (except towards the end of the last one, when they were approaching the Azores). Even though their horizon was only about four miles this seems to illustrate in a striking manner the immensity of the oceans and the desirability of trying to encourage all ships in relatively unfrequented ocean areas to send radio weather messages whenever they can. All these long passages were across areas where shipping is normally sparse.

These few introductory remarks seem to lead conveniently into the question of the International Geophysical Year programme in so far as it affects ships at sea. As mentioned in earlier numbers of *The Marine Observer*, voluntary observers aboard selected ships are asked to continue doing their normal meteorological work during the I.G.Y. In areas in which shipping is known to be sparse (central South Atlantic and North Atlantic north of 60°N.; the whole of the Pacific and Indian Oceans and the Southern Ocean), every endeavour should be made to record observations in the logbook at all the main synoptic hours (0000, 0600, 1200 and 1800 G.M.T.), even if the ship is unable to transmit them all by radio. A special effort should be made throughout the I.G.Y. to ensure correct exposure of instruments and accuracy of all observations, whether they are instrumental or otherwise. The I.G.Y. Meteorological Committee has drawn particular attention to the value

of cloud observations in connection with making estimates of radiation and of the consequent importance of good cloud observations therefore during the I.G.Y. It is realised that these are difficult observations for officers aboard ship, but it is hoped that a special effort will be made. Observers aboard ship are also asked to take particular care during the I.G.Y. in recording thunderstorms. As mentioned elsewhere in this number, and on previous occasions, aurora observations will also be very important during the I.G.Y. and all observers are asked to record this phenomenon whenever seen. It is gratifying to know that we are already getting a good number of aurora reports as will be seen from the "Marine Observers' Log" in this number.

In addition to our regular selected ships, the Meteorological Office will, as part of an international scheme, arrange for Port Meteorological Officers to visit all ships which are likely to proceed through relatively unfrequented waters and to seek their co-operation. These ships will be asked to make non-instrumental observations, with the addition of pressure and temperature readings, using the ship's own instruments, provided their accuracy satisfies the Port Meteorological Officer. These ships will be supplied with maps showing the special areas in which their observations are required and the particular radio stations to which their reports should be sent. They will be given the necessary instructions and the forms on which to record their observations. The messages they send will be preceded by the word "SHIGY". Similar action will be taken by Port Meteorological Officers of other countries and it is thus hoped that a particularly good network of ship reports from all oceans will be obtained during the I.G.Y.

These meteorological activities aboard merchant ships may not be very spectacular but, as stated by Sir Graham Sutton in our January 1957 number, they do constitute a major contribution to the I.G.Y. programme, for it is only by this voluntary effort from such ships that we can hope to get an accurate meteorological picture from the oceans.

At the same time, the weather ships operated by various nations in the Atlantic and in the Pacific will be playing their part, by making observations not only at the surface, but also in the upper atmosphere. They will also make an oceanographical contribution. Research ships of various nations will concentrate on detailed oceanographic work and will also assist in surface meteorological work. There will thus be considerable scientific activity at sea during the next 18 months, as well as on the land and in the air.

As is customary in the July number of *The Marine Observer*, we include our "Work of the Year" report about the activities of our voluntary observing merchant ships, of the weather ships and of the Marine Division of the Meteorological Office. The report clearly shows that our relations with the shipping industry are admirable and that voluntary observers aboard British ships have continued to play a major part in the international scheme for the collecting of meteorological information from the oceans. As our "Marine Observers' Log" shows, the observations are not only meteorological, but embrace ocean currents, oceanography, ornithology and a certain amount of astronomy. Some of our keen observers—notably Captain Harrison of the *Cambridge*—send in an incredible variety of information which shows how interesting the sea can be if one keeps one's eyes open. As we have remarked on previous occasions, there seems little doubt that an officer who is thus observant of nature's wonders is also observant of what is going on aboard the ship and is a better seaman as the result. On behalf of the Director of the Meteorological Office we thank all our voluntary observers for the good work which they have done during the year on our behalf.

On another page we publish a list of those who are recipients of Excellent Awards for their meteorological work during the year. We congratulate them. We are very glad to know that our voluntary observers aboard trawlers and coasting steamers can now qualify for these awards.

MARINE SUPERINTENDENT.

WORK OF THE MARINE DIVISION OF THE BRITISH METEOROLOGICAL OFFICE AND THE VOLUNTARY OBSERVING FLEET DURING THE YEAR ENDED 31st MARCH, 1957

1. Voluntary Observing Ships

Voluntary observing ships are recruited by Port Meteorological Officers at London, Liverpool, Southampton, Glasgow and Cardiff and by Merchant Navy Agents at Newcastle, Hull and Leith. It is their duty to instruct the officers of these ships on how to make meteorological observations and, as ships' officers are continually changing, it is necessary for personal contact to be maintained, by quarterly visits to the ships where possible, to ensure that all new observers receive instructions. Another purpose of these visits is to see that the meteorological instruments are in a satisfactory condition and to issue logbooks and stationery if required.

During the year, Port Meteorological Officers and Merchant Navy Agents made a total of about 4,600 visits to observing ships.

The British Voluntary Observing Fleet, as shown in Table 1 on page 129, is comprised as follows:

(a) *Selected ships.* These ships make detailed observations, and code and transmit them by radio to the appropriate shore radio stations according to arrangements made by the World Meteorological Organisation (W.M.O.) and the International Convention for Safety of Life at Sea. This is, therefore, an international scheme, by which voluntary observing ships of all nations which are members of W.M.O. send their observations to the meteorological service appropriate to the region in which they are situated. In addition to making meteorological observations, both selected and supplementary ships keep records of whales sighted, for the National Institute of Oceanography, and make notes on the types of aurorae which they observe, for the Department of Philosophy, Edinburgh University. Ships fitted with radar make radar observations for the Admiralty.

(b) *Supplementary ships.* These ships make less detailed observations than those made by selected ships. Consequently, they use an abbreviated code when transmitting their weather reports by radio.

(c) *Coasting vessels.* These ships make observations of sea temperature when in home waters, and transmit them to Dunstable. Many of them make observations of wind, weather and visibility when in the North Sea, in order to meet the needs of meteorologists in all countries bordering the North Sea.

(d) *Light-vessels.* By courtesy of Trinity House, 13 light-vessels make observations of wind, waves, visibility and air and sea temperature. Eleven of these vessels transmit their reports to Dunstable by R/T through G.P.O. coast stations. *Dowsing, Galloper* and *Royal Sovereign* light-vessels now provide more detailed weather reports, for inclusion in the B.B.C. weather bulletins for shipping.

(e) *Trawlers.* These make non-instrumental observations, which they transmit to Britain, Norway or Iceland, by w/t or R/T as convenient.

Burnham radio station and the Central Telegraph Office, London, are connected by teleprinter to the meteorological communications centre at Dunstable—an arrangement which ensures rapid receipt of messages by the meteorologists for plotting on the weather maps upon which their forecasts are based. Weather reports from all these ships, being transmitted by radio to the appropriate meteorological centre at the time of observation, eventually arrive in the Marine Division, either in the form of logbooks which have been written up aboard ship, or (in the case of trawlers and coasting ships for which no written records are required) in the form of teleprinter messages, which Dunstable forward to the Marine Division, in order to be punched on to Hollerith cards and thus made readily available for climatological investigation or for answering enquiries.

A careful scrutiny of the logbooks sent in by selected and supplementary ships

	1956												1957		
	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March			

Table 1. Number of British Observing Ships

No. of Selected Ships on Fleet List	505	502	498	495	497	495	493	497	497	496	493	491
No. of Supplementary Ships on Fleet List	..	61	63	63	63	63	61	57	55	53	51	51
No. of Marid Ships on Fleet List	92	93	92	92	91	87	92	93	94	94	95	95
No. of Light-vessels on Fleet List	13	13	13	13	13	13	13	13	13	13	13	13
No. of Trawlers on Fleet List	24	31	31	31	31	31	38	38	38	38	38	38
No. of Non-Instrumental Ships on Fleet List	6	6	6	6	6	6	6	6	6	6	6	6

Table No. 2. Ships' Radio Weather Messages received at Dunstable

<i>British Selected Ships</i>												
No. reporting to Dunstable	334	340	325	319	360	309	316	303	309	292	299	321
No. of messages received	3,548	3,578	3,358	3,290	3,312	3,204	3,516	3,316	3,307	3,152	3,365	3,241
No. of groups (excluding address and ship's name)	29,063	29,584	27,178	26,811	26,933	26,276	28,660	27,139	27,240	26,502	28,509	27,352
Daily average of messages	118	116	112	106	107	107	113	111	107	102	120	105
<i>British Marid Ships</i>												
No. reporting to Dunstable	52	49	52	49	49	54	61	45	42	47	38	51
No. of messages received	394	378	432	388	379	390	321	308	276	257	221	358
Daily average of messages	13	12	14	13	12	13	10	11	9	8	8	12
<i>Foreign Ships</i>												
No. reporting to Dunstable	99	114	114	143	141	145	153	127	138	135	117	121
No. of messages received	391	436	403	499	548	599	527	503	463	432	480	470
No. of groups (excluding address and ship's name)	3,333	3,787	3,513	4,304	4,783	5,218	4,588	4,272	3,918	3,643	4,108	4,126
Daily average of messages	13	14	13	16	17	20	19	17	15	14	17	15
<i>Light-vessels</i>												
No. reporting to Dunstable	11	11	11	11	11	11	11	11	11	11	11	11
No. of messages received	811	803	806	837	837	794	830	805	1,004	1,059	995	1,100
Daily average of messages	27	26	27	27	27	27	27	27	32	34	36	35

Table No. 3. Instrumental Equipment on Loan to British Voluntary Observing Ships

<i>Selected</i>												
1. Full set of M.O. instruments	501	498	494	491	493	491	489	493	493	492	489	487
(a) Full set of M.O. instruments except barograph	..	..	..	..	..	..	..	..	..	..	..	..
(b) Full set of M.O. instruments except barometer	..	..	..	..	..	..	..	..	..	..	..	..
2. Marid. Set of instruments	92	93	92	92	91	87	92	93	94	94	95	95
3. Light-vessel. Set of instruments	13	13	13	13	13	13	13	13	13	13	13	13
(a) Supplementary set	59	59	61	61	61	61	59	55	53	51	49	49
(b) Supplementary set, with aneroid instead of mercurial barometer	..	..	..	..	..	..	..	..	..	..	..	..
4. barometer	2	2	2	2	2	2	2	2	2	2	2	2

shows that observations are, in general, made carefully and accurately, and that the radio weather messages are regularly transmitted to the authorities concerned. Many of the logbooks contain interesting astronomical, oceanographical and ornithological observations in the "Additional Remarks" pages, as well as of meteorological phenomena. An average of 113 logbooks has been received monthly.

The set of instruments supplied to each selected ship consists of mercurial barometer, barograph, portable screen with thermometers and canvas sea-water bucket. Supplementary ships are provided with the same instruments, except for barograph and bucket. Table 3 (page 129) shows the number of sets of instruments that are on loan to observing ships.

Table 4 gives an indication as to the trades in which British selected ships are engaged.

Table 4. Numbers of British selected ships on main routes from and to the United Kingdom

Australasia	..	..	..	..	..	..	116
Far East	..	..	..	..	..	..	62
Persian Gulf	..	..	..	..	..	..	6
South Africa	..	..	..	..	..	..	20
North Atlantic	..	..	..	..	..	..	89
West Indies	..	..	..	..	..	..	21
Atlantic coast of South America	..	..	..	..	..	..	46
Pacific coast of South America	..	..	..	..	..	..	13
Pacific coast of North America	..	..	..	..	..	..	9
North-west Europe	..	..	..	..	..	..	2
Trooping service	..	..	..	..	..	..	4
Falkland Islands and Antarctic	..	..	..	..	..	..	14
World wide "tramping"	..	..	..	..	..	..	112

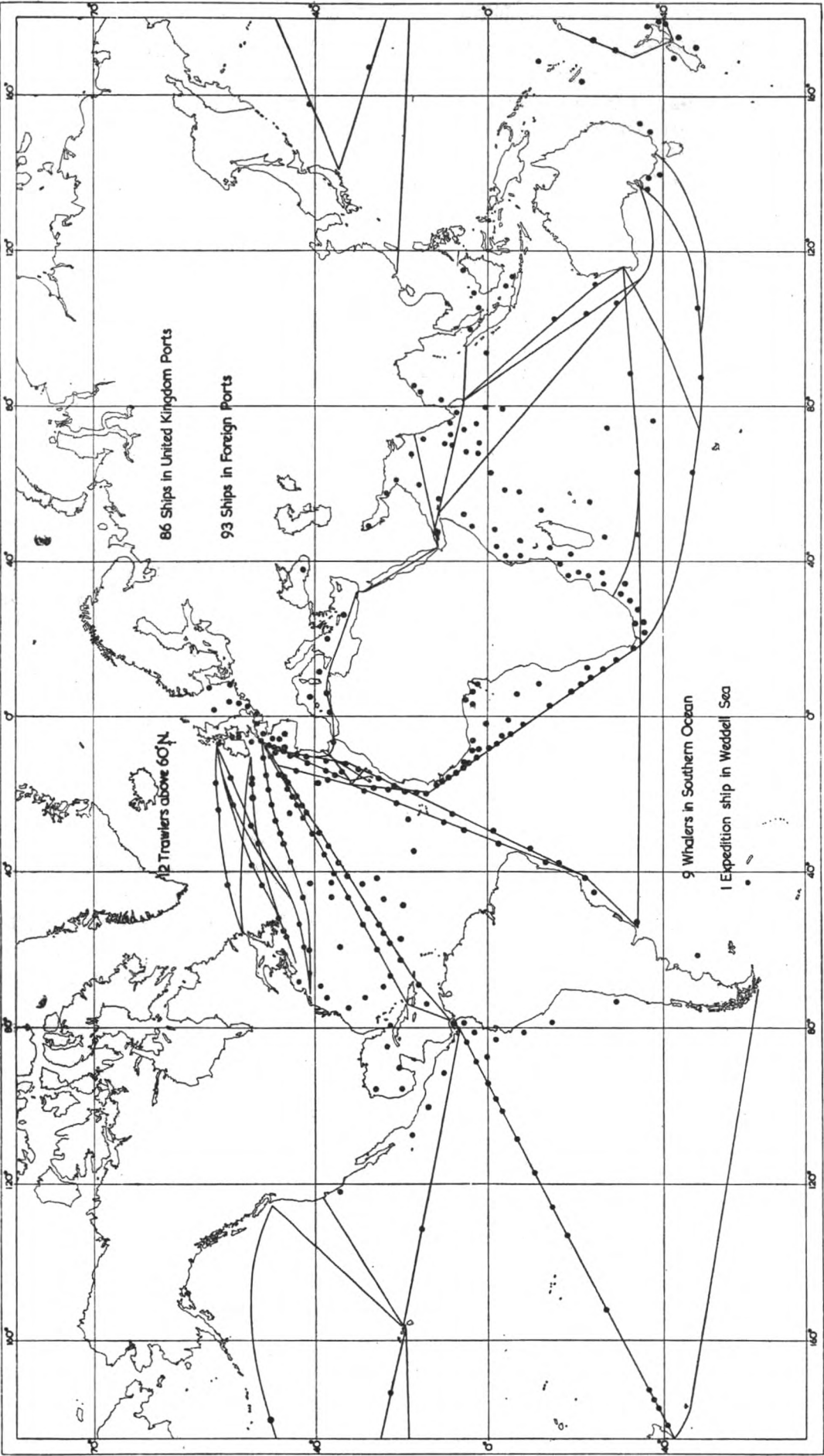
Table 2 (page 129) gives a summary of radio reports received at Dunstable from voluntary observing ships. All ships in the eastern Atlantic and North Sea send their radio reports to Dunstable. A check on ships in the eastern Atlantic has shown that, over the last year, approximately 54 per cent of the radio reports were received within one hour of the time of observation and 76 per cent were received within two hours. A special effort has been made, with some success, to obtain more observations from ships in the North Sea.

As in former years, a map is reproduced (page 131) showing the world-wide distribution of British selected ships on a day picked at random.

2. Ocean Weather Ships

Our four ocean weather ships have now completed nine years' service, and during the year these ships have carried out, in rotation with French and Netherlands vessels, a full programme of surface observations every three hours, radio-sonde ascents every 12 hours and radio-wind observations every six hours at ocean stations A, I, J and K in the North Atlantic. Norwegian weather ships operated for six months at station A and subsequently returned to station M which had in the meantime been manned by Netherlands vessels. Special observations of sea water temperature gradient with a bathythermograph have been continued aboard all ships. *Weather Explorer* is still making wave observations with the electric wave recorder. Other special work included magnetic variation swings for the Hydrographic Department of the Admiralty and the preserving of plankton and sea-surface samples for the Ministry of Agriculture and Fisheries and for the Scottish Home Department.

Search and rescue exercises were carried out whenever practicable in co-operation with aircraft of Coastal Command. During these exercises the opportunity was taken to drop mail, newspapers and urgently required stores in watertight containers. For the first time a fragile radar valve, required as a replacement for the meteoro-



The positions of British ships which made observations on 11th March, 1957.

logical set aboard one of the weather ships, was dropped and recovered undamaged by the ship—a parachute being used.

Weather Watcher vacated station for two days last October in an unsuccessful search for a missing United States Clipper aircraft. *Weather Recorder* vacated station for a similar period in December to stand by S.S. *Baron Cawdor* at her master's request after his ship had sustained damage to her bridge and steering gear in heavy weather.

Increasing use is being made both by civil and military aircraft of the weather ships' navigational aids and communication facilities; over 7,000 transatlantic aircraft used these facilities during the year.

Until 31st December, 1956, the synoptic observations made at stations I and J were transmitted by radio direct to Dunstable and from stations A and K to Washington (U.S.A.) and Rennes (France) respectively, whence they were relayed to Dunstable. Since 1st January, 1957, a new system has been in operation, whereby these weather ships broadcast their synoptic observations at certain fixed times each day.

Microfilm copies of observations recorded aboard British weather ships were made and distributed in exchange for similar microfilms from other operating countries of the North Atlantic Ocean Station Agreement.

3. Marine Climatology

The average number of logbooks received from selected and supplementary ships was 113 per month. Logbooks and upper-air data have been received regularly from ocean weather ships operating on stations A, I and J. Microfilm copies of observations made at other ocean stations have been received.

Observations from all logbooks, including those received from naval ships, have been punched on to Hollerith cards. The total number of observations punched during the year was 175,758, which included some from logbooks received from Canadian, South African, Australian, Norwegian, Netherlands and French ships.

4. Currents and Ice

Preparation of the *Atlas of Surface Currents of the eastern North Pacific Ocean* is nearly completed and the atlas should be published some time in 1957. Work has continued on the computation of surface current data for the eastern part of the South Pacific Ocean, which is the last section of the Pacific Ocean remaining to be charted. All observations received of ice in the Antarctic region from December 1945 to June 1956 have been plotted on monthly charts. The ultimate purpose of this is the revision of Antarctic ice charts.

5. Admiralty Pilots and Charts

The sections relating to surface currents and ice in the Admiralty Pilots are continuously being revised. Six volumes have been dealt with, three of which contained sections on ice. The revision of the meteorological sections of these Pilots was co-ordinated with the World Climatological Branch, and meteorological charts for publication with the texts were prepared in the Marine Division.

Information relating to surface currents was forwarded to the Admiralty to be inserted on 15 new or revised Admiralty navigational charts covering widely separated parts of the oceans.

6. Special Work

(a) Meteorological and ocean current statistics for ocean weather stations I (59°N., 19°W.), J (52½°N., 20°W.) and A (62°N., 33°W.) for 1955 were completed and summaries prepared.

(b) Trials were continued aboard *Weather Recorder* on the measurement of air temperature, humidity and sea temperature gradients near sea level, using thermo-

couples mounted on a dan buoy. Some useful observations were obtained during the summer.

(c) Some progress was made with an investigation into the incidence, in relation to the synoptic situation, of temperature inversions below about 8,000 feet at ocean weather stations I and J, using punch-card methods.

(d) Mean monthly values of various factors involved in the energy balance, at ocean weather station J, were computed and some further work was done on the diurnal variation of cloudiness at stations I and J.

(e) Further progress was made with an investigation into the long-term variation of air and sea temperatures over the tropical Atlantic.

(f) Experiments were carried out in co-operation with the Instruments Division in the measurement of rainfall at sea. Special rain-gauges were mounted as high as possible on the mast of an ocean weather ship, in order to avoid spray and the effect of the ship on the air-flow, and work is continuing on these lines.

(g) Arrangements were made, in connection with the International Geophysical Year, for radiation instruments to be installed in one of the ocean weather ships.

7. Publications

(a) A new book, *Meteorology for Mariners*, was published in February 1957.

(b) *The Marine Observer* was published quarterly.

(c) Work was continued on the new publication, *Climatological and Sea-Surface Current Charts of the North Atlantic* (see page 151).

8. International Co-operation

The Marine Superintendent, who has been President of the Commission for Maritime Meteorology since 1946, presided over the second session of that Commission at Hamburg in October. The British delegation was led by Mr. H. C. Shellard of the Marine Division. The conference made a number of recommendations designed to improve the network of observations from oceanic areas and to provide better meteorological services for shipping. Dr. H. Thomsen of Denmark has now been elected President.

9. Awards

The meteorological logbooks received from selected and supplementary ships, Marid ships and trawlers, were carefully assessed by a nautical officer. Prizes are being presented to the masters, principal observing officers and radio officers of the ships whose logbooks came in the first 100 in order of merit. The books to be awarded as prizes this year are Bartholomew's *Advanced Atlas of Modern Geography* and *Discoveries and Inventions*, fourth edition, revised and rewritten by J. G. Crowther.

The Director, Sir Graham Sutton, presented barographs last September to four masters of British voluntary observing ships for consistently good meteorological work over a long period (see January 1957 number of this journal).

EXCELLENT AWARDS, 1956-57

The list of ships, their captains, principal observing officers and radio officers from whom, during the year ended 31st March, 1957, we have received meteorological logbooks of such a standard of excellence as to be thought deserving of an award, is published on pages 135-7 of this issue.

Once again, as in every July number of *The Marine Observer* since 1924 with the exception of the war years, it is our very great pleasure to congratulate those captains and officers named in the list. They will be individually notified of the award and asked for an address to which it may be sent. With correspondence with ships at sea being what it is, however, it may happen that an officer will see his name in the list before he receives the official letter. In this case we have no

objection to his writing to us at Harrow (the address is on the front page of this issue), and we will send the award to him at whatever address he names. We ask all recipients to be very sure to acknowledge the receipt of their awards on the form which will be sent with them.

The assessing of all ships' meteorological logbooks and the placing of them in an order of merit is a task not lightly undertaken. The officer responsible for this, a seaman himself, has constantly in mind the varied opportunities for observing in different trades and in different types of ship and makes allowances accordingly.

In the year ending 31st March, 1957, the highest marks were gained by the following 12 ships:

1. S.S. *Laurentia* (Donaldson Bros. & Black), Captain T. S. Graham.
2. S.S. *Newfoundland* (Johnston Warren Line), Captain C. H. Kenyon.
M.V. *Trevelyan* (Hain S.S. Co.), Captain H. Gravell.
3. S.S. *Rialto* (Ellerman's Wilson Line), Captain H. Greenhill.
M.V. *Naticina* (Shell Tankers, Ltd.), Captain J. A. McGherrie.
S.S. *Warkworth* (R. S. Dalgleish, Ltd.), Captain N. Thompson, M.B.E.
4. M.V. *Daleby* (Sir R. Ropner & Sons), Captain F. D. Lloyd.
S.S. *Prospector* (T. & J. Harrison, Ltd.), Captain E. V. Dunn.
M.V. *Marna* (Chr. Salvesen & Co.), Captain J. A. McConachie.
5. S.S. *Cairndhu* (Cairns, Noble & Co.), Captain J. W. Scott.
M.V. *Tarantia* (Anchor Line, Ltd.), Captain G. Ramage.
M.V. *Port Lincoln* (Port Line, Ltd.), Captain R. H. Finch.

This is the third year in which we have published a "short list" of awards and we would congratulate *Rialto* on appearing for the third time, while *Marna*, *Newfoundland*, *Port Lincoln* and *Warkworth* are making their second appearance. The customary photographs of the first three ships appear opposite page 140.

From the list of Excellent Awards to selected and supplementary ships it will be seen that 54 shipping companies are represented this year and, while it is almost inevitable that the larger companies will have the greater number of Excellent Awards because of the size of their observing fleets, it is interesting to note that it is by no means the larger companies who have gained the most places in the three "short lists".

In the year under review, 1,363 logbooks were received from selected and supplementary ships. Of these, 392 or 34·8 per cent were assessed "Excellent". The previous year saw the percentage at 25·6 per cent, in the year before that it was 23·3 per cent, while in the year ended 31st March, 1954, it was 17·3 per cent. It is with no small pleasure that we record this steady annual increase in the number of books being classed as "Excellent", though this will inevitably increase the number of officers who, though sending in books of excellent quality, do not receive an award. It was a very early marine observer, Saint Paul, who wrote: "Wherefore seeing we also are compassed about with so great a cloud of witnesses . . . let us run with patience the race that is set before us." To those officers who, like the writer when he was at sea, have never found their names in the list, perhaps we can give no better advice.

The Excellent Award scheme has this year been extended to take in the Marid ships and trawlers, whose unspectacular but valuable work has long been a great help to this Office in preparing the forecasts for coastal sea areas. These ships keep no written records and a just selection of ships for the award has proved to be no small problem. The selection has been made on the basis of the greatest number of radio messages received during the year and the officers who have served longest in the ships sending them.

We congratulate the officers named in the Marid and trawler lists on page 137 on being the first to participate on the extension of the scheme to those classes of voluntary observing ships.

L. B. P.

EXCELLENT AWARDS (Year ending 31st March, 1957)

SHIP	CAPTAIN	PRINCIPAL OBSERVING OFFICER	SENIOR RADIO OFFICER	OWNERS
<i>Athenic</i> ..	L. H. Edmeads ..	J. D. Habersfield ..	H. Knight ..	Shaw, Savill & Albion Co., Ltd.
<i>Australia Star</i> ..	J. A. Hoppé ..	G. C. Williams ..	L. Cooper ..	Blue Star Line, Ltd.
<i>Avondene</i> ..	J. G. Tew ..	E. B. Fitzpatrick ..	J. T. W. Moody ..	Dene Shipping Co., Ltd.
<i>Baron Renfrew</i> ..	J. A. Barton ..	D. Nicholas ..	P. E. D. Harris ..	W. Runciman & Co., Ltd.
<i>Bassano</i> ..	W. Warden ..	G. Downie ..	A. Wall ..	H. Hogarth & Sons, Ltd.
<i>Beaverlodge</i> ..	C. H. Tutty ..	D. A. Brackenbury ..	A. Leary ..	Ellerman's Wilson Line, Ltd.
<i>Begonia</i> ..	L. H. Johnston, M.B.E. ..	P. D. T. Roberts ..	J. Watt ..	Canadian Pacific Steamship Co.
<i>Bellerby</i> ..	R. Reekie ..	J. M. Oliver ..	J. E. B. Sams ..	Stag Line, Ltd.
<i>British Marquis</i> ..	E. Dunn ..	A. H. Ross ..	D. P. Hulme ..	Sir R. Ropner & Co., Ltd.
<i>Cairnawon</i> ..	E. L. Mitchinson ..	A. E. Saintry ..	A. P. Oliver ..	B.P. Tanker Co., Ltd.
<i>Cairndhu</i> ..	H. E. Bragg ..	K. A. Murray ..	D. W. Cook ..	Cairns, Noble & Co., Ltd.
<i>Calchas</i> ..	J. W. Scott ..	N. Shell ..	J. M. Mahon ..	Cairns, Noble & Co., Ltd.
<i>Cambridge</i> ..	F. N. Fisher ..	R. Montgomery ..	M. Rigby ..	A. Holt & Co.
<i>Chepman</i> ..	P. P. O. Harrison ..	R. Pook ..	D. C. Evans ..	Federal Steam Navigation Co., Ltd.
<i>Cheshire</i> ..	C. A. Smith ..	R. Gibbens ..	P. F. Prime ..	Runciman (London), Ltd.
<i>Chindwara</i> ..	H. B. Peate, D.S.C., R.D., Capt. R.N.R. ..	M. J. Collins ..	G. Talbot ..	Bibby Bros. & Co.
<i>City of Johannesburg</i> ..	B. A. Rogers, D.S.C., R.D., Cdr. R.N.R. (Retd.) ..	J. A. Stanton ..	J. Downey ..	British India Steam Navigation Co., Ltd.
<i>City of Swansea</i> ..	W. J. Merchant ..	P. Collin ..	M. McL. Riley ..	Ellerman & Bucknall S.S. Co., Ltd.
<i>Clan Davidson</i> ..	J. Vizer ..	D. Steward ..	J. Hinds ..	Ellerman Hall Line, Ltd.
<i>Clan MacLay</i> ..	T. A. Watkinson ..	J. Sutherland ..	G. Rinsky ..	Clan Line Steamers, Ltd.
<i>Corfu</i> ..	S. S. Davidson ..	D. Paterson ..	F. Fawcett ..	Clan Line Steamers, Ltd.
<i>Corinaldo</i> ..	G. K. Fox ..	J. N. W. Davies ..	W. Powell ..	P. & O. Steam Navigation Co.
<i>Corinthic</i> ..	R. McNie ..	H. D. McDiarmid ..	A. R. Cox ..	Donaldson Bros. & Black, Ltd.
<i>Daleby</i> ..	A. C. Jones ..	P. F. Hogg ..	T. Lillis ..	Shaw, Savill & Albion Co., Ltd.
<i>Durham</i> ..	F. D. Lloyd ..	K. Barnett ..	M. R. Carney ..	Sir R. Ropner & Co., Ltd.
<i>Edward Wilshaw</i> ..	A. Hocken ..	H. C. Hynard ..	B. Nutt ..	Federal Steam Navigation Co., Ltd.
<i>English Star</i> ..	C. C. Muckelston ..	A. Miller ..	J. M. Wade ..	Cable & Wireless, Ltd.
<i>Esso Glasgow</i> ..	L. Vernon ..	A. W. Kinghorn ..	J. Barnie ..	Blue Star Line, Ltd.
<i>Explorer</i> ..	W. Brians ..	R. G. Allen ..	C. Turner ..	Eso Petroleum Co., Ltd.
<i>Glenartney</i> ..	W. Eustance ..	G. F. Smith ..	T. O'Looney ..	T. & J. Harrison, Ltd.
<i>Gothic</i> ..	H. S. Wood ..	J. W. Cottier ..	B. Chamberlain ..	Glen Line, Ltd.
<i>Graig</i> ..	L. J. Hopkins ..	T. I. Oliver ..	B. McGovern ..	Shaw, Savill & Albion Co., Ltd.
<i>Granford</i> ..	T. Glover ..	W. Abramowicz ..	E. M. Grover ..	Idwal Williams & Co.
	H. Garrett ..	L. Taylor ..	A. Watcham ..	Goulandris Bros., Ltd.

SHIP	CAPTAIN	PRINCIPAL OBSERVING OFFICER	SENIOR RADIO OFFICER	OWNERS
<i>Greathope</i> ..	R. Cook ..	F. G. Lovern ..	J. M. Hatfield ..	Newbigin Steam Shipping Co., Ltd.
<i>Haparangi</i> ..	D. H. Chadwick ..	B. Pusey ..	I. Barber ..	New Zealand Shipping Co., Ltd.
<i>Highland Princess</i> ..	H. A. Wright ..	G. J. Moat ..	F. Goodall ..	Royal Mail Lines, Ltd.
<i>Hubert</i> ..	J. Whayman, D.S.C., R.D., Capt. R.N.R. ..	B. D. C. Franklin ..	F. J. Fitzgerald ..	Booth S.S. Co., Ltd.
<i>Inishowen Head</i> ..	H. N. Clarke ..	N. W. G. Walsh ..	A. E. Adams ..	G. Heyn & Sons, Ltd.
<i>Ixion</i> ..	R. Blakey ..	A. T. Moody ..	W. W. Beebee ..	A. Holt & Co.
<i>Jason</i> ..	D. W. Stroud ..	R. F. J. Dixon ..	I. T. Davies ..	A. Holt & Co.
<i>Laurentia</i> ..	T. S. Graham ..	W. G. Cullen ..	D. Murray ..	Donaldson Bros. & Black, Ltd.
<i>Leicestershire</i> ..	E. D. Brand ..	J. F. Code ..	F. W. Greaves ..	Bibby Bros. & Co.
<i>Loch Garth</i> ..	G. S. Grant, R.D., Cdr. R.N.R. (Retd.) ..	I. J. Berry ..	F. Page ..	Royal Mail Lines, Ltd.
<i>Magdapor</i> ..	H. G. Allan ..	C. R. Lucas ..	D. C. Brown ..	T. & J. Brocklebank, Ltd.
<i>Makalla</i> ..	H. Simpson ..	M. T. L. Woodcroft ..	W. Curry ..	T. & J. Brocklebank, Ltd.
<i>Manchester Vanguard</i> ..	W. E. Quirk, R.D., Cdr. R.N.R. ..	A. O. Copeland ..	D. Spooner ..	Manchester Liners, Ltd.
<i>Marengo</i> ..	S. H. Bennett ..	A. Parker ..	B. Bason ..	Ellerman's Wilson Line, Ltd.
<i>Marna</i> ..	J. A. McConachie ..	J. Carnie ..	J. Shepherd ..	Chr. Salvesen & Co.
<i>Matheran</i> ..	H. E. MacGregor ..	A. C. Stallard ..	J. S. Sams ..	T. & J. Brocklebank, Ltd.
<i>Meta</i> ..	A. D. McNab ..	J. I. Punton ..	B. M. Middleton (deck officer) ..	Glen & Co., Ltd.
<i>Milo</i> ..	C. E. Knight ..	P. J. Wright ..	E. Cookson ..	Bristol Steam Navigation Co., Ltd.
<i>Naticina</i> ..	J. A. McGherrie ..	W. I. Simpson ..	T. Cahill ..	Shell Tankers, Ltd.
<i>Newfoundland</i> ..	C. H. Kenyon ..	K. L. Row ..	R. Drake ..	Johnston Warren Lines, Ltd.
<i>Nordic</i> ..	F. S. Thornton, O.B.E. ..	B. H. White ..	T. A. Batty ..	Shaw, Savill & Albion Co., Ltd.
<i>Orari</i> ..	R. Ramsay ..	R. S. Shannon ..	E. Barley ..	New Zealand Shipping Co., Ltd.
<i>Otaki</i> ..	J. D. Bennett ..	E. J. Norman ..	W. Clark ..	New Zealand Shipping Co., Ltd.
<i>Otranto</i> ..	R. W. Roberts, O.B.E., D.S.C. ..	W. J. Denly ..	H. Harris ..	Orient Steam Navigation Co., Ltd.
<i>Pacific Northwest</i> ..	F. H. Perry ..	P. Crone ..	T. Parker ..	Furness, Withy & Co., Ltd.
<i>Pacure</i> ..	A. Thompson ..	J. Bull ..	A. O'Sullivan ..	Elders & Fyffe, Ltd.
<i>Parthia</i> ..	S. A. Jones, R.D., Cdr. R.N.R. (Retd.) ..	T. A. Nicholson ..	J. Pattie ..	Cunard Steamship Co., Ltd.
<i>Perthshire</i> ..	T. N. Soane ..	F. J. Cameron ..	D. Alcock ..	Turnbull, Martin & Co., Ltd.
<i>Port Hardy</i> ..	H. W. Brammall, D.S.O., D.S.C., R.D., Cdr. R.N.R. (Retd.) ..	P. R. Carling ..	G. Clarke ..	Bibby Bros. & Co.
<i>Port Lincoln</i> ..	R. H. Finch ..	J. H. Lloyd-Davies ..	T. Hargrave ..	Port Line, Ltd.
<i>Port Napier</i> ..	C. Townshend ..	G. B. Rapp ..	A. Hudson ..	Port Line, Ltd.
<i>Port Pirie</i> ..	G. G. Langford ..	P. R. Ardley ..	P. Wiggins ..	Port Line, Ltd.
<i>Port Townsville</i> ..	L. J. Skailes ..	J. M. Evans ..		

<i>Port Victor</i> ..	A. Fairbairn ..	J. C. Naylor ..	J. McMillan ..	Port Line, Ltd.
<i>Port Vindex</i> ..	E. E. Roswell ..	C. S. Liley ..	R. Hodgson ..	Port Line, Ltd.
<i>Prospector</i> ..	E. V. Dunn ..	H. Traynor ..	J. H. R. Weston ..	T. & J. Harrison, Ltd.
<i>Rangitiki</i> ..	A. E. Lettington, O.B.E., D.F.C. ..	I. Excell ..	C. L. Lamb ..	New Zealand Shipping Co., Ltd.
<i>Retriever</i> ..	J. G. West ..	K. Matheson ..	D. Sydenham ..	Cable & Wireless, Ltd.
<i>Reynolds</i> ..	J. Burns ..	D. W. Parry ..	J. L. Black ..	Bolton Steamship Co., Ltd.
<i>Rialto</i> ..	H. Greenhill ..	D. J. Pengelly ..	A. Gavin ..	Ellerman's Wilson Line
<i>Ruahine</i> ..	F. Loughheed ..	M. Piner ..	J. Heath ..	New Zealand Shipping Co., Ltd.
<i>Runa</i> ..	J. Gilfillan ..	R. Parrish ..	A. Corless ..	Glen & Co., Ltd.
<i>Settler</i> ..	H. G. Skelly ..	R. L. Hammond ..	A. Harrison ..	T. & J. Harrison, Ltd.
<i>Shackleton</i> ..	W. Johnston ..	T. Woodfield ..	R. E. Molland ..	Falkland Islands Dependencies Survey
<i>Sheldrake</i> ..	C. C. Reynolds ..	C. I. H. Greaves ..	C. Norris ..	General Steam Navigation Co., Ltd.
<i>Southern Cross</i> ..	Sir David Aitchison, K.C.V.O. ..	R. L. Reid ..	H. Matthews ..	Shaw, Savill & Albion Co., Ltd.
<i>Strathaird</i> ..	R. J. F. Paice ..	G. J. Dobbin ..	H. A. M. Jardine ..	P. & O. Steam Navigation Co.,
<i>Tamaroa</i> ..	B. Forbes-Moffatt ..	W. J. Lynam ..	D. MacRae ..	Shaw, Savill & Albion Co., Ltd.
<i>Tarantia</i> ..	G. Ramage ..	T. A. Patience ..	A. McPherson ..	Anchor Line, Ltd.
<i>Tasmania Star</i> ..	R. White, D.S.C. ..	P. A. Stevens ..	C. A. James ..	Blue Star Line, Ltd.
<i>Tekoa</i> ..	F. M. Williamson, Lt. R.N.R. ..	D. E. Standing ..	A. Tinley ..	New Zealand Shipping Co., Ltd.
<i>Telemachus</i> ..	A. Lane ..	A. G. Bole ..	F. M. Shannon ..	A. Holt & Co.
<i>Teviot</i> ..	W. A. Kennedy ..	J. McCaughrean ..	M. R. Byrne ..	Royal Mail Lines, Ltd.
<i>Thelma</i> ..	T. A. W. Fairweather ..	J. A. C. McColl ..	L. J. Delany ..	Glen & Co., Ltd.
<i>Tongariro</i> ..	R. Webster ..	N. M. Parry ..	P. Moor ..	New Zealand Shipping Co., Ltd.
<i>Trelissick</i> ..	F. Bolton ..	A. E. Kelley ..	J. Weston ..	Hain S.S. Co., Ltd.
<i>Trevelyan</i> ..	H. Gravell ..	J. L. Hazell ..	J. Vaughan ..	Hain S.S. Co., Ltd.
<i>Trevince</i> ..	B. George ..	D. J. Cornish ..	C. D. McCarthy ..	Hain S.S. Co., Ltd.
<i>Twickenham</i> ..	S. E. Hooper ..	D. Dickson ..	W. Houragan ..	Watts, Watts & Co., Ltd.
<i>Umtali</i> ..	F. E. J. O'Hea ..	C. M. Cozens ..	S. Hewitt ..	Bullard, King & Co., Ltd.
<i>Umtata</i> ..	D. L. Weston ..	J. H. Szablowski ..	J. Molloy ..	Bullard, King & Co., Ltd.
<i>Velletia</i> ..	C. Nettleship ..	J. M. Grierson ..	W. J. Beattie ..	Shell Tankers, Ltd.
<i>Wainera</i> ..	R. A. Barns ..	T. T. Salmon ..	J. Downie ..	Shaw, Savill & Albion Co., Ltd.
<i>Warkworth</i> ..	N. Thompson, M.B.E. ..	C. Harron ..	F. D. Farthing ..	R. S. Dalgleish, Ltd.
<i>Woolwich</i> ..	D. V. Cameron ..	A. Sugden ..	J. E. Miller ..	Watts, Watts & Co., Ltd.
<i>Yarmouth Trader</i> ..	R. A. Goodings ..	G. G. Callender ..	D. E. Kerrigan ..	Great Yarmouth Shipping Co., Ltd.

Marid Ships

<i>Cambria</i> ..	R. A. H. Lord ..	G. Davey ..	J. J. D. Sheil ..	British Transport Commission
<i>Loch Seaforth</i> ..	J. Smith ..	N. MacKenzie ..	G. Adams ..	David MacBrayne, Ltd.

Trawlers

SHIP		SKIPPER		WIRELESS OPERATOR		OWNERS	
<i>Benevolio</i> ..	..	G. Honhold ..	..	C. Duplock ..	..	Hellyer Bros., Ltd.	..
<i>Macedonian</i> ..	..	G. Ward ..	..	The Skipper ..	..	Dominion Steam Fishing Co., Ltd.	..

THE MARINE OBSERVERS' LOG



July, August, September

The Marine Observers' Log is a quarterly record of the most unusual and significant observations made by mariners.

The observations are derived from the logbooks of marine observers and from individual manuscripts. Photographs or sketches are particularly desirable.

Responsibility for each observation rests with the contributor.

TURTLE

North Atlantic Ocean

S.S. *Regent Hawk*. Captain G. Hobson. Dublin to Coveñas, Colombia.

18th August, 1956, 1430 G.M.T. Sighted medium-sized turtle endeavouring to climb on to a large plank of driftwood, presumably to sunbathe.

Position of ship: 30 miles, 240°, from Flores, Azores.

Note. Dr. H. W. Parker, of the Natural History Museum, comments:

"I regret that it is not possible to say what the turtle was. It could have been one of five different species but records from the Azores are of some interest."

SWORDFISH

English Channel

M.V. *British Escort*. Captain J. M. Mason. Port Said to Grangemouth. Observer, Mr. W. R. Knight, 2nd Officer.

29th September, 1956, 1700 G.M.T. A large swordfish was seen jumping close by the ship; it was at least 15 ft long. It is believed that swordfish of such a size in this area are rather rare.

Position of ship: 20 miles south of Bishop Rock.

Note. Dr. H. W. Parker, of the Natural History Museum, comments as follows:

"There are two possible species of swordfish in British waters, *Xiphias Gladius* and *Istiophorus Americanus*. Unfortunately it is not possible to say which of these two was the one seen.

"There was another independent sighting of a swordfish of which we have been informed nearly coincident in space and time with Captain Mason's observation. Sight records, when there is the possibility of more than one species being involved, can be quite inconclusive and it is also difficult to determine whether the lack of evidence of the occurrence of large active fishes is really an indication of rarity. It is one of the anomalies that animals of intermediate size tend to be rather less well known than one would expect. They are too big to handle easily and so nobody takes the trouble to collect them for detailed examination."

TIDE RIPS

Red Sea

M.V. *Orari*. Captain J. R. Ramsey. Aden to Suez. Observers, the Master, Mr. R. M. Michael, 2nd Officer, Mr. E. L. Hubbard, 3rd Officer, Mr. J. W. Stilkler, 4th Officer, and Mr. D. E. Watts, Chief Radio Officer.

1st August, 1956, 1200 G.M.T. The photographs (opposite page 141) taken by

the Chief Radio Officer, show tide-rip patterns in the Red Sea. The wind at the time was light and variable.

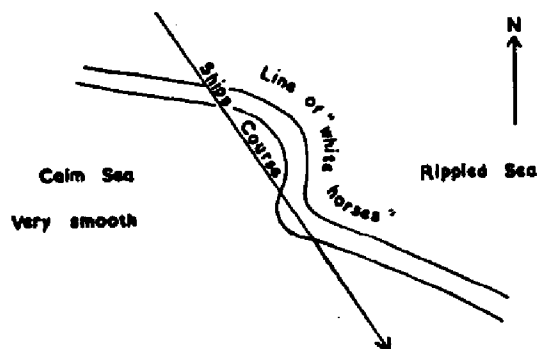
Position of ship: $22^{\circ} 15' \text{N.}$, $37^{\circ} 30' \text{E.}$

LINE OF DEMARCATION

North Atlantic Ocean

M.V. *Capetown Castle*. Captain J. Trayner. Las Palmas to Cape Town. Observers, Mr. D. Bailey, 4th Officer, and others.

31st August, 1956. From 0750 to 0820 G.M.T. the vessel passed through a strong and very pronounced demarcation line in the sea, approximately 50 ft wide. This



line ran mainly WNW-ESE, but for a short distance of about 2 miles it ran parallel to the ship's course. No change in the colour or temperature of the sea was observed throughout. To NE. of the line the sea was rippled and on the SW. side it was calm. The demarcation was seen for half an hour, a distance of 10 miles, but it appeared to continue to each horizon, no beginning or ending being observed. Wind, light airs.

Position of ship: $00^{\circ} 26' \text{N.}$, $09^{\circ} 04' \text{W.}$

Note. The observer suggests that this line of demarcation may have been the boundary between the Guinea and South Equatorial Currents. This might be so, but in the absence of information about the set of current on each side of the line there can be no certainty about it. The vector mean chart for August to October in the Atlantic current atlas shows that the boundary line between west-going and east-going vector mean current is lat. 2°N. , between longs. 2°W. and 18°W. The rose for the region between lat. 2°N. and the equator, between these longitudes, shows a marked preponderance of westerly currents but also a considerable proportion of easterly ones. There therefore seems to be a considerable variation in the roses for the other quarters of the year, but less frequently.

S.S. *Parthia*. Captain S. A. Jones. New York to Greenock. Observer, Mr. R. P. Wakefield, Senior 3rd Officer.

5th August, 1956, 1740 G.M.T. Approaching Grand Bank from westward in approximately 400 fm, a definite line of demarcation was observed about 4 miles ahead, the sea changing from dark blue to turquoise green. The fathometer was seen to shoal rapidly and was reading 160 fm on reaching the lighter-coloured water. The master and senior officers, with many years' experience of this trade, stated that they had never seen this phenomenon before.

Position of ship: $44^{\circ} 51' \text{N.}$, $55^{\circ} 50' \text{W.}$

Note. This observation has been forwarded to the Hydrographer.

DISCOLOURED WATER

Caribbean Sea

M.V. *Cumberland*. Captain A. E. Williams. Auckland to Hamburg. Observers, the Master and Mr. C. Hill, 3rd Officer.

10th September, 1956, 1300 G.M.T. (approx.). While passing the mouth of the Rio Magdalena, the water became a light-green colour and flotsam was noticed. The density was taken and found to be 1006. The sea temp. was 83°F. The vessel continued to sail through this discoloured water and at 1500 passed through a very noticeable line of demarcation (green/blue) in a $120-300^{\circ}$ direction. At this time the river mouth was bearing 174° and was 9 miles distant, and the ship was again

in salt water. The seaward boundary of the discoloured water was not visible. Wind ENE., force 5.

Position of ship: $11^{\circ} 06'N.$, $75^{\circ} 18'W.$, to $11^{\circ} 14'N.$, $74^{\circ} 50'W.$

New Zealand Waters

M.V. *Port Pirie*. Captain G. G. Langford. Auckland to Napier.

16th September, 1956, 0040–0100 G.M.T. Observed very clearly defined discoloured water, through which the ship passed. The discoloration appeared to extend from the shore to a distance of approximately $\frac{1}{2}$ mile beyond the ship and was complete except for a few isolated dark patches about 1 mile from the shore. Whereas the sea was a very dark, deep blue, the patch was a vivid emerald green with a definite line of demarcation between the two colours. The echo sounder was in operation and nothing unusual was observed on the trace.

Wind sw., force 3. Moderate sea and swell. Air temp. $58^{\circ}F.$ Bar. 1018.5 mb, steady. Sounding, 57 fm.

Position of ship: 3 miles east of East Island, East Cape, New Zealand.

Note. Dr. Hart, of the National Institute of Oceanography, comments as follows:

“Bright green is an unusual type of discoloration little known as yet, more suggestive of *Euglenoid* than *Dinoflagellate* bloom and perhaps correlated with land run-off in view of the position. A sample would have been exceptionally interesting.”

N.B. We would like to stress again the usefulness of preserved samples in connection with observations of discoloured water.—Editor.

WATERSPOUT

North Atlantic Ocean

S.S. *Regent Hawk*. Captain G. Hobson. Dublin to Coveñas, Colombia.

22nd August, 1956, 1905–1915 G.M.T. Shortly after 1900 a waterspout was observed to be forming, appearing as in Fig. 1. After about 10 min, the column descended to sea level (Fig. 2), causing the sea to “boil” and “mushroom” upwards. The column remained almost upright throughout and showed a well-defined dark core within a light inner sleeve, the whole inside a dark outer sleeve.



(1)

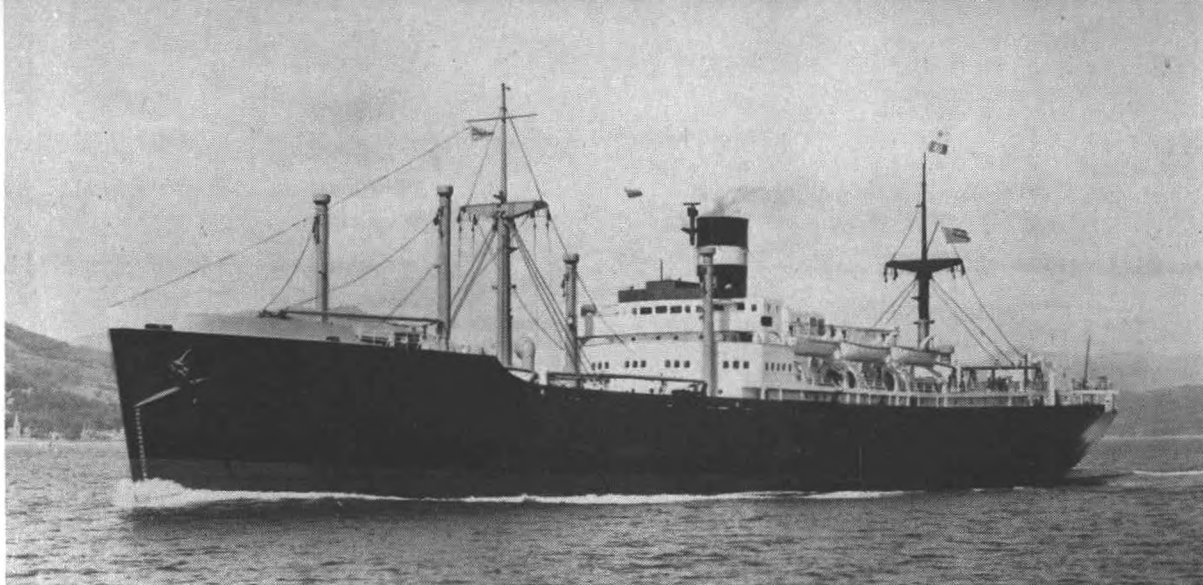
(2)

The radar gave a range of 8 miles, at which distance it was impossible to see the direction or rate of rotation. The waterspout appeared to throb and swell along its length and after a further 5 min or so, it disintegrated in mid-air. Wind 270° , force 1. Air temp. $82^{\circ}F.$, wet bulb 72.9° , sea 83.3° . Bar. 1022.2 mb.

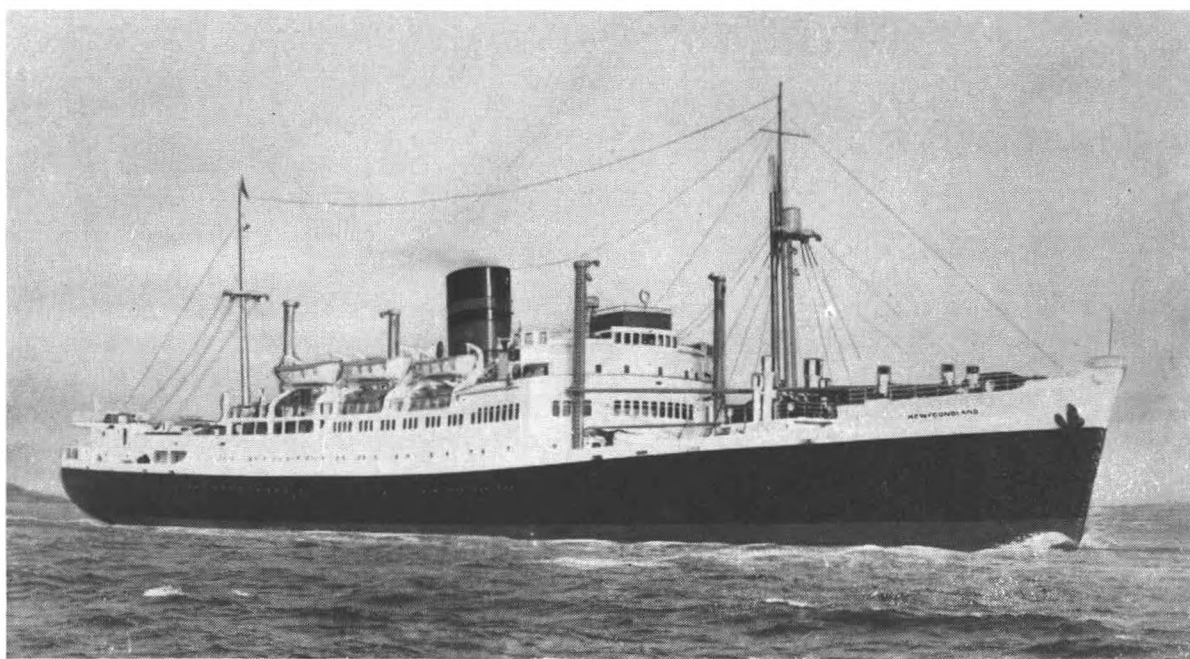
Position of ship: $28^{\circ} 10'N.$, $51^{\circ} 36'W.$

S.S. *Lalande*. Captain E. D. Spooner. Trinidad to Montevideo. Observer, Mr. P. V. des Landes, Chief Officer.

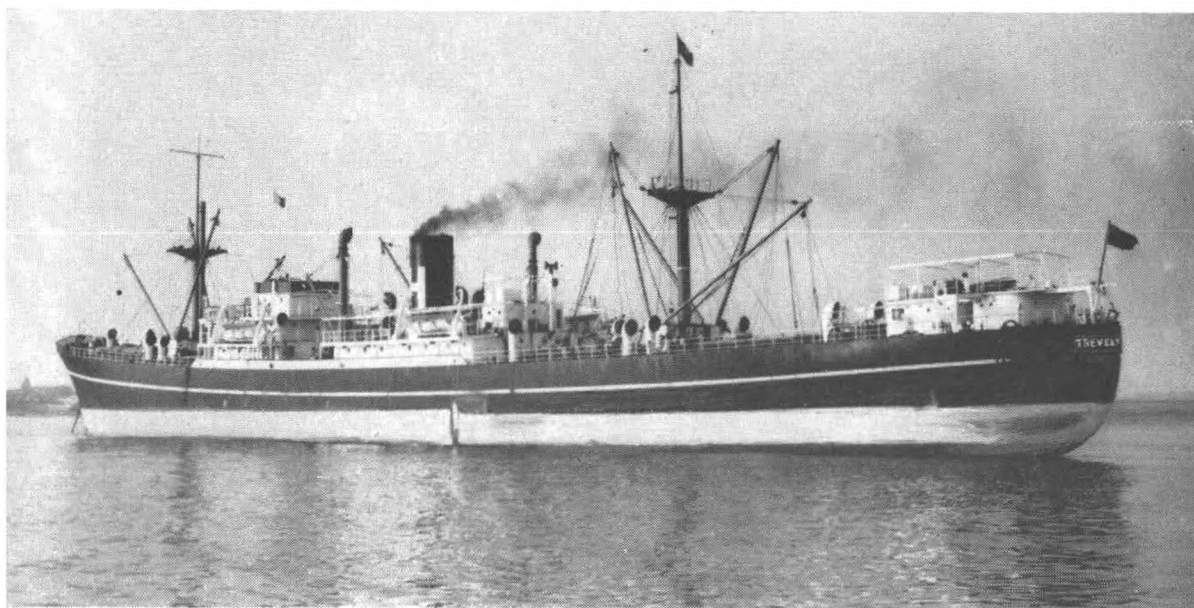
28th August, 1956. At 0910 G.M.T. heavy Cb cloud was approaching the ship



S.S. *Laurentia* (Donaldson Bros. and Black), Captain T. S. Graham



S.S. *Newfoundland* (Johnston Warren Line), Captain C. H. Kenyon



M.V. *Trevelyan* (Hain S.S. Co.), Captain H. Gravell

The three ships which gained the highest markings for their meteorological logbooks during the year ended March 1957 (see also page 133).

(Opposite page 140)

(Opposite page 141)



Photo by D. E. Watts

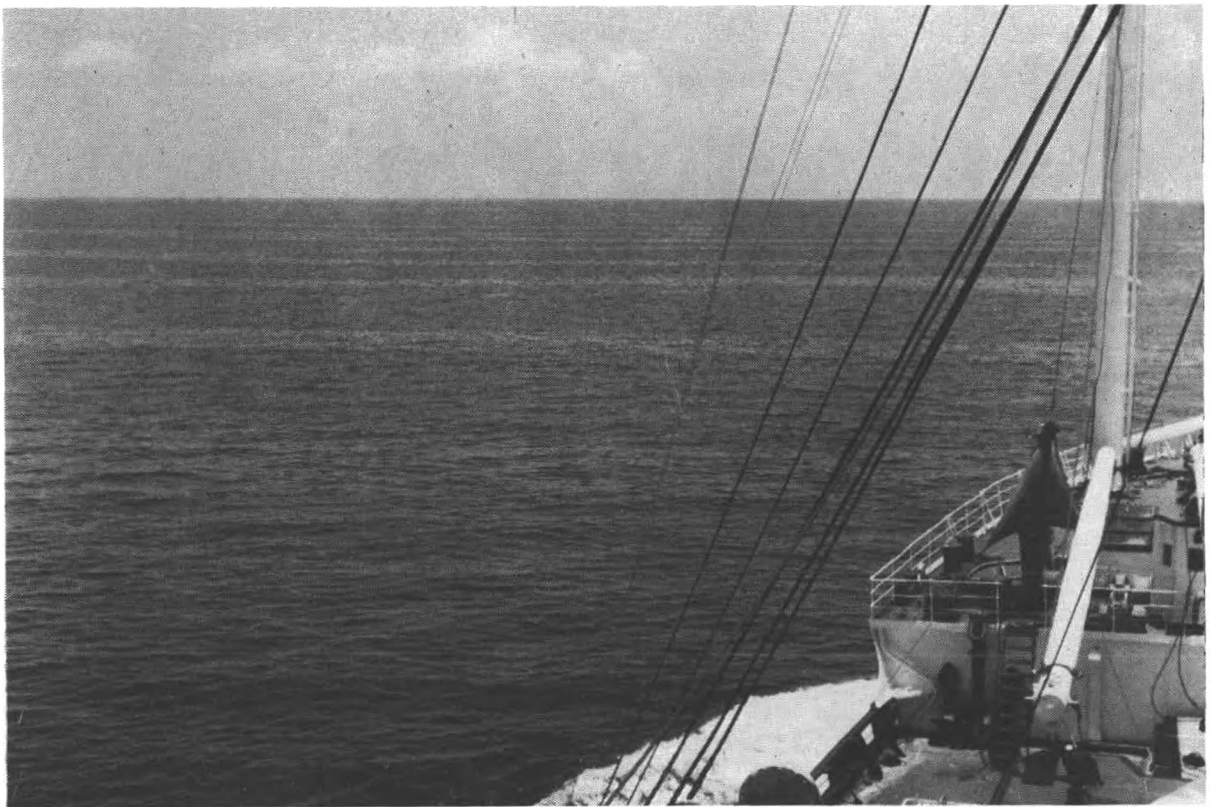


Photo by D. E. Watts

Photographs of tide rips (see page 138).

with accompanying squall. Wind increased to SE., force 5, then at 0914 backed suddenly to NE., force 5. No rain fell. At 0915 a waterspout was observed bearing 080°, distant about 4 miles. The base appeared to be a cloud of whirling spray above which there was a thin, slightly curved, dark-grey funnel reaching to the base of the cloud. At 0919, a second squall passed over the ship accompanied by heavy rain, which obscured the waterspout. At 0925, when the squall and rain passed, the waterspout had disappeared.

From 0925 onwards the sea was very erratic, sometimes rippled and at other times moderate, yet with no marked difference in wind velocity. From 1030 to 1035 the ship passed through a line of rough water, stretching in an E.-W. direction, the direction of the waves being SSE. The wind was still ESE. with no cloud overhead to cause a squall. On leaving the disturbed water, the vessel swung off her course about 10° to port.

Position of ship at 0910: 05° 37'N., 44° 09'W.

S.S. *Teviot*. Captain W. A. Kennedy. Santiago de Cuba to London. Observers, the Master and Mr. J. McCaughrean.

12th September, 1956, 1430 G.M.T. It was noticed that a waterspout was attempting to form from the base of a large bank of Cb, which was bearing SE., about 8 miles distant (Fig. 1). The vortex descended to within 300 ft of the sea surface, causing a great deal of agitation thereon, but was unable to reach the water.

At 1440 the vortex diminished somewhat and was distorted through being enveloped in rain falling from the same cloud (Fig. 2, opposite page 157).

At 1441 a second vortex appeared clear of, and to windward of, the rain (Fig. 3). For a short time this funnel hung about 300 ft below the cloud base and then descended to within 200 ft of the sea, again causing a disturbance on the water, but not completing the column. At this juncture, the first vortex cleared the rain and also descended, but was equally unsuccessful in reaching the sea (Fig. 4).

Between 1445 and 1520 the Cb travelled NW. across the ship's stern, and all the time both vortices, clear of the rain, endeavoured to complete the column from the cloud base to the sea.

At 1520 the second vortex disappeared into the rain, and, at the same moment, the first vortex reached the surface of the sea. However, after no more than 30 sec the column broke and the spout dispersed. By 1530 there was no trace of either vortex.

During the whole period the remainder of the sky was covered with a very thin veil of As, through which it was possible to obtain a meridian altitude of the sun.

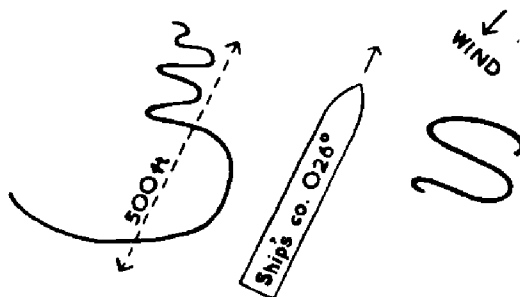
Rippled sea, moderate sw'ly swell. Wind SW., force 1-2. Bar. 1023 mb. Air temp. 81°F, sea 80°.

Position of ship at 1500: 34° 12'N., 44° 57'W.

PHOSPHORESCENCE

North Atlantic Ocean

M.V. *English Star*. Captain L. Vernon. Recife to London.



14th September, 1956, 0245 G.M.T. A curved and wavy ribbon of phosphorescence about 5 ft wide and very bright was observed to port, and a smaller ribbon,

also curved, but less distinct, to starboard. At first sight, at a distance of about $\frac{1}{2}$ mile, each resembled the wake of a small ship but no other ships were about. Course of ship 26° .

Wind NNE., force 4. Slight sea, low NE. swell. Air temp. 76°F , sea 72° .

Position of ship: $18^{\circ} 21' \text{N.}$, $21^{\circ} 22' \text{W.}$

Persian Gulf

M.V. *British Resource*. Captain S. Bruce. Durban to Mina al Ahmadi. Observer, Mr. D. G. Inwood, 3rd Officer.

2nd July, 1956, 2010 G.M.T. Two phosphorescent wheels were observed, the vessel passing between them. They appeared at first to be a straight band of light on the horizon moving rapidly on an opposite course to the ship, i.e. moving in a SSE'ly direction. As the phenomenon drew nearer it split up into the familiar bands of the wheels, which were seen to be rotating rapidly in a clockwise direction. These bands were made up of myriads of tiny specks of light and were approximately 10 ft wide. The whole surrounding area of sea was also lit up, bathing the ship in a weird suffused glow. As the phenomenon passed astern, it again took on the shape of one single band of light. At the time of observation there was no wind, sea calm, slight dust haze reducing visibility to about 5 miles. Air temp. 87.4°F , sea 88° . Sky cloudless.

Position of ship: $26^{\circ} 56' \text{N.}$, $52^{\circ} 15' \text{E.}$

Arabian Sea

S.S. *Orion*. Captain A. E. Coles, R.D. Aden to Colombo. Observer, Mr. G. Whitehead, Senior 3rd Officer.

2nd August, 1956. A large amount of phosphorescence of two different forms was observed. On the windward side of the ship was a path about 20 ft wide and nearly the length of the ship consisting of patches 2-3 ft wide, appearing to come from a depth to the surface and, when breaking, of varying intensity. All around the ship were large patches, about 30-40 ft in diameter, coming from a depth, and breaking up on reaching the surface. These were exceptionally bright and very numerous.

Wind ssw, force 5. Visibility good. Sea rough. Swell heavy. Slight cloud. No rain.

Position of ship: $09^{\circ} 40' \text{N.}$, $63^{\circ} 20' \text{E.}$, to $64^{\circ} 45' \text{E.}$

S.S. *Empire Orwell*. Captain C. W. C. Pinckney, O.B.E., R.D. Colombo to Aden.

1st September, 1956, 2030 G.M.T. A heavy rain shower was observed to NW., distant 3 miles. Along its leading edge patches of phosphorescence were intermittently observable for duration of 2-3 sec and of such brilliance as to be mistaken for the lights of a passing ship and to be reported by the lookout as such. Air temp. 75°F , sea 82° . Wind NW., force 4. Cloud 4/8 Cb.

Position of ship: $08^{\circ} 55' \text{N.}$, $70^{\circ} 08' \text{E.}$

Note. This observation is of special interest because the very numerous observations of phosphorescence we have received up to the present time have seldom, if ever, shown any direct connection between the phenomenon and rainfall. It is well known that disturbance of the water may produce phosphorescence when suitable organisms are present in the sea, as in breaking wave crests and in the bow wave and wake of a ship. In most cases, presumably, the agitation due to rainfall is insufficient to have any marked effect in producing phosphorescence.

Indian Ocean

M.V. *Bellerophon*. Captain H. H. Sanderson. Port Said to Aden. Observers, the Master and Mr. D. Malcolm, 3rd Officer.

3rd September, 1956, 1730 G.M.T. Observed patches of phosphorescence, which started as small spots and appeared to originate from a point a few feet below the

surface of the water. They grew rapidly, at a rate of about 35-40 kt, until they were between 100 ft and 200 ft in diameter and roughly circular in shape. The patches near the observer appeared quite dull, but those at a distance were extremely bright. The effect was not unlike the initial flash of an atom bomb explosion, as seen in newsreels. The phenomenon lasted until 2030. Wind 16 kt. Waves, period 6 sec, height 5 ft.

Position of ship: $09^{\circ} 56' \text{N.}$, $65^{\circ} 58' \text{E.}$

South Pacific Ocean

M.V. *Durham*. Captain A. Hocken. Wellington to Balboa. Observer, Mr. C. B. Treleven, 3rd Officer.

8th July, 1956, 0910 G.M.T. The vessel was heading 084° in darkness when a line of "white" was observed ahead, spreading to about two points on either bow, at a distance of perhaps 1 mile, with the appearance of broken water. On approach, it was observed to be formed by closely grouped pieces of phosphorescent material, each piece elliptical in shape and with a steady glow. The mass was perhaps seven cables long, some 200 ft across, and appeared to be on, or near, the surface of the sea. Wind 220° , force 4. Air temp. 49°F , sea 53° . Sky 5/8 Sc, occasional showers.

Position of ship: $43^{\circ} 23' \text{S.}$, $160^{\circ} 43' \text{W.}$

S.S. *Captain Cook*. Captain A. Bankier. Balboa to Wellington. Observers, Mr. R. S. McLundie, 3rd Officer, and Mr. D. Campbell, 4th Officer.

20th July, 1956. At 1700 G.M.T. an area of phosphorescence was observed, which on investigation proved to consist of innumerable phosphorescent "blobs". They were mostly scattered but a large patch of them stretched narrowly in a N-S. direction. Seen from above, they appeared to be cylindrical in shape, 1 ft in length, 3 in. in diameter and inanimate. They gave a constant blue light and there was no glow from the bow wave or wake. The depth of these objects below the surface could not be ascertained. Air temp. 50°F , sea 54° . Sea slight, moderate S'ly swell.

Position of ship: $39^{\circ} 41' \text{S.}$, $172^{\circ} 45' \text{W.}$

CLOUD

Mozambique Channel

S.S. *Clan Chattan*. Captain R. R. Baxter. Beira to Colombo.

28th August, 1956, 0713 G.M.T. The photograph opposite page 156 (exposure 1/500 sec), taken by Captain Baxter, shows a long, thin line of Cu, bearing 030° - 210° , which extended across an otherwise clear sky, from horizon to horizon, for a distance of at least 180 miles. Cloud increased temporarily to full cover about $1\frac{1}{2}$ hours later, accompanied by rather erratic changes in wind direction.

Position of ship: $14^{\circ} 58' \text{S.}$, $41^{\circ} 43' \text{E.}$

ABNORMAL REFRACTION

Tyrrhenian Sea

S.S. *Tagelus*. Captain A. S. M. Jamieson. La Spezia to Fao. Observer, Mr. D. G. Whiteley, 2nd Officer.

21st August, 1956, 2300 G.M.T. The vessel was proceeding in a SE'ly direction along the west coast of Italy when remarkable distortions of both sea and horizon were observed over a period of some 20 min. The horizon, which was not well-defined owing to low cloud or distant fog, appeared to arch upward to the extent of 2° or 3° over an angular distance of about 25° , with a corresponding lifting of the sea, giving a vivid appearance of a long and tremendous swell, of ominous proportions. A similar, but less remarkable, distortion appeared later, consisting of two such waves with a deep furrow between. Phenomenon of similar duration.

Weather calm, heavy dew. Air temp. 77°F , wet bulb 76.5° . Cloud 8/8 Fn and Ns. Fog patches clearing.

Position of ship: $41^{\circ} 12' \text{N.}$, $12^{\circ} 00' \text{E.}$

Strait of Belle Isle

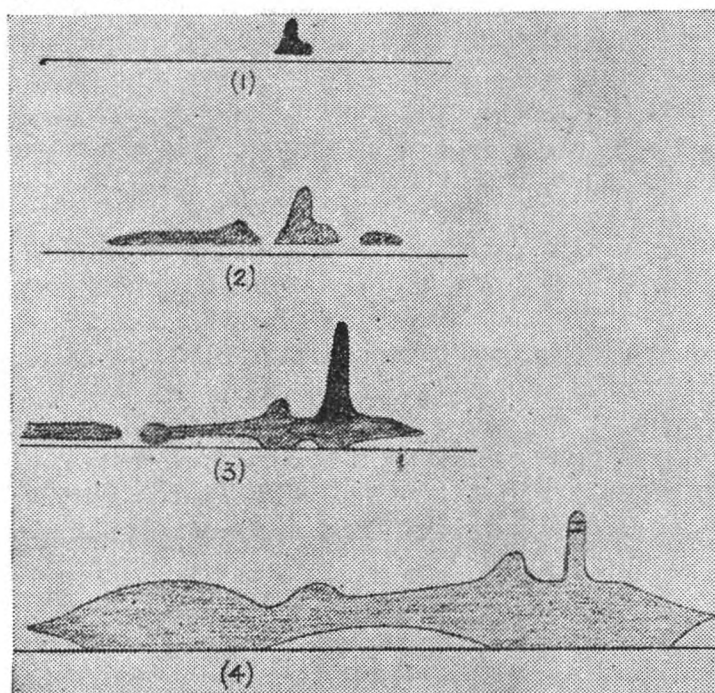
S.S. *Beaverlodge*. Captain L. H. Johnston, M.B.E. Antwerp to Montreal. Observer, Mr. R. M. Dickinson, 3rd Officer.

10th August, 1956. At 1731 G.M.T., 20 miles from Cape Norman. Height of bottom of image about 4' of arc above horizon (Fig. 1).

At 1735, 19 miles from Cape Norman (Fig. 2).

At 1745, 16 miles from Cape Norman, it was noticed that the lighthouse was considerably elongated and part of an inverted image was evident (Fig. 3).

At 1754, 14 miles from Cape Norman, the upper part of the image was of more or less normal shape (Fig. 4).



By 1800 the land mass had assumed its normal appearance. Air temp. 52°F , wet bulb 48° , sea 54° . Good visibility, 7/8 cloud. Normal visibility of Cape Norman light 16 miles.

Position of ship at 1800: $51^{\circ} 42' \text{N.}$, $55^{\circ} 36' \text{W.}$

Canadian Waters

M.V. *City of Khartoum*. Captain T. G. Mathias. Port Said to St. John, N.B. Observer, Mr. J. Petter, 3rd Officer.

3rd July, 1956. Observed a mirage of all lights visible on west coast. Gannet Rock light, which had dipped 15 min previously, suddenly rose well above horizon, showing three lights, one above the other. The distance at which the light was finally observed to dip was 40 miles (actual range 16 miles). The same phenomenon occurred in respect of Point Lepreau light, which was not due to rise for another half-hour, and many other lights normally out of range. Air temp. 54°F , sea 47° . Very clear, with signs of haze on eastern coast.

Position of ship: $44^{\circ} 45' \text{N.}$, $66^{\circ} 20' \text{W.}$

LUNAR HALO

West African Waters

M.V. *Trevince*. Captain B. W. George. Cape Town to Freetown. Observers, Mr. E. F. Boyd, Chief Officer and Mr. D. R. Owens, Apprentice.

25th September, 1956. At 0450 G.M.T. a distinct lunar halo was observed. The

altitude of the moon was 75° , the angular distance between the moon and the inner edge of the halo was 9° and the halo was $1\frac{1}{2}^\circ$ wide, all angles being measured by sextant. A band of Cc was seen to be running with the halo which appeared to move in a clockwise direction. Cloud $\frac{2}{8}$ Cu (C_{12}), $\frac{1}{8}$ Ac (C_{M3}) and $\frac{1}{8}$ Cc (C_{H9}).

Position of ship: $05^\circ 06'N.$, $10^\circ 56'W.$

Note. We do not appear to have received an observation of this halo from the sea before. Its theoretical radius is $7^\circ 54'$ but on the comparatively small number of occasions when it has been seen its radius has been variously observed from $7\frac{1}{2}^\circ$ to $9\frac{1}{2}^\circ$. It is called Van Buijsen's halo after the Dutch observer who first recognised it. It is also referred to as the "halo of 8° ".

Bay of Bengal

S.S. *City of Durham*. Captain D. C. Hamilton. Calcutta to Aden. Observer Mr. G. A. Pratley, 3rd Officer.

15th July, 1956. A narrow well-defined lunar halo of radius 24° , measured to the inside of the halo, was observed from about 1500 to 1615 G.M.T. Altitude of moon 38° . The moon was surrounded by a slight haze, and haze was also noticeable at the base of the halo. Towards the end of the observation passing cirrus clouds obscured the area. When the cloud cleared the halo had disappeared, though the moon was still surrounded by haze. Distant lightning, far to the westward, was observed throughout.

Position of ship: $08^\circ 20'N.$, $82^\circ 40'E.$

Note. Previous observations of one of the two halos of radii $23^\circ 24'$ and $24^\circ 34'$ have occasionally been published in this journal. When the radius is given as 24° as in this observation it might refer to either of these halos. Further information on these and other unusual halos is given in the note following the observation of S.S. *Yo Chow* published on pages 203–204 of the October 1956 number of this journal and also the note following the observation of M.V. *Brisbane Star* on page 205 of the same number. The two halos of about 24° radius may possibly not be very rare; it is difficult to say since they can rarely be observed as the 22° halo is usually present and blends with them.

SCINTILLATION OF STARS

South Atlantic Ocean

S.S. *Clan Campbell*. Captain H. C. Simpson, O.B.E. Dakar to Cape Town. Observer, Mr. R. K. Wilson, 2nd Officer.

18th July, 1956, 0230 G.M.T. On rising, the star Canopus was observed to be scintillating. The colour change was most striking and the sequence appeared to be bright blue, green, bright red, blue, *et seq.* The scintillation persisted for approximately 50 min. At the same time Rigel was also scintillating in a similar manner.

Position of ship: $18^\circ 35'S.$, $05^\circ 00'E.$

AURORA

North Atlantic Ocean

S.S. *Carinthia*. Captain A. MacKellar. Liverpool to Quebec. Observer, Mr. J. G. Parry, 3rd Officer.

2nd September, 1956. Considerable auroral activity in the form of rays reaching to an apex almost overhead. Visible from 0400 G.M.T. when clouds broke up, to 0630, by which time it had diminished to only a few patches in the west. As bright as moonlight at 0500, enabling an iceberg, 6 miles away by radar, to be clearly visible through binoculars.

Position of ship: $52^\circ 42'N.$, $52^\circ 42'W.$

S.S. *Manchester Explorer*. Captain W. E. G. Oliver. Manchester to Great Lakes. Observer, Mr. L. Fletcher, 2nd Officer.

2nd September, 1956, 0500 G.M.T. Northern Lights, of intensely bright blue

and greenish light, were observed for a period of 5 min. They radiated from the zenith to the horizon, spreading until the full encircling movement was complete, and the ship appeared to be in the centre of a cone of light for approximately 30 sec. The lights afterwards faded slowly until the only brightness left was centred overhead.

Position of ship: $50^{\circ} 37' \text{N.}$, $58^{\circ} 35' \text{W.}$

S.S. Assyria. Captain J. D. Bradley, R.D. London to Montreal. Observers, Mr. J. R. Turner, 2nd Officer, and Mr. F. A. Wood, Apprentice.

3rd September, 1956. An area of sky from the horizon to approximately 20° altitude, bearing 305° – 325° , had been illuminated since 0215 G.M.T. At 0245 beams of light parallel to the horizon were observed in this area moving upwards from the horizon at about 1 sec intervals and reaching a maximum altitude of 30° . This phenomenon lasted approximately 5 min. Following the cessation of the horizontal bands of light, the sky between 355° and 010° became brightly illuminated similar to the bright patch previously noticed, and rays of aurora were observed from 300° through N. to 040° . These were of greatest intensity at the eastern and western extremities and reached about 25° in altitude.

Position of ship: $52^{\circ} 45' \text{N.}$, $20^{\circ} 58' \text{W.}$

S.S. Sheldrake. Captain C. C. Reynolds. Cartwright (Labrador) to Montreal. Observer, Mr. C. I. H. Greaves, 2nd Officer.

4th September, 1956, between 0600 and 0800 G.M.T. The northern sky between the bearings of 250° and 030° to an altitude of 60° was covered by large pulsating patches of aurora. The colour varied between violet and white, the whole giving a bright shimmering effect not unlike flashes of gunfire as seen over an horizon.

The visibility and refraction throughout the night had been quite exceptional, all shore lights being sighted between 30 and 40 miles outside their charted ranges.

Position of ship: $50^{\circ} 20' \text{N.}$, $58^{\circ} 54' \text{W.}$

S.S. Warkworth. Captain N. Thompson, M.B.E. River Tyne to Port Churchill. Observers, Mr. C. Harron, 2nd Officer, and Mr. W. J. Childerstone, 3rd Officer.

5th–6th September, 1956, 2300–0100 G.M.T. Mid-position $58^{\circ} 18' \text{N.}$, $23^{\circ} 36' \text{W.}$ Pulsating arc with rays extending fan shape towards zenith. Altitude of arc's apex 40° . Bearings of ends 030° through N. to 270° . Moderate display throughout. Colour white.

6th–7th September, 1956, 2250–0140 Mid-position $58^{\circ} 18' \text{N.}$, $31^{\circ} 36' \text{W.}$ One large diffused patch extending over $2/8$ of sky, no pulse observed whatever. Approximate maximum altitude 50° . General bearing NW'ly. Faint display.

7th–8th September, 1956, 0100–0420. Mid-position $58^{\circ} 12' \text{N.}$, $37^{\circ} 12' \text{W.}$ Arc of more or less uniform light with occasional vertical rays issuing towards zenith. Fading after three hours to dull diffused patch. Altitude of apex 35° . Bearings of ends 280° and 360° . Moderate display. Colour white.

8th–9th September, 1956, 2330–0300. Mid-position $58^{\circ} 06' \text{N.}$, $43^{\circ} 48' \text{W.}$ Brilliant display of curtain aurora, well-defined and with continuous rapid motion. N'ly and obscured by cloud, s'ly and bearing 260° , thence through zenith towards NNE. Colours green and white with reddish tinge.

9th–10th September, 1956, 2315–0615. Mid-position $59^{\circ} 06' \text{N.}$, $50^{\circ} 18' \text{W.}$ First display observed while still twilight. Bright arc with ray structure, this faded completely and was replaced with a similar arc. Altitude of arcs 50° (5° thick). Bearings of first arc 020° – 270° ; second arc 050° – 240° . Duration of displays 15 min each, with interval of 15 min between. This faded to diffused patch until 0200, then replaced by brilliant curtain display stretching from 250° through zenith to 010° ; this faded at 0400 to diffused patch.

11th September, 1956, at 0100. In $60^{\circ} 18' \text{N.}$, $57^{\circ} 36' \text{W.}$ Momentary break in

clouds revealed bright pulsating arc in southern sky. Approximate altitude of apex 20° . Bearings of ends 140° and 220° very approximately.

12th September, in $61^{\circ} 24' \text{N.}$, $67^{\circ} 54' \text{W.}$ Aurora identified through break in clouds but unable to state type.

13th September, 1956, in $62^{\circ} 42' \text{N.}$, $76^{\circ} 36' \text{W.}$ No aurora observed.

14th September, 1956, in $61^{\circ} 12' \text{N.}$, $84^{\circ} 54' \text{W.}$ Sky completely clouded. Aurora not observed.

15th September, 1956, from 0530 to 1100 in mid-position $59^{\circ} 01' \text{N.}$, $93^{\circ} 10' \text{W.}$ Curtain aurora observed stretching in a NW.-SE. direction through zenith. Each end of this curtain terminated in a bright diffuse patch, the altitude of each being approximately 30° . The curtain continually dissolved and reformed but the patches retained their bright glow throughout. Occasionally short streamers of light issued from the NW. patch. Colour of curtain, white tinged with green; patches white.

S.S. *Begonia*. Captain R. Reekie. Port Churchill to Southampton.

15th August, 1956. At 0130 G.M.T. observed aurora of the ray type extending from 060° to 240° . The arc was from horizon to horizon and the apex passed close to the zenith. This lasted for 30 min when its place was taken by diffused patches. The whole display lasted until 0400.

Position of ship: $59^{\circ} 06' \text{N.}$, $52^{\circ} 10' \text{W.}$

Southampton to Port Churchill.

10th September, 1956. At 0340 G.M.T. observed aurora in the form of an arc. Both ends of the arc extended right down to the horizon from 050° to 250° and the apex passed close to the zenith. The display lasted until 0420.

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

11th September, 1956. At 0310 G.M.T. observed aurora consisting of pulsating arc with ray structure, also diffused patches which were continually wavering and changing form. The display lasted until 0530 and covered half the sky from 260° to 040° .

Position of ship: $58^{\circ} 47' \text{N.}$, $48^{\circ} 55' \text{W.}$

S.S. *Manchester Vanguard*. Captain W. E. Quirk, R.D. Manchester to Montreal. Observer, Mr. A. O. Copeland, 3rd Officer.

25th September, 1956, 2200 G.M.T. A ball of pale bluish light about 5° altitude, bearing 345° , was seen. At 2217, precisely on the instant of visible moonrise, the ball emitted a fan of rays across the sky. The rays were extremely bright and illuminated the cloud layers. At 2221 the rays suddenly disappeared and I observed a single auroral arc, extending to the horizon on each side from 014° to 295° through N., with apex at altitude 23° . The sky between the horizon and arc was dark. The arc was at first pale blue, later assuming a steady green hue. At 2235 a bright glow developed on the eastern extremity and slowly moved across the horizon eliminating the dark segment, reaching the western extremity at 2330. A second arc then formed between the original one and the horizon, with dark segments between the two. At 2337 the arcs disappeared, leaving only a pale bluish diffused light across the northern sky.

Position of ship: $56^{\circ} 13' \text{N.}$, $32^{\circ} 23' \text{W.}$

30th September, 1956. At 0010 G.M.T. I observed a steady arc of aurora emitting a pale bluish light. The altitude of the arc was 10° , extending to the horizon on each side between 303° and 047° , having a dark segment through which stars were clearly visible. At 0045 the arc became a pulsating curve emitting short rays. Shortly afterwards the display changed to one band of brighter light with ray structure. At 0125 a steady arc was again observed between 290° and 058° , reaching

the horizon at each extremity. At 0129 a bright ray emerged from the horizon bearing 068° and spread across the sky, curving to a point south of the zenith, but disappeared 3 min later leaving the steady arc as before. At 0140 the light intensified to a bright bluish-white. At 0210 a small inner arc developed, altitude 8° , the altitude of the greater arc being $16\frac{1}{4}^{\circ}$ and azimuth 289° – 057° on the horizon. The sea was brightly lit in an ellipse with its centre at the ship. At 0300 a band with ray structure emitted long curving rays to a point south of the zenith and a corona was formed. The sky to the north appeared to be veiled in fine Cs but I believe this to have been an effect of the extremely bright auroral light, since no cloud was visible in any other part of the sky. At 0310 a perfect bow was formed of altitude 38° , azimuth 288° – 060° , and rays emerged to form a sharply-defined and perfectly complete corona on the meridian south of the zenith. Shortly after this vivid display the light waned but the corona remained visible until at least 0420 when the observation ended.

Position of ship: $49^{\circ} 59' \text{N.}$, $62^{\circ} 24' \text{W.}$

Hudson Bay

S.S. *Warkworth*. Captain N. Thompson. Port Churchill to Hull. Observer, Mr. W. J. Childerstone, 3rd Officer.

5th August, 1956, 0500 G.M.T. Aurora was observed in the southern sky between bearings of 140° and 220° . It consisted of a bright low arc, broken in places. Occasional bright streamers issued upwards and faded at an altitude of approximately 30° . The display lasted for 15 min and then faded to a dull glow for a further 30 min.

Position of ship: $61^{\circ} 36' \text{N.}$, $84^{\circ} 24' \text{W.}$

Note. The maximum frequency of occurrence of aurora borealis is observed along a line or narrow belt forming an oval containing the north magnetic pole. This line crosses Hudson Bay approximately along the 60th parallel. There are as yet insufficient observations on the poleward side of this zone to determine the frequency with which aurora is seen to the southward of the observer. It seems, however, likely that aurora (including arcs) would be seen, in the northern part of Hudson Bay, more frequently to the south than to the north.

South Pacific Ocean

M.V. *Wairangi*. Captain J. L. Stobbs, R.D. Lyttleton to Balboa. Observers, Mr. B. A. Hills, 3rd Officer, and Mr. I. S. M. Condie, 4th Officer.

2nd September, 1956. At 0805 G.M.T. a display of aurora was observed lasting until 0845. Starting as a dull red arc above some Cu cloud about 10° above the horizon it increased to about 35° – 40° altitude and intensified in colour, reaching maximum brightness and altitude at about 0815. At this time numerous white rays appeared extending outside the area of the arc. These rays were subject to rapid darting movements towards the zenith and constant change in direction. The rays were active until 0830 when they gradually subsided, disappearing completely at 0835. The arc diminished more slowly and was visible until about 0845.

Position of ship: $42^{\circ} 55' \text{S.}$, $179^{\circ} 18' \text{W.}$

M.V. *Australia Star*. Captain J. A. Hoppé. Brisbane to Lyttleton.

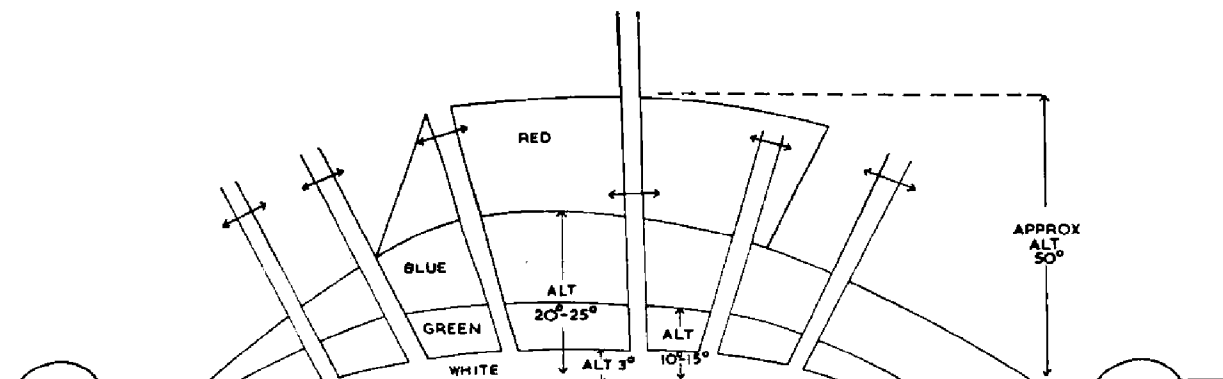
2nd September, 1956. At 1030 G.M.T. (ship's time 2230, 1st September). A fine example of the Southern Lights was observed. The phenomenon rose from low-lying cloud or fog patches with a brilliant white hue slowly developing into a vivid red colour, having several strong beams of white light radiating upwards and outwards from the centre, giving it a fan-like appearance. The centre of the fan bore 200° and had an altitude of 15° , the horizontal angle being approximately 70° . The maximum altitude was 80° while the extremities of the light extended from ESE. to W. After 30 min the lights slowly faded and disappeared.

Position of ship: $42^{\circ} 46' \text{S.}$, $173^{\circ} 40' \text{E.}$

Australian Waters

M.V. *Southern Satellite*. Captain W. Scott. Bahrain to Sydney, N.S.W. Observer, Mr. J. G. Wilson, 3rd Officer.

8th September, 1956, at about 1445 G.M.T. Off Cape Leeuwin, aurora was observed round an arc of the horizon from 130° to 198° , to an approximate altitude of 50° . As shown in the sketch, it consisted of irregular arcs of white, green and blue, surmounted by a block of most intense red. The colour intensity diminished with decreasing altitude. These bands were intersected by narrow radial white beams, one of which extended higher than the rest to an altitude of 65° – 70° . On each side of the extremities of the blue arc there was a whitish glow about 4° – 5° in width, reaching to about 3° in altitude. The whole display then increased in intensity, with each of the beams sweeping backwards and forwards over an arc of



about 10° . At 1530 it began to fade slowly and by 1600 only a faint white glow was still visible. While fading, the aurora swung about 50° to eastward. Other displays, similar in form but of less intensity, were observed two hours before and four hours after the one described.

Position of ship: $34^{\circ} 20'S$, $114^{\circ} 38'E$.

South Indian Ocean

S.S. *Orion*. Captain A. E. Coles, R.D. Fremantle to Durban. Observer, Mr. J. English, 1st Officer.

8th September, 1956, 1435 G.M.T. Just after moonset (moon three days old) observed a glow over the southern horizon; beams of light irradiated and slowly wheeled across the sky from E. to W., diffusing and becoming a deep red, this cycle being repeated. As the deep red faded in the W. a fresh lot of beams sprang up in the E. and developed as before. The phenomenon occurred between bearings 125° and 230° , reaching an altitude of 20° , and lasted about 1 hr 20 min.

Position of ship at 1435: $31^{\circ} 40'S$, $113^{\circ} 45'E$.

S.S. *Ixion*. Captain R. Blakey. Cape Town to Albany. Observer, Mr. A. T. Moody, 3rd Officer.

8th September, 1956, at 1445 G.M.T. A few seconds after moonset the sky to the southward appeared quite light, the light coming from behind a bank of Sc low on the horizon. This light gradually became brighter and extended both upwards and horizontally. A gradual change in light intensity in various sectors was then noticed, the whole turning into bands of brilliant white, almost silver, light reaching from the horizon to an altitude of 35° . The bands were approximately 5° wide.

A gradual colour change then took place, the bands becoming various shades of red, from deep red to almost pink, the width of the bands also varying. The sky was quite clear and stars against the red background were clearly visible yet had lost some of their brilliance.

At 1500 the aurora was at its best, extending through a horizontal arc of 100° , from 120° to 220° and to an altitude of 35° . From 30° above the horizon the colour faded and the red glow was lost above 35° . The above altitudes and bearings could

only be measured approximately as the ends of the bands were not sharply-defined but faded off gradually.

By 1505 a dense layer of Sc coming from the NE. began to obscure the aurora, but a red glow, in some sectors quite bright, could be seen through cloud gaps till 1520 when the sky became overcast.

Position of ship: $36^{\circ} 01'S.$, $107^{\circ} 17'E.$

M.V. *Port Phillip*. Captain W. Eastoe. Fremantle to Cape Town. Observers, Mr. G. F. Brandon, 4th Officer, and Mr. J. E. Toghill, 2nd Officer.

8th September, 1956. Between 1446 and 1456 G.M.T. the ship being on a true course of 270° , part of the southern sky, between 160° and 200° , was observed to turn from a dull crimson to bright red and back to crimson, then gradually fade away. The maximum altitude reached was about 40° . The weather at the time was sky $3/8$ clouded with lenticular Sc and no wind.

Position of ship: $29^{\circ} 22'S.$, $65^{\circ} 37'E.$

Note. The observations of M.V. *Southern Satellite*, S.S. *Orion*, S.S. *Ixion* and M.V. *Port Phillip* are of particular interest as they all refer to the same aurora and show that it was visible in relatively low latitudes. Remarks on the special importance of observations of low latitude aurorae will be found near the end of the article on "Aurora Observations During the International Geophysical Year" in the January, 1957, number of this journal.

METEOR

West African Waters

S.S. *Umtali*. Captain F. E. J. O'Hea. Cape Town to Las Palmas. Observer, Mr. M. W. Duncan, 4th Officer.

4th August, 1956, 2230 G.M.T. A brilliant green meteor with an orange trail was observed bearing 110° , altitude 9° approximately, proceeding N. The meteor disappeared bearing 103° , altitude 3° approximately, just below Mars. The duration of visibility was 2 sec.

Position of ship: $26^{\circ} 52'N.$, $15^{\circ} 43'W.$

South Atlantic Ocean

M.V. *Australind*. Captain J. F. Wood. Durban to Las Palmas. Observer, Mr. D. N. Brooks, 3rd Officer.

28th September, 1956, 0015 G.M.T. Meteor, with vivid orange trail turning bright yellow, first observed south of Rigel. After 4 or 5 sec it disappeared west of Capella. The magnitude was approximately three times that of Rigel. The trail remained visible for about 2 sec after the main body had disappeared.

Position of ship: $00^{\circ} 30'S.$, $09^{\circ} 05'W.$

Sulu Sea

M.V. *Cingalese Prince*. Captain R. C. Proctor, O.B.E. Manila to Sto. Niño. Observers, Mr. J. F. Newton, 2nd Officer, and Cadet Ford.

9th September, 1956. At 2013 G.M.T. a bright meteor appeared just above Canopus, bearing 130° , altitude approximately 15° , and moved round the horizon in an anticlockwise direction, keeping at a constant altitude, but travelling slowly, taking about 12 sec to reach a bearing of 360° , when it disappeared behind a bank of cloud. The object had a trail about 5° long which remained constant. The brilliance of the object was estimated at -3.0 and that of the trail at -1.0 .

Position of ship: $10^{\circ} 20'N.$, $122^{\circ} 15'E.$

CLIMATOLOGICAL AND SEA-SURFACE CURRENT CHARTS OF OCEAN AREAS

A new publication has recently been prepared in the Marine Division of the Meteorological Office. This takes the form of *Climatological and Sea-Surface Current Charts of Ocean Areas*, somewhat similar to the *Pilot Charts* issued by the U.S. Hydrographic Department.

Separate monthly charts will be produced for each ocean—North Atlantic, South Atlantic, North Pacific, South Pacific and Indian Ocean. On the main body of each chart will appear the principal steamer tracks, wind roses, predominant direction and constancy and maximum daily rate of currents, and ice limits. Inset charts will contain sea and air isotherms, isobars of mean pressure, visibility, frequency of winds of force 7 and above and hurricane tracks.

The first ocean on which we are working is the North Atlantic and the first month for which the chart has been published is May. This chart is available for inspection at Port Meteorological Offices. It is anticipated that charts of this ocean for subsequent months will be produced at approximately monthly intervals.

These charts are being prepared as a result of suggestions made by certain masters and officers of our voluntary observing ships. Their object is to combine on one sheet as much useful meteorological information as possible, together with information about predominant sea-surface currents, instead of having a separate chart for each element, as is done in our detailed climatological atlases. They will thus be very useful for quick reference. They are not intended to supplant the existing climatological atlases which give, in addition, other types of information which could not be included on the new charts. Furthermore, the representation of the meteorological elements shown in the inset charts is simplified and shows much less detail than the corresponding atlas charts. Neither do the new charts supplant the current atlases, since it is not possible to insert current roses on the charts. No information can therefore be given on these new charts about the degree of variability of current from the predominant direction and average rate, in different parts of an ocean, for which the current atlases should be consulted.

This is not the first time that the Meteorological Office has issued monthly charts of a somewhat similar type. In 1901 monthly meteorological charts of the North Atlantic Ocean were issued and in 1906 similar charts were published for the Indian Ocean. These charts were reissued each year, the backs of them being used for the publishing of articles, notices to observers and interesting observations made at sea. The charts were somewhat difficult to read, owing to the detailed and varied information that was attempted to be portrayed thereon, and the cost of monthly publication was considerable and increasing, so it was decided to discontinue them after 1923 and to replace them with permanent climatological atlases. In 1924 a new publication called *The Marine Observer* was introduced to fulfil more adequately the function of the articles and information given on the backs of the charts.

The new monthly charts will be much clearer and more informative than the old ones. They will not be reproduced each year; they are printed on good paper and the same chart should last for several years. Considerable care has been taken to avoid overcrowding too much information on each chart and the shipping industry was consulted as to their contents. To avoid confusion in distinguishing between the various elements, three colours (grey, red and blue) are used. The charts are obtainable from H.M. Stationery Office, at the addresses given on the title page of this journal, at a price of 3s. each. They can be purchased separately if required.

Migrants at North Atlantic Weather Ships in 1956

By IVOR McLEAN (Meteorological Office) and
KENNETH WILLIAMSON (Fair Isle Bird Observatory)

Introduction

It has been known for some years that observation of the birds visiting the weather ships, which occupy fixed stations in the north-eastern Atlantic, can be very rewarding, and by courtesy of the Marine Division of the Meteorological Office a few ornithologists have accompanied ships on their tours of duty and accounts of the birds seen have been published.^{1, 2}

The present contribution differs from earlier ones in that the first-named author, an amateur ornithologist with experience of bird observatory work, is by profession a meteorologist, and during a full tour of 12 months' duty in the weather ships was able to make a more complete coverage of the migration seasons than has been accomplished in the past. He is responsible for the majority of the observations, which are concerned mainly with migratory land-birds, and we are grateful for other notes to Mr. R. G. Findlay, who served as a meteorologist aboard British weather ships for nearly six years. These observations were forwarded to the second author at the end of each voyage and have been prepared by him, together with the general statement of the close relationship between migration and meteorology, for publication. Lack of space forbids the publication of these observations in full, but a copy of the complete list may be obtained from the Editor, by anyone wishing to study it.

In a foreword to a paper of Allison *et al.*,² M. L. R. Romer has indicated the value and interest to ornithology of work of this kind, and it is hoped that the present contribution may help to stimulate an interest in bird-watching among the officers and scientific staffs of the weather ships, as well as among voluntary observers in British merchant ships. Reports, to be adequate, should include detailed descriptions in support of identification, a brief indication of the local weather, and, where possible, the time and direction of arrival and departure, condition of the bird on arrival, duration of stay on board or in the vicinity of the vessel, and its behaviour towards the ship. An effort was made to determine these facts in the present series, in so far as this was compatible with the prior demands of professional duties; and occasionally additional information was secured by measuring and weighing birds that could be caught.

" Migrational Drift "

As a result of research carried out in recent years at Fair Isle, betwixt Orkney and Shetland, Williamson^{3, 4, 5} has advanced the theory of " migrational drift ". It is well known that populations of migratory birds, in passing between summer and winter quarters, move in certain " preferred directions " and in so doing tend to concentrate along such " leading-lines " or " guiding-lines " as sea-coasts, river valleys and so on which help them to navigate towards their goal. It has also been claimed^{6, 7} that successful orientation is dependent upon birds being able to " fix " their positions by observation of the sun, and there is a good deal of experimental evidence that a bird's navigational ability is seriously impaired if the sun is not in view. Thus, under a heavy overcast sky, or in mist and fog, or frontal weather with rain and drizzle, the bird loses direction. At such times its movement becomes one with that of the medium in which it is travelling—in other words, a down-wind " migrational drift " results.

The studies at Fair Isle have shown that a great deal of the passage migration which takes place through the British Isles in spring and autumn is due in the first place to down-wind displacement in easterly weather, under conditions inimical to accurate navigation, of flocks of birds migrating along the " guiding-lines " provided by the North Sea coasts of the Low Countries, north-west Germany, Denmark and western Norway. Birds attempting to make short sea-crossings, as between East Anglia and Holland, or across the Skagerrak separating Denmark and

Norway, are particularly prone to drift in unfavourable weather, and especially when making these journeys by night. The dangers are substantially great on the longer inter-island route via which many Iceland and Greenland birds seek to pass through Faeroe and Shetland to the British area. Such down-wind drift, in the gale-force westerlies of the Atlantic storm-track, has been shown to be primarily responsible for the frequent occurrence of North American birds in the British Isles.^{5, 8, 9, 10}

As one of the present authors has stated⁵: "Wind, in fact, is the migrant bird's greatest enemy, and this is especially true of the large number of species whose journeys (because they require the daytime for feeding) must be performed largely by night. By analogy, the most favourable migration weather is that which gives the calmest air conditions and so reduces the risk of drift to a minimum. It is for this reason that migratory movements reach their zenith in anticyclonic weather, for within an anticyclone the winds are either light or non-existent, and these conditions may obtain over a wide area for several days. I believe that this lack of wind is the most important of the external proximate factors stimulating the migrant bird." The pre-eminence of wind, and its independence of other qualities of the meteorological environment, such as temperature and barometric pressure, is further supported by the observation at Fair Isle of movements derived either from the Iceland-Faeroes sector, or from western Norway, when calm col conditions prevail in these areas. Such cols may lie between adjacent highs, or within a depression between the opposing airstreams of two contiguous low-pressure centres.

One other relevant point should be mentioned. Research at Fair Isle has also shown that the loss in weight of a land-bird which is forced to make a North Sea crossing may be as much as 20-25 per cent, and of course greater still if the journey is trans-oceanic from Greenland or America. Much of this is quickly regained if the victim of the drift, finding a congenial environment, stays "off-passage" for several days (for examples, see *Fair Isle Bird Observatory Bulletin*, No. 6, pages 30-32). Migrant birds must make frequent and regular halts for the recuperation of their reserves of glycogen and fats, and a bird which is wind-blown over any inhospitable zone such as a sea or desert would add wind-speed to its own flight-speed by making a down-wind drift, so covering the furthest distance in the shortest time and with the smallest expenditure of its severely limited physical resources. There is thus a possibility that down-wind drifting might lead to a greater number of successful crossings, and therefore a higher survival rate, than any other method of flying over an inhospitable region such as a desert or sea; in which case, over the course of many generations, this advantageous behaviour might become hereditary in migratory populations.

The Present Observations

When the authors examined the present series of records from the weather ships against the background of the general weather situation (using local data and the Daily Weather Report), good agreement was found with the views expressed above. It is virtually impossible, of course, to be certain of the recent migrational history of any bird visiting a ship in mid-ocean, and although the basis of our interpretation is necessarily theoretical, the weight of evidence as a whole strongly supports the hypothesis of "migrational drift", and instances can be found illustrating most of the factors we have discussed. Most of the cases, and particularly the individual or isolated ones, are dealt with under the appropriate species heading in the systematic list mentioned on page 152, but there are two periods of the autumn migration which, we feel, are worthy of special consideration.

The events at station I (59°N., 19°W.) during the latter part of September bear out the suggestion that there is much migration of Icelandic birds south-eastwards into the British area when calm or col weather prevails along the inter-islands route (i.e. Faeroe-Shetland-Orkney), see Figs. 1 and 2. At least 28 migrants,



Fig. 1.
0600 G.M.T. on 19th September, 1956.

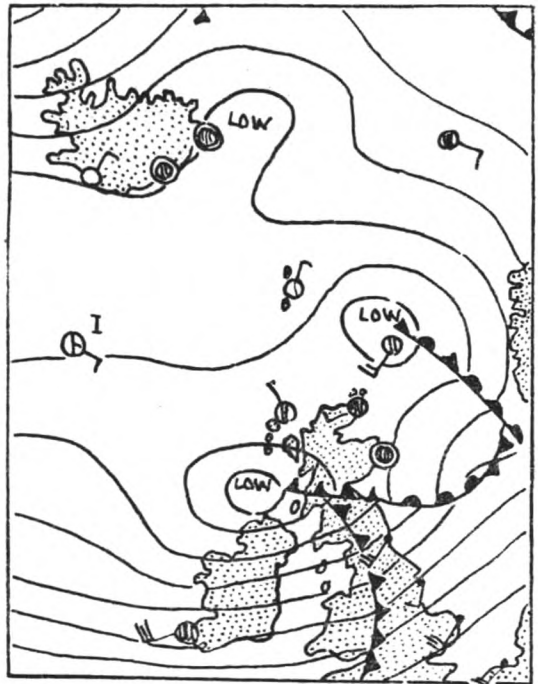


Fig. 2.
0600 G.M.T. on 28th September, 1956.

mostly meadow pipits (12) and wheatears (10), came aboard, and at least 10 of these died—four killed by the ship's cat, the remainder probably as the result of starvation following exhaustion of their energy-reserves. Their weakness indicates that the journey to the ship had been a circuitous one, and it is suggested that they were attempting this south-eastwards migration through the calm weather of the col but lost direction on encountering the mist and fog which were prevalent in the Faeroe and Shetland regions, subsequently reaching station I by down-wind drift on light to moderate south-east winds. Four turnstones on 20th September, and a snow bunting, a white wagtail and several meadow pipits on 30th, seem likely to have reached the ship in the same way. The last fortnight of September is late in the season for meadow pipit and wheatear passage but the numbers recorded may well have been unduly high for that position; only a thin trickle of movement of these species was going on at Fair Isle on these dates.

The "off-passage" stay of a merlin at station I at this time is of particular interest (see photograph opposite page 156): it arrived in col weather on 23rd September, and was seen to leave in a south-easterly direction early on 1st October with a fine chance of a cyclonic passage to the British Isles. Thus its arrival and departure at station I took place under similar weather conditions to those shown to govern the arrival of Icelandic merlins at Fair Isle^{9, 12}. Merlin occasionally remain "off-passage" at Fair Isle (there were records of 19 and 14 days for two birds in autumn 1956), but that one should do so for a full week at a weather ship in mid-ocean is surely remarkable. Scraps of raw meat were put out for it, and were eaten, and although it gave chase to small migrants (and on one occasion a storm petrel) it was seen to kill only one wheatear. Another merlin passed by on 28th September.

The circumstances attending the arrival of an American wader, a buff-breasted sandpiper (see photograph opposite page 156), at station I on 21st September, confirm recent views concerning the free down-wind drift of American vagrants across the Atlantic Ocean to the European side. A vast low-pressure system covered the North Atlantic, one centre of which had swept down from Labrador (with fronts crossing the Gulf of St. Lawrence) on 18th-19th, and had moved to the south of Cape Farewell by mid-day on 20th. With another centre located south

of Denmark Strait there was a generally westerly airstream across the ocean to the vicinity of station I. Had the bird continued, it might well have reached Iceland in the same cyclonic airstream—and would have avoided a fatal encounter with the ship's cat!

The other notable period was in the late autumn, when observations made at station J ($52\frac{1}{2}^{\circ}\text{N.}$, 20°W.) emphasised the triggering influence of anticyclonic weather on migratory birds. During the week from 30th October to 5th November some 40 birds were recorded, and there are good reasons for believing that they fall into two distinct groups: (a) drift-migrants from western France or the south-western portion of the British Isles, and (b) long-distance trans-oceanic migrants from Iceland or Greenland (snow bunting and purple sandpiper). The weather throughout was dominated by a large high centred to the west of Britain and generally north of the ship's position, so that between these dates station J was situated in an easterly or south-easterly anticyclonic airflow, with light wind and for the most part clear weather in the presumed area of origin of the birds (see Fig. 3). Locally

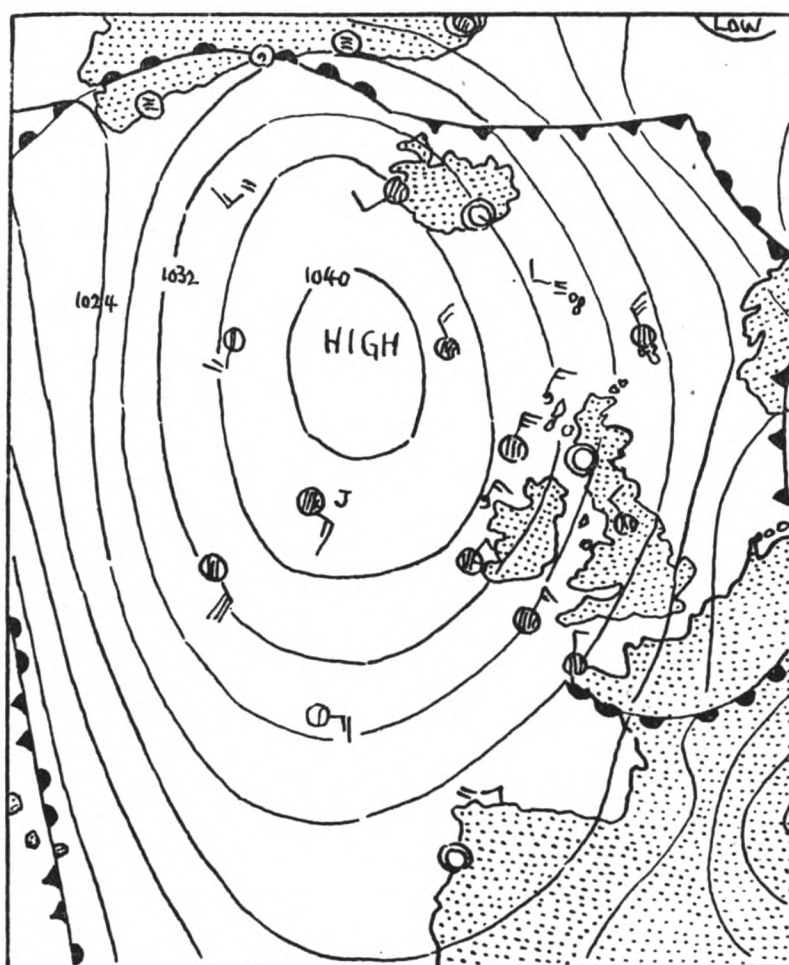


Fig. 3. 1200 G.M.T. on 2nd November, 1956.

the cloud consisted of a thick sheet of stratocumulus at 3,000–4,000 feet which completely hid the sun, and it is interesting to note that the ship was not able to get a sun-fix for navigation during the period but had to rely on Decca and Loran fixes. In view of the conclusion of recent research workers that migrating birds require some kind of sun-fix for their own navigation, the cloud conditions in this case may well be a significant factor in the appearance of so many birds so far from land.

Such species as were recorded—blackbird, redwing, starling, skylark, chaffinch and linnnet—are known to be regular autumn migrants across the Irish Sea and St. George's Channel to wintering-grounds in Ireland, and all were present in the

movements then proceeding into that country through Great Saltee Bird Observatory, off the south-east coast.¹¹ These birds, including the smallest, were not unduly fatigued, and indeed some did not rest on board or remain long in the neighbourhood, indicating a comparatively short flight in favourable weather. An unusual nocturnal visitor on 3rd November was a short-eared owl, and this too stayed for only a brief while before disappearing into the darkness.

On the other hand, the recent migrational history of the purple sandpipers and snow buntings must have been very different. Five of the former came aboard on 2nd November and another on 3rd, and it is probable that all succumbed, as they appeared to be utterly exhausted, and were very loth to fly, preferring to run along the deck when disturbed. They weighed from $1\frac{1}{2}$ to 2 ounces (approximately 42–56 gm). Weigold¹³ gives 60–84 gm (average 72 gm) for three migrants at Heligoland, and 74–95 gm for nine Icelandic birds. It seems likely, therefore, that the loss sustained by the arrivals at station J was at least 35–40 per cent. The snow buntings were in similarly poor shape: of several which came aboard on 3rd and 4th two were drowned when they tried to alight on the sea after being disturbed. One bird weighed half an ounce (about 14 gm), an incredibly low weight representing about 60 per cent loss, but a second was better at one ounce. Few migrants reach Fair Isle at less than 30 gm, and “normal” weight in autumn is nearer 40 gm. Considering the vastness of this anticyclonic system, it is not unlikely that these weakened birds had travelled southwards from east Greenland in the clockwise airflow of the high.

The diagrams on pages 154 and 155 are based on the charts in the Daily Weather Report of the Meteorological Office.

It is proposed to attempt a similar analysis to the above at the end of 1957, and the authors would be glad to have the use of any observations of land-birds at sea made by observers in merchant ships, as well as those on board ocean weather ships. Such observations might assist greatly in helping to elucidate problems concerning bird movements in the sea areas surrounding the British Isles. They should be sent c/o The Editor, “The Marine Observer”, and will be gratefully acknowledged if incorporated in a subsequent article.

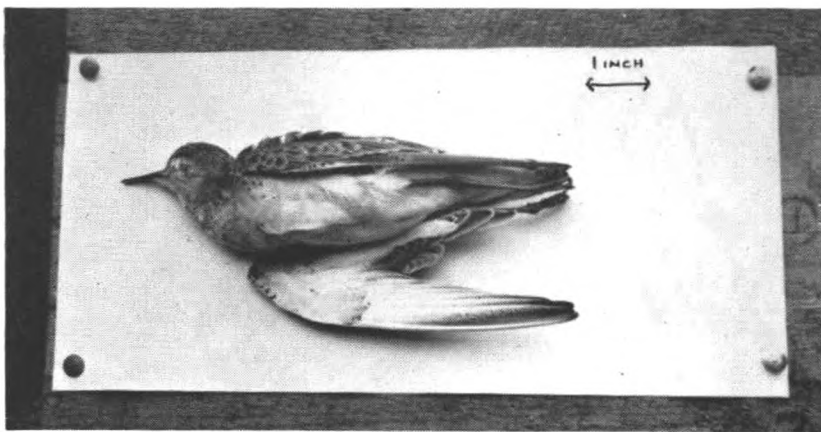
REFERENCES

- ¹ ALLISON, F. R., BARRAS-SMITH, M. A., DARLINGTON, A., and ROMER, M. L. R. Migrants observed from ocean weather-ships, July–October 1950. *Brit. Birds, London*, **44**, 1951, pp. 219–222.
- ² ALLISON, F. R., BARRAS-SMITH, M. A., DARLINGTON, A., and ROMER, M. L. R. Bird observation on ocean weather-ships in 1950. *Mar. Obs., London*, **22**, 1952, pp. 27–32.
- ³ WILLIAMSON, K. Migrational drift in Britain in autumn 1951. *Scot. Nat., Edinburgh*, **64**, 1952, pp. 1–18.
- ⁴ WILLIAMSON, K. Migration into Britain from the north-west, autumn 1952. *Scot. Nat., Edinburgh*, **65**, 1953, pp. 65–94.
- ⁵ WILLIAMSON, K. Migrational drift. *Acta XI Congressus International Ornithologici* (1954), 1955, pp. 179–186.
- ⁶ KRAMER, G. Experiments in bird orientation. *Ibis, London*, **94**, 1952, pp. 265–285.
- ⁷ MATTHEWS, G. V. T. Bird Navigation. Cambridge, 1955.
- ⁸ DAVIS, P. American Robin on Lundy. *Brit. Birds, London*, **46**, 1953, pp. 364–367.
- ⁹ WILLIAMSON, K. American birds in Scotland in autumn and winter 1953–54. *Scot. Nat., Edinburgh*, **66**, 1954, pp. 13–29 and 200–204.
- ¹⁰ ALEXANDER, W. B., and FITTER, R. S. R. American land-birds in western Europe. *Brit. Birds, London*, **48**, 1955, pp. 1–14.
- ¹¹ RUTTLEDGE, R. F., and WEAVING, J. Spring and autumn migration (1956) at Great Saltee. *Fair Isle Bird Observatory Bulletin*, **3**, 1957, pp. 135–143.
- ¹² WILLIAMSON, K. The migration of the Iceland Merlin. *Brit. Birds, London*, **47**, 1954, pp. 434–441.
- ¹³ WEIGOLD, H. Mabe, Gewichte und zug nach alter und Geschlecht bei Helgoländer Zugvögeln. *Biol. Anstalt auf Helgoland*, No. 17, 1926.



Photo by R. R. Baxter

Line of cumulus observed from S.S. *Clan Chattan* (see page 143).



A buff-breasted sandpiper—one of the ship's cat's victims at station I (see page 154).

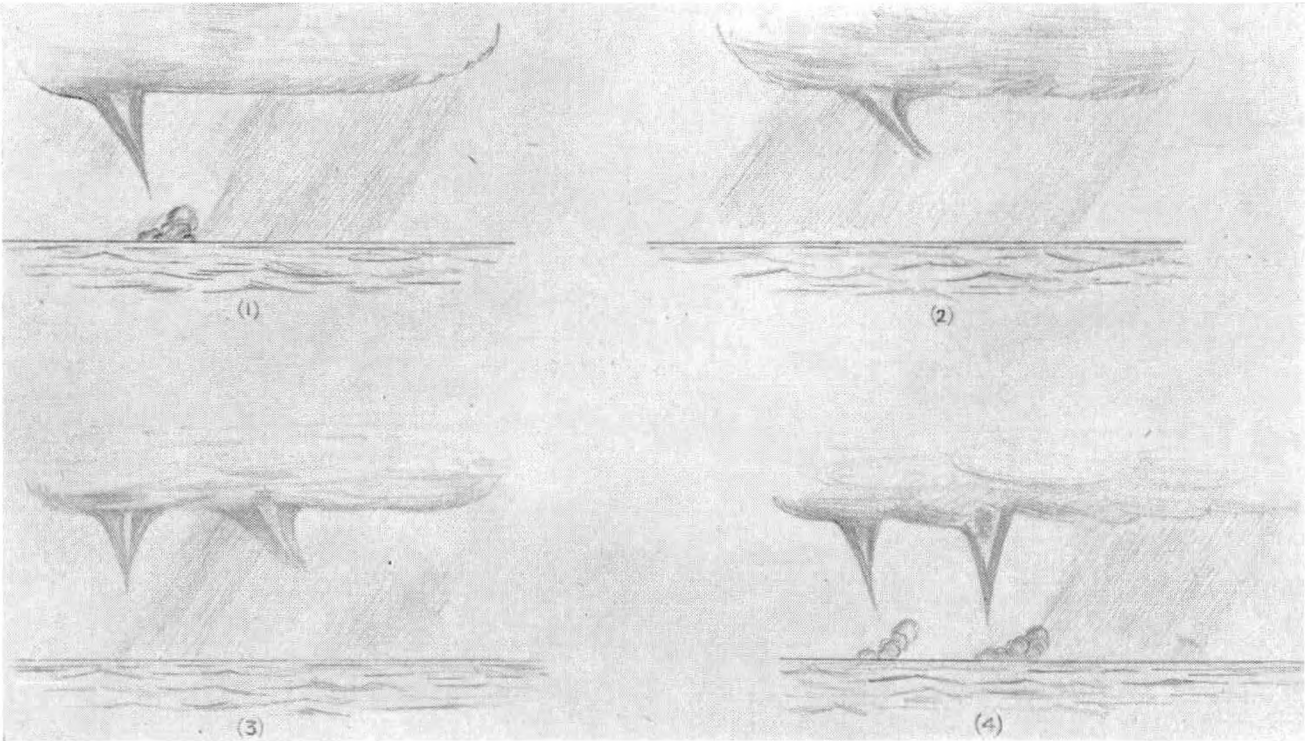


A merlin at station I (see page 154)

(*Opposite page 156*)



W.M.O. and I.G.Y. stamps (see page 165).



Waterspouts observed from S.S. *Teviot* (see page 141).
(Opposite page 157)

Whales Observed in the Indian Ocean

NOTES ON THEIR DISTRIBUTION

By S. G. BROWN, B.Sc.
(National Institute of Oceanography)

In 1951 the Meteorological Office kindly offered to co-operate with the National Institute of Oceanography in the collection of records of whales observed at sea by merchant ships and other vessels. Dr. Mackintosh outlined the scheme in *The Marine Observer*¹ and gave an account of the information required, with a description of some of the larger species of whales.* A short report by the same author, on the first year's observations, appeared later.³ The main object of this scheme is to obtain new information on the world distribution of the larger whales especially, but also of the smaller cetacea such as the dolphins and porpoises.

Data

The first reports were received in April 1952, and by April 1956 some 370 had been received; 65 of them are extracts from meteorological logbooks forwarded by the Meteorological Office, most of the remainder being on the special form provided by this Institute. The great majority of reports contain a number of whale observations and a large number cover more than one voyage. A few observations from aircraft have also been received but are not used in this paper.

The voyages cover the Atlantic, Indian and Pacific Oceans. Preliminary plotting of the observations from all three oceans showed that it would be better in the first instance to concentrate on the results of those from each ocean in turn rather than to attempt to produce a world chart of all the records. The present notes on the observations in the Indian Ocean may be regarded as a preliminary account of some of the results of the first four years.

The boundaries of the area under consideration can be seen in Fig. 1. It extends from 20°E. to 120°E. in the south but in the north the Red Sea is excluded in the west and so are the waters of the East Indian Archipelago in the east (from 100°E. and including all waters east of Sumatra and north of Java). The observations from these areas will be examined at a later date.

A total of 133 reports refer to the Indian Ocean as outlined: 80 of them give sufficient details for the approximate route to be plotted and the ships concerned apparently kept a fairly regular watch for whales. The remaining 53, conveniently referred to as *M* reports (mostly extracted from meteorological logbooks), have been used to reinforce some of the conclusions reached. The observations include 40 sightings of large whales, a large whale being defined as a whale assumed to be about 40 feet or more in length. This definition includes the sperm whale, the humpback whale and all the rorquals (except the minke or lesser rorqual). The reports identify, more or less tentatively, sperm whales, humpback whales and blue, fin and sei whales, but since it is very difficult to distinguish between the last three species at sea, they have been combined under the heading "rorquals" in this study. In addition to specific identifications by the observers, their descriptions of the size and behaviour, etc., of unidentified whales have occasionally enabled an identification to be made, e.g. as a humpback whale, or a rorqual. There remain a number of observations of large whales which cannot be identified. These have been classed as "large whales", possibly including any one or all of the above species. In addition there are many records of dolphins and small whales, but these have not been considered in the present study since they are of little commercial importance though of considerable interest in general marine biology. It is intended to examine their distribution in a future paper.

The track of each vessel from the 80 whale reports has been roughly plotted on a Mercator chart, according to the noon positions of the vessel and the positions at

* An enlarged edition of these notes was issued by the Institute in July, 1952², for the use of observers in ships.

which any observations were recorded. The chart was next divided into areas ("squares") of 10° latitude by 10° longitude and into subdivisions of those areas. The distance steamed in each area (to the nearest 100 miles) was calculated and the total mileage was also divided into miles steamed in each of the four three-monthly periods, September-November, December-February, March-May, June-August.

In this preliminary study it has been assumed that a reasonable lookout for whales, consistent with bridge duties, etc., has been kept on all the vessels for which tracks have been plotted. Most of the whale reports state that such a lookout was maintained. It is recognised, of course, that there will be varying degrees of vigilance on different vessels, and some observers doubtless kept a keener watch for cetacea than others. However, it can be supposed that the average degree of vigilance would be fairly constant except perhaps in regions covered by only one or two ships. No allowance has been made for hours of darkness or poor visibility, so that the figures of the total mileage steamed in each area, shown in Fig. 1, indicate the relative rather than the actual intensity of observation in the different areas.

Whales are never evenly scattered over the oceans; they are irregularly distributed and different species have more or less extensive seasonal movements. It will be realized that there are limits to the inferences to be made from these observations, for they cover the region unequally and species can seldom be distinguished with certainty. Furthermore, the total number seen is small in the statistical sense, and this means that the pattern of the plotted observations may be due in part to chance as well as to the real distribution of the whales. But if the inferences set out below seem rather cautious at this stage it should be remembered (a) that they are entirely new, for almost no evidence on the general quantities and distribution of whales in the region has yet been published, and (b) that we can expect in time to get more and firmer results out of the same observations when newer data are added to them and when they are taken with other evidence relating to the same region, such as that from returned whale marks, old whaling logbooks, records of catches at whaling stations and improving knowledge of the seasonal rhythms in cetacean distribution.

Total Whales

It is immediately apparent from an examination of the mileage figures that very much more intensive observation has been carried out to the north of the Equator than to the south. The North Indian Ocean, the Gulf of Aden and its approaches, and the approaches to Ceylon show the greatest mileage steamed. The northern part of the Arabian Sea and the Bay of Bengal have been the least frequented areas. In the South Indian Ocean the areas on the shipping routes from the Red Sea and Ceylon to Western Australia, and from South Africa to Western Australia, have been covered the most and there is very little coverage elsewhere.

The number of sightings of all the large whales made by the vessels for which the mileages steamed have been calculated are shown in Fig. 2. The number of whales seen at each sighting is not indicated but of the 103 sightings plotted, 78 (75 per cent) were of one or two whales only. Thus the number of sightings is roughly proportional to the number of whales seen. The approximate numbers of the different species seen were:

	Rorquals	Sperms	Humpbacks	"Large whales"	Total
Sightings	35	33	15	20	103
Number of whales (approx.)	98	82	61	22	263

The chart shows that the sightings are concentrated on the busiest shipping routes as is to be expected. More observations are needed before we can plot for each 10° "square" the number of whales of each species per 1,000 miles steaming to give a reliable comparison between the numbers in each "square". It is possible, however, to check the areas in which all large whales appear to be concentrated or scarce if the number of sightings of all species per 1,000 miles steaming,

and the approximate numbers of whales seen, in different areas is calculated. Certain broad features of distribution are then seen to stand out fairly clearly.

Comparing first the parts of the Indian Ocean north and south of the Equator, we have 0.28 sightings/1,000 miles (0.68 whales/1,000 miles) to the north and 0.19 sightings/1,000 miles (0.50 whales/1,000 miles) to the south. From this we can only say that there is no evidence of any great difference in the overall "density" of the populations. The figures do suggest rather more in the northern part, but with the limited number of observations the difference between the two figures may be due to chance.

Next the ocean as a whole may be conveniently divided further into five areas, the boundaries of which are outlined in Fig. 1. These are:

1. The Gulf of Aden and its approaches.
2. The Arabian Sea, which is taken to include the whole area north of the equator and west of 80°E., omitting area 1.
3. The Bay of Bengal, the area north of the equator and east of 80°E.
4. The Central Indian Ocean, from the equator to 30°S. and extending from 50°E. to 100°E.
5. The zone between South Africa and Western Australia, south of 30°S.

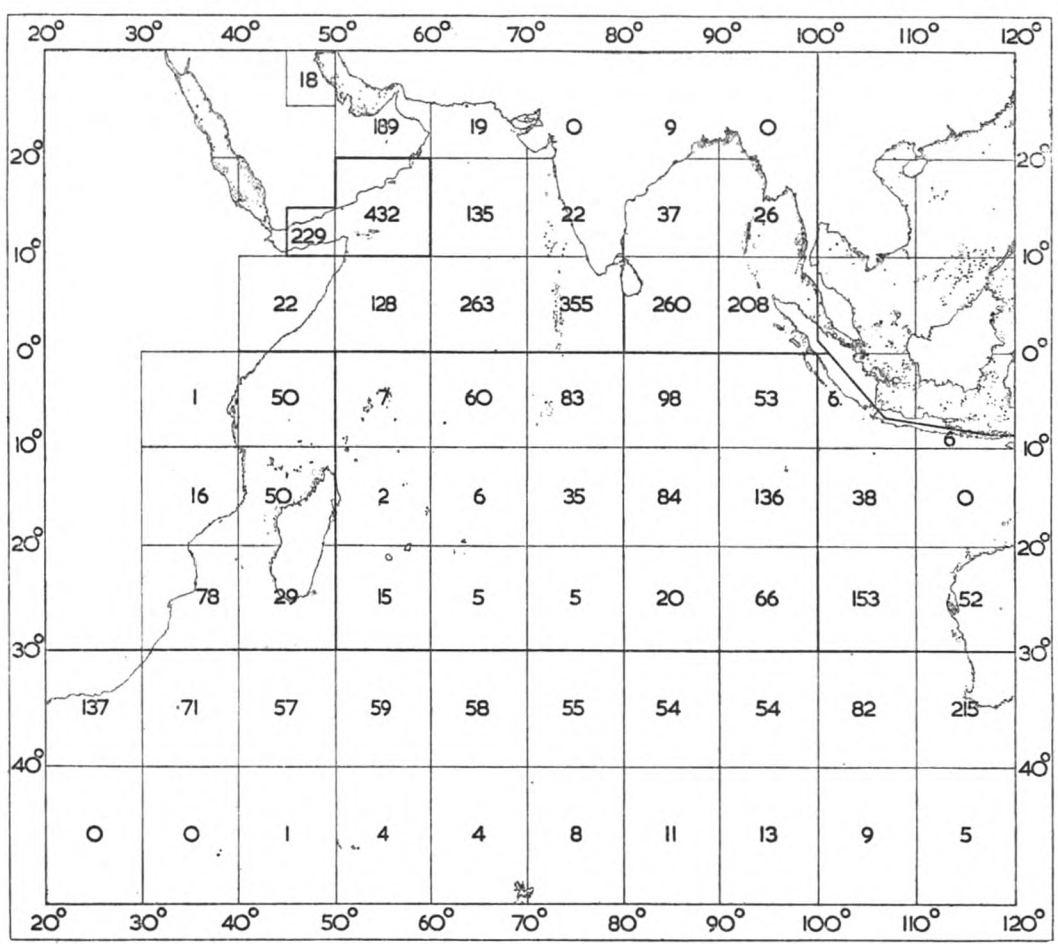


Fig. 1. Chart showing the boundaries of the Indian Ocean, the division into areas and the total mileage steamed in each 10° "square" (in hundreds of miles).

The total distances steamed, the sightings of all species, and the approximate numbers of whales seen, for the whole year in these five areas are set out in Table 1. The highest concentrations of whales occurs in the Gulf of Aden and its approaches. There are fair numbers of whales in the Arabian Sea (but not in the Persian Gulf and its approaches) and in the zone between South Africa and Western Australia. In the Central Indian Ocean, and to a less extent in the Bay of Bengal, there is a very marked scarcity of whales. There is little to be said about the areas on either

side of the Central Indian Ocean, near to the African and Australian coasts. Here the observations may be affected through the tendency of some whales, e.g. hump-back whales, to keep close to the coast inside the shipping routes, and the sampling is thus less reliable than elsewhere.

Table 1. Sightings and numbers of all large whales in different areas of the Indian Ocean.

	Miles steamed	Number of sightings	Sightings /1000 miles	Number of whales	Number /1000 miles
Gulf of Aden and Approaches ..	66,100	34	0.51	76	1.15
Arabian Sea ..	115,100	24	0.21	64	0.56
Bay of Bengal ..	54,000	7	0.13	20	0.37
Central Indian Ocean	67,500	4	0.06	5	0.07
Africa-Australia ..	89,700	26	0.29	86	0.96

It is interesting to compare the overall density of the whale populations in the Indian Ocean with the density in the Antarctic. Perhaps the best evidence of the latter is given by the results of the voyages of the *Discovery II*. In the course of oceanographic work in the Southern Ocean before the war, *Discovery II* steamed many thousands of miles in the Antarctic. Details of the observations which relate to the years 1933-39 have been given by Mackintosh and Brown.⁴ A special constant lookout for whales was kept and the figures, which relate to baleen whales only, eliminate periods of darkness and poor visibility. In the Indian Ocean sector of the Antarctic the density of the whale populations varied from about 70 whales/1,000 miles steamed in summer to about 18 whales/1,000 miles in winter. The corresponding figures for the baleen and "large" whales only, omitting sperm whales, are, for the North Indian Ocean, 0.24 and 0.28 whales/1,000 miles, and for the South Indian Ocean 0.26 and 0.49 whales/1,000 miles respectively. If we assume that half of the total distance steamed in the Indian Ocean was in darkness or poor visibility and that only one-third of the whales which would have been sighted from *Discovery II* (with the special lookout) were sighted by the reporting vessels, the density of the populations of whales in the Antarctic is approximately 47 times as great as that in the North and South Indian Oceans in the summer months and from 6 to 11 times as great in the winter months.

Since there are good reasons for believing that most of the baleen whales are absent from the Antarctic in the winter months it seems curious at first that the density of the Antarctic population in this sector in winter is greater than that of the population in the Indian Ocean, but of course the area of open water in this sector of the Antarctic Ocean in winter is only about one-ninth of that of the Indian Ocean. The whales in the latter will therefore be scattered over a very much greater area of ocean.

When the observations are split up according to species and seasons the data become further reduced and generally not sufficient for conclusions as to seasonal movements. But seasons must be taken into account if only to show, for example, that certain groups of whales were not seen only at one time of year.

Sperm Whales

Thirty-three sightings of sperm whales were reported (Fig. 3). The approximate number of whales seen was 82. Twenty-three of the sightings were of one or two whales only, and the greatest numbers seen at one time were about 10 and 13 whales.

Twenty-three observations (60 whales) were reported in the North Indian Ocean, 12 of them (38 whales) in the Gulf of Aden and approaches. There are 10 sightings in the South Indian Ocean, only two of them in the Central Indian

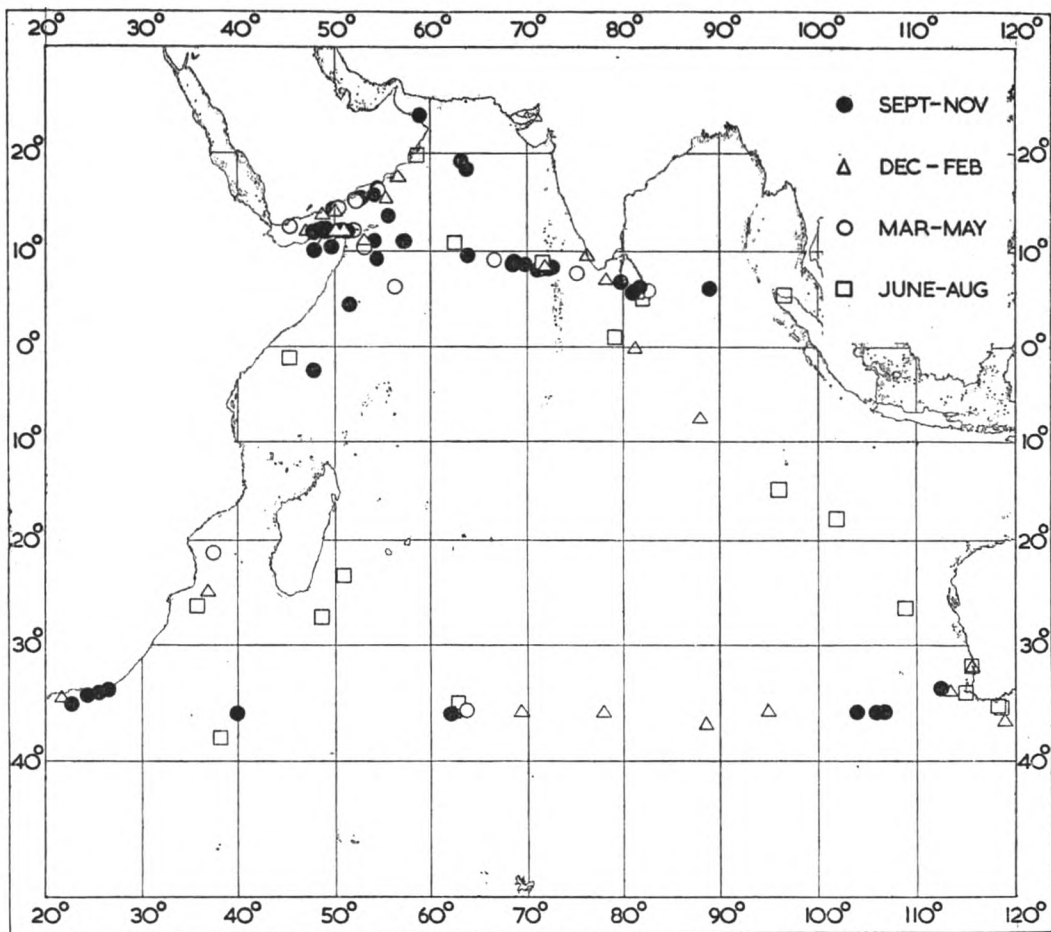


Fig. 2. The distribution of sightings of all large whales.

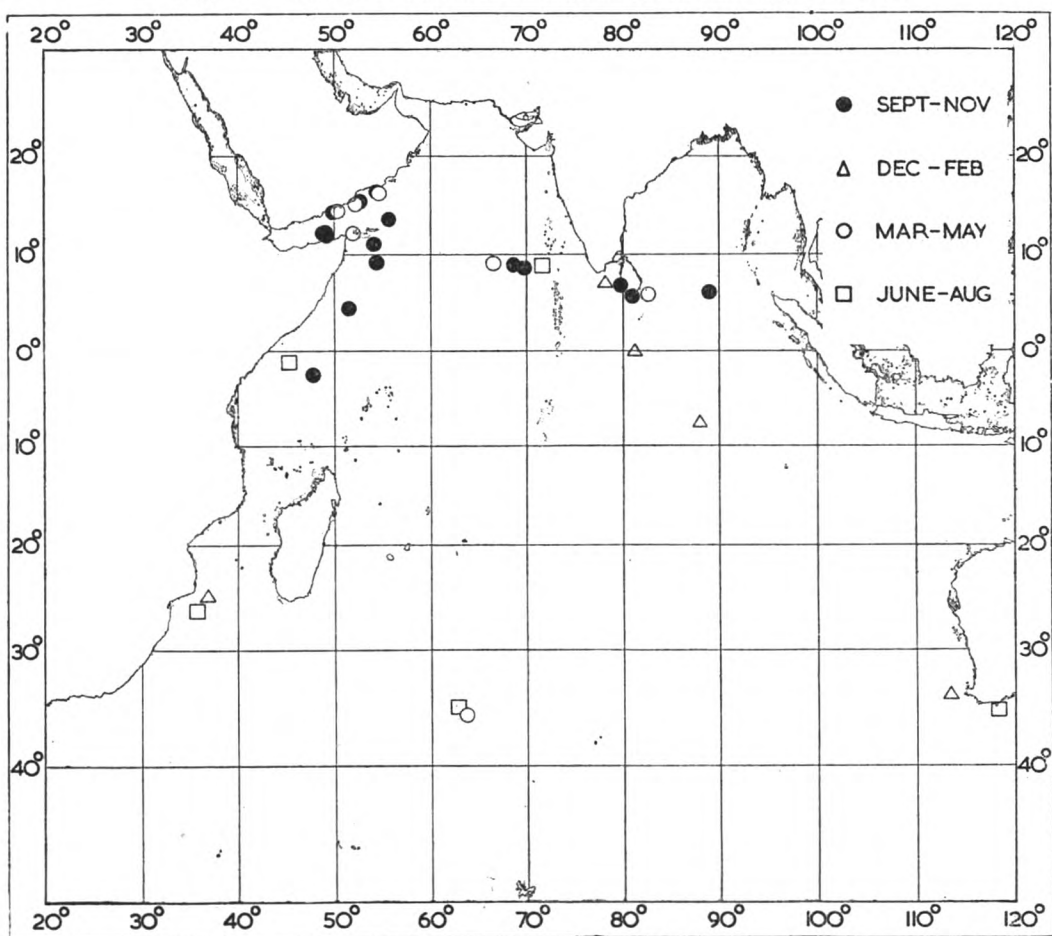


Fig. 3. The distribution of sightings of sperm whales.

Ocean area. It seems that even in the North Indian Ocean sperm whales do not outnumber the rorquals and humpbacks (31 sightings of 89 whales).

The seasonal distribution of sperm whales shown in Fig. 3, and reinforced by sightings plotted from the *M* reports, agrees very well with the distribution of this species determined by Townsend (1935)⁵ on his charts plotted from the logbook records of nineteenth-century American whaleships. The only striking difference is that he does not record any sperm whales taken on the "Coast of Arabia" ground in the period March-May, whereas Fig. 3 shows several records for this period in this area. It is possible that very few whalers visited the area at this time. In an earlier paper⁶ he states that the whaling in the Arabian Sea (lat. 15°N.) was chiefly in December and January.

Townsend,⁵ speaking of the distribution of sperm whales generally, states that his charts show "a seasonal oscillation of most of the sperm whales between north and south latitudes, or at least toward or away from the equator". He goes on to say: "There is much evidence that there is an extensive southward movement of sperm whales as the northern winter season comes on. A reverse movement is indicated for the winter season south of the equator." The sightings of the individual species in the four three-monthly periods, expressed as sightings per 1,000 miles steaming (Table 2), show that north of the equator in the sightings of sperm

Table 2. Numbers of sightings of individual species per 1,000 miles steaming.

	September- November	December- February	March- May	June- August
	NORTH OF EQUATOR			
Sperm	0.184	0.017	0.220	0.015
Rorquals	0.098	0.117	0.073	0.060
Humpback	0.061	0.033	0.073	0.015
"Large whales"	0.074	0.033	0.073	0.015
	SOUTH OF EQUATOR			
Sperm	0.020	0.073	0.025	0.067
Rorquals	0.139	0.091	—	0.034
Humpback	0.020	—	—	0.067
"Large whales"	0.060	0.055	—	0.051

whales, and to a very much smaller extent in humpback whales and "large whales", there is a preponderance of sightings in September-November and in March-May. South of the equator the sperm whale sightings are at a maximum in December-February and June-August, although the difference between the four seasons is much less marked than in the northern hemisphere. This distribution of the observations (which also applies to the actual numbers of whales seen) suggests that sperm whales are represented to the north of the equator mainly in the northern autumn and spring and to the south of it in the southern summer and winter, as if there were a double migration. More observations may show whether this is in fact the case or whether the apparent distribution is due to chance.

Humpback Whales

Only 15 records of humpback whales, referring to some 61 animals, were made (Fig. 4). The 10 observations north of the equator were all of single whales or very small parties, seven being the greatest number recorded. Two of the four records from the coast of Western Australia refer to parties of about 12 whales in each. Large numbers of humpback whales are known to be present off the Australian coasts in the southern winter and the fact that only four sightings were reported

indicates, as mentioned earlier, that the present observations do not reliably sample the coastal areas.

Of the 10 humpback sightings seen in the North Indian Ocean, six are in the southern winter. They are almost certainly members of the same population as is found in the Antarctic in the southern summer. They suggest that this species travels farther north on its winter migration than might be expected from what is so far known of their distribution and migrations. On the west coast of Africa whaling stations catching humpback whales have operated in the past from St. Thomé and Cape Lopez on the equator. On the east coast, however, there were no stations north of Mozambique, about 15°s.

Rorquals

Thirty-five sightings (approximately 98 whales) are plotted in Fig. 4. None are recorded in the Central Indian Ocean area. The number seen north of the equator is interesting, especially those noted in December-February when the greater part of the southern population of blue and fin whales at least must be in Antarctic waters, and the presence of rorquals in the Gulf of Aden and its approaches at all seasons of the year is noteworthy. Evidently not all rorquals go south for the southern summer and it may be that more than was thought either miss the southern migration altogether, or get out of step with the main migration movements.

The 12 records in the South Africa-Western Australia zone are also of special interest. Baleen whales sighted here may give a clue to the routes followed by them in their annual migrations to and from the Antarctic. Eleven of the observations were made in September-November and December-February, and these are likely to be of migrating animals. There are no sightings in March-May and only one in June-August. Few ships cover this region and the number of sightings is very small, but some tentative conclusions may be drawn from them. The mileage

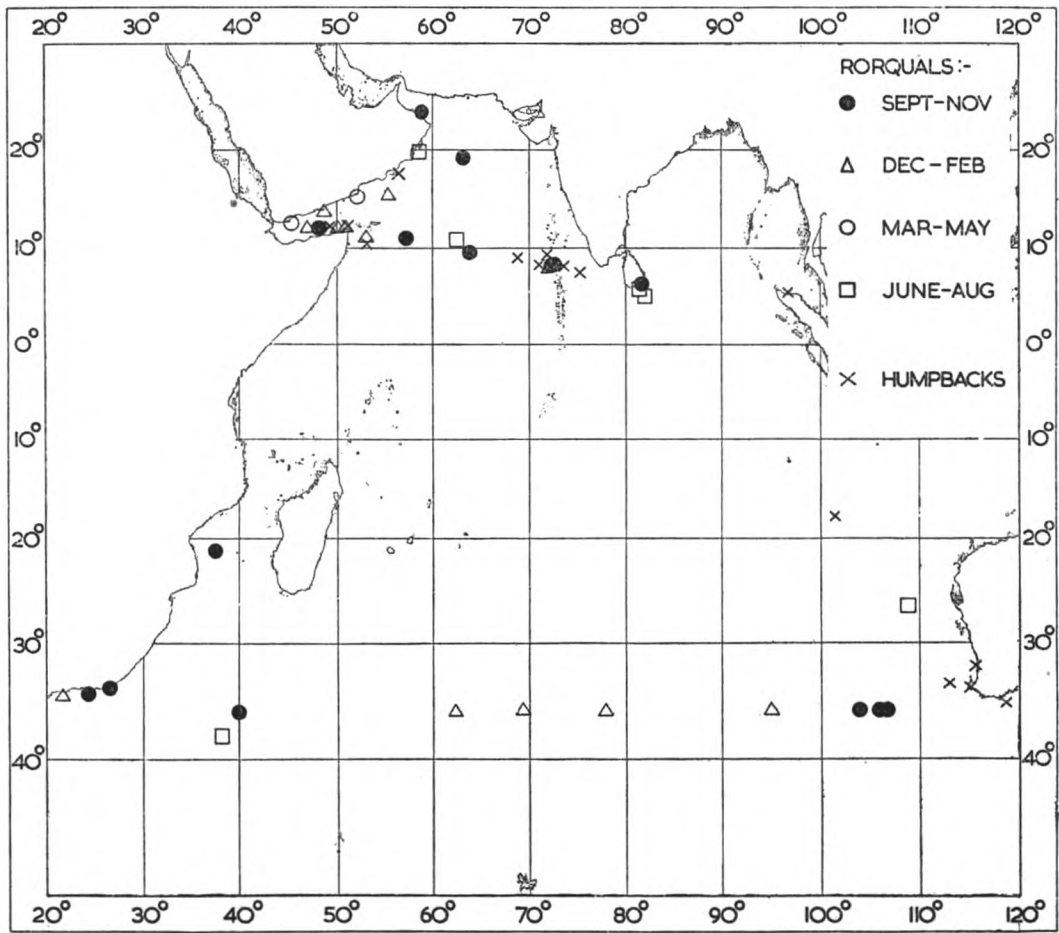


Fig. 4. The distribution of sightings of rorquals and humpback whales.

steamed in the zone in each of the three periods from September to May is approximately equal, but it is doubled in the period June-August. It seems likely, therefore, that there really are very few rorquals in this area at this time. The distance steamed in each of the 10° "squares" between 40°E. and 100°E. , from 30° to 40°S. , is approximately equal during the period September-February so that the distribution of the sightings suggests that in the rorquals in this sector of the Southern Ocean, migration is along a broad front rather than restricted to one or two narrow routes. It will be very interesting to see if the accumulation of further records from this zone will confirm this.

Conclusions

The main conclusions reached may be summarised here. There is apparently no great difference in the overall density of the large whale populations per unit area north and south of the equator. The highest concentrations of whales in the Indian Ocean occur in the Gulf of Aden and its approaches, the Arabian Sea and in the zone between South Africa and Australia. The least concentration is found in the Central Indian Ocean.

In summer the concentration of baleen whales in the Antarctic is very many times greater than in the Indian Ocean but there is much less difference in winter. The number of sperm whales in the ocean as a whole seems not to outnumber that of the different species of baleen whales combined.

Humpback whales and rorquals are found unexpectedly far north, on the supposition that they all belong to the southern hemisphere populations. Rorquals have been observed right across the 30° to 40°S. zone between South Africa and Australia where ships might be expected to intercept them occasionally during their migrations.

The National Institute of Oceanography will be most grateful for the continued co-operation of mariners who are willing to make whale observations. Reports are required from all oceans and of all species of whales. If full records can be given, with the vessel's noon position for each day (or every second or third day), these will be most valuable as they allow the vessel's track to be plotted and estimates of the mileages steamed by vessels and the coverage of different areas to be made. However, all records are useful and will be examined.*

The whale reports which have accumulated from the Atlantic and Pacific Oceans are now being examined, along with other data, and it is hoped to published further preliminary reports on the results in due course.

Acknowledgments

The National Institute of Oceanography is indebted to the Director of the Meteorological Office, Sir Graham Sutton; the Marine Superintendent, Commander C. E. N. Frankcom; his staff, and the Port Meteorological Officers for their help in organising and operating the scheme, and for the extracts of whale observations from the meteorological logbooks of vessels.

We wish to thank all masters of vessels and observers who have sent in the whale reports upon which these notes are based, and to record our appreciation of the trouble they have taken to make useful observations for us. Observations have been received from a total of 92 ships.

The author is indebted to Dr. N. A. Mackintosh for helpful advice and criticism and to Mr. A. Style for his valuable assistance in the preparation of the figures.

* Special forms for this purpose and all necessary instruction can be obtained from any Port Meteorological Officer in United Kingdom ports. Further supplies of these forms will be sent to the ship by the National Institute of Oceanography.

REFERENCES

- ¹ MACKINTOSH, N. A. Observations on whales from ships. *Mar. Obs., London*, **22**, 1952, pp. 87-90.
- ² National Institute of Oceanography. Observations on whales from ships. 2nd edition, July 1952, p. 11.
- ³ MACKINTOSH, N. A. Observations of whales from ships; Report on the first year's observations. *Mar. Obs., London*, **23**, 1953, p. 228.
- ⁴ MACKINTOSH, N. A., and BROWN, S. G. Preliminary estimates of the southern populations of the larger baleen whales. *The Norwegian Whaling Gazette*, No. 9, 1956, pp. 469-480.
- ⁵ TOWNSEND, C. H. The distribution of certain whales as shown by logbook records of American whaleships. *Zoologica, New York*, **19**, No. 1, April 1935, pp. 1-50.
- ⁶ TOWNSEND, C. H. Where the nineteenth century whaler made his catch. *Bull. N.Y. zool. Soc., New York*, **34**, No. 6, 1931, pp. 173-8.

AURORA OBSERVATIONS

The following is an extract from a letter dated 12th February, 1957, received from Mr. J. Paton:

"Many thanks again for this further batch of ships' observations.

"The response of ships' observers and the extremely valuable information they are providing, bodes well for the I.G.Y. We are told by the C.S.A.G.I.* Office that in the matter of material deriving from ships Britain is far ahead of other countries in its preparations for the I.G.Y. The credit for this lies with you and your department.

"We are going to attempt during the I.G.Y. to draw nightly a meridional map for the Atlantic area. For this, we shall be dependent almost entirely on ship and aircraft observations. We shall be most grateful if you can acquaint officers of all ships plying in the Atlantic (N. and S.) with the importance of auroral observations, especially during the I.G.Y."

(Some notes on Mr. Paton's work in connection with aurora observations, particularly with reference to the International Geophysical Year, appeared in the January 1957 number of this journal.)

*C.S.A.G.I. is the Special Committee for the I.G.Y.

ISSUE OF W.M.O. AND I.G.Y. COMMEMORATIVE POSTAGE STAMPS

A short note about special W.M.O. stamps appeared in the last number of this journal. Two other stamps which may be of interest to maritime meteorologists were issued by United Nations on 28th January, 1957. The design, common to both the 3c. and 8c. values (the 3c. stamp is shown opposite page 157), publicises the World Meteorological Organisation and depicts a complete radio-sonde in flight. The balloon is drawn to symbolise the globe and thus emphasises the world-wide responsibilities of W.M.O. The pair of stamps can be bought from most dealers for about 1s. 3d. mint or used.

Those of our readers who are philatelists may also be interested in various stamps issued in connection with the International Geophysical Year (see opposite page 157). These stamps commemorate Antarctic expeditions and two of them—the Australian 2s. and the Russian 40 kopeks—include in their design a map of Antarctica. The latter stamp also shows the locations of Russian scientific and weather stations. These two stamps may be obtained from stamp dealers for about 2s. and 1s. sterling respectively.

The set of four values issued by the Falkland Islands Dependencies overprinted "Trans-Antarctic Expedition 1955-58" are shown on a cover, cancelled with the first-day postmark at Halley Bay, which came to England on the return trip of *Magga Dan*. Most first-day covers of these stamps were postmarked at Shackleton base, and are readily obtainable for about 6s. per cover. Mint sets of the four stamps average about 1s. 6d. These stamps are from amongst the beautiful Queen Elizabeth II Falkland Islands Dependencies set, each value showing a vessel which has been used in the work of the Falkland Islands Dependencies Survey.

N. H. I.

Book Reviews

Marine Cargo Operations, by Captain Charles L. Sauerbier, U.S.N.R. 9½ in. × 6½ in. pp. xi + 548. *Illus.* Chapman & Hall, Ltd., London, 1956. 84s.

The subject is well presented and with the numerous excellent illustrations the reader's interest is held throughout the book. A new and simplified approach is given to cargo operations which can at once be appreciated by those of a practical turn of mind.

The first two chapters deal with the shipowners' organisation and the chain of responsibility for cargo from the time it is booked for shipment until final discharge.

Several interesting illustrative legal cases relative to the handling and stowage of cargo are discussed, showing how damage to cargo often occurs through neglect of simple precautions, and the heavy damages that are sometimes awarded in the courts as a result. One instance of some meteorological interest is that of a ship which loaded 732 cases and 319 bags of licorice extract at Basra. When loading commenced the temperature was about 115°F. The entire cargo of licorice was stowed in the forward part of No. 4 'tweendecks directly forward of the engine-room. The cargo extended from the deck of the compartment to within 12 inches of the overhead deck. The cases were stowed about 8 high with the bags on top. The ship proceeded to an East African port and loaded chrome ore. Some of the chrome ore was placed just aft of the licorice with a temporary wooden bulkhead erected between the two cargoes. During the voyage no temperatures were taken of the hold spaces and no inspections made. In Baltimore, where the licorice was to be discharged, it was found that the extract had broken out of most of the cases and bags when in a glutinous state and thereafter had become a hard mass. Many of the cases and bags were stuck together. Wood, nails and other foreign material were embedded in the licorice.

In court the shipper's argument was that the damage was due to improper stowage. The licorice should have been stowed in a lower hold below the water-line and also dunnage should have been used between tiers to allow a better circulation of air. The decision of the court in this case was in favour of the shipper. In spite of the poor stowage position of this cargo the relatively simple precaution of inspecting the cargo at intervals and recording temperatures might have made it possible for some action to be taken to reduce the temperature in the compartment and so have avoided or considerably reduced the amount of damage.

Chapter 3 deals with the principles of stowage and gives some useful examples of stability and trim calculations; also a practical method of estimating with reasonable accuracy the hogging and sagging stresses with any given load distribution. Dunnaging and the securing of cargo to prevent shifting at sea is also dealt with in this chapter.

Chapters 4 and 5, dealing with the planning and stowage of cargo, give the ship's officer all the essential information he requires on these two important aspects of cargo operations.

The ship's loading, discharging and handling equipment is fully explained in Chapters 6 and 7 which, together with detailed illustrations, provide a valuable reference to those seeking guidance in preparation for the handling of any particular type of dry cargo.

Chapter 8 of the book deals with the ventilation of cargo holds and will be of special value to mariners who are already familiar with the meteorological principles involved. As an introduction to the subject, however, it cannot be strongly recommended because the explanations are not always clear, some of the humidity parameters are incorrectly defined and rather too much stress seems to be laid on the importance of dehumidifiers and other costly equipment. Thus specific humidity is defined as the weight of water vapour per unit weight of dry air. According to the internationally accepted definitions (Annex IV of the Technical Regulations of

the World Meteorological Organisation, 1956) this is the mixing ratio, specific humidity being the weight of water vapour per unit weight of *moist* air. Dew point is defined as "that temperature below which the air will be unable to retain the moisture it presently contains". In the discussion of wet-bulb temperature the fact that it is dependent on the rate of ventilation if this is below about 7 knots is only weakly implied by the statement that "a light flow of air over the wick is necessary to wipe away the high humidity air film that will develop around the bulb in dead air". The need for protection against radiation effects is not mentioned. A rather complicated psychrometric chart is introduced and this seems unnecessary to the argument and liable to confuse any reader whose scientific knowledge is limited. There is a good account of the properties of hygroscopic substances, including a calculation showing clearly how a hygroscopic cargo can control the atmosphere surrounding it. It is unfortunate that the examples given to illustrate the calculation of the dew point of air surrounding a hygroscopic substance of known temperature and moisture content, when equilibrium is reached, appear to refer to diagrams different from those actually provided so that the reader has to find out for himself, for example, that "slanting dashed line" is to be interpreted as "horizontal full line". The discussion on the control of storage atmosphere by a commodity includes the measurement of the moisture content of cargoes and the effects of hot and cold bulkheads, etc. The importance of the control of ventilation by means of the dew point is properly stressed. The author states that a mechanical ventilation system if used intelligently can eliminate 80 per cent of all condensation while the remaining 20 per cent can be eliminated if the ship is equipped with a dehumidifier and connecting ducts which are used correctly. The author points out, however, that "many ships equipped with an excellent and expensive mechanical dew point control system have failed to use it correctly: if these systems fail to check condensation from any cause, it is probably due to improper operation by the ship's personnel". The last part of the chapter is devoted to rather detailed descriptions of a number of commercial installations for controlling hold climate under all possible conditions. Some of their weaknesses are mentioned, e.g. in the instrumentation used for measuring temperature and dew point, but the question whether their considerable cost is likely to be recovered in a reasonable time by improved cargo turn-out, especially in view of management difficulties, is not discussed.

Chapter 9 shows what is being done in the U.S.A. in the way of research and development into improving and speeding up cargo operations.

This book can be recommended to all deck officers on whose expert knowledge of all aspects of cargo operations the safe and sound delivery of cargo largely depends.

A. D. W., H. C. S.

Physics in Meteorology, by A. C. Best, O.B.E., D.Sc. 7½ in. × 5 in. pp. viii + 159.

Illus. Sir Isaac Pitman & Sons, Ltd., London, 1957. 18s.

This book is written primarily for students of physics with the object of describing and explaining a selection of meteorological phenomena in physical terms, and demonstrating that meteorology is a branch of physics in which the atmosphere is the laboratory. Nevertheless it contains a great deal that may be of interest to mariners. Each chapter consists of a comprehensive and up-to-date summary of the present state of our knowledge on such subjects as the physics of clouds and rain, atmospheric electricity, meteorological optics and acoustics and radio-meteorology, to mention a few. Each chapter is divided into numbered and headed sections and the book is illustrated by many diagrams. Although there is a good number of mathematical formulae, these are clearly explained in the text and, where their derivations are given in detail, the sections concerned can be omitted by the non-mathematical reader without serious loss.

The first chapter deals briefly with the main instruments that are used for routine

surface and upper-air measurements and also with some special instruments developed for research work. A surprising omission is a reference to the recently published *Handbook of Meteorological Instruments, Part 1. Instruments for surface observations*, London, H.M.S.O., 1956.

Chapter II contains an excellent account of the latest theories about the formation and composition of clouds, all types of precipitation and fog. Detailed information on the size-distribution of water droplets and ice crystals in clouds, descriptions of the two main processes by which it is believed that cloud elements can combine to form precipitation and an explanation of the growth of hailstones are all included. In the section on fog it is stated that sea fogs are usually formed by the passage of air from land over a relatively cold sea but most mariners will know that the frequent fogs off Newfoundland, in the north-west Pacific and off the Californian coast, for example, are all due to the movement of damp air from regions of fairly warm sea water to regions of colder sea water.

The subject of Chapter III is radiation, and it opens with an account of the physical laws and definitions. The depletion by absorption, scattering and reflection of the incoming solar beam and of the outgoing terrestrial radiation are dealt with in detail and the thermal effects of radiation in the atmosphere and the heat balance of the earth are discussed.

The chapter on atmospheric electricity which follows describes the effects of the presence in the air at all times of the minute electrically charged particles called ions. Methods are described of measuring the potential gradient, space charge and conductivity of the atmosphere near the ground and the results of such measurements both in fine weather and in disturbed conditions are given. It is interesting to learn that although overland the diurnal variation of potential gradient closely follows that of atmospheric pollution, over the oceans there is a maximum at 1900 G.M.T. and a minimum at 0500 G.M.T. in all parts of the world. The physics of thunderstorms, the structure of the lightning flash and aurorae are also dealt with.

Chapter V is concerned with wind and deals first with the large-scale motions which can be depicted on weather charts and then with small-scale eddy structure and winds near the earth's surface. It explains why, in the northern hemisphere, clockwise rotation around a centre of low pressure is possible in the case of a dust devil* but impossible on the larger scale of a depression.

The physical explanation of such phenomena as the rainbow, halos, coronae and blueness of the sky are given in the next chapter, which also includes a section on the propagation of sound in the atmosphere and how it is affected by variations of temperature and wind with height.

The chapter on radio-meteorology will have a special interest for the mariner since radio and radar are of such importance to him. The effects of meteorological conditions on the path of radio waves are described and followed by consideration of conditions favourable for anomalous propagation both over oceans and land. The absorption and scattering of radio waves by atmospheric constituents and by clouds and precipitation is dealt with, and figures are given showing that while a cloud can only give an appreciable radar echo if its water content is high and the wavelength is of the order of 1 cm, moderate rain at a range of 50 kilometres is likely to give an echo comparable with that of a small aircraft at the same distance, even using a wavelength of 10 cm.

In his final chapter the author discusses the present position regarding weather control. A comparison of the amounts of energy involved in various meteorological processes with that released in an atomic explosion shows that the larger-scale natural phenomena are associated with much greater amounts of energy than are at man's disposal. At best we can exercise control on a small scale or provide a trigger action in the case of larger processes. The use of the gardener's cloche and fog dispersal are given as examples of the former and attempts to produce rain

* A dust devil is a whirlwind, formed by strong convection over a dry sandy region, which carries up the dust into the air with it.

artificially or to disperse cloud as examples of the latter. It is concluded that intentional modification of the weather on a large scale is not yet a proven possibility. Such speculative ideas as breaking up the polar ice and the afforestation of desert areas, which have been put forward in recent years, are not discussed.

The book is well printed and very few errors were noted. There is a good index and useful lists of references are given at the end of each chapter. The price is not unreasonable by present-day standards.

H. C. S.

Passenger Liners of the Western Ocean—A record of the North Atlantic Steam and Motor Passenger Vessels from 1838 to the present day (2nd Edition), by Commander C. R. Vernon Gibbs, R.N. 8½ in. × 5½ in. pp. 434. *Illus.* Staples Press, Ltd., London, 1957. 42s.

This is a second and completely revised edition of what is obviously a labour of love; the first edition appeared four years ago. The author must have done an enormous amount of research into the fascinating history of this important trade, in which British ships have always played such a prominent part. At first glance one might think that a review of such a book would find no place in a magazine devoted to meteorology, but the author quickly reminds us of the big part that meteorology has always played in the destinies of this trade and of the ships engaged upon it.

The histories of no less than 46 shipping companies belonging to various nations are described and brief notes are given about the destinies of 800 individual ships, including their dimensions, passenger capacity and speed performances.

Chapter 1 takes the form of a prelude devoted to the sailing packets, including those of the famous Black Ball Line, and discusses in general terms the transition from sail to paddle-steamers and thence to screw propulsion. Chapter 2 is entitled "The pioneer steamship companies associated with the sailing packet lines" (1838-46). We are told that the *Great Western* in 1838 had the honour of being the pioneer regular transatlantic steamship. The size of these early steamships, fitted with sails to assist them on their eastward passage, emphasises the courage of the pioneer companies, and the author tells us that they devoured coal. Thus the *Great Western* is described as a wooden paddle-steamer of 1,350 gross tons. She burnt about 30 tons of coal a day and her average westbound speed was 8 knots and eastbound 9.5 knots. She carried 150 passengers and 200 tons of cargo and the author tells us that "she and her contemporaries avoided the roughest Atlantic weather by refitting at the beginning of each year". The paddle-steamer *Arabia*, of 2,400 gross tons, burnt 120 tons of coal a day to achieve 12½ knots. Mention is made of another such ship having to leave the Mersey with her sponsons submerged in order to carry enough coal for the voyage!

The 20 main chapters of the book are devoted to the activities of various steamship companies and are conveniently divided into appropriate sections. Chapter 3 is entirely devoted to the Cunard Line (1840-); Chapter 4 deals with American Wooden Steamships and French Frigates (1847-68). Chapter 7 is devoted to "Various unsuccessful screw companies of the 1850's" and includes the Great Shipping Company which operated Brunel's famous failure the *Great Eastern*.

Three chapters are entirely devoted to the Canadian trade, in which the C.P.R. ships play the most prominent role.

Each section begins with a few notes about the formation and development of the company concerned, followed by a short history of each individual ship. It contains a wealth of graphic detail such as: coal for eastbound crossings had to be shipped from England under sail until American supplies became available in the 1850's . . . ; smoking was restricted to the upper deck, where poultry were carried in coops . . . ; fresh vegetables were placed under upturned boats to protect them from the weather. . . .

The part that weather played in this fascinating history is perhaps best illustrated by the following quotations:

"Wooden steam-ships wore out quickly and the buffetting of North Atlantic gales drew heavy repair bills . . ."; "*Britannia* became frozen in at Boston in 1844 and a 7-mile channel was cut at the expense of local merchants to enable her to gain the open sea . . ."; "In 1899 *Pavonia* . . . was completely disabled after heavy weather had wrenched all boilers from their seatings."

A number of passenger ships in these early days disappeared at sea and presumably foundered in heavy weather, and loss of life in these casualties was prodigious. Thus the *Arctic*, 1854, foundered off Cape Race after a collision in dense fog, combined with heavy seas, with a loss of about 300 lives; *City of Glasgow* disappeared with 480 people on board . . . in the same year; *Hibernia* foundered due to breaking her shaft in 1868 with a loss of 66 lives. The German liner *Elbe* was lost with 330 lives after a collision in fog off Lowestoft in 1895. These are just a few examples picked at random. Collisions in fog and groundings—notably off the Irish coast and on Sable Island—were also frequent and there are several instances of these passenger ships in addition to *Titanic* colliding with icebergs. The book shows us that the *Titanic* sinking, in which nearly 1,500 lives were lost, dwarfs all the previous cases—merely because of the larger number of passengers that such a large ship could carry compared with her predecessors.

As a contrast the number of serious casualties to passenger ships since the *Titanic* disaster on this trade, apart from war-time casualties, is refreshingly small, and the recent *Andrea Doria* in collision with the *Stockholm* with a loss of 52 persons in fog off Nantucket in July 1956 is outstanding.

If bad weather accounted for a lot of ship casualties, the author brings home to us very vividly the tragic loss of ships associated with this trade during the two world wars, and the consequent loss of life which occurred. The ships which survived the whole of either of these wars were exceptional.

The book includes some interesting historical appendices and a number of admirable illustrations.

C. E. N. F.

Personalities

OBITUARY.—We regret to record the death of CAPTAIN E. F. FERRABY of the P. & O. liner *Canton* on 24th January, 1957, while outward bound to the Far East.

Edward Frowd Ferraby was born at Nottingham in 1899 and was a P. & O. cadet in H.M.S. *Worcester*. He joined the company as 4th Officer in April 1919 after war service in the Royal Naval Reserve.

He was promoted Chief Officer in July 1936 and was serving in that capacity in the *Rawalpindi* when war broke out in 1939. The ship was taken over by the Admiralty as an armed merchant cruiser and Captain Ferraby rejoined the Royal Naval Reserve. He was a Sea Transport Officer at Tobruk when it fell in 1942 and was taken prisoner, being released in an exchange of prisoners in May 1943.

He returned to P. & O. service in May 1946 as Staff Commander of the *Strathaird* and later commanded the *Karmala*, *Paringa*, *Maloja*, *Corfu* and *Carthage*, and was making his first voyage in command of the *Canton* when he died.

Captain Ferraby had been a voluntary marine observer since 1924 when he was in the *Moldavia*. In 12 years we received 31 returns from him, 15 of which were assessed as "Excellent". He received Excellent Awards in 1951, 1952 and 1953. In April 1957 we received the logbook containing his last observations.

L. B. P.

OBITUARY.—We regret to record the death of CAPTAIN R. BLAKEY of the Blue Funnel liner *Ixion* on 4th January, 1957, while outward bound to Australia.

Richard Blakey served his apprenticeship with the Prince Line and continued in their service as 3rd and 2nd Officer until he joined the Blue Funnel Line in

February 1925. He was promoted to 2nd Officer in September 1929, to Chief Officer in December 1935 and took his first command in May 1943.

Captain Blakey's principal meteorological work was done for the U.S. Weather Bureau when he was in the Prince Line "on station" from American ports, but since 1955 he had been observing for us in the *Ixion* and all his meteorological logbooks had been classed "Excellent". He received an Excellent Award in 1956 and his name appears on page 136 as a recipient of one of this year's awards. This is being sent to his next of kin. His last logbook was received here in April 1957 and covered the voyage on which he died.

L. B. P.

Notices to Marine Observers

Radio Weather Messages from Ships in U.S.A. Reporting Areas

In the *Marine Observer's Guide* there appears a note requesting British voluntary observing ships when in "U.S.A. reporting area" to send their radio weather messages to Government radio stations in preference to routing them through commercial radio stations.

The Chief of the U.S. Weather Bureau has now asked us to draw particular attention to this note and to the fact that arrangements have now been made for U.S. ocean weather ships, both in the Atlantic and Pacific Ocean, also to accept radio weather messages from voluntary observing ships on the same basis as the U.S. Government shore radio stations.

In accordance with this request, ships which are regularly trading through these areas are requested to send radio weather messages through commercial shore stations only when it is impossible to clear the message through a U.S. ocean weather ship or through a Government shore station.

Voluntary observing ships which are only occasional visitors to the U.S. area are requested to transmit radio weather messages to the U.S. authorities only when they can be cleared through a U.S. weather ship or through a Government shore station and not to send such messages through commercial shore stations at all.

The relevant notice in the *Marine Observer's Guide* has been amended.

As stated in the *Marine Observer's Guide*, the U.S. Government radio stations for the North Atlantic are Balboa, Boston, Galveston (NOY only), Jacksonville, Miami, New Orleans (NMG only), New York (NMY only), Norfolk and San Juan (Puerto Rico). For the North Pacific they are Balboa, Honolulu, Long Beach, San Francisco and Seattle.

The following is a list of the U.S. weather ship stations which will accept ships' radio weather messages under this arrangement.

Station	Location	Call Sign
	North Atlantic	
"B" (Ocean Station Vessel)	56°30'N., 51°00'W.	4 YB
"C" (" " ")	52°45'N., 35°30'W.	4 YC
"D" (" " ")	44°00'N., 41°00'W.	4 YD
"E" (" " ")	35°00'N., 48°00'W.	4 YE
	North Pacific	
"N" (Ocean Station Vessel)	31°00'N., 140°00'W.	4 YN
"V" (" " ")	34°00'N., 164°00'E.	4 YV

Radio Weather Messages from the U.K. Reporting Area

As from 0001 G.M.T. on 1st July 1957, British observing ships in the U.K. reporting area are asked to send their radio weather messages to "OBS" followed by the name of the U.K. coast radio station which they are working, e.g. "OBS PORTISHEAD". Use of the address "Weatherdun Wire London" has been discontinued.

This is the first part of a scheme, often mooted by our observers, for the simplification of telegraphic addresses of meteorological centres throughout the world. Further steps to secure the uniformity of such addresses will be discussed at a forthcoming conference of the W.M.O.

The existing arrangements whereby ships in the U.K. area who are not in touch with U.K. coast stations may transmit their messages to certain Icelandic or European stations provided they are appropriately addressed (see *Marine Observer's Guide*, pages IV-8 and IV-9) will remain in force.

Voluntary Observing Ships—Buckets for Sea Surface Temperature Readings

In the *Marine Observer's Guide*, Part II, page 3, we asked our voluntary observers to have a canvas bucket made aboard the ship should they be unfortunate enough to lose the one supplied or should it become worn-out. We are glad to note that many ships have done this, but of late we have noticed a tendency in a few ships to revert to the condenser intake for taking sea temperatures if the bucket supplied becomes unusable.

We are disappointed to see this, because it seems to infer that our advice in the *Marine Observer's Guide* and the *Marine Observer's Handbook* about our preference for sea water temperature observations by the "bucket method" over that of the "condenser intake" method is not fully understood. Condenser intake observations of sea temperature are probably reasonably correct when the sea is disturbed by a wind of about force 4 or above and the layers are well mixed as a result, provided the intake thermometer is situated close to the ship's side and its accuracy has been checked against a standard instrument. On the other hand there is always the danger of "phonetic" mistakes in passing the temperature reading from the engine-room to the bridge. In calm weather, particularly in a relatively slow ship, the intake reading may differ considerably from that at the surface. It is for this reason that the Meteorological Office has consistently kept to the "bucket method" for taking sea temperatures except in large fast ships where bucket observations are difficult to make.

Before World War II it was the custom for all voluntary observing ships to make their own canvas buckets for sea temperature purposes. After the war we decided that it was perhaps unreasonable to ask for this to be done aboard every ship as a routine in these times of high wages and high cost of materials. Also, experimental work had shown that the simple canvas bucket was not as accurate as it might be. We therefore designed and supplied to the ships a special canvas bucket which we hoped would give better results. But if that bucket is lost, we feel that samples taken with a "home-made" canvas bucket will give better results than those taken from the condenser intake in the average ship.

We hope, therefore, that voluntary observers will be good enough to make a special effort to get a canvas bucket made aboard the ship if our bucket happens to become unserviceable at sea.

If parts of the old bucket are available, they can often be used in making the new one, which should for preference have a double skin to insulate the contents as much as possible.

A note should be made in the meteorological logbook when the "home-made" bucket is brought into use.

ERRATA

The Marine Observer, April 1957. In the caption to the photographs opposite page 80, alter s. to sw. In the caption to the map on page 106, alter °F to °C.

Fleet Lists

The Marine Observer, July, 1957

GREAT BRITAIN

The following is a list of British ships voluntarily co-operating with the Marine Division of the Meteorological Office.
The names of the Captains, 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 third column.
All returns received from observing ships will be acknowledged, direct to the ship, by the Marine Superintendent.
The Port Meteorological Officers and Merchant Navy Agents at the ports will make personal calls on the Captains 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 financial year. The names of the Captains, Principal Observing Officers and Senior Radio Officers gaining these awards are published in a special list in *The Marine Observer*.
It is requested that prior notification of changes of service, probable periods of lay-up, transfer of Captain, or other circumstances which may prevent the continuance of voluntary meteorological service at sea, may be made to the appropriate Port Meteorological Officer or Merchant Navy Agent.
Captains are requested to point out any errors or omissions which may occur in the list.

Selected Ships

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS/MANAGERS
<i>Abraham Larten</i>	GKZB	18.3.57	O. Vestrum	L. Lauritzen	P. Idland	Union Whaling Co.
<i>Accra</i>	GJSW		H. C. Allen	J. H. Tachnic Menon, A. J. Bryant, M. Murphy	J. Stuart	Elder Dempster Lines, Ltd.
<i>Adelaide Star</i>	GKPB	15.3.57	O. C. Robertta, O.B.E.	N. McMillan, M. Foster	W. Gibb	Blue Star Line, Ltd.
<i>Aden</i>	GIMN	12.11.56	W. T. Banks	C. R. Bishop, P. B. Jackson, N. Bushby	W. Hargreaves	P. & O. Steam Navigation Co.
<i>Afghanistan</i>	GNVB	11.6.56	A. N. Henderson	J. Cummins, D. M. Foster, A. Bashford	D. M. Foster	F. C. Strick & Co., Ltd.
<i>Ayana</i>	GKVV	14.1.57	F. W. Mould	J. M. Hunter, H. R. Coates, R. M. Nener	T. Barnes	Trinder Anderson & Co.
<i>Asax</i>	GJXM	24.1.57	G. Carney	A. R. Davidson, M. Nall, D. Cretch	A. Walker	A. Holt & Co.
<i>Albistan</i>	MABT	7.2.57	R. Mace	C. A. Paterson, P. E. Thompson, J. Brown, C. J. Davis	R. Holley	F. C. Strick & Co., Ltd.
<i>Alcantara</i>	GLQR	16.5.56	D. R. Miller	P. Foster, T. Farquharson, J. McCaughrean	R. E. Hammond	Royal Mail Lines, Ltd.
<i>Alsatia</i>	MABL	15.10.56	J. Chapman, R.D. Capt.	R. W. Barton, A. D. Hunt, i. H. P.	D. McKinnon	Cunard Steamship Co., Ltd.
<i>Amakura</i>	MCPN	22.3.56	S. Armitage	Williams, R. A. Woodall	R. Banks	Booker Bros. McConnell & Co. Ltd.
<i>Andes</i>	GOCV	21.1.57	D. R. Miller	D. Andrew, T. Jones, C. Eckersley	—, Quinton	Royal Mail Lines Ltd.
<i>Anubria</i>	GDWM	5.7.56	W. E. Warwick R.D.	J. Hunt I. Farquharson S. Phillips	D. Byrne	Cunard Steamship Co., Ltd.
<i>Apapa</i>	MACE	19.12.56	R.N.R.	J. W. Dunn, F. Sergeant, D. Nurse	G. I. Gilling	Elder Dempster Lines, Ltd.
<i>Arabia</i>	GLKF	26.2.57	C. H. Sweeny	F. Grayson, A. G. Maxwell	T. Sandham	Cunard Steamship Co., Ltd.
<i>Arabistan</i>	GCKK	16.11.56	W. Law, R.D., Cdr.	P. Binns, J. W. Smith, A. P. Tarbuck, R. A. Woodall	A. Murry	F. C. Strick & Co., Ltd.
<i>Araby</i>	GMZL	22.10.56	R. B. Arthur, M.B.E.	M. B. Hirst, F. W. Bush, H. Sennett	R. J. Halpins	Royal Mail Line Ltd.
			W. B. Avison	A. F. Hawkins, J. D. Williams, R. J. Howlett		

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGERS
<i>Arakaka</i> ..	GDVN	5.10.56	J. A. Carter	R. A. Hammond, F. Sanchez, A. Bunkell	T. Murdock ..	Booker Bros. McConnell & Co., Ltd.
<i>Argentina Star</i> ..	GTFK	21.2.57	E. R. Pearce, O.B.E.	B. Abbott, W. G. Jones, J. Gathercole	K. Milligan ..	Blue Star Line, Ltd.
<i>Arel</i> ..	GMDY	19.2.57	C. M. G. Evans, M.B.E.	E. J. Evans, D. C. Chisholm, A. C. H. Childs	C. Reed ..	H.M. Postmaster General
<i>Armagh</i> ..	GQGG	22.11.56	T. Hastings	R. S. Grubb, I. Cameron, J. Johnston	J. Cain ..	Avenue Shipping Co.
<i>Arendel Castle</i> ..	GCZL	19.3.57	D. D. McKenzie	D. France, R. Ridgets, J. Davies	G. Kilminster	Union Castle Mail S.S. Co., Ltd.
<i>Ashburton</i> ..	GNJN	12.3.57	C. Parry ..	E. Dunbar, H. L. Jones	C. L. Roberts	Trinder Anderson & Co.
<i>Asia</i> ..	GLJV	8.8.56	F. E. Patchett	J. Cosnett, H. L. Smith, D. W. Wilford	J. S. Marshall	Cunard Steamship Co., Ltd.
<i>Asyria</i> ..	GGKX	11.2.57	J. G. Bradley, R.D., Capt. R.N.E.	B. V. Mercer, W. L. McDougall, D. A. Davies, J. Turner	B. A. Long ..	Cunard Steamship Co., Ltd.
<i>Asturias</i> ..	GLQS	14.3.57	T. Powell ..	F. Morton, W. R. Strevens, L. Hall, J. McDermott, J. Wisden	R. Farrell ..	Royal Mail Lines, Ltd.
<i>Athelfoam</i> ..	GMFN	24.1.57	R. H. Lonsdale	J. B. Marshall, J. Lloyd, M. Highly, D. Carstairs	T. Hefferman	Athel Line, Ltd.
<i>Athemic</i> ..	GBLS	4.2.57	L. H. Edmeads	J. D. Haberfield, J. O. Williams, P. K. Murchison, J. M. Brew	H. S. Knight	Shaw, Savill & Albion Co., Ltd.
<i>Athlone Castle</i> ..	GYTK	5.11.56	A. G. V. Patey	C. Ennis, J. Dilly, F. O'Grady	I. Summers ..	Union Castle Mail S.S. Co., Ltd.
<i>Aureol</i> ..	GMGJ	26.11.56	W. Munt ..	J. R. Donker, —, Mannion	F. W. J. Broomfield	Elder Dempster Lines, Ltd.
<i>Australia Star</i> ..	GYCS	14.11.56	J. A. Hoppé	J. Jermy, D. Greenland, M. Bradshaw	L. Cooper ..	Blue Star Lines, Ltd.
<i>Australind</i> ..	GJKF	16.10.56	J. F. Wood	B. D. Diggle, —, McGill, D. N. Brooks, A. L. White	T. M. Sherriff	Trinder Anderson & Co.
<i>Avistone</i> ..	GBSV	26.1.57	W. R. M. Hill	S. O. Nazar, R. C. Skellorn	L. R. Bradley	Purvis Shipping Co., Ltd.
<i>Avonmoor</i> ..	GFGL	14.11.56	J. A. Barton	D. Nicholas, G. L. Martin, K. Smith	P. E. D. Harris	Walter Runciman & Co., Ltd.
<i>Balaena</i> ..	GLDG	13.5.54	P. Virik ..	R. Christoffersen, —, Bentzen, A. Andersen	J. Dahl ..	Hector Whaling, Ltd.
<i>Balanitia</i> ..	GBNM	1.1.57	I. L. Perkins	K. Ogilvie, H. Nixon, N. C. Kerr	E. F. Larkin	Royal Mail Lines, Ltd.
<i>Baron Elphinstone</i> ..	GCCD	23.10.56	T. D. Drysdale	A. A. McDonald, J. Stevens, P. D. Cowan	F. Cumniffe ..	H. Hogarth & Sons
<i>Baron Glencommer</i> ..	GTQK	25.2.56	T. R. Reid ..	I. S. Graham, T. Walker, H. Bryson	T. R. Collins	H. Hogarth & Sons
<i>Baron Macleay</i> ..	GKXW	21.2.57	W. Warden	—, Cornack, J. McInnes, —, Graham	H. G. Donnell	H. Hogarth & Sons
<i>Baron Murray</i> ..	GIFB	29.1.57	J. Pearson	A. E. Stainthorpe, E. Jones, J. Harrington	J. M. Parin ..	H. Hogarth & Sons
<i>Barrister</i> ..	MSFR	26.11.56	D. Wolstenholme	G. F. Smith, J. Bean, S. Marlow	P. Roberts ..	T. & J. Harrison, Ltd.
<i>Baskerville</i> ..	GSDN	21.2.57	J. G. Wilson	J. I. Aitkin, P. Reeves, N. L. Smith	G. A. L. Stacey	Runciman (London), Ltd.
<i>Bassano</i> ..	GNXK	3.1.57	C. H. Tutty	G. Marshall, A. M. Robertson, F. Barns, K. Youngman	A. Leary ..	Ellerman's Wilson Line, Ltd.
<i>Beaverburn</i> ..	MAGB	3.4.56	W. J. P. Roberts	G. Cotton, B. Gardener, —, Roberts	G. Adamson	Canadian Pacific S.S., Ltd.
<i>Beaver Cove</i> ..	GNLX	8.2.57	N. W. Duck, D.S.C., R.D., Capt. R.N.R.	I. Palmer, P. C. Lovell, —, Smith	J. Franklin ..	Canadian Pacific S.S., Ltd.
<i>Beaverdell</i> ..	GBBS	20.11.56	J. Soame ..	D. Pyatt, D. J. Roberts, J. Bryane	W. Cumming	Canadian Pacific S.S., Ltd.
<i>Beaverford</i> ..	MQJG	30.1.57	F. W. S. Roberts	R. J. Baddock, M. Organ, C. R. Worthington, D. Roberts	B. Johnson ..	Canadian Pacific S.S., Ltd.
<i>Beaver Glen</i> ..	GBCP	21.2.57	J. Soame ..	G. Gamblin, J. Wyllie, E. Brewer, M. Mayes	J. Coutts ..	Canadian Pacific S.S., Ltd.
<i>Beaver Lake</i> ..	GBCQ	1.1.57	N. C. H. Scallan, R.D., Cdr. R.N.R. (Retd).	R. Stevens, J. Brooks, H. A. Jones, G. E. Gamblin	A. McCartney	Canadian Pacific S.S., Ltd.
<i>Beaver Lodge</i> ..	MAGI	28.2.57	L. H. Johnstone, M.B.E.	P. D. T. Roberts, T. Hughes, J. Bryan	F. Howard ..	Canadian Pacific S.S., Ltd.
<i>Bellerophon</i> ..	CGCM	6.12.56	H. H. Sanderson	D. Malcolm, D. Macdonald, A. Donnan	I. A. Rath ..	A. Holt & Co., Ltd.
<i>Bennetts</i> ..	MAGG	14.1.57	R. Griffiths	T. Fyfe, G. R. Bannerman, J. S. Bunnell	W. Paterson ..	W. Thomson & Co.
<i>Benvannock</i> ..	GCQR	3.9.57	A. N. Hurst	D. Shore, J. Barney, I. Ramsay	E. Fitzgerald	Ben Line Steamers, Ltd.

Birmingham City	GPYF	7.2.57	J. N. Remsay	C. F. Harfoot, W. H. Standley, S. Dicken	A. Pilkington	Bristol City Line, Ltd.
Biscoe	GDCW	..	L. Michell ..	A. J. Gibbs, E. Reed, R. O. Jones, J. E. Noble	—, Sherif ..	Hector Whaling, Ltd.
Bransfield	GDRK	4.5.54	M. Paulsen	A. G. Giblin	T. Salvesen ..	Hector Whaling, Ltd.
Brasil Star	GTLF	8.2.57	G. E. Barnard	J. R. Massey, R. A. Young, E. W. S. Gill	J. Crag ..	Blue Star Line, Ltd.
Bravo	GLDZ	26.2.57	F. Firth ..	F. M. Martin, D. W. Cawkwell, J. P. Moller	K. Webster ..	Ellerman's Wilson Line, Ltd.
Brisbane Star	GZCJ	21.1.57	S. Foulkes ..	—, Thomas, —, Rawlinson, —, Hutchinson	J. Williams ..	Blue Star Line, Ltd.
Britannic	GDXF	13.3.57	A. Mackellar, R.D., Cdre.	P. M. R. Bingham, G. Cowley, J. T. Johnson, J. Cooper	J. Kidson ..	Cunard Steamship Co., Ltd.
British Consul	GCXT	1.1.57	A. D. R. MacDonald	A. S. Flint, R. G. Twist, J. C. Blackburn	R. T. Nankervis ..	British Tanker Co., Ltd.
British Endeavour	GFCN	26.2.57	G. P. Barton	K. V. Meacock, B. Sexton, S. Pollock	J. D. Connor ..	British Tanker Co., Ltd.
British Escort	GCRB	11.3.57	G. M. Appleby ..	W. R. Knight, N. Gunter-Smith, R. J. Young	A. E. Leeder ..	British Tanker Co., Ltd.
British General	GCDJ	10.5.56	G. C. Dobson	M. Burrows, T. N. Griffiths, D. Lister	B. Lawton ..	British Tanker Co., Ltd.
British Marquis	GWVL	8.3.57	E. L. Mitchinson ..	A. E. Gainty, W. Bishop-Lagget, F. J. Ratcliff	A. P. Oliver ..	British Tanker Co., Ltd.
British Patience	GUFF	29.10.56	C. K. Temple	C. G. Jones, W. Hare, J. M. Walters	R. F. Bracewell ..	British Tanker Co., Ltd.
British Piper	GDNN	11.2.57	R. B. Lewis	G. Lambert, A. M. Gregor, H. B. Browning	—, Chatfield ..	British Tanker Co., Ltd.
British Resource	GFCD	10.10.56	S. Bruce	D. G. Inwood, T. Evans, A. P. M. Davis	R. Nicholson ..	British Tanker Co., Ltd.
British Sailor	GSBQ	5.3.57	H. I. McMichael, O.B.E.	K. Warner, R. Payne, D. Harris	E. Taylor ..	British Tanker Co., Ltd.
British Splendour	GCJT	15.6.56	H. G. Jeary	F. Bolingbroke, F. Weeks, J. Huntingdon, A. Gill	J. Nicolson ..	British Tanker Co., Ltd.
Brittany	GCLZ	2.10.56	C. W. Ellis	R. Bolger, G. Willis, D. Starbuck	B. T. S. Watson ..	British Tanker Co., Ltd.
Brocklewood	GMZS	18.9.56	C. C. Dingle	T. B. Casey, J. A. Martin, R. W. Clarke	P. Mahony ..	Royal Mail Lines, Ltd.
Brookmoor	GDWP	3.10.56	W. A. Watson	T. J. Graham, A. H. Brown, W. Shepherd	D. Copeham ..	Walter Runciman & Co., Ltd.
Cackmation	GPIN	14.1.57	G. H. Percy	K. A. Murray, G. Holland, K. Rainforth	D. Cook ..	Cairns, Noble & Co.
Cairndhu	GPBB	4.12.56	H. J. Pinnell	A. I. McDonald, D. M. Aitchison, M. Organ	W. P. Grieves ..	Cairns, Noble & Co.
Cairngowan	GNZZ	14.1.57	I. G. Foster	J. A. Barton, J. Lobban, A. Stanton	E. Johnston ..	Cairns, Noble & Co.
Calchas	GMSS	27.3.57	F. N. Fisher	R. Montgomery, R. McDonald, M. L. Morgan	M. Rigby ..	A. Holt & Co.
Caledonia	GCKR	7.1.57	D. Blair	D. Barclay, K. McArthur, A. McKelvie	J. McConnel ..	Anchor Line, Ltd.
Calgarra	MAIB	25.10.56	J. H. Clinton	A. McGugan, D. A. Cambell, P. J. Telford	J. Moody ..	Donaldson Line, Ltd.
Calix Canberra	GQDL	..	E. Bushell ..	D. Smith, A. M. Morrison, A. Anderson	M. Beirn ..	Overseas Tankship (U.K.), Ltd.
Calix Edinburgh	GBDZ	..	T. Curling ..	I. R. Walker, D. Reese, I. McCulloch	J. Delahunt ..	Overseas Tankship (U.K.), Ltd.
Calix London	MLTP	28.3.57	C. M. Edward, O.B.E.	P. H. Jones, W. Smith, R. Rushbrook	W. Richards ..	Overseas Tankship (U.K.), Ltd.
Cambridge	MMBF	24.5.56	P. P. O. Harrison	R. Pook, P. Bower, D. Cubitt, R. Cooper, E. N. Jordan	K. Ormeroid ..	Federal Steam Navigation Co., Ltd.
Canton	GDDT	1.1.57	H. J. M. Perry	A. J. Arrowsmith, P. J. Clark, D. J. Black, K. S. Maclean	N. Fontaine ..	P. & O. Steam Navigation Co.
Cape Clear	GCKN	26.5.56	P. Farnborough	D. Cormack, G. V. Mackie, D. Cameron	I. M. Baker ..	Lyle Shipping Co., Ltd.
Cape Grafton	MAIF	16.11.56	C. A. Jones	F. Saunders, W. Cowan, A. Macleod	P. Argumont ..	Lyle Shipping Co., Ltd.
Capetown Castle	GKGM	28.1.57	J. Trayner ..	R. Marchment, P. Webb, D. Bailey	R. Brew ..	Union Castle Mail S.S. Co., Ltd.
Captain Cook	GLBX	25.10.56	A. Bankier	A. L. McGugan, C. Sheppard, J. MacIver	L. W. Hooper ..	Donaldson Bros. & Black, Ltd.
Carinthia	GVEQ	10.12.56	A. MacKellar, R.D., Cdre.	T. D. Ridley, P. J. Lawley	W. Steward ..	Cunard Steamship Co., Ltd.
Carnarvon Castle	GJSL	15.3.57	W. S. Byles, R.D., Capt.	F. W. O'Grady, B. Bradley, R. N. Toye	H. G. Liggins ..	Union Castle Mail S.S. Co., Ltd.
Caronia	GYKS	2.11.56	R. G. Thelwell, O.B.E., R.D., Cdre. R.N.R.	D. J. Swinnerton, D. Howells, P. A. Seymour, W. M. Smith, B. Newcombe	I. G. W. McDonald ..	Cunard Steamship Co., Ltd.
Carthage	GRNX	28.3.57	J. Paice ..	M. C. Thomas de Merune, R. Lyon	—, Arthurs ..	P. & O. Steam Navigation Co.
Caslon	MCJR	22.3.56	J. M. Cherry	D. J. Powell, R. G. Goodfellow, T. R. Robinson	T. Crowther ..	Runciman (London), Ltd.

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGERS
Caxton ..	GCDX	5.10.56	W. J. Coull	P. B. Kelman, H. W. Gascoigne, J. Woods	W. P. M. Edmunds ..	Runciman (London), Ltd.
Ceramic ..	GFLM	28.3.57	F. A. Smith	D. R. Pochin, R. L. Ried, B. L. A. Jeffries, A. Temperley, I. Jackson	L. D. Waterhouse ..	Shaw Savill & Albion Co., Ltd.
Chantala ..	GQMR	2.1.57	L. T. Carter	T. E. Kelso, B. J. Biddick, A. R. Matthews	R. D. Dingley ..	British India Steam Nav. Co., Ltd.
Chepman ..	GFVR	5.11.56	T. O. Hodgson	C. Hann, T. Rollo, R. Gibbens ..	P. F. Rime ..	Runciman (London), Ltd.
Chehaze ..	GLXV	27.12.56	H. B. Peate, D.S.C., R.D., Capt. R.N.R.	M. J. Collins, R. B. Calvert	G. Talbot ..	Bibby Bros. & Co.
Chindwara ..	GFRT	5.2.57	B. A. Rogers, D.S.C., R.D., Cdr. R.N.R. (Retd.)	J. A. Stanton, D. J. Whitehouse, R. J. Ralph	J. Downey ..	British India Steam Nav. Co., Ltd.
Cilicia ..	GDGL	26.2.57	R. Blake ..	A. T. McKendrick, T. G. Curcheon, R. Laugmuir	W. Clayburn	Anchor Line, Ltd.
Cingalese Prince ..	GFRC	22.11.56	R. C. Proctor, O.B.E.	D. Milburn, J. F. Newton, K. E. Maxwell	K. A. Brooks	Prince Line, Ltd.
City of Barcelona ..	GTRK	14.11.56	A. H. G. Jones ..	K. Crow, J. Hughes, A. A. C. Mason, D. Riddell	W. Fryer ..	Ellerman Lines, Ltd.
City of Birmingham ..	GZLR	28.1.57	E. M. Robertson ..	F. Dawson, J. Thompson, G. Taylor	I. D. Clutton	Ellerman Lines, Ltd.
City of Brisbane ..	GDLM	3.1.57	E. G. Chapman ..	C. A. Fawcett, A. K. Comrie, D. G. Howe	F. E. L. Hall	Ellerman Lines, Ltd.
City of Bristol ..	GCPN	4.1.57	T. L. Vaughan ..	M. Hurley, J. Knight, L. Roberts, J. Lyons	D. Meighan ..	Ellerman Lines, Ltd.
City of Cape Town ..	GBBQ	15.2.57	E. Bonfield ..	J. Ashby, B. D. Bellhouse, J. Solley	B. D. Evans ..	Ellerman Lines, Ltd.
City of Carlisle ..	GBJK	4.9.56	E. M. Jenkins ..	J. B. Waugh, W. Fleming, C. Ogg	F. E. L. Boyak	Ellerman Lines, Ltd.
City of Chester ..	MAHN	9.8.56	A. L. Beckett ..	J. S. Nuttall, G. Stewart, J. G. Hill, J. Knight	C. K. Cotching	Ellerman Lines, Ltd.
City of Delhi ..	GLBW	5.11.56	I. W. E. Caffyn ..	J. Craig, J. L. Blanch, R. T. G. Calder	R. Morris ..	Ellerman Lines, Ltd.
City of Durham ..	GBJM	4.2.57	D. Hamilton ..	D. S. Taylor, F. C. O'Neill, I. L. Melville	D. E. Gudgeon	Ellerman Lines, Ltd.
City of Edinburgh ..	GNGC	4.5.56	P. Byrnes ..	R. Frame, K. L. Murray, B. Fletcher, R. Birch	I. Morgan ..	Ellerman Lines, Ltd.
City of Evansville ..	GJNF	17.9.56	R. S. Steel ..	G. H. Salter, J. K. Ashby, W. S. Coutts	B. W. Evans	Ellerman Lines, Ltd.
City of Johannesburg ..	GBKW	20.3.57	J. B. McLaren ..	P. Collin, R. Moon, J. Cole	H. McGowan	Ellerman Lines, Ltd.
City of Khararburg ..	GBZC	18.2.57	W. Howel ..	J. Petter, N. Airey, O. Roberts, C. Bell	E. Ramsey ..	Ellerman Lines, Ltd.
City of Khararburg ..	GKXL	11.1.57	G. R. Jackson ..	P. M. Field, R. P. M. Cook, I. Caunce	J. Roberts ..	Ellerman Lines, Ltd.
City of Lille ..	GSLN	15.1.57	A. R. Moran ..	P. Thornton, —, Henderson, A. S. Conyers	A. T. Murray	Ellerman Lines, Ltd.
City of Liverpool ..	GZJX	12.10.56	F. M. Warmaley ..	J. Kinley, D. W. Asquith, T. R. H. Lane	W. Peat ..	Ellerman Lines, Ltd.
City of Lyons ..	GMCN	25.6.56	W. Howel ..	D. A. McKinnon, P. W. Huxham, S. G. Hider	E. D. McMahon	Ellerman Lines, Ltd.
City of Manchester ..	GXLD	5.2.57	W. A. Hannah ..	P. A. Embley, L. H. Cullen, M. P. Lamble	I. C. Dalglish	Ellerman Lines, Ltd.
City of New York ..	GLYQ	4.3.57	A. M. Westlake ..	C. J. P. Rogel, I. McBeath, P. E. Pope, W. A. Browne	D. Sturdy ..	Hall Line, Ltd.
City of Pretoria ..	GBLN	6.9.56	A. G. Freeman ..	R. Clark, D. Barbour, B. J. Lewis, A. Fry	K. G. Arthur	Ellerman & Bucknall S.S. Co., Ltd.
City of Swansea ..	GBZT	5.2.57	J. Vizer ..	J. McKendrick, A. A. Hardiman, D. Russell	C. Bristow ..	Ellerman Lines, Ltd.
City of Sydney ..	GSEFM	3.12.56	W. S. Lowe ..	A. Crawford, A. D. Munro, M. Bolton	G. Cookburn	Ellerman Lines, Ltd.
Clan Brodie ..	GKPD	10.9.56	A. V. Gordon ..	B. W. Hollman, T. H. Graham, B. Richards, D. K. Morris	D. Rae ..	Cayzer Irvine & Co., Ltd.
Clan Buchanan ..	GKNM	6.11.56	H. T. Booth ..	P. Kent, R. K. Wilson, M. R. Pearson	B. Richards ..	Cayzer Irvine & Co., Ltd.
Clan Campbell ..	GDZK	4.10.56	H. C. Simpson, O.B.E.	E. Ramsay, B. Fairweather, S. Cresswell	R. F. Cole ..	Cayzer Irvine & Co., Ltd.
Clan Chattan ..	GFBX	10.12.56	R. R. Baxter ..	G. A. Berry, R. C. Toogood, G. E. Mitchell	E. Shillabeer	Cayzer Irvine & Co., Ltd.
Clan Chisholm ..	GFBY	3.5.56	W. R. Woodriffe ..	R. Echolme, J. Denyer, J. Sutherland	C. Crew ..	Cayzer Irvine & Co., Ltd.
Clan Davidson ..	MAWU	3.10.56	T. A. Watkinson ..		G. D. Angley	Cayzer Irvine & Co., Ltd.

<i>Clan Forbes</i> ..	GPGB	22.3.57	L. Pogson ..	G. G. Greenfield, G. W. A. Smith, A. J. Flinley ..	K. Kathrell ..	Cayzer Irvine & Co., Ltd.
<i>Clan Macaulay</i> ..	GZCS	2.8.56	A. G. McPherson ..	F. King, C. Gowans, L. O'Keeffe ..	C. Haggerty ..	Cayzer Irvine & Co., Ltd.
<i>Clan Macdonald</i> ..	GCPG	30.7.56	A. J. Hogg ..	M. N. Ure, G. Johnson, M. C. Banbury, N. D. McGregor ..	G. Martyn ..	Cayzer Irvine & Co., Ltd.
<i>Clan Macdougall</i> ..	GFBQ	29.1.57	J. McCrone ..	J. K. Currie, T. Hunter, K. H. Dann, D. M. Henderson ..	R. Fowle ..	Cayzer Irvine & Co., Ltd.
<i>Clan Mackinnon</i> ..	GKIX	27.12.56	R. N. Mayo ..	K. Morton, O. T. Ross, P. J. Morrison ..	G. Norton ..	Cayzer Irvine & Co., Ltd.
<i>Clan MacLaren</i> ..	GSSC	27.12.56	V. Green ..	B. H. Bowen, T. H. Ward, E. Taylor ..	R. W. Moore ..	Cayzer Irvine & Co., Ltd.
<i>Clan Macleay</i> ..	GSTV	28.12.56	S. S. Davidson ..	D. V. B. Jones, F. B. Currie, J. Chabble ..	F. Fawcett ..	Cayzer Irvine & Co., Ltd.
<i>Clan Maclean</i> ..	GWSX	15.1.57	H. Whitehead ..	J. G. P. Davidson, D. Richards, M. Brackenridge ..	T. Martin ..	Cayzer Irvine & Co., Ltd.
<i>Clan Macrae</i> ..	MAHP	11.12.56	H. Lockyer ..	G. Anderson, G. B. Charleson, J. N. Markie ..	D. W. Powell ..	Cayzer Irvine & Co., Ltd.
<i>Clan Macraeish</i> ..	GUBB	22.8.56	E. Gough, O.B.E. ..	I. M. Shearer, E. V. Inch, I. Dalziel, J. A. Green ..	W. Ellmers ..	Cayzer Irvine & Co., Ltd.
<i>Clan Robertson</i> ..	GRQQ	28.12.56	H. J. Anchor, O.B.E., R.D., Cdre. R.N.R. (Retd.) ..	J. A. Brown, G. Reid, J. L. Harris, J. Patterson ..	P. Shaw ..	Cayzer Irvine & Co., Ltd.
<i>Clan Shaw</i> ..	GBYW	18.3.57	L. C. Higgins, M.B.E. ..	R. B. Bullmore, J. C. Smith, J. G. Smith ..	G. H. Hudd ..	Cayzer Irvine & Co., Ltd.
<i>Clan Sutherland</i> ..	GFYZ	9.11.56	F. H. Turton ..	D. Stabart, I. Gann, N. C. Von Wellingsh ..	W. Gay ..	Cayzer Irvine & Co., Ltd.
<i>Clan Urquhart</i> ..	GFBK	27.8.56	C. M. Powell, M.B.E. ..	B. Middleton, M. Silvers, T. R. Halliday ..	T. Jones ..	Cayzer Irvine & Co., Ltd.
<i>Clydebank</i> ..	GKLM	14.3.55	F. Hale ..	W. C. Stoddard, R. Spedding, H. R. Hall ..	E. B. Maguire ..	Andrew Weir & Co., Ltd.
<i>Consuelo</i> ..	GCGQ	4.3.57	A. Jardine ..	J. D. Edward, B. G. Wright, T. Fugill ..	W. Gittins ..	Furness-Houlder Argentine Lines, Ltd.
<i>Confu</i> ..	GRNW	5.2.57	G. K. Fox ..	J. N. H. Davies, J. W. Slec, M. Fisher ..	W. Powell ..	Ellerman's Wilson Line, Ltd.
<i>Coramaldio</i> ..	GMPK	11.3.57	R. McNie ..	H. McDiarmid, W. C. Halden, A. Dougal ..	A. Cox ..	P. & O. Steam Navigation Co.
<i>Corinthic</i> ..	GZYL	1.3.57	A. C. Jones ..	G. Broom, P. Hogg, J. Cousins, I. Condie ..	—, Lillis ..	Donaldson Bros. & Black, Ltd.
<i>Corrales</i> ..	GSJL	29.1.57	T. C. Crane ..	G. N. Foster, G. Wallis, C. Styann, J. M. Quinlan ..	F. McLaughlin ..	Shaw Savill & Albion Co., Ltd.
<i>Cotopaxi</i> ..	GQNX	13.2.57	J. D. Richards ..	D. G. Fugh, J. Davies, D. J. Bishop ..	M. M. Garbett ..	Pacific Steam Navigation Co.
<i>Cretic</i> ..	GTFP	20.3.57	J. H. Vizer ..	A. Warrick, W. A. Siddal, —, McIntosh ..	H. Bursen ..	Shaw Savill & Albion Co., Ltd.
<i>Crofter</i> ..	MNGX	12.10.56	E. B. Stephens ..	B. W. Jones, A. K. Jones, G. D. Bird ..	J. Nicolson ..	T. & J. Harrison, Ltd.
<i>Cumberland</i> ..	GPPY	1.10.56	A. E. Williams ..	R. Anstey, C. Hill, W. Mason ..	R. Oliver ..	Federal Steam Navigation Co., Ltd.
<i>Cusco</i> ..	GKPF	27.9.56	R. D. S. Eckford ..	R. M. Attwater, P. Guerrier, G. D. Pattison ..	V. Dalton ..	Pacific Steam Navigation Co.
<i>Daleby</i> ..	MFV	4.3.57	F. D. Lloyd ..	A. H. Ross, G. Chipchase, R. Jarwick ..	D. J. A. Stephens ..	Ropner Shipping Co., Ltd.
<i>Darro</i> ..	MAID	29.1.57	L. T. Peterson ..	J. G. Street, P. R. Brown, A. F. Hawkins ..	T. Lee ..	Royal Mail Lines, Ltd.
<i>Deerpool</i> ..	GKDY	1.2.57	R. H. Anderson ..	R. S. Davies, A. D. Lewin, D. W. Clarke ..	J. M. Barry ..	Sir R. Ropner & Co., Ltd.
<i>Delphic</i> ..	MBLQ	27.12.56	C. L. Carroll, D.S.C., R.D., Lt.-Cdr. R.N.R. (Retd.) ..	R. P. Griffin, J. Gunning, D. G. Model ..	J. F. Dooney ..	Shaw Savill & Albion Co., Ltd.
<i>Desado</i> ..	MAIH	28.1.57	R. C. S. Woolley, R.D., Cdr. R.N.R. (Retd.) ..	A. J. Milward, M. Wardle, R. Hawkey, R. N. Miller ..	J. Smith ..	Royal Mail Lines, Ltd.
<i>Devon</i> ..	GDRF	25.6.56	J. E. Bury ..	J. Thorpe, L. Bridges, P. Ireland ..	C. Francis ..	Federal Steam Navigation Co., Ltd.
<i>Devonshire</i> ..	GTTV	21.3.57	H. Kerbyson ..	A. McPherson, R. Humphreys, D. Notman ..	A. Jones ..	Bibby Bros. & Co.
<i>Dibara</i> ..	GYQV	6.2.57	M. C. Williams ..	P. Keith, R. A. Norman, I. K. Bowerman, G. Pegler ..	S. T. Taylor, M.B.E. ..	British India Steam Nav. Co., Ltd.
<i>Diomed</i> ..	GVBC		D. R. Jones ..	P. J. Shorrocks, B. Killham, D. H. Stewart, P. D. Roberts ..	D. M. Hughes ..	National Institute of Oceanography
<i>Discovery II</i> ..	GWVM	1.1.57	S. S. F. Dalgleish ..	G. A. Day, D. Paget-Clarke, J. Hayward ..	L. Miller ..	Shaw Savill & Albion Co., Ltd.
<i>Dominion Monarch</i> ..	GRGG	10.12.56	K. G. Fisher, G.M. ..	A. R. Smith, T. Hicks, M. Thornton, B. Bloxham, N. Hamilton ..	F. V. Harford ..	Federal Steam Navigation Co., Ltd.
<i>Dorset</i> ..	GZFQ	30.11.56	K. Barnett ..	G. L. Lowery, W. D. F. Cooper, R. J. Baylis ..	E. Caley ..	Royal Mail Lines, Ltd.
<i>Drina</i> ..	MAIL	11.3.57	F. I. Swallow ..	N. Smith, J. Williams, T. Bledwyn ..	J. Kenny ..	Trent Maritime Co., Ltd.
<i>Duke of Athens</i> ..	GMYS	4.2.57	L. W. Loose ..	W. I. Taylor, L. W. Tait, S. Vass ..	J. S. Richards ..	

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGERS
<i>Dunedin Star</i>	GKKT	1.1.57	J. McInnes	D. J. Robertson, O. J. Edwards, J. Hutton	H. Darker	Blue Star Line, Ltd.
<i>Dunera</i>	GBBR	8.1.57	H. B. W. Cray, M.B.E.	B. Hutton, F. Hills, G. Hankin	T. Holden	British India Steam Nav. Co., Ltd.
<i>Durango</i>	MAIM	8.2.57	F. A. C. Thacker	D. T. Ancona, —, Gibson, R.N.R., R. E. Fairley, W. G. Henderson	M. Illiot	Royal Mail Lines, Ltd.
<i>Durban Castle</i>	GPGP	15.2.57	R. Cambridge, D.S.C., R.D., Cdr. R.N.R. (Retd.)	B. J. Bennett		Union Castle Mail S.S. Co., Ltd.
<i>Durham</i>	GWVK	14.3.57	A. Hocken	H. C. Hynard, K. Field, D. Hannam, J. Needham	B. Nutt	Federal Steam Navigation Co., Ltd.
<i>Edenfield</i>	GFJF	1.4.57	J. F. Blake	G. S. Wake, K. C. Purnell, J. R. Stillings	A. H. Arthurs	Hunting & Son, Ltd.
<i>Edinburgh Castle</i>	GOHN	3.12.56	L. H. Farrow	I. R. Mason, —, Arnold, —, Wearing	J. Hodgson	Union Castle Mail S.S. Co., Ltd.
<i>Egidia</i>	GJZD	6.2.56	D. Barclay	R. Watt, J. McLarty, —, Stockley	F. Blyth	Anchor Line, Ltd.
<i>Elysia</i>	GJZK	28.1.57	D. Barclay	W. Stockley, W. R. Miller, W. Rogerson	A. R. Prole	Anchor Line, Ltd.
<i>Empire Clyde</i>	GDXS	8.2.57	A. C. Johnston	W. Colquhoun, N. McFarlane, G. Reid, A. J. Dickie	R. Shore	Anchor Line, Ltd.
<i>Empire Fowey</i>	GMFW	26.3.57	W. T. C. Lethbridge	B. G. Metcalf, J. B. Latham, I. H. Craig, G. R. Yeatman	W. Dawson	P. & O. Steam Navigation Co.
<i>Empire Ken</i>	GKZJ	19.12.56	T. W. Stevens, R.D., Capt. R.N.R.	H. R. H. Griffiths, G. Chamberlain, J. Flood	T. Winslow	Royal Mail Lines, Ltd.
<i>Empire Ornell</i>	GRCB	9.10.56	C. W. C. Pinckney	W. R. Burt, E. LeVine, C. R. McGuffie	A. Shippam	Orient Steam Navigation Co., Ltd.
<i>Empire Star</i>	GCDD	6.3.57	F. N. Johnson, M.B.E.	D. Tranter, R. M. Burns, J. White	J. Nesbit	Blue Star Line, Ltd.
<i>Empress of Britain</i>	GUCH	26.11.56	S. W. Keay	—, Watts, —, Morrison, —, Richardson, M. Lester		Canadian Pacific S.S., Ltd.
<i>Empress of France</i>	GNTV	8.1.57	J. P. Dobson, D.S.C., R.D., Capt. R.N.R.	H. A. Jones, B. Brown, —, Watson, —, Quinn	—, Booth	Canadian Pacific S.S., Ltd.
<i>Empress of Scotland</i>	GMLV	28.1.56	J. P. Dobson, D.S.C., R.D., Capt. R.N.R.	G. Cotton, R. Elliott, R. Dickinson, N. Walker	B. Campbell	Canadian Pacific S.S., Ltd.
<i>English Star</i>	MFSS	27.3.57	L. Vernon, M.B.E.	B. Peters, P. Savies, R. White	J. Barnie	Blue Star Line, Ltd.
<i>Essequibo</i>	GKPK	6.3.57	A. J. G. Barff, R.D., R.N.R. (Retd.)	D. H. McCree, E. J. O'Keeffe, N. R. Slacke, M. Bennett, J. S. Barton	P. Snaith	Royal Mail Lines, Ltd.
<i>Essex</i>	GMML	27.12.56	S. Andrews	P. J. Sedgwick, B. M. Leek, D. Moran, J. Rice	L. Sutton	Federal Steam Navigation Co., Ltd.
<i>Essex Trader</i>	GCMS	5.9.56	R. E. Bennett	E. Atkinson, K. Stanisewski, J. I. Sharp	R. W. Elliott	Trader Navigation Co., Ltd.
<i>Esso Cambridge</i>	GRWJ	9.1.57	R. Drummond	K. Goody, B. B. Cockram, R. J. Smith	R. Whenn	Esso Transportation Co., Ltd.
<i>Esso Canterbury</i>	GQZF	13.2.57	J. W. Smith	J. R. Lewis, G. R. Eunson, M. J. Tucker	M. T. Hale	Esso Transportation Co., Ltd.
<i>Esso Exeter</i>	GSTS	8.1.57	R. M. Kerr	E. R. Gulwell, J. W. Borrowdale, A. G. Harper	J. Clarke	Esso Transportation Co., Ltd.
<i>Esso Glasgow</i>	GTXC	13.2.57	T. Potts	J. L. Bugbee, J. A. Rushworth, T. Moor	I. Patric	Esso Transportation Co., Ltd.
<i>Esso Manchester</i>	GWCD	4.1.57	C. L. Thomas	D. Maudsley, M. Backhouse, D. G. Boothroyd, R. Michell	W. Townsend	Esso Transportation Co., Ltd.
<i>Eucadia</i>	GJZL	21.3.56	J. L. Gibson, O.B.E.	J. Serthgeour, D. Lockhart, W. Skeed, S. Holloway	D. Sproat	Anchor Line, Ltd.
<i>Eumaeus</i>	MRWT	18.3.57	H. C. Large	P. Dodge, P. G. Young, J. C. Creer	J. C. Wilson	A. Holt & Co.
<i>Explorer</i>	GYIX	1.4.57	W. S. Eustance	F. H. Curry, W. W. Brindle, K. Rostrow	T. O'Looney	T. & J. Harrison, Ltd.
<i>Factor</i>	GPZV	22.10.56	R. Williams	R. B. Simmonds, R. H. Douglas, D. H. Clark	J. W. Clark	T. & J. Harrison, Ltd.
<i>Fanad Head</i>	GNOQ	21.11.56	J. Alexander	G. W. Houston, E. McIntosh, A. W. Burns	J. Lyons	G. Heyn & Sons, Ltd.
<i>Flamenco</i>	GCBV	9.8.56	T. H. McGill	A. G. Corbett, E. J. Pepper, C. Taylor	J. Sherwood	Pacific Steam Navigation Co.
<i>Fremantle Star</i>	MQFT	24.10.56	G. King	G. Stanley, N. Luck, R. Westrip	G. Bouliden	Blue Star Line, Ltd.
<i>Fresno City</i>	GBYD	27.12.56	J. M. Cox	D. J. Ferris, J. D. Campbell, F. Johns	D. J. Barnes	Sir William Reardon Smith & Sons, Ltd.

<i>Gallic</i>	..	GFNC	11.1.57	G. Anderson	..	D. C. Woodall, J. Seck, W. McGrindle, D. Robertson	..	F. Chan	..	Moller's Ltd.
<i>Garvelpark</i>	..	GKSV	7.3.57	W. Tawse	..	A. Galbraith, H. Rogers, A. Scott	..	D. Bissel	..	Messrs. J. & J. Denholm, Ltd.
<i>Geelong Star</i>	..	GNWF	22.11.56	J. S. Crowe	..	G. Stubblings, I. Hay, P. Gilks	..	P. Morrison	..	Blue Star Line, Ltd.
<i>Glenartney</i>	..	GBLG	22.1.57	H. S. Wood	..	J. W. Cortier, M. J. Glover, G. Templeton	..	B. I. Chamberlain	..	Glen Line, Ltd.
<i>Glenbank</i>	..	GKLC	25.2.56	H. A. Carver	..	J. Bain, H. J. Pope, J. P. Morgan	..	T. J. Hayes	..	Andrew Weir & Co., Ltd.
<i>Glenorchy</i>	..	GBLL	8.2.57	R. A. Hanney	..	J. D. Williams, C. M. F. Hill, N. H. F. Weldhen, M. F. Wardle	..	A. H. Hill	..	Glen Line, Ltd.
<i>Gloucester</i>	..	MANK	12.2.57	J. Budgell	..	G. Clarke, L. Bridges, W. Doodson	..	A. Wake	..	Federal Steam Navigation Co., Ltd.
<i>Gloucester City</i>	..	GKJS	11.12.56	S. G. Smith, O.B.E.	..	A. F. Ashton, L. T. Williams, J. R. Cambell	..	M. Brett	..	Chas. Hill & Sons
<i>Golfo</i>	..	GBYL	6.2.57	T. H. Bull	..	N. Thomas, D. C. Jones, N. Abbott, T. C. Mullings	..	P. J. Kelly	..	Elders & Fyffes, Ltd.
<i>Gothic</i>	..	MAUQ	2.1.57	L. J. Hopkins	..	T. I. Oliver, R. O. Guille, J. R. Tommy	..	B. McGovern	..	Shaw, Savill & Albion Co., Ltd.
<i>Grang</i>	..	MFDS	25.1.57	Glover	..	D. J. Owen, W. Abramowicz, K. Krutanis	..	E. M. Grover	..	Idwal Williams
<i>Grantford</i>	..	MOGC	17.9.56	H. Garrett	..	L. Taylor, F. J. Tinsley, E. Wellburn	..	A. Watcham	..	Gouldandris Bros., Ltd.
<i>Great City</i>	..	GBYS	6.6.56	D. Beynon	..	G. E. Ellerby, P. J. Harry, J. Attwood	..	R. Caldwell	..	Sir William Reardon Smith & Sons, Ltd.
<i>Grelmarion</i>	..	MAHQ	7.2.57	W. J. Escudie	..	K. Dixon, M. Grant, J. James	..	A. Davy	..	Cardigan Shipping Co., Ltd.
<i>Haparang</i>	..	GJYX	30.10.56	D. Chadwick	..	E. T. Rowland, C. J. Highfield, R. Jackson, G. Breen	..	R. Waters	..	New Zealand Shipping Co., Ltd.
<i>Harington</i>	..	GFCZ	13.8.56	H. Small	..	A. Slade, M. J. Clark, A. Dumas	..	S. Patterson	..	J. & C. Harrison, Ltd.
<i>Hauraki</i>	..	GJLV	2.10.56	R. G. Hollingdale	..	J. F. Piner, S. Sutcliffe-Hey, J. String-fellow	..	K. Higham	..	New Zealand Shipping Co., Ltd.
<i>Hector</i>	..	GDNK	14.3.57	R. Webb	..	J. W. Collister, A. A. Railton, D. M. Drummond	..	H. F. Murray	..	A. Holt & Co.
<i>Helenus</i>	..	GBTM	15.2.57	F. G. Radford	..	J. Barron, F. J. Pink, R. H. Sidley	..	D. L. Colley	..	A. Holt & Co.
<i>Helicina</i>	..	GKBC	5.9.56	D. E. Jones	..	J. R. Saunders, A. C. Watson, C. Stran-croom, G. Brown	..	N. A. Gilchrist	..	Anglo-Saxon Petroleum Co., Ltd.
<i>Hertford</i>	..	GKNW	10.11.56	E. A. Burton	..	J. S. Laidlaw, J. M. Burn, F. Michael, M. J. D'Oyly	..	I. G. Roberts	..	Federal Steam Co., Ltd.
<i>Highland Brigade</i>	..	GJKN	20.3.57	P. M. Burrell	..	R. New, R. Sutton, A. Striger	..	T. Desboro, M.B.E.	..	Royal Mail Lines, Ltd.
<i>Highland Chieftain</i>	..	GCTY	24.7.56	P. M. Burrell	..	A. Stevens, R. E. Forrester, T. Parks, J. Escolme	..	W. Rollason	..	Royal Mail Lines, Ltd.
<i>Highland Monarch</i>	..	GMZF	14.2.56	H. E. Sang	..	W. Carver, R. Byles, D. Salt, F. Chapman, G. Panes	..	F. Dunk	..	Royal Mail Lines, Ltd.
<i>Highland Princess</i>	..	GFMN	28.1.57	E. N. Giller	..	G. J. Moat, J. W. E. Thwaites, F. G. Nickson	..	G. Goodall	..	Royal Mail Lines, Ltd.
<i>Hilary</i>	..	GQVM	23.4.56	J. H. Stoker	..	G. Calvert, D. J. Taylor, J. B. Burke	..	A. Newcombe	..	Booth S.S. Co., Ltd.
<i>Hildebrand</i>	..	GKTK	8.10.56	J. H. Stoker	..	G. R. Sharp, D. B. Bird, E. Lange	..	D. Douglas	..	Booth S.S. Co., Ltd.
<i>Himalaya</i>	..	GBDK	22.2.57	R. G. Freeman	..	J. Neal, J. Crighton, P. W. Love, G. Hardesty, R. J. Alderson, G. H. Hollobone	..	H. Jardine	..	P. & O. Steam Navigation Co.
<i>Hinakura</i>	..	GDVS	14.1.57	S. W. Andrew	..	J. W. Hale, T. S. Wadie, R. Donald, L. Mann	..	J. Miller	..	New Zealand Shipping Co., Ltd.
<i>Hororata</i>	..	MANZ	14.12.56	H. R. M. Smith	..	L. E. Howell, B. J. Pusey, E. Fawcett	..	D. J. James	..	New Zealand Shipping Co., Ltd.
<i>Hubert</i>	..	GSBF	9.11.56	J. Whayman, D.S.C., R.D., Capt. R.N.R.	..	B. C. D. Franklin, G. W. Walker, R. Tolcher	..	F. Fitzgerald	..	Booth S.S. Co., Ltd.
<i>Huntingdon</i>	..	GFCT	27.12.56	P. S. Calcutt	..	F. R. Wilson, B. Bagot, P. Plumley	..	T. N. Green	..	Federal Steam Navigation Co., Ltd.
<i>Hurumu</i>	..	GJZF	19.6.56	F. Pover	..	D. E. Smith, C. Masson, G. Silver, A. Smith	..	A. Sadler	..	New Zealand Shipping Co., Ltd.
<i>Hyrcania</i>	..	MADE	22.10.56	J. Robertson	..	J. A. Shaw, N. Partington, C. Ceifert	..	N. Elliss	..	Baltic Trading Co., Ltd.
<i>Imperial Star</i>	..	GIAC	11.1.57	L. Evans	..	F. Agnew, P. Elliott, H. Dyer, J. Noyon	..	D. Whitehead	..	Blue Star Line, Ltd.
<i>Inishowen Head</i>	..	KAOC	1.4.57	H. N. Clarke	..	M. Walsh, R. Crawford, J. Roberts	..	G. Heyn & Sons, Ltd.	..	G. Heyn & Sons, Ltd.
<i>Interpreter</i>	..	GPZY	28.12.56	W. Weatherall	..	J. R. Willan, G. Cubbin, J. R. Keighan	..	J. G. Jones	..	T. & J. Harrison, Ltd.
<i>Inverbank</i>	..	GKML	11.1.55	R. A. Lorrains	..	D. S. Hoskins, J. F. Campbell, C. Strachan	..	V. Rowe	..	Andrew Weir & Co., Ltd.

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Ivernia</i> ..	GTKX	26.2.57	J. D. Armstrong, R.D., Lt.-Cdr. R.N.R. (Retd.)	— Easton, — Burn, L. Portet .. W. B. Bannerman, A. T. Moody, A. J. Trueman	F. Brown ..	Cunard Steamship Co., Ltd.
<i>Ision</i> ..	MLLB	27.11.56	R. Blakey ..	M. Middleton, T. Kidd, B. Sharp, M. Belcher	W. Beebee ..	A. Holt & Co.
<i>Jamaica Producer</i> ..	VPLM	12.12.56	G. E. M. Jenkins ..	R. F. Dixon, H. J. Bowers, T. H. Leggatt	A. Webb	Kaye Son & Co., Ltd.
<i>Jaxon</i> ..	GBMW	14.1.57	D. W. Stroud	J. Morley, M. Smith, R. Le Pivert	I. T. Davies	A. Holt & Co.
<i>John Biscoe</i> ..	MXDS	22.1.57	W. Johnston	R. Halliday, D. Edwards, R. A. Willison	— Molland	Government of the Falkland Islands
<i>John Holt</i> ..	GNFD	22.11.57	J. G. Jones	J. O. Dickenson, R. Robinson, — Roy	R. Caldwell ..	Guinea Gulf Line, Ltd.
<i>Journalist</i> ..	MSFQ	22.11.56	T. G. Holden	R. W. Smith, H. Burgess, J. Cutcliffe	P. Goulden ..	T. & J. Harrison, Ltd.
<i>Kenilworth Castle</i> ..	MQLP	14.3.56	I. A. Aplin ..	A. Menzies, — Turner, R. Dewsnap	G. C. Graze ..	Union Castle Mail S.S. Co., Ltd.
<i>Kenuta</i> ..	GCBW	1.3.56	T. J. Naylor	T. Harcus, A. Dixon, G. Boyle ..	I. W. Dick ..	Pacific Steam Navigation Co.
<i>King Robert</i> ..	MAON	21.3.56	J. C. Smith, O.B.E.	W. Burgess, W. Moss, R. Mulroney	R. Green ..	King Line, Ltd.
<i>King William</i> ..	GNVF	1.3.57	J. C. Davies	N. Wray, J. E. Parker, V. Llewellyn	V. Hatcher ..	King Line, Ltd.
<i>Kohistan</i> ..	GSFZ	29.10.56	T. Shields ..	S. Fox, J. Tambllyn, R. S. Brown	S. Dornan ..	F. C. Strick & Co., Ltd.
<i>Koyan</i> ..	GKST	2.4.57	R. W. H. Aitken	M. P. Roberts, P. V. DesLandes, R. Bellis	A. N. Gilbert	Henderson & Co.
<i>Lalande</i> ..	GNFL	26.11.56	E. D. Spooner	P. J. Testemale, J. A. Baxter, A. C. Rennell	J. B. Christian	Lampport & Holt Line, Ltd.
<i>Lanarkshire</i> ..	GCTC	7.2.57	R. B. Linsley	D. W. Luff, N. Foot, N. Roberts ..	R. Richardson	Turnbull Martin & Co., Ltd.
<i>Langton Grange</i> ..	MAOT	24.1.57	J. R. Faulkner	W. G. Cullen, T. Scott, W. Spowart	T. O'Shea ..	Houlder Bros. & Co., Ltd.
<i>Laurentia</i> ..	GNDY	8.2.57	T. S. Graham	I. F. Code, J. W. Walde, J. Routledge ..	D. Murray ..	Donaldson Bros. & Black, Ltd.
<i>Leicestershire</i> ..	GDBL	23.1.57	E. D. Brand	R. W. Lorains, C. Andoe, N. O. R. Webster	F. W. Greaves	British India Steam Nav. Co., Ltd.
<i>Levernbank</i> ..	GNLF	19.12.56	R. A. Leach	H. G. Chafer, H. L. Upton, J. F. Holder	J. M. Manford	Andrew Weir & Co., Ltd.
<i>Limerick</i> ..	GNLF	4.1.57	R. F. Hellings	R. P. Jones, D. Edmunds, T. F. Maddox	R. E. Bennett	Birt, Potter & Hughes
<i>Linguist</i> ..	GQBC	16.10.56	W. E. Williams	W. McKean, R. Allen, J. Henrickson	— Harris ..	T. & J. Harrison, Ltd.
<i>Lisoria</i> ..	GQKJ	26.6.56	J. L. McQueen	D. Martin, M. Robinson, H. Blagdon	I. Lumpitlaw	Donaldson Line, Ltd.
<i>Livorno</i> ..	GNPJ	26.3.57	A. W. Johnstone	T. Walton, A. McDiarmid, P. Jackson ..	T. Regan ..	Ellerman's Wilson Line, Ltd.
<i>Lloydcrest</i> ..	GNPW	14.12.56	L. Barwell ..	R. J. Luke, N. Wardle, M. G. Martin ..	M. McDonald	Crest Shipping Co., Ltd.
<i>Loch Avon</i> ..	MAOY	24.4.56	G. M. Fletcher	I. J. Berry, J. D. Wilson, R. J. Brockbank	J. Greenlough	Royal Mail Lines, Ltd.
<i>Loch Garth</i> ..	GMZY	28.2.57	G. S. Grant, R.D., Cdr. R.N.R. (Retd.)	M. Keen, R. Harding, R. Holford, J. Barton	F. Page ..	Royal Mail Lines, Ltd.
<i>Loch Ryan</i> ..	MAOZ	12.11.56	T. W. Stevens, R.D., Capt. R.N.R.	D. P. Prince, A. Murgatroyd, J. Corcoran	L. C. Frances	Royal Mail Lines, Ltd.
<i>London Pride</i> ..	GKTJ	2.3.56	W. Bingham	A. Rossouw, D. H. White, B. Lloyd ..	P. B. Killeen	London Overseas Freighters, Ltd.
<i>Lotarium</i> ..	GBLP	13.1.56	N. Clarke ..	W. L. Williams, J. J. Redden, J. A. Kerbyson, N. C. Humphries	B. I. Mellors	Anglo-Saxon Petroleum Co., Ltd.
<i>Macharda</i> ..	GKKF	6.12.56	H. F. Scots	C. R. Lucas, J. C. Long, A. M. Warren, G. Jones	R. Goodson ..	T. & J. Brocklebank, Ltd.
<i>Magdagar</i> ..	GBJX	18.10.56	H. G. Allan, M.B.E.	R. V. K. Robbins, P. F. Blackburn, K. Jones	D. C. Brown	T. & J. Brocklebank, Ltd.
<i>Mahanada</i> ..	GOFM	20.11.56	J. B. Newman	J. H. Moore, J. Pattison, J. E. Millichap, W. R. France	T. Williams ..	T. & J. Brocklebank, Ltd.
<i>Mahout</i> ..	GDZN	12.3.56	T. C. Eddy	M. C. Tait, J. S. Saxty, P. M. Woolfendon	J. Guthrie ..	T. & J. Brocklebank, Ltd.
<i>Maiseer</i> ..	GZSV	6.3.57	A. Hill, O.B.E.	M. T. L. Woodcroft, A. P. Briggs, E. L. Jackson	E. Smith ..	T. & J. Brocklebank, Ltd.
<i>Makalla</i> ..	GOFN	4.9.56	H. Simpson	P. Margeson, W. Adam, D. R. Bond	C. Watson ..	T. & J. Brocklebank, Ltd.
<i>Malancha</i> ..	GZRD	23.7.56	J. G. Nuttall	D. C. Burgess, C. J. Redman, A. W. King	H. K. Wrigley	Prince Line, Ltd.
<i>Malayan Prince</i> ..	GNSQ	14.1.57	G. G. Rich, M.B.E.	B. D. Mills, P. B. Webster, A. W. M. Adlam	D. Briggs ..	Mancheater Liners, Ltd.
<i>Manchester City</i> ..	GBBP	30.10.56	W. Hine, R.D., Lt.-Cdr. R.N.R. (Retd.)		J. Kane ..	

<i>Manchester Explorer</i> ..	GNBK	6.3.57	W. E. G. Oliver	J. Williamson, A. G. Rowlands, G. B. Hannford	D. Hodgson ..	Manchester Liners, Ltd.
<i>Manchester Mariner</i> ..	GSPD	17.1.57	E. W. Raper	A. S. Bashford, H. Lynn, K. W. Rourke	M. Doran ..	Manchester Liners, Ltd.
<i>Manchester Merchant</i> ..	MGZQ	28.3.57	W. H. Downing	T. Hood, P. Fielding, J. M. Brook	..	Manchester Liners, Ltd.
<i>Manchester Pioneer</i> ..	GNVG	28.1.57	A. Starnier ..	W. Boyle, P. Cullen, G. Harfoot	J. Buchanan ..	Manchester Liners, Ltd.
<i>Manchester Port</i> ..	GYNF	23.11.56	J. L. McLaren	T. M. Brook, A. S. Rowlands, D. Barlow	J. Berry ..	Manchester Liners, Ltd.
<i>Manchester Progress</i> ..	GPGD	19.2.57	M. Bewley ..	D. R. Nutton, A. W. Hopkinson, A. Swan	J. Buchanan ..	Manchester Liners, Ltd.
<i>Manchester Prospector</i> ..	GQKV	28.8.56	F. Lewis ..	J. Illingworth, J. Low, P. Jones ..	W. B. McPherson	Manchester Liners, Ltd.
<i>Manchester Regiment</i> ..	GBRD	6.2.57	F. Downing	L. A. Potts, A. Rowlands, B. Winchester, R. Dale	L. McDonald	Manchester Liners, Ltd.
<i>Manchester Shipper</i> ..	MAPC	22.10.56	H. Hancock ..	R. Sooton, L. Taylor, P. Humphrey ..	W. Critchley	Manchester Liners, Ltd.
<i>Manchester Spinner</i> ..	GNVB	5.11.56	F. L. Osborne	M. Kipling, J. E. Askew, P. Cullen	J. Reid ..	Manchester Liners, Ltd.
<i>Manchester Trader</i> ..	GMWG	22.2.57	E. W. Espley	R. Dootson, T. B. Hancock, S. Smith, J. D. Holden	B. E. Bewley	Manchester Liners, Ltd.
<i>Manchester Vanguard</i> ..	MWMN	8.2.57	W. E. Quirk, R.D., Cdr.	A. O. Capeland, —, Tester, N. W. Cocksboot	D. Spooner ..	Manchester Liners, Ltd.
<i>Manchester Venture</i> ..	GVDL	23.11.56	J. E. Jones ..	J. McKay, H. Evans, J. M. Rushworth, W. Glanville	E. Gill	Manchester Liners, Ltd.
<i>Mandator</i> ..	GBNY	28.12.56	E. L. Jones	D. F. Barratt, H. F. Newell, P. Gunzen	C. Carmichael	T. & J. Brocklebank, Ltd.
<i>Manistee</i> ..	GRXC	31.10.56	T. Barber ..	J. Nicholson, F. Watts, A. Southcott	L. Varmen ..	Elders & Fyffes, Ltd.
<i>Maplecone</i> ..	GNLX					Canadian Pacific S.S., Ltd.
<i>Mapledell</i> ..	GBBS					Andrew Weir & Co., Ltd.
<i>Marabank</i> ..	GCCP	7.1.56	C. G. Watterson	W. Mottram, W. R. Sullivan, E. J. Ray	J. Fahy ..	Ellerman's Wilson Line, Ltd.
<i>Marango</i> ..	GLFW	29.1.57	A. C. Gillis ..	F. Smith, A. Parker, R. Lawson	B. Bason	T. & J. Brocklebank, Ltd.
<i>Marland</i> ..	GTGW	11.1.57	T. C. Eddy	P. W. Colville, L. Des Andes, D. Wild	G. Hazell ..	Kaye Son & Co., Ltd.
<i>Marilla</i> ..	GNQT	23.10.56	W. H. Alexander	D. Clifford, L. Manser .. O. Pritchard,	G. J. Guy ..	T. & J. Brocklebank, Ltd.
<i>Matheran</i> ..	GOFQ	10.8.56	H. E. McGregor	A. C. Stallard, P. Owen	J. Shepherd ..	T. & J. Brocklebank, Ltd.
<i>Matina</i> ..	GSZX	15.10.56	W. G. Lock	A. F. Booth, H. E. Beyer, D. C. Jones, B. Hodges	A. C. Knight	Elders & Fyffes, Ltd.
<i>Matrelania</i> ..	GTTM	26.10.56	C. S. Williams	D. I. McManus, H. Dove, H. Dormer	J. Connock ..	Cunard Steamship Co., Ltd.
<i>Media</i> ..	GSWR	16.1.57	T. T. Sheenan	R. Ogilvy, P. A. Brush, J. K. Finlay	A. F. Crosby	Cunard Steamship Co., Ltd.
<i>Melbourne Star</i> ..	GDFZ	5.10.56	G. Aldridge	J. Rodgers, J. Collins, M. H. Flynn	D. Fisher ..	Blue Star Line, Ltd.
<i>Middlesex</i> ..	MPBK	25.3.57	I. C. Davison	G. McIver, A. Britain, J. H. Hutton,	A. Wake ..	Federal Steam Navigation Co., Ltd.
<i>Monarch</i> ..	GBDF	13.2.57	J. P. F. Betson, O.B.E.	T. Rowland	T. Tilly ..	H.M. Postmaster General
<i>Maristan</i> ..	MABB	27.12.56	E. Dunn ..	I. J. L. Lang, W. A. Howgego, P. V. Flynn, D. Alford	R. B. Barrie ..	F. C. Strick & Co., Ltd.
<i>Myrtlebank</i> ..	GLOB	17.7.56	L. W. Thorne	E. Cairns, J. F. Ockleford, M. A. J. Greenham	F. E. Anderson	Andrew Weir & Co., Ltd.
<i>Napier Star</i> ..	MAPN	4.12.56	R. H. Stark	D. Campbell, G. D. Scott, A. Patterson	W. McMillon	Blue Star Line, Ltd.
<i>Naticina</i> ..	GIGH	14.2.57	J. A. McGherrie	D. R. McWhan, D. S. Gilmour, R. Glenn	E. Cookson ..	Anglo-Saxon Petroleum Co., Ltd.
<i>Nestor</i> ..	GNZG	18.12.56	E. W. Studley	W. Smith, W. I. Simpson, J. P. Rendle	H. Roberts ..	A. Holt & Co.
<i>New Australia</i> ..	GZKD	27.9.56	J. W. Hart ..	E. L. Stubbings, A. F. S. Forster, R. Granger, H. J. Moore	W. Miller	Shaw, Savill & Albion Co., Ltd.
<i>New York City</i> ..	GYDD	12.11.56	A. L. Webb, O.B.E.	P. Carden, J. Talbot, B. Roberts, —, W. Coombes, D. A. Braid, N. B. Roles, —, Jones	A. I. Brooks	Charles Hill & Sons
<i>New Zealand Star</i> ..	GYCR	6.12.56	E. N. Rhodes	P. Mitchell, R. Dawson, C. Spencer	T. Morrison	Blue Star Line, Ltd.
<i>Newfoundland</i> ..	GNMC	27.12.56	C. H. Kenyon	K. L. Row, J. Moore, W. R. Parrish	T. Cahill ..	Furness Withy & Co., Ltd.
<i>Norfolk</i> ..	MMBD	20.2.57	W. J. T. Stevens	G. Dixon, M. Hughes, M. Field	J. Bilton ..	Federal Steam Navigation Co., Ltd.
<i>Nordic</i> ..	GDJC	17.12.56	F. S. Thornton, O.B.E.	E. Humphries, B. H. White, P. J. Dickinson	R. Drake	Prince Lines, Ltd.
<i>Norwegian</i> ..	GBVS	21.11.56	R. E. Small	A. W. Henderson, P. R. Shaw	J. Soper ..	Cable & Wireless, Ltd.
<i>Nottingham</i> ..	GCNC	11.6.56	J. James ..	P. Egan, E. Cooper, G. Caulfield, D. Harris	A. Harris ..	Federal Steam Navigation Co., Ltd.

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGERS
<i>Nova Scotia</i> ..	GNNK	2.1.57	J. B. Stewart	E. W. Foxworthy, J. G. Smith, J. D. Ransome	W. C. Brock	Furness Withy & Co., Ltd.
<i>Novelist</i> ..	GMLG	10.1.57	R. F. Longster	T. Wilson, T. Baxendale, R. H. Jones	W. Gannall	T. & I. Harrison, Ltd.
<i>Obuasi</i> ..	GMLQ	5.2.57	J. A. Brooke	D. B. Parnun, R. W. Gibson	G. Barlow	Elder Dempster Lines, Ltd.
<i>Orifield</i> ..	GNMN	6.2.57	W. H. Lawson	F. M. Cummings, I. A. Haddow, G. S. Taylor	P. Shine	Hunting & Son, Ltd.
<i>Orari</i> ..	GJXX	8.3.57	J. R. M. Ramsey	J. A. North, B. Foster, R. S. Shannon, W. G. Dick	T. A. Batte	New Zealand Shipping Co., Ltd.
<i>Orcades</i> ..	MABA	12.3.57	C. K. Blake, O.B.E.	D. P. Postlethwaite, R.N.R., R. G. Woods, R. Ellingham	F. Miller	Orient Steam Navigation Co., Ltd.
<i>Orion</i> ..	GYKL	16.1.57	A. E. Coles, R.D., Capt. R.N.R.	—, English, —, Spiers, —, Williams, —, Whitehead, —, Hughes	F. Harrop	Orient Steam Navigation Co., Ltd.
<i>Oronsay</i> ..	GCNB	4.3.57	N. W. Smith	J. Robinson, S. Munson, J. Boyde	R. Oakley	Orient Steam Navigation Co., Ltd.
<i>Orontes</i> ..	GBXM	2.4.57	C. W. C. Pinckney, O.B.E., R.D., Cdr. R.N.R. (Retd.)	D. Steffi, B. Pickering, M. D. Rushan	H. Palmer	Orient Steam Navigation Co., Ltd.
<i>Orsotia</i> ..	GNDL	21.11.56	C. K. Blake, O.B.E.	C. H. Goddard, R.N.R., J. L. Chapman, R.N.R., J. M. Wells, R.N.R.	P. Parish	Orient Steam Navigation Co., Ltd.
<i>Otaki</i> ..	GPBV	28.12.56	J. D. Bennett	E. J. Norman, J. S. Glover, R. T. Youngman, P. A. Kelly	E. Barley	New Zealand Shipping Co., Ltd.
<i>Otranto</i> ..	GFKV	30.1.57	R. W. Roberts, O.B.E., D.S.C.	W. J. Denley, D. B. Gaffney, N. I. Collett	W. Clarke	Orient Steam Navigation Co., Ltd.
<i>Pacific Fortune</i> ..	GBFM	15.1.57	H. A. Shaw	H. R. Howell, J. S. Jones, A. B. Smith	J. R. M. Thomas	Furness Withy & Co., Ltd.
<i>Pacific Northwest</i> ..	GQCP	20.8.56	H. Harris	P. Croone, F. H. Perry, R. Morris, A. Seabrook	H. Harris	Furness Withy & Co., Ltd.
<i>Pacific Reliance</i> ..	GMJK	26.2.57	P. F. Owens	J. A. Lee, A. Hodges, F. Pearson	W. J. Jennings	Furness Withy & Co., Ltd.
<i>Pacific Unity</i> ..	GUAN	1.11.56	A. H. Cooke	G. G. Lear, D. Garside, E. J. Woods	F. O'Shea	Furness Withy & Co., Ltd.
<i>Pacure</i> ..	GCNX	16.10.56	R. H. Evans	J. Beatson, R. J. Williams, J. Bull	M. Coady	Elders & Fyffes, Ltd.
<i>Pampas</i> ..	GCDL	7.2.57	L. T. Peterson	P. J. Williams, J. A. G. Arnott, R. J. Kistler	W. Macarthy	Royal Mail Lines, Ltd.
<i>Papanui</i> ..	GDJW	12.2.57	D. A. G. Dickens, Lt. R.N.R.	R. C. Anderson, —, Hale	P. Leigh	New Zealand Shipping Co., Ltd.
<i>Paparoa</i> ..	GBCZ	19.4.56	J. D. Guyler	J. Hunter, P. B. Butcher, A. A. Faulkner, J. M. Charlesworth	I. Warr	New Zealand Shipping Co., Ltd.
<i>Paraguay</i> ..	MAQS	16.12.55	W. J. Phillips	B. M. Rowley, R. F. Dalglish, I. Parks	J. Talbot	Royal Mail Lines, Ltd.
<i>Paraguay Star</i> ..	GTNC	14.11.56	D. McFarlane	E. Whitley, T. Ireland, R. Gibb, D. Wilkinson, B. Knights, B. Temperton, R. Bilton	J. Martin	Blue Star Line, Ltd.
<i>Pardo</i> ..	GMNZ	21.1.57	R. D. Jones	R. J. Harding, P. T. Shephard, A. Hanily	D. Grimbaldston	Royal Mail Lines, Ltd.
<i>Partina</i> ..	GCLQ	12.11.56	T. Fraser, D.S.C., R.D., Capt. R.N.R.	J. D. Williams, R. Sly, D. Hatton	G. T. Curtis	Royal Mail Lines, Ltd.
<i>Parthia</i> ..	GSWQ	14.12.56	S. A. Jones, R.D., Cdr. R.N.R.	T. A. Nicholson, C. C. Walker, R. P. Wakefield, N. M. Douglass	A. O'Sullivan	Cunard Steamship Co., Ltd.
<i>Patagonia Star</i> ..	GQGT	31.1.57	E. Jernyn	R. N. Parker, M. R. Hawes, C. J. Ireland	B. Deitz	Lampport & Holt Line, Ltd.
<i>Perim</i> ..	GCCB	10.10.56	—, Stansfield	—, De Sausmarez, —, Mackie, —, Simmons	R. Carhill	P. & O. Steam Navigation Co.
<i>Perthshire</i> ..	GYWK	14.1.57	T. N. Soane	R. G. Turner, J. W. Bennet, A. B. Forster	J. Pattie	Turnbull Martin & Co., Ltd.
<i>Pilcomayo</i> ..	GBZX	16.11.56	G. Medlycott	D. S. Guinness, C. Oxborough, J. A. Philip	E. Fitzgerald	Royal Mail Lines, Ltd.
<i>Pipiriki</i> ..	GDRQ	4.12.56	T. Alderman, R.D., Lt.-Cdr. R.N.R.	R. S. Hales, B. D. Allen, S. Evans, A. Carver	T. Olrog	New Zealand Shipping Co., Ltd.
<i>Pizarro</i> ..	GQNY	14.8.56	P. L. Hockey	F. Nuttall, D. J. Houghton, C. Farnworth, —, Pearson	G. L. Jones	Pacific Steam Navigation Co.

Planter	GZSS	7.11.56	F. Hill	J. W. Chatfield, W. Williamson, K. Watson	J. W. Anderson	T. & J. Harrison, Ltd.
<i>Polar Maid</i>	MAQX	19.5.54	W. Spence	J. B. Kerr, D. McLean, P. Forsyth	J. Williams	Polar Whaling Co., Ltd.
<i>Port Adelaide</i>	MGCG	16.10.56	W. B. Craig	W. Durhie, M. Mortimore, M. Foden	P. J. Kelly	Port Line, Ltd.
<i>Port Auckland</i>	GWRB	24.1.57	E. J. Syvret, O.B.E.	J. S. Whitehead, A. D. Braithwait, J. C. Boyle	H. R. Bassford	Port Line, Ltd.
<i>Port Brisbane</i>	GWRC	23.1.57	F. W. Bailey, M.B.E.	T. Carnie, D. Dixon, R. Osmond, P. Rayner	D. Don	Port Line, Ltd.
<i>Port Dunedin</i>	GLCJ	4.12.56	T. S. Paton	R. C. Case-Green, W. J. North, G. H. Boswell	T. A. Cameron	Port Line, Ltd.
<i>Port Hardy</i>	GOFG	5.3.57	S. W. Dobson	Downard, G. Hudson, K. Gowsell	D. Alcock	Bibby Line, Ltd.
<i>Port Hobart</i>	GKGC	5.12.56	F. J. Lavers	L. K. Pegram, P. Beattie, R. G. Asplet	E. McCartney	Port Line, Ltd.
<i>Port Jackson</i>	GZKR	3.4.57	P. S. Ball	W. Petter, J. Naylor, J. Mackinnon	E. Loft	Port Line, Ltd.
<i>Port Lincoln</i>	GFZK	31.1.57	R. H. Finch	D. N. M. Haddon-Cave, J. H. Lloyd-Davies, D. S. Taylor	G. Clarke	Port Line, Ltd.
<i>Port Macquarie</i>	MAQY	26.7.56	J. S. Moate	B. M. LeLeivre, C. A. Lancaster, A. E. Hoggarth	G. Clarke	Port Line, Ltd.
<i>Port Napier</i>	GPKD	10.1.57	C. R. Townshend	I. M. Evans, G. B. Rapp, J. Hart	T. Hargreave	Port Line, Ltd.
<i>Port Phillip</i>	MAQZ	10.10.56	W. Eastoe	G. Brandon, J. E. Toghiani, J. D. C. Tainish	R. Robertson	Port Line, Ltd.
<i>Port Pirie</i>	GLVO	26.11.56	G. G. Langford	M. J. Davis, D. E. Kemp, J. R. Bell	H. J. Roberts	Port Line, Ltd.
<i>Port Transville</i>	MGCV	4.1.57	L. J. Skailes	R. Kono, L. Williamson, W. P. Russell	K. A. Nakin	Port Line, Ltd.
<i>Port Victor</i>	MSWK	7.11.56	J. A. Fairbairn	C. Baldam, C. Brown, J. Webber	J. McMillen	Port Line, Ltd.
<i>Port Vindex</i>	MAUW	29.1.57	E. Roswell	C. S. Liley, J. Brown, J. Hitchmough	R. Hodgson	Port Line, Ltd.
<i>Port Wellington</i>	GDNJ	1.1.57	E. W. R. Young	E. Walshaw, D. M. Church, I. Collier	M. J. Farrelly	Port Line, Ltd.
<i>Port Wymouth</i>	GZCW	30.11.56	L. W. Cady	M. F. Norris, J. G. Whyte, D. J. Turner	W. Fitzgerald	Port Line, Ltd.
<i>Portland Star</i>	GZSY	6.3.57	R. S. Hopper, D.S.C., Lt.-Cdr. R.N. (Retd.)	I. Waller, B. G. Knights, R. C. Cameron	I. S. Baigent	Blue Star Line, Ltd.
<i>Potaro</i>	GNLJ	31.10.56	W. Tennent	I. Wilson, B. Copland, J. Martin	G. S. Britton	Royal Mail Lines, Ltd.
<i>Potasi</i>	GPQL	4.4.56	D. W. Hutchison	R. B. Bryant, G. McHunter, K. L. Crowther	C. H. Weeks	Pacific Steam Navigation Co.
<i>Powell</i>	GKJL	1.8.56	D. Cornwell	L. C. Fuke, R. Wilson, D. Allan	D. Jenkins	Hector Whaling, Ltd.
<i>Pretoria Castle</i>	GOAE	3.7.56	G. H. Mayhew	A. D. Foulkes, R. E. Bestel, B. Oram	T. Williams	Union-Castle Mail S.S. Co., Ltd.
<i>Prospector</i>	GIMS	2.8.56	W. Layton	H. Traynor, R. W. Eastaugh, J. Adams	D. Bloom	T. & J. Harrison, Ltd.
<i>Rakata</i>	GFGW	9.10.56	C. F. Robinson	E. J. Carr, J. T. Varney, D. I. Jamison	J. Broome	New Zealand Shipping Co., Ltd.
<i>Ramona Head</i>	MAXX	27.3.57	W. A. Haddock, O.B.E.	R. Harris, —, Clint, A. J. Quail	J. Lyons	G. Heyn & Sons, Ltd.
<i>Ramsay</i>	GPSW	25.3.57	W. A. Kyne	D. A. Kiddell, J. Parsloe, P. R. Owen	P. Mullane	Bolton Steam Shipping Co., Ltd.
<i>Rangitane</i>	CDBV	6.12.56	R. G. Rees	D. Thomas, A. Dorkins, D. Hyde, J. Thompson	L. Whittington	New Zealand Shipping Co., Ltd.
<i>Rangitata</i>	GSZN	25.2.57	A. E. Lettington, O.B.E., D.F.C.	D. W. Handley, I. M. Pears, G. S. Breen	C. L. Lambe	New Zealand Shipping Co., Ltd.
<i>Rangitiki</i>	GSXW	4.10.56	A. E. Lettington, O.B.E., D.F.C.	I. Excell, D. W. Handley, I. M. Pears	C. L. Lambe	New Zealand Shipping Co., Ltd.
<i>Rangitoto</i>	GLMV	16.11.56	C. R. Pulcher, O.B.E.	T. Gibbons, J. Gair, D. Standing, R. Barton	S. Parker	New Zealand Shipping Co., Ltd.
<i>Ratlin Head</i>	GRDB	18.3.57	M. Kennedy	R. Crawford, C. E. Pringle, W. D. Teal	E. Heywood	G. Heyn & Sons, Ltd.
<i>Regent Hawk</i>	GMND	24.1.57	G. Hobson	J. H. Thomas, J. Beard, N. Baird	R. W. Jones	Regent Petroleum Tankship Co., Ltd.
<i>Regent Royal</i>	GRPN	23.10.56	R. Armstrong	J. H. Thomas, S. S. Jenkins, W. J. May	J. A. Jackson	Regent Petroleum Tankship Co., Ltd.
<i>Reina del Mar</i>	GTYN	26.3.57	A. G. Litherland	I. S. Smith, H. Cunliffe, J. K. Spencer	I. Butler	Pacific Steam Navigation Co.
<i>Reina del Pacifico</i>	GMPS	26.11.56	D. W. Hutchison	R. Pass, A. Gordon, R. Douglas, J. Turner	T. Tynan	Pacific Steam Navigation Co.
<i>Retriever</i>	MRWY	18.3.57	J. G. West	D. Silwood, P. Watts, M. Simmons	—, Fitzsimmons	Cable & Wireless Co., Ltd.
<i>Reynolds</i>	CQNC	11.12.56	J. Burns	D. Parry, G. Leith, D. F. Cameron	G. D. Hurst	Bolton Steam Shipping Co., Ltd.
<i>Rhodesia Star</i>	GUAX	16.1.57	F. L. Hambridge	J. G. Thompson, A. J. Chivers, P. Daniels	P. Middleton	Blue Star Line, Ltd.

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGERS
<i>Rialto</i> ..	GBLV	7.1.57	H. Greenhill	A. Hodson, J. Robinson, J. Driukall, J. Bradley	A. Gavin	Ellerman's Wilson Line, Ltd.
<i>Richmond Castle</i> ..	GCSP	25.7.56	W. C. J. Swift	M. Oates, I. R. H. Mason, P. Stead	P. E. Mahon	Union Castle Mail S.S. Co., Ltd.
<i>Ripplingham Grange</i> ..	GIGP	28.9.56	R. Owen	P. Hector, M. H. L. Jenkins, J. Morrison	I. Taylor	Houlder Bros. & Co., Ltd.
<i>River Afton</i> ..	MOXX		I. P. Johnson	D. Wilson, J. G. Nielson, S. Frank	T. J. Ahern	Mungo Campbell & Co., Ltd.
<i>Rochester Castle</i> ..	GZQF	10.10.56	R. G. Pargiter	H. Miller, J. Taylor, A. Lawrence	F. Borguist	Union Castle Mail S.S. Co., Ltd.
<i>Roanagh Head</i> ..	GNTN	10.5.56	R. W. Black, O.B.E.	F. R. N. Best, P. Ellis, W. R. Nelson	B. P. Lewis	G. Heyn & Sons, Ltd.
<i>Roscommon</i> ..	GZPY	28.11.56	L. J. Ridout	R. Smellie, J. Munden, M. Lambert	I. Thomlinson	Trinder Anderson & Co.
<i>Rosita Castle</i> ..	GYJZ	14.2.57	W. Anson	B. R. Webb, P. D. Lofis	J. Brown	Union Castle Mail S.S. Co., Ltd.
<i>Rosvallan Castle</i> ..	GDFT	14.11.56	G. D. Fowler, R.D., Lt.-Cdr.	G. Wood, T. Kelway, —, Van Der Post, —, Stead	J. Cookson	Union Castle Mail S.S. Co., Ltd.
<i>Roxburgh Castle</i> ..	GBGS	14.3.57	C. W. Armstrong, R.D., Cdr.	E. Harding, G. Beaumont, G. Dadds	J. Hodge	Union Castle Mail S.S. Co., Ltd.
<i>Ruahine</i> ..	GKSY	24.1.57	R.N.R.	M. Piner, J. Stickler, P. Holloway	A. McMuray	New Zealand Shipping Co., Ltd.
<i>Rumic</i> ..	GGCS	18.3.57	F. Loughheed	—, Theakstone, —, Borthwick, —, Creese	J. Conn	Shaw Savill & Albion Co., Ltd.
<i>Renswick</i> ..	GFVN		J. S. Pinkney	P. Palfreman, S. Ward, B. Batty	C. V. Child	Headlam & Son
<i>Sacramento</i> ..	GKCN	30.11.56	H. Grummill	H. Edwards, T. Baker, B. Batty	J. S. Cott	Ellerman's Wilson Line, Ltd.
<i>Saint John</i> ..	GRBT	12.2.57	C. Bradley	J. G. Black, A. Ellis, H. Bulmer, R. Greenland, A. Phillips	M. Prior	South American Saint Line, Ltd.
<i>Salacia</i> ..	GZRN	18.3.57	G. M. Clark	D. G. Hall, A. Johnston, W. Williamson	T. Fitzgerald	Donaldson Bros. & Black, Ltd.
<i>Salamanca</i> ..	GLSG	27.12.56	A. Lyall	M. E. Jones, D. B. Jones, W. A. Johnston	W. Read	Pacific Steam Navigation Co.
<i>Salaverry</i> ..	GBLQ	29.8.56	J. Evans	C. Rowntree, J. K. Spencer, G. B. Swan	M. Coady	Pacific Steam Navigation Co.
<i>Salinas</i> ..	GLLK	7.3.57	A. B. Powell	C. A. Hilton, P. Whitaker, C. Rowntree	W. Allen	P. Henderson & Co.
<i>Salween</i> ..	GFFN	8.2.57	K. Marsh	W. H. Ross, S. A. McInnes, P. Morris	E. J. Patinsson	Eagle Oil & Shipping Co., Ltd.
<i>San Felix</i> ..	GFJZ	20.11.56	A. N. Rylett	D. G. T. Daniel, H. F. Mitchell, K. Hardy	H. Playford	Eagle Oil & Shipping Co., Ltd.
<i>San Velino</i> ..	GCNY	28.3.57	G. A. H. Knott, O.B.E.	K. Branley, J. D. Tomlinson, N. H. Chandler	K. Jenkins	Eagle Oil & Shipping Co., Ltd.
<i>San Veronica</i> ..	MASQ	12.12.56	S. Miller	M. T. Lewis, L. F. Lawrence, G. I. Robson	D. J. Brown	Elder Dempster Lines, Ltd.
<i>San Vulfrano</i> ..	MASR	12.2.57	T. B. Wright	P. W. Hodges, W. Aitken, F. B. Ridout	R. Walsh	Pacific Steam Navigation Co.
<i>Santus</i> ..	GQON	8.11.56	H. Welton	J. Morris, D. Turner	H. V. Littlecott	Blue Star Line, Ltd.
<i>Santander</i> ..	GBNR	20.2.57	F. T. Leicester	R. I. Hunter, J. T. Bruce, D. J. Good	A. Farman	Cunard Steamship Co., Ltd.
<i>Sarmiento</i> ..	MARW	1.6.56	A. B. Powell	I. Shephard, W. Bolitho, W. Jenkins	H. Arnold	Scottish Tankers, Ltd.
<i>Saxon Star</i> ..	MARX	14.2.57	C. A. Holleyoak	B. M. Mitchell, T. R. Cree, M. D. Squibbs	S. W. Brown, M.B.E.	Cunard Steamship Co., Ltd.
<i>Saxonia</i> ..	GSJS	4.9.56	W. T. Fitzgerald, R.D., Capt. R.N.R. (Retd.)	P. J. R. Lawley, G. Buckley, P. Walton, D. J. Wilford	P. McBride	Blue Star Line, Ltd.
<i>Scottish Eagle</i> ..	MMVX	18.3.57	D. T. Griffith	M. W. Scott, W. S. Wallace, T. M. Connolly	M. J. Brophy	T. & J. Harrison, Ltd.
<i>Scythia</i> ..	GDYP	6.11.56	F. G. Watts, R.D., Lt.-Cdr.	D. J. Atkinson, A. W. Hoyle, D. H. Howells	D. Doherty	T. & J. Harrison, Ltd.
<i>Seattle Star</i> ..	MMNW	26.3.57	—, Bremberg	J. G. King, D. L. Dennison, M. S. Bradshaw	R. E. Molland	Falkland Islands Dependency Survey
<i>Selector</i> ..	MARZ	14.1.57	C. C. Heaton	J. J. Dwyer, R. M. Benson, A. J. Watkins	S. Ribee	Torrey Research Station
<i>Settler</i> ..	GTTX	15.10.56	H. G. Skelly	D. V. Jones, R. L. Hammond, P. Clements	B. Evernett	Headlam & Son
<i>Shackleton</i> ..	GVDC	1.6.56	W. Johnston	T. Woodfield, T. Flack, A. Kerr	H. Williams	P. & O. Steam Navigation Co.
<i>Sir William Hardy</i> ..	GSZY	30.11.56	I. Munro	S. Ribee, M. Slater	G. Greenfield	Ropner Shipping Co., Ltd.
<i>Sweeton</i> ..	GDBS	24.1.57	W. Armstrong	E. Wilson, T. Ellerby, W. R. Atkinson		
<i>Socotra</i> ..	MASC	27.12.56	W. H. Waghorn	H. O. Cribb, M. J. Borland, C. S. Bradley		
<i>Somersby</i> ..	GRLK		J. Kenny	A. P. Joel, H. Kitching, K. Harper		

South Africa Star	..	GUAW	25.9.56	R. M. T. Jones	..	D. Murray, D. Tranter, D. McKillop	A. Francis	Blue Star Line, Ltd.
Southern Cross	..	GSWW	28.2.57	Sir David Aitchison, K.C.V.O.	..	T. P. Cameron, B. Charlton, T. Ffowes Williams, W. Newport, L. Mounsey, C. Wood	H. Matthews	Shaw, Savill & Albion Co., Ltd.
Southern Garden	..	MASF	10.5.56	W. Spence	..	G. Sinclair, R. D. Frysendorf, J. D. Thomson	J. Smethurst	Chr. Salvesen & Co.
Southern Harvester	..	GFZJ	19.4.56	L. Bartho	..	W. Christoffersen, F. Johansen	A. R. Turnbull	Chr. Salvesen & Co.
Southern Opal	..	MASG	10.5.56	A. F. Balkie	..	W. Ross, J. K. Mavor, J. G. Boyle	T. Johnson	Chr. Salvesen & Co.
Southern Satellite	..	GTNR	21.3.57	W. Swanson	..	D. Wall, J. G. Wilson, N. McLean	P. Curson	Chr. Salvesen & Co.
Southern Ventures	..	GNNM	25.4.56	H. Myhre	..	K. Snekketad, A. Harkness, O. Vikklunder	—, McMorran	Chr. Salvesen & Co.
Specialist	..	GCYF	29.3.56	L. W. Sharman	..	T. F. Maddox, J. B. Mitchell, A. A. Dunn	P. Goulden	T. & J. Harrison, Ltd.
Stirlingshire	..	GCOD	15.1.57	E. W. Jenkin	..	D. Paterson, D. M. Geddes, B. Hockley	W. Larus	Turnbull Martin & Co., Ltd.
Stirling Castle	..	GYPX	20.3.57	J. F. Oakley	..	D. Marchmont, W. E. Doods	W. A. Brown	Union Castle Mail S.S. Co., Ltd.
Strathaird	..	GRSX	15.2.57	K. A. H. Cummins	..	A. F. Petrie, W. Thompson, N. McClean	J. F. Clark	P. & O. Steam Navigation Co.
Stratheden	..	GDGT	11.1.57	W. H. O. Wood-Roe	..	—, Pearce, P. I. Black, —, Dupton, R. E. Webb	P. Maloney	P. & O. Steam Navigation Co.
Strathmore	..	GYMS	12.12.56	J. M. Peter	..	L. W. Banforth, R. Lowther, D. Shipp, J. Shaw, D. Perry, C. Sabine, P. Aspinall	J. P. Carey	P. & O. Steam Navigation Co.
Strathmore	..	GRPZ	9.1.56	M. Polson	..	A. F. Petrie, D. Bates, J. Lane	M. J. Murphy	P. & O. Steam Navigation Co.
Strathmore	..	MAST	25.10.56	H. C. R. Dell	..	L. Lawrence, J. McLean, W. Mason	P. Curson	Chr. Salvesen & Co.
Surrey	..	QQOS	18.12.56	H. I. D. Scaden	..	P. E. Robertson, P. J. Field, M. J. Ewens, D. Evans	A. Wake	Federal Steam Navigation Co., Ltd.
Sussex	..	MMSQ	26.11.56	N. A. Thomas	..	M. F. Henson, J. Masson, M. Wood	A. Tittley	Federal Steam Navigation Co., Ltd.
Swiftpool	..	MAEF	11.9.56	C. H. Churchill	..	I. F. Smith, A. B. Stalker, J. Baxter, T. W. Stirling	J. McLeod	Federal Steam Navigation Co., Ltd.
Sydney Star	..	MSDN	19.2.57	R. White, D.S.C.	..	P. Robinson, A. Dekonski, B. W. Hayward	P. J. Behan	Sir Robert Ropner Co., Ltd.
Taberistan	..	MKSM	21.1.56	F. W. Bowley	..	C. Denny, P. Stevens, N. Roberts	T. W. Elliott	Blue Star Line, Ltd.
Tagelus	..	GZDR	31.1.57	A. S. M. Jamieson	..	J. Beerman, R. J. Kane, —, Deering	S. Bentley	F. C. Strick & Co., Ltd.
Tamela	..	GEMG	25.2.57	W. Rowlands	..	D. G. Whiteley, R. Tinnmouth, J. A. Legg	D. W. Cross	Anglo-Saxon Petroleum Co., Ltd.
Tamallion Castle	..	GCBF	7.6.56	N. M. Lloyd, R.D., Cdr.	..	G. W. Barton, A. G. Maxwell, J. S. McKean	C. E. Jones	Elder Dempster Lines, Ltd.
Tarkana	..	MQWN	19.2.57	R. W. Philip	..	M. N. Lloyd, P. Rippon, R. Goddard	W. Hawksworth	Union Castle Mail S.S. Co., Ltd.
Tasmania Star	..	MASU	7.6.56	G. C. Goudie	..	D. Corner, R. B. M. Fawcett	W. P. Cameron	Elder Dempster Lines, Ltd.
Tectus	..	GKPC	7.3.57	T. W. Green	..	P. G. Entwistle, D. Murray, R. W. Hawkes	C. V. James	Blue Star Line, Ltd.
Tekoa	..	GEMJ	2.6.56	F. Williamson	..	B. Jonsson, C. T. Fellows, R. Barister	G. E. Randall	Anglo-Saxon Petroleum Co., Ltd.
Telemachus	..	GJFO	30.7.56	A. Lane	..	D. Standing, J. D. Cubitt, J. Reid	A. Tidle	New Zealand Shipping Co., Ltd.
Tenagodus	..	GBLB	2.4.57	R. C. Swainston	..	A. G. Hole, R. G. Southern, J. Johnstone	F. M. Shannon	A. Holt & Co.
Tetela	..	GDLZ	2.1.57	J. E. Purves	..	J. Y. Cox, B. R. Alderton, S. L. Lambert	C. E. Hutchinson	Anglo-Saxon Petroleum Co., Ltd.
Teutis	..	GMPN	10.9.56	G. A. C. Kennedy	..	R. Box, D. J. Morris	D. McHugh	Elders & Fyffes, Ltd.
Thaumastus	..	MASX	25.2.57	J. W. Barnsley	..	J. A. Niblock, P. W. Campbell, J. C. Craigie	H. Gaskell	Royal Mail Lines, Ltd.
Thelicomus	..	GDTs	10.5.55	A. H. Dare	..	M. E. Bodiam, G. Anderson, R. H. Wills	B. Draisey	Anglo-Saxon Petroleum Co., Ltd.
Thule	..	GEMT	28.3.57	S. H. Bennett, M.B.E.	..	J. B. Morris, J. Magillivray, R. S. Smith	A. G. Cope	Anglo-Saxon Petroleum Co., Ltd.
Tinaru Star	..	GKBL	13.2.57	F. M. Williamson	..	R. E. Davik, G. Abrahamsen, R. Pettersen	E. Bergan	Hector Whaling, Ltd.
Tinto	..	GKYM	14.3.57	S. J. Stark	..	I. Tait, D. McKerron, D. G. McNeil	W. G. Peddie	Blue Star Line, Ltd.
Tongararo	..	GBYT	7.3.57	W. F. Denyer	..	—, Everingham, J. Ledger, J. W. Guiliatt	G. S. Dunn	Ellerman's Wilson Line, Ltd.
Torr Head	..	GLFZ	28.12.56	I. M. Price	..	D. J. Newman, G. D. Hudson, N. M. Parry, J. A. Agnew	N. M. Percy	New Zealand Shipping Co., Ltd.
Tregenna	..	GZPW	30.11.56	S. J. Stark	..	R. A. Maxwell, J. D. Savage, T. A. F. Austin	I. McKinnon	G. Heyn & Sons, Ltd.
Tyleran	..	GBPM	28.12.56	I. M. Price	..	R. C. Powell, E. Stewart, R. B. Cowden	C. Currie	Hain S.S. Co., Ltd.
Tyleran	..	GBPQ	30.11.56	I. M. Price	..	J. Cushion, D. A. Loud, A. W. Orr	G. R. E. Warder	Hain S.S. Co., Ltd.

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS/MANAGERS
<i>Trebyon</i>	GBPP	21.11.56	W. T. Evans	D. K. Dall, A. Downs, A. Kelley	V. Duggan	Hain S.S. Co., Ltd.
<i>Trevorlas</i>	MATL	8.2.57	W. H. Whitaker	R. Jean, J. Evans	K. Murray	Hain S.S. Co., Ltd.
<i>Tribeman</i>	GBNZ	11.9.56	J. F. W. Wallis	A. G. Nicholson, S. Lloyd, W. C. Johnston	J. Watt	T. & J. Harrison, Ltd.
<i>Tribulus</i>	GFJS	23.1.57	J. Carmichael	W. T. Copeland, N. Coull, R. J. Williams	J. McCutcheon	Royal-Saxon Petroleum Co., Ltd.
<i>Tweed</i>	GBRP	15.1.57	G. A. Gibbons	B. E. Crabb, A. Acaon, R. O. Fairbairn	F. H. Robinson	Watts, Watts & Co., Ltd.
<i>Twickenham</i>	GNDC	10.10.56	S. E. Hooper	J. Martin, D. N. Allan, D. Romeril	W. Dewhurst	
<i>Tyrone</i>	GZPZ	25.2.57	J. D. Blake	J. G. C. Campbell, P. T. McPherson, N. Pookitt	L. A. E. Laval	Trinder Anderson & Co.
<i>Umtali</i>	GYWB	23.11.56	F. E. J. O'Hea	G. M. Cozens, M. W. Duncan, V. J. Shanahan	S. Hewitt	Bullard King & Co., Ltd.
<i>Umtata</i>	GDQF	22.1.57	D. L. Weston	J. H. Szablowski, N. J. Parker, P. Austin	J. Molloy	Bullard King & Co., Ltd.
<i>Valleria</i>	MGGD	15.2.57	A. C. Short, O.B.E.	W. G. Todd, G. Bradley, J. S. Palmers	J. Murray	Anglo-Saxon Petroleum Co., Ltd.
<i>Vestra</i>	MNMB	24.10.56	D. S. Archibald	J. T. Sharp, D. S. Archibald, D. C. White	D. C. White	J. T. Salvesen & Co.
<i>Volo</i>	GPCJ	5.9.56	L. R. Stilwell	H. Breiby, A. Robertson, G. Forward	G. Bart	Ellerman's Wilson Line, Ltd.
<i>Volvula</i>	GTYY	5.2.57	J. Nettleship	T. Storey, J. S. Ayres, —, La Marechal, R. Brown	J. McKee	Shell Tanker, Ltd.
<i>Waipawa</i>	GWXQ	4.2.57	A. S. D'Arcy Masters	D. M. Mortimer, D. Edé, J. Clyde, R. Barton	C. Cowen	Shaw, Savill & Albion Co., Ltd.
<i>Wairangi</i>	MATX	26.10.56	J. L. Stobbs, R.D., Lt.-Cdr. R.N.R.	B. A. Hills, R. L. Reid, I. S. M. Condie	G. Adamson	Shaw, Savill & Albion Co., Ltd.
<i>Watvera</i>	GBJB	28.12.56	T. H. Davies	T. Salmon, H. P. M. Lawrence, A. Thompson, E. A. Outen	J. Downie	Shaw, Savill & Albion Co., Ltd.
<i>Wabits Bay</i>	GKBZ	20.3.57	A. Donald, O.B.E.	W. E. N. Gordon, J. Hansen, J. A. R. Longford-Lewis	S. Clatworthy	Sir R. Ropner & Co., Ltd.
<i>Wanstead</i>	GFLS	12.2.57	A. J. Cox	J. Lough, R. H. Hall, —, Solomon, R. Arnott	W. H. Carmichael	Watts, Watts & Co., Ltd.
<i>Warkworth</i>	MALF	2.4.57	N. Thompson, M.B.E.	C. Harron, G. B. Bell, W. Childerstone	F. D. Farthing	Watergate Steam Shipping Co., Ltd.
<i>Wendover</i>	GFML	11.10.56	W. Donald	J. L. Thompson, M. G. King, I. J. Branch	N. E. Fletcher	Watts, Watts & Co., Ltd.
<i>Westmeath</i>	GQGI	25.5.56	T. G. Wilson	D. L. King, V. Cox, J. McWilliams	J. Blake	New Zealand Shipping Co., Ltd.
<i>Winchester Castle</i>	GTPZ	18.3.57	G. W. B. Lloyd	P. C. Kaye, J. Drought, A. P. Rea, A. J. Acutt	E. H. Pitt	Union Castle Mail S.S. Co., Ltd.
<i>Windsor</i>	GPQG	25.2.57	J. A. Tully	J. Shearer, D. C. Hall, J. D. W. Collister	G. Chandler	Watts, Watts & Co., Ltd.
<i>Woodford</i>	GFMM	18.3.57	J. Cormack	J. Lang, D. P. Marshall, J. Timms, A. Ferguson	M. Moore	Watts, Watts & Co., Ltd.
<i>Woolwich</i>	GRWC	17.9.56	D. Cameron	D. Wells, J. Lewis, M. Court	J. E. Miller	Watts, Watts & Co., Ltd.
<i>Worcestershire</i>	GFZM	13.11.56	F. C. Brooks	G. W. Waugh, J. J. Mullins, D. F. T. Downward	W. G. Fletcher	Bibby Bros. & Co.
<i>Yoma</i>	GLPN	7.3.57	I. Laing	D. B. Watt, H. McColl, K. O. Zubrowski	W. Robson	P. Henderson & Co.

Supplementary Ships

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGERS
<i>Alert</i> ..	GCBM	7.5.56	R. H. J. Wallis	R. M. Turnbull, D. M. Curror, G. McLagan	A. Prest	H.M. Postmaster-General
<i>Apollo</i> ..	MSFM	28.12.56	G. V. Barnes	W. Keys, H. G. Mowatt, J. Rich	W. Kays	Bristol Steam Navigation Co., Ltd.
<i>Bellerby</i> ..	MOJF	12.2.57	E. Dunn	— Meakin, B. Ryan, D. B. Miller	D. P. Hulme	Ropner Shipping Co., Ltd.
<i>Blaircova</i> ..	GLLG	24.11.55	J. MacVean	J. E. Halliday, M. Gilmour, A. McAdam	E. Yard	Geo. Nisbet & Co.
<i>Borodino</i> ..	GFST		E. Ford, R.D., R.N.R.	S. Wilkenson, R.D., R.N.R., J. Deheer, R. Whittleton	F. Smith	
<i>British Bugler</i> ..	GKFZ	29.8.56	C. V. Harrison	G. B. Sinclair, K. Jackson	F. Kirk	British Tanker Co., Ltd.
<i>Cape Howe</i> ..	GCYP	22.11.56	A. M. Fraser	J. F. Morton, T. R. Baker, J. C. Carr	R. Mullins	Lyle Shipping Co., Ltd.
<i>Cara</i> ..	GSZJ		A. Mackay	I. Skinner, A. Livingstone, G. Cowan	I. Hart	Glen & Co., Ltd.
<i>Carlo</i> ..	GQKL		H. Whitfield, M.B.E.	R. S. Neesham, D. Brackenbury, P. Ramsay	F. Michalls	Ellerman's Wilson Line, Ltd.
<i>Circasia</i> ..	GZMD	1.1.57	I. McG. Brown	H. M. Keenan, J. I. McGrindle	B. Walford	Anchor Line, Ltd.
<i>Clan Alpine</i> ..	GIFF	21.1.57	T. O. Marr	J. L. Daniel, L. A. Laing, J. Campbell	C. J. Ritchie	Cayzer Irvine & Co., Ltd.
<i>Clan Lamont</i> ..	GITD	27.12.56	J. E. Townrow	— Lokeefe, A. J. Graham, J. N. Peace, M. Swift	R. G. Davies	Cayzer Irvine & Co., Ltd.
<i>Clan MacBrayne</i> ..	MAQA	9.4.54	C. A. Thomas	J. MacNiven, D. M. Geddes, D. Grant	D. Munroe	Cayzer Irvine & Co., Ltd.
<i>Dartmoor</i> ..	GFQT	30.7.56	L. G. Welch	G. C. Laing, A. Coaster, R. J. Phillips	M. Van Schalkwyck	Walter Runciman & Co., Ltd.
<i>Devon City</i> ..	MBKL	6.9.56	J. Sloan	J. B. Cuckow, G. A. Thompson, D. Cobby	E. McGirr	Sir William Reardon Smith & Sons, Ltd.
<i>Eastern City</i> ..	GBRB	1.3.57	I. Williams	T. J. Williams, D. S. Sapp, — Judd	K. Pearson	Sir William Reardon Smith & Sons, Ltd.
<i>Edward Wilshaw</i> ..	MBMP	1.4.57	C. C. Muckleston	A. Miller, W. T. Goodale, G. Proctor	J. M. Wade	Cable & Wireless, Ltd.
<i>Greenbatt</i> ..	MSGG	6.9.56	— Smith	— Taylor, J. C. E. Brown, — Haymal	C. Hans	Newbiggin S.S. Co., Ltd.
<i>Harpaton</i> ..	GFEF	24.7.56	G. Jones	W. R. Vickers, T. S. W. Davies, D. S. Christie	P. F. Spencer	J. & C. Harrison & Co., Ltd.
<i>Hesione</i> ..	GUGJ	26.10.56	L. W. Gibbins	H. Munro, R. Grieve, — Wilson	N. Burnitt	Houston Line (London), Ltd.
<i>Hudson Firth</i> ..	MPCR	18.10.56	J. Plait	I. Cunningham, A. Fordham	J. P. McKernon	Hudson S.S. Co., Ltd.
<i>Hudson Firth</i> ..	GDKM	11.1.57	H. G. Bennett	M. R. Uminski, M. A. Smith, M. L. McNair	D. R. Eddowes	Hudson S.S. Co., Ltd.
<i>Letchnorth</i> ..	MAOV	10.3.55	J. E. S. Newby	K. Brammer, D. V. Duncanson, S. Hardy	S. G. L. Rice	R. S. Dalgleish, Ltd.
<i>Loch Gowan</i> ..	MMJT	10.10.56	E. N. Giller	G. N. Rouse, P. Hawkey, M. H. Hobbs	P. Hemery	Royal Mail Lines, Ltd.
<i>Lingula</i> ..	GKOT	14.2.57	J. L. Williams	R. Shaw, F. R. Christian, M. J. Laws	H. Harrison	Anglo-Saxon Petroleum Co., Ltd.
<i>Maitno</i> ..	GQCQ	20.3.57	R. Cudbertson	L. Gibson, R. W. Martin, P. M. Ogram, P. Tate	G. Gannon	
<i>Marie Louise Mackay</i> ..	GDNP	1.11.55	C. F. Hunter	L. P. Denny, H. Goodbody, W. Nimmo, L. Cook, S. Bailey	E. Mathias	Commercial Cable Co.
<i>Markab</i> ..	GCVT	21.7.55	C. Christensen	M. Rosic, J. Phillis, J. Toet	D. A. Styles	Phocan Ship Agency, Ltd.
<i>Marna</i> ..	MLPK	18.1.57	J. A. McConachie	J. Carnie, W. Morrison	J. Devitt	Chr. Salvesen & Co.
<i>Menastone</i> ..	GUFA	9.4.56	— Sheasby	A. Todd, W. Thomas, P. Sunmore	J. S. Sams	Messrs. Stone & Rolfe, Ltd.
<i>Meta</i> ..	MPWB	26.10.56	A. D. McNab	J. Panton, W. Hett, W. Graham	J. S. Sams	Glen & Co., Ltd.
<i>Milo</i> ..	GQDP	7.2.57	H. E. Lawson	P. J. Wright, B. Middleton	C. Rolfe	Bristol Steam Navigation Co., Ltd.
<i>Mirror</i> ..	GDFL	14.8.56	T. A. Vickers	E. J. Reilly, M. Bonds, C. C. S. Budgen	V. Hatcher	Cable & Wireless, Ltd.
<i>Mulberry Hill</i> ..	MAKQ	20.11.56	S. H. Mallett	D. A. McBain, L. Fraser, B. Wood	R. Rowe	Counties Ship Management Co., Ltd.
<i>Narva</i> ..	GQFP	19.7.56	R. S. McLachlan	A. T. Clark, A. McIntyre, A. Tweddle		Glen & Co., Ltd.

Supplementary Ships—Contd.

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGERS
<i>Nicania</i>	GIGJ	6.1.56	J. Carr	L. F. Money, B. R. Alderton, B. S. Holroyd	C. R. McAnerney	Anglo-Saxon Petroleum Co., Ltd.
<i>Northia</i>	GDOK	3.4.56	A. Mackay	M. A. Cooper, I. G. C. Wildish, J. Dagless	T. M. Sherriff	Anglo-Saxon Petroleum Co., Ltd.
<i>Port Fairy</i>	GSTP	16.2.56	W. M. Clough	D. A. Church, R. C. W. Marr, W. R. C. Petter	E. Loft	Port Line, Ltd.
<i>Rookwood</i>	GPSN	21.3.57	A. Dover	W. G. Dedwith, D. V. Duncanson, B. Taylor	J. Kelleher	Wm. France, Fenwick & Co., Ltd.
<i>Runa</i>	GFSW	28.3.57	R. McNinch	R. Parish, W. Taylor	A. Corless	Glen & Co., Ltd.
<i>Shana</i>	MMGC		J. Loose	K. Wilson, —, Ballantyne	—, Quin	Glen & Co., Ltd.
<i>Table Bay</i>	MFTV	14.1.57	E. B. Murray	D. P. Reid, S. Liddle, C. V. Mackie	S. Stringer	Lyle Shipping Co., Ltd.
<i>Tarantia</i>	GIGS	14.1.57	G. Ramage	T. Cameron, R. Porter, T. Patience	A. McPherson	Anchor Line, Ltd.
<i>Tempo</i>	GKWZ	4.2.57	H. Greewar	R. Price, T. Sistrerson	A. Tadd	Pelton S.S. Co., Ltd.
<i>Thelma</i>	MBKK	23.11.56	T. A. W. Fairweather	J. A. G. McColl, J. D. McIntosh, D. H. Fairweather	L. J. Delany	Glen & Co., Ltd.
<i>Trelisick</i>	GBPR	26.10.56	F. G. Bolton	A. E. Kelley, J. Dabry, B. Davies	J. Weston	Hain S.S. Co., Ltd.
<i>Trevelyan</i>	MATE	19.2.57	H. Gravell	J. L. Hazell, D. V. Tattoo, G. Blight	J. Vaughan	Hain S.S. Co., Ltd.
<i>Travince</i>	MATH	12.11.56	B. George	D. J. Cornish, E. F. Boyd, A. L. Warren	C. D. McCarthy	Hain S.S. Co., Ltd.
<i>Tronida</i>	MM LX	15.10.51	R. J. Sinclair	R. Angus, K. Chow		Chr. Salvesen & Co.
<i>Truro</i>	GJTO	16.8.56	F. Firth	G. H. Potter, J. A. Squire, R. A. Jones	F. Petch	Ellerman's Wilson Line, Ltd.
<i>Tynemouth</i>	MVYV	21.1.57	W. L. Pattison	F. Wright, J. Barrass, J. Ayre	J. Duignan	Burnett S.S. Co., Ltd.
<i>Uganda</i>	GFRQ	9.1.57	D. W. Speirs, R.D., R.N.R.	S. A. Turk, C. K. Taylor, A. T. Tulloch, M. A. Ruddhead	J. H. Soulsby	British India Steam Nav. Co., Ltd.
<i>Warwick Castle</i>	GRRJ	18.2.56	J. D. B. Fisher	D. P. Daley, R. Diggle, P. Pollard	P. Thomas	Union Castle Mail S.S. Co., Ltd.
<i>Yarmouth Trader</i>	GUAP	11.7.56	R. A. Goodings	D. E. Kerrigan, G. G. Callendar		Great Yarmouth Shipping Co., Ltd.

Marid Ships

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

NAME OF VESSEL	CALL SIGN	CAPTAIN	OWNERS/MANAGERS
<i>Actuality</i>	GPPF	D. O'Leary	F. T. Everard & Sons, Ltd.
<i>Aire</i>	MPYL	J. Collier	Associated Humber Lines
<i>Amsterdam</i>	MFBP	C. R. Baxter, D.S.C. ..	British Transport Commission
* <i>Angelo</i>	GQFY	J. K. Marrow	Ellerman's Wilson Line, Ltd.
† <i>Apollo</i>	MSFM	G. V. Barnes	Bristol Steam Navigation Co., Ltd.
<i>Ariosto</i>	GKPW	W. C. Gill	Ellerman's Wilson Line, Ltd.
* <i>Atlantic Coast</i> ..	GWSY	J. O. Rowlands, M.B.E. ..	Coast Lines, Ltd.
<i>Barra Head</i>	MPOZ	D. McDonald	A. F. Henry & MacGregor, Ltd.
* <i>Belvina</i>	MLZF	W. Fisher	London & Edinburgh Shipping Co., Ltd.
<i>Blyth</i>	MPYB	C. B. E. Eaton	Associated Humber Lines
<i>British Coast</i>	GWQX	P. A. Johnson	Coast Lines, Ltd.
* <i>British Scout</i>	GJKD	W. Burford	British Tanker Co., Ltd.
<i>Bury</i>	GRNM	H. Aaron	Associated Humber Lines
<i>Bylands Abbey</i>	GVGK	J. W. Westerdale	Associated Humber Lines
<i>Caledonian Coast</i> ..	GKXF	J. Beckett	Coast Lines, Ltd.
<i>Cambria</i>	GBKT	R. H. Lord, R.D., Lt.-Cdr. R.N.R. ..	British Transport Commission
<i>Cato</i>	GUAK	L. Jenkins	Bristol Steam Navigation Co., Ltd.
<i>Cicero</i>	GRTD	E. Tyler	Ellerman's Wilson Line, Ltd.
<i>Clupea</i>	GOAJ	J. Jappy	Fishery Board for Scotland
<i>Corfen</i>	GDJX	A. Metcalf	Wm. Cory & Son, Ltd.
<i>Corfleet</i>	GWTD	A. G. Waller	Wm. Cory & Son, Ltd.
<i>Cormain</i>	MAHT	J. T. Collin	Wm. Cory & Son, Ltd.
<i>Cormead</i>	GDBX	E. Allen	Wm. Cory & Son, Ltd.
<i>Cormist</i>	GDVT	R. J. Barrow	Wm. Cory & Son, Ltd.
<i>Cormoat</i>	GLKV	R. B. Armstrong	Wm. Cory & Son, Ltd.
<i>Cormull</i>	MAHS	F. Hansen	Wm. Cory & Son, Ltd.
<i>Corncrake</i>	MJKL	J. M. B. Clark	Moss Hutchison Line, Ltd.
<i>Crane</i>	MMCS	—, Clarke	Moss Hutchison Line, Ltd.
<i>Don</i>	MNCD	J. W. Laverack	Associated Humber Lines
<i>Drake</i>	MMYC	W. Lockhart	General Steam Navigation Co., Ltd.
* <i>Dryburg</i>	GNVD	G. Simpson	George Gibson & Co., Ltd.
<i>Duke of Argyll</i>	GNVX	W. N. Greenwood	British Transport Commission
<i>Duke of Lancaster</i> ..	GCPQ	V. Irwin, R.D., Cdr. R.N.R. ..	British Transport Commission
<i>Duke of Rothesay</i> ..	GVJB	H. Thompson	British Transport Commission
<i>Empire Gaelic</i>	MAVR	T. Morgan	Atlantic Steam Navigation Co., Ltd.
<i>Explorer</i>	MRCZ	.. ..	Scottish Home Department
<i>Falcon</i>	MNXL	S. W. Develin	General Steam Navigation Co., Ltd.
<i>Fountains Abbey</i>	MSGT	F. Wooler	Associated Humber Lines
<i>Fulham X</i>	MADV	D. Battle	Central Electricity Authority
<i>Golden Dawn</i>	MLZV	A. Adamson, M.B.E., R.D., Sk.-Lt. R.N.R. ..	A. Adamson, M.B.E.
* <i>Gothland</i>	MJMS	H. Anderson	Currie Line, Ltd.
<i>Great Western</i>	GWRD	H. H. Cooney	British Transport Commission
<i>Grebe</i>	MAEY	J. S. Lickis	General Steam Navigation Co., Ltd.
<i>Greyfriars</i>	MLQN	D. Hunt	E. R. Newbigin, Ltd.
<i>Guernsey Coast</i> .. ..	.. ..	F. C. Lucas	Coast Lines, Ltd.
<i>Hardrian Coast</i>	MANT	W. Wyneas	Coast Lines, Ltd.
<i>Harrogate</i>	MNDB	J. M. Walters	Associated Humber Lines
<i>Hebble</i>	MLZS	H. W. Crabtree	British Transport Commission
<i>Hibernia</i>	MBMT	E. A. Horspool	British Transport Commission
<i>Hibernian Coast</i>	GKXC	S. Mearns	Coast Lines, Ltd.
<i>Iberian Coast</i>	GFDL	D. Collins	Tyne Tees Shipping Co., Ltd.
<i>Isle of Guernsey</i>	GQYJ	C. E. Hatchley	British Transport Commission
<i>Isle of Jersey</i>	GRBQ	R. A. Large	British Transport Commission
<i>Isle of Sark</i>	GTSL	H. G. Le Huquet	British Transport Commission
<i>Jersey Coast</i>	MKDL	H. G. Keilit	Coast Lines, Ltd.
* <i>Jura</i>	MARU	L. J. Blanche	Admiral Shipping Co., Ltd.
<i>Kirkham Abbey</i>	MWRT	W. H. Fox	Associated Humber Lines
<i>Lairds Crest</i>	GYZP	D. McCormace	Burns Laird Line, Ltd.
<i>Lairds Wood</i>	GYZQ	H. Davidson	Burns Laird Line, Ltd.
<i>Loch Seaforth</i> .. ..	.. ..	J. Smith	David MacBrayne, Ltd.
<i>London Merchant</i>	MBRZ	W. Fisher	London Scottish Lines, Ltd.
<i>Macclesfield</i>	MFDV	H. Boyes	British Transport Commission
<i>Maidstone</i>	MNQV	G. R. Gill	British Transport Commission
<i>Marine Craft Unit (R.A.F.) No. 1102</i>	.. ..	J. R. Radley	Royal Air Force
* <i>Melrose</i>	MCFD	J. Murray	Geo. Gibson & Co., Ltd.
<i>Melrose Abbey</i>	GSYW	J. Blackburn	Associated Humber Lines
† <i>Meta</i>	MPWB	A. D. McNab	Clydesdale Shipowners Co., Ltd.
† <i>Milo</i>	GQDP	H. E. Lawson	Bristol Steam Navigation Co., Ltd.
<i>Minna</i>	GKPS	T. Mather	Fishery Board for Scotland
† <i>Narva</i>	GQFP	J. McLaughlan	Glen & Co. (Scottish Navigation Co., Ltd.)
* <i>Netherlands Coast</i> ..	MQLK	E. G. Fisher	Tyne Tees Shipping Co., Ltd.
<i>Ocean Coast</i>	GYMP	J. D. Mercer	Coast Lines, Ltd.
* <i>Pluto</i>	GUAB	A. F. Dudgeon	Bristol Steam Navigation Co., Ltd.
<i>Peregrine</i>	GIGM	A. E. Guest	General Steam Navigation Co., Ltd.
<i>Princess Maud</i>	GWRT	E. A. Bradshaw	British Transport Commission
* <i>Rattray Head</i>	GCBR	G. Gay	A. F. Henry & McGregor, Ltd.
<i>Ringdove</i>	GRKK	E. C. Painter, D.S.C. ..	General Steam Navigation Co., Ltd.

Marid Ships—contd.

NAME OF VESSEL	CALL SIGN	CAPTAIN	OWNERS/MANAGERS
*Rollo	GSFG	S. Stakes	Ellerman's Wilson Line, Ltd.
Runa	GFSW	J. Gilfillan	Clydesdale Shipowners Co., Ltd.
St. Clement	GRGM	L. Mainland	N. of Scotland & Ork. & Shet. S.N. Co., Ltd.
St. Helier	GLBT	G. Cartwright	British Transport Commission
St. Julien	GLBV	B. Newton	British Transport Commission
St. Magnus	GFYK	W. McKay	N. of Scotland & Ork. & Shet. S.N. Co., Ltd.
St. Niman	GJBB	A. M. Dundas	N. of Scotland & Ork. & Shet. S.N. Co., Ltd.
Selby	MLFT	F. Drury	Associated Humber Lines
Silvio	GSVC	W. White	Ellerman's Wilson Line, Ltd.
Slieve Bawn	MQCC	A. Robertson	British Transport Commission
Slieve Bearnagh	MLNL	E. H. Ashton	British Transport Commission
Slieve Bloom	MQDD	I. Griffiths	British Transport Commission
Slieve League	MQCM	R. Roberts	British Transport Commission
Slieve More	MQBM	G. J. Butterworth	British Railways (L.M. Region)
Southern Coast	MASD	D. Mercer	Coast Lines, Ltd.
Suffolk Coast	MMVC	J. Coxon	Tyne Tees Shipping Co., Ltd.
Teano	GSTY	D. Stokes	Ellerman's Wilson Line, Ltd.
†Thelma	MBKX	T. Fairweather	Glen & Co., Ltd.
Vienna	G'TBR	A. Sutton	British Railways (Eastern Region)
*Whitby Abbey	MSGV	H. M. Collier	Associated Humber Lines
†Yarmouth Trader	GUAP	R. A. Goodings	Great Yarmouth Shipping Co., Ltd.

* These ships also send in non-instrumental weather messages when in the North Sea.
† Ships also on the supplementary list.

Trawlers and North Sea Traders

The following is a list of trawlers and North Sea traders voluntarily observing and reporting those elements of the weather which do not entail the use of any meteorological instruments.

NAME OF SHIP	CALL SIGN	SKIPPER	OWNERS/MANAGERS
Trawlers:			
Afridi	MQKL	D. Roberts	Derwent Trawlers, Ltd.
Athenian	GFWY	L. Coultas	Onward Steam Fishing Co., Ltd.
Banquo	MSWY	W. Moon	Hellyer Bros., Ltd.
Benvolio	MDPD	G. Honhold	Northern Fishing Co.
Bradman	GMCC	A. Phillipson	Crampin Steam Fishing Co., Ltd.
Ernest Holt (Research Vessel)	GFXD	H. J. Aldiss, R.D., Lt.- Cdr. R.N.R. (Ret'd.), Master	Ministry of Agriculture and Fisheries
Fezenta	GLGB	J. T. Cod	Onward Steam Fishing Co., Ltd.
Grimsby Town	GQML	W. Hardie	Consolidated Fisheries, Ltd.
Hargood	MGKK	A. Whittlelon	Derwent Trawlers, Ltd.
Imperialist	GRGJ	E. Fieldsend	Northern Fishing Co.
James Barrie	GBJF	B. Stipetic	Newington Steam Trawlers Co., Ltd.
Kingston Emerald	MBSM	S. Duffield	Kingston Steam Trawlers Co., Ltd.
Lancer	GCAC	J. M. Wright	Loyal Steam Fishing Co., Ltd.
Loch Levan	GCCX	W. Parkinson	Loch Fishing Co., Ltd.
Loch Oskraig	GZQX	G. Gaff	Loch Fishing Co., Ltd.
Lord Cunningham	GBKD	B. Abbey	Lord Line, Ltd.
Macedonian	MGFC	G. Ward	Dominion Steam Fishing Co., Ltd.
Northern Duke	GYYP	J. Green	Northern Trawlers, Ltd.
Northern Queen	GGJN	R. Blyth	Northern Trawlers, Ltd.
Northern Sceptre	MQMT	T. Booth	Northern Trawlers, Ltd.
Northern Sea	GKKR	W. Barrell	Northern Trawlers, Ltd.
Northern Wave	GYZC	G. Whitecombe	Northern Trawlers, Ltd.
Prince Philip	MBLD	N. Rogers	St. Christopher Steam Fishing Co., Ltd.
St. Alcuin	MGCW	G. Argument	Thomas Hamling & Co., Ltd.
St. Amant	GFVD	A. Cowling	Thomas Hamling & Co., Ltd.
St. Apollo	GBBZ	J. Myers	Thomas Hamling & Co., Ltd.
St. Britwin	MFJX	J. Gibson	Thomas Hamling & Co., Ltd.
St. Elstan	GDDL	F. Gray	Thomas Hamling & Co., Ltd.
St. Keverne	GMDR	J. Dobson	Thomas Hamling & Co., Ltd.
St. Nectan	GZJY	A. Salter	Thomas Hamling & Co., Ltd.
St. Wistan	GDDK	T. Howe	Thomas Hamling & Co., Ltd.
Suberna	GZNJ	J. W. Tomlinson	Lionel C. Tomlinson
Sardinian	MFZW	C. Coultas	Sir Thomas Robinson & Son, Ltd.
Serron	GQRX	H. Hall	Standard Steam Fishing Co., Ltd.
Stella Antares	GKCD	B. Stainforth	Charston Smith Trawlers, Ltd.
Stella Aquila	MWMZ	G. Weir	Charston Smith Trawlers, Ltd.
Stella Canopus	GKQR	P. Taylor	Charston Smith Trawlers, Ltd.
Stella Polaris	MAWW	J. Kersey	Charston Smith Trawlers, Ltd.
Vanessa	GPMN	T. Fall	Atlas Steamship Co., Ltd.
Yardley	GJYT	J. C. Evans	Crampin Steam Fishing Co., Ltd.
North Sea traders:			
Electra	MRYX	A. L. Cook	Cable & Wireless, Ltd.
Folda	MLFR	A. Goodlad	Chr. Salvesen & Co.

Light-vessels

The following light-vessels voluntarily observe, record and/or report from coastal waters of Great Britain.

NAME OF VESSEL	MASTERS
<i>Bar</i>	E. E. Abbott
<i>Dowsing</i>	W. M. Ling
<i>East Goodwin</i>	—, Nixion
<i>Gallopier</i>	E. G. Mullitt
<i>Humber</i>	—, Fuller
<i>Newarp</i>	B. Hadden
<i>Royal Sovereign</i>	L. P. Dawson, S. G. Sharnan
<i>St. Gowan</i>	H. G. T. Morgan, V. J. Lake
<i>Seven Stones</i>	D. Appleby, J. H. Cooper
<i>Shambles</i>	C. N. Duff, A. C. Edward
<i>Shipwash</i>	J. L. Goldsmith, G. Broom
<i>Skulmartin</i>	D. Hawkins, J. O'Neill
<i>Smith's Knoll</i>	J. A. R. Reeves

Training Establishments

The following is a list of Training Establishments which submit logbooks, kept by the cadets under training, to the Marine Division.

ESTABLISHMENT	CAPTAIN/SUPERINTENDENT	LAST RETURN RECEIVED
<i>Conway, H.M.S.</i>	E. Hewitt, R.D., Capt. R.N.R.	7.1.57
<i>Pangbourne Nautical College</i>	H. C. Skinner, O.B.E., Cdr. R.N. (Retd.)	26.3.57
<i>Warsash, School of Navigation</i>	G. W. Wakeford, Capt.	11.4.57
<i>Worcester, H.M.S.</i>	G. C. Steele, V.C., Cdr. R.N. (Retd.)	14.1.57

AUSTRALIA

The following is a list of observing ships voluntarily co-operating with the Australian Meteorological Branch.

NAME OF VESSEL	CALL SIGN	OWNERS
Selected Ships:		
<i>Aros</i>	SMPT	Australia West Pacific Line
<i>Asphalion</i>	GZPZ	A. Holt & Co.
<i>Bulolo</i>	VJPD	Burns Philip & Co.
<i>Canara</i>	MAGZ	British India Steam Navigation Co.
<i>Charon</i>	GZJQ	A. Holt & Co.
<i>Chupra</i>	GDZV	British India Steam Navigation Co.
<i>Citos</i>	SEDN	Australia-West Pacific Line
<i>Delos</i>	SIGA	Australia-West Pacific Line
<i>Duntroon</i>	VLFB	Melbourne Steamship Co., Ltd.
<i>Gorgon</i>	MBKC	A. Holt & Co.
<i>Idomeneus</i>	GKYZ	A. Holt & Co.
<i>Koolinda</i>	VJFC	Western Australian State Steamships
<i>Koorawatha</i>	VLCW	McIlwraith & McEachern Ltd.
<i>Kooringa</i>	VLKR	McIlwraith & McEachern, Ltd.
<i>Malaita</i>	VJYY	Burns Philip & Co.
<i>Malekula</i>	VLWB	Burns Philip & Co.
<i>Milos</i>	SIVA	Australia-West Pacific Line
<i>Nellore</i>	GBLZ	Eastern & Australian Steamship Co., Ltd.
<i>Orestes</i>	GFPQ	A. Holt & Co.
<i>Port Melbourne</i>	GTFF	Port Line, Ltd.
<i>Romanic</i>	GSLS	Bolton Steam Shipping Co., Ltd.
<i>Triadic</i>	GDNM	British Phosphate Commissioners
<i>Trienza</i>	GJJZ	British Phosphate Commissioners
<i>Triona</i>	GDFZ	British Phosphate Commissioners
<i>Wanganella</i>	VJPQ	Huddart Parker & Co., Ltd.
<i>Westralia</i>	VJNJ	Huddart Parker & Co., Ltd.
Supplementary Ships:		
<i>Daylesford</i>	VJQM	Western Australian State Steamships
<i>Dorrigo</i>	VMWB	Western Australian State Steamships
<i>Dulverton</i>	VJVI	Western Australian State Steamships
<i>Kabbarli</i>	VLXV	Western Australian State Steamships
<i>Koojarra</i>	VMXK	Western Australian State Steamships
<i>Kybra</i>	VJFN	Western Australian State Steamships

INDIA

The following is a list of observing ships voluntarily co-operating with the India Meteorological Department.

NAME OF VESSEL	CALL SIGN	OWNERS
Selected Ships:		
<i>Alavi</i>	VWBL	The Mogul Line, Ltd.
<i>Bahadur</i>	MAVH	Asiatic Steam Navigation Co., Ltd.
<i>Dara</i>	GD TT	British India Steam Navigation Co., Ltd.
<i>Daressa</i>	GFSM	British India Steam Navigation Co., Ltd.
<i>Dumra</i>	GMLM	British India Steam Navigation Co., Ltd.
<i>Dwarka</i>	GCKS	British India Steam Navigation Co., Ltd.
<i>Havildar</i>	GLVK	Asiatic Steam Navigation Co., Ltd.
<i>Indian Exporter</i>	VWVW	India Steamship Co., Ltd.
<i>Indian Merchant</i>	VWVR	India Steamship Co., Ltd.
<i>Indian Pioneer</i>	VWVS	India Steamship Co., Ltd.
<i>Indian Reliance</i>	VWCJ	India Steamship Co., Ltd.
<i>Indian Trader</i>	VWVT	India Steamship Co., Ltd.
<i>Islami</i>	VWJC	The Mogul Line, Ltd.
<i>Jaladuta</i>	VWDJ	Scindia Steam Navigation Co., Ltd.
<i>Jalaganga</i>	VWJG	Scindia Steam Navigation Co., Ltd.
<i>Jalaketu</i>	VWWC	Scindia Steam Navigation Co., Ltd.
<i>Jalakrishna</i>	VWJM	Scindia Steam Navigation Co., Ltd.
<i>Jalamanjari</i>	VWWY	Scindia Steam Navigation Co., Ltd.
<i>Jalaprabhash</i>	VWYD	Scindia Steam Navigation Co., Ltd.
<i>Jalayamuna</i>	VWJJ	Scindia Steam Navigation Co., Ltd.
<i>Jaljawahar</i>	VWDD	Scindia Steam Navigation Co., Ltd.
<i>Jehangir</i>	VWBJ	The Mogul Line, Ltd.
<i>Kampala</i>	GCKX	British India Steam Navigation Co., Ltd.
<i>Karanja</i>	MACS	British India Steam Navigation Co., Ltd.
<i>Mahadevi</i>	GCRN	Asiatic Steam Navigation Co., Ltd.
<i>Mohammedi</i>	GCBS	The Mogul Line, Ltd.
<i>Mozaffari</i>	MACV	The Mogul Line, Ltd.
<i>Nadir</i>	GCDV	Asiatic Steam Navigation Co., Ltd.
<i>Nicobar</i>	VWJL	The Eastern Shipping Corporation
<i>Nurani</i>	MAPS	Asiatic Steam Navigation Co., Ltd.
<i>Rajula</i>	GMSN	British India Steam Navigation Co., Ltd.
<i>Risaldar</i>	GLVL	Asiatic Steam Navigation Co., Ltd.
<i>Santhia</i>	GFSN	British India Steam Navigation Co., Ltd.
<i>Shahjehan</i>	GPVX	Asiatic Steam Navigation Co., Ltd.
<i>Sirdhana</i>	GCLD	British India Steam Navigation Co., Ltd.
<i>State of Bombay</i>	VWWP	The Eastern Shipping Corporation
<i>State of Madras</i>	VWWN	The Eastern Shipping Corporation
<i>State of Saurashtra</i>	VWXY	The Eastern Shipping Corporation
<i>Subadar</i>	MADK	Asiatic Steam Navigation Co., Ltd.
<i>Umara</i>	GMNS	British India Steam Navigation Co., Ltd.
Supplementary Ships:		
<i>Amra</i>	GNNX	British India Steam Navigation Co., Ltd.
<i>Bharatbhushan</i>	VWCY	The Bharat Line, Ltd.
<i>Bharatmitra</i>	VWYX	The Bharat Line, Ltd.
<i>Bharatraja</i>	VWXL	The Bharat Line, Ltd.
<i>Bharatrani</i>	VWXM	The Bharat Line, Ltd.
<i>Bharatratna</i>	VWZX	Bharat Line, Ltd.
<i>Bharatveer</i>	VWZY	Bharat Line, Ltd.
<i>Bharatvijaya</i>	VWZK	Bharat Line, Ltd.
<i>Indian Commerce</i>	VWZW	India Steamship Co., Ltd.
<i>Indian Renown</i>	VWCF	India Steamship Co., Ltd.
<i>Indian Resolve</i>	VWDN	India Steamship Co., Ltd.
<i>Indian Resource</i>	VWDK	India Steamship Co., Ltd.
<i>Itaura</i>	GMWW	British India Steam Navigation Co., Ltd.
<i>Jag Ganga</i>	VWYV	Great Eastern Shipping Co., Ltd.
<i>Jag Rani</i>	VWZF	Great Eastern Shipping Co., Ltd.
<i>Jag Tara</i>	LKJR	Great Eastern Shipping Co., Ltd.
<i>Jag Vijay</i>	VWWT	Great Eastern Shipping Co., Ltd.
<i>Jalazad</i>	VWDF	Scindia Steam Navigation Co., Ltd.
<i>Jalakendra</i>	VWWB	Scindia Steam Navigation Co., Ltd.
<i>Jalamayur</i>	VWWX	Scindia Steam Navigation Co., Ltd.
<i>Jalamohan</i>	VWCX	Scindia Steam Navigation Co., Ltd.
<i>Jalapadma</i>	VWYN	Scindia Steam Navigation Co., Ltd.
<i>Jalaprabha</i>	VWXS	Scindia Steam Navigation Co., Ltd.
<i>Jalaputra</i>	VWBN	Scindia Steam Navigation Co., Ltd.
<i>Jalarajendra</i>	VWYP	Scindia Steam Navigation Co., Ltd.
<i>Jalvallah</i>	VWYM	Scindia Steam Navigation Co., Ltd.
<i>Jalavihar</i>	VWBQ	Scindia Steam Navigation Co., Ltd.
<i>Jalavijaya</i>	VWBR	Scindia Steam Navigation Co., Ltd.
<i>Jalavishnu</i>	VWBS	Scindia Steam Navigation Co., Ltd.
<i>Jalausha</i>	VWWV	Scindia Steam Navigation Co., Ltd.
<i>Malika</i>	GCSK	Asiatic Steam Navigation Co., Ltd.
<i>Rizwani</i>	VWBF	The Mogul Line, Ltd.
<i>Saudi</i>	GVKL	The Mogul Line, Ltd.
<i>State of Andhra</i>	VWBD	Eastern Shipping Corporation
<i>State of Travancore-Cochin</i>	VW BX	Eastern Shipping Corporation

HONG KONG

NAME OF VESSEL	CALL SIGN	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS AND MANAGERS
Anking	MLLJ	G. T. M. Ramsay	T. A. C. Taylor, W. Cooper, B. F. Commercial	Chin Fook On	China Navigation Co., Ltd.
Anshan	GMFM	A. Naismith	L. J. James, R. A. Elder, K. D. Johnson	Wu P. Chi Siang	China Navigation Co., Ltd.
Belinda	VRPV	A. H. Bathurst	J. W. Coultas, S. M. Cheng, S. Luk	K. F. Chan	Shun Cheong Steam Navigation Co., Ltd.
Changsha	MLLK	E. Bruce	D. L. Wilson, R. J. Carson, D. Lyon	U. In San	China Navigation Co., Ltd.
Changtu	VPFK	E. B. Beeham	J. A. Doyle, T. I. Robertson, F. Leechman	F. Secretan	China Navigation Co., Ltd.
Changtu	MTWN	C. A. N. Baker	J. R. Brett, J. Kieley, J. M. Crockett	Wai Pun Un	China Navigation Co., Ltd.
Choy Sang	VRKQ	J. H. Thomas	T. H. Nichols, I. D. Patterson, P. Ferrar	D. B. Cunningham	Indo-China Steam Navigation Co., Ltd.
Chungking	GTCN	H. Pilling	L. L. Watson, B. Ginley, R. Sanders	Ng Pui Chuen	China Navigation Co., Ltd.
Eastern Argosy	ZCUG	H. J. Cairns	J. P. B. Stormont, R. N. Maund, R. C. Hoggard		
Eastern Glory	VRLL	W. T. Rochester	J. G. Perrin, G. C. Taylor, D. J. Hooper	H. E. Tucker	Indo-China Steam Navigation Co., Ltd.
Eastern Muse	ZCSF	F. H. Main	G. Kinley, M. H. Major, G. A. Angus	F. J. Ross	Indo-China Steam Navigation Co., Ltd.
Eastern Queen	VRML	E. J. Thomson	M. J. Pope, J. W. Nugent, R. King	J. C. Middleton	Indo-China Steam Navigation Co., Ltd.
Eastern Saga	VRKK	D. G. R. Kinnear	C. Preston, D. McCrudden, R. E. Strange	R. O. Smith	Indo-China Steam Navigation Co., Ltd.
Eastern Star	GMRQ	S. Schofield	R. K. Learoyd, A. B. Waller, J. W. Kempster	W. C. Walker	Indo-China Steam Navigation Co., Ltd.
Elbrenon	HORM	W. E. Roberts	Kuo Mou Lai, Chen Shyue Yeng	A. C. Martin	Indo-China Steam Navigation Co., Ltd.
Elisbeth	VRJL	J. D. Chapman	J. Allan, W. L. Auyoung	Chan Yu Tang	Tradeships, Ltd.
Fengting	GGQY	R. C. W. Gorman	J. W. G. Wilby, R. G. W. MacAlister, G. Burgum	C. M. Tsang	Shun Cheong Steam Navigation Co., Ltd.
Fengtien	GDVX	B. McLennan	J. M. Parker, P. W. Campbell, S. D. Hwang	Tsang Pui Leung	China Navigation Co., Ltd.
Foochow	GZPD	V. R. Woolfe	F. Cunningham, B. J. Williams, C. Y. Zia	Tang Yuen	China Navigation Co., Ltd.
Fubien	GBQZ	G. P. Cope	A. H. McAuley, Y. T. Lee, C. Tee	Wan Siu Hung	China Navigation Co., Ltd.
Furing	GGSB	A. V. Harrison	O. R. Jones, N. B. Manning, Khin Hla	J. P. Asome	China Navigation Co., Ltd.
Hai Hing	LKFD	G. Hamre	E. Saltrvold, P. B. Halten, K. Amundsen	Choi Pong Cheung	China Navigation Co., Ltd.
Hai Lee	LIVC	T. Thorkildsen	A. Skjorvestad, E. O. Kvalheim, J. Evensen	Yeuk Chung	Thoresen & Co., Ltd.
Hai Meng	LNKX	J. Eide	A. Overland, F. Pettersen, T. Næss	Wuie Iu Chan	Thoresen & Co., Ltd.
Hang Sang	VRKR	N. H. King	J. Parish, J. E. Hanbridge, R. P. Fountain	K. T. Chan	Thoresen & Co., Ltd.
Hanyang	GTTY	J. W. Evans	A. Bartley, P. A. Blaney, C. To	R. Prosser	Indo-China Steam Navigation Co., Ltd.
Henrich	OXRE	U. Bahnsen	F. Fallesen, W. Kronenbitter, E. Anderson	Yeung Wai Chiu	China Navigation Co., Ltd.
Hermelin	LACF	N. Soelberg	O. H. Andersen, P. I. Boe, F. Rosendahl	Y. F. Ip	Jebsen & Co.
Hernod	LAPM	E. Nordendal	H. Yndestad, B. Aresvik, S. Hostad	T. K. Chiu	Thoresen & Co., Ltd.
Helios	LKIZ	O. Osterberg	M. Sandvik, P. Pedersen, P. Finne	K. Y. Lai	Thoresen & Co., Ltd.
Henrik	LKTL	H. Kystvaag	A. Lerstang, O. Johansen	P. Poon	Thoresen & Co., Ltd.
Hervar	LAPL	H. Andersen	R. Starpnes, K. Jacobsen, R. Farstad	W. K. Fung	Thoresen & Co., Ltd.
Hew Sang	VRKV	W. E. Reeve	P. J. Sullivan, B. O. Jensen, G. G. Mackay	S. I. V. Yarrow	Indo-China Steam Navigation Co., Ltd.
Hin Sang	VRKL	J. F. G. Fotheringham	P. Bush, W. M. Pearson, N. J. Wilson	Luk U. Cheong	Indo-China Steam Navigation Co., Ltd.
Hoi Hoi	LNXE	B. Maeland	M. Aarland, L. Drange, H. Pedersen	H. Fastingsen	Karsten Larssen & Co. (Hong Kong), Ltd.
Hoi Wong	LNQL	M. Bjerkenes	R. Okland, O. Espeeth, K. Hennnes	E. Moller	Karsten Larssen & Co. (Hong Kong), Ltd.
Hoi Ying	LLUT	K. Munkejord	J. Ekrene, R. Lien, K. Andersen	L. Andersson	Karsten Larssen & Co. (Hong Kong), Ltd.
Hong Kong Trader	ZCKN	A. L. R. Marchant	Ko Keng Jen, Zee Chia Gee, Fung Bui	Wen Wing Hoo	Great Southern Steamship Co., Ltd.
Hop Sang	VPBP	T. C. W. Marr	W. D. Skidmore, E. E. Ewbank, J. Chisholm	D. Taylor	Indo-China Steam Navigation Co., Ltd.
Ho Sang	VRGJ	E. M. Norman	A. C. Bromfield, J. A. Cant, G. A. Milward	R. H. Bullers	Indo-China Steam Navigation Co., Ltd.
Hunan	GPQL	D. W. R. Gash	D. Green, D. M. Clift, W. Lee	Lo Kin Chek	China Navigation Co., Ltd.
Hupoh	GWRN	F. Kelly	K. A. Page, M. W. Lewis, H. F. Ho	Tsang Kau	China Navigation Co., Ltd.
Jacob Jebsen	OYJO	R. A. D. Nielsen	G. Andersen, F. Kopp, T. M. Hansen	Leung Chu Yung	Jebsen & Co.
Lao	SKRT	S. Ostling	Alex. R. Erickson, Per O. Cranqvist, Ivar Charles Blomqvist	P. R. G. Wengelin	Everett Steamship Corporation

<i>Lok Sang</i>	..	VRJN	R. G. Stanton	M. J. Crichton, R. Beedie, L. Kirk ..	H. Burgoyne ..	Indo-China Steam Navigation Co., Ltd.
<i>Mai Hock</i>	..	LJEU	O. Antonsen	G. B. Putt, Lam Hoi, Chung Cheuk ..	Hung San ..	Karsten Larsen & Co. (Hong Kong), Ltd.
<i>Ocean Trader</i>	..	ZCKH	J. L. Raines	G. E. Bennett, N. C. Pearson, R. A. Button ..	Lam Bun ..	Great Southern Steamship Co., Ltd.
<i>Pakhot</i>	..	GTTK	J. W. E. Warrior	G. E. Lingard, I. F. Lee, S. C. Tsang ..	Leung Man Hin ..	China Navigation Co., Ltd.
<i>Poyang</i>	..	GTFP	R. E. Selwyn-Jones	L. Fagerland, N. Nilzen, O. Gjerd ..	Lok Kow Wei ..	China Navigation Co., Ltd.
<i>Produce</i>	..	LIPG	L. Hetland	D. M. Gill, H. L. Thein, A. M. Barker ..	D. Dowie ..	Karsten Larsen & Co. (Hong Kong), Ltd.
<i>Sangola</i>	..	GCLB	W. E. Davies	S. H. Damp, M. D. O'Keefe, M. D. ..	Lai Mou Wah ..	British India Steam Navigation Co., Ltd.
<i>Shansi</i>	..	GTQP	W. J. Bunney	Burbidge ..	Kwan Hok Kwan ..	China Navigation Co., Ltd.
<i>Sinkiang</i>	..	GNQW	F. Hindle	D. A. Hutchinson, J. B. Aldiss, G. Chell ..	Leung Kau ..	China Navigation Co., Ltd.
<i>Soachow</i>	..	GTWS	A. Watson	A. W. K. Prosser, J. M. Innes, A. T. Tugwell ..	B. A. I. Olsson ..	Everett Steamship Corporation
<i>Star Alcyone</i>	..	HPUU	W. S. T. Rasmusson	K. G. T. Larsson, P. E. A. Rindberg, E. N. ..	P. G. Nilsson ..	Everett Steamship Corporation
<i>Star Betelgeuse</i>	..	HOFI	D. Hulthen	O. C. G. Warfvinge, S. H. Soderlind, K. ..	Li San Kau ..	China Navigation Co., Ltd.
<i>Szechuen</i>	..	GKWJ	E. H. Histed	G. Krastins ..	K. Y. Pun ..	Shun Cheong Steam Navigation Co., Ltd.
<i>Tai Chung Shan</i>	..	VRGX	D. O. Conway	G. Baxter, D. G. Langdon, C. J. Wong ..	R. P. Emery ..	China Navigation Co., Ltd.
<i>Tai Ping</i>	..	VPFQ	N. L. Hall	H. C. N. Hyde, M. L. Shi, C. L. Ho ..	K. Y. Lam ..	Shun Cheong Steam Navigation Co., Ltd.
<i>Tai Poo An</i>	..	ZCSG	E. C. Thomson	R. A. Smith, M. J. McCabe, G. J. James ..	K. C. Yip ..	Shun Cheong Steam Navigation Co., Ltd.
<i>Tai Poo Sek</i>	..	ZCKP	E. M. L. Merrett	N. B. Hall, H. K. Fung, C. M. Lee ..	..	China Navigation Co., Ltd.
<i>Taiyuan</i>	..	MMLF	Y. N. Campbell	W. Davison, Y. S. Lee, W. Lau ..	..	China Navigation Co., Ltd.
<i>Tak Sang</i>	..	VRKN	G. P. Parish	J. F. O'Connor, J. M. K. Kelly, K. H. ..	..	China Navigation Co., Ltd.
<i>Thai</i>	..	SLWT	A. G. A. Heinze	Netleship ..	..	Indo-China Steam Navigation Co., Ltd.
<i>Yachow</i>	..	GWQB	W. Pollock	S. R. Bridgeford, A. W. Lloyd-Taylor, D. E. ..	..	Everett Steamship Corporation
<i>Yunnan</i>	..	GWXP	A. J. Keddie	G. H. Drake, T. V. Hedendint, B. I. Mansen ..	..	China Navigation Co., Ltd.
	..			G. Gilroy, J. C. Mark, S. M. Ho ..	..	China Navigation Co., Ltd.
	..			G. W. Bryant, G. Cornforth, P. S. C. Yang ..	..	China Navigation Co., Ltd.

MALAYA

NAME OF VESSEL	CALL SIGN	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS AND MANAGERS
<i>Bentong</i>	ZBNF	A. Laythorpe	F. H. Roe ..	K. P. Quinn ..	Straits Steamship Co., Ltd.
<i>Bemeg</i>	GMWB	R. L. Bruce	J. Adamson ..	S. G. Thomson ..	Ben Line Steamers, Ltd.
<i>Bidor</i>	ZBBZ	F. T. Callister	B. J. Roberts ..	F. J. Menezes ..	Straits Steamship Co., Ltd.
<i>Darvel</i>	VPOC	A. R. Pearson	R. G. Mallet ..	A. T. Das ..	Straits Steamship Co., Ltd.
<i>Islander</i>	VSPS	P. B. Bruce	A. H. Spears ..	P. L. Long ..	Houstead & Co., Ltd.
<i>Kah Poh</i>	ZBBJ	J. S. Robertson	J. S. Robertson ..	..	Ho Chiang Shipping Co., Ltd.
<i>Katang</i>	VPOD	M. S. Wright	C. A. Church ..	P. V. Abrahams ..	Straits Steamship Co., Ltd.
<i>Kampar</i>	ZBNG	G. H. Brown	J. H. G. Tapscott ..	A. E. Engineer ..	Straits Steamship Co., Ltd.
<i>Katong</i>	ZBNR	R. C. Liddle	A. M. Hutton ..	B. G. Major ..	Straits Steamship Co., Ltd.
<i>Kimanis</i>	VSND	G. L. Brown	J. S. Armitage, B. F. Rehse ..	D. A. E. Goodland, Koh Chwee Seng ..	Straits Steamship Co., Ltd.
<i>Kinabalu</i>	MGDC	I. Berry	P. N. Hicks, H. P. Davies ..	M. J. Fernandez ..	Straits Steamship Co., Ltd.
<i>Larut</i>	VPKO	R. C. Barker	V. W. Pinnington ..	P. A. Andrade ..	Straits Steamship Co., Ltd.
<i>Marudu</i>	VPOB	A. B. Durrant	P. C. Smith ..	C. E. George, Mhd. Salleh bin Abdullah ..	Straits Steamship Co., Ltd.
<i>Matang</i>	VSPB	J. M. Harkness	T. G. O'Sullivan, B. W. Reeves ..	J. A. Sinclair ..	Straits Steamship Co., Ltd.
<i>Perak</i>	VSPJ	B. S. Sprenger	W. M. Evans ..	K. M. Pillai ..	Straits Steamship Co., Ltd.
<i>Perlis</i>	VSRA	D. Lloyd Jones	H. R. Watson ..	N. Tham ..	Straits Steamship Co., Ltd.
<i>Recorder</i>	GSFS	A. Tudor ..	N. Morganti, J. H. Killick, R. Wright ..	G. O'Brien ..	Cable & Wireless, Ltd.
<i>Salong</i>	VSYZ	R. G. Ogden ..	R. G. Ogden ..	..	Straits Steamship Co., Ltd.

BERMUDA

NAME OF VESSEL	CALL SIGN	OWNERS
<i>Ocean Monarch</i>	GJXD	Furness, Withy & Co., Ltd.
<i>Queen of Bermuda</i>	GZKF	Furness, Withy & Co., Ltd.

CANADA

NAME OF VESSEL	CALL SIGN	OWNERS
Selected Ships:		
<i>Arosa Sun</i>	HPTT	Arosa Lines (Canada), Ltd.
<i>Baffin</i>		Minister of Mines and Technical Surveys
<i>Bluenose</i>	VDND	Minister of Transport, Canadian Government
<i>Canadian Challenger</i>	VGSK	Canadian National (West Indies) Steamships, Ltd.
<i>Canadian Constructor</i>	VGBY	Canadian National (West Indies) Steamships, Ltd.
<i>Canadian Cruiser</i>	VGPZ	Canadian National (West Indies) Steamships, Ltd.
<i>Cyrus Field</i>	GKQC	Western Union Telegraph Company
<i>D'Iberville</i>	CGSM	Minister of Transport, Canadian Government
<i>Esso Knoxville</i>	HPTK	Panama Transport Co., Panama, R.P.
<i>Esso San Juan</i>	HOJV	Panama Transport Co., Panama, R.P.
<i>Fort Avalon</i>	MBMC	Furness Withy & Co.
<i>Fort Hamilton</i>	GCSS	Furness Withy & Co.
<i>Fort Hearne</i>	VCGX	Hudson's Bay Co., Ltd.
<i>Imperial Edmonton</i>	VGSI	Imperial Oil Shipping Co., Ltd.
<i>Imperial Toronto</i>	VGSC	Imperial Oil Shipping Co., Ltd.
<i>Irvingbrook</i>	HPBM	Western Trading Corporation, Nassau, Bahamas
<i>Lakemba</i>	VPKV	Pacific Shipowners, Suva, Fiji
<i>Lakonia</i>	GCDB	Donaldson Lines, Ltd.
<i>Lord Kelvin</i>	GDMM	Western Union Telegraph Co.
<i>Pinnacles</i>	VGGZ	Shell Canadian Tankers, Ltd.
<i>Rupert'sland</i>	VDDX	Hudson's Bay Co., Ltd.
<i>Sunglean</i>	LJSQ	Lorents S. Lyngass, Tonsberg, Norway
<i>Sunjarv</i>	MSPD	Saguenay Terminals, Ltd.
<i>Thor I</i>	LLWZ	A.S. Thor Dahl, Sandeffjord, Norway
<i>Thorsgaard</i>	LALK	A.S. Thor Dahl, Sandeffjord, Norway
<i>Waihero</i>	ZMJO	Union Steamship Co. of New Zealand
<i>Waikawa</i>	ZMJI	Union Steamship Co. of New Zealand
<i>Wairuna</i>	ZMJT	Union Steamship Co. of New Zealand
<i>Waitomo</i>	ZMKO	Union Steamship Co. of New Zealand
Supplementary Ships:		
<i>Anna Bakke</i>	LHNK	Knutsen Line
<i>Bougainville</i>	LMSQ	Klaveness Line
<i>Canadian Conqueror</i>	VCPV	Canadian National (West Indies) Steamships, Ltd.
<i>Canadian Highlander</i>	VCPV	Canadian National (West Indies) Steamships, Ltd.
<i>Canadian Leader</i>	VCQC	Canadian National (West Indies) Steamships, Ltd.
<i>Canadian Observer</i>	VCNW	Canadian National (West Indies) Steamships, Ltd.
<i>Canadian Victor</i>	VCNX	Canadian National (West Indies) Steamships, Ltd.
<i>City of Brooklyn</i>	GZKT	Ellerman Lines, Ltd.
<i>Elisabeth Bakke</i>	LJJX	Knutsen Line
<i>Ellen Bakke</i>	LDAA	Knutsen Line
<i>Gjertrud Bakke</i>	LJZK	Knutsen Line
<i>Hindanger</i>	LMAB	Westal-Larsen, Bergen, Norway
<i>Kristen Bakke</i>	LATI	Knutsen Line
<i>Paloma Hills</i>	VGGX	Shell Canadian Tankers, Ltd.
<i>Rincon Hills</i>	VGGY	Shell Canadian Tankers, Ltd.
<i>Sunbeam</i>	LMCE	Samulsen Falsun, Norway
<i>Sunmoira</i>	LLXD	Dampskibsselskapet, Marna A/S, Oslo, Norway
<i>Sunnyville</i>	LNQZ	Klaveness Line
<i>Sunrose</i>	LLLR	Lorents S. Lynglass, Tonsberg, Norway
<i>Suva</i>	VQWQ	Pacific Shipowners, Ltd.
<i>Ventura</i>	LAFS	Ditleve-Simonsen, Ltd.
<i>Vigan</i>	LAGQ	Ditleve-Simonsen, Ltd.
<i>William Carson</i>	VOLW	Minister of Transport, Canadian Government

PAKISTAN

NAME OF SHIP	CALL SIGN	OWNERS
<i>Al Hasan</i>	AQAN	Muhammadi S.S. Co., Ltd.
<i>Al Hussaini</i>	AQAH	Muhammadi S.S. Co., Ltd.
<i>Al Sayyada</i>	AQAS	Muhammadi S.S. Co., Ltd.
<i>Anwar Baksh</i>	AQAM	United Oriental S.S. Co., Ltd.
<i>Kader Baksh</i>	AQBK	United Oriental S.S. Co., Ltd.
<i>Maula Baksh</i>	AQBP	United Oriental S.S. Co., Ltd.
<i>Ocean Endurance</i>	AQBW	Trans-Oceanic S.S. Co., Ltd.
<i>Pakistan Prosperity</i>	AQAZ	Karachi Steam Navigation Co., Ltd.
<i>Safina-e-Arab</i>	AQBI	Pan-Islamic S.S. Co., Ltd.
<i>Safina-e-Nusrat</i>	AQBV	Pan-Islamic S.S. Co., Ltd.

NEW ZEALAND

The following is a list of observing ships voluntarily co-operating with the Meteorological Service of New Zealand.

NAME OF VESSEL	CALL SIGN	OWNERS
Selected Ships:		
<i>Kaimanawa</i>	ZMGZ	Union Steam Ship Company of New Zealand, Ltd.
<i>Kaitoke</i>	ZMTZ	Union Steam Ship Company of New Zealand, Ltd.
<i>Kaponga</i>	ZMVE	Union Steam Ship Company of New Zealand, Ltd.
<i>Karitane</i>	ZMJX	Union Steam Ship Company of New Zealand, Ltd.
<i>Kauri</i>	ZMCV	Union Steam Ship Company of New Zealand, Ltd.
<i>Kawaroa</i>	ZMBX	Union Steam Ship Company of New Zealand, Ltd.
<i>Kawatiri</i>	ZMKX	Union Steam Ship Company of New Zealand, Ltd.
<i>Kawerau</i>	ZMFY	Union Steam Ship Company of New Zealand, Ltd.
<i>Komata</i>	ZMCX	Union Steam Ship Company of New Zealand, Ltd.
<i>Kopua</i>	ZMLZ	Union Steam Ship Company of New Zealand, Ltd.
<i>Koromiko</i>	ZMRT	Union Steam Ship Company of New Zealand, Ltd.
<i>Kowhai</i>	ZMQU	Union Steam Ship Company of New Zealand, Ltd.
<i>Kuroto</i>	ZMFJ	Union Steam Ship Company of New Zealand, Ltd.
<i>Kurutai</i>	ZMQH	Union Steam Ship Company of New Zealand, Ltd.
<i>Matua</i>	ZMBN	Union Steam Ship Company of New Zealand, Ltd.
<i>Maui Pomare</i>	ZMMG	New Zealand Government
<i>Monowai</i>	ZMCD	Union Steam Ship Company of New Zealand, Ltd.
<i>Navua</i>		Union Steam Ship Company of New Zealand, Ltd.
<i>Port Montreal</i>	GRKJ	Port Line, Ltd.
<i>Port Quebec</i>	GWGQ	Port Line, Ltd.
<i>Port Saint John</i>	GBCZ	Port Line, Ltd.
<i>Tofua</i>	ZLMI	Union Steam Ship Company of New Zealand, Ltd.
<i>Waimate</i>	ZMDV	Union Steam Ship Company of New Zealand, Ltd.
<i>Waimea</i>	ZMRU	Union Steam Ship Company of New Zealand, Ltd.
<i>Waipori</i>	ZMFL	Union Steam Ship Company of New Zealand, Ltd.
<i>Watrata</i>	ZMBZ	Union Steam Ship Company of New Zealand, Ltd.
<i>Wairimu</i>	ZMVR	Union Steam Ship Company of New Zealand, Ltd.
<i>Waitemata</i>	ZMQW	Union Steam Ship Company of New Zealand, Ltd.
Supplementary Ships:		
<i>Coromel</i>		Jurie Shipping Co., Ltd.
<i>Kaiapoi</i>	ZMVD	Union Steam Ship Company of New Zealand, Ltd.
<i>Kaimai</i>		Union Steam Ship Company of New Zealand, Ltd.
<i>Kaimiro</i>	ZMEC	Union Steam Ship Company of New Zealand, Ltd.
<i>Kaitangata</i>	ZMTJ	Union Steam Ship Company of New Zealand, Ltd.
<i>Kaitawa</i>	ZMVC	Union Steam Ship Company of New Zealand, Ltd.
<i>Kaitoa</i>		Union Steam Ship Company of New Zealand, Ltd.
<i>Kaituna</i>		Union Steam Ship Company of New Zealand, Ltd.
<i>Komui</i>	ZMVB	Union Steam Ship Company of New Zealand, Ltd.
<i>Korowai</i>	ZMKD	Union Steam Ship Company of New Zealand, Ltd.
<i>Piri</i>	ZMGM	Imperial Chemical Industries, Ltd.
<i>Port Waikato</i>	ZMJN	Holm & Company, Ltd.
<i>Viti</i>	VQWS	Tasman Steam Ship Company of New Zealand, Ltd.
<i>Waiana</i>	ZMDQ	Union Steam Ship Company of New Zealand, Ltd.
<i>Waitaki</i>	ZMLR	Union Steam Ship Company of New Zealand, Ltd.

SOUTH AFRICA

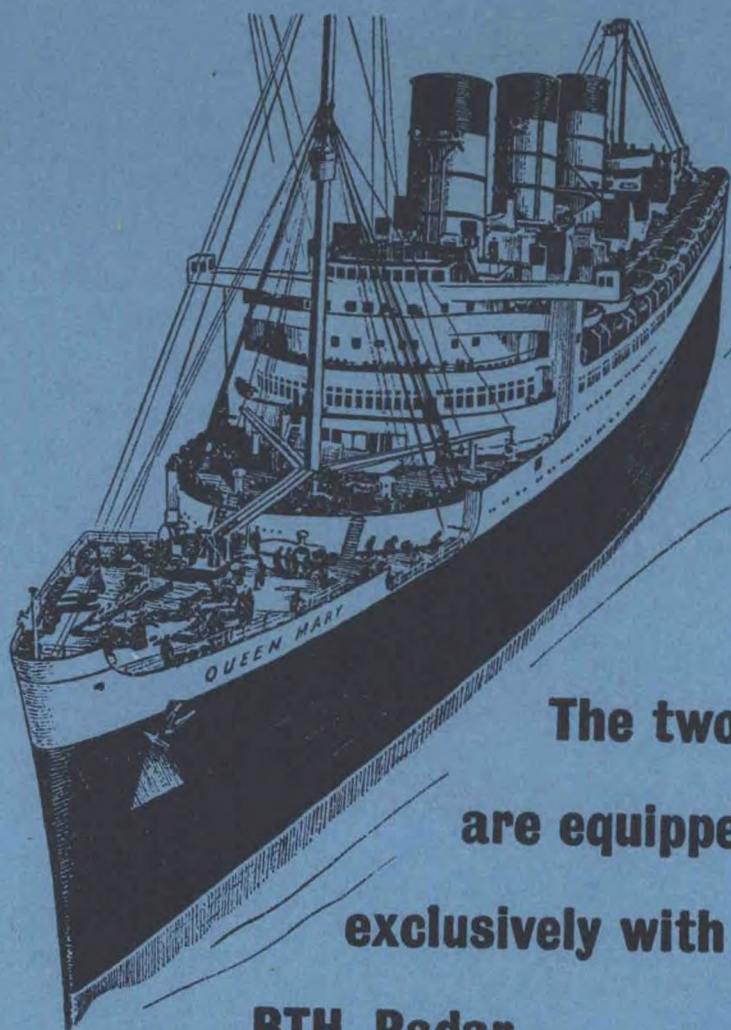
The following is a list of observing ships voluntarily co-operating with the South African Weather Bureau.

NAME OF VESSEL	CALL SIGN	OWNERS/COMMANDING OFFICER
<i>Africana II</i>	ZSVK	Division of Fisheries, Cape Town
<i>F. T. Bates</i>	ZSWW	South African Railways and Harbours, Cape Town
<i>Constantia</i>	ZSRF	South African Marine Corporation, Cape Town
<i>Frances Repetto</i>	ZSNB	Tristan Development Co., Cape Town
<i>Herero Coast</i>	MQZK	Thesens Steamship Co., Cape Town
<i>Morgenster</i>	ZSSJ	South African Marine Corporation, Cape Town
<i>South African Merchant</i>	ZTFT	South African Marine Corporation, Cape Town
<i>Tristania</i>	ZSCW	Tristan Development Co., Cape Town
<i>Vergelegen</i>	ZSSN	South African Marine Corporation, Cape Town
South African Nautical College, "General Botha"		Captain G. V. Legassick, D.S.C., R.D., Capt. R.N.R.
Naval Gymnasium, Saldanha Bay		Inst.-Commander S. C. Biermann, B.A.

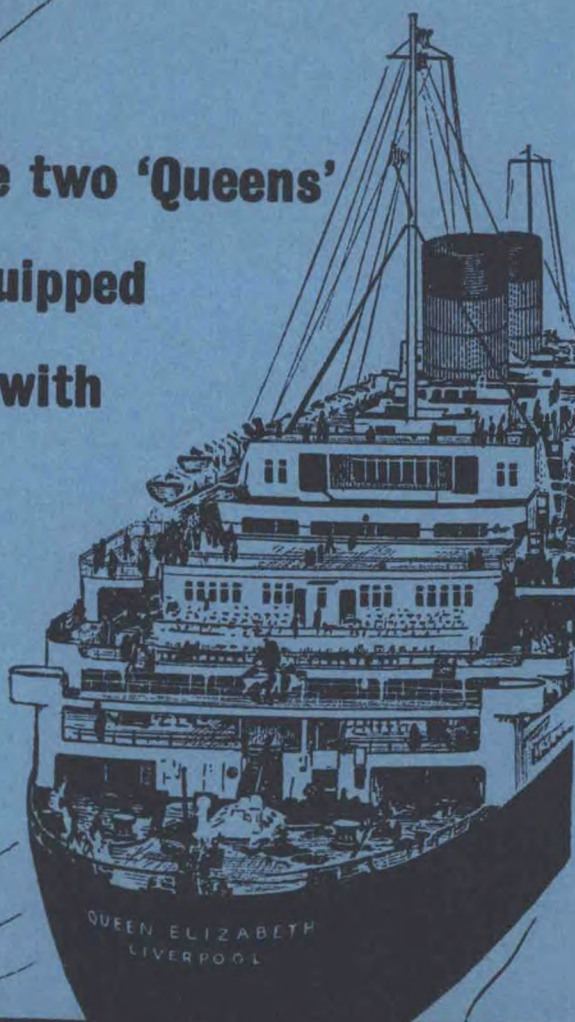
WEST INDIES

The following observing ships voluntarily co-operate with the British Caribbean Meteorological Service.

NAME OF VESSEL	CALL SIGN	OWNERS
<i>Electra</i>	MRYX	Cable & Wireless, Ltd.
<i>West Indian</i>	WRBR	Indo-China Steam Navigation Co., Ltd.



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Meteorological Atlases

The above four atlases contain monthly charts of wind, barometric pressure, air and sea temperature, and all meteorological elements including some typical tracks of tropical revolving storms.

This atlas contains a generalised surface current chart for the area and monthly charts of wind, barometric pressure, air and sea temperature, and all meteorological elements.

The above two atlases contain quarterly "current arrow" and "current rose" charts.

The above two atlases contain current rose charts, predominant current charts, and vector mean current charts.

Polar ice, mean limits of sea ice, extreme limits of sea ice, extreme limits of bergs.

Mean limits of pack, extreme limits of pack, mean limits of bergs, extreme limits of bergs.

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