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*A quarterly journal of Maritime
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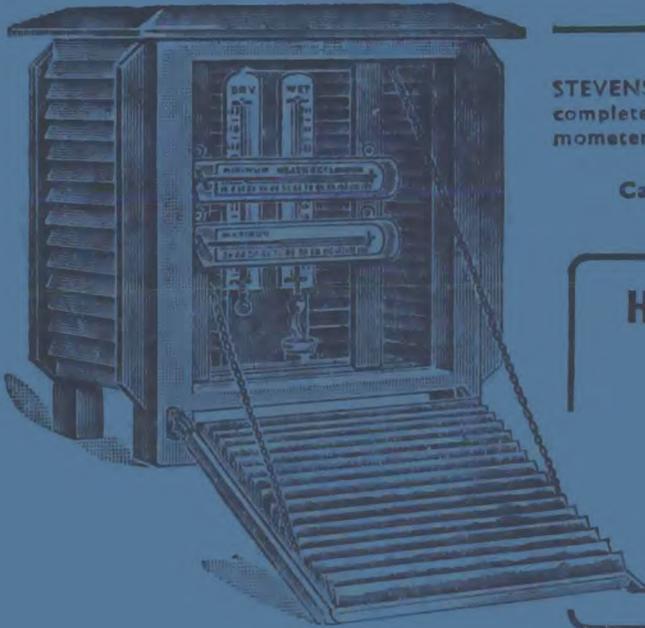
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VOL. XXV

No. 169

JULY, 1955

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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 the April number of *The Marine Observer*, reference was made to the number of shipping casualties which had occurred round the coasts of the United Kingdom during the winters of 1953-54 and 1954-55, and a suggestion was made that if similar weather conditions had prevailed in (say) 1855, the number of casualties would have been considerably more for various reasons.

On page 127 of this present number is a table which was kindly prepared for us by Captain Topley of the Ministry of Transport, from records contained in that office concerning lives lost at sea by wreck or casualty to vessels registered in the United Kingdom, from the years 1878-1953 inclusive. The figures are truly remarkable. It will be seen that the maximum total of lives lost in any year during the period concerned was as high as 3,274 in 1882 and the minimum was as low as 8 in 1952. Samuel Plimsoll's load-line Act came into force in 1876, and if the introduction of a load-line is a real safety measure, as it surely must be, then it seems that the casualties must have reached some rather astronomical figures prior to the first load-line Act being passed.

It is not until 1903 that any substantial drop in the casualty figures shown in the table occurs; by that date steam vessels were more or less established and wireless telegraphy had arrived on the scene. Perhaps the benefits of the Merchant Shipping Act of 1894 were by then making their presence felt, as were also the examinations for masters and mates, by ensuring that officers serving in merchant ships were reasonably efficient in discharging their duties.

We have no record as to the number of vessels which correspond to the figures of lives lost. During the period when the casualties were so high there occurred the gradual transition from sail to steam, and during that period there seems little doubt that ships were very much smaller than they were from 1903 on. It seems, therefore, that the number of vessels corresponding to the heavy loss of life was probably quite considerable.

As early as 1871 an Act was introduced requiring the load draft of a ship to be recorded. The 1876 Load-Line Act required foreign-going ships to be marked with a load-line, but its position was left to the discretion of the ship owner. It was not till 1890 that rules were introduced by the Board of Trade specifying the position in which the load-line was to be in various types of ships. In 1882, however, Lloyds had introduced tables of freeboard, and it seems probable that the provisions of the 1890 Load-Line Act were largely based upon these. By 1906 seasonal load-line marks (winter, summer, Indian summer and winter North Atlantic) had been introduced, and there seems no doubt that in making a decision about the zones in which vessels could be loaded to these various marks, the authorities depended to a large extent upon the climatological information which had been provided since 1855 by voluntary observers aboard British ships. It is obvious that meteorology has to come into the picture when considering this question of ships' load-lines.

The 1894 Act provided for various safety measures, including the famous precautions to prevent grain cargo from shifting, rules for life-saving appliances, collision regulations and made special provision for the survey of ships. It was therefore very comprehensive.

The load-line rules were further modified in the 1932 Convention for Safety of Life at Sea, when "seasonal winter", "tropical" and "seasonal tropical" zones were introduced, and they remain substantially the same now.

Examinations for masters and mates were introduced on a voluntary basis in 1845, as a result of a Report of a Select Committee which had been set up in 1836 to investigate the causes of the increasing number of casualties to British ships and consequent loss of life. The Committee found that the abnormal loss of life and ships was partly due to the "incompetence of masters and officers". In 1851 compulsory examinations for masters and mates were introduced.

It seems that the first significant drop in casualties which occurred in 1903 is probably due to a combination of favourable circumstances. The high figure of 2,400 lives in 1912 was very largely caused by the *Titanic* disaster. From 1919 onward we see another significant drop in the casualty figures and there was another notable fall in 1930. The figures seem to have remained somewhat similar from then up to 1953—those for 1954 are not yet available.

Lives Lost at Sea by Wreck of or Casualty to Vessels registered in the United Kingdom

Year	Crew	Passengers	Total	Year	Crew	Passengers	Total
1878	1,317	234	1,551	1916	—	—	—
1879	1,376	50	1,426	1917	—	—	—
1880	1,344	269	1,613	1918	—	—	—
1881	2,151	45	2,196	1919	305	21	326
1882	3,011	263	3,274	1920	158	3	161
1883	2,410	91	2,501	1921	245	28	273
1884	2,040	205	2,245	1922	367	17	357
1885	1,367	76	1,443	1923	329		
1886	1,017	51	1,068	1924	164	5	169
1887	1,568	348	1,916	1925	199	4	203
1888	1,349	114	1,463	1926	214	2	216
1889	1,207	799	2,006	1927	123	45	168
1890	1,109	178	1,287	1928	197	73	270
1891	1,318	590	1,908	1929	146	10	156
1892	1,320	52	1,372	1930	38	7	45
1893	1,086	110	1,196	1931	56	6	62
1894	1,520	129	1,649	1932	36	33	69
1895	1,348	1,196	2,544	1933	94	52	146
1896	1,334	474	1,808	1934	114	1	115
1897	991	46	1,037	1935	129	7	136
1898	629	52	681	1936	28	2	30
1899	1,201	159	1,360	1937	64	6	70
1900	1,026	29	1,055	1938	95	16	111
1901	957	54	1,011	1939	—	—	—
1902	959	698	1,657	1940	—	—	—
1903	599	25	624	1941	—	—	—
1904	544	21	565	1942	—	—	—
1905	750	22	772	1943	—	—	—
1906	659	120	779	1944	—	—	—
1907	648	114	762	1945	—	—	—
1908	500	20	520	1946	70	Nil	70
1909	581	106	687	1947	110	3	113
1910	690	260	950	1948	124	2	126
1911	662	18	680	1949	29	Nil	29
1912	1,545	863	2,408	1950	115	Nil	115
1913	577	71	648	1951	61	Nil	61
1914	787	956	1,743	1952	8	Nil	8
1915	—	—	—	1953	59	102	161

NOTES

- (1) These figures have been taken from the Returns of Shipping Casualties.
- (2) Up to 1914 the figures refer to the year ending 30th June and from 1914 onwards the calendar year ending 31st December.
- (3) In the passenger numbers are included non-fare-paying passengers such as pilots and shore workers.
- (4) The number of passengers in 1922–23 cannot be split and the total figure is an average for the two years.
- (5) Some highlights on these figures are as follows:

(a) 1895 <i>Kow Shing</i>	(d) 1912 <i>Titanic</i>
(b) 1902 <i>Camorta</i>	(e) 1928 <i>Vestris</i>
(c) 1910 <i>Waratah</i> and <i>Loodiana</i>	(f) 1953 <i>Princess Victoria</i>

It does not seem that any of these trends can be specifically tied to any one special safety measure, but it is worth noting that since the *Titanic* disaster we have seen the introduction of the International Ice Patrol, two International Conventions for Safety of Life at Sea (1932 and 1948), more or less steady improvements in the efficiency of ship propulsion, the perfection of radio as a safety measure, enormous improvements in life-saving appliances and considerable steps forward in aids to navigation (including compasses and charts), as well as the provision of very comprehensive world-wide meteorological information for shipping.

It is hardly surprising that many of the casualties included in this list were due to meteorological causes. Some of the more striking examples were the *Loodiana* (1910), disappeared in a cyclone between Mauritius and Colombo; the *Titanic* (1912), hit an iceberg in low visibility; one of the causes of the loss of the *Vestris* (1928) was "heavy weather, high wind and sea, causing the vessel to list to starboard"; the *Princess Victoria* was certainly a weather casualty. (The *Camorta* (1902) and *Waratah* (1910) merely disappeared: nobody knows why.)

As the figures in this table show, the sea has become a much safer place as far as human life is concerned, but particularly for passengers. Lloyds Casualty List tells us, however, that the number of ships that are involved in casualties of one form or another is still very considerable, and it seems that the majority of them are still in some way or other related to weather conditions (be it heavy weather damage, collision in fog, lost propellers or dragging when at anchor). In this connection it is rather disappointing to note that radar does not seem to have proved itself quite such an unqualified boon to the navigator as it was first thought to be. Recent discussions at the Institute of Navigation have emphasised how much it is necessary for the mariner to combine seamanship with the use of any such navigational aid.

Sometimes the weather strikes directly in a particularly ferocious and unusual manner. Such a case occurred in January this year when two British trawlers, the *Lorella* and the *Roderigo*, were caught in a NE gale accompanied by an air temperature of about 28°F off the north coast of Iceland. Both these vessels became severely iced up, and it seems obvious from the radio signals which they sent that they both capsized as a result, with the loss of all hands.

Anybody who has traded regularly on the North Atlantic will have had some experience of the unpleasantness of heavy icing on deck and the consequent danger to the ship's stability, and of the great difficulty of getting rid of the ice during heavy weather.

Modern invention has undoubtedly done a lot to help provide safety at sea, and Meteorological Services contrive (with the aid of radio weather messages which they receive from ships) to provide adequate warnings to shipping of dangerous weather conditions. Seamanship and experience will always be needed by the mariner in order to make proper use of the various facilities which are available to him, but circumstances inevitably arise from time to time when the forces of nature become too great for all man's inventive genius and skill, with the result that disaster overcomes even the best-found ship.

A ship does not need to go to sea to get involved in a "meteorological" casualty. An unusual legal action was heard recently in a British court, resulting from a cruising liner being suddenly blown some 13 ft away from the quay at Trieste by a very sudden and violent squall in July, 1952. A woman passenger who was on the gangway at the time was severely injured as a result. The terms of her passenger ticket precluded her suing the shipping company, but she brought a successful action against the master of the ship for damages, claiming that the gangway was not safe and the ship was not properly moored.

Cases of this nature remind us that a seaman's job is never really done—he needs to remain weather-minded in harbour as well as at sea.

Elsewhere in this number is an account of the work of British voluntary observing ships during the past year. This report shows that the part which British ships play

in this international selected ship scheme for the collection of meteorological information from the oceans continues to be very considerable, and that the quality of the observations remains at a high standard. Reports from our Port Meteorological Officers and Merchant Navy Agents have again drawn attention to the evident interest which ships' officers show in their voluntary observing duties and in meteorology generally. In addition to publishing a list of the "Excellent Awards" which have been awarded, it will be noted that this year we have also recorded the names of those ships which gained the highest marks for the quality of their meteorological work at sea during the year.

We congratulate all those who gained these awards, and on behalf of the Director of this Office we thank all our voluntary observers for the useful work they have done for international meteorology during the year. There is no doubt that radio weather messages from ships continue to make their contribution to safety of life at sea.

MARINE SUPERINTENDENT.

WORK OF THE YEAR (ENDING 31st MARCH, 1955) OF THE MARINE DIVISION OF THE BRITISH METEOROLOGICAL OFFICE AND THE VOLUNTARY OBSERVING FLEET

1. Voluntary observing ships

(a) ORGANISATION AND COLLECTION OF OBSERVATIONS

The Marine Division has Port Meteorological Officers in London, Liverpool, Southampton, Cardiff and Glasgow, and Agents in the Forth, Tyne and Humber areas. It is their duty to visit the masters and officers of merchant ships, to interest them in keeping meteorological records, to recruit them as voluntary meteorological observers, to instruct them as necessary in making the observations and thereafter to re-visit the ships at regular intervals. They also issue meteorological instruments to the majority of the ships and inspect them as opportunity offers. During the year some 3,850 visits were made to ships by these officers.

(b) BRITISH SHIPS

The Voluntary Observing Fleet is comprised as follows:

- (i) *Selected ships*, which make meteorological observations four times daily (0000, 0600, 1200 and 1800 G.M.T.) on a world-wide basis, in accordance with arrangements made by the World Meteorological Organisation and the International Convention for Safety of Life at Sea. Meteorological instruments (mercury barometer, barograph, screen and thermometers, canvas sea-water bucket), logbooks and instructions for doing the work are supplied to these ships. The observations are transmitted by wireless in the International Meteorological Code to specified Meteorological Services in whatever ocean the vessel is situated. Approximately 500 British selected ships co-operate in this manner out of a world total of about 2,600 observing ships. Included in this figure are eight British whaling vessels which were specially recruited for making meteorological observations in the Antarctic Ocean.
- (ii) *Supplementary ships*, which make and transmit their coded reports four times daily by radio (using an abbreviated code) on a world-wide basis, in a similar manner to selected ships. These ships are supplied only with a mercurial barometer, thermometers and screen, such instruments being sufficient for this abbreviated code reporting. The number of supplementary ships is about 60.
- (iii) *Coasting vessels*, about 96 in number, which make observations of sea temperatures (Marid observations) in home waters once daily and transmit the coded reports by radio-telephone to Dunstable, via G.P.O. coast

	1954												1955		
	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.			
No. of Selected Ships on Fleet List	503	503	499	496	494	499	501	504	507	507	509	506			
No. of Supplementary Ships on Fleet List	57	57	56	60	62	61	61	60	58	59	59	58			
No. of <i>Marid</i> Ships on Fleet List	84	85	85	86	86	86	87	90	92	93	93	93			
No. of Lightvessels on Fleet List	13	13	13	13	13	13	13	13	13	13	13	13			

Table I. Number of British Observing Ships

No. of Selected Ships on Fleet List	503	503	499	496	494	499	501	504	507	507	509	506
No. of Supplementary Ships on Fleet List	57	57	56	60	62	61	61	60	58	59	59	58
No. of <i>Marid</i> Ships on Fleet List	84	85	85	86	86	86	87	90	92	93	93	93
No. of Lightvessels on Fleet List	13	13	13	13	13	13	13	13	13	13	13	13

Table 2. Ships' Radio Weather Messages received at Dunstable

1. <i>British Selected Ships</i>												
No. reporting to Dunstable	290	291	296	298	299	293	302	261	294	275	276	306
No. of messages received	2,706	2,837	2,940	2,875	3,056	3,038	3,038	2,769	2,634	2,639	2,794	3,238
No. of groups (excluding address and ship's name)	22,736	23,828	24,407	28,112	28,578	25,366	26,038	23,454	22,249	22,548	22,898	27,002
Daily average of messages	90	92	98	93	99	101	99	92	85	85	100	105
2. <i>Marid Ships</i>												
No. reporting to Dunstable	48	48	49	49	48	46	42	44	42	44	42	50
No. of messages received	338	384	373	345	385	335	269	236	243	305	223	313
Daily average of messages	11	12	12	11	12	11	9	8	8	10	8	10
3. <i>Foreign Ships</i>												
No. reporting to Dunstable	123	147	120	119	131	153	146	126	134	122	136	171
No. of messages received	412	553	423	447	466	538	511	497	458	375	487	602
No. of groups (excluding address and ship's name)	3,084	4,291	3,303	3,442	3,688	4,155	3,912	3,860	3,452	2,846	3,898	4,743
Daily average of messages	14	18	14	14	15	18	16	17	15	12	17	19
4. <i>Lightvessels</i>												
No. reporting to Dunstable	11	11	11	11	11	11	11	11	11	11	11	11
No. of messages received	639	668	651	656	678	648	658	637	703	838	769	862
Daily average of messages	21	21	22	21	22	22	21	21	23	27	27	28

Table 3. Instrumental Equipment on Loan to British Voluntary Observing Ships

1. <i>Selected</i>												
(a) Full set of M.O. instruments	495	495	491	489	487	492	494	497	500	502	499	499
(b) Full set of M.O. instruments except barograph	4	4	4	4	4	4	4	4	4	4	4	4
(c) Full set of M.O. instruments, except aneroid	3	3	3	2	2	2	2	2	2	2	2	2
(d) Full set of M.O. instruments, except aneroid instead of mercurial barometer	1	1	1	1	1	1	1	1	1	1	1	1
<i>Marid</i> . Set of instruments	84	85	85	86	86	86	87	90	93	93	93	93
3. <i>Lightvessel</i> . Set of instruments	13	13	13	13	13	13	13	13	13	13	13	13
(e) Supplementary set	55	55	54	58	60	59	59	58	57	57	57	56
(b) Supplementary set, except aneroid instead of mercurial barometer	2	2	2	2	2	2	2	2	2	2	2	2

stations. When in the North Sea area these vessels include certain non-instrumental observations in their messages. Three of these ships, trading across the North Sea, only make non-instrumental observations.

- (iv) *Lightvessels*, 13 of which make observations of wind, waves, visibility and air and sea temperatures twice daily. The coded reports of 11 of these vessels are transmitted by radio-telephone to Dunstable, via G.P.O. coast stations.
- (v) *Trawlers*, 17 of which (engaged in fishing in far northern waters) make non-instrumental observations and send their coded messages by wireless-telegraphy or radio-telephony as convenient, to British, Norwegian or Icelandic radio stations. Owing to physical difficulties, no record of these observations is required to be kept aboard these ships.

The meteorological observations made aboard all the above vessels, with the exception of trawlers, are recorded in special logbooks and are forwarded to the Marine Division for climatological analysis.

Among their other activities selected and supplementary ships make observations of whales on behalf of the National Institute of Oceanography, and aurora observations for the Department of Natural Philosophy, Edinburgh University. Special radar observations are also made aboard selected ships so fitted.

Table 1, page 130, shows the number of vessels of each class monthly throughout the year.

The table below 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, mainly via Suez or the Cape	.. ..	58
Australasia, mainly via Panama	.. ..	47
Far East	.. ..	70
Persian Gulf	.. ..	10
South Africa	.. ..	16
West coast of Africa	.. ..	8
North Atlantic	.. ..	65
West Indies	.. ..	27
Atlantic coast of South America	.. ..	33
Pacific coast of South America	.. ..	16
Pacific coast of North America	.. ..	21
North-west Europe	.. ..	14
Trooping service	.. ..	9
Falkland Islands and Antarctic	.. ..	13
World-wide "tramping"	.. ..	104

(c) FOREIGN SHIPS

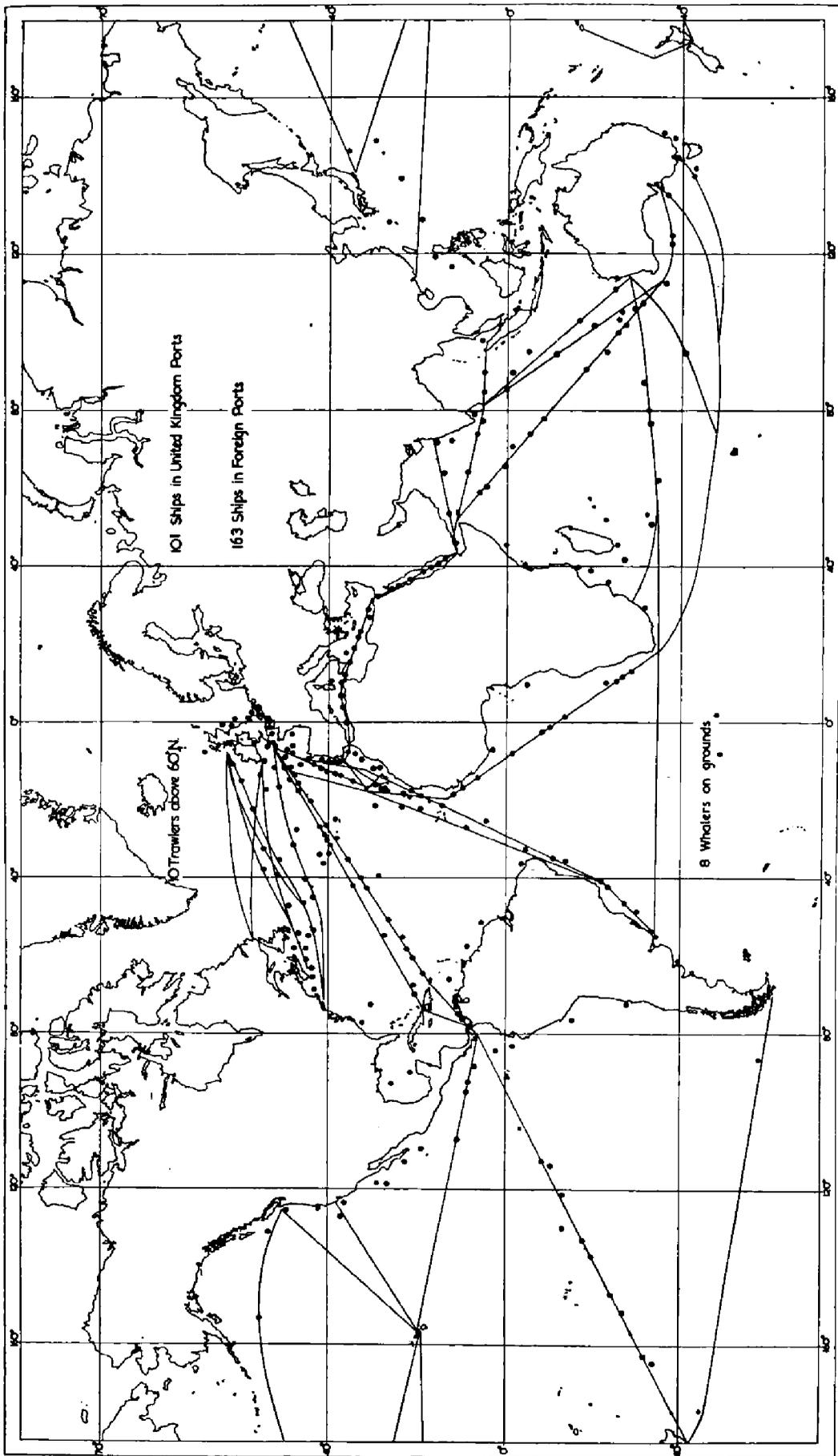
Radio weather messages from ocean weather ships operated by other nations in the North Atlantic and from foreign selected merchant ships have also been received regularly throughout the year at the Central Forecasting Office in Dunstable.

(d) WHALERS

Eight British whaling ships were recruited for making voluntary observations in the Antarctic as part of a special international scheme. Radio weather messages from these ships, in which the ship's position is given in cipher, were routed via South African or Australian radio stations.

(e) QUALITY OF OBSERVATIONS

The scrutiny of the logbooks received from voluntary observing ships shows that the observations are generally made with care, accuracy and neatness, and that the radio weather messages are regularly transmitted to the appropriate authorities. The meteorological logbooks are a credit to the voluntary observers, and many of them contain detailed reports of unusual phenomena encountered at sea as well as



The positions of British ships which made meteorological observations on 26th February, 1955 (a day picked at random).

oceanographical and ornithological observations. An average of 113 logbooks were received in the Marine Division monthly during the year and in addition some logbooks and forms which were kept aboard Canadian and Norwegian ships.

(f) RADIO REPORTS

Table 2 shows the numbers of British selected ships, coastal vessels, foreign ships and lightvessels reporting to Dunstable, and the number of messages received at the Central Forecasting Office, excluding reports received from ocean weather ships. It is not practicable to prepare similar tables for other parts of the world, but the map on page 132 shows the general distribution of British selected ships on a day picked at random.

Of the reports received from selected ships in the eastern Atlantic, a 12-monthly check showed that approximately 54 per cent were received within one hour of the time of observation and 78 per cent within two hours.

(g) EQUIPMENT

Table 3 shows the distribution of instrumental equipment on loan to voluntary observing ships.

2. Ocean weather ships

During the year each of the four British ocean weather ships completed seven years' service.

As a result of the latest North Atlantic Ocean Stations Agreement (Paris, February, 1954) the British and European weather ships have since 25th December, 1954, been spending 24 days on station instead of the former routine of 21 days.

Station "I" (INDIA), in position $61^{\circ} 00' N$, $15^{\circ} 20' W$ until 1200 G.M.T. on 10th July, 1954, and thereafter in position $59^{\circ} 00' N$, $19^{\circ} 00' W$, was manned by British ships until 17th February, 1955, and then in rotation with a Netherlands ship. The station was occupied for 363 days, being vacated on two days due to late sailing of the relief ship.

Station "J" (JULIETT), in position $52^{\circ} 30' N$, $20^{\circ} 00' W$, was manned either by a British or Netherlands ship until 28th December, 1954, and then in rotation with a French ship. The station was occupied for 361 days, being vacated on four days whilst landing a patient to hospital at Londonderry.

Station "A" (ALPHA), in position $62^{\circ} 00' N$, $33^{\circ} 00' W$, was manned by a United States, Netherlands or Norwegian ship until 29th December, 1954, then in rotation by a British, French or Netherlands ship. Since 29th December, 1954, the station has been occupied continuously.

Station "K" (KILO), in position $45^{\circ} 00' N$, $16^{\circ} 00' W$, was manned by a French or Netherlands ship until 3rd January, 1955, then in rotation by a British, French or Netherlands ship. Since 3rd January, 1955, the station was occupied continuously.

The weather ships carried out a full programme of meteorological work. Search and rescue exercises were carried out whenever practicable in co-operation with aircraft of R.A.F. Coastal Command. During the exercises mail, newspapers and urgently required stores were dropped in watertight containers by the aircraft. A weekly "mail-drop" combined with a navigational exercise by aircraft from the R.A.F. Station Topcliffe was inaugurated.

The weather ships' navigational aids are used regularly by both civil and military aircraft; 7,487 aircraft made use of the facilities provided by the British ships during the year and 2,059 contacts were made by foreign weather ships on stations India and Juliett.

Special observations of the sea-water temperature gradient with a bathy-thermograph aboard one ship were continued, as were the records of a wave recorder loaned by the National Institute of Oceanography. Arrangements are in hand to equip the other three British weather ships with bathy-thermographs loaned by the Admiralty.

Oceanographical work has continued for the Ministry of Agriculture and Fisheries and the Fisheries Division of the Scottish Home Department; this included the

towing of plankton recorders, taking samples of sea-surface water and the jettisoning of drift bottles. The jettisoning of plastic envelopes on behalf of the National Institute of Oceanography in connection with an investigation into oil pollution, which began on 1st January, 1954, terminated on 31st December, 1954.

Magnetic variation swings were carried out on station, whenever weather conditions allowed, for the Hydrographic Department of the Admiralty.

Logbooks and upper-air data were received from all weather ships operating on stations INDIA and JULIETT and since 29th December, 1954, from station ALPHA. Microfilmed copies were made and distributed to other nations signatory to the North Atlantic Ocean Stations Agreement. British ships when operating on station KILO recorded their observations on forms supplied by the French Meteorological Service.

Arrangements were made for hourly surface weather reports to be made by the weather ships on stations ALPHA, INDIA and JULIETT in connection with the flight of H.R.H. the Princess Margaret to Montreal on 31st January, 1955.

Owing to a serious boiler defect which necessitated her withdrawal from service for about six weeks, O.W.S. *Weather Explorer* was unable to carry out her scheduled duties at station KILO during the period 20th February to 16th March, 1955. The Royal Research Ship *Discovery II* was accordingly chartered from the National Institute of Oceanography to undertake this patrol. The stores and special air/sea rescue equipment were supplied for the voyage, and a temporary shelter was erected on the after-deck for balloon filling. Radar winds were not made as the ship was only fitted with a surface radar, but pilot balloon ascents were made using a marine theodolite (borrowed from the Admiralty) and a compass and sextant. *Discovery II* has a comprehensive radio installation, and with the addition of a portable V.H.F. set, borrowed from O.W.S. *Weather Explorer*, she was able to carry out the normal communication duties of a weather ship. Modified navigational aids to aircraft were available but no radar fixes were possible. Six meteorologists and four radio staff were additional to the ship's normal complement.

An instructor from the R.A.F. sailed for one voyage in each British weather ship in turn during the year and delivered first-aid lectures to members of the ships' companies. Several senior N.C.O's from the R.A.F. Station Topcliffe have sailed in the ships to gain experience of ships' communications to aircraft, and a warrant officer from Headquarters No. 90 Group, R.A.F., also sailed as a passenger for one voyage. A Turkish meteorologist (United Nations Fellowship) sailed in one ship to station JULIETT, was transferred at sea and returned to Greenock in the relieved ship.

3. Marine climatology

Routine work carried out during the year in the Marine Division of the Meteorological Office included:

(a) COLLECTION OF OBSERVATIONS

The numbers of meteorological logbooks received each month in the Marine Division from selected and supplementary ships were as follows:

Table 5. Meteorological logbooks received in the Marine Division

1954									1955		
April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
91	136	136	122	127	107	101	116	113	122	81	107

Logbooks and upper-air data have also been received regularly from ocean weather ships at stations INDIA and JULIETT, and since 29th December, 1954, from

ALPHA. Microfilm copies of observations made at all other North Atlantic ocean weather stations have been received.

(b) ANALYSIS OF OBSERVATIONS

- (i) Observations from logbooks received from British voluntary observing ships and British ocean weather ships as well as from Naval logbooks were punched on to Hollerith cards. Also some logbooks were received from Canadian, South African, Norwegian, Netherlands and French ships. The total number of observations punched was 243,718.
- (ii) Tabulations of all observations in the Southern Hemisphere made by British observing ships, totalling 31,553 observations, were supplied to the Massachusetts Institute of Technology and the South African Meteorological Service up to 1st July last, for a special project which has now been terminated.
- (iii) Hollerith cards in the Marine Division now total 12,500,000. The use of these cards by machine methods makes possible the climatological investigations on a world-wide basis which were undertaken during the year.
- (iv) The Port Meteorological Officer at Glasgow has distributed to shipping interests six daily forecast charts supplied by the Senior Forecaster at Renfrew Airport.
- (v) Fog record forms have been collected throughout the year by the Port Meteorological Officers from the authorities who have them made on our behalf in the five areas—London, Liverpool, Southampton, Cardiff and Glasgow.

4. Currents and Ice

The computation of data for the preparation of surface current charts of the North Pacific Ocean, eastward of longitude 160°W, has been completed and similar work for the South Pacific Ocean eastward of longitude 160°W has been begun.

5. Admiralty Pilots and charts

(a) The sections relating to surface currents have been entirely rewritten for new editions of six Admiralty Pilots required during the year, and generalised current charts have been prepared for these where necessary. Sections relating to ice in two of these Pilots have also been rewritten. The revision of the meteorological sections of the six Pilots has been co-ordinated with the World Climatology Branch and meteorological charts have been prepared for these publications in the Marine Division.

(b) During the year information relating to currents to be placed on 47 Admiralty navigational charts was forwarded to the Admiralty.

6. Special work

(a) Meteorological and ocean current statistics for ocean weather stations INDIA and JULIETT in the North Atlantic for the year 1953 were completed. The preparation of similar statistics for 1954 has begun. This division has also assumed responsibility for preparing similar statistics for station ALPHA with effect from 1st January, 1955.

(b) An extensive revision of the text and diagrams of *Meteorology for Mariners* was completed in December, 1954. The text has recently been approved for publication and will soon be sent to the printers.

(c) Investigations into errors of exposure of rain-gauges and thermometers in screens aboard ocean weather ships were continued. Similar investigations into errors of screen exposures were made with electrical resistance thermometers in screens set up in various positions aboard H.M.S. *Vidal* during her voyage in the tropics in April to July, 1954.

(d) Successful experiments to measure simultaneous values of air and sea temperature respectively a few feet above and below the sea surface have recently

been made by meteorological staff in ocean weather ships using electrical resistance thermometers mounted on a Dan buoy and staff. The apparatus is undergoing modification.

(e) The series of simultaneous radar wind measurements made between pairs of ocean weather ships during relief periods on station was completed in December, 1954. The results of these observations are now being analysed.

(f) Air and sea temperature anomalies over the North Atlantic in the summer of 1954 and for the preceding winter and spring were extracted from punch-card data available in the Marine Division, and were described at a symposium held at Harrow in October, 1954, to discuss the meteorology of the summer of 1954 over the British Isles.

(g) Revision of a paper on short period variations of air and sea temperature has been retarded due to staff shortage, while an investigation already begun into the incidence of air temperature inversions at ocean weather stations has been held in abeyance for the same reason.

(h) Co-operation in the study of the measurement of waves was maintained between the Marine Division and the National Institute of Oceanography, and much use was made by the latter of the records held by the Marine Division for work upon the problem of heat exchange between ocean and atmosphere.

(i) Papers were produced on the following subjects:

(i) A verification of Ekman's theory of wind-driven ocean currents, using data from British ocean weather stations.

(ii) Some landmarks in meteorological progress, 1855-1955.

(iii) Preparation of weather charts aboard ship.

(iv) Five years' observations and means of meteorological elements at ocean weather stations INDIA and JULIETT.

(v) The loss of the former Brazilian battleship *Sao Paulo*.

(j) A three-months' course of training was given to Mr. Kulaksiz of Turkey, who was studying maritime meteorology under a United Nations Fellowship. During his stay Mr. Kulaksiz made a very comprehensive study of the work of the Marine Division, including the Hollerith system used, and visited also the port meteorological offices at London, Liverpool and Glasgow for practical work aboard selected ships, the ocean weather ships and the base at Greenock, and finally the Central Forecasting Office at Dunstable.

7. Inquiries

(a) Information, including statistical tables and charts of marine data, was supplied on request to the Naval Weather Service, other Government Departments, scientific institutions, commercial firms and private individuals. Examples included monthly and annual frequencies of wave heights and periods, also wind forces for ocean weather stations "I", "J" and "M" for a Government Department; wave data and the possibility of day-to-day forecasting of waves for underwater oil drilling in the Persian Gulf by Anglo-Iranian Oil Company; and wave information in the North Atlantic at the time of the casualty *World Concord* for Messrs. Vickers Armstrong.

(b) Information was supplied to the Ministry of Transport and Civil Aviation for several investigations into serious shipping casualties. The personal attendance of a meteorologist was necessary at the formal investigations held during the year into the loss of the *Michael Griffiths* (west of Scotland, January, 1954), the *Yew Valley* (North Sea, January, 1953), the *Hassett* (east Scotland, September, 1953), the obsolete battleship *Sao Paulo* (on passage Brazil-United Kingdom, October-November, 1951) and the *Island Magee* (North Sea, November, 1954).

Information was also supplied for the preliminary investigations into the casualties of the ships *World Concord*, *Tresillian*, *Olaf Ringsdal Jnr.*, *The Lady Shiela*, *The Gypsy Queen*, *Lorella* and *Roderigo*.

- (c) Inquiries dealt with included the following:
- (i) Weather conditions over the North Sea in connection with bird migration at night, for Dr. K. B. Rooke.
 - (ii) Weather data for North-East Pacific, in connection with surveys off Canadian Pacific coasts for the Fisheries Research Board of Canada.
 - (iii) Copies of certain logbooks of ships in the Bay of Bengal in connection with occurrences of cyclones and tropical storms, for Director of Observatories, Poona, India.
 - (iv) Sea temperatures at Seven Stones Lightvessel, October, 1953, to September, 1954, for Trevannance Clean Beaches Scheme, St. Agnes, Cornwall.
 - (v) Mean monthly wave heights in feet for Luce Bay, Point of Ayr, Portland Bill, Spurn Point, including averages and greatest wave heights, for a Government Department.
 - (vi) Wind and sea conditions likely to be encountered in May, 1955, on voyage Southampton to the West Indies via Vigo, for a private inquirer.
 - (vii) Likely date one would be able to land a flying-boat between 67°N and 68°N on the Greenland coast in the Cap Rink area, for a private inquirer.

(d) During the year over 60 inquiries necessitating certified statements of weather conditions were answered.

8. Publications

Quarterly numbers of *The Marine Observer* for April, July and October, 1954, and January, 1955, were published. The contents included such subjects as drifts caused by winds and currents, cargo ventilation, storm over the British Isles, the judgment of visibility at sea, detection of ice by radar, meteorological aspects of marine drilling, a verification of Ekman's theory and the history and development of the Meteorological Office. Replacement No. 1 to *The Marine Observer's Guide* was published and distributed. A revised edition of the atlas *Monthly Meteorological Charts of the Greenland and Barents Seas* is in the process of being printed.

A revised reprint of *International Meteorological Code, Decode for Use of Shipping* was published. Amendment List No. 1 to this publication was necessitated by recent international changes in meteorological codes.

The atlases *South Pacific Ocean Currents* and *Monthly Meteorological Charts of the Atlantic* are being reprinted.

A new publication *Meteorology for Mariners* is ready for printing.

9. International co-operation

The Marine Superintendent in his capacity as President of the Commission for Marine Meteorology of the World Meteorological Organisation carried out considerable international correspondence concerning the work of his Commission and related work for other technical commissions.

10. Awards

The meteorological observations made aboard selected and supplementary ships are recorded in special logbooks and are forwarded to the Marine Division for climatological analysis. These logbooks are carefully scrutinised and classified by a nautical officer, and prizes in the form of books are presented to the masters, principal observing officers and radio officers of certain ships whose records are classed as excellent. Excellent Awards were made to 100 selected ships during the year and names of the recipients are to be found on page 138. The books selected are *Sea Birds*, by J. Fisher and R. M. Lockley, and *The University Atlas*.

In addition inscribed barographs were presented to four master mariners who have been responsible for doing consistently good meteorological work at sea for a period of 15 years or more.

EXCELLENT AWARDS (Year ending 31st March, 1955)

SHIP	CAPTAIN	PRINCIPAL OBSERVING OFFICER	SENIOR RADIO OFFICER	OWNERS
<i>Afghanistan</i> ..	R. Connacher ..	N. H. Crawford ..	E. M. Petrie ..	F. C. Strick & Co., Ltd.
<i>Ajax</i> ..	S. C. Llewelyn ..	J. K. Marshall ..	A. E. Holman ..	A. Holt & Co.
<i>Arabistan</i> ..	J. E. Cooke ..	R. Ellingham ..	J. C. Crowley ..	F. C. Strick & Co., Ltd.
<i>Arawa</i> ..	L. J. Hopkins ..	E. Creese ..	P. W. Booth ..	Shaw, Savill & Albion Co., Ltd.
<i>Argentina Star</i> ..	E. R. Pearce, O.B.E. ..	S. Gill ..	J. Hulme ..	Blue Star Line, Ltd.
<i>Assyria</i> ..	J. G. Bradley, R.D., Capt. R.N.R. ..	W. B. Seubert ..	B. Long ..	Cunard Steamship Co., Ltd.
<i>Avisvale</i> ..	A. D. Niblett ..	S. T. Burt ..	W. L. Parry ..	Purvis Shipping Co., Ltd.
<i>Avondene</i> ..	F. Moorcraft ..	E. B. Fitzpatrick ..	J. T. W. Moody ..	Dene Shipping Co., Ltd.
<i>Avonmoor</i> ..	F. F. Gilbert ..	K. Arthur ..	K. O'Connor ..	W. Runciman & Co., Ltd.
<i>Baron Renfrew</i> ..	J. Wylie ..	C. Godson ..	M. Barry ..	H. Hogarth & Sons, Ltd.
<i>Beaverlodge</i> ..	W. S. P. Roberts ..	J. Brooks ..	E. R. Legear ..	Canadian Pacific Railway Co.
<i>Bellerophon</i> ..	A. R. McDavid ..	W. A. Dunn ..	J. C. Wilson ..	A. Holt & Co.
<i>British General</i> ..	R. Skea ..	J. L. Gillan ..	H. H. Houston ..	British Tanker Co., Ltd.
<i>British Patience</i> ..	N. Leybourne, D.S.C. ..	A. Longden ..	W. H. Ball ..	British Tanker Co., Ltd.
<i>British Piper</i> ..	J. Mason ..	P. R. Newton ..	D. Sheen ..	British Tanker Co., Ltd.
<i>Cairnavon</i> ..	G. H. Percy ..	A. R. Fairley ..	W. Anderson ..	Cairns, Noble & Co., Ltd.
<i>Calchas</i> ..	D. Jones ..	M. J. Jones ..	D. M. Hughes ..	A. Holt & Co.
<i>Canton</i> ..	J. C. W. Last ..	G. J. Jones ..	M. J. Murphy ..	P. & O. Steam Navigation Co.
<i>Captain Cook</i> ..	A. Bankier ..	A. Maclean ..	L. W. Hooper ..	Donaldson Bros. & Black, Ltd.
<i>Carnarvon Castle</i> ..	W. S. Byles, R.D., Capt. R.N.R. ..	J. P. Bains ..	H. G. Liggins ..	Union Castle Mail S.S. Co., Ltd.
<i>Ceramic</i> ..	F. A. Smith ..	B. Agnew ..	E. L. Boyce ..	Shaw, Savill & Albion Co., Ltd.
<i>Cingalese Prince</i> ..	B. R. Simons, M.B.E. ..	A. Farrar-Hare ..	K. McGuire ..	Prince Line, Ltd.
<i>City of Delhi</i> ..	W. Lowe ..	— Strong ..	— Cullen ..	City Line, Ltd.
<i>City of Khios</i> ..	T. Dennis ..	D. N. McDonald ..	A. Walsh ..	Hall Line, Ltd.
<i>City of Lyons</i> ..	I. R. Pulford ..	J. M. Longstaff ..	J. Jones ..	Hall Line, Ltd.
<i>Clan Macrae</i> ..	W. R. Woodrife ..	G. H. Marshall ..	M. Cuthbert ..	Clan Line Steamers, Ltd.
<i>Coptic</i> ..	A. E. Smith, R.D., Cdr. R.N.R. ..	C. A. Brodie ..	H. M. Burson ..	Shaw, Savill & Albion Co., Ltd.
<i>Dallas City</i> ..	D. W. Boutcher ..	P. Whitecross ..	B. S. Thompson ..	Sir William Reardon Smith & Sons, Ltd.
<i>Darro</i> ..	T. Powell ..		T. O'Dea ..	Royal Mail Lines, Ltd.
<i>Delphic</i> ..	C. L. Carroll, D.S.C., R.D., Lt.-Cdr. R.N.R. (Retd.) ..			
<i>Devonshire</i> ..	H. Kerbyson ..	D. A. Rogers ..	A. Morriss ..	Shaw, Savill & Albion Co., Ltd.
<i>Dominion Monarch</i> ..	B. Forbes-Moffatt ..	G. F. Risley ..	A. Jones ..	Bibby Bros. & Co., Ltd.
<i>Dorset</i> ..	A. E. Williams ..	R. O. Guille ..	F. V. Harford ..	Shaw, Savill & Albion Co., Ltd.
		B. D. Allan ..	J. Tomlinson ..	Federal Steam Navigation Co., Ltd.

<i>Edward Wilshaw</i>	H. W. Milne	E. R. Orr	G. O'Brien	Cable & Wireless, Ltd.
<i>English Star</i>	L. Vernon, M.B.E.	D. Newlin	H. Smith	Blue Star Line, Ltd.
<i>Eucadia</i>	W. MacVicar	D. Barclay	D. Sproat	Anchor Line, Ltd.
<i>Eumaews</i>	H. C. Large	R. H. Baldwin	J. Birchall	A. Holt & Co.
<i>Garvelpark</i>	A. McF. Allan	I. M. Ramsay	J. McL. Robertson	J. & J. Denholm, Ltd.
<i>Gloicester</i>	J. E. Bury	B. Smith	R. Oliver	Federal Steam Navigation Co., Ltd.
<i>Haparangi</i>	Sir David Aitchison, K.C.V.O.	I. MacIntosh	C. H. Roberts	Shaw, Savill & Albion Co., Ltd.
<i>Helicina</i>	D. Chadwick	B. Gulson	E. Graham	New Zealand Shipping Co., Ltd.
<i>Hertford</i>	W. C. Loughlin	A. Ferguson	S. D. Cox	Shell Tankers, Ltd.
<i>Hestone</i>	E. A. Burton	J. C. Waller	T. M. Ready	Federal Steam Navigation Co., Ltd.
<i>Himalaya</i>	J. deGaris	P. M. Gouger	N. Burnitt	Houston Line (London), Ltd.
<i>Hororata</i>	D. G. H. O. Baillie	N. D. Smith	J. F. Clarke	P. & O. Steam Navigation Co.
<i>Hurumu</i>	E. H. Hopkins	M. J. Charlesworth	T. N. Green	New Zealand Shipping Co., Ltd.
<i>King William</i>	F. Pover	A. Britain	A. H. Sandilands	New Zealand Shipping Co., Ltd.
<i>Lancashire</i>	J. C. Davies	F. W. Moss	W. Stirling	King Line, Ltd.
<i>Latia</i>	A. N. Williamson	J. W. Waldie	C. S. Talbot	Bibby Bros. & Co., Ltd.
<i>Laurentia</i>	J. Davison	G. T. Evans	N. Armstrong	Shell Tankers, Ltd.
<i>Leicestershire</i>	T. S. Graham	T. Scott	D. Murray	Donaldson Bros. & Black, Ltd.
<i>Loch Garth</i>	T. J. A. Thomson	L. D. Conway	J. E. Unsworth	Bibby Bros. & Co., Ltd.
<i>Malmesbury</i>	T. W. Stevens, R.D., Capt. R.N.R.	N. C. Kerr	J. Greenhalgh	Royal Mail Lines, Ltd.
<i>Mandasar</i>	S. W. Howell	K. Walker	J. Corfield	Houlder Bros. & Co.
<i>Marna</i>	G. A. Jackson, M.B.E.	R. H. Wills	B. Beecham	T. & J. Brocklebank, Ltd.
<i>Martand</i>	L. M. Smith	J. Carmie	B. J. Guy	Chr. Salvesen & Co.
<i>Master Nicolas</i>	H. Fosbrooke	D. Moore	B. O'Hara	T. & J. Brocklebank, Ltd.
<i>Mataroa</i>	R. Bradley	J. Teasdale	T. Cannon	Tsavliris (Shipping), Ltd.
<i>Matina</i>	R. G. James, R.D., Capt. R.N.R.	J. P. Miller	A. C. Knight	Shaw, Savill & Albion Co., Ltd.
<i>Menastone</i>	W. G. Lock	P. H. Morgan	C. F. McCullough	Elders & Fyffes, Ltd.
<i>Middlesex</i>	S. Sheasby	W. Ward	E. Barley	Thomas Stone (Shipping), Ltd.
<i>Mulberry Hill</i>	N. A. Thomas	W. D. F. Cooper	P. T. Higgins	Federal Steam Navigation Co., Ltd.
<i>Nestor</i>	A. G. Gillanders	S. G. Sanderson	H. Roberts	Counties Ship Management Co., Ltd.
<i>New Australia</i>	J. M. Anderson	B. A. Hood	H. Matthews	A. Holt & Co.
<i>New Zealand Star</i>	K. D. G. Fisher	P. K. Murchison	E. Ewart	Shaw, Savill & Albion Co., Ltd.
<i>Nicamia</i>	E. N. Rhodes	L. Franklin	C. R. McAnerney	Blue Star Line, Ltd.
<i>Novelist</i>	S. A. Greenaway	B. R. Alderton	J. M. Robinson	Shell Tankers, Ltd.
<i>Paranga</i>	R. H. Longster	J. F. Adams	C. Jameson	T. & J. Harrison, Ltd.
<i>Perthshire</i>	E. J. Kerridge	P. W. G. Everett	J. Pattie	P. & O. Steam Navigation Co.
<i>Philomel</i>	T. N. Soane	S. R. Davidson	T. A. Dunne	Turnbull, Martin & Co., Ltd.
<i>Port Adelaide</i>	H. M. Selmer	J. Flett	P. Keilly	General Steam Navigation Co., Ltd.
<i>Port Auckland</i>	C. R. Townshend	D. E. Bowden	J. S. Skinner	Port Line, Ltd.
<i>Port Dunedin</i>	J. G. Lewis, O.B.E.	E. E. Chapman	I. W. Hart	Port Line, Ltd.
<i>Port Fairy</i>	J. Stannard	P. P. Holmes	J. Sargent	Port Line, Ltd.
	L. W. Cady	N. Fraser		

EXCELLENT AWARDS (continued)

SHIP	CAPTAIN	PRINCIPAL OBSERVING OFFICER	SENIOR RADIO OFFICER	OWNERS
<i>Port Hobart</i> ..	P. S. Ball ..	D. J. Evans ..	P. A. Byrnes ..	Port Line, Ltd.
<i>Port Lincoln</i> ..	E. W. Dingle, M.B.E. ..	P. Richards-Jones ..	W. Paterson ..	Port Line, Ltd.
<i>Port Macquarie</i> ..	L. J. Skailes ..	R. W. Leslie-Makeig ..	W. E. G. Richards ..	Port Line, Ltd.
<i>Port Townsville</i> ..	E. W. R. Young ..	R. C. W. Marr ..	T. G. Thomson ..	Port Line, Ltd.
<i>Port Victor</i> ..	E. T. N. Lawrey ..	W. Duthie ..	D. MacNeil ..	Port Line, Ltd.
<i>Port Wellington</i> ..	T. L. Kidwell ..	D. I. Pull ..	J. B. French ..	Port Line, Ltd.
<i>Rakaia</i> ..	C. P. Robinson ..	P. J. Sedgwick ..	P. H. Broome ..	New Zealand Shipping Co., Ltd.
<i>Rangitata</i> ..	G. Kinnell, O.B.E. ..	J. T. Varney ..	J. Grant ..	New Zealand Shipping Co., Ltd.
<i>Rangitiki</i> ..	A. E. Lettington, O.B.E., D.F.C. ..	A. G. Mash ..	J. D. Charter ..	New Zealand Shipping Co., Ltd.
<i>Regent Royal</i> ..	R. Armstrong ..	J. A. Creswell ..	J. A. Jackson ..	Regent Petroleum Co., Ltd.
<i>Rialto</i> ..	H. Greenhill ..	A. M. England ..	C. V. Child ..	Ellerman's Wilson Line, Ltd.
<i>San Cirilo</i> ..	E. J. Osbourne ..	J. D. Baty ..	D. Neeson ..	Eagle Oil & Shipping Co., Ltd.
<i>Scottish Eagle</i> ..	R. R. Baxter ..	J. A. Brown ..	D. Witteridge ..	Scottish Tanker Co., Ltd.
<i>Sussex Trader</i> ..	H. Young ..	T. E. Thistleton ..	P. Jordan ..	Trader Navigation Co., Ltd.
<i>Telemachus</i> ..	N. A. Rae, M.B.E., R.D., Lt.-Cdr. R.N.R. ..	J. H. Lockwood ..	J. C. Noble ..	A. Holt & Co.
<i>Trevider</i> ..	F. G. Bolton ..	D. A. Loud ..	L. Leuchars ..	Hain S.S. Co., Ltd.
<i>Twickenham</i> ..	I. A. Tully ..	J. Collister ..	W. M. Mackenzie ..	Watts, Watts & Co., Ltd.
<i>Umtali</i> ..	F. E. J. O'Hea ..	J. H. Butcher ..	S. Hewett ..	Bullard, King & Co., Ltd.
<i>Umtata</i> ..	D. L. Weston ..	G. S. Wood ..	J. Molloy ..	Bullard, King & Co., Ltd.
<i>Umzinto</i> ..	R. Harber ..	J. G. Campbell ..	S. Merchant ..	Bullard, King & Co., Ltd.
<i>Velletia</i> ..	S. Algar ..	R. G. Kiddle ..	R. E. Blair ..	Shell Tankers, Ltd.
<i>Waipawa</i> ..	J. L. Stobbs, R.D., Lt.-Cdr. R.N.R. ..	A. S. G. L'Estrange ..	J. Houghtney ..	Shaw, Savill & Albion Co., Ltd.
<i>Wales Bay</i> ..	A. Donald ..	W. K. West ..	H. Wilson ..	Sir R. Ropner & Co., Ltd.
<i>Warkeworth</i> ..	N. Thompson, M.B.E. ..	R. Atkinson ..	B. Holyoake ..	R. S. Dalgleish, Ltd.
<i>Worcestershire</i> ..	F. C. Brooks ..	R. W. Barton ..	W. G. Fletcher ..	Bibby Bros. & Co., Ltd.

The Growth of Meteorological Services for Seamen

By Cdr. C. H. WILLIAMS, R.D., R.N.R.
(Marine Division, Meteorological Office)

In the January, 1955, number of this journal an article entitled "Some Landmarks in Meteorological Progress", by R. F. M. Hay, M.A., made reference to the first gale warnings for shipping. The first cautionary or storm-warning signals were made on 6th February, 1861. These were devised by Admiral FitzRoy, who was then Head of the Meteorological Department of the Board of Trade. After a year or two of experiment and a good deal of argument on the matter he was allowed to issue storm warnings to various parts of the country.

In 1857 it had been arranged that simultaneous observations should be made at a number of selected stations in the British Isles, and these were telegraphed to London where they were plotted on synchronous charts. From these charts it was seen that distinct intimation of marked changes in the weather and warnings of dangerous storms might be made available to the areas likely to be affected.

The idea of giving warning of storms by telegraph was familiar in Europe and in America even before the year 1836, but that was by semaphore telegraph only. The gradual introduction of the electric telegraph during the period 1837-50 provided much more simple and speedy means of transmitting these warnings, and resulted in the system of warning cones hoisted at a large number of ports which is in use to this day in very much the same form. To quote from *The Weather Book* by Admiral FitzRoy, published in 1863:

"In August, 1861, the first published forecasts of weather were tried; and after another half-year had elapsed for gaining experience by varied tentative arrangements the present system was established. Twenty-two reports are now received each morning (except Sundays) and ten each afternoon besides five from the Continent. Double forecasts (two days in advance) are published with the full tables (on which they chiefly depend) and are sent to eight daily papers and to one weekly, to Lloyds, the Admiralty, the Horse Guards (War Office), the Board of Trade and the Humane Society."

(It can be seen now that these forecasts, especially those for two days in advance, were much too ambitious, based as they were on only 22 telegraphed reports. Nowadays some hundreds of reports extending over all Europe and the North Atlantic are needed every few hours in order that forecasts for 24 hours ahead may be made.)

To resume the quotations from FitzRoy's *Weather Book*:

"Prophesies or predictions they are not; the term forecast is strictly applicable to such an opinion as is the result of a scientific combination and calculation. . . . Certain it is that although our conclusions may be incorrect, our judgment erroneous, the laws of nature and the signs afforded to man are invariably true. Accurate interpretation is the real deficiency. . . . Having collated and duly considered the Irish telegrams the first forecast for that district is drawn and then successively the west central, north-west France, south-west, south-east and east coasts are taken. These comparisons being made and the first forecasts altered as requisite, short expressive abstracts are written, copied and forthwith sent out for immediate publication. Should the indications be such as to require cautionary signals to be shown along any or all of the coasts, a printed list of places is sent with merely a word or two in addition to the Telegraph Offices close at hand. These words are simply 'North Cone' or 'South Cone', 'Drum' or 'Drum and N. (or S.) Cone',* as the case may require. . . . These cautionary notices are transmitted rapidly, signals being shown around the coasts in about half an hour from the telegrams leaving London at about 200 stations when all are warned. Their value has been fully proved and acknowledged but the forecasts which are their actual foundation

* Some time between 1871 and 1887 the "Drum" was dispensed with, and only the North and South cones have been used ever since.

are not yet so generally noticed, not being fully compared, or fully appreciated."

It is an interesting fact that the telegraphed weather messages referred to by Admiral FitzRoy in 1863 were in a figure code, in five-figure groups, on the same principle as the five-figure groups in the present-day international meteorological code. FitzRoy also mentions barographs as instruments that had been newly invented in 1861. The introduction of visual gale warnings in 1861 at ports in the British Isles was undoubtedly a great step forward in the utilisation of meteorological knowledge. The warnings must have saved many ships and lives. FitzRoy was described at the time as "One of the greatest living benefactors of our age".

Much other work was done through Government Meteorological Offices in the fifties and sixties of the last century; by FitzRoy and later by Toynbee in this country and by Maury in the U.S.A., building on work previously done by private individuals. Maury's wind and current *Pilot Charts* have been well known to navigators ever since, and in FitzRoy's time wind charts were produced. Both officers had the same twofold object in view; of aiding navigators by making navigation easier and more certain, and of amassing accurate observations over all the oceans for the purpose of scientific research into weather and climate. This work continued steadily. A number of publications were produced and made available to shipping.

In 1882 synoptic charts were drawn for the period 1st August to 3rd September over the whole of the North Atlantic, using the data extracted from ships' meteorological logs. These charts formed the basis for the discussion of weather systems, and they enabled Abercromby to draw up his prognostics which were largely used in forecasting right up to the end of the 1914-18 War. Monthly meteorological charts of the North Atlantic were made available to ships in 1901 and similar charts of the East Indian Ocean in 1906. The backs of these charts were used as a means of communication between the Marine Division of the Meteorological Office and the observers abroad.

Nowadays ships on most of the important trade routes are well supplied with weather information by means of radio bulletins, giving gale warnings and forecasts for stated areas of oceans. This modern aspect of the work was, of course, only possible after the introduction of wireless telegraphy in ships early in this century. In 1909 a few transatlantic liners commenced w/T weather reports to the shore when within range. This marked another great step forward in marine meteorology. *The Marine Observer's Handbook* and *Seamen's Handbook of Meteorology* were published in 1915. The latter was designed as a companion to the old *Barometer Manual* which had been first published in about 1861. There had also been a *Fishery Barometer Manual* in 1864 giving clear and useful guidance to fishermen.

Another important service for seamen was the introduction of the International Ice Patrol in 1913, following the tragic loss of the liner *Titanic* the previous year.

By the end of the 1914-18 War wireless telegraphy in ships had much improved in range and reliability, making possible a much more ambitious scheme of ships' weather reporting as well as the introduction of a radio bulletin for ships in coastal waters; this was the commencement of the *Weather Shipping Bulletin* in 1919. In February that year a conference on "weather reports from ships" had been held at which the Admiralty, the Air Ministry and the Meteorological Office were represented, and at subsequent conferences it was agreed that radio weather reports from ships in the North Atlantic (which had been suspended during the war) should be resumed as soon as possible. A new code* and schedule were agreed upon. The idea was that ships, in addition to transmitting their weather messages in a simple code to shore stations for meteorological services, should be encouraged to exchange such synchronous observations at sea. This latter idea of exchanging coded messages did not become much used, although ships of the same owners often exchanged messages in plain language giving weather information.

* The first comprehensive international code for radio weather reports from ships was introduced by the International Meteorological Organisation in 1921.

Ships in the Atlantic were by that time able to transmit their weather messages to the shore from as far as longitude 40°w, and on 27th March, 1921, the first post-war coded weather report from a ship was received in the Meteorological Office. Thus began the present system of ships' weather reports by radio, which has now spread into a world-wide international organisation. The greatly increased number of ships' reports enabled forecasts to be issued covering large sea areas.

In June, 1921, a forecast message was introduced covering the western seaboard of the British Isles and giving observations in code of the actual weather at five shore stations—Stornoway, Blacksod, Holyhead, Scilly and Dungeness. In a few ships attempts were made to plot simple weather charts, based on this scant information and a few intercepted ships' reports.

From this has grown the present-day Atlantic Bulletin from which any ship can plot a comprehensive weather chart of the eastern Atlantic. The Weather Shipping Bulletin for coastal areas was greatly extended to include the North Sea and other areas until we now have 26 named coastal areas. The visual gale warnings continue in much the same form as first used.

Contact between the Marine Division of the Meteorological Office and the masters and officers of the voluntary observing ships is essential. This is done primarily by the Port Meteorological Officers and Merchant Navy Agents, and until 1924 it was supplemented by the issue of monthly "Pilot Charts" of all oceans on the backs of which were printed articles on various aspects of the meteorological work at sea. These charts were expensive to produce, the data shown on them very crowded and the large size made it difficult to keep them for reference. And so, in January, 1924, *The Marine Observer* superseded the Pilot charts. It was published monthly until 1933 when it was changed to a quarterly edition. During the 1939-45 War the present climatological atlases of all oceans, based on information secured from voluntary observing ships from 1855 to 1939 were produced; these are available to all British selected ships on request.

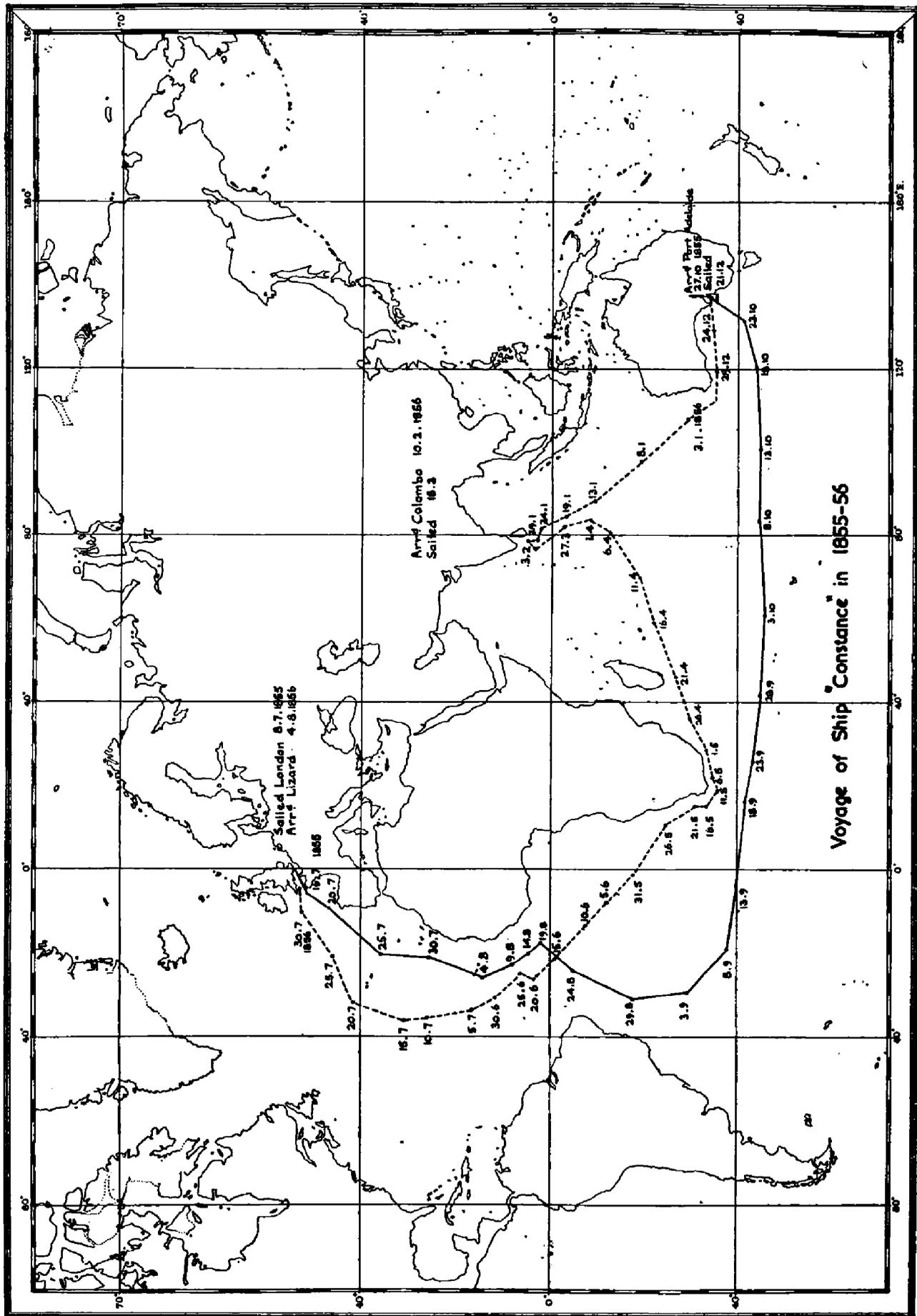
Old Time Marine Observer's Log

Continuing the notes published in the January number taken from old meteorological logbooks which are still in the Marine Division, the following is an extract from the Weather Book Register of the full-rigged ship *Marlborough*, Captain Henry Toynbee, on a passage from Madras to Table Bay in January, 1861. In the logbook was a watercolour sketch of clouds. It was painted by Mr. H. C. Lawton, one of the officers, and Captain Toynbee added remarks as follows:

"Mr. Lawton has succeeded in representing the cloud which I am inclined to call fog cloud (I have called it Stratus in the Weather Book). It is the lowest cloud we have, moving as it does with the lower stratum of the atmosphere, its motion is perhaps more watched by the sailor than that of any other cloud. In a calm if he notices the distant clouds (of this kind) beginning to move he feels sure that a breeze is coming; he never likes to see the sky without it, in fact it might be called the 'sailor's friend'."

(Opposite page 156 is a photograph of the watercolour sketch. The cloud would probably be described nowadays as stratusfractus. In the actual coloured sketch the sky was shown a deep blue; this appears as a darker tone in the photograph in order to show up the cloud by contrast. The remark about sailors not liking to be without a breeze applies, of course, to the days of sail.)

Below is a chart showing the voyage of the full-rigged ship *Constance* during the years 1855 and 1856. The positions are plotted for every fifth day, so the tracks are only approximate. The *Constance* sailed from London on 8th July, 1855, being towed from Gravesend to sea by a steam tug with the delightful name of *Friend of all Nations*. The logbook from which the positions have been plotted was one of the very early logs received in the Meteorological Office. It was not a regularly



printed logbook but was one in which the headings of the columns were written each day. The writing is very good indeed, with many remarks on both weather and the work of the ship, sails set or furled, etc.

On her outward voyage she made the passage from London to Port Adelaide, Australia, in 111 days, arriving there on 27th October, 1855. She sailed from there on 21st December bound for Colombo, arriving on 10th February, 1856, 51 days out. On 18th March she sailed from Colombo bound for London, arriving off the Lizard on 4th August, a slow passage of 139 days. Her round voyage had taken $12\frac{1}{2}$ months.

Extracts from the Meteorological Logbook of the Wooden full-rigged ship *Pizarro*, Captain Samuel White Sweet, on a voyage to Honolulu in 1859

This is a very clearly-written log with the barometer readings to .001 of an inch and the thermometer readings to a tenth of a degree F. It is chiefly remarkable for the many interesting remarks on the appearance and colour of the sky and the sea, accompanied by small pen and ink sketches of the many birds, fish and other life of the ocean. The following are a few extracts from these remarks, with tracings of the little drawings.

Captain Sweet laid great store by his M.O. barometer. He noted in the logbook: "I have found the barometer in passing round Cape Horn an infallible guide; this as well as on other occasions."

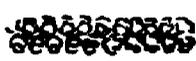
And later he remarked: "If you are well acquainted with the barometer I fancy it almost speaks to one."

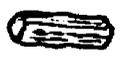
On the passage from Liverpool to Honolulu, on 9th February, 1859, in latitude $37^{\circ} 43's$, longitude $89^{\circ} 26'w$ he noted: "The wind has been very unsettled. This morning and at 10 a.m. it shifted into the SE and then we had a strong 'rip'. The wind was NW previous to the shift and light with rain, so the small waves running SE met the wind from that quarter (NW) which blew the tops off the waves over which one got the idea of a strong current (and a very erroneous one)."

On 19th June, 1859, when in latitude $55^{\circ} 48's$, longitude $136^{\circ} 52'w$, he noted: "Midnight. Saw three icebergs—about 150 ft high and 200 ft long and some small pieces."

And on 23rd June in latitude $59^{\circ}s$, longitude $119^{\circ}w$: "At 5 a.m. saw an immense iceberg about three miles long and 600 ft high."

On the homeward passage:

Lat. $38^{\circ} 14's$, Long. $43^{\circ} 15'w$. "This is the size of life; it is just like a piece of glass tube, for the centre and little hollow cups on each side of it with small mouths at the outside part, and it moves very quickly  by contracting the cups (a sort of convulsive action). It moves either end first. I broke one in two but the pieces appeared just as lively as before separated."

Lat. $37^{\circ} 39's$, Long. $39^{\circ} 30'w$. "This moves by convulsive jerks. It is also jelly-like with streaks in it like frame or bone streaks; they are more opaque than the body." 

Lat. $22^{\circ} 23's$, Long. $27^{\circ} 37'w$. "Saw four fin-backed whales. First of the flying-fish seen today."



Lat. $20^{\circ} 24's$, Long. $27^{\circ} 19'w$. "Porpoises about. Saw a very large whale close to the ship. 'Hump-back', I think."



Lat. 20° 24's, Long. 27° 19'w. "Drew up in a bucket some kind of a jelly-like glass which appeared to have no life in it."

"That is the size of it and had very light specks down the middle of it."

"A boatswain bird about."

Lat. 17° 30'N, Long. 35° 44'w. "A large school of sperm whales going north-east and a very large school of porpoises. Caught one; it had several squid in its stomach."



Note. The little drawing of a sperm whale is of interest, as it shows one of the main differences between it and other whales; the spout is angled forward instead of upright.

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.

ICEBERGS

North Atlantic Ocean

S.S. *Empress of Australia*. Captain J. P. Watson, R.D., R.N.R. Montreal to Liverpool. Observer, Mr. R. T. Stoneley, 4th Officer.

8th September, 1954. Two icebergs were observed, photographs of which are reproduced opposite pages 157 and 172. The iceberg shown in Figs. 1 and 2 was 240 ft. high, and that shown in Fig. 3 180 ft high. The photographs were taken with a German camera, the Frauka, having a lens of 3.5cm focus. Exposures were 1/25 sec stop 16 for Figs. 1 and 2 and 1/50 sec stop 11 for Fig. 3, both on Verichrome film.

Position of ship: 52° 01'N, 54° 24'W.

Note. These excellent photographs show the details of the bergs very well. They are also interesting because the bergs were observed about 90 miles outside (to the eastward of) the extreme limit of bergs in this region for the month of September, as shown in M.O.M. 465, *Monthly Ice Charts, Western North Atlantic*. The limit so shown is that beyond which bergs and growlers have only been reported on rare occasions, 1920-43.

BOTTLE DRIFT

North Atlantic Ocean

M.V. Georgic. Captain G. H. Morris. Southampton to New York.

On 9th September, 1953, Mr. K. D. A. Lamb, Junior 1st Officer, threw a bottle overboard in position 43°N , 51°W . He has in the last few years thrown overboard about 24 bottles, but this is the first occasion on which the finder, if any, has written to him.

The bottle was discovered by M. Lemerrier Gilbert whilst on holiday at Biscarosse-Plage (approximate position $44^{\circ} 25'\text{N}$, $1^{\circ} 14'\text{W}$) at 0500 on 17th August, 1954. The actual position was about 1 km. south of Biscarosse-Plage.

Note. This is an interesting observation. From the Great Bank of Newfoundland the North Atlantic Current fans outward in directions between E and NE. Bottles thrown overboard in this region which have got into the more NE'ly part of the current have been picked up on the west coast of Norway. In the present instance the bottle, whatever its temporary vicissitudes owing to current variability, made good an E'ly course towards the English Channel, whence it was diverted by the generally S'ly tendency of the current in the eastern part of the ocean into the Bay of Biscay.

CURRENT RIPS

Pacific Ocean

S.S. Captain Cook. Captain A. Bankier. Balboa to Wellington. Observers, the Master and Mr. A. Maclean.

9th August, 1954, 1930 G.M.T. (0950 L.T.). When $17\frac{1}{2}$ miles off Turiea Papakena (Papakava) current rips were observed lying in a W-E, curving ENE, direction and widespread. Demarcation between rip and surrounding sea was very clearly defined, the rip being of greenish-white close to and nearly black in the distance. The sounding machine was run constantly in this area but no soundings were obtained.

Position of ship: $20^{\circ} 31'\text{S}$, $148^{\circ} 47'\text{W}$.

PHOSPHORESCENCE

Atlantic Equatorial Waters

S.S. Avondene. Captain F. Moorcraft. Newport (Mon.) to Buenos Aires. Observer, Mr. A. Booth, 3rd Officer.

2nd July, 1954, 2300 G.M.T. Bands of phosphorescence were observed on the water in a 100° - 280° general direction. They were about 10 yd wide and 100 yd apart. It was a dark night and the bands could be seen stretching away from the ship for a considerable distance. The bands were quite well defined and consisted of numerous pieces of about 5 in. to 9 in. in length, with very few pieces between the bands. The phenomenon lasted for about 20 min till 2320. Wind 100° , force 4. Air temp. 76.9°F , sea temp. 77.1° .

Position of ship: $00^{\circ} 30'\text{N}$, $31^{\circ} 10'\text{W}$.

S.S. Umzinto. Captain R. Harber. Ascension to London. Observers, the Master and Mr. J. Lyon, 4th Officer.

31st August, 1954, 2345 G.M.T. A stationary belt of marked phosphorescence was encountered which appeared to be extending in an E-W direction across the horizon. At a distance of 5 miles the horizon appeared as a suffused glow, which, on closer approach, resolved into phosphorescent light emitted from numerous small breaking wavelets. After travelling 3 or 4 miles in the belt the phosphorescent content of

the water appeared to diminish; a further 30 to 35 miles was traversed before the phenomenon ended. During the preceding hour the sky had been overcast with low cloud, mainly Cu, but at the time of the observation was clear.

Position of ship: $01^{\circ} 46'N$, $15^{\circ} 55'W$.

Gulf of Guinea

M.V. *Roxburgh Castle*. Captain W. C. J. Swift. Cape Town to Las Palmas. Observer, Mr. A. D. Mildren, 3rd Officer.

30th August, 1954. Between 2030 and 2200 G.M.T. very marked phosphorescence was observed around the ship, and on each side lines of phosphorescence appeared at 50 yd intervals up to $\frac{1}{2}$ mile distant. These lines were observed up to $\frac{1}{4}$ mile ahead. The distances are estimated. Wind SE, force 2-3. Air temp. $72^{\circ}F$, wet bulb 70° , sea temp. 74° .

Position of ship at 2100: $5^{\circ} 40'S$, $3^{\circ} 30'W$.

S.S. *Clan Macrae*. Captain W. R. Woodriffe. Dakar to Durban. Observer, Mr. G. E. Mitchell, 3rd Officer.

31st August, 1954, 0130-0230 G.M.T. Isolated patches of phosphorescence were seen on both sides of the vessel. At about 0145 on the port side a trail was observed about $2\frac{1}{2}$ miles in extent, about 50 to 100 ft broad and about 100 yd from the vessel. Between the ship and the trail were bright spots of phosphorescent light which were not caused by the ship's wake, while in the bow wave these bright spots were markedly increased. When observed through binoculars the spots took various forms—stars, crescents, cigar shapes and others—sometimes breaking into a cascade of smaller particles when disturbed by the water surface breaking. Sea smooth, sky overcast.

Position of ship: $3^{\circ} 15'S$, $7^{\circ} 30'W$.

Gulf of Aden

S.S. *San Felix*. Captain J. Bright. Mena-al-Ahmadi to Gibraltar. Observer, Mr. S. D. Mayl, 3rd Officer.

22nd August, 1954, 1800 G.M.T. The sea was glassy calm with a moderate swell and the vessel passed several patches of phosphorescence. One such patch glowed brilliantly as it came abeam, the centre then faded away and left a circle of phosphorescence which appeared to expand. Other patches were apparently moving through the water, one being seen to cross the path of the ship from one side to the other. The vessel's bow wave and the water alongside glowed brilliantly throughout.

Position of ship: $14^{\circ} 41'N$, $50^{\circ} 42'E$.

S.S. *British Sailor*. Captain E. J. Cole. Suez to Mena-al-Ahmadi. Observer, Mr. J. A. Surman, 2nd Officer.

25th August, 1954, 0145 A.T.S. The sea was glassy calm, but on the horizon to the NE there appeared a white bank as of fog which spread towards the vessel. After about 10 min the whole sea surface over an arc of 180° from right forward to right aft on the port side of the ship was covered as if by a coating of milk. On the starboard side the sea surface had a normal appearance. This phenomenon lasted for 30 min, when the sea surface gradually resumed its normal colour, a very dark green. After a further 10 min the phenomenon returned and lasted for 45 min when it finally disappeared. Neither the bow wave nor the wake of the vessel showed any marked phosphorescence. Wind at 0145 SSW, 3-4 kt, which suddenly dropped. Sky heavily overcast with low Nb; visibility throughout 10 miles. Air and sea temp. $74\frac{1}{2}^{\circ}F$.

Position of ship: $16^{\circ} 00'N$, $54^{\circ} 20'E$.

Arabian Sea

S.S. *Helicina*. Captain W. C. Loughlin. Cape Town to Mena-al-Ahmadi. Observer, Mr. A. Alexander, 2nd Officer.

1st September, 1954, 2330 G.M.T. The vessel passed through a large area of phosphorescent water, while there was a strong "sweet" odour.

Position of ship: $21^{\circ} 50'N$, $60^{\circ} 04'E$.

Note. In the last number of this journal, page 93, an observation by S.S. *Rookwood* of a fishy odour associated with phosphorescence was recorded. The observation of S.S. *Helicina* is the first instance we have had of a sweet odour being noted in this connection.

PHOSPHORESCENCE SEEN IN THE AIR

Arabian Sea

S.S. *City of Khios*. Captain T. Dennis. Aden to Karachi. Observer, Mr. D. Brown, 2nd Officer.

23rd July, 1954, 2100 G.M.T. Shafts of pale white light were observed moving swiftly NE-SW. They appeared to be just above the surface of the sea and parallel with each other. They were passing the ship at the rate of about one per second, and appeared to stretch as far as the eye could see on each side of the vessel and did not at any time appear to curve. After about 15 min the phenomenon disappeared. Wind WNW, force 4. Sky partly cloudy and moon obscured by cloud.

Position of ship: $24^{\circ} 19'N$, $66^{\circ} 20'E$.

Note. This observation is of very great interest as it adds another to the six instances that we already have of phosphorescence apparently seen in the air above the sea surface. One of these, from the German ship W.M.S. *Olympic Challenger*, was published on page 233 of the October, 1954, number of the journal, and the other five are referred to in the note which follows on page 234. The observation of S.S. *City of Khios* is the first received from a British ship of phosphorescence seen above the sea surface; it is of moving parallel bands, not of a phosphorescent wheel.

On re-examination of the other observations where the luminosity was seen in the air, it appears that only two of them can definitely be called phosphorescent wheels. These are the observation of W.M.S. *Olympic Challenger* in November, 1953, when the centre of rotation was seen to be at about 1 mile from the ship, and that of S.S. *Van Waerwijck* in November, 1920.

PHOSPHORESCENCE AND RADAR

Equatorial Pacific Waters

M.V. *Malaita*. Captain Brett Hilder. Rabaul to Sydney. Observers, the Captain and Mr. T. A. Colquhoun, 2nd Officer.

5th September, 1954, 0100 S.M.T. Off the eastern point of New Guinea approaching China Strait, where the waters are dangerous with coral islets and submerged reefs, with the radar on continuously, the Second Officer reported a loom of light to the SW, extending over about 15° . There were reefs in that direction, distant about 5 miles, and the loom remained apparently in coincidence with the reefs as they came abeam and dropped astern. This loom appeared to be more brilliant than I have observed before.

At 0200 we were on a course of $210^{\circ}T$, heading for the light on Bright Island, when a loom appeared in that direction and extended rapidly from ahead to some points on the port bow. This was likewise in coincidence with some submerged reefs, but as the lighted area came over the horizon towards us it was closer to us than the reefs should have been. We were fixing the ship's position by cross bearings as well as by radar, and I noticed that the radar screen showed what appeared to be a rain squall in the area of phosphorescence. To the eye the light did have rather the appearance of a white squall of fierce wind and rain, except for the

illumination. As we got closer the light showed up in horizontal streaks, like sand-banks or submerged reefs, and as we were going to meet the area before we could alter course it was quite alarming. The masses of phosphorescence and the echo on the radar both covered an area of about 2 miles square. The set was Marconi Radiolocator Mark IV, 3-mile range, sweep speed 21 r.p.m.

At 0220 the ship met the area, and the nearest patch passed under the ship. Our breaking bow wave showed up dark against the light, which seemed to be at least 2 fathoms down. The long patches appeared to be round in section and had rounded ends, and while most of them were parallel to the horizon, some curved sharply away, as shown in the sketch made by the master (see page 156). The islands in sight are Deedes, Good and Bright Islands with Engineer Group in the background.

Light rain was falling from an overcast sky, with a lot of fractonimbus about. The ship reached the radar echo at the same time as the phosphorescence, but there was no noticeable increase in precipitation or wind force. The illumination was very brilliant but did not vary or pulsate, nor did it have any proper motion except relative motion caused by the ship's speed of 10 kt. The wind was light, about SE, force 2, with slight sea and swell. Air temp. 78°F, wet bulb 76°, sea temp. 80°.

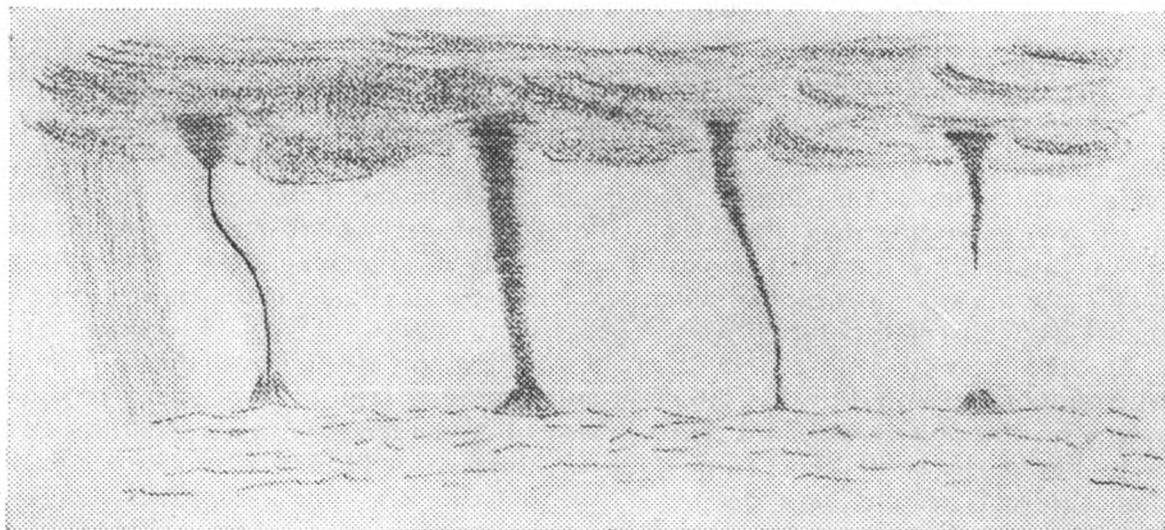
In the circumstances I came to the conclusion that the phosphorescence was actually shown on the radar screen. This is scarcely credible, but if radar can be shown to stimulate this effect in the sea perhaps it can be stimulated in return, possibly through the agency of a low cloud in both directions.

Note. The following comment on the above observation has been received from Mr. J. R. Webster, of the Ministry of Transport and Civil Aviation (Marine Nav. Aids Division):

“The radar echoes might have been either sea-clutter or rain-clutter, more likely the former, if there was broken water due to submerged reefs. The report does not provide sufficient evidence of a common source of the radar echoes and phosphorescence and I cannot imagine that they were from a common source, particularly as the phosphorescence is reported to have been ‘at least two fathoms down’. I am sorry that I am unable to make any constructive comments, but the report does not give any clue to the source of the radar echoes and the only connection with the phosphorescence appears to be in geographical location.” This observation was sent also to other authorities.

WATERSPOUTS North Atlantic Ocean

M.V. Esso Plymouth. Captain H. W. Brice. London to Baytown (Texas). Observer, Mr. G. R. Eunsen, Chief Officer.



9th September, 1954, 2000–2100 G.M.T. Very heavy clouds of dark blue colour formed to westward, believed to be Cb; the nearer part of the cloud mass resembled

a line squall cloud. Heavy rain squall observed on radar screen 15 to 16 miles to NW. Seven waterspouts formed ahead of the rain squall approaching the ship. All the spouts appeared to be of small diameter and the direction of rotation could not be determined. Soon after forming all started to bend with the bases running ahead of the tops. Each dispersed as the rain squall approached it, but immediately before dispersing a part was lifted up to cloud base, leaving only a thin dark-coloured cone with apparent haze around it. At one time four fully-formed spouts could be seen. The height of the cloud base from which the spouts formed was approximately 5° , but at one point cloud almost came down to horizon. Heavy rain at ship from 2100 prevented further observation.

Position of ship at 2000: $21^{\circ} 44'N$, $75^{\circ} 19'W$.

M.V. *Canadian Leader*. Captain D. Creaser. Halifax to Nassau. Observers, the Master and Mr. S. H. Withers, 2nd Officer.

16th July, 1954, 1805–1835 G.M.T. Heavy Nb cloud covered half the sky from which nine waterspouts were observed. (Seven visible at one time.) The largest spout had a diameter of 60 ft at sea level. The base of the cloud was about 200 ft and the length of the largest spout about 300 ft, which was observed from 300 yd. The spouts travelled from SW to NE.

Position of ship: $37^{\circ} 30'N$, $69^{\circ} 00'W$.

ST. ELMO'S FIRE Eastern Pacific Ocean

M.V. *Drina*. Captain F. J. Swallow. Balboa to Acajutla. Observer, Mr. J. W. F. Collins, 2nd Officer.

28th August, 1954, 0600 G.M.T. During a violent thunderstorm St. Elmo's fire was observed on top of the jackstaff; there were three beams equally spaced radiating as spokes of a wheel of great brilliance. The "fire" appeared to be jumping back and forth on steel plate in the bows and crackling. A strong tingling sensation which caused the hair on hands, arms and head to stand up was experienced when a hand was placed on metalwork in proximity of the bow. The thunderstorm lasted about one hour and the "fire" was observed throughout.

Position of ship: $09^{\circ} 01'N$, $84^{\circ} 34'W$.

Note. This is an observation of special interest on account of the variety of phenomena experienced. We do not recollect a previous instance of several beams radiating from a comparatively small surface such as the top of a jackstaff.

LUNAR HALO Bay of Biscay

M.V. *Trevider*. Captain F. G. Bolton. London to Port Said. Observer, Mr. D. A. Loud, 2nd Officer.

13th September, 1954, 0120–0150 G.M.T. A complete lunar halo was observed, radius 46° , with arc of lower contact to the left. It was about 4° in width, bright and clear all round and showing the colours of the spectrum, pale red on the inside. The altitude of the moon was about 42° .

Position of ship: $46^{\circ} 00'N$, $07^{\circ} 30'W$.

Note. The 46° halo is not usually seen complete, probably on account of the large area of sky which has to be covered with Cs to include it. The observation of the lower arc of contact, known in the case of this halo as an infralateral arc, is interesting since those arcs are very rarely seen. Two of them can be formed, one on the left and one on the right of the vertical line through the moon or sun. With increasing lunar or solar altitude these arcs move towards each other until at an altitude of about 68° they merge into one curve, tangent to the halo at its lowest point.

Gulf of Cadiz

S.S. *British Sailor*. Captain E. J. Cole. Port Said to United Kingdom. Observer, Mr. P. Frier, 3rd Officer.

13th September, 1954, 2215 G.M.T. A lunar halo was observed with a measured diameter of 35° . The altitude of the moon was $41\frac{1}{2}^\circ$.

Position of ship: $36^\circ 37'N$, $08^\circ 12'W$.

Indian Ocean

S.S. *Marabank*. Captain T. S. Robertson. Colombo to Cape Town. Observer, Mr. A. Smith, 3rd Officer.

6th September, 1954, 1530 G.M.T. A lunar halo was observed of radius 15° ; the altitude of the moon was 48° . By 1555 the radius appeared to increase to 18° . The sky inside the halo appeared much darker than that outside. At 1615 halo and moon were obscured by low cloud.

Position of ship at 1800: $1^\circ 00'N$, $75^\circ 30'E$.

Note. An observation of a 15° halo by S.S. *Baron Maclay* was published in the January, 1955, number of this journal, page 36. In the note appended it was stated that this is not a recognised radius and that the halo must therefore be classed as abnormal. It is thus of particular interest to have another similar observation so soon afterwards. The 18° halo seen soon afterwards belongs to the class known as the 17° halo, the observed radii of which are from about 17° to 18° . The observation by S.S. *British Sailor* is also of this halo.

S.S. *Clan Mackinnon*. Captain J. P. Dumphy. Colombo to Aden. Observer, Mr. E. J. E. Owen, 2nd Officer.

17th July, 1954, 2330 G.M.T. A lunar halo was observed of radius $24\frac{1}{4}^\circ$, and the moon at altitude 54° . The inner edge of the halo was clear and very sharp, but the outer edge appeared to be serrated. The halo appeared to be very wide, and although accurate measurement was not possible it was estimated to be $3\frac{1}{2}^\circ$ to 4° . The halo was visible for 70 min and became less distinct towards the end of the period, but apparently maintained the observed radius.

Position of ship: $07^\circ 56'N$, $59^\circ 08'E$.

Eastern Pacific Ocean

S.S. *Mulberry Hill*. Captain A. C. Gillanders. San Pedro to Panama Canal. Observer, Mr. S. G. Sanderson, 2nd Officer.

17th September, 1954, 0925 G.M.T. A pronounced lunar halo was observed, with radius of inner edge $23\frac{1}{2}^\circ$ and altitude of moon 76° . The width of the halo was approximately 3° but the outer edge was not clearly defined. At 0945 the halo became less brilliant and by 1010 it was completely obscured by broken lower cloud.

Position of ship: $09^\circ 50'N$, $87^\circ 56'W$.

Note. The halos of $23\frac{1}{2}^\circ$ (computed radius $23^\circ 24'$) and $24\frac{1}{2}^\circ$ (computed radius $24^\circ 34'$) are of great rarity, since each is normally masked by the ordinary 22° halo on which it would be superimposed, resulting only in making the 22° halo look broader than usual. In the observations of S.S. *Clan Mackinnon* and S.S. *Mulberry Hill* the 22° halo was fortunately not visible, thus enabling the slightly larger radii to be clearly measured. The observations are thus of great interest, particularly as we have had no previous ones of these halos.

ABNORMAL REFRACTION

South Atlantic Ocean

M.V. *Carnarvon Castle*. Captain W. S. Byles, R.D., R.N.R. Madeira to Cape Town. Observers, Mr. Cochrane, Chief Officer, and Mr. T. M. Logan, 4th Officer.

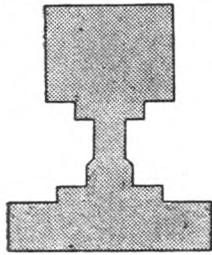
20th August, 1954, sunset. Off Cape Seal the sun set normally until about nine-tenths below the horizon. The remaining tenth then appeared to spread out to more than the sun's diameter and assume an oblong shape, which remained for 3 min; the sun then set in 1 min. After the sun had set mountain tops assumed elongated

shapes and peaks pencil-like forms. One peak appeared to change position on the mountain. About 5 min later mountains returned gradually to normal appearance.

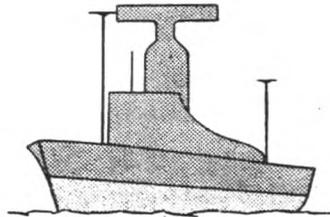
Position of ship: off Cape Seal.

Hudson Bay

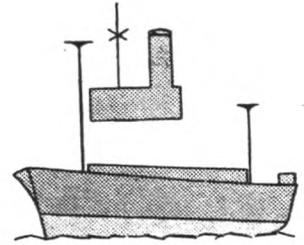
S.S. *Cairnavon*. Captain G. H. Percy. Port Churchill to Barry. Observers, the Master, Mr. A. R. Fairley, 2nd Officer, and Mr. T. C. Walker, 3rd Officer.



(1)



(2)



(3)

10th August, 1954, 1415 G.M.T. A "Fort" type vessel was observed at a distance of about 18 miles, exhibiting a fairly well-defined inverted image (Fig. 1). By 1430 the inverted image had become gradually smaller, and the vessel itself more elongated (Fig. 2), distance 9 miles. The inverted image continued to decrease in size as the vessels approached each other, and at 1450, distance $4\frac{1}{2}$ miles, the other vessel appeared to have elongated funnel and masts, with the top bridge seemingly detached (Fig. 3). At 1452 the vessel assumed normal appearance. At 1415, air temp. 54°F , wet bulb 51° , sea temp. 40° ; at 1450, air temp. and wet bulb as before, sea temp. $45\frac{1}{2}^{\circ}$. Light variable airs; calm sea.

Position of ship at 1415: $62^{\circ} 17'\text{N}$, $80^{\circ} 58'\text{W}$.

GREEN FLASH

North Atlantic Ocean

M.V. *Rangitoto*. Captain C. R. Pilcher, O.B.E. Curaçao to Southampton. Observer, Mr. K. W. Mayhew, 3rd Officer.

5th July, 1954, 2220 G.M.T. The green flash was observed at sunset. Viewed through glasses (7x) the flash could be seen for 7 to 8 sec, rising to several minutes of altitude, where there was a thin line of fair weather Cu. Visibility excellent.

Position of ship: $29^{\circ} 18'\text{N}$, $48^{\circ} 42'\text{W}$.

Note. It is not stated whether the usual appearance of this phenomenon, the last remaining segment of the sun turning green, was observed. No doubt the duration given refers to the green rays or sky coloration seen above the point of sunset.

S.S. *Velletia*. Captain S. Algar. Port Said to Philadelphia. Observer, Mr. J. D. Sandry, 3rd Officer.

12th September, 1954, 2208 G.M.T. The planet Venus was clearly observed to the horizon; as it dipped on setting a blue flash occurred. The magnitude at the time of setting was — 4.0. Sea calm, visibility excellent.

Position of ship at 2400: $37^{\circ} 00'\text{N}$, $33^{\circ} 42'\text{W}$.

Note. The occurrence of the blue flash or the violet one at sunset was commented on in a note published on page 212 of the October number of this journal. It was then stated that the visibility of colours beyond the green had been considered rare, but that more of such observations had been received recently. The above interesting observation is the first we have had of the occurrence of a blue flash at the setting of a planet.

Eastern Pacific Ocean

S.S. *Captain Cook*. Captain A. Bankier. Balboa to Wellington. Observer, Mr. A. Maclean, 2nd Officer.

29th July, 1954, 2120 L.T. The planet Venus was observed setting on bearing

275°T and altitude 3°. By the unaided eye and later by binoculars (magnification 7x) the planet's colouring changed alternately from orange through brilliant red to light and bright green. The shades remained virtually the same, but a " shimmer " of light appeared round the body just prior to its setting. At the instant the planet set a green flash was observed, and a small arc of whitish light over the point of setting gradually faded as the planet set below the horizon.

Position of ship: 6° 50'N, 80° 30'W.

Note. The arc of whitish light in the sky over the point of setting of Venus is very interesting as it seems likely to have been an observation of twilight due to the planet. This would naturally be of small extent and duration.

AURORA

North Atlantic Ocean

S.S. *Beaverglen*. Captain C. L. de H. Bell, D.S.C., R.D., R.N.R. Quebec to London. Observer, Mr. R. N. Walker, 4th Officer.

24th July, 1954, 0300 G.M.T. Aurora observed in the form of an arc, extending from 300° to 040°; the height of the base was approximately 30°. At 0310 the brightness of the arc intensified and 10 min later developed into a corona. At 0330 the arc form was resumed, with the aurora becoming weaker. Moonlight and clouds obscured further observation after 0400.

Position of ship: 52° 41'N, 49° 03'W.

METEOR

North Atlantic Ocean

S.S. *Rincon Hills*. Captain E. A. Mullock. Observers, the Master and Mr. C. A. Bradshaw.

1st July, 1954, 0606 G.M.T. A small yellow meteor was observed at bearing 140° and slightly below Fomalhaut. It travelled w and disappeared when bearing 230° and in line with Antares. Its brilliance was as a second magnitude star and was visible for 10 sec, and when it disappeared its fall was still visible as a faint thin line covering an arc of 40°.

Position of ship: 23° 23'N, 68° 14'W.

M.V. *Sussex*. Captain F. Loughheed. Curaçao to London. Observer, Mr. B. A. Smith, 3rd Officer.

25th July, 1954, 0215 G.M.T. Very bright meteor was observed travelling overhead in a ESE-WNW direction. It appeared between Fomalhaut and Altair and disappeared near Arcturus. Its duration of flight was 3-4 sec and magnitude three times that of Mars. The meteor wavered in flight and left a 20° white trail, slightly serpentine at the commencement of its passage, which faded gradually until the meteor took on a reddish tinge and disappeared.

Many lesser meteors were seen about this time, and it was noted that the great majority of them came from an E'ly direction. Sky clear.

Position of ship: 22° 32'N, 59° 41'W.

S.S. *Baron Maclay*. Captain D. MacGregor. Cape Breton Is. to Liverpool. Observer, Mr. J. E. Oliver, 3rd Officer.

17th August, 1954, 0150 G.M.T. A meteor was observed at bearing 020°T, altitude 15°, very bright with a pronounced trail of reddish-white " sparks ". The meteor appeared to burst with a greenish flash, and small pieces appeared to spread from it, greenish-yellow in colour. All left reddish-white trails and were visible for about 1½ sec.

Position of ship: 50° 54'N, 30° 55'W.

S.S. *Pinnacles*. Captain T. Lotvedt. Portland, Maine, to Puerto La Cruz. Observers, the Master and Mr. A. Wardell, Chief Officer.

15th September, 1954, 2230 G.M.T. A meteor was observed falling towards the sea from a position in the constellation Pegasus, bearing 104° T, altitude 30° , period 3 sec. It had an orange glow, and when at altitude 20° it exploded into a brilliant green ball with various pieces being thrown off it. It continued its passage for a further 3 sec, retaining its orange glow but gradually fading; it disappeared at altitude 5° to 10° .

Position of ship: $32^{\circ} 04'N$, $67^{\circ} 32'W$.

Caribbean Sea

S.S. *Rincon Hills*. Captain E. A. Mullock. Observers, the Master and Mr. H. A. Fleet.

11th August, 1954, 0025 G.M.T. A very brilliant meteor was first sighted at bearing 350° , altitude 40° ; it disappeared at bearing 030° , altitude 20° . It travelled very fast and gave off a bright red light at first which turned to green shortly before disappearing. When at bearing N two pieces fell from it, the larger piece was about the size of the star Altair and the smaller piece about half that size. Before breaking up the meteor appeared to be more than twice the size of Venus when setting and had a very brilliant green trail.

Position of ship: $18^{\circ} 22'N$, $68^{\circ} 27'W$.

Note. This observation, and that of S.S. *Pinnacles* above, were forwarded to us by the Controller, Canadian Meteorological Division.

Atlantic Equatorial Waters

M.V. *Darro*. Captain T. Powell. Southampton to River Plate. Observer, Mr. C. Colwinston-Thomas, 3rd Officer.

1st July, 1954, 2330 G.M.T. A meteor of unusual brilliance appeared in the vicinity of the star Altair at altitude 47° , bearing 104° . It fell rapidly and was visible for about 3 sec. The head was a distinct green and the trail white; the whole seemed of the same brilliance and size of Venus. At approximately altitude 37° it split into two green parts with white trails, with an angle of about 30° between, before disappearing at altitude 20° . Visibility excellent.

Position of ship: $01^{\circ} 15'S$, $29^{\circ} 50'W$.

Tyrrhenian Sea

S.S. *Leicestershire*. Captain T. J. A. Thomson. Port Said to Marseilles. Observer, Mr. L. D. Conway, 3rd Officer.

5th August, 1954, 2300 G.M.T. A meteor appeared just N of Mizar, bearing 335° , and disappeared just below the Pole Star. It was golden yellow in colour and fragments appeared to break off it as it travelled. The duration of flight was a full $3\frac{1}{2}$ sec.

Position of ship: $40^{\circ} 13'N$, $12^{\circ} 00'E$.

Pacific Ocean

M.V. *Ajax*. Captain S. C. Llewellyn. Long Beach to Buenaventura. Observer, Mr. J. K. Marshall, 3rd Officer.

5th July, 1954, 0406 G.M.T. A brilliant meteor was observed near Sagittarius, bearing 120° T. Its initial altitude was 15° and final 5° , and duration of flight was $3\frac{1}{2}$ sec. It started as a white flash, then became a brilliant green with a green trail 4° to 5° in length. It disappeared with a white flash.

Position of ship: $26^{\circ} 44'N$, $114^{\circ} 39'W$.

National Institute of Oceanography

The Annual Report for 1953-54 of the National Oceanographic Council just published (Cambridge University Press, 5s.), gives a full account of the organisation and work of the National Institute of Oceanography, whose headquarters is at Wormley, Surrey.

The report on the work in marine physics, which may be of interest to readers of *The Marine Observer*, includes the following:

Waves

Throughout the year waves in the North Atlantic have been recorded by the O.W.S. *Weather Explorer* using a ship-borne wave recorder (see *The Marine Observer*, April, 1955). Records of 5 min duration were made every three hours while the ship was on station in $61^{\circ} 00'N$, $15^{\circ} 20'W$ or $52^{\circ} 30'N$, $20^{\circ} 00'W$. A statistical summary shows that during December and February, which were the stormiest months, maximum wave heights of 40 to 50 ft occurred in almost 10 per cent of the records. The highest waves measured, on 16th November, were just over 50 ft. June was the quietest month, during which there were no waves higher than 15 ft. The wave recorder developed no mechanical or electrical defect during the year and retained its calibration to within 3 per cent.

Comparison of the recorded wave characteristics with the relevant meteorological charts showed that high winds produced higher and shorter waves in the deep ocean than they did in the coastal region W and N of Cornwall where measurements have been made. A preliminary examination of the data indicates that there is some factor in the coastal region, possibly the eddies and complicated velocity structure of the tidal streams, which makes the processes of wave generation and propagation less efficient than they are in the more stationary deep water. The report states that it is reasonable to expect that the shorter waves would suffer most attenuation and that a greater proportion of the energy would be left in the longer wave lengths. This appears contrary to the general opinion that oceanic waves become shorter and steeper on a bank, but interesting records can be found of instances in which a sea running on to a bank has become less violent when relatively shallow water is reached. The highest wave measured during some six years' recording in a good exposure with soundings of 80 ft off the north coast of Cornwall was 35 ft, and it is known that the ocean waves approaching the continental shelf are often higher than this.

One of the results of the continued study of wave generation and propagation carried out on the King George VI reservoir at Staines is that, for the same wind strength measured 30 ft above the water, the waves are 25 per cent higher and 10 per cent longer when the air is colder than the water than when the air is warmer than the water.*

The statistical distribution of wave heights on the surface of the reservoir, which is about one mile across, agrees well with the theoretical distribution.

Wind drift

The flow of water through the Strait of Dover has been recorded continuously throughout the year by the electromagnetic method, using a reserve cross-channel cable made available by the Post Office Engineering Department. From November to March similar measurements were made across the sections between Aldeburgh and Domburg. Tidal movements are the most prominent feature of the records, and since their speeds are known they provide a means of calibrating the measured voltages between the two coasts, and the drift currents were studied by eliminating the tidal streams.

The current through the Strait has been found to be influenced more by the difference in water level between the eastern part of the English Channel and the southern part of the North Sea than by the winds in the Strait itself. The differences in level are mainly due to the effect of the wind over the more extensive water



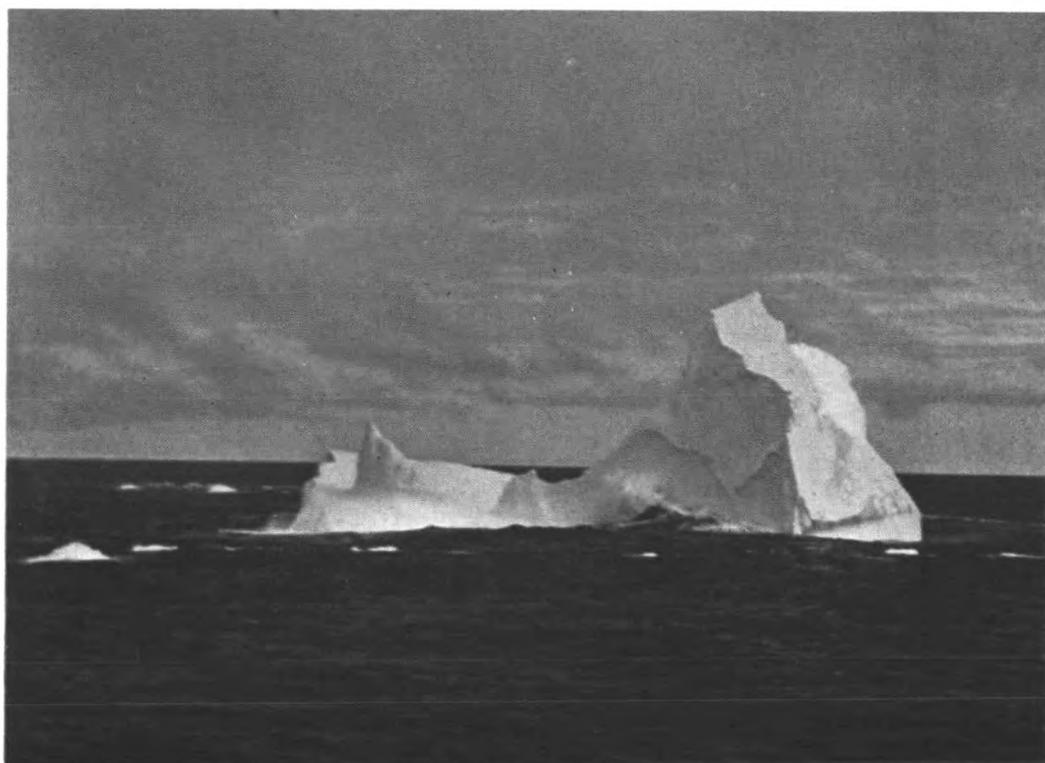
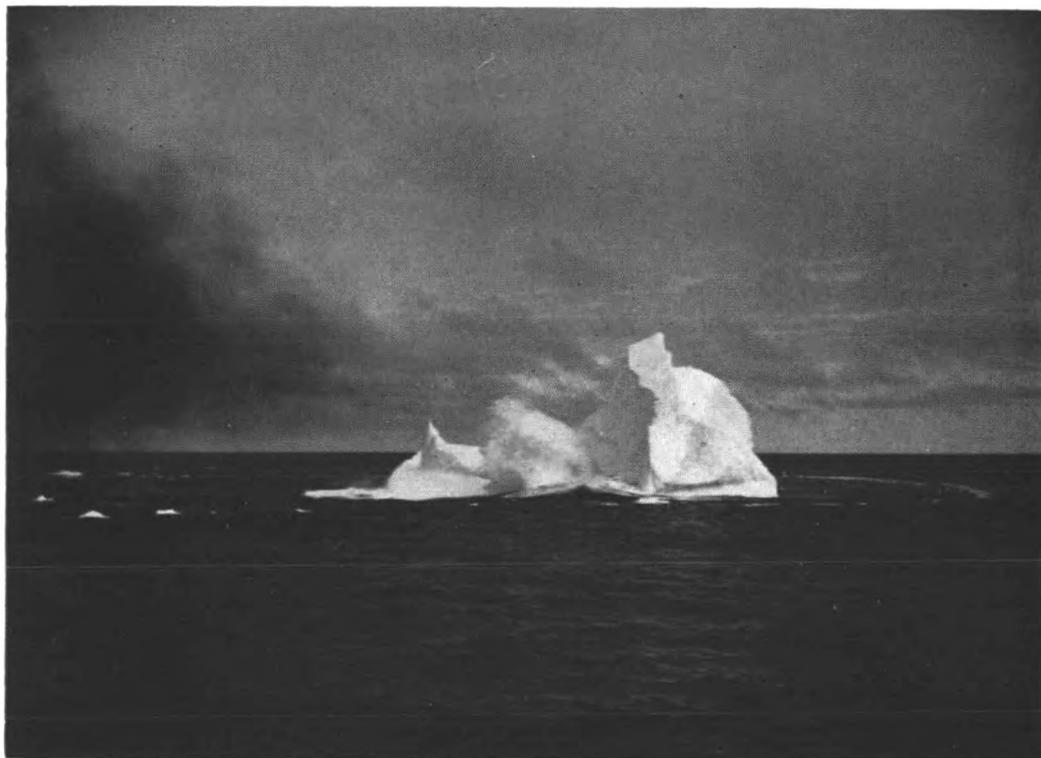
Photograph of a painting in the meteorological logbook of the ship *Marlborough*, 1861.
(See page 143.)



Phosphorescence observed from M.V. *Malaita*, 5th September, 1954, at $10^{\circ} 29'S$, $151^{\circ} 15'E$.
(See page 149.)

Opposite page 156

Opposite page 157



Photographs by R. T. Stoneley

Icebergs seen from S.S. *Empress of Australia*, 8th September, 1954, at $52^{\circ} 01'N$, $54^{\circ} 24'W$.
(See page 146.)

surfaces outside the Strait. The strongest tidal flow measured during the year was on 1st November when the drift to the NE reached a peak value of 2 kt, sufficient to prevent any flow of water to the SW during two successive ebb tides. On 3rd January there was a strong drift of nearly 2 kt in the opposite direction to the SW. This was associated with a minor storm surge which raised the water level at Lowestoft by nearly 5 ft. The agreement reached between measurements made on the Dover-Calais and Aldeburgh-Domburg cables is sufficient to show that the volume of water flowing through the two sections is practically the same, so that movements through the Strait are closely related to those of the southern North Sea.

The work soon to be published in detail will serve the useful purpose of showing how allowance can be made for the appreciable effect of the flow of water through the Strait of Dover on the height of storm surges in the southern North Sea and Thames Estuary, and it will add much to our understanding of the water movements of the southern North Sea in relation to the wind. It will also provide basic information about the drag of the wind on the sea surface at different wind speeds and on the effect of friction between the sea bottom and the water at different current velocities.

Commander Lawford has continued his study of the relationship between the wind and water speeds recorded for the Institute by Trinity House lightvessels. In well-exposed positions the speed of the water appears to be directly proportional to the wind speed up to wind strengths of Beaufort 4 or 5, and the water speed is approximately 1·2 per cent of the wind speed. For stronger winds there is a clear indication of a sharper increase in water movement with wind speed.

Transfer of energy between air and sea

A joint expedition with the Department of Meteorology, Imperial College, to measure the wind structure above the sea in the trade wind region achieved very useful results. Some 500 slowly ascending balloons were followed, the positions being measured accurately every 20 sec (50 metres), using theodolites at the ends of a surveyed base line in the small flat island of Anegada, an outlying island in the West Indies.

Previous observations of the same kind in the Scilly Islands had given a clear indication that the classical concept of a boundary layer some 1,000 metres thick, in which the speed and direction of the wind is modified by friction with the sea surface while the wind remains more or less undisturbed at greater heights, is not valid over the sea. The alternative assumption that the effect of friction might be appreciable over a much higher vertical column helps to explain significant differences between the estimates of the drag of the wind on the sea made by meteorological and oceanographic techniques, as well as having important consequences for the study of the general circulation of the atmosphere.

The observations made at Anegada provide the evidence in support of this assumption. Detailed observations obtained by releasing balloons every 10 min and sometimes every 5 min have shown that even the daily mean wind strengths in the lowest 1500 metres of the trade winds are not as steady as has been supposed, and it seemed advisable to use mean values over a longer period to find the surface drag.

It was found that the average rate of ascent of a balloon was almost constant with height so that the vertical velocity components of the wind have been calculated as well as the horizontal components, and the intensity of the turbulence and transfer of momentum in horizontal and vertical directions have been calculated. These results are being treated statistically and it is already clear that in the lowest 1500 metres much of the horizontal transfer of momentum is brought about by large eddies with periods greater than one day. In the vertical transfer similar eddies appear to be most effective.

The calculation of energy exchange by evaporation and conduction, and of the differences between incoming and outgoing radiation over the South Atlantic, has

been completed and good progress has been made with comparable data from the Indian and South Pacific Oceans. As stated in earlier reports, the work is mainly based on observations of dry and wet bulb temperature, sea-surface temperature and wind made by the British Voluntary Observing Fleet between 1855 and the present time. Having these observations on Hollerith cards has made the investigation practicable. The work in the South Atlantic shows that over most of the ocean the exchange of energy is greatest in winter and least in summer, and greater in autumn than in spring. The regions of greatest exchange lie mainly over the warm currents flowing into higher latitudes and areas of low exchange over the cold currents flowing towards the Equator. The greatest variations are found in the neighbourhood of 40°S on the western side of the ocean and south of Africa.

In the report on work in marine biology, grateful acknowledgement is made of the reports on discoloured water by observing officers of British selected and supplementary ships. Acknowledgment is also made of observations of whales and other cetacea by these officers and those in other ships. Such observations are inevitably rather concentrated on the principal shipping routes, but preliminary plottings indicate that whales are rather more evenly scattered in some regions than might have been expected, for example over the North Atlantic as a whole. It will probably be shown, however, that there is a tendency for cetacea to be concentrated in other localities such as the Arabian Sea and Gulf of Aden, in the vicinity of Dakar and in the Gulf of Panama.

The report also deals with the R.R.S. *Discovery II*, which remained under care and maintenance until 3rd December, 1953, when she was put in hand for refit. The programme for this ship for 1954–55 included an attempt to measure and study deep-water movement in relation to density distribution and other factors. Studies were also being made of surface drift currents in relation to wind. Research on wave generation and decay were to be undertaken by working up and down wind from the O.W.S. *Weather Explorer*, which is also fitted with a wave recorder, as well as some oceanographic survey work in the East and North Atlantic.

The report recalls with sadness that after 28 years of arduous and varied surveys under the Discovery Committee, the Admiralty (during World War II) and finally the National Oceanographic Council, R.R.S. *William Scoresby* has passed into the hands of the ship-breakers. In more recent years the name *William Scoresby* was chiefly associated with her annual whale-marking voyages in Antarctic and sub-Antarctic waters, but before this work began she had already made her name with, among other work, the completion of three full-scale trawling surveys on the Patagonian Shelf and Burdwood Bank, a survey of the Humboldt Current region and the plankton survey of the waters around South Georgia. This latter survey comprised some of the most intensive station work ever done by a research ship. *William Scoresby's* earlier commissions were mainly concerned with work in the waters of the Falkland Islands section of Antarctica. She entered the Weddell Sea and in 1930 acted as base ship for Sir Hubert Wilkins when he penetrated far into the heavy pack ice of the Bellingshausen Sea. Recommissioned as research vessel in 1949, she did her first and only cruise for the National Oceanographic Council with the whale-marking programme in the South Indian Ocean and an extremely valuable survey of the Benguela Current.

P. R. B.

Note. This means that for a certain observed height of sea waves, on occasions when the air is much colder than the sea, the Beaufort wind force would be less than when the air temperature is nearer the sea temperature. This agrees with some observations made by Dr. C. F. Brooks (U.S.) during voyages on merchant ships across the Atlantic prior to 1951, when he found that a wind of force 5 over warm water created large waves and white caps. When the ship passed into colder water, although the wind force, estimated from the funnel smoke, remained the same the sea disturbance dropped, giving an impression of a force 3 to 4 wind (see W.M.O. Technical Note No. 2 Part II). This effect has also been noted by Roll and an explanation advanced by Seilkopf and has been investigated by Brown (*The Marine Observer*, April, 1953, page 94).

Netherlands Conference on Meteorological Problems of the North Sea

An informal meteorological meeting of interest to North Sea mariners took place at De Bilt, Holland, on 7th–8th February of this year, under the auspices of the Royal Netherlands Meteorological Institute, which is the State Meteorological Service of Holland. Its purpose was to discuss some of the meteorological problems of the North Sea, against the background of the disastrous floods which occurred on the east coast of England and in Holland in February, 1953. Prominent items on the agenda were the adequacy—for weather forecasting purposes—of ship reports from the North Sea as at present received, and the question of establishing a fixed observing station, in the vicinity of the Dogger Bank for example, but the opportunity was taken to consider also certain aspects of the meteorological services provided for shipping by the countries represented at the meeting. In addition to the Netherlands these countries were Belgium, Denmark, France, Norway, Sweden, the United Kingdom and Western Germany. The delegates included the Directors of the Meteorological Services of Belgium, Denmark and Norway.

At an early stage in the meeting the availability of ship reports from the North Sea was examined, and the Netherlands and United Kingdom delegates presented statistics relating to a recent period. A study of these statistics suggested that the exchange of available ship reports between North Sea countries was by no means complete. This exchange is, in fact, largely made over an existing meteorological teleprinter network which links the United Kingdom with western European countries, whilst to three centres on this network, namely Dunstable, Frankfurt and Paris, are assigned the main responsibilities for the collection and distribution of reports. The discussion of this problem led to the adoption of a recommendation advising means by which the exchange of information can be made more nearly complete, and providing, in particular, for the transmission of reports from British lightvessels to all countries around the North Sea.

At this point it was natural to consider the network of reporting ships, and this gave rise to a good deal of discussion. Information regarding shipping lines operating across the North Sea was presented by the majority of delegates, and the representative of Western Germany described the steps taken by his Service to obtain reports from German fishing vessels, both in the North Sea and in areas north-westwards to Iceland. The question of hours of observation was debated at some length, and several delegates were of the opinion that ideally the requirement was for about six ships, well placed to cover the North Sea, to send complete reports in Form 21A every three hours. However, it was agreed that improvements in the present situation must inevitably be gradual, and the formal recommendation adopted on this matter required that Meteorological Services should approach shipowners to secure as many reports as possible from ships already reporting from the North Sea, and to recruit as many additional ships as possible. Code Forms 21A or 22A are preferred, with observations and reports being made at the main synoptic hours and, if possible, at the intermediate synoptic hours as well. During discussion it was recognised that there is some lack of upper-air observations from the North Sea, and it was considered that Services should investigate the possibilities of establishing meteorological reconnaissance flights to meet requirements.

The meeting then turned its attention to aspects of national radio storm-warning services for shipping.

In the first place a study was made of the present divisions of the North Sea adopted by different countries for the purposes of shipping forecasts, and it was recognised that some confusion may arise in the minds of recipients of these broadcasts by reason of the fact that certain names do not always apply to identical areas. For example, Dogger (or Dogger Bank) refers to somewhat different areas in the North Sea according to the country employing this designation. Eventually

agreement was reached on the boundaries of the areas which should apply to the following area designators when used in the shipping forecast and warning issues of all North Sea countries: Viking Bank, Forties (or Fladen Ground), Fisher Bank, Dogger, German Bight, Humber and Thames. The adoption of these recommendations by the Meteorological Office is now being considered, and due notice will be given before any change in the present designations is made.

The second important aspect of the forecast and warning services for North Sea shipping which was discussed was the procedure used for indicating the force of the wind. A lack of uniformity in the national practices was noted, which was liable to give rise to uncertainty arising from the fact that some countries use descriptive terms only to indicate the wind force and do not add the equivalent Beaufort number. The words "severe", "storm" and "tempête" are particularly liable to misinterpretation. The meeting therefore recommended that in weather bulletins for shipping issued by w/T or R/T, information in actual reports, forecasts and warnings regarding wind speed should always be given in Beaufort number, it being left to the discretion of individual Meteorological Services to add equivalent values in knots or metres per second, or appropriate descriptive terms. In this country action has already been taken in accordance with this recommendation, and Beaufort numbers have been included in shipping forecasts since 1st April.

The final main item on the agenda was the discussion of the possibility of further improving the observational network in the North Sea by the establishment of a fixed observing post approximately in the middle of the North Sea. It was noted that a Netherlands weather ship had been stationed in that area for about six months in 1953, and the information received from it had been of considerable value to the national forecasting services. There seemed little doubt of the overall benefit which would result from the permanent establishment of such a fixed station, both in relation to day-to-day forecasting and for research purposes, but careful thought needed to be given to the question as to whether it was preferable to have one fixed post taking both surface and upper air observations rather than to concentrate all efforts on increasing the number of surface reports from merchant ships. In view of the high cost of establishing and maintaining an observational post it was necessary to be satisfied that no other less expensive means of acquiring the requisite basic data could be made available, and on account of the detailed examination of the various aspects of the project which needed to be undertaken, the meeting decided to establish an informal working group to consider the problem during subsequent months and to report its findings in due course to the Directors of all the Meteorological Services represented at the meeting. The group would be asked to estimate the value of an observational post on or near the Dogger Bank, both as regards surface and upper-air information, and would investigate the possibilities of establishing such a post and make an evaluation of the cost. This observing post might consist of one of the following alternatives:

- (a) An automatic fixed buoy.
- (b) An anchored ship.
- (c) A moving ship.
- (d) A tower or similar fixed structure, manned or unmanned.

The Meteorological Office is represented on this working group.

There is no doubt that the meeting afforded a valuable opportunity for an interchange of views on the various problems discussed, and the recommendations adopted represent a fruitful result of a short and concentrated conference.

S. P. P.

BIRDWATCHING

The seventh Annual Report of the Royal Naval Birdwatching Society* mentions the many interesting observations received from the Merchant Navy by way of the

* *Sea Swallow*, being the Annual Report of the Royal Naval Birdwatching Society, December, 1954. 4s.

meteorological logbook. A few of these are published together with a number of articles and reports from the Society's members serving in the Royal Navy.

In his foreword the president, Vice-Admiral the Mackintosh of Mackintosh, records that the Society has had a successful year and is achieving its objects. He welcomes the members who, as R.N.R. officers, have joined from the Merchant Navy.

The Society was formed eight years ago, and its main aims include:

- (i) The encouragement and promotion of birdwatching with special reference to birdwatching at sea; and
- (ii) co-operation with other Societies in carrying out investigations connected with birds at sea and on land.

The Society provides a central source to which members can refer, and from which assistance on ornithological matters is given.

Membership is open to:

- (i) Serving and retired personnel of the Royal Navy, Royal Marines, R.N.R., R.N.V.R., Naval Auxiliary Services and W.R.N.S.; and
- (ii) personnel of the Commonwealth Navies, their Reserves and Auxiliary Services.

Subscriptions:

- (i) The annual subscription (payable on 1st January) is 10s. for officers and 7s. for others. (This subscription covers the cost of the Annual Report and Bulletins.)
- (ii) Life membership subscription is £5 for officers and £2 10s. for others. (This subscription does not include the Annual Report, the supply of which is 4s. extra annually.)

The Annual Report, entitled *Sea Swallow*, contains articles and records contributed by members. The Society has also commenced publication of *Sea Passage Bird Lists* giving details and identification notes of sea birds to be encountered on certain sea routes. The following lists are available at 1s. 6d. each:

- Route 1. United Kingdom to Gibraltar.
- Route 2. Gibraltar to Port Said.
- Route 3. Port Said to Aden.
- Route 4. Aden to Persian Gulf.
- Route 5. Aden to New Zealand. (Ready shortly. A long list, cost not yet known.)

The Society also issues a standard form of "Bird Sea Report Sheet" for use in forwarding passage reports. A specimen sheet can be obtained from the Hon. Secretary, whose address is given below.

The Society will welcome the enrolment of eligible officers and men in the Merchant Navy to membership. Enquiries should be addressed to the Hon. Secretary: Commander (S) C. E. Smith, Royal Navy, H.M.S. *Ceres*, Wetherby, Yorkshire.

In view of the interest already shown by certain members of the Merchant Navy, who may not be eligible for membership under the existing rules, it has been decided that copies of the publications quoted in paragraph 5 may be purchased by anybody in the Merchant Navy. Application (with remittance and address) should be made to the Hon. Secretary. Stocks held at present are small.

At the same time the Society will continue to welcome reports on birds from *all sources* in the Merchant Navy, and these should either be entered in the meteorological log or forwarded direct to the Society's chairman: Captain G. S. Tuck, D.S.O., R.N. (Retd.), Prattenden's Cottage, Bury, Pulborough, Sussex.

Note. All ornithological observations recorded by voluntary observers in meteorological logbooks are forwarded to the Royal Naval Birdwatching Society, and many of them eventually appear in "The Marine Observers' Log" with appropriate comment.

EXCELLENT AWARDS—1954-55

Once more it is our pleasant duty to congratulate the 100 captains, principal observing officers and senior radio officers whose meteorological logbooks have been considered the best received during the year ending the previous 31st March, and whose names appear on page 138 of this journal.

For many years past it has been the invariable rule for all meteorological logbooks received from ships to be scrutinised by a nautical officer on the staff of the Marine Division at Harrow in the first instance. A system of marking has been devised whereby logbooks can be assessed, not only as to the quality of the observations themselves, but also as to the care and attention which has been paid to their accuracy, bearing in mind the variable opportunities of precise and continuous observation which are given to officers in different types of ships and different trades.

All meteorological logbooks which gain 80 per cent or more of possible marks are assessed as "Excellent", and the 100 which gain the best marks in this category qualify for the Excellent Award.

In the year ended 31st March, 1955, the highest marks were gained by the following ships:

1. S.S. *Warkworth* (R. S. Dalgliesh & Sons), Captain N. Thomson.
2. S.S. *Rialto* (Ellerman's Wilson Line), Captain H. Greenhill.
M.V. *Cingalese Prince* (Prince Line), Captain B. R. Simons, M.B.E.
3. S.S. *Clan Macrae* (Clan Line), Captain W. R. Woodriffe.
S.S. *Lancashire* (Bibby Bros. & Co.), Captain A. N. Williamson.
M.V. *Port Hobart* (Port Line), Captain P. S. Ball.
4. M.V. *Dorset* (New Zealand Shipping Co.), Captain A. E. Williams.
M.V. *Latia* (Shell Tankers, Ltd.), Captain J. Davison.

It will be noticed that in this year's awards 51 shipping companies are represented. We feel that this is a good measure of the uniform quality of the voluntary work of all officers in all types of ships and in all trades.

It is encouraging, too, to notice the increasing number of ships which are gaining the "Excellent" assessment. In the year ended 31st March last, 1,357 meteorological logbooks were received in the Marine Division of which 316, or 23.3 per cent, were so assessed. In the previous year, out of a total of 1,473 logbooks received, "Excellent" assessments were given to 255, or 17.3 per cent.

Progress in other directions this year is also noticeable. For instance, about 65 per cent of logbooks received during the year gave ocean current information. The year before about 62 per cent had done so and two years ago the figure was about 61 per cent. The scope of the additional remarks pages appears limitless, and we have recently forwarded to the Natural History Museum the first specimen of a moth which we have received from a ship at sea.

At the present rate of progress, with the number of awards remaining at 100, it is inevitable that the number of officers who send in "Excellent" logbooks without gaining an award will continue to increase. To such officers, in addition to reminding them that the "Excellent" assessment is recorded on their personal card in this Office, we can only repeat what we quoted in similar circumstances in these pages a few years ago, the advice of St. Paul, himself no mean observer of the weather in his day, to his friends at Corinth: "Know ye not that they which run in a race run all, but one receiveth the prize. So run that ye may obtain."

L. B. P.

ERRATUM

The Marine Observer, Vol. XXV, No. 167, page 19. There are only 288 Marsden squares in each hemisphere, not 300 as was suggested. Thus in line 30 it should read 288 not 300, and in 31, 301 to 588 instead of 301 to 600.

Wave Heights and Periods at Ocean Weather Stations India and Juliett, 1949-53

By P. R. BROWN, M.Sc., A.R.C.S., D.I.C.
(Marine Division, Meteorological Office)

The wave observations from the British ocean weather ships on stations INDIA and JULIETT for the period from January, 1949, when wave observations were first reported in their present detail, to December, 1951, were analysed to ascertain the relationship of wave height and period to wind force, and wave height to air-sea temperature difference in a note by Brown¹ in this journal in 1953. Since then the Marine Division of the Meteorological Office has received several requests for the frequencies of wave heights and periods for ocean weather stations "I" and "J" irrespective of wind or air-sea temperature difference. It was therefore decided to publish these frequencies for the period 1949-53 inclusive for stations "I" and "J".

In the preparation of the frequencies, observations for "I" and "J" were used when the weather ships were on station, including those made by Dutch weather ships while on station "J". The ship was considered to be on station whenever it was within a "grid" given by straight lines joining the points defined below, the grid being moved to correspond with changes in the mid position of the station.

Station "I"			Station "J"		
Period	Mid Position	Position of Grid Corners	Period	Mid Position	Position of Grid Corners
January, 1949, to March, 1950	60° 00'N } 20° 00'W }	61° 45'N 16° 18'W	January, 1949, to March, 1950	53° 50'N } 18° 40'W }	55° 35'N 15° 34'W
		58° 15'N 16° 40'W			52° 05'N 15° 49'W
		58° 15'N 23° 20'W			52° 05'N 21° 31'W
		61° 45'N 23° 42'W			55° 35'N 21° 46'W
March, 1950, to August, 1953	59° 00'N } 19° 00'W }	60° 45'N 15° 26'W	March, 1950, to December, 1953	52° 30'N } 20° 00'W }	54° 15'N 17° 00'W
		57° 15'N 15° 46'W			50° 45'N 17° 14'W
		57° 15'N 22° 14'W			50° 45'N 22° 46'W
		60° 45'N 22° 34'W			54° 15'N 23° 00'W
August, 1953, to December, 1953	61° 00'N } 15° 20'W }	62° 45'N 11° 31'W			
		59° 15'N 11° 55'W			
		59° 15'N 18° 45'W			
		62° 45'N 19° 09'W			

When two ships were within this grid at a time of changeover, the observations of the ship farthest from the mid-position have been discarded. In order that each observation should have equal weight in the results, only the first wave group was included in the results. If an observation included a second wave group, as it occasionally did, this second group was not included.

One of the British ocean weather ships, the *Weather Explorer*, was fitted in February, 1953, with a wave recorder which has been described in detail by Tucker.² The wave observations used in this note therefore include those made by this vessel between February and December, 1953, with the aid of such a recorder. Observations from other ships, both British and Dutch, and from the *Weather Explorer* prior to February, 1953, were estimates. The values of wave height and period measured by this wave recorder in the *Weather Explorer* between February, 1953, and January, 1954, were analysed in a paper by Darbyshire³ in a previous issue of *The Marine Observer*.

The value of wave height observed is the mean height of the highest waves. The wave heights when below 31 ft are reported in a code, the limits of which are defined primarily in metres. The corresponding limits are shown in the frequency tables up to 29 ft to the nearest $\frac{1}{4}$ ft, except that the limit between the first two ranges has been rounded off to 1 ft (the value quoted in the code for countries using feet). When the wave height is above 31 ft the highest code figure is reported and the exact height is given in plain language in the logbook and radio message:

Percentage Frequencies

Stat

Height in feet	Value given in M.O. 509	< 1	1½	3	5	6½	8	9½	11	13	14	16	17½
	Range	< 1	1-2½	2½-4	4-5½	5½-7½	7½-9	9-10½	10½-12½	12½-14	14-15½	15½-17½	17½-18½
January	0.6	0.5	4.6	8.5	10.4	11.2	15.8	10.8	4.4	8.7	3.2	2.5	
February	—	0.9	6.6	10.9	12.9	13.5	14.0	7.9	1.6	7.8	1.9	2.7	
March	0.5	1.3	6.5	5.7	10.5	12.6	13.0	13.3	2.2	9.6	2.2	4.2	
April	0.1	1.0	8.2	10.6	13.7	14.0	14.5	12.9	1.7	9.5	1.6	3.4	
May	—	4.1	16.0	10.9	18.9	15.6	12.6	7.6	2.5	3.1	0.5	1.2	
June	0.6	4.5	20.9	16.3	24.0	14.8	10.4	4.2	1.3	1.6	0.4	—	
July	1.6	4.3	20.1	17.5	24.6	12.2	11.3	3.9	1.1	1.9	0.1	0.8	
August	0.2	5.2	21.1	15.5	17.9	14.8	14.8	4.2	2.0	2.3	0.4	0.3	
September	0.4	2.2	16.2	16.0	17.7	14.4	12.6	5.2	1.8	5.7	2.0	1.3	
October	0.2	1.3	8.1	12.3	18.7	15.2	15.0	8.8	3.0	7.5	2.4	2.9	
November	0.3	0.8	13.1	9.4	15.7	9.5	14.1	9.1	2.7	8.3	2.7	3.2	
December	0.3	0.4	3.3	2.6	9.5	13.5	15.6	14.8	4.7	13.0	2.8	5.1	
Year	0.4	2.3	12.4	11.6	16.5	13.5	13.5	8.4	2.3	6.4	1.6	2.2	

Stat

Height in feet	Value given in M.O. 509	< 1	1½	3	5	6½	8	9½	11	13	14	16	17½
	Range	< 1	1-2½	2½-4	4-5½	5½-7½	7½-9	9-10½	10½-12½	12½-14	14-15½	15½-17½	17½-18½
January	0.2	0.7	5.1	4.9	11.1	15.9	14.5	10.0	2.6	9.5	2.3	3.1	
February	0.6	1.4	5.1	9.8	14.0	13.3	13.9	12.3	3.4	9.5	1.9	4.8	
March	0.6	2.5	10.9	7.3	18.8	17.1	18.3	8.8	4.6	4.3	1.7	2.4	
April	—	0.7	9.9	9.8	15.9	14.9	13.6	9.3	3.2	5.5	1.7	1.1	
May	0.2	5.3	16.2	11.7	14.7	11.5	13.5	7.0	3.9	6.1	1.9	1.5	
June	0.9	6.2	22.7	16.3	22.5	12.7	6.7	5.0	1.4	1.8	1.4	0.3	
July	1.3	0.7	16.0	18.5	29.8	11.1	7.3	4.5	1.4	2.7	1.1	0.5	
August	—	1.9	10.9	19.0	22.6	15.1	11.7	5.7	1.4	1.8	1.8	0.8	
September	0.5	2.9	16.5	13.9	14.9	11.3	10.3	6.7	3.3	6.4	3.1	2.7	
October	0.1	0.3	3.2	7.7	11.8	11.8	13.2	11.5	5.4	8.7	4.3	3.3	
November	—	0.2	6.9	7.3	15.9	13.1	19.5	12.2	2.6	8.4	2.7	2.2	
December	—	0.5	2.4	6.1	14.3	13.3	16.6	12.6	5.0	13.7	3.2	6.0	
Year	0.4	1.9	10.6	11.0	17.2	13.5	13.2	8.8	3.2	6.5	2.3	2.4	

the ranges in the last columns of the frequency tables for heights of 30 to 57 ft have therefore been chosen arbitrarily. The values of the mean height for each code figure shown in the British pamphlet M.O. 509, *Decode for the Use of Shipping*, are also given. The ranges of the periods given in the frequency tables are the same as those for the code figures.

Although there are duplicated forms there are no logbooks available in the Marine Division for some of the Dutch ocean weather ship observations for station "J" in 1950 and 1951: for 27 observations of height 30½ ft or more in these years, no detailed information is therefore available in the Division as to the exact wave height, and these heights have been assumed to be within the range 30 to 33 ft.

The distribution of the frequencies of wave height with range follow the general pattern which is to be expected in the open ocean, i.e. frequencies are small for wave heights of less than 1 ft, they increase until a mode is reached and then decrease again until at large heights the frequency is small. The frequency curve, however, is not smooth when plotted against height; one cause of this is that some of the ranges in feet include observations of height in two whole feet, e.g. the range 18½ to 20½ ft, while others include only observations of one whole number,

Wave Heights 1949-53

“ I ”

19	21	22½	24	25½	27	29						
18½-20½	20½-22½	22½-23½	23½-25½	25½-27	27-28½	28½-30	30-33	33-38	38-43	43-57	Height un- able to be determined	Number of Obser- vations
4.9	0.6	1.0	1.0	2.9	0.5	0.8	2.7	0.9	0.9	1.3	1.5	878
2.9	1.5	0.7	0.6	1.4	0.4	0.1	0.4	0.1	—	—	11.1	944
3.3	0.3	0.9	0.3	2.5	0.6	—	0.2	0.2	0.1	0.2	10.0	1,061
3.1	0.4	0.6	0.2	2.3	0.1	—	0.5	0.1	—	—	1.4	1,113
1.5	0.3	0.4	—	—	—	0.2	—	—	—	—	4.6	1,087
—	0.4	0.2	—	—	—	—	—	0.1	—	—	0.4	1,124
0.3	0.1	0.1	—	0.1	—	—	—	—	—	—	0.1	1,116
0.2	—	0.1	—	—	—	—	—	—	—	—	1.0	1,053
1.4	0.4	0.2	—	0.9	—	0.3	—	—	—	—	1.1	992
1.3	0.4	0.4	0.3	0.1	0.6	—	0.1	0.1	—	—	1.3	1,052
2.7	0.9	1.1	0.5	2.5	0.6	0.1	0.3	0.6	0.2	—	1.5	1,090
5.3	1.1	1.5	0.5	2.3	0.4	0.1	1.1	0.3	0.1	—	1.7	809
2.1	0.5	0.6	0.3	1.2	0.3	0.1	0.4	0.2	0.1	0.1	2.9	12,319

“ J ”

19	21	22½	24	25½	27	29						
18½-20½	20½-22½	22½-23½	23½-25½	25½-27	27-28½	28½-30	30-33	33-38	38-43	43-57	Height un- able to be determined	Number of obser- vations
2.1	0.7	0.5	0.7	1.2	0.5	0.1	0.2	—	—	—	14.2	1,238
2.2	0.6	0.7	1.4	1.9	0.3	0.3	0.8	—	0.2	0.1	1.2	1,126
1.5	0.2	0.1	0.1	0.2	0.2	0.2	—	—	—	—	0.4	1,225
1.7	1.4	0.7	1.2	1.1	0.1	—	0.3	—	—	—	7.8	1,199
2.6	1.2	0.7	0.5	0.7	0.2	—	0.3	—	—	—	0.2	1,239
0.6	0.1	—	—	—	—	—	—	—	—	—	1.3	1,200
0.8	0.5	0.5	0.3	0.9	0.7	0.2	—	—	—	—	1.3	1,209
1.3	0.4	1.3	1.3	0.5	1.1	0.2	1.1	—	—	—	0.3	1,191
1.7	1.1	0.9	0.3	1.1	—	0.1	0.3	0.3	0.2	—	1.6	1,170
3.6	1.5	1.2	1.1	1.5	1.7	2.0	3.2	1.1	0.3	—	1.7	1,214
4.0	0.7	0.5	0.1	1.8	0.2	0.1	1.1	0.1	—	—	0.4	1,066
2.4	0.1	1.6	0.3	0.8	0.1	—	0.3	0.1	0.3	—	0.4	1,171
2.0	0.7	0.7	0.6	1.0	0.4	0.3	0.6	0.1	0.1	0.0	2.6	14,248

e.g. 17½ to 18¾ ft; as the observer usually estimates the height in feet to the nearest whole number it is to be expected that the frequency of observed values in a range of the first type will be greater than that in a range of the second type, although the ranges for the first 19 code numbers, except the first, are all equal to half a metre.

There is considerable similarity between the frequency tables of wave periods for the two stations; the average yearly wave period, however, is appreciably greater for station “ J ” than for station “ I ”, the annual frequencies for periods below 7 sec being less, and for periods of 7 to 13 sec greater for station “ J ” than “ I ”.

The close similarity between the two tables of wave height for stations “ I ” and “ J ” is striking. Considering the annual frequencies for the five-year period 1949-53, the difference of the frequency between the two stations in any range does not exceed 0.9 per cent, other than for the range 2½ to 4 ft when the difference is 1.8 per cent. This close agreement between the two tables suggests that the frequency distribution of wave heights for the two stations is approximately similar and that the observers reach quite a high standard of accuracy in estimating the wave height, a task which is not always easy to perform without a wave recorder.

Percentage Frequencies of Wave Periods 1949-53

Station " I "

Period in seconds	5 or < 5	5-7	7-9	9-11	11-13	13-15	15-17	17-19	19-21	> 21	Calm or period un- able to be determined
January	3.7	38.0	34.7	11.4	2.4	0.2	0.1	—	—	—	9.3
February	2.5	28.7	47.1	6.0	0.4	—	—	—	—	—	15.2
March	3.2	23.0	48.3	6.9	0.4	0.3	0.2	—	0.1	—	17.7
April	6.8	30.6	48.5	4.5	1.8	0.8	—	0.1	0.1	—	6.8
May	9.5	32.1	45.2	1.7	0.1	—	—	0.1	—	—	11.3
June	13.2	43.2	31.1	1.9	0.2	—	—	—	0.1	—	10.3
July	13.3	47.8	26.2	2.4	0.3	—	—	—	0.1	—	9.9
August	17.0	51.1	17.7	1.8	0.3	—	—	—	—	—	12.1
September	13.6	32.9	38.7	3.5	0.5	0.1	0.1	—	0.1	—	10.5
October	14.0	29.4	37.6	4.0	0.2	0.5	—	—	0.1	—	14.2
November	5.7	38.6	30.4	8.1	4.8	0.7	0.2	0.1	0.1	0.1	11.1
December	7.4	32.9	37.6	10.8	2.2	0.4	0.2	—	—	—	8.4
Year	9.3	35.9	36.8	5.0	1.1	0.3	0.1	0.0	0.1	0.0	11.4

Station " J "

Period in seconds	5 or < 5	5-7	7-9	9-11	11-13	13-15	15-17	17-19	19-21	> 21	Calm or period un- able to be determined
January	1.5	27.3	41.0	9.3	1.1	0.1	0.1	—	—	—	19.6
February	5.3	25.2	40.4	17.8	2.0	—	—	—	—	—	9.1
March	9.9	31.3	41.9	5.9	0.9	0.2	0.1	0.1	—	—	9.6
April	2.0	20.6	36.7	19.8	4.7	0.2	—	—	—	0.1	15.9
May	7.6	24.1	43.5	16.1	2.1	0.1	0.2	—	0.1	—	6.3
June	8.6	30.4	47.6	5.8	0.3	—	—	—	—	—	7.3
July	12.7	28.4	39.5	11.7	1.2	0.1	—	—	0.1	—	6.4
August	7.9	25.6	49.0	12.4	2.1	0.2	—	—	0.1	—	2.8
September	9.4	33.0	42.4	8.5	3.3	0.3	—	—	—	—	3.1
October	3.0	27.9	40.9	12.7	8.4	0.4	0.1	—	—	—	6.5
November	8.6	40.1	33.1	4.6	0.5	0.1	0.2	0.4	—	0.1	12.4
December	1.4	26.2	55.1	9.4	0.8	—	—	—	0.1	—	7.1
Year	6.5	28.2	42.7	11.2	2.3	0.1	0.1	0.0	0.0	0.0	8.9

The annual frequency of occurrence is highest for the range $5\frac{3}{4}$ to $7\frac{1}{2}$ ft at both stations. The proportion of all observations, including those which cannot be estimated, with observed heights of $10\frac{3}{4}$ ft or more, is 26.8 per cent at station " I " and 29.7 per cent at station " J ", while the proportion of observations with heights above $25\frac{1}{2}$ ft is 2.4 per cent at station " I " and 2.5 per cent at station " J ".

One exceptional feature of the distribution of heights is the high percentage frequency for all the ranges between 27 and 38 ft for station " J " for October. This was due to the large number of observations with wave heights in this range in October, 1950, 1951 and 1952.

No wave height above 50 ft was reported by any ship on station " I " or " J " in the period 1949-53, but there are several reports of heights above this figure from British voluntary observing ships: the highest reports from these voluntary ships are of 80 ft, including one from the R.M.S. *Majestic* in the North Atlantic in December, 1922, and one from the R.R.S. *John Biscoe* on 1st April, 1953, at $63^{\circ} 30'S$, $56^{\circ} 18'W$ off Graham Land.

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- ¹ BROWN, P. R. *The Marine Observer*, **23**, 1953, p. 94.
- ² TUCKER, M. J. *Nature*, **170**, 1952, p. 657.
- ³ DARBYSHIRE, J. *The Marine Observer*, **25**, 1955, p. 114.

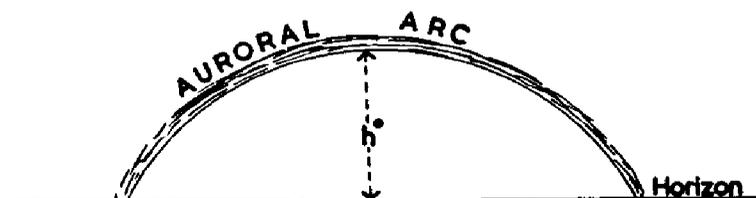
OBSERVATION OF AURORA

Mr. James Paton, M.A., B.Sc., F.R.S.E., Director of the Aurora and Zodiacal Light Section of the British Astronomical Association, has sent us this further appeal for observers of aurora.

In *The Marine Observer* for July, 1953, there appeared an article on Aurora Borealis, illustrated by photographs of typical auroral forms. Observers in selected and supplementary ships in British waters and on passages to and from the United States and Canada were invited to make nightly observations of the sky, when possible and convenient, and to report the times when aurora was absent or present, on specially prepared forms. Although aurora has been infrequent during the period 1953-55, as is to be expected at a time when sunspots are few, many valuable observations have been made in ships and entered in the maps which we prepare for each night to show synoptically the position and types of aurora. These maps are used to examine the relationship of aurora with events in the sun and with associated magnetic and radio disturbances.

A close network of observers on land extending from Greenland to the English Channel is active, but, of course, for sea and ocean areas we rely entirely on observations made in ships and in aircraft (B.O.A.C. Atlantic crews make nightly observations). Observations in ships are therefore extremely valuable, and we wish to express our thanks to those ships' observers who have responded to our appeal and whose assistance we acknowledge in each publication of results. We hope that they will continue to co-operate with us in this work and that many other observers may join them. As sunspots increase in frequency and reach the expected maximum in 1958, the frequency and brilliance of aurora will also increase. It need hardly

be mentioned how thrilling it is to witness a great aurora. We invite those in ships not merely to *see* but also to *observe* and to record their observations, for they may be in a



position to supply data of the utmost importance. Apart from the above region for which observations entered in special forms are asked, observations made between longitudes 40° W and 40° E in both the Northern and Southern Hemispheres are of particular value, and it is worth pointing out that Aurora Borealis and Aurora Australis may be seen as close as 20° to the Equator during great solar disturbance. If an arc is observed, please measure approximately the altitude h° of the highest point on its lower border, recording the time of observation (G.M.T.) to the nearest minute. This allows us to determine the exact position in space of the arc.

During the period from 1st July, 1957, to 31st December, 1958, known as the International Geophysical Year, all nations are collaborating in a detailed study of the earth and its atmosphere, and the study of aurora will form an important part of the work.

Forms for observation with instructions may be obtained from Port Meteorological Officers and Agents, and when completed are enclosed with the meteorological logbooks when they are returned to the Marine Division. Observers who may wish to make enquiries are invited to write to me, or to call when in Edinburgh, at the Department of Natural Philosophy, The University, Drummond Street, Edinburgh 8.

Editorial note. The special forms for reporting aurora were designed by Mr. Paton so as to give the more important features of the observations in a concise and standardised way, and there is little work in filling them up. They also ensure a more continuous watch for aurora and give definite information about the times or dates when aurora was *not* visible.

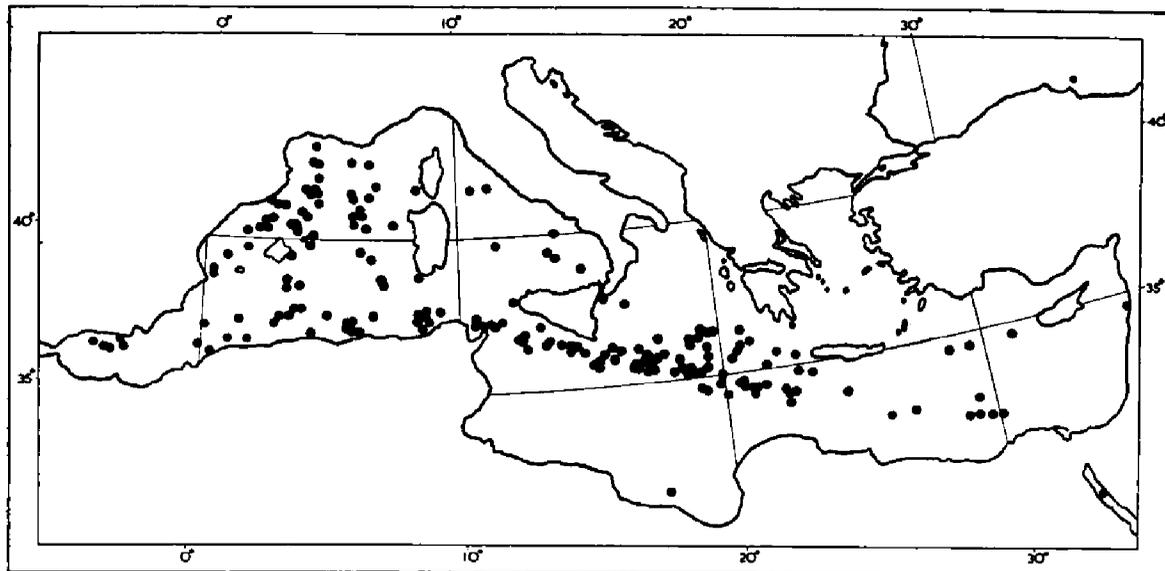
It must be emphasised that the observations made on Mr. Paton's special forms are not intended to replace the notes of the observation of aurora which have hitherto been entered in the Remarks column of the logbook or the more detailed accounts, often accompanied

by diagrams or sketches, frequently given in the Additional Remarks pages. It is hoped that we shall continue to receive these as before from all ships, including those in the western ocean which fill in the forms. Such accounts have provided much interesting information for publication in "The Marine Observers' Log" and have undoubtedly added considerably to our knowledge of the distribution of aurora over the globe. Also, without such logbook entries the record of a ship's observations would not be complete, since the forms received are not retained in the Marine Division.

As Mr. Paton states, observations of aurora in both hemispheres between longitudes 40°W and 40°E are of particular value, and we have heard from him previously that observations made in any part of the globe are also of interest to him. Accordingly we send him at regular intervals complete copies of all the observations of aurora in the logbooks of all ships. If any ship would care to undertake the filling up of the forms over the larger area between longitudes 40°W and 40°E this would be greatly appreciated.

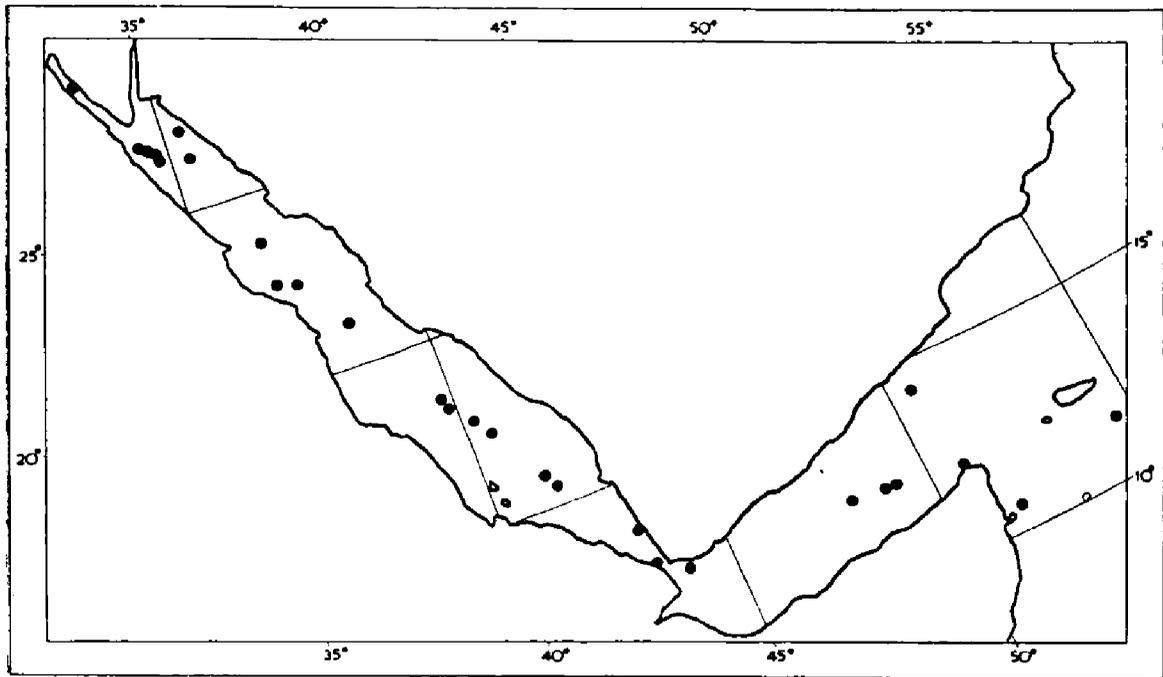
SHIPS' WEATHER REPORTS IN THE MEDITERRANEAN AND RED SEAS

Selected ships, having been asked to report weather in the Mediterranean on all possible occasions, will be interested to learn that there has been a marked improvement in the number of reports received at Malta during 1954 as compared with 1953. The average monthly number of ships' reports received at Malta in 1954 was 699 against 616 during the previous year. These figures, of course, represent reports from ships of several nationalities, but a considerable proportion of them were British.



This improvement is much appreciated and it is hoped that ships will continue to keep up and, if possible, improve upon this standard of reporting. The majority of the messages were for the observation hours 0600 and 1200 G.M.T. If ships could, whenever possible, also report weather at 0000 and 1800, such messages would be most valuable. Obviously, the more selected ship reports received in good time and covering a wide area, the better will be the resulting weather forecasts transmitted by Malta Radio for the use of all ships. The stations listed in *The Marine Observer's Guide* (M.O. 477) for receiving ships' weather messages in the Mediterranean and Red Seas are:

		<i>Call Sign</i>	<i>Address</i>
Gibraltar .. ..	..	GYW	Meteo Gibraltar
Malta .. ..	..	VPT	Meteor Luqa
Alger .. ..	..	FFA	Phiserar Alger
Oran .. ..	..	FUK	Meteo Oran
Bizerta .. ..	..	FUX	Phiserar Tunis
Alexandria .. ..	..	SUH	Met Almaza
Qoseir .. ..	..	SUK	Met Almaza
Port Sudan .. ..	..	STP	Meteor Khartoum



In the western Mediterranean, British ships unable for any reason to clear their radio weather messages to Gibraltar or Malta should send them (appropriately addressed) to one of the French North African stations, Alger, Oran or Bizerta.

The two charts show the distribution of ships' weather messages received at Dunstable from the Mediterranean and Red Sea areas during the week 21st November to 27th November, 1954. The distribution is fairly good in the western Mediterranean but it must be remembered that it is shown for a whole week. At any one of the four daily synoptic hours the average number was only about nine; for the Red Sea area the number was much less, and an improvement in the number of ships' weather messages in that area would be most welcome.

Book Reviews

The Meteorology of the Falkland Islands and Dependencies, 1944-1950. By J. Pepper, M.A., PH.D. 11½ in. × 9½ in. pp. vi + 250. *Illus.* Falkland Islands Dependencies Survey, 1954. 42s.

In this publication the aims have been confined mainly to a presentation of a comprehensive summary of the meteorological observations at the bases in the Falkland Islands and Dependencies, namely Marguerite Bay, Argentine Islands, Port Lockroy, Hope Bay, Deception Island, Admiralty Bay, Signy Island, Cape Geddes, South Georgia and Stanley, and a discussion of these observations, and in these aims the book succeeds.

Part I of the book consists of a discussion of the meteorology of the area, including chapters on each of the main elements, followed by appendices on the Antarctic Convergence, the Distribution of Pack Ice, Ice Reports from Bases for 1950 and Notes on Observing at the Argentine Islands. Part II consists of a gazetteer of the meteorological stations and Part III meteorological tables for each of the bases, together with explanations and notes on the observations and records.

Dr. Pepper has presented a very full and clear picture of the meteorological conditions and has not attempted to go too deeply into the physical causes of the atmospheric and water circulations of the Antarctic and Southern Ocean, the theories of which are at present partly in a conjectural stage.

The charts of mean monthly pressure and temperature for the area are a most useful feature. Dr. Pepper discusses the annual and diurnal variations of the main elements and the discussion on the different causes of the temperature variations is very interesting. It is interesting to note that the highest temperatures at Stanley and South Georgia in the period were 75°F and at the other bases 53° at Hope Bay. The lowest temperature was -39° at Marguerite Bay followed closely by -38° at Argentine Islands, both these temperatures occurring in September. The lowest temperatures appear to occur later in the winter as one goes from N to S in this region. During a sledge journey from Argentine Islands a minimum temperature of -50° was recorded about 30 miles S of the base on the night of 25th–26th June, 1949; allowance should be made for the fact that the thermometer was probably exposed at only 1 to 2 ft above the snow surface.

Simpson found that at McMurdo Sound during May, June and July, when the sun is below the horizon in this latitude and there is no direct solar radiation, the temperature was greater than average from 9 a.m. to 7 p.m. (local time) and below for the remainder of the day, except for a sudden and pronounced rise at 4 a.m. It is therefore interesting to find that the results from Marguerite Bay, where the sun remains below the horizon in mid-winter, appear to support Simpson's finding that the temperature during the "day" (from 8h. to 19h. in this case) in mid-winter is above the average. It should be pointed out that only observations at 8h., 14h. and 19h. and maximum and minimum temperatures were available, and as the effect is small hourly observations are really necessary to detect it. It is not possible to test Simpson's finding of the sudden rise at 4 a.m. at Marguerite Bay: a study of the thermograph records did show some evidence of it, but the instrument was not sensitive enough to make the evidence convincing.

The highest gusts reported from the following stations in 1950 were 90 kt from Signy Island in March, 80 kt from Admiralty Bay in October, 79 kt from South Georgia in March and 77 kt from Deception Island in September. No records of gusts were available from Hope Bay and Port Lockroy. It would appear that gusts reaching 70 kt will occur at least once every year over most of the region; gusts reaching 80 kt are also likely to occur at least once a year in some part of the region, most probably in the N, in the region of the South Orkneys, the South Shetlands or South Georgia. Gusts reaching 90 kt are less frequent; the only one recorded in 1950 was at Signy Island. Although no reports of gusts are available for Hope Bay during the period, it has been ascertained from one of the recent observers there that gusts reaching 100 kt and over have been recorded at this base.

The appendix on the Antarctic Convergence is extracted from the article by Dr. N. A. Mackintosh in the *Discovery Reports: The Antarctic Convergence and the Distribution of Surface Temperatures in Antarctic Waters*. The Antarctic Convergence is the line at the surface along which the Antarctic surface water, which is a shallow layer of cold water lying above a deeper layer of warm and highly saline water, sinks below the less dense sub-Antarctic water to the northwards. The Antarctic Convergence is distinguished by a more or less sharp change of temperature at the surface and is continuous around the Southern Ocean, though there are regions where it can sometimes be hardly traced. There are reasons for believing it has a close connection with meteorological conditions in the Southern Ocean. It is farthest S, about 60°S , in longitude 80°W , and farthest N, about 49°S , in longitude 35°W . The latitude of the Convergence is not greatly affected by the time of year. Apart from a chart of the position of the Antarctic Convergence, there are also a chart showing the annual variation of the "middle" temperature of the Convergence surface gradient, charts of the mean sea surface temperatures and a diagrammatical profile of the movement of water in the South Atlantic Ocean.

There appear to be few errors. One is that accepting the definition of "backing", as when the wind is changing in the opposite direction to the hands of a watch in either hemisphere, the word "backed" in the top line, second column, page 83, should read "veered".

This publication should provide a most useful reference book for anyone wishing to use the records of any of the F.I.D.S. bases. Also, many mariners and others who are concerned with the meteorology of Antarctica will find it most interesting. It is beautifully produced, with excellent maps, plates and figures, and costs £2 2s. 0d.

P. R. B.

Ships of the Cunard Line. By Frank E. Dodman. 7½ in. × 5 in. pp. 144. *Illus.* Adlard Coles, Ltd., and Harrap & Co., Ltd., 1955. 12s. 6d.

This book is a complete history of the Cunard Line and its ships, from its formation in 1839 with the *Unicorn* to the present day, with the launching of the *Ivernia* in December, 1954.

It deals with the struggle between the earlier shipping companies to obtain the mail contracts. The founder of the Cunard Line, Samuel Cunard, obtained the mail contract for a service across the Atlantic before even owning any ships, and the Company was directed by a member of the Cunard family from its formation in 1839 until Sir Edward Cunard resigned from its board of directors in the 1920's.

First formed as the British and North American Royal Mail Steam-packet Company in 1839, it became the Cunard Steamship Company in 1878, which it has remained ever since, except for a period from 1934 until 1950 when it was known as the Cunard-White Star Line. A chapter deals with the White Star ships taken over at the time of the merger in 1934; this was one of the conditions of the Government loan towards the construction of the *Queen Mary*.

The evolution of the steamship, from the time of the paddle-steamer through the iron and steel screw era until the present-day turbine steamer, is fully described, with chapters on each type of vessel. From the formation of the Company in 1839 all the ships were steamers with auxiliary sail until the *Campania* came into service in 1893, this being the first twin-screw Cunarder. Sail disappeared in 1910 when the *Umbria* came off service.

A chapter of interest to all deals with the Blue Riband, with times and average speeds, from that first recorded, the *Sirius* in 1838, to the present holder the *United States* in 1952, with interesting information about the *Mauretania*, perhaps the most famous of all trans-Atlantic liners, which held the Blue Riband for 22 years.

One point of interest to the seaman brought out in this book is that the present-day navigation lights were used by Cunard ships when there were no official regulations, and were afterwards adopted by the Board of Trade.

One chapter is devoted to the history of the Cunard ships from 1839-1954, and another gives descriptions of all their ships in service today, from the *Scythia*, built in 1920, to the last one launched in 1954, with full details regarding dimensions, tonnage, passengers and crew carried. War losses for both world wars are given in full. This book is well illustrated with 60 drawings and silhouettes by the author and 50 photographs and plans.

For the ship-lover and all interested in statistics it is a thoroughly interesting publication, and a book to settle many an argument concerning the Blue Riband holders, speeds and tonnages, etc., of Cunard ships.

J. R. R.

Note. The association between Cunard ships and the Meteorological Office goes back to early days and has been consistent throughout. Our first record of observations from a Cunarder was in 1867: Captain John A. Martyn kept a Weather Book Register between December, 1867, and June, 1868, while serving in the company's vessels *Sidon*, *China* and *Tarifa*. The observations were excellent and a special letter of thanks was sent.

At present 13 Cunarders figure in the selected ship fleet list.

Ships of the P. & O. By Captain A. G. Course. 4½ in. × 5½ in. pp. 78. *Illus.* Adlard Coles, Ltd., and Harrap & Co., Ltd., 1955. 6s. 6d.

The history of the P. & O. Line is very largely the history of the mechanically propelled Merchant Navy. In point of fact the first steamship company was floated

in 1824, but the Peninsular Steam Navigation Company, as the P. & O. then was, could probably claim to be the first foreign-going steamship company, for it was in 1837 that the Company was founded with the object of establishing steamship communication with the Iberian Peninsula and of carrying Her Majesty's mails as far as Gibraltar. This was done in the first instance by chartering six ships which were subsequently bought. Three years later the Company's contract was extended to carry the mails to Egypt and two years after that the new Company operated steamers eastward from Suez towards India. These extensions caused the Line to adopt its present title. In 1848 a further extension was made by running ships between India and Hong Kong, whilst in 1852 the Australian service was inaugurated, followed in 1864 by a mail service between China and Yokohama.

Today, with a fleet of 34 ships totalling 450,000 tons, the routes pioneered by the founders remain basically unchanged, though many additional ports of call are served by the cargo ships.

Such, briefly, is the history of the P. & O. told in Captain Course's little book. But the book is more than a mere house history. In it, and with the help of the illustrations which are by Commander C. H. Williams, whose work is well known to readers of *The Marine Observer*, we may trace the evolution of the steamship from auxiliary power through paddle to screw (for years the mail contract which the Company held with Admiralty required that mails should be carried in paddle-steamers), from wood through iron to steel, and in the whole 118 years of the Company's life we read that hardly a year has passed without some new ship entering their service, many of them bringing new features with them.

Their *Ariel*, built in 1846, was one of the first British merchant ships to have watertight compartments. In 1848 their *Canton* was armed with two 32-pounder guns against Chinese pirates, and had the gratifying experience of towing, in a calm, one of Her Majesty's ships of war to the scene of an action.

In our own time their *Viceroy of India* was the first British ocean-going ship to be electrically propelled; their *Himalaya* was the first passenger liner to have a fresh-water distillation plant installed which could supply the entire ship's needs at an economical cost; whilst their *Chusan* was the pioneer of the large ocean-going liners to be fitted with the Denny-Brown ships' stabilisers for counteracting rolling.

Their most modern cargo ships are fitted with either Drihold or Cargocaire system of ventilation in the holds, its purpose being to provide complete control of the humidity of the air in the cargo spaces and avoiding damage to the cargo through condensation, a subject to which we in the Meteorological Office have given considerable thought.

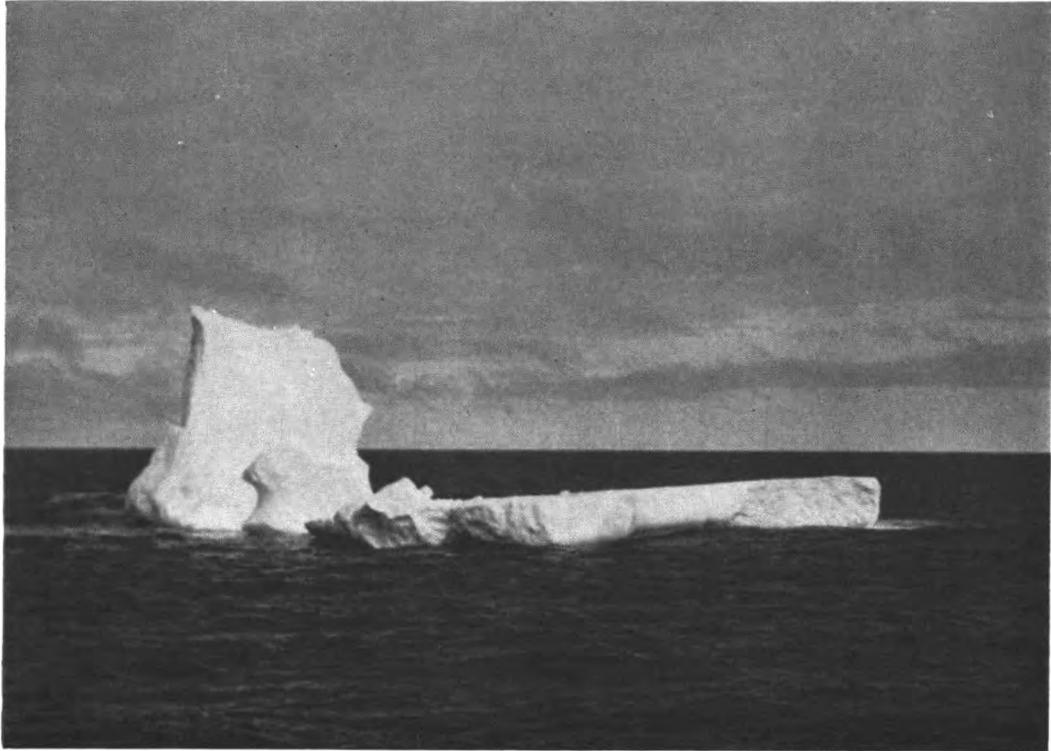
Altogether this is a first-rate little book for those interested in facts and figures relating to ships. Photographs of the post-1918 types and silhouettes or drawings of the pre-1914 types, together with a complete and detailed fleet list of all the ships, numbering well over 300, owned by the Company from its inception to the present day, make it an admirable book of reference.

L. B. P.

Note. Ships of the P. & O. fleet have also been associated with the Meteorological Office throughout the 100 years of its life. It was in 1855 that we received meteorological logbooks from the S.S. *Madras*, Captain G. H. English, London to Madras, and from the S.S. *Colombo*, Captain R. McQueen, on a trooping run in the Black Sea during the Crimean War. Today 14 of the Company's ships are active in the voluntary observing fleet.

INSTITUTE OF NAVIGATION

At the Annual General Meeting of the Institute of Navigation in October, 1954, Mr. D. H. Sadler, Superintendent of the Nautical Almanac Office, was re-elected President. In his presidential address Mr. Sadler outlined the activities of the Institute up to the present, and stressed the useful role that it could play as a forum for the discussion of all aspects of navigation and allied subjects. He rightly



Photograph by R. T. Stoneley

Iceberg seen from S.S. *Empress of Australia*, 8th September, 1954. (See page 146.)



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ROCKALL, viewed here from a height of 400 ft, is a remarkable rocky islet in lat. $57^{\circ} 36' N$, long. $13^{\circ} 46' W$, about 200 miles WNW of Barra Head. It is of coarse granite, said to be highly magnetic, and is about 83 ft in extent at its base. The summit of the islet, sharp-pointed and whitened by the excrement of sea birds, is at a height of 70 ft. It can only be ascended on its NE side, but a landing can seldom be effected and even in the finest weather is difficult, the rock being steep-to on all sides. About $1\frac{1}{2}$ cables to the NE of Rockall is a small detached rock called Haslewood Rock which dries at 3 ft. The surf around this rock is seen in the background of the picture. There is a depth of 30 fm between the two rocks, which form the twin summits of a submarine mountain.

Opposite page 173



Photograph by W. R. Buckley & Son

Captain J. H. Quick, Professional Officer (Chief Nautical Surveyor) in the Ministry of Transport and Civil Aviation. (See page 175.)

pointed out that without the active voluntary work of members in writing articles for the Journal, providing topics for discussions and doing work on committees, the Institute could not exist. The scope of the subjects which have appeared in the Journal is illustrated in the following table:

Astronomical Navigation (sea and air)	..	..	..	..	62
Marine Radar	..	..	..	..	40
Air General (a wide title)	..	..	..	..	32
Radio Aids	..	..	..	..	25
History	..	..	..	..	28
Oceanography and Hydrography	..	..	..	..	18
Meteorology (including pressure-pattern flying, flight planning, etc.)	..	..	..	..	17
Marine General	..	..	..	..	16
General	..	..	..	..	15
Air Traffic Control	..	..	..	..	10
Compass and Magnetism	..	..	..	..	6
Interplanetary Navigation	..	..	..	..	2

It is interesting to note from this the place of honour which astronomical navigation still occupies, despite the electronic aids which have so captured the imagination since they appeared on the scene. It will be noted that meteorology has rightly played a prominent part in the Institute's activities, not only in relation to air navigation but also at sea.

The Institute's Gold Medal was awarded to Captain A. M. A. Majendie (who was flight captain of the Comet fleet) for his contribution to navigation in the field of jet aircraft operation.

Among the mariners who were awarded Fellowships of the Institute this year were Captain A. H. Hutton, Nautical Adviser to the General Steam Navigation Company, and Captain F. R. Miller, Principal Examiner of Masters and Mates for the Commonwealth of Australia.

C. E. N. F.

Personalities

OBITUARY.—It is with regret that we record the death of CAPTAIN H. E. REILLY, D.S.C., R.D., R.N.R., which took place on 9th January this year at his home in Wellington, New Zealand. Captain Reilly had retired from the service of the New Zealand Shipping Co., Ltd., in January, 1954, after 34 years in the Company.

Harold Edward Reilly went to sea in 1906 as an apprentice in one of the ships of Messrs. Ernest Bigland, Ltd. On obtaining his "ticket" he served as Third Officer and Second Officer in the ships of Turner Brightman & Co. and in 1913 with Messrs. Lane & McAndrew.

In 1914 he joined the Elder Dempster Line, but in December that year was called up for service in the Royal Navy as a Sub-Lieutenant, R.N.R. He served throughout the war and until 1920, being promoted to Lieutenant during that period. He joined the New Zealand Shipping Co. in November, 1920, as Third Officer and by 1922 had been promoted to Chief Officer. In 1929 he was appointed to his first command in the Company. From then until the outbreak of war in 1939 he commanded several of the Company's ships, and during the war he again served afloat in the Navy as a Commander, R.N.R., and was awarded the D.S.C. Returning to the New Zealand Shipping Co. after the war he commanded in turn the *Pipiriki*, *Suffolk* and *Hurunui*. In January, 1954, he retired from the sea due to ill health and settled in New Zealand. Captain Reilly had been a voluntary observer since 1924, and he was one of the four officers chosen in 1954 for the presentation of a barograph by the Director of the Meteorological Office. The instrument had been taken to New Zealand where it was to have been presented by the Director of the

New Zealand Meteorological Service, but unfortunately Captain Reilly had died before this could be done. It has since been presented to his widow.

C. H. W.

OBITUARY.—It is with much regret that we record the death, which occurred suddenly on 23rd April, 1955, of CAPTAIN F. B. WEST, the Tyne area Merchant Navy Agent for the Meteorological Office.

Captain West was a native of South Shields. He had spent much of his early life at sea in the White Star Line. During the 1914-18 War he served as a Lieutenant, R.N.R. Over 30 years ago he founded the business of Messrs. F. B. West & Co., marine surveyors, at Newcastle. In 1936 he was appointed Merchant Navy Agent at Newcastle in succession to Captain J. J. McEwan, and had been associated with this work until his death.

He was highly thought of in shipping circles on the Tyne as well as by his many friends in the Voluntary Observing Fleet and in the Marine Division of the Meteorological Office.

C. H. W.

RETIREMENT.—CAPTAIN D. G. H. O. BAILLIE retired from the sea in February this year. He was first associated with the P. & O. Steam Navigation Co. as a Company's cadet in the *Worcester* in 1911, and his last command was the *Himalaya*.

During the First World War he served in the Royal Navy as an R.N.R. officer, returning to the P. & O. in 1919 as a Third Officer. He served in a number of the Company's ships and was for about nine months in one of their shore appointments in Colombo.

Promoted to Chief Officer in 1935 he was in the *Carthage* when she was taken up as an armed merchant cruiser on the outbreak of the war in 1939. He remained in the ship as a Lieut.-Commander, R.N.R. In 1942 he returned to the P. & O. as Staff Commander of the *Stratheden* for the North Africa landings that year. He was made Commodore of the Company in 1953.

Captain Baillie's first association with the Meteorological Office was in 1924, and he has contributed many excellent logbooks.

We wish him health and happiness in his retirement.

C. H. W.

RETIREMENT.—CAPTAIN HENRY R. WILKINSON retired in December, 1954, from the Ocean Weather Ship Service, in which he had been in command of the O.W.S. *Weather Explorer* since her first commissioning in February, 1948.

He first went to sea in 1913 as a cadet in the full-rigged ship *Mersey*, the training ship of the White Star Line. On the outbreak of war in 1914 he joined the Royal Naval Reserve as a midshipman and served in the battle-cruiser H.M.S. *Tiger* until 1917. From then until he was demobilised in 1919 he served in H.M.S. *Springbok* in the Harwich Flotilla and then in *P.49* as Lieutenant in command.

Passing for extra master in 1920 he rejoined the White Star Line as a junior officer and served in several of their ships until 1931 when, together with many other officers, he lost his employment because of the great slump in shipping. After trying several shore jobs Captain Wilkinson joined the United Africa Company in 1936 and sailed as master of the *Nupe* in the West African trade. He was a voluntary observer at sea for the Meteorological Office from 1925-30.

During the 1939-45 War he served afloat in the Royal Navy as a Commander, R.N.R., first in the East Coast Trawler Escort Force and later as a Commodore of East Coast Convoys, for which latter work he was mentioned in despatches. During the war he also commanded H.M.S. *Lairds Isle* and H.M.S. *Kernot*. After six winters on the somewhat arduous duties of an ocean weather ship in the North Atlantic, Captain Wilkinson has retired to a more comfortable job ashore.

We wish him health and happiness in his new venture.

C. H. W.

RETIREMENTS AND PROMOTIONS OF SENIOR NAUTICAL STAFF IN THE MINISTRY OF TRANSPORT AND CIVIL AVIATION

Captain J. C. Taylor, who has been Professional Officer (Chief Nautical Surveyor) in the Ministry of Transport since 1947, retired on 31st March due to ill health. Captain Taylor joined the Board of Trade as a nautical surveyor at Cardiff in 1926. In 1944 he was appointed Principal Officer of the London Survey District. In 1952 he was awarded the C.B.E.

Captain Taylor started his sea career the hard way in the Dundee Whalers, in which he served for some years. He then served in MacAndrews and British India ships and was latterly for several years master of a ship fur trading in the Hudson Bay area.

Captain Taylor has been succeeded by Captain J. H. Quick, who has been Principal Examiner of Masters and Mates since 1945.

Captain Quick served his time in sail aboard the four-masted barque *Lauriston*, after which he also joined the Hudson's Bay Company and served for some time in the *Nascope*. He then joined the New Zealand Shipping Co., and after serving in their ships for several years he joined a smaller company trading out of London in order to "put in time" for the London Pilot Service. He was master of the S.S. *Hubblestone* for about five years, engaged in the Bay of Biscay trade. Having passed for extra master he entered the Board of Trade as a Nautical Surveyor in 1931. Captain Quick served on the Central Board of Examiners for several years and then was appointed a Surveyor at Mark Lane. In 1937 he was transferred to Great Yarmouth, where he was promoted a Senior Surveyor in 1943. In 1944 he was appointed Deputy Principal Examiner and he succeeded Captain T. P. Marshall as Principal Examiner in 1945. In 1953 he was awarded an O.B.E.

The new Principal Examiner of Masters and Mates is Captain H. Topley, who has been Deputy Principal Examiner since 1948.

Captain Topley was trained in H.M.S. *Worcester*, and in 1915 he was appointed a temporary midshipman, R.N.R. He was demobilised as a Sub-Lieutenant in 1919 and then served with Messrs. Dalgliesh of Newcastle until 1921, when he joined the Anglo-American Oil Company, where he eventually obtained command. He passed for extra master in 1924.

In 1936 he joined the Board of Trade as Nautical Surveyor and Examiner of Masters and Mates. After serving in various ports and on the Central Marking Board he was promoted to Senior Nautical Surveyor at Cardiff in 1944.

C. E. N. F.

Notices to Marine Observers

Postal Arrangements

The quarterly numbers of *The Marine Observer* are published on the last Wednesdays of December, March, June and September.

The Marine Observer is addressed to the Captain, S.S./M.V., c/o the owners, and captains are requested to make their own arrangements for forwarding.

Shipowners, Marine Superintendents and all concerned in the despatch of mails to ships are asked to kindly facilitate the despatch and delivery of mail received at their offices from the Meteorological Office and "Air Publications and forms Stores" to their ships abroad. Addressed to the captains of ships, this contains information required for the conduct of meteorological work at sea, and is most effective if received by the captains at the earliest possible date.

Drawings by Marine Observers

In the meteorological logbooks which we receive there are many excellent diagrams and sketches, a number of which are published in *The Marine Observer* each quarter. Unfortunately, owing to the nature of the paper and ink used, these are not always suitable for publication and have to be redrawn, and however carefully this is done some of the individual character of the drawing is lost. It is suggested, therefore, that marine observers should draw their diagrams in Indian ink on plain white paper where possible and attach them to the Additional Remarks section of the logbooks. In this way we might be able to reproduce the sketches without alteration. Some pencil drawings can also be reproduced as they stand. Though, due to the prohibitive cost, we are not able to print in colour, we still hope to continue receiving the interesting coloured sketches that observing officers send us from time to time.



Some more sketches from those drawn by observing officers of M.V. *Port Wellington* on the dust cover of a meteorological logbook.

NAUTICAL OFFICERS AND AGENTS OF THE MARINE DIVISION OF THE METEOROLOGICAL OFFICE, GREAT BRITAIN

Headquarters.—Commander C. E. N. Frankcom, O.B.E., R.D., R.N.R., Marine Superintendent, Meteorological Office, Air Ministry, Headstone Drive, Harrow, Middlesex. (Telephone: Harrow 4331, Ext. 324.)

Lieut.-Commander L. B. Philpott, D.S.C, R.D., R.N.R., Nautical Officer. (Telephone: Harrow 4331, Ext. 31.)

Mersey.—Commander M. Cresswell, R.N.R., Port Meteorological Officer, Room 709, Royal Liver Building, Liverpool, 3. (Telephone Central: 6565.)

Thames.—Commander C. H. Williams, R.D., R.N.R., Port Meteorological Officer, Room 1, Second Floor, Adelaide House, London Bridge, London, E.C.4. (Telephone: Mincing Lane, 8232.)

Bristol Channel.—Mr. J. C. Matheson, Port Meteorological Officer, 2 Bute Crescent, Cardiff. (Telephone: Cardiff 21423.)

Southampton.—Captain J. R. Radley, Port Meteorological Officer, 50 Berth, Old Docks, Southampton. (Telephone: Southampton 24295.)

Clyde.—Captain R. Reid, Port Meteorological Officer, 53 Bothwell Street, Glasgow. (Telephone: Glasgow Central, 2558.)

Forth.—Captain A. Wilson, 9 Rosslyn Crescent, Edinburgh, 6. (Telephone: Leith 35788.)

Humber.—Captain R. E. Dunn, c/o Principal Officer, Ministry of Transport, Trinity House Yard, Hull. (Telephone: Hull 36813.)

Fleet Lists 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	OWNER/MANAGERS
<i>Accra</i>	GJSW	3.8.54	W. Munt	J. F. Murphy, R. Munro	J. Stuart	Elder Dempster Lines, Ltd.
<i>Aden</i>	GJMN		W. J. Banks	N. Perser, B. S. Mordant, P. B. Jackson, A. K. Ewing	E. M. Petrie	P. & O. Steam Navigation Co. F. C. Strick & Co., Ltd.
<i>Afghanistan</i>	GNVB	24.6.54	R. Connacher	N. H. Crawford, F. E. Bowley, F. M. Price	L. Kidd	Trinder Anderson & Co.
<i>Ajana</i>	GKVV	15.3.55	F. W. Mould	H. A. McGill, T. Hastings, P. J. E. Charman	C. Braithwaite	A. Holt & Co.
<i>Ajax</i>	GJXM	13.4.55	J. H. Kaye	K. F. Eder, J. K. Marshall, R. B. Stephens	I. Peel	Royal Mail Lines, Ltd.
<i>Albistan</i>	MABT	19.8.54	E. E. Dunn	M. Fleming, E. C. Cross	R. Hammond	
<i>Alcantara</i>	GLQR	13.4.55	H. H. Treeweeks	G. Moore, J. Duff, R. E. Fairly	—	Cunard Steamship Co., Ltd.
<i>Alsatia</i>	MABL	20.4.54	J. Chapman, R.D., R.N.R. (Retd.)	R. W. Barten, H. P. Williams, A. P. Hunt	E. Ash	Booker Bros. McConnell & Co., Ltd. Royal Mail Lines, Ltd.
<i>Amakura</i>	MCPN	19.6.53	A. Jones	D. Andrews, C. St. John-Keyton, J. H. Donaldson	W. Smith	
<i>Andes</i>	GQCV	10.3.55	H. D. Hooper, O.B.E.	J. Derby, J. Salt, C. Oxborough, T. Lilley	D. P. Byrne	Cunard Steamship Co., Ltd.
<i>Andria</i>	GDWM	14.3.55	A. G. Cuthill	P. A. A. James, I. Edwards, J. A. B. Munro, P. Gadsden	G. I. Gilling	Elder Dempster Lines, Ltd.
<i>Apapa</i>	MACE	9.3.54	A. G. Baptiste	D. J. Brown, A. Hopper	T. D. Sandham	Cunard Steamship Co., Ltd.
<i>Arabia</i>	GLKF	28.1.55	W. B. Tanner, R.D., R.N.R. (Retd.)	Q. Paul, M. J. Myers, R. J. F. Nighting	J. C. Crowley	F. C. Strick & Co., Ltd. Royal Mail Lines, Ltd.
<i>Arabistan</i>	GCKK	23.12.54	D. L. Cook	J. A. Jenkins, D. Calvert, J. Sharp	M. Duff	
<i>Araby</i>	GMZL	1.12.53	A. J. G. Barff	J. A. LeBrecot, R. Foulkes, M. Larrine	J. Fraser	Booker Bros. McConnell & Co., Ltd.
<i>Arakaba</i>	GDVN	19.4.55	J. A. Carter	R. A. Hammond, J. L. Anczykowski, J. Donaldson, F. Sanchez	J. Huline	Shaw, Savill & Albion Co., Ltd. Blue Star Line, Ltd.
<i>Arava</i>	GSMN	18.10.54	L. J. Hopkins	B. Cresse, S. Carr, O. Thomas	W. J. Read	Elders & Fyffes, Ltd.
<i>Argentina Star</i>	GTKF	15.12.54	E. R. Pearce, O.B.E.	M. Moore, J. Bottwood, J. Rodgers	T. Philips	Avenue Shipping Co.
<i>Araguani</i>	GMBL	3.1.54	R. W. Lundy, O.B.E., R.D., Lt.-Cdr. R.N.R. (Retd.)	F. D. Tolfree, N. Abbott, J. Nicholson, B. Griffiths		
<i>Armagh</i>	GQGG	5.4.55	J. F. Wood	A. Ashdown, J. Cole, J. Johnston		

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGERS
<i>Arundel Castle</i>	GCZL	10.3.55	D. D. MacKenzie ..	A. W. Lewins, M. Llewelyn, —, Hopkinson, R. Marchmont ..	E. Pitt, D.S.C.	Union Castle Mail S.S. Co., Ltd.
<i>Ascania</i>	GKNJ	2.10.54	E. A. Divers, O.B.E., R.D., Capt. R.N.R.	J. K. Finlay, J. S. Roe, L. W. Crump ..	H. M. Milligan ..	Cunard Steamship Co., Ltd.
<i>Ashburton</i>	GNJN	1.4.55	C. Parry ..	J. P. McRink, H. Jones, R. N. Toyne ..	T. W. Firth ..	Trinder Anderson & Co.
<i>Asia</i>	GLJV	1.11.54	F. E. Patchett ..	P. J. Davies, P. Jackson, O. H. Howells, R. Smith, C. R. Bishop, R. Pauley ..	J. S. Marshall ..	Cunard Steamship Co., Ltd.
<i>Asyria</i>	GGKX	25.1.55	R. J. N. Nicholas, R.D., Cdr. R.N.R.	J. A. Davies, J. R. Turner, R. E. Hills ..	B. A. Long ..	Cunard Steamship Co., Ltd.
<i>Asturias</i>	GLQS	16.2.55	S. J. G. Hill ..	J. Postill, J. V. McDermott, A. J. Heather, G. Bonner, J. Arnot, P. J. Williams ..	R. Farrell ..	Royal Mail Lines, Ltd.
<i>Athelfoam</i>	GMFN	24.1.55	A. W. Pegg ..	J. K. Davies, J. H. Fraser, A. B. Hunter ..	R. Breyitt ..	Athel Line, Ltd.
<i>Athenic</i>	GBLS	31.1.55	L. E. Edmeads ..	A. J. Smyth, J. O. Williams, W. A. Siddal ..	H. S. Knight ..	Shaw, Savill & Albion Co., Ltd.
<i>Athlone Castle</i>	GYTK	25.4.55	C. C. Page ..	N. W. Curd, M. Llewelyn, A. Chalmers ..	J. Summers ..	Union Castle Mail S.S. Co., Ltd.
<i>Aureol</i>	GMGJ	27.10.54	J. I. Smith, O.B.E.	—, Donaldson, D. I. Flynn ..	F. W. J. Broomfield ..	Elder Dempster Lines, Ltd.
<i>Auricula</i>	GMPV	1.12.54	G. E. Hunt ..	F. R. Christian, R. M. Watt ..	G. H. S. Jordan ..	Messrs. Shell Tankers, Ltd.
<i>Australia Star</i>	GYCS	18.9.54	R. White, D.S.C.	G. C. Williams, J. C. Harris, F. Agnew ..	L. Cooper ..	Blue Star Line, Ltd.
<i>Australind</i>	GJKF	28.1.55	R. Wilcocks ..	J. Whyte, H. R. Coates, R. Warwick ..	G. Chandler ..	Trinder Anderson & Co.
<i>Austone</i>	GJSV	2.2.55	A. A. Roche ..	J. P. Garfield, T. Davies, W. W. Brindle ..	L. R. Bradley ..	Purvis Shipping Co., Ltd.
<i>Avonene</i>	MAWG	13.1.55	F. Moorcraft ..	E. B. Fitzpatrick, G. Ross ..	J. T. W. Moody ..	Dene Shipping Co., Ltd.
<i>Avonmoor</i>	GFGL	25.4.55	L. C. Welch ..	D. A. Crawford, R. R. Jordan, G. Everitt ..	T. D. D. Kenny ..	Walter Runciman & Co., Ltd.
<i>Balaena</i>	GLDG	13.5.54	P. Urink ..	R. Christoffersen, —, Bentzen, A. Andersen ..	J. Dahl ..	Hector Whaling, Ltd.
<i>Balanita</i>	GBNM	15.4.54	I. A. Phillips ..	C. H. Burdon, J. J. Rutter, D. H. McCree ..	J. Maudsley ..	Royal Mail Lines, Ltd.
<i>Baron Elphinstone</i>	GCCD	15.2.55	T. D. Drysdale ..	R. Potter, G. Downie, D. Reed, J. Dobing ..	K. Murphy ..	H. Hogarth & Sons
<i>Baron Fairlie</i>	GLCY	29.1.55	T. R. Reid ..	T. Rees-Davies, W. F. Anderson, M. J. Bagg ..	D. L. Gormm ..	H. Hogarth & Sons
<i>Baron MacLay</i>	GKXW	18.4.55	D. MacGregor ..	C. Godson, C. P. Roy, G. Cummings ..	K. Mills ..	H. Hogarth & Sons
<i>Baron Murray</i>	GJFF	26.8.54	J. Pearson ..	J. W. Budka, J. Minarts ..	P. Murphy ..	H. Hogarth & Sons
<i>Baron Rengrew</i>	GYDR	8.11.54	J. Wylie ..	J. A. Roberts, G. MacMillan, D. Harlock ..	E. L. Marchant ..	T. & J. Harrison, Ltd.
<i>Barrister</i>	MSFR		A. Wolstenholme ..	—, Watson, J. Bean, J. Dyer ..	—, Stacey ..	Runciman (London), Ltd.
<i>Baskerville</i>	GSDN		J. G. Wilson ..	G. C. Elvidge, M. Martin, J. J. Aitkin ..	A. Leary ..	Ellerman's Wilson Line, Ltd.
<i>Basano</i>	GNXK	10.3.55	C. H. Tutty ..	M. Robinson, C. R. Tutty, G. Lawson ..	G. Adamson ..	Canadian Pacific S.S., Ltd.
<i>Beaverburn</i>	MAGB	19.3.55	W. J. F. Roberts ..	R. Elliot, J. Richardson, P. Ainsworth ..	B. Johnson ..	Canadian Pacific S.S., Ltd.
<i>Beaverford</i>	MQJG	22.4.55	J. Soame ..	R. J. Baddock, M. Organ, C. R. Worthington, D. Roberts ..	W. H. Pettit ..	Canadian Pacific S.S., Ltd.
<i>Beaverglen</i>	GBCP	17.9.54	C. L. deH. Bell, D.S.C., R.D., Capt. R.N.R. (Retd.)	R. N. Walker, M. Scott, C. Parry ..	A. E. S. Thompson ..	Canadian Pacific S.S., Ltd.
<i>Beaverlake</i>	GBCQ	5.2.54	N. W. Duck, D.S.C., R.D., Capt. R.N.R.	C. Hutchinson, G. Palmer, J. Whaling, M. Scott ..	W. Maudsley ..	Canadian Pacific S.S., Ltd.
<i>Beaverlodge</i>	MAGJ	20.11.54	L. H. Johnston ..	D. H. Walker, C. Hutchinson, B. Stewart ..	F. C. Davlin ..	A. Holt & Co.
<i>Bellerophon</i>	GGCM	1.2.55	A. R. David ..	E. B. Malvan, P. Wilks, G. A. Fisher, E. Shotton ..	E. Carruthers ..	W. Thomson & Co.
<i>Bennevis</i>	MAGG	15.9.54	R. L. Chalmers ..	T. McDougall, G. S. Cairns, J. B. Forrest ..	D. Wilkes ..	Hector Whaling, Ltd.
<i>Benvennoch</i>	GCDZ	29.10.54	J. C. Allan ..	A. Syme, G. Bannerman, D. Cochran ..	D. W. Sims ..	Blue Star Line, Ltd.
<i>Bitcoe</i>	GDCW	22.4.55	S. K. Williams ..	C. T. Fellowes, M. D. Chester, G. E. Baker ..	J. Hudson ..	Ellerman's Wilson Line, Ltd.
<i>Brasil Star</i>	GTLF	17.2.55	G. E. Barnard ..	L. N. Franklin, M. Middleton, P. Husson ..		
<i>Bravo</i>	GLDZ	27.5.55	J. A. Etches ..	A. J. Collard, R. Lomax, F. M. Martin ..		

<i>Brisbane Star</i>	GZCJ	10.2.55	S. Foulkes	P. J. Harris, M. Hawes, B. G. Knights	P. J. Harris, M. Hawes, B. G. Knights	D. Turner	Blue Star Line, Ltd.
<i>Bristol City</i>	GUAY	15.2.55	H. Harris	T. Russel, W. H. Stoodley, T. F. Gilmore	T. Russel, W. H. Stoodley, T. F. Gilmore	A. V. Chappell	Charles Hill & Sons
<i>Britannic</i>	GDXF	29.6.54	G. H. Morris	P. A. Brush, R. G. M. Hunt, K. T. Jones	P. A. Brush, R. G. M. Hunt, K. T. Jones	J. Kidson	Cunard Steamship Co., Ltd.
<i>British Consul</i>	GCXT	19.3.55	W. I. Davies	N. H. Johnstone, A. C. Browne, K. J. Brunton	N. H. Johnstone, A. C. Browne, K. J. Brunton	C. R. N. Jarmy	British Tanker Co., Ltd.
<i>British Endeavour</i>	GFCN	12.10.54	E. L. Michinson	G. R. Grey, R. E. Chalkin, W. N. Young	G. R. Grey, R. E. Chalkin, W. N. Young	R. L. Jacobs	British Tanker Co., Ltd.
<i>British Escort</i>	GCRB	4.10.54	W. S. Tully	K. J. MacKay, J. W. R. Phillips, J. MacKay	K. J. MacKay, J. W. R. Phillips, J. MacKay	J. McLellan	British Tanker Co., Ltd.
<i>British General</i>	GCDJ	16.3.55	G. C. Dobson	R. G. Brockman, A. Hendry, E. C. Hemenstall	R. G. Brockman, A. Hendry, E. C. Hemenstall	K. D. Harris	British Tanker Co., Ltd.
<i>British Marquis</i>	GWVL	25.1.55	J. V. Robinson	G. F. T. Smith, A. P. Hughes, D.S.O., J. F. Hobbs	G. F. T. Smith, A. P. Hughes, D.S.O., J. F. Hobbs	D. W. James	British Tanker Co., Ltd.
<i>British Patience</i>	GUFF	31.3.55	R. Phillips	P. M. Alderton, L. Ashburn, B. J. Grandfield	P. M. Alderton, L. Ashburn, B. J. Grandfield	W. H. Ball	British Tanker Co., Ltd.
<i>British Piper</i>	GDNN	11.1.55	D. Ayres	E. C. Morris, H. J. Shields, G. A. B. King	E. C. Morris, H. J. Shields, G. A. B. King	A. G. Cope	British Tanker Co., Ltd.
<i>British Resource</i>	GFCD	4.10.54	B. M. Naylor	L. G. C. Buckenham, D. C. Dalton, A. L. Wheaton	L. G. C. Buckenham, D. C. Dalton, A. L. Wheaton	P. Wrang	British Tanker Co., Ltd.
<i>British Sailor</i>	GSBQ	19.3.54	H. I. McMichael, O.B.E.	J. F. Surman, J. G. Harrison, G. H. Smith	J. F. Surman, J. G. Harrison, G. H. Smith	P. Kenrick	British Tanker Co., Ltd.
<i>British Splendour</i>	GCJT	29.12.54	G. Atfield	A. Phillips, R. Meybourn, M. Connell	A. Phillips, R. Meybourn, M. Connell	C. O'Neil	British Tanker Co., Ltd.
<i>British Union</i>	GCLZ	11.1.55	R. T. C. Wright	S. M. F. DeCogan, A. J. Brown, E. J. Glover	S. M. F. DeCogan, A. J. Brown, E. J. Glover	R. R. Gregory	British Tanker Co., Ltd.
<i>Brittany</i>	GMZS	31.3.55	C. C. Dingle	G. S. B. Moore, J. L. Holt, R. Luke	G. S. B. Moore, J. L. Holt, R. Luke	P. Mahoney	Royal Mail Lines, Ltd.
<i>Brockleymoor</i>	GDWP	30.11.54	D. J. Jones	T. J. Graham, D. Nicholas	T. J. Graham, D. Nicholas	E. Williams	Walter Runciman & Co., Ltd.
<i>Cairnavor</i>	GPIN	30.8.54	G. H. Percy	A. R. Fairley, N. Sutherland, T. Walker	A. R. Fairley, N. Sutherland, T. Walker	W. Anderson	Cairns, Noble & Co.
<i>Cairnahu</i>	GPBB	3.12.54	J. W. Scott	D. Aitchison, J. Hogg, J. Barton	D. Aitchison, J. Hogg, J. Barton	W. Devine	Cairns, Noble & Co.
<i>Cairnesh</i>	GMKR	6.7.53	G. R. Norvell	L. Edwards, G. Pattison, D. Lamb	L. Edwards, G. Pattison, D. Lamb	W. Greaves	Cairns, Noble & Co.
<i>Cairngowan</i>	GNZZ	3.12.54	J. G. Foster	I. Gault, J. E. Potter, T. Bell	I. Gault, J. E. Potter, T. Bell	E. Johnston	Cairns, Noble & Co.
<i>Calchas</i>	GMSS	13.1.55	D. R. Jones	M. J. Jones, K. George, E. Farmer	M. J. Jones, K. George, E. Farmer	D. M. Hughes	A. Holt & Co. Ltd.
<i>Caledonia</i>	GCKR	16.8.54	D. Barclay	D. Lambert, D. F. Storey, J. Ritchie	D. Lambert, D. F. Storey, J. Ritchie	J. Cragg	Anchor Line, Ltd.
<i>Cambridge</i>	MMBF	7.4.55	P. P. O. Harrison	L. T. Faucett, P. W. Bower, R. F. D. Pook, S. W. Lambrick	L. T. Faucett, P. W. Bower, R. F. D. Pook, S. W. Lambrick	D. W. Field	Federal Steam Navigation Co., Ltd.
<i>Canton</i>	GDDT	16.2.55	J. C. W. Last	G. J. Jones, G. E. V. Holmes, A. J. Arrowsmith, R. Hubbard	G. J. Jones, G. E. V. Holmes, A. J. Arrowsmith, R. Hubbard	M. J. Murphy	P. & O. Steam Navigation Co.
<i>Cape Clear</i>	GCKN	9.3.54	P. St. C. Willett	J. S. Taylor, D. Cameron, G. Barker	J. S. Taylor, D. Cameron, G. Barker	D. Hanley	Lyle Shipping Co., Ltd.
<i>Cape Grafton</i>	MAJF	16.12.54	D. M. Taylor	A. C. Hunter, E. M. Rebone, C. C. Paterson	A. C. Hunter, E. M. Rebone, C. C. Paterson	A. P. Brooke	Lyle Shipping Co., Ltd.
<i>Capatoun Castle</i>	GKGM	12.2.55	J. Trayner	G. Dodds, D. Jackson, B. Webb	G. Dodds, D. Jackson, B. Webb	J. Williams	Union Castle Mail S.S. Co., Ltd.
<i>Captain Cook</i>	GLBX	2.2.55	A. Bankier	C. Sheppard, N. Dalziel, I. McLundie	C. Sheppard, N. Dalziel, I. McLundie	L. W. Hooper	Donaldson Bros. & Black, Ltd.
<i>Carnarvon Castle</i>	GJSL	21.1.55	W. S. Byles, R.D., Capt. R.N.R.	I. L. White, B. Bennett, N. Curd, H. Miller	I. L. White, B. Bennett, N. Curd, H. Miller	H. G. Liggins	Union Castle Mail S.S. Co., Ltd.
<i>Caronia</i>	GYKS	18.11.54	C. S. Williams	D. Lee, L. Easton, A. M. Christie, J. King	D. Lee, L. Easton, A. M. Christie, J. King	W. A. Sturgeon	Cunard Steamship Co., Ltd.
<i>Carthage</i>	GRNX	25.3.55	D. H. F. Armstrong	B. J. Carter, P. Kennard	B. J. Carter, P. Kennard	W. Poingdestre	P. & O. Steam Navigation Co.
<i>Caston</i>	MCJR	22.2.54	R. Blacklock	R. C. Scroggins, T. R. Robinson, R. R. Rawlins	R. C. Scroggins, T. R. Robinson, R. R. Rawlins	G. Dunn	Runciman (London), Ltd.
<i>Cavina</i>	GKFF	13.4.55	F. P. Inch	T. Hancock, R. Daley, W. Thompson, E. R. Williams, D. J. Ely	T. Hancock, R. Daley, W. Thompson, E. R. Williams, D. J. Ely	W. McHugh	Elders & Fyffes, Ltd.
<i>Caxton</i>	GCDX	8.12.54	W. J. Coull	L. C. Fuke, W. M. Hendry, G. C. Elvidge	L. C. Fuke, W. M. Hendry, G. C. Elvidge	W. P. M. Edmunds	Runciman (London), Ltd.
<i>Ceramic</i>	GFLM	13.4.55	F. A. Smith	I. C. McIntosh, G. Houchin, B. Agrew, C. D. Craig	I. C. McIntosh, G. Houchin, B. Agrew, C. D. Craig	S. Lillis	Shaw, Savill & Albion Co., Ltd.
<i>Chantala</i>	GQMR	10.3.55	L. W. Smith	W. M. Courts, —, Stubbington, D. R. Andrews	W. M. Courts, —, Stubbington, D. R. Andrews	N. Taylor	British India Steam Nav. Co., Ltd.
<i>Chepman</i>	GFVR	17.1.55	L. C. Burton	J. S. Glen, J. W. Peck, E. S. Peers	J. S. Glen, J. W. Peck, E. S. Peers	B. Braithwaite	Runciman (London), Ltd.
<i>Cheshire</i>	GLXV	7.9.54	N. F. Fitch	J. J. Mullins, B. Pennington, P. Northway	J. J. Mullins, B. Pennington, P. Northway	C. Beyer	Bibby Bros. & Co.
<i>Chindawara</i>	GFRT	10.7.54	B. A. Rogers, D.S.C., R.D., Cdr. R.N.R.	H. B. Chambers, A. S. Bolles, T. I. Robertson	H. B. Chambers, A. S. Bolles, T. I. Robertson	G. J. Edge	British India Steam Nav. Co., Ltd.
<i>Cilicia</i>	GDGL	1.4.55	J. L. Gibson, O.B.E.	D. MacLeod, G. Hendry, N. McFarlane	D. MacLeod, G. Hendry, N. McFarlane	C. Pennington	Anchor Line, Ltd.
<i>Cingalese Prince</i>	GFRC	6.1.55	B. R. Simons, M.B.E.	A. Farrar-Hare, P. Norwood, A. McMath	A. Farrar-Hare, P. Norwood, A. McMath	K. McGuire	Prince Line, Ltd.

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGERS
<i>City of Barcelona</i> ..	GTKR	5.11.54	A. N. Fry ..	P. G. Pope, A. M. Oxberry, D. B. Williams ..	J. Sheridan ..	Ellerman Lines, Ltd.
<i>City of Birmingham</i> ..	GZLR	28.1.55	W. S. Doidge ..	E. S. Page, J. W. E. Caffyn, P. Leatham ..	H. Reynolds ..	Ellerman Lines, Ltd.
<i>City of Brisbane</i> ..	GDLM	29.12.54	E. G. Chapman ..	D. J. Shiel, J. Crinnell, B. Morris, A. M. Bowman, — Fieldhouse ..	A. E. Lawrence ..	Ellerman Lines, Ltd.
<i>City of Bristol</i> ..	GCPN	23.3.55	W. A. Owen ..	C. H. Long, R. I. MacNab, I. G. Lumby ..	L. R. Jones ..	Ellerman Lines, Ltd.
<i>City of Cape Town</i> ..	GBBQ	18.11.54	J. Blewett ..	J. R. Lowe, J. R. Phinn, N. Bradley ..	L. E. Clayton ..	Ellerman Lines, Ltd.
<i>City of Carlisle</i> ..	GBJK	12.1.55	F. McKay ..	P. J. Carne, G. Roose, A. MacMillan, P. R. Williamson ..	J. O'Donoghue ..	Ellerman Lines, Ltd.
<i>City of Chester</i> ..	MAHN	31.3.55	W. A. Hannah ..	D. D. Jamieson, W. Locker, C. Granger, T. Lovell ..	D. G. Hallam ..	Ellerman Lines, Ltd.
<i>City of Delhi</i> ..	GLBW	5.10.54	W. S. Lowie ..	K. Graham, W. Courts, A. Ledger ..	F. Culin ..	Ellerman Lines, Ltd.
<i>City of Derby</i> ..	GFWC	18.11.54	F. W. Woods ..	C. F. Fawcett, D. S. Maclean ..	J. Simpson ..	Ellerman Lines, Ltd.
<i>City of Dieppe</i> ..	GSVQ	12.2.55	G. J. Law, O.B.E. ..	I. E. Parry, R. Frame, D. H. McIntosh, W. Browne ..	T. Bradbury ..	Ellerman Lines, Ltd.
<i>City of Durham</i> ..	GBJM	30.11.54	W. J. Merchant ..	J. B. Jones, R.N.R., G. G. Francis, D. Laird ..	L. Peppers ..	Ellerman Lines, Ltd.
<i>City of Edinburgh</i> ..	GNGC	4.11.54	J. W. Wotherspoon, M.B.E. ..	J. F. Turvill, J. E. Leigh, T. Innes ..	P. H. Smyth ..	Ellerman Lines, Ltd.
<i>City of Evansville</i> ..	GINF	24.3.55	T. L. Vaughan ..	J. Cowper, W. Fleming, R. MacMahon ..	W. T. Brace ..	Ellerman Lines, Ltd.
<i>City of Johannesburg</i> ..	GBKW	1.12.54	R. J. Ricketts ..	R. P. M. Cook, G. Rainer, A. J. Lawrie ..	M. Sheehan ..	Ellerman Lines, Ltd.
<i>City of Kharitourm</i> ..	GBZC	8.8.54	E. M. Jenkins ..	G. H. Salter, J. Sapp, J. D. L. Kenny ..	E. M. Grover ..	Ellerman Lines, Ltd.
<i>City of Lichfield</i> ..	GCXL	3.12.54	G. R. Jackson ..	A. A. Smith, I. Butcher, D. Quinn ..	A. T. Murray ..	Ellerman Lines, Ltd.
<i>City of Lille</i> ..	GSLN	12.5.54	H. Mackie ..	F. W. More, D. Wright, G. H. Watkins ..	I. Morgan ..	Ellerman Lines, Ltd.
<i>City of Liverpool</i> ..	GZJX	12.5.54	W. A. Rogerson ..	P. Thornton, J. H. Robson, L. King ..	E. D. McMahon ..	Ellerman Lines, Ltd.
<i>City of Lyons</i> ..	GMCN	22.1.55	L. R. Pulford ..	J. M. Longstaff, J. Kinley, W. M. McGregor ..	C. Cowen ..	Hall Line, Ltd.
<i>City of New York</i> ..	GLYQ	1.7.54	A. M. Westlake ..	W. F. P. Connell, A. Burnett, — Mornill ..	A. Gordon ..	Ellerman Lines, Ltd.
<i>City of Paris</i> ..	GFQM	23.2.55	T. H. Speakman ..	J. B. Somerville, F. O'Neill, R. Binnie, I. W. Bernard ..	K. G. Arthur ..	Ellerman & Bucknall S.S. Co., Ltd.
<i>City of Pretoria</i> ..	GBLN	24.1.55	A. G. Freeman ..	T. R. Hughes, A. A. Romsden, P. Field ..	R. G. Bell ..	Ellerman Lines, Ltd.
<i>City of Swansea</i> ..	GBZT	23.1.55	F. J. H. T. Vizer ..	J. A. McIntyre, — Waddleston, — Murfin, — Lewis ..	T. H. Rowlands ..	Ellerman Lines, Ltd.
<i>City of Sydney</i> ..	GSEF	18.2.55	G. F. Sumpton ..	J. M. S. Gibson, J. Kendal, R. A. White ..	K. Talbot ..	Cayzer Irvine & Co., Ltd.
<i>Clan Brodie</i> ..	GKPD	3.12.54	B. Vernon-Browne ..	A. G. Cruickshank, A. B. Foster, L. A. O'Keefe, A. Crawford ..	J. Brown ..	Cayzer Irvine & Co., Ltd.
<i>Clan Buchanan</i> ..	GKNM	22.12.54	H. T. Booth ..	J. A. Riach, R. Shattock ..	R. F. Cole, M.B.E. ..	Cayzer Irvine & Co., Ltd.
<i>Clan Campbell</i> ..	GDZK	21.12.54	H. C. Simpson, O.B.E. ..	J. C. Walters, L. B. Charleson, R. N. Field ..	V. Sleavin ..	Cayzer Irvine & Co., Ltd.
<i>Clan Chattan</i> ..	GFBB	10.3.55	J. McCrone ..	J. J. Gregor, N. Wallace, C. L. Lea-Swain, W. J. Curven ..	H. E. P. Macnamara ..	Cayzer Irvine & Co., Ltd.
<i>Clan Chishalm</i> ..	GFBY	10.1.55	V. W. Green ..	R. Bullmore, E. Taylor, D. Lightly ..	G. D. Ainslie ..	Cayzer Irvine & Co., Ltd.
<i>Clan Davidson</i> ..	MAWU	22.1.55	T. A. Watkinson ..	T. M. Connolly, P. Philip, W. O. M. Cathro ..	P. H. Cottrill ..	Cayzer Irvine & Co., Ltd.
<i>Clan Forbes</i> ..	GPGB	10.1.55	I. C. Scott ..	D. C. Stobbart, T. H. Graham, S. M. Grant, L. Pritchard ..	C. Heggerty ..	Cayzer Irvine & Co., Ltd.
<i>Clan Macaulay</i> ..	GZCS	20.1.55	F. H. S. Petherbridge ..	R. S. Schooling, R. A. Escolme, E. N. Bass, M. R. Pearson ..	G. Martyn ..	Cayzer Irvine & Co., Ltd.
<i>Clan MacDonald</i> ..	GCPG	25.3.55	A. J. Hogg ..	N. Campbell, G. S. Grann, P. C. W. Hoblyn ..	C. E. C. Crewe ..	Cayzer Irvine & Co., Ltd.
<i>Clan MacDougall</i> ..	GFBO	11.1.55	P. MacMillan ..	T. Hunter, A. Moir, R. Wilson, A. Elston ..	G. Norton ..	Cayzer Irvine & Co., Ltd.
<i>Clan MacKinnon</i> ..	GK LX	18.3.55	J. P. Dumphy ..	J. Currie, E. S. E. Owen, T. J. Strange ..		

<i>Clan MacLaren</i>	..	GSSC	4.4.55	A. G. McPherson ..	E. A. Protherd, J. A. Hyslop, H. I. S. White	R. W. Moore ..	Cayzer Irvine & Co., Ltd.
<i>Clan MacLay</i>	..	GSTV	10.2.55	S. S. Davidson ..	G. M. Silvers, G. Stonehouse, J. G. Lynch	F. Fawcett ..	Cayzer Irvine & Co., Ltd.
<i>Clan MacLean</i>	..	GSWX	5.2.55	H. Whitehead ..	E. T. Burke, H. S. Cotterall, J. H. Beavan	W. G. Peddie ..	Cayzer Irvine & Co., Ltd.
<i>Clan Macrae</i>	..	MAHP	10.11.54	W. Woodruffe ..	P. J. Hodgeman, G. E. Mitchell, I. H. Scott	M. Cuthbert ..	Cayzer Irvine & Co., Ltd.
<i>Clan MacTavish</i>	..	GUBB	26.5.54	E. Gough, O.B.E. ..	J. Allison, I. M. Shearer, R. A. Fletcher, F. R. Usher	W. Ellmers ..	Cayzer Irvine & Co., Ltd.
<i>Clan Robertson</i>	..	GRQQ	12.2.55	H. J. Anchor, O.B.E., R.D., Capt. R.N.R. (Retd.) ..	R. J. Brews, R. M. McCrane, J. Patterson	A. Hadden ..	Cayzer Irvine & Co., Ltd.
<i>Clan Shaw</i>	..	GBYW	4.4.55	F. J. E. Houghton ..	C. J. Abbott, J. G. Smith, D. J. Edmonds, A. B. Walgate	G. H. Hudd ..	Cayzer Irvine & Co., Ltd.
<i>Clan Sutherland</i>	..	GFWZ	4.4.55	F. H. Turton ..	G. E. Trowsdale, E. C. Harvey, J. A. Lyons	W. Gay ..	Cayzer Irvine & Co., Ltd.
<i>Clan Urquhart</i>	..	GFBK	1.7.54	T. W. Irman, O.B.E. ..	A. A. Elston, L. S. Jones, M. C. Mac-Cable, D. Townshend	R. Morris ..	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>Condessa</i>	..	MAHU	8.10.54	F. W. Kent ..	J. Jacques, M. Gilmour, H. Swindells	J. Bishop ..	Furness-Houlder Argentine Lines Ltd.
<i>Corfu</i>	..	GRNW	15.4.55	C. F. Halliday ..	M. H. S. Hewlings, R.N.R., A. C. Mac-Kinnon, D. A. Hansing, R. Thaw	F. J. Arthurs ..	P. & O. Steam Navigation Co.
<i>Corinaldo</i>	..	GMKP	11.1.55	R. McNie ..	J. Reid, A. Dougall, J. McDonald	A. R. Cox ..	Donaldson Bros. & Black
<i>Corinthic</i>	..	GZYL	13.4.55	A. C. Jones ..	G. H. Lewis, G. B. Broom, R. Frisby, D. Miller	L. Waterhouse ..	Shaw, Savill & Albion Co., Ltd.
<i>Corrales</i>	..	GSJL	4.4.55	J. E. Purvess ..	G. Spiking, B. Hodges, J. A. Park	S. Ribee ..	Elders & Fyffes, Ltd.
<i>Cotopaxi</i>	..	GONX	12.1.55	J. D. Richards ..	J. B. Glen, W. A. E. Johnston, J. E. Evans	D. Oliver ..	Pacific Steam Navigation Co.
<i>Craftsman</i>	..	GPZT	29.5.54	T. B. Littlechild ..	G. B. Thomson, F. R. Robinson, J. Maddison	D. Baty ..	T. & J. Harrison, Ltd.
<i>Crofter</i>	..	MNGX	31.3.55	S. Diamond ..	J. A. Heald, H. Sutcliffe, D. Smith	B. W. Dunscombe ..	T. & J. Harrison, Ltd.
<i>Cumberland</i>	..	GPPY	20.11.54	A. E. Williams ..	S. Sparrow, J. Weston, G. Lowery	G. S. Ross ..	Federal Steam Navigation Co., Ltd.
<i>Cuzco</i>	..	GKPF	2.12.54	R. D. S. Echford ..	K. L. Crowther, G. D. Pattison, A. Jestico	V. Dalton ..	Pacific Steam Navigation Co.
<i>Dalely</i>	..	MFBV	13.4.55	F. D. Lloyd ..	K. Barnett, C. Dixon, P. Robinson	M. R. Carney ..	Ropner Shipping Co., Ltd.
<i>Dallas City</i>	..	GCLS	14.2.55	R. Dodds ..	P. Whitcross, O. J. Lindsay, D. Baker	J. M. Robson ..	Sir William Reardon Smith & Sons, Ltd.
<i>Darro</i>	..	MAID	22.2.55	T. Stevens ..	E. Long, M. B. Wingate, G. Varney	J. R. Hinds ..	Royal Mail Lines, Ltd.
<i>Debrett</i>	..	GRPR	29.6.54	C. E. Legg ..	W. L. Murray, D. H. Llewellyn, J. E. Lenham	J. Powell ..	Lampport & Holt Line, Ltd.
<i>Deerpool</i>	..	GKDY	22.2.55	S. Richards ..	G. Henshaw, R. E. Gatiss	A. Owen ..	Sir R. Ropner & Co., Ltd.
<i>Delphic</i>	..	MBLQ	13.4.55	C. L. Carroll, D.S.C., R.D., Lt.-Cdr. R.N.R. (Retd.) ..	D. A. Rogers, B. Tomalin, J. D. Haberfield	A. Morris ..	Shaw, Savill & Albion Co., Ltd.
<i>Deseado</i>	..	MAIH	23.2.55	R. C. S. Woolley, R.D., Cdr. R.N.R. ..	J. F. Flood, R. J. Turner, C. Ratcliffe	P. Murray ..	Royal Mail Lines, Ltd.
<i>Dexon</i>	..	GDRF	6.1.55	R. G. Hollingdale ..	J. M. Burn, J. Wright, T. E. Partridge	E. Caley ..	Federal Steam Navigation Co., Ltd.
<i>Devonshire</i>	..	GTTY	7.2.55	H. Kerbyson ..	G. F. Risley, J. Longrigg, G. H. Draysey	A. Jones ..	Bibby Bros. & Co.
<i>Deltara</i>	..	GYQV	10.3.55	M. C. Williams ..	D. C. Watson, T. W. Barnett, I. K. Bowerman, R. J. Elston	S. J. Taylor, M.B.E. ..	British India Steam Nav. Co., Ltd.
<i>Discovery II</i>	..	GWVM	4.10.54	H. O. L'Estrange, D.S.C., R.D., Lt.-Cdr. R.N.R. ..	C. W. P. Sumner, R. M. Frederick, J. Norrington	— Miller ..	National Institute of Oceanography.
<i>Dominion Monarch</i>	..	GRGG	19.3.55	B. Forbes-Moffatt ..	R. O. Guille, P. Gardew, D. Hammetton, R. L. Reid, R. Hind	F. V. Harford ..	Shaw, Savill & Albion Co., Ltd.
<i>Dorset</i>	..	GZFO	26.10.54	K. Barnett ..	E. Hubbard, M. Blake, B. Foster	J. Tomlinson ..	Federal Steam Navigation Co., Ltd.
<i>Drina</i>	..	MAIL	15.3.55	F. J. Swallow ..	J. P. Crawford, J. Collins, —, Anderson, —, Jones	D. C. H. Franklin ..	Royal Mail Lines, Ltd.
<i>Dryden</i>	..	GQGT	4.1.55	W. J. M. Ankers ..	J. R. Chatterton, K. J. McGuire, J. B. Hodgson	K. N. T. Jones ..	Lampport & Holt Lines, Ltd.
<i>Duke of Athens</i>	..	GMYS	19.8.54	T. Walton ..	K. Tucker, T. Owen, D. Montague	E. Dennis ..	Trent Maritime Co., Ltd.

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGERS
<i>Dunedin Star</i>	GKKT	22.11.54	J. D. W. Davies	C. Holleyoak, J. B. Kirkham, J. Hulton	R. Read	Blue Star Line, Ltd.
<i>Dunera</i>	GBBR	20.11.54	A. A. Kay	C. R. S. Monk, J. A. Stanton, T. M. Hall	T. F. Holden	British India Steam Nav. Co., Ltd.
<i>Dunkery Beacon</i>	GUFS	14.12.54	A. C. E. Green	C. T. Richardson, P. J. Kenny, P. McPherson	E. A. Robson	Phs. Van Ommeren (London), Ltd.
<i>Durango</i>	MAIM	30.9.54	H. A. Wright	B. E. Bether, D. B. Cairns, C. B. Chamberlain	H. Davies	Royal Mail Lines, Ltd.
<i>Durban Castle</i>	GPGP	8.10.54	J. A. Sowden	J. Perrett, R. Foster, D. Kerr	D. Drover	Union Castle Mail S.S. Co., Ltd.
<i>Duranda</i>	GFSL	23.9.54	W. J. Machon	P. J. Clarke, D. M. D. Rae, R. Palmer	— Blackford	British India Steam Nav. Co., Ltd.
<i>Durham</i>	GWWK	27.9.54	J. D. Bennett	J. Stringfellow, J. Hannah, D. Brockbank	T. M. Jones	Federal Steam Navigation Co., Ltd.
<i>Edenfield</i>	GJFF	31.1.55	J. F. Blakie	M. Rutter, W. H. Lawson, D. E. Arnell	J. M. Mahon	Hunting & Son, Ltd.
<i>Edinburgh Castle</i>	GOHN	25.3.55	H. A. Deller	H. Miller, P. Redforth, J. Dilly	J. Hodgson	Union Castle Mail S.S. Co., Ltd.
<i>Egidia</i>	GJZD	14.3.55	R. H. Harris	R. Watt, J. McLarty, — Stockley, J. Kane	J. Crosbie	Anchor Line, Ltd.
<i>Elyssia</i>	GJZK	10.2.55	A. J. F. Colquhoun, M.B.E.	A. M. Kendrick, T. Patience, M. C. Bell	A. R. Prole	Anchor Line, Ltd.
<i>Empire Clyde</i>	GDXS	20.1.55	A. C. Johnston	J. A. Scrimgeour, G. Ramage, W. Hallum, G. Murdoch, A. Johnston, J. McCutcheon	D. Thompson	Anchor Line, Ltd.
<i>Empire Fowey</i>	GMFW	10.12.54	W. T. C. Lethbridge	P. J. Clark, A. J. Whitehead, J. F. Banister, J. Vole	G. Dawson	P. & O. Steam Navigation Co.
<i>Empire Halladale</i>	GPVQ	19.2.55	R. Blake	J. S. Watson, H. A. Cameron, W. W. Cameron, M. B. McTavish	D. Robson	Anchor Line, Ltd.
<i>Empire Ken</i>	GKZJ	29.12.54	C. E. Mason	N. Wardle, — Byles, K. Harper, — Sankey	E. Winslow	Royal Mail Lines, Ltd.
<i>Empire Orwell</i>	GRCB	1.1.55	C. K. Blake, O.B.E.	G. B. McGuffie, N. Lawson, D. R. Carroll	S. Shippam	Orient Steam Navigation Co., Ltd.
<i>Empire Star</i>	GCDD	10.3.55	F. N. Johnson, M.B.E.	D. R. McWhan, A. V. Watt, R. C. Cameron	J. N. James	Blue Star Line, Ltd.
<i>Empress of Australia</i>	GQMQ	20.10.54	J. P. Dobson, D.S.C., R.D., Capt. R.N.R.	R. T. Stoneley, H. West, A. Ashton	J. Butterworth	Canadian Pacific Steamships, Ltd.
<i>Empress of France</i>	GNTV	10.12.54	R. A. Leicester, O.B.E.	J. S. Brooks, G. Geddes, B. Snell, L. E. McDowell	E. Murphy	Canadian Pacific Steamships, Ltd.
<i>Empress of Scotland</i>	GMLV	15.12.54	C. E. Duggan, R.D., Capt. R.N.R.	D. Humphreys, W. Ligertwood, R. J. Baddock	W. Campbell	Canadian Pacific Steamships, Ltd.
<i>English Star</i>	MFSS	13.4.55	L. Vernon, M.B.E.	T. V. Anderson, J. Law, E. S. Neave	H. B. Smith	Birt, Potter & Hughes
<i>Enton</i>	GNLF	24.8.54	R. F. Hellings	D. Brodie, J. Blake, P. Johnson	H. H. Lyons	Shaw, Savill & Albion Co., Ltd.
<i>Esperance Bay</i>	GSMP	18.2.55	H. C. Smith	M. Thornton, T. T. Salmon, D. G. Ede	P. Smith	Royal Mail Lines, Ltd.
<i>Essequibo</i>	GKPK	9.9.54	T. W. F. Bolland	R. H. Atkinson, I. Park, J. G. Street, D. Knights, P. Shephards	J. Skirrow	Federal Steam Navigation Co., Ltd.
<i>Essex</i>	GMML	9.11.54	L. W. Fuller	H. Harkins, J. Corker, F. R. Wilson	G. C. Waterfield	Trader Navigation Co., Ltd.
<i>Essex Trader</i>	GCMS	26.10.54	R. E. Bennett	E. Whisley, E. E. Atkinson, D. Milburn	D. Robertson	Esso Transportation Co., Ltd.
<i>Esso Cambridge</i>	GRWI	12.2.55	W. Pettman	G. Thomas, C. Welch, J. Wilson	N. MacLean	Esso Transportation Co., Ltd.
<i>Esso Canterbury</i>	GWZF	10.3.55	O. H. Shephard	J. L. Watson, G. Arthur, O. Donovan	E. Thomas	Esso Transportation Co., Ltd.
<i>Esso Glasgow</i>	GTXC	25.4.55	A. Denton	J. Harlow, E. Prest, R. Potts	L. Newman	Esso Transportation Co., Ltd.
<i>Esso Manchester</i>	GWCD	21.2.55	R. E. Smith	A. C. Armstrong	L. A. Bundoock	Esso Transportation Co., Ltd.
<i>Esso Plymouth</i>	GYRX	23.12.54	E. J. Newbold	H. K. Stevens, J. B. Bain, G. D. Scott	I. Paterson	Anchor Line, Ltd.
<i>Etivebank</i>	GDMK	22.10.54	R. J. Warn	A. C. Armstrong	J. M. Watson	A. Holt & Co.
<i>Eucadia</i>	GJZL	23.12.54	W. MacVicar, M.B.E.	D. Barclay, J. C. Robertson, R. B. Douglas	H. M. Robinson	T. & J. Harrison, Ltd.
<i>Eumaeus</i>	MRWT	29.12.54	H. C. Large	L. Henshall, D. Hammond, D. McCaffery	— Cross	T. & J. Harrison, Ltd.
<i>Explorer</i>	GYJX	31.3.55	W. S. Eustance	W. C. T. Pennant, E. J. Maxwell, D. T. English		
<i>Factor</i>	GPZY	3.12.54	E. B. Stephens	R. Bell, R. H. Douglas, A. G. Nicholson		

<i>Fanad Head</i>	GNQQ	24.6.54	W. J. Leinster	R. A. Maxwell, W. R. Nelson, T. McDowell	E. Gill	G. Heyn & Sons, Ltd.
<i>Flamenco</i>	GCBV	5.8.54	P. L. Hocky	C. Pringle, I. J. Leicester, G. McIntyre	P. E. Grenway	Pacific Steam Navigation Co.
<i>Franconia</i>	GBRO	14.12.54	D. M. MacLean, D.S.C., R.D., Capt. R.N.R. (Retd.)	H. L. Ashcroft, C. Hutcheson, H. Blackburn	E. P. Bishop	Cunard Steamship Co., Ltd.
<i>Fremantle Star</i>	MQFT	26.7.54	C. R. Horton, D.S.C.	C. G. Smeaton, T. E. Harris, S. C. Buchanan	R. Gill	Blue Star Line, Ltd.
<i>Fresno City</i>	GBYD	20.11.54	D. L. Beynon	J. S. Randall, H. Ward, M. Scarffe	A. Ferguson	Sir William Reardon Smith & Sons Ltd.
<i>Garvelpark</i>	GKSV	12.1.55	A. McF. Allan	N. E. F. Jacotine, E. Eelco, I. M. Ramsey	J. McL. Robertson	Messrs. J. & J. Denholm, Ltd.
<i>Geelong Star</i>	GNWF	12.11.54	J. S. Crowe	P. A. Roberts, I. B. Owen, K. L. Morris	J. Mathews	Blue Star Line, Ltd.
<i>Geologist</i>	GJMR	3.12.54	A. E. Jackson	R. H. Williams, D. M. Meyer, A. K. Jones	H. M. Robinson	T. & J. Harrison, Ltd.
<i>Georgic</i>	GRLJ	19.4.55	W. M. Stewart, O.B.E.	D. Calvert, P. Walton, J. K. Finlay, D. A. Williams, I. McGregor, H. Hurttley	G. A. Hill	Cunard Steamship Co., Ltd.
<i>Glenartney</i>	GBLG	10.3.55	H. E. Readshaw	W. B. Bannerman, M. P. Stone, P. D. Kemp	H. Q. Cox	Glen Line, Ltd.
<i>Glenbank</i>	GKLC	7.7.54	J. B. Mitchell	B. P. Forde, J. O'Connor, P. Lichy	P. McGowan	Andrew Weir & Co., Ltd.
<i>Glenorchy</i>	GBLL	24.2.55	R. A. Hanney	J. D. Gardner, J. C. Ray, P. J. Shorrocks	D. Rave	Glen Line, Ltd.
<i>Gloucester</i>	MANK	20.11.54	J. E. Bury	D. C. Blackman, B. S. Smith, N. Niblock	R. Oliver	Federal Steam Navigation Co., Ltd.
<i>Gloucester City</i>	GKJS		A. L. Webb, O.B.E.	A. N. Couch, J. Campbell, — Reece	C. Thompson	Chas. Hill & Sons.
<i>Golfito</i>	GBYL	23.11.54	J. H. Bull	D. J. Ely, H. G. Cresswell, G. Foster	F. Griffiths	Elders & Fyffes, Ltd.
<i>Gothic</i>	MAUQ	20.1.55	K. Fisher	J. Daiby, I. Cousins, A. Murison	L. Rawson	Shaw, Savill & Albion Co., Ltd.
<i>Graig</i>	MFDS	15.12.54	S. Glynn-Woods	G. M. Nish, D. Owen, B. G. Cawson	R. Small	Idwal Williams & Co., Ltd.
<i>Grandford</i>	MOGC	24.6.54	E. C. I. Morgan	R. Rawlinson, M. D. Perry, H. J. Garrett	J. Edmunds	Goulandris Bros., Ltd.
<i>Great City</i>	GBYS	17.1.55	I. Williams	A. G. Bateley, J. Vaughan, J. Atwood		Sir William Reardon Smith & Sons, Ltd.
<i>Grelmarion</i>	MAHQ	21.3.55	D. Chadwick	B. Gulson, F. Taylor, J. Cosh, J. Fordham	E. Graham	Cardigan Shipping Co.
<i>Haparangi</i>	GJYX	27.3.54	J. Wharton	B. O'Sullivan, J. G. Nelson, L. W. Hagreen	J. Cockayne	New Zealand Shipping Co., Ltd.
<i>Harpalycus</i>	GYNB			J. B. Steele, W. T. Loskoczyński, L. J. W. Hageen	J. E. Conway	J. & C. Harrison, Ltd.
<i>Harrington</i>	GFCZ	19.2.55	J. F. Champion	F. G. Bevis, R. S. Hales, D. L. Turner, A. J. Rawson	C. Robinson	New Zealand Shipping Co., Ltd.
<i>Hauraki</i>	GJLV	19.1.55	H. D. Horwood	R. A. Warren-Perry, T. P. Welch, J. W. Ellison	D. W. Rae	A. Holt & Co.
<i>Hector</i>	GBNK		G. R. Cheetham	G. Holmes, R. M. Simpson, J. Hughes	S. D. Colley	A. Holt & Co.
<i>Helena</i>	GBTM	31.3.55	S. G. Ellams	A. Alexander, L. Storm, H. M. Scott	T. O'Looney	Anglo-Saxon Petroleum Co., Ltd.
<i>Helicina</i>	GKBC	9.3.54	W. C. Loughlin	H. C. Arden, G. Renston, R. H. Jones	H. Hare	Federal Steam Navigation Co., Ltd.
<i>Herdsmen</i>	GPZX	15.7.54	W. A. Sawie	C. Hill, J. Laidlow, C. Millar, I. McWhannell	T. Desboro	Royal Mail Lines, Ltd.
<i>Hertford</i>	GKNW		E. A. Burton	R. R. New, R. Stapledon, J. Hindmarsh, C. W. Harris	W. Rollason	Royal Mail Lines, Ltd.
<i>Highland Brigade</i>	GJKN	10.3.55	J. Smith, R.D., Capt. R.N.R. (Retd.)	S. Ross, R. Hill, J. Escolme	R. Dunk	Royal Mail Lines, Ltd.
<i>Highland Chieftain</i>	GCTY	8.1.55	P. M. Burrell	M. Boyd, J. Thornhill, D. Henderson, D. Wilford	F. Goodall	Royal Mail Lines, Ltd.
<i>Highland Monarch</i>	GMZF	7.2.55	D. R. Miller	J. P. Crawford, P. Campbell, R. Greenall, J. G. C. Thomas, I. Farquharson	A. Newcombe	Booth S.S. Co., Ltd.
<i>Highland Princess</i>	GFMN	6.11.54	S. J. G. Hill	R. T. King, G. Calvert, D. J. Taylor, T. W. McMullan	D. Douglas	Booth S.S. Co., Ltd.
<i>Hilary</i>	GQVM	11.7.53	J. H. Stoker	J. Kerr, J. Davis, F. Cavendish	J. F. Clarke	P. & O. Steam Navigation Co.
<i>Hildebrand</i>	GKTK	5.4.55	J. Whayman, D.S.C*, R.D., Capt. R.N.R.	N. D. Smith, H. F. Mossei, P. R. L. Bishop	G. Miller	New Zealand Shipping Co., Ltd.
<i>Himalaya</i>	MCDY	9.2.55	D. G. H. O. Baillie	R. A. Wilson, M. W. Carrell, J. Masson		
<i>Himakura</i>	GDVS	10.3.55	N. L. Warren			

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGERS
<i>Hororata</i>	MANZ	10.12.54	H. R. M. Smith	M. J. Charleworth, W. N. Seybold, J. B. Comping, B. C. Whybrow	T. N. Green	New Zealand Shipping Co., Ltd.
<i>Huntingdon</i>	GFCT	17.12.54	P. S. Calcutt	C. Pennington, R. M. Michael, A. D. Harrington	A. G. Wallace	Federal Steam Navigation Co., Ltd.
<i>Hurunui</i>	GJZF	10.12.54	F. Power	A. Britain, R. Loveridge, J. S. Thorpe	A. H. Sandilands	New Zealand Shipping Co., Ltd.
<i>Hycania</i>	MADE	22.3.54	A. V. Jones	W. J. Knox, J. Wilson	D. James	Baltic Trading Co., Ltd.
<i>Imperial Star</i>	GIAC	19.2.55	G. C. Goudie	K. S. Mann, C. P. Davy, F. Bury	O. R. Whitehead	Blue Star Line, Ltd.
<i>Inshoven Head</i>	MAOC	11.1.55	H. N. Clarke	S. Thompson, A. Fee, W. Cooper	A. E. Adams	G. Heyn & Sons, Ltd.
<i>Interpreter</i>	GPZY	10.12.54	T. Winstanley	R. Simmons, B. W. Jones	T. & J. Harrison, Ltd.	T. & J. Harrison, Ltd.
<i>Inverbank</i>	GKML	11.1.55	R. A. Lorraine	D. Stewart, P. N. Eberington, I. Aldiss	D. J. Murphy	Andrew Weir & Co., Ltd.
<i>Island Producer</i>	MLLB	10.3.55	G. E. M. Jenkins	P. N. Broad, J. T. Lister, P. A. Harnett	N. J. Wilkinson	A. Holt & Co.
<i>Jason</i>	VPLM	29.6.54	D. W. Stroud	W. Henderson, G. Millward, —, Stringer	W. H. Tubbs	Kave Son & Co., Ltd.
<i>John Biscoe</i>	VPNE	7.4.55	W. Johnston	G. Alder, P. Hopper, E. G. Painter	T. Davies	A. Holt & Co.
<i>John Holt</i>	GNFD	28.10.54	F. R. Phillips	R. G. Turner, J. G. Jones, N. G. Beniz	P. King	Government of the Falkland Islands
<i>Journalist</i>	MSFO	10.3.55	D. M. Black, O.B.E.	I. Baillie, J. Bromley	I. Patterson	Guinea Gulf Line, Ltd.
<i>Kaipara</i>	GOGJ	28.10.54	T. G. Wilson	D. B. Diggle, G. Gunn, J. Byron	F. X. Smythe	T. & J. Harrison, Ltd.
<i>Kaipara</i>	GZPY	10.3.55	D. M. Black, O.B.E.	D. L. King, J. Chambers, L. W. Davies	T. H. Deans	Trinder Anderson & Co.
<i>Kentworth Castle</i>	MQLP	28.1.55	E. Allen	P. A. Torrens, D. Witty, G. C. Craze	T. P. Toomey	Trinder Anderson & Co.
<i>Kent</i>	GPDC	10.12.54	A. C. M. Black, O.B.E.	D. Mitchell, R. Kinlock, P. Lay, D. Smith	I. S. Godfrey	Union Castle Mail S.S. Co., Ltd.
<i>Kenuta</i>	GOBW	21.1.55	T. J. Naylor	D. Beaumont-Jones, A. B. Powell, R. Pass	D. E. A. Watts	Federal Steam Navigation Co., Ltd.
<i>King Robert</i>	MAON	24.6.54	J. C. Davies	G. Boyle, I. P. Daniel	I. W. Dick	Pacific Steam Navigation Co., Ltd.
<i>King William</i>	GNVR	10.12.54	A. N. Henderson	W. Moss, I. Welsh, D. Morgan	R. V. Pemberton	King Line, Ltd.
<i>Kohistan</i>	GSPZ	22.4.55	W. I. McIntosh	D. M. Foster, G. Grindrod, W. Cowan	L. Lambert	King Line, Ltd.
<i>Koyan</i>	GKST	15.9.54	L. Ankers	G. H. Robertson, R. S. Brown	P. H. Reynolds	F. C. Strick & Co., Ltd.
<i>Lalande</i>	GNFL	3.6.54	W. R. Faulkner	K. Horner, J. T. Lowe, B. A. Early	P. Henderson & Co.	Lampport & Holt Line, Ltd.
<i>Lanarkshire</i>	GCTC	10.12.54	R. B. Lindsay	A. D. Haydon, G. Berry, I. M. Thomson	H. H. Mann	Turnbull Martin & Co., Ltd.
<i>Lancashire</i>	GLZC	2.1.55	H. B. Peate, D.S.C.	J. H. Birch, J. S. Morris, P. R. Byrne	C. S. Talbot	Bibby Bros. & Co.
<i>Langton Grange</i>	MAOT	18.2.54	J. R. Faulkner	M. H. L. Jenkins, P. Healy, M. Dickenson	J. Brosnan	Houlder Bros. & Co., Ltd.
<i>Lassell</i>	GFND	12.2.55	J. King	J. Samson, A. Corlett, E. Minshull	J. Kennedy	Lampport & Holt Line, Ltd.
<i>Latia</i>	GLCF	15.3.55	J. Davison	G. T. Evans, A. H. Green, W. I. Simpson	N. Armstrong	Anglo-Saxon Petroleum Co., Ltd.
<i>Laurentia</i>	GNDY	30.11.54	T. S. Graham	T. Scott, N. Larsen, W. Joyce	D. Murray	Donaldson Bros. & Black, Ltd.
<i>Levernbank</i>	GLPZ	30.6.52	A. T. Stansfield	F. G. Howard, A. Dorkins, J. Scobbie	J. Simpson	Andrew Weir & Co., Ltd.
<i>Linguist</i>	GQBC	19.4.55	W. Weatherall	J. O. Dickenson, C. S. Boom, J. A. Ashcroft	E. J. Shillabeer	T. & J. Harrison, Ltd.
<i>Livorno</i>	GPWF	4.7.53	A. Hinchcliffe	R. A. Jones, D. J. Rouse	M. MacMahon	Ellerman's Wilson Line, Ltd.
<i>Lloydcrest</i>	MAOY	22.8.53	L. Barwell	A. Burrell, J. Beckensale, G. Bridges	J. Rowe	Crest Shipping Co., Ltd.
<i>Loch Aon</i>	GMZI	1.12.54	H. E. Sang	J. A. Race, P. Brown, J. Connell	M. R. Lirtlejohn	Royal Mail Lines, Ltd.
<i>Loch Garth</i>	GMZY	10.3.55	T. Powell	J. Evans, J. Napper, C. Robinson, G. Vale	F. Page	Royal Mail Lines, Ltd.
<i>Loch Ryan</i>	MAOZ	6.11.54	H. V. Todd, R.D., Cdr.	R. L. Collins, J. Cox, L. W. Green, A. Fairbairn	O. Livermore	Royal Mail Lines, Ltd.
<i>London Pride</i>	GKTI	7.9.54	J. H. Cooper	J. Morgan, G. Douglas, D. Rattray	J. P. Deegan	London Overseas Freighters, Ltd.
<i>Lotorum</i>	GBLP	19.2.55	N. Clarke	G. A. Wareing, A. Scott, G. J. Thomas	G. O. Winship	Anglo-Saxon Petroleum Co., Ltd.
<i>Macharda</i>	GKKF	26.1.55	T. C. Eddy	J. E. Millichap, I. A. MacLaren, R. C. Main	G. Stone	T. & J. Brocklebank, Ltd.
<i>Magdapor</i>	GBJX	10.3.55	J. Richardson	P. Slade, C. Pears, B. Fry	D. C. Brown	T. & J. Brocklebank, Ltd.
<i>Mahanada</i>	GOFM	29.12.54	J. B. Newman	W. G. M. Coles, A. G. M. Ward, A. B. Davis, D. Newcombe	V. Fawcett	T. & J. Brocklebank, Ltd.
<i>Mahout</i>	GDZN	10.3.55	W. Gibson	E. D. Symonds, E. G. Anderson, D. Woolfenden, J. Moore	P. Y. Wright	T. & J. Brocklebank, Ltd.

<i>Mahseer</i>	..	GZSV	5.2.55	H. G. Allan, M.B.E.	..	G. M. Taylor, G. R. Riley, D. L. des Landes	G. M. Caddy	..	T. & J. Brocklebank, Ltd.
<i>Maihar</i>	..	GSCL	9.2.55	G. B. Thomas	..	R. V. K. Robbins, C. Hicks, J. Honbridge	I. Davis	..	T. & J. Brocklebank, Ltd.
<i>Makalla</i>	..	GOFN	31.3.55	H. Simpson	..	D. M. G. Murphy, E. Watkins, H. Evans	W. Curry	..	T. & J. Brocklebank, Ltd.
<i>Malancha</i>	..	GZRD	7.7.54	S. Broughton	..	E. T. M. Chambers, J. Saxty, P. Maraden	M. D. Wrightley	..	T. & J. Brocklebank, Ltd.
<i>Malayan Prince</i>	..	GNSQ	22.4.55	E. G. Jones	..	P. R. Cable, R. P. Aske, E. E. Talbot	M. D. Johnson	..	Prince Line, Ltd.
<i>Manchester City</i>	..	GBBP	31.3.55	E. W. Espley	..	T. B. Hancock, P. A. Barracough, A. Cookson	W. Huyton	..	Manchester Liners, Ltd.
<i>Manchester Explorer</i>	..	GNBK	19.3.55	W. E. G. Oliver	..	J. Baker, G. G. G. Fletcher	T. G. Jones	..	Manchester Liners, Ltd.
<i>Manchester Mariner</i>	..	GSPD	..	S. G. Eilams	..	G. Holmes, R. M. Simpson, J. Hughes	D. Colley	..	Manchester Liners, Ltd.
<i>Manchester Merchant</i>	..	MGZQ	31.3.55	J. E. Jones	..	D. S. Millard, J. Illingworth, D. C. Woodall	A. J. S. Broadbent	..	Manchester Liners, Ltd.
<i>Manchester Pioneer</i>	..	GNVG	17.9.53	A. Starnier	..	J. Rushworth, T. W. Field, C. J. Harfoot	I. Buchanan	..	Manchester Liners, Ltd.
<i>Manchester Port</i>	..	GYNF	10.1.55	J. L. McLaren	..	L. Fletcher, L. Taylor, G. A. Cowell	M. Doran	..	Manchester Liners, Ltd.
<i>Manchester Progress</i>	..	GPGD	21.1.55	M. Bewley	..	J. C. Elliot, F. Aske, T. Hancock	J. Sterry	..	Manchester Liners, Ltd.
<i>Manchester Prospector</i>	..	GQKV	27.8.54	F. Lewis	..	J. Green, T. M. Varley, M. J. Butler, A. H. Swan, D. Thomas, P. H. Williams	A. B. MacPherson	..	Manchester Liners, Ltd.
<i>Manchester Regiment</i>	..	GBRD	10.3.55	W. H. Downing	..	G. R. Thompson, G. Andrews, J. T. Bird	J. Reid	..	Manchester Liners, Ltd.
<i>Manchester Skipper</i>	..	MAPC	20.11.54	W. Hine, Lt.-Cdr.	R.N.R.	A. W. Barber, P. N. Fielding, N. T. Storr, I. Williamson	W. Critchley	..	Manchester Liners, Ltd.
<i>Manchester Spinner</i>	..	GNVB	30.11.54	E. W. Raper	..	J. Bird, P. Cresswell, D. Millard	P. B. McNab	..	Manchester Liners, Ltd.
<i>Manchester Trader</i>	..	GMWG	19.2.55	F. Downing	..	G. B. Hannaford, G. R. Clayton, D. G. Thomas	P. J. Fitzgerald	..	Manchester Liners, Ltd.
<i>Mandasar</i>	..	GBNY	24.6.54	G. A. Jackson, M.B.E.	..	R. H. Wills, C. Gray, J. K. Cooper	G. Stoddart	..	T. & J. Brocklebank, Ltd.
<i>Mamstee</i>	..	GRXC	15.2.55	F. J. Baker	..	A. Lees, J. Granniccliffe, J. Beatson, K. Leslie	L. Varmen	..	Elders & Fyffes, Ltd.
<i>Maplecove</i>	..	GNLX	25.4.55	W. R. Thorburn	..	P. Leslie, N. Saddington, D. A. Jones	T. Herriots	..	Canadian Pacific S.S., Ltd.
<i>Mapledell</i>	..	GBBS	10.3.55	N. W. Duck, D.S.C., Capt. R.N.R.	R.D.,	W. P. Emberton, D. E. Rae, P. L. Leslie, M. H. Scott, D. Jones	T. Herriots	..	Canadian Pacific S.S., Ltd.
<i>Marabank</i>	..	GCCP	22.12.54	T. S. Robertson	..	A. Smith, J. F. Carr, A. Ingham	R. Skarrat	..	Andrew Weir & Co., Ltd.
<i>Marengo</i>	..	GLFW	7.1.55	F. Ellison	..	E. Lushingham, F. Smith, G. Mitchell	D. Frith	..	Ellerman's Wilson Line, Ltd.
<i>Margay</i>	..	GFYQ	18.1.55	E. A. Prentice	..	J. Jenney, N. O. R. Webster, A. G. Scott	P. C. Bryne	..	Kaye Son & Co., Ltd.
<i>Marbhor</i>	..	GTFZ	22.12.54	H. F. Scoins	..	D. D. Barlow, J. S. Munro	— Banks	..	T. & J. Brocklebank, Ltd.
<i>Martand</i>	..	GTGG	19.1.55	H. Foshrooke	..	H. S. Prestwood, J. McK. Coles, R. Roberts	B. J. Guy	..	T. & J. Brocklebank, Ltd.
<i>Martita</i>	..	GNQT	18.10.54	H. Bovill	..	J. R. Crane, N. Webster, T. Boyd	F. Boyack	..	Kaye Son & Co., Ltd.
<i>Mataroa</i>	..	GCSV	4.4.55	R. G. James, R.D., R.N.R.	Capt.	T. Hicks, B. Smith, J. Yarwood, L. Mounsey	E. Boyce	..	Shaw, Savill & Albion Co., Ltd.
<i>Matheran</i>	..	GOFQ	2.11.54	R. Humble	..	J. R. Knott, O. Pritchard, D. W. G. Groves	L. Dixon	..	T. & J. Brocklebank, Ltd.
<i>Matina</i>	..	GSZX	24.1.55	W. G. Lock	..	P. H. Morgan, G. Wallis, D. N. Boon, J. Wright	A. C. Knight	..	Elders & Fyffes, Ltd.
<i>Mauratania</i>	..	GTTM	20.8.54	A. B. Fasting, R.D., R.N.R. (Retd.)	Capt.	M. Bingham, D. Atkinson, B. Newcomb, P. King	A. Cannock	..	Cunard Steamship Co., Ltd.
<i>Media</i>	..	GSWR	6.10.54	F. G. Watts, R.D., R.N.R. (Retd.)	Lt.-Cdr.	T. P. Jones, R. L. Joyner, D. McManus	F. J. S. Alcock	..	Cunard Steamship Co., Ltd.
<i>Melbourne Star</i>	..	GDFZ	10.11.54	C. Aldridge	..	K. Kelly, J. Naillard, R. H. Dawson	M. P. Evans	..	Blue Star Line, Ltd.
<i>Middlesex</i>	..	MPBK	5.10.54	N. A. Thomas	..	W. D. F. Cooper, R. E. Donald, E. D. Jones	E. Barley	..	Federal Steam Navigation Co., Ltd.
<i>Monarch</i>	..	GBDF	28.8.54	J. P. F. Betson	..	W. Richardson, I. J. L. Lang, P. V. Flynn	T. Tilly	..	H.M. Postmaster General.
<i>Muristan</i>	..	MABB	23.3.55	T. Dunn	..	I. Seymour, J. Ockleford, — Pope	— Patinson	..	F. C. Strick & Co., Ltd.
<i>Myrtlebank</i>	..	GLQB	3.6.54	L. F. Holden	..	B. Sparham, R. O. Nielsen, F. S. Williams	W. R. Ness	..	Andrew Weir & Co., Ltd.
<i>Napier Star</i>	..	MAPN	4.2.55	J. B. Kennedy	..	F. E. Thomas, G. C. Jones, G. J. Crisford	J. Ruthren-Murray	..	Blue Star Line, Ltd.
<i>Naticina</i>	..	GIGH	22.4.55	R. S. Allan	..	J. V. Cook, R. Shaw, J. Chester, M. J. Laws	T. M. Winney	..	Anglo-Saxon Petroleum Co., Ltd.

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS/MANAGERS
<i>Nestor</i> ..	GNZG	1.4.55	J. M. Anderson ..	P. K. MacDonald, W. A. Cameron, D. W. Powrie ..	H. Roberts ..	A. Holt & Co.
<i>New Australia</i> ..	GZKD	13.4.55	J. W. Hart ..	A. L'Estrange, D. G. Modell, F. Sangster, H. Riding ..	G. Hunt ..	Shaw, Savill & Albion Co., Ltd.
<i>New York City</i> ..	MATR	3.12.54	E. Irish ..	R. W. Whitman, R. Davics, E. Mace ..	T. Jenkins, M.B.E. ..	Charles Hill & Sons, Ltd.
<i>New Zealand Star</i> ..	GYCR	10.3.55	E. N. Rhodes ..	S. Tompsett, P. Hunt ..	E. Ewart ..	Blue Star Line, Ltd.
<i>Newfoundland</i> ..	GNMC	6.10.54	C. H. Kenyon ..	P. Warne, R. I. Heys, K. Swinburne ..	T. Cahill ..	Furness Withy & Co., Ltd.
<i>Nordic</i> ..	GDIC	13.12.54	F. S. Thornton, O.B.E. ..	J. Buddles, P. Tebbut, R. J. Newlings ..	D. Gough ..	Prince Line, Ltd.
<i>Norseman</i> ..	GBVS		R. E. Small ..	P. H. Edwards, A. W. Henderson, P. A. Shaw ..	W. Harney ..	Cable & Wireless, Ltd.
<i>Nottingham</i> ..	GCNC	14.8.54	E. H. White ..	L. Bridges, R. H. Burton, P. Fletcher, C. Jones ..	L. Sutton ..	Federal Steam Navigation Co., Ltd.
<i>Novia Scotia</i> ..	GNNK	3.12.54	J. Anson, O.B.E. ..	E. H. Gregson, A. C. Wales, A. R. Smith ..	W. C. Brock ..	Furness Withy & Co., Ltd.
<i>Novelist</i> ..	GMLG	1.1.55	R. H. Longster ..	R. M. Benson, M. Patterson, C. Carew ..	P. E. Bowler ..	T. & J. Harrison, Ltd.
<i>Oakland Star</i> ..	GFKT	1.4.55	A. H. Watson ..	G. Turncliff, L. Smith, W. A. Ansdell ..	B. Thompson ..	Lampport & Holt Line, Ltd.
<i>Obuasi</i> ..	GMLQ	13.4.55	R. W. Phillip ..	D. A. Norris, R. Myers, D. Corner, D. Howe ..	S. W. Barlow ..	Elder Dempster Lines, Ltd.
<i>Oilfield</i> ..	GNMN	24.4.55	J. Hempsey ..	D. G. Bissett, B. W. O. Amstad, A. McPhee ..	P. Shine ..	Hunting & Son, Ltd.
<i>Orari</i> ..	GJKX	19.11.53	J. R. M. Ramsey ..	A. Stokoe, C. S. Single, M. Blake, P. Holloway ..	W. H. Jones ..	New Zealand Shipping Co., Ltd.
<i>Orcades</i> ..	MABA	16.3.55	S. S. Burnmand ..	F. Le Messurier, A. Field, C. S. Thomas, J. Thornton, B. Clarke ..	F. Miller ..	Orient Steam Nav. Co., Ltd.
<i>Orion</i> ..	GYKL	17.1.55	A. E. Coles, R.D., Capt. R.N.R. ..	R. Martingley, T. R. Williams, T. J. McCarthy ..	F. Harrop ..	Orient Steam Nav. Co., Ltd.
<i>Oronsay</i> ..	GCNB	10.3.55	A. C. G. Hawker, C.B.E. ..	P. Anthony, D. Gaffney, C. H. Goddard ..	R. Oakley ..	Orient Steam Nav. Co., Ltd.
<i>Orontes</i> ..	GEXM	8.2.55	J. D. Birch, D.S.C., R.D., Capt. R.N.R. (Retd.) ..	G. Whitehead, F. Wooley, H. G. Ward, J. English, C. Walker ..	A. Quintin ..	Orient Steam Nav. Co., Ltd.
<i>Orsova</i> ..	GNDL	13.4.55	N. A. Whinfield ..	E. A. Robinson, K. E. Howard, R. G. Woods ..	P. Parish ..	Orient Steam Nav. Co., Ltd.
<i>Otaki</i> ..	GPBV	29.10.54	A. Hocken ..	W. A. French, P. Butcher, B. R. Baggott ..	R. Heath ..	Orient Steam Nav. Co., Ltd.
<i>Otranto</i> ..	GFKV	12.3.55	A. E. Coles, R.D., Capt. R.N.R. ..	D. J. Steff, J. W. Jackson, J. W. Spiers ..	C. Seaton ..	Orient Steam Nav. Co., Ltd.
<i>Pacific Fortune</i> ..	GBFM	31.3.55	H. A. Shaw ..	A. Adams, M. J. Brown, G. D. Kaye ..	I. R. M. Thomas ..	Furness, Withy & Co., Ltd.
<i>Pacific Northwest</i> ..	GOCP	31.3.55	F. H. Perry ..	D. M. Lloyd, D. Fuller, P. Crane ..	J. Robertson ..	Furness, Withy & Co., Ltd.
<i>Pacific Reliance</i> ..	GMJK	21.1.55	P. F. Owens ..	D. W. Hopkins, V. C. Jackson, R. White ..	W. J. Jennings ..	Furness, Withy & Co., Ltd.
<i>Pacific Unity</i> ..	GUAN	28.1.55	E. A. Kemp ..	A. Hodges, P. R. Farthing, E. Woods ..	F. O'Shea ..	Furness, Withy & Co., Ltd.
<i>Pacuare</i> ..	GCMX	10.3.55	P. Purvess ..	R. J. Williams, D. Morris, G. K. Evans ..	R. Haskayne ..	Elders & Fyffes, Ltd.
<i>Pampas</i> ..	GCGL	31.3.55	L. T. Peterson ..	M. V. Keen, W. M. Wheatley, M. H. Hobbs ..	A. Duggan ..	Royal Mail Lines, Ltd.
<i>Papanui</i> ..	GDJW	17.1.55	H. A. Owen ..	J. R. Gair, F. Christall, C. Keay, D. Farthing ..	M. Hookway ..	New Zealand Shipping Co., Ltd.
<i>Paparoa</i> ..	GBCZ	28.3.55	G. D. Guylter ..	R. P. B. Manson, W. J. Hooley, R. A. Burton, A. W. Finch ..	I. Barbar ..	New Zealand Shipping Co., Ltd.
<i>Paraguay</i> ..	MAQS	22.3.55	W. S. Thomas ..	R. F. Dalgeish, B. M. Rowley, D. Knights ..	D. Powell ..	Royal Mail Lines, Ltd.
<i>Paraguay Star</i> ..	GTNC	25.6.54	D. R. MacFarlane, D.S.O., O.B.E. ..	I. W. Hay, B. Gibb, M. Moore ..	I. MacDonald ..	Blue Star Line, Ltd.
<i>Pardo</i> ..	GMNZ	2.1.55	W. Williams ..	R. J. Bland, C. B. Lambert, D. H. McCree ..	W. Graham ..	Royal Mail Lines, Ltd.
<i>Parima</i> ..	GCLQ	31.12.54	G. S. Grant, R.D., Lt.-Cdr. R.N.R. (Retd.) ..	H. J. Perkins, M. Wardle, C. Cawley ..	E. Doyle ..	Royal Mail Lines, Ltd.

<i>Paringa</i>	..	MMBD	26.6.54	E. J. Herridge	..	P. W. G. Everett, M. R. Prowse, C. H. Greaves, J. R. K. Rees	C. Jameson	..	P. & O. Steam Navigation Co.
<i>Parthia</i>	..	GSWQ	24.3.55	J. D. Armstrong, D.S.C., R.D., Lt.-Cdr.R.N.R.(Retd.)	..	P. J. R. Lawley, V. Charles, W. G. Smith	A. O'Sullivan	..	Cunard Steamship Co., Ltd.
<i>Perim</i>	..	GCGB	13.4.55	L. Porter	..	P. Bealey, W. A. Read, M. Watkinson	R. Cahill	..	P. & O. Steam Navigation Co.
<i>Pertshire</i>	..	GYWK	11.12.54	T. N. Soane	..	S. R. Davidson, M. N. Ure, R. A. G. Simmons, D. Berrle	J. Pattie	..	Turnbull Martin & Co., Ltd.
<i>Philomet</i>	..	GYPV	22.4.55	S. Green	..	A. H. Tripp, G. R. May, B. C. Tribe	H. Humphries	..	General Steam Nav. Co., Ltd.
<i>Pilcomayo</i>	..	GBZX	27.11.54	C. M. Fletcher	..	R. J. Turner, P. C. Davies, D. Hatton	I. Donochie	..	Royal Mail Lines, Ltd.
<i>Pipiriki</i>	..	GDRQ	16.11.54	H. Harding	..	B. Hudson, R. Pipe, D. Swyer	A. McLinnes	..	New Zealand Shipping Co., Ltd.
<i>Planter</i>	..	GZSS	19.3.55	H. T. Wells	..	G. Crook, F. R. Robinson, J. Willan	T. & J. Harrison	..	Port Line, Ltd.
<i>Port Adelaide</i>	..	MCCG	19.3.55	W. B. Craig	..	D. A. Burgess, D. J. Evans, J. L. Hope	P. Keilly	..	Port Line, Ltd.
<i>Port Auckland</i>	..	GWRB	15.3.55	E. J. Syvret	..	W. P. Russell, C. U. C. Gordon, D. P. Culburn	J. Skinner	..	Port Line, Ltd.
<i>Port Brisbane</i>	..	GWRC	13.4.55	F. W. Bailey, M.B.E.	..	J. B. Hammond, C. Liley, K. W. Joyne	D. Don	..	Port Line, Ltd.
<i>Port Hardy</i>	..	GDFG	27.11.54	G. W. Dobson, R.D., Capt. R.N.R.	..	J. F. Beckett, J. W. MacKinlay, J. W. Cushion	A. G. Johnson	..	Bibby Line, Ltd.
<i>Port Hobart</i>	..	GKGC	18.10.54	P. S. Ball	..	D. J. Evans, A. M. Downes, D. Haddon-Cave	P. A. Byrnes	..	Port Line, Ltd.
<i>Port Jackson</i>	..	GZKR	6.1.55	G. G. Langford	..	B. Skrimshire, M. S. Box, D. Church	F. Sherman	..	Port Line, Ltd.
<i>Port Lincoln</i>	..	GFZK	7.2.55	E. W. Dingle, M.B.E.	..	P. Richard-Jones, E. Newstead, A. C. Marriage, P. R. Ardley	W. Paterson	..	Port Line, Ltd.
<i>Port Macquarie</i>	..	MAQY	30.12.54	L. J. Skaites	..	R. W. Leslie-Makeig, S. W. Lunn, A. A. Gough	W. E. G. Rickards	..	Port Line, Ltd.
<i>Port Napier</i>	..	GPKD	29.12.54	C. R. Townshend	..	G. L. Danton, A. D. James, P. Beattie	T. Hargreave	..	Port Line, Ltd.
<i>Port Phillip</i>	..	MAQZ	4.4.55	L. Copeland	..	J. Toghill, T. Stowell, P. Stevens	J. Robertson	..	Port Line, Ltd.
<i>Port Pyrie</i>	..	GLVQ	4.4.55	P. H. Pedrick	..	B. E. Crabb, E. E. Chapman, P. B. Griffiths	W. Sharkey	..	Port Line, Ltd.
<i>Port Stephens</i>	..	GCQR	9.8.54	J. H. Leask	..	M. H. F. Smith, M. J. Perry, V. D. Gardner	E. Connolly	..	Silver Line, Ltd.
<i>Port Townsville</i>	..	MGCV	18.1.55	E. W. R. Young	..	W. Duthie, J. R. King, J. P. Hatchley, D. J. North	T. G. Thomson	..	Port Line, Ltd.
<i>Port Victor</i>	..	MSWK	31.12.54	J. L. Porter	..	R. D. B. Polock, H. J. Holdrup, P. J. Hannon	D. McNeil	..	Port Line, Ltd.
<i>Port Vindex</i>	..	MAUW	18.11.54	E. E. Roswell	..	A. J. Starkey, J. C. Naylor, R. S. Komoll	R. C. Crompton	..	Port Line, Ltd.
<i>Port Wellington</i>	..	GDNI	22.10.54	T. L. Kidwell	..	E. E. Chapman, G. G. Mooney, D. I. Pull	J. B. French	..	Port Line, Ltd.
<i>Port Wyndham</i>	..	GYCW	24.1.55	G. Hodson	..	B. Dunlop-Jones, C. Milne, R. Johnstone	J. C. Coutts	..	Port Line, Ltd.
<i>Portland Star</i>	..	GZSY	26.7.54	A. W. Mitchell	..	J. Jermyn, W. Neill, W. Ferriday	E. Saul	..	Blue Star Line, Ltd.
<i>Potaro</i>	..	GNIJ	22.10.54	W. Tennent	..	J. P. L. Thornhill, R. Kistler, R. Clarke	R. Bailey	..	Royal Mail Lines, Ltd.
<i>Powell</i>	..	GKJL	31.3.55	D. Cornwell	..	A. C. Webner, C. G. Stiff, S. Christie	M. L. Van Schelkvyk	..	Hector Whaling, Ltd.
<i>Pretoria Castle</i>	..	GOAE	25.2.55	G. H. Mayhew	..	P. J. O. Sheridan, C. Ennis, P. Rippon	D. Bristow	..	Union Castle Mail S.S. Co., Ltd.
<i>Princess Waimai</i>	..	OJNS	19.10.54	Dr. B. M. Cwilong	..	D. Mulville, J. Gizowski	Dr. B. M. Cwilong	..	Dr. B. M. Cwilong
<i>Prospector</i>	..	GJMS	19.10.54	E. V. Dunn	..	E. Sherlock, D. A. Hancock, G. L. Beecroft	R. Greenhough	..	T. & J. Harrison, Ltd.
<i>Radley</i>	..	GZZG	26.2.55	H. W. White, O.B.E.	..	K. Robson, H. Blair, G. D. Gibbons	M. McEvoy	..	Stephens, Sutton, Ltd.
<i>Rakata</i>	..	GFGW	6.11.54	C. P. Robinson	..	P. J. Sedgwick, D. J. Newman, D. Swetnam	P. Broome	..	New Zealand Shipping Co., Ltd.
<i>Ramore Head</i>	..	MAXX	20.11.54	R. A. Ferguson	..	D. Craig, E. G. Davey, R. Harris	F. Murrant	..	G. Heyn & Sons, Ltd.
<i>Rangitane</i>	..	GDBV	19.1.55	D. H. Chadwick	..	D. Burdett, P. B. Eccles, D. F. Cooper, P. Egan	C. Lombe	..	New Zealand Shipping Co., Ltd.
<i>Rangitata</i>	..	GSZN	19.1.55	G. Kinnell, O.B.E.	..	J. T. Varney, D. Crabtree, H. C. Hynard, M. Field	J. Grant	..	New Zealand Shipping Co., Ltd.
<i>Rangitiki</i>	..	GXXW	24.3.55	A. E. Lettington, O.B.E., D.F.C.	..	F. Rickett, M. Hosworth, D. Handley, G. Caulfield	J. D. Charter	..	New Zealand Shipping Co., Ltd.

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGERS
<i>Rangitoto</i>	GLMV	30.11.54	C. R. Pflcher, O.B.E.	B. Anstey, T. Walton, B. Pusey, K. Hyde	F. Fowler	New Zealand Shipping Co., Ltd.
<i>Rathlin Head</i>	GRDB	2.1.55	M. Kennedy	R. J. Crawford, C. E. Pringle, J. McG. Greig	E. Heywood	G. Heyn & Sons, Ltd.
<i>Regent Hawk</i>	GMND	25.3.55	G. Hobson	L. W. Walker, Z. Wojewodzki, H. Marshman	R. W. Jones	Regent Petroleum Tankship Co., Ltd.
<i>Regent Royal</i>	GRPN	31.3.55	R. Armstrong	J. A. Cresswell, R. H. Swift, A. Peters	J. A. Jackson	Regent Petroleum Tankship Co., Ltd.
<i>Reina Del Pacifico</i>	GMPS	20.10.54	J. Whitehouse	P. B. Potts, A. MacLean, R. T. Bruce, C. Taylor	J. Butler	Pacific Steam Navigation Co.
<i>Retriever</i>	MRWY		C. C. R. Evans	W. T. Goodall, G. H. C. Reynolds, K. Matheson, J. K. Cook	J. Grant	Cable & Wireless, Ltd.
<i>Reynolds</i>	GQNC	14.3.55	J. J. Grugon	G. W. Brown, J. C. Pratt, C. Dale	H. A. Smith	Bolton Steam Shipping Co., Ltd.
<i>Rhodesia Star</i>	GUAX	1.11.54	F. L. Hambridge	D. N. Murray, W. Robertson, M. G. Thomas	P. Middleton	Blue Star Line, Ltd.
<i>Rialto</i>	GBLV	10.3.55	H. Greenhill	D. J. Pengelly, A. D. Robinson, S. Smith	D. McQueen	Ellerman's Wilson Line, Ltd.
<i>Richmond Castle</i>	GCSP	22.4.55	I. D. B. Fisher	C. D. Rea, P. E. Carter, C. E. Bragg	H. McCall	Union Castle Mail S.S. Co., Ltd.
<i>Ripplingham Grange</i>	GIGP	22.3.55	R. Owen	G. Spong, P. Hector, J. Eiston	K. Vernon	Houlder Bros. & Co., Ltd.
<i>Rochester Castle</i>	GZQF	28.1.55	D. W. Sowden, R.D., Lt.-Cdr. R.N.R.	K. J. Barry, J. Cranner	J. R. Walker	Union Castle Mail S.S. Co., Ltd.
<i>Roonagh Head</i>	GNTN	6.11.54	E. W. Black, O.B.E.	T. Mel. Hamill, A. F. James, F. R. N. Beat	B. P. Lewis	G. Heyn & Sons, Ltd.
<i>Roslin Castle</i>	GYJZ	10.3.55	J. M. Lycett, D.S.C., R.D., Cdr. R.N.R.	E. A. C. Paul, N. E. Upham, R. J. C. Parkin	L. L. Hunt	Union Castle Mail S.S. Co., Ltd.
<i>Roathallam Castle</i>	GDFT	24.3.55	A. G. Bickwell	R. Goddard, D. Kernick, G. Hatcher, G. McMullan, C. McKeown, B. Oram	I. Pollock	Union Castle Mail S.S. Co., Ltd.
<i>Roxburgh Castle</i>	GBGS	10.12.54	W. C. T. Swift	A. D. Mildrew, T. Jones, A. Foulkes	G. Walker	Union Castle Mail S.S. Co., Ltd.
<i>Royal Star</i>	MARI	31.3.55	A. H. Dare	F. Agnew, D. G. Mellinget, N. D. Lawson	G. Lyell	Blue Star Line, Ltd.
<i>Ruathine</i>	GKSY	23.2.55	F. Loughheed	F. Green, O. Springett, D. Jones, R. Shannon	W. Whittington	New Zealand Shipping Co., Ltd.
<i>Rumic</i>	GGCS	10.3.55	C. W. Sendall	R. E. Greenhalgh, D. Camblejohn, T. Whirton	A. McMurray	Shaw, Savill & Albion Co., Ltd.
<i>Sacramento</i>	GKCN	22.11.54	J. Robinson, M.B.E.	R. W. Lawson, G. Potter, W. Skinner	H. L. Hall	Ellerman's Wilson Line, Ltd.
<i>Salacia</i>	GZRN	17.12.54	J. L. Downie	D. G. Hall, I. McFarlane, H. D. McDiarmid	I. Humphrey	Donaldson Bros. & Black, Ltd.
<i>Salamanca</i>	GLSG	22.12.53	P. L. Hockey	E. J. Pepper, G. R. Dewansap, R. B. Bryant	B. E. Bewley	Pacific Steam Navigation Co.
<i>Salaverry</i>	GBLQ	16.2.55	E. C. Hicks, Cdr. R.N.R. (Retd.)	D. C. Steele, D. I. Jones, G. B. Swan	A. T. Shawcross	Pacific Steam Navigation Co.
<i>Salinas</i>	GLIK	29.12.54	D. W. Hutchinson	G. McC. Hunter, R. K. Thomas, P. L. Whitaker	H. Roderick	Pacific Steam Navigation Co.
<i>Salween</i>	GFFN	18.2.55	S. Thomson	A. H. S. Gray, G. Armstrong, K. Mackay, R. Robertson	W. J. Scott	P. Henderson & Co.
<i>Samanco</i>	MARQ	7.9.54	T. H. G. McGill	M. E. Jones, G. E. Turner, E. Gowland	M. D. Pilgrim	Pacific Steam Navigation Co.
<i>Samaria</i>	GJCF	13.12.54	W. T. Fitzgerald, R.D., Capt. R.N.R. (Retd.)	J. L. Easton, J. A. Burnhope, R. G. Hills, F. E. D. Hall	R. M. Shore	Cunard Steamship Co., Ltd.
<i>San Adolfo</i>	GYKK	12.2.55	A. Walker	F. D. Smith, P. Flanders, E. J. Causing	C. Maquire	Eagle Oil & Shipping Co., Ltd.
<i>San Cirilo</i>	GZMR	24.6.54	E. J. Osbourne	J. D. Baty, W. Richardson, M. J. Weston	D. Neeson	Eagle Oil & Shipping Co., Ltd.
<i>San Felix</i>	GFJZ	13.12.54	J. Bright	B. J. Hamilton, J. D. Tomlinson, K. J. Dumbavin	J. R. Chisbett	Eagle Oil & Shipping Co., Ltd.
<i>San Velino</i>	GCNY	16.11.53	L. Mays	G. J. Hughes, T. J. Magee, P. Kinton	P. Scanlon	Eagle Oil & Shipping Co., Ltd.

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGERS
<i>Tamaroa</i> ..	GFWX	17.1.54	T. H. Davies	R. J. McVittie, L. Howells, T. P. N. Cameron, W. J. Lyman	D. MacRae	Shaw, Savill & Albion Co., Ltd.
<i>Tamale</i> ..	GCBF	7.7.54	H. Flowerdew, O.B.E.	Baget, R. Munro, —, Ball	A. Allen	Elder Dempster Lines, Ltd.
<i>Tantallon Castle</i> ..	MQWN	24.6.54	N. M. Lloyd	R. Radford, J. Francis	A. Smith	Union Castle Mail S.S. Co., Ltd.
<i>Tarkwa</i> ..	MASU	8.12.54	G. D. Simpson, O.B.E.	J. Sanderson, J. Phillips, W. E. Christie	D. T. De Witt	Elder Dempster Lines, Ltd.
<i>Tasmania Star</i> ..	GKPC	14.2.55	E. L. Jermy	C. E. Leatham, R. Bayley, G. Munro, A. Pickford	C. V. James	Blue Star Line, Ltd.
<i>Tectus</i> ..	GBMJ	14.3.55	D. Curtis-Lewis	W. Snowden, G. A. Ramsden, J. S. L. Avre	W. Hayes	Anglo-Saxon Petroleum Co., Ltd.
<i>Tekoa</i> ..	GJFQ	22.4.55	J. H. Sladen	A. Dorkins, K. Field, T. Rowland, P. Deslands, E. Travers	G. Liston	New Zealand Shipping Co., Ltd.
<i>Telemachus</i> ..	GBLB	22.4.55	N. A. Rae, M.B.E., R.D., Lt.-Cdr. R.N.R.	J. H. Lockwood, N. H. F. Welton, L. Bainton, C. McKay	M. Shannon	A. Holt & Co.
<i>Tetela</i> ..	GMPN	22.4.55	G. M. Parry, M.B.E.	P. A. Chubb, D. Howell, N. W. Thomas	W. Parry	Elders & Fyffes, Ltd.
<i>Tenagodus</i> ..	GDLZ	13.4.55	W. Broughton	F. I. Bodger, J. F. Gristwood, J. J. Diston	E. G. Hutchinson	Anglo-Saxon Petroleum Co., Ltd.
<i>Teuiot</i> ..	MASX	25.2.55	G. B. Medlycott	D. I. Walker, A. N. Brook, R. W. Ramsey	W. Thomson	Royal Mail Lines, Ltd.
<i>Thalamus</i> ..	GDSV	3.12.54	A. Stonehouse	E. W. Hughes, P. J. Cornish, —, Knight	E. Makin	Anglo-Saxon Petroleum Co., Ltd.
<i>Thaumastus</i> ..	GDTS	25.2.55	F. W. Barnes	R. F. Weller, R. W. Denmark, J. D. Westley	W. H. Jones	Anglo-Saxon Petroleum Co., Ltd.
<i>Theticonus</i> ..	GBMT	26.11.54	D. Mellon	J. Wylie, A. T. Thompson, J. C. Young	P. McMannon	Anglo-Saxon Petroleum Co., Ltd.
<i>Timaru Star</i> ..	GKKM	15.2.55	H. W. McNeil	N. Johnson, M. Foster, P. Davies	A. Sloan	Blue Star Line, Ltd.
<i>Tinto</i> ..	GBYT	17.11.54	S. H. Bennett, M.B.E.	J. A. Green, C. Turty, D. Smee	G. S. Dunn	Ellerman's Wilson Line, Ltd.
<i>Tongeriro</i> ..	GLFZ	8.12.54	I. C. Davison	P. Cresswell, A. Mason, J. Baxter, J. Hale	P. Dickson	New Zealand Shipping Co., Ltd.
<i>Torr Head</i> ..	GZPW	16.12.54	S. J. Stark	J. McG. Greig, T. A. F. Austin, R. S. M. Heddes	J. McKinnon	G. Heyn & Sons, Ltd.
<i>Tregenna</i> ..	GBPM	9.12.54	W. F. Denver	I. M. Downard, T. Youdan, P. J. S. Bishop	W. H. James	Hain S.S. Co., Ltd.
<i>Treleuan</i> ..	GBPQ	12.7.54	J. Cornish	A. Downs, S. H. Ray, H. A. Manby	T. Wright	Hain S.S. Co., Ltd.
<i>Trelyon</i> ..	GBPP	15.2.55	W. T. Evans	A. Downs, E. D. Stewart, D. Phillips	K. Balby	Hain S.S. Co., Ltd.
<i>Treyaylor</i> ..	GCKG	23.2.55	S. O. Watkins	W. Dodson, J. Spall, R. Jeans, W. Flursey, T. Davies, M. Eil	G. McCullen	Hain S.S. Co., Ltd.
<i>Trevider</i> ..	MATG	14.1.55	F. G. Bolton	D. Loud, E. Spencer-Payne, P. Dolin	L. Leuchars	Hain S.S. Co., Ltd.
<i>Tribesman</i> ..	GBNZ	13.4.55	W. P. Baker	F. L. Steele, W. C. Johnston, J. R. Keighan	R. Baty	T. & J. Harrison, Ltd.
<i>Tribulus</i> ..	GFJS	19.3.55	A. M. Chapman	R. Hayward-Wills, R. W. Lumsden, E. N. Taylor	A. B. Vos	Anglo-Saxon Petroleum Co., Ltd.
<i>Trochiscus</i> ..	GFKB	10.3.55	C. McK. Young	I. Mayo, F. Walton, W. E. Reed	D. B. Strang	Shell Tanker, Ltd.
<i>Tweed</i> ..	GHRP	15.2.55	G. C. W. Meldrum	R. Box, J. S. Widen, P. J. Foster	T. O'Shea	Royal Mail Lines, Ltd.
<i>Twickenham</i> ..	GNDC	16.4.55	S. E. Hooper	J. F. Coyne, D. N. Allan, D. Dickson	J. Rayner	Watts, Watts & Co., Ltd.
<i>Tyrone</i> ..	GZPZ	9.11.54	N. Fraser	C. T. Marchant, J. M. Hunter, P. J. MacPherson	L. A. E. Laval	Trinder, Anderson & Co.
<i>Umtali</i> ..	GYWB	12.7.54	F. E. J. O'Hea	J. H. Butcher, W. Gibson, J. G. Jenn, D. L'Estrange	S. Hewett	Bullard, King & Co., Ltd.
<i>Umitata</i> ..	GDQF	4.4.55	D. L. Weston	G. S. Wood, R. Harris, H. G. Swanson	I. Molloy	Bullard, King & Co., Ltd.
<i>Umsizito</i> ..	GIFQ	19.3.55	R. Harber	J. G. Campbell, J. G. Steel, J. R. Aldous	S. Merchant	Bullard, King & Co., Ltd.
<i>Vedetta</i> ..	MGGD	18.1.55	J. Thornton	J. D. Sandry, J. A. Forbes, J. J. Thomson	—, Riley	Anglo-Saxon Petroleum Co., Ltd.
<i>Vestra</i> ..	MNNB	11.12.54	D. S. Archibald	K. B. Singer, D. C. White	G. Williams	J. T. Salvesen & Co.
<i>Volvo</i> ..	GPCJ	18.12.53	J. Maynard	G. Paton, R. Massam, W. Walker	J. Houghney	Ellerman's Wilson Line, Ltd.
<i>Waiparua</i> ..	GWXQ	10.1.55	M. Bennett	A. S. G. L'Estrange, R. F. Ryding, D. James		Shaw, Savill & Albion Co., Ltd.

<i>Wairangi</i>	..	MATX	6.1.55	J. L. Stobbs	..	A. M. MacDougall, I. S. McEwan, M. J. England	H. V. Littlecot	..	Shaw, Savill & Albion Co., Ltd.
<i>Waivera</i>	..	GBJB	11.1.55	R. A. Barns	..	D. S. Knight, A. B. Chandler, J. Theakston, J. Clyde	J. Downie	..	Shaw, Savill & Albion Co., Ltd.
<i>Walvis Bay</i>	..	GKBZ	1.12.54	A. Donald	..	W. K. West, J. Edward, J. A. R. Lewis	H. Wilson	..	Sir R. Ropner & Co., Ltd.
<i>Wanstead</i>	..	GFLS	13.4.55	I. W. Jackson	..	F. MacDonald, M. F. Diggins, F. Martin	H. M. O'Gorman	..	Watts, Watts & Co., Ltd.
<i>Warkworth</i>	..	MALF	28.10.54	N. Thomson, M.B.E.	..	R. Atkinson, G. Bell, C. Harrow	R. Munro	..	R. S. Delglish, Ltd.
<i>Wendover</i>	..	GFML	17.5.54	W. Donald	..	D. J. Vincent, R. T. Mudd, M. Court	B. Shakin	..	Watts, Watts & Co., Ltd.
<i>Winchester Castle</i>	..	GTPZ	16.12.54	G. W. B. Lloyd	..	K. R. Bennett, A. J. Chalmers, —, Barnes	R. Brew	..	Union Castle Mail S.S. Co., Ltd.
<i>Windsor</i>	..	GPOG	29.12.54	A. Cox	..	J. R. Kirby, J. Lane, W. H. Head	G. Wallis	..	Watts, Watts & Co., Ltd.
<i>Woodford</i>	..	GFMM	10.1.55	J. Cormack	..	I. Branch, J. Lewis, D. W. Griffin, D. W. J. Berwick	D. Carr	..	Watts, Watts & Co., Ltd.
<i>Worcestershire</i>	..	GFZM	10.3.55	F. C. Brooks	..	R. W. Barton, R.N.R., R. M. Bessant, J. F. Code	W. D. Fletcher	..	Bibby Bros. & Co.
<i>Yoma</i>	..	GLPN	15.11.54	S. Thomson	..	S. B. Hamilton, T. A. Hood, T. Duncan	W. Scott	..	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	13.4.55	R. H. J. Wallis	R. M. Tuckwell, D. Curror	A. Prest	H.M. Postmaster General
<i>Ariel</i>	GMDY	29.4.54	C. M. G. Evans, M.B.E.	E. J. Evans, D. C. Chisholm, A. C. H. Childs	R. Cunningham	H.M. Postmaster General
<i>Bellerby</i>	MQJF	14.3.55	J. R. Copping	E. H. Williams, W. E. N. Gordon, D. N. Richardson	J. Cotter	Ropner Shipping Co., Ltd.
<i>Blairclova</i>	GLLG	16.12.54	H. MacKinnon	J. E. Halliday, C. Ferguson, A. McAdam	E. Yard	Geo. Nisbet & Co.
<i>Cape Breton</i>	GLXG	2.2.53	J. Smith	J. Miller, W. R. Pilling, A. D. Chappell	J. MacDonald	C. T. Bowring & Co., Ltd.
<i>Circassia</i>	GZMD	12.2.55	J. McG. Brown	J. Ballantyne, R. M. Sinclair, J. G. Robertson	C. J. Ritchie	Anchor Line, Ltd.
<i>Clan Alpine</i>	GIFF	4.4.55	T. O. Marr	A. C. Myhill, M. P. R. Turner, R. W. T. Kenyon	R. G. Davies	Cayzer Irvine & Co., Ltd.
<i>Clan Lamont</i>	GTTD	30.12.54	J. E. Townrow	J. S. Cummings, A. Stafford, T. H. E. Ward	D. Munroe	Cayzer Irvine & Co., Ltd.
<i>Clan MacBrayne</i>	MAQA	9.4.54	C. A. Thomas	J. MacNiven, D. M. Geddes, D. Grant	H. M. Burson	Shaw, Savill & Albion Co., Ltd.
<i>Coptic</i>	GSND	14.9.54	A. E. Smith, R.D., Cdr.	C. A. Brodie, D. Campbelljohn, D. H. Clarke, A. Pugh	W. Beverley	Walter Runciman & Co., Ltd.
<i>Dartmoor</i>	CFQT	22.3.55	F. Bradfield	R. Thompson, A. Coaster, J. R. Jenkins	L. Mills	Sir William Reardon Smith & Sons, Ltd.
<i>Devon City</i>	MBKL	4.1.54	S. Leebetter	J. Groves, A. Praaser, R. L. Hunter	F. H. Wright	Cable & Wireless, Ltd.
<i>Eastern City</i>	GBRB	3.12.54	H. W. Marshall	W. D. Jones, A. H. Davies, P. G. H. Vanner	G. O'Brian	British India Steam Nav. Co., Ltd.
<i>Edward Wilshaw</i>	MBMP	7.12.54	R. W. Porter-Reynolds	R. Riddle, N. Morganti, J. Orr	J. Reardon	Counties Ship Management Co., Ltd.
<i>Empire Trooper</i>	GLXJ	13.4.55	R. H. A. Bond, O.B.E.	P. W. R. Smith, F. G. Hill, C. S. Robertson, F. Everett	D. T. Greaves	Newbiggin S.S. Co., Ltd.
<i>Fry Hill</i>	MAKS	18.12.54	J. Campbell	J. Naisbitt, C. Morgan	R. Miller	J. & C. Harrison & Co., Ltd.
<i>Greenbatt</i>	MSGG	15.12.54	R. Cook	I. D. S. Ogilby	J. Hill	
<i>Harpalion</i>	GFFX		H. R. C. Small	A. H. Webber, J. Baras P. Brake		

Supplementary Ships—Contd.

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGERS
<i>Hesione</i>	GUGJ	10.3.55	F. D. Bonney	A. M. Ewing, B. Dubery, W. Lindsay	N. Burnett	Houston Line (London), Ltd.
<i>Horsa</i>	MPFI		D. Dickson	I. Turner, A. Wallace	J. Turner	Currie Line, Ltd.
<i>Hudson Deep</i>	MPCR	24.11.54	J. Gibbons, D.S.C.	K. McKenzie, J. Cunningham, R. Baron	D. Colley	Hudson S.S. Co., Ltd.
<i>Hudson Firth</i>	GDKM	19.3.55	E. W. Pybus	M. R. Urminski, W. Wilson	E. J. Strandley	Hudson S.S. Co., Ltd.
<i>Kirriemoor</i>	GYIW	5.2.55	W. A. Watson	T. Byrne, J. C. Anderson, I. L. Lothian	T. S. Foote	W. Runciman & Co., Ltd.
<i>Leicestershire</i>	GDBL	15.4.55	T. J. A. Thomson	L. Conway, A. Kirk, G. W. Waugh	J. E. Unsworth	British India Steam Nav. Co., Ltd.
<i>Letchworth</i>	MAOV	10.3.55	J. E. S. Newby	K. Brammer, D. V. Duncanson, S. Hardy	R. R. Rice	R. S. Dalgleish, Ltd.
<i>Linga</i>	GLCK	1.12.54	C. J. Hedges	J. M. Clouting, A. Bonniwell, V. Teasdale	R. Rae	Anglo-Saxon Petroleum Co., Ltd.
<i>Lingula</i>	GKDT	13.4.55	H. C. L. Phillips	J. R. Adams, C. Veitch, M. Bruce	T. Regan	Anglo-Saxon Petroleum Co., Ltd.
<i>Loch Gowan</i>	MMJT	3.3.55	E. N. Giller, M.B.E.	D. Walker, M. Boyd, B. Thorne, R. Phillips	P. Hemrey	Royal Mail Lines, Ltd.
<i>Marie Louise Mackay</i>	GDNP	25.11.54	C. F. Hunter	L. R. Cook, L. P. Denny, W. D. Harper, M. Poyser	E. Mathias	Commercial Cable Co.
<i>Marhab</i>	GCVT	18.11.54	C. Christensen	T. Phelis, H. Kurth, J. L. Loris	D. L. Stewart	Phocean Ship Agency, Ltd.
<i>Marna</i>	MLPK	29.1.55	L. M. Smith	J. Carne, W. Morrison, J. MacNiell	L. M. Smith	Chr. Salvesen & Co.
<i>Menastone</i>	GUFA		S. Sheasby	A. R. S. Campbell, W. Ward, G. Davies	C. F. McCullough	Messrs. Stone & Rolfe, Ltd.
<i>Mathura</i>	GCXO		J. P. Jackson	J. Dunn, T. J. Hamilton, S. Baxter	R. Goodman	T. & J. Brocklebank, Ltd.
<i>Meta</i>	MPWB	18.2.55	A. D. McNab	R. G. Lawrenson, R. S. McLachlan, J. Chism	D. MacFarlane	Glen & Co., Ltd.
<i>Mirror</i>	GDFL	5.8.54	T. A. Vickers	J. D. Hawkins, I. G. Dryburgh, A. J. de C.	J. Poulten	Cable & Wireless, Ltd.
<i>Mulberry Hill</i>	MAKQ	2.2.55	A. C. Gillanders	Harrison, M. Simons	P. T. Higgins	Counties Ship Management Co., Ltd.
<i>Nicania</i>	GIGJ	17.2.55	S. A. Greenaway	S. G. Sanderson, A. Mitchell, R. Wilkinson	C. R. McNerny	Anglo-Saxon Petroleum Co., Ltd.
<i>Northia</i>	GDOK	13.4.55	C. L. Fiddler	B. Holroyd, M. P. Shillito, B. S.	T. Dunsire	Port Line, Ltd.
<i>Port Fairy</i>	GSTP	21.1.55	L. W. Cady	D. Martin, J. Heade, R. W. Grice	J. Sargent	Bolton Steam Shipping Co., Ltd.
<i>Ramsay</i>	GPSW		I. B. Burns	N. Fraser, R. C. W. Marr, T. Woodfield	C. Mosley	Wm. France, Fenwick & Co., Ltd.
<i>Rembrandt</i>	GPFD	25.1.55	W. E. Kyne, M.B.E.	I. R. Smith, B. A. Lillivick, D. W. Parry	J. Moss	Hall Bros.
<i>Rookwood</i>	GPSN	14.1.55	A. Dover	D. Fullwood, M. Siddle, J. Reikstins	L. Loosmore	Glen & Co., Ltd.
<i>Royal Emblem</i>	GDSC	17.1.55	J. J. Reed	A. Broadwith, S. Umplesby, F. Turnbull, G. Freiberys, R. D. Davidson, A. F. Culling	A. Corless	Ellerman's Wilson Line, Ltd.
<i>Runa</i>	GFSW	3.2.55	L. W. Loose	R. Gray, H. Delacour, J. H. Greenland	H. Moore	Lyte Shipping Co., Ltd.
<i>Silvio</i>	GSVC	2.7.54	S. F. Williams	N. Hebdon, N. Cook, J. Pickering	G. Roberts	Anchor Line, Ltd.
<i>Table Bay</i>	MFTV	9.9.54	H. Gentles	J. G. Paul, C. N. Carruth	S. W. Heilbron	Glen & Co., Ltd.
<i>Tarantia</i>	GIGS	31.1.55	R. S. Paton	C. Boyle, T. L. Lanylands, D. MacCullum	K. Hicks	Hain S.S. Co., Ltd.
<i>Thelma</i>	MBKK	23.9.54	T. A. W. Fairweather	J. A. G. McColl, J. D. McIntosh, D. MacDonald	T. Dunne	Hain S.S. Co., Ltd.
<i>Trelistick</i>	GBPR	10.3.55	D. I. Spencer	I. J. Annett, G. Gillon, D. K. Paterson	M. P. Clarkson	Hain S.S. Co., Ltd.
<i>Trevelyan</i>	MATE	4.10.54	H. Gravell	A. J. W. Imlach, D. L. Lacey, D. Saddler	D. A. McKenzie	Chr. Salvesen & Co.
<i>Trevince</i>	MATH	6.4.55	B. George	E. Sprunks, E. F. Boyd, G. Malchett	J. Nicoll	Ellerman's Wilson Line, Ltd.
<i>Trevorlas</i>	MATL	19.3.55	I. M. Price	M. Kennet, L. Watson, J. O. Spence	R. C. Cullen	Union Castle Mail S.S. Co., Ltd.
<i>Tronda</i>	MMLX	15.10.51	R. J. Sinclair	R. Angus, K. Clow		
<i>Truro</i>	GITQ		W. White	A. Cameron, A. Gillis, R. Stevenson		
<i>Warwick Castle</i>	GRRJ	11.1.55	J. M. Rayner, R.D., Capt. R.N.R.	J. A. Spencer, G. Beaumont, T. B. Schmidt		

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>Amsterdam</i>	MFBP	C. R. Baxter, D.S.C.	British Transport Commission
* <i>Angelo</i>	GQFY	H. Tognola	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>	MPQZ	W. Flett	A. F. Henry & MacGregor, Ltd.
<i>Beaully</i>	MLZK	H. Matheson	W. Sloan & Co.
<i>Belravock</i>	MKGV	— Irvine	London & Edinburgh Shipping Co., Ltd.
* <i>Belvina</i>	MLZF	W. Fisher	London & Edinburgh Shipping Co., Ltd.
<i>British Coast</i>	GWOX	R. E. Holt	Coast Lines, Ltd.
<i>British Scout</i>	GJKD	T. S. Rawlingson	British Tanker Co., Ltd.
<i>Brora</i>	MLVY	M. MacIver	William Sloan & Co.
<i>Caledonian Coast</i>	GLXF	J. Webber, M.B.E.	Coast Lines, Ltd.
<i>Cambria</i>	GBKT	N. Lloyd-Williams	British Transport Commission
<i>Cato</i>	GUAK	L. Jenkins	Bristol Steam Nav. Co., Ltd.
<i>Clupea</i>	GOAJ	J. Jappy	Fishery Board for Scotland
<i>Corfen</i>	GDJX	F. S. Granger	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	T. Slack	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	E. R. W. Allen	Wm. Cory & Son, Ltd.
<i>Corncrake</i>	MJKL	W. S. Dunlop	Moss Hutchison Line, Ltd.
<i>Crane</i>	MMCS	B. Cooney	Moss Hutchison Line, Ltd.
<i>Drake</i>	MMYC	J. Main	General Steam Nav. 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	J. Irwin, R.D., Cdr.	British Transport Commission
<i>Duke of Rothesay</i>	GNVL	H. Thompson	British Transport Commission
<i>Eildon</i>	MLZL	J. Little	G. Gibson & Co., Ltd.
<i>Empire Cedric</i>	GRSC	W. H. Laws, R.D., Lt.-Cdr. R.N.R. (Retd.)	Atlantic Steam Nav. Co., Ltd.
<i>Empire Doric</i>	MAVQ	W. Close	Atlantic Steam Nav. Co., Ltd.
<i>Empire Gaelic</i>	MAVR	H. T. Green	Atlantic Steam Nav. Co., Ltd.
<i>Explorer</i>	MRCZ	G. B. McLaren	Scottish Home Department
<i>Falcon</i>	MNXL	S. W. Develin	General Steam Nav. Co., Ltd.
<i>Fountains Abbey</i>	MSGT		Associated Humber Lines
<i>Golden Dawn</i>	MLXV	A. Adamson, M.B.E., R.D., Sk. Lt. R.N.R. (Retd.)	A. Adamson, M.B.E.
* <i>Gothland</i>	MJMS	H. Anderson	Currie Line, Ltd.
<i>Great Western</i>	GWRD	D. O. Griffiths	British Transport Commission
<i>Grebe</i>	MAEY	J. S. Lickis	General Steam Nav. Co., Ltd.
<i>Greyfriars</i>	MLON	D. Hunt	E. R. Newbigin, Ltd.
<i>Guernsey Coast</i>	MANS	H. Keilit	British Channel Islands Shipping Co., Ltd.
<i>Harrogate</i>	MNDB	J. M. Walters	Wilson's & N.E. Railway Shipping Co., Ltd.
<i>Hibernia</i>	MBMT	W. E. Meade	British Transport Commission
<i>Hibernian Coast</i>	GKXC	G. Mearns	Coast Lines, Ltd.
<i>Horsa</i>	MPFJ	D. Dickson	Currie Line, Ltd.
<i>Isle of Guernsey</i>	GOYJ	F. Brevilly	British Transport Commission
<i>Isle of Jersey</i>	GRBQ	C. E. Abbey	British Transport Commission
* <i>Jura</i>	MARU	L. J. Blanche	Admiral Shipping Co., Ltd.
* <i>Kinnaird Head</i>	GCSQ	G. Henderson	A. F. Henry & MacGregor, Ltd.
* <i>London Merchant</i>	MBRZ	C. A. Piper	London Scottish Lines, Ltd.
<i>Maidstone</i>	MNQV	E. H. Ashton	British Transport Commission
<i>Marine Craft Unit (R.A.F.) No. 1102</i>		Flt.-Lt. D. A. Koster	Royal Air Force
* <i>Melrose</i>	MCFD	J. Murray	George Gibson & Co., Ltd.
<i>Melrose Abbey</i>	GSYW	J. Blackburn	Hull & Netherlands S.S. Co., Ltd.
<i>Meta</i>	MPWB	A. D. McNab	Glen & Co., Ltd.
* <i>Milo</i>	GQDP	H. E. Lawson	Bristol Steam Nav. Co., Ltd.
<i>Mirna</i>	GKPS	T. Mather	Fishery Board for Scotland
<i>Moray Coast</i>	MKDL	J. Richardson	Coast Lines, Ltd.
<i>Narva</i>	GQFP	R. J. McNinch	Glen & Co. (Scottish Nav. Co., Ltd.)
<i>Ocean Coast</i>	GYMP	G. H. Clarke	Coast Lines, Ltd.
* <i>Pluto</i>	GUAB	G. V. Barnes	Bristol Steam Nav. Co., Ltd.
<i>Peregrine</i>	GIGM	W. Lockhart	General Steam Nav. Co., Ltd.
<i>Princess Maud</i>	GWRT	R. A. H. Lord, D.S.C., R.D., Lt.-Cdr. R.N.R. (Retd.)	British Transport Commission
* <i>Ratray Head</i>	GCBR	J. Graham	A. F. Henry & MacGregor, Ltd.
<i>Ringdove</i>	GRKK	E. C. Painter, D.S.C.	General Steam Nav. Co., Ltd.
* <i>Rollo</i>	GSFG	S. Stokes	Ellerman's Wilson Line, Ltd.
<i>Rora Head</i>	MKVB	G. Harvey	N. of Scotland & Ork. & Shet. S.N. Co., Ltd.
<i>Runa</i>	GFSW	T. Henry, O.B.E.	Clydesdale Shipowners Co., Ltd.
<i>St. Clair</i>	MMFX	T. Gifford	N. of Scotland & Ork. & Shet. S.N. Co., Ltd.
<i>St. Clement</i>	GRGM	W. J. Ramsay	N. of Scotland & Ork. & Shet. S.N. Co., Ltd.

Marid Ships—contd.

NAME OF VESSEL	CALL SIGN	CAPTAIN	OWNERS/MANAGERS
<i>St. Helier</i>	GLBT	W. Baker	British Transport Commission
<i>St. Julien</i>	GLBV	L. J. Richardson	British Transport Commission
<i>St. Magnus</i>	GFYK	W. McKay	N. of Scotland & Ork. & Shet. S.N. Co., Ltd.
<i>St. Ninian</i>	GJBB	A. M. Dundas	N. of Scotland & Ork. & Shet. S.N. Co., Ltd.
<i>Selby</i>	MLFT	A. C. Allen	Wilson's & N.E. Railway Shipping Co., Ltd.
<i>Slieve Bawn</i>	MQCC	E. A. Bradshaw	British Transport Commission
<i>Slieve Bearagh</i>	MLNL	C. R. Gill	British Transport Commission
<i>Slieve Bloom</i>	MQDD	A. J. Thomas	British Transport Commission
<i>Slieve More</i>	MQBM	R. Roberts	British Railways (L.M. Region)
<i>Southern Coast</i>	MASD	G. Goldman	Coast Lines, Ltd.
<i>Stock Force</i>	MGYD	G. Roberts	W. S. Kennaugh & Co., Ltd.
<i>Suffolk Coast</i>	MMVC	T. Taylor	Tyne Tees Shipping Co., Ltd.
<i>Teal</i>	GBXC	C. C. Reynolds	General Steam Nav. Co., Ltd.
<i>Teano</i>	GSTY	A. T. Jardine	Ellerman's Wilson Line, Ltd.
<i>Thelma</i>	MBKK	T. A. W. Fairweather	Glen & Co., Ltd.
<i>Vanellus</i>	GDVW	J. E. Green	British & Continental S.S. Co., Ltd.
<i>Vienna</i>	GTBR	A. Pearson-Sutton	British Railways (Eastern Region)
* <i>Whitby Abbey</i>	MSGV		Associated Humber Lines
<i>Yarmouth Trader</i>	GUAP	R. A. Goodings	Great Yarmouth Shipping Co., Ltd.

The ships marked * also send in non-instrumental weather messages.

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 OR MASTER	OWNERS/MANAGERS
Trawlers:			
<i>Alamein</i>	GKCD		Hull Merchants Amalgamated Trawlers, Ltd.
<i>Banquo</i>	MSWY		Hellyer Bros., Ltd.
<i>Bradman</i>	GMCC	S. Phillipson	Bunch Steam Fishing Co., Ltd.
<i>Ernest Holt</i>	GFXD	H. V. Aldiss	Ministry of Agriculture and Fisheries
<i>Grimby Town</i>	GQNL	W. Hardy	Consolidated Fisheries, Ltd.
<i>Imperialist</i>	GRGJ		Northern Fishing Co.
<i>James Barrie</i>	GBJF		Newington Steam Trawling Co., Ltd.
<i>Kingston Emerald</i>	NBSH		Kingston Steam Trawling Co., Ltd.
<i>Lancer</i>	GCPC	J. Pidgeon	Royal Steam Fishing Co., Ltd.
<i>Loch Levan</i>	GCTXM	W. Parkinson	Loch Fishing Co. of Hull, Ltd.
<i>Loch Oshaig</i>	GZQX	E. Moore	Loch Fishing Co. of Hull, Ltd.
<i>Sabina</i>	GZNJ	J. W. Tomlinson	Lionel C. Tomlinson
<i>St. Alcuin</i>	MGCW	G. Argument	Thomas Hamling & Co., Ltd.
<i>St. Amant</i>	GFUD	J. Meyers	Thomas Hamling & Co., Ltd.
<i>St. Apollo</i>	GBBZ	A. E. Fisher	Thomas Hamling & Co., Ltd.
<i>St. Britwin</i>	MFXJ	J. Dobson	Thomas Hamling & Co., Ltd.
<i>St. Elston</i>	GDDL	W. Parkinson	Thomas Hamling & Co., Ltd.
<i>St. Nectan</i>	GZJY		Thomas Hamling & Co., Ltd.
<i>St. Wiston</i>	GDDK		Thomas Hamling & Co., Ltd.
<i>Serron</i>	GQRX	J. Pidgeon	Standard Steam Fishing Co., Ltd.
<i>Stella Canopus</i>	GKQR	J. Kersey	Charleson-Smith Trawlers, Ltd.
<i>Stella Polaris</i>	NAWW	G. Weir	Charleson-Smith Trawlers, Ltd.
North Sea traders:			
<i>Carlo</i>	GQKL		Ellerman's Wilson Line, Ltd.
<i>Iberian Coast</i>	GFDP	D. Collins	Tyne-Tees Shipping Co., Ltd.
<i>Netherlands Coast</i>	NQLK		Tyne-Tees Shipping Co., Ltd.

Lightvessels

The following lightvessels 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>	J. R. Audley, S. R. Smith, D. A. Bacon
<i>East Goodwin</i>	W. A. Price, L. W. Ling, L. N. Hawkes
<i>Gallop</i>	E. G. Mullitt
<i>Humber</i>	S. A. Balle, W. S. Parish
<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
<i>Shipwash</i>	J. L. Goldsmith
<i>Skulmartin</i>	D. Hawkins
<i>Smith's Knoll</i>	W. J. Hall, J. O'Neill

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.	19.4.55
<i>Pangbourne Nautical College</i>	H. C. Skinner, O.B.E., Cdr. R.N.	29.12.54
<i>Warsash, School of Navigation</i>	G. W. Wakeford, Capt.	22.2.55
<i>Worcester, H.M.S.</i>	G. C. Steele, V.C., Capt. R.N.R.	7.4.55

AUSTRALIA

Voluntary Observing Ships

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

NAME OF VESSEL	OWNERS
Selected Ships:	
<i>Asphalion</i>	Alfred Holt & Co.
<i>Bulolo</i>	Burns Philp & Co., Ltd.
<i>Canara</i>	British India Steam Navigation Co.
<i>Charon</i>	Alfred Holt & Co.
<i>Chupra</i>	British India Steam Navigation Co.
<i>Duntroon</i>	Melbourne Steamship Co., Ltd.
<i>Gorgon</i>	Alfred Holt & Co.
<i>Idomeneus</i>	Alfred Holt & Co.
<i>Koolinda</i>	Western Australian State Steamships
<i>Koomilya</i>	McIlwraith McEacheron, Ltd.
<i>Koorawatha</i>	McIlwraith McEacheron, Ltd.
<i>Kooringa</i>	McIlwraith McEacheron, Ltd.
<i>Lowana</i>	Melbourne Steamship Co., Ltd.
<i>Malaita</i>	Burns Philp & Co., Ltd.
<i>Malekula</i>	Burns Philp & Co., Ltd.
<i>Nellore</i>	Eastern and Australian Steamship Co., Ltd.
<i>Orestes</i>	Alfred Holt & Co.
<i>Triadic</i>	British Phosphate Commission
<i>Trienza</i>	British Phosphate Commission
<i>Triona</i>	British Phosphate Commission
<i>Wanganella</i>	Huddart Parker & Co., Ltd.
<i>Westralia</i>	Huddart Parker & Co., Ltd.
Supplementary Ship:	
<i>Kabbarli</i>	Western Australian State Steamships

BERMUDA

Voluntary Observing Ships

The following is a list of observing ships voluntarily co-operating with the Meteorological Station, Bermuda.

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

CANADA

Voluntary Observing Ships

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

NAME OF VESSEL	CALL SIGN	OWNERS
Atlantic list:		
<i>Beaverbrae</i>	VCPO	Canadian Pacific Steamships, Ltd.
<i>Canadian Challenger</i>	VGSK	Canadian National Steamship Co., Ltd.
<i>Canadian Conqueror</i>	VCPV	Canadian National Steamship Co., Ltd.
<i>Canadian Constructor</i>	VGBY	Canadian National Steamship Co., Ltd.
<i>Canadian Cruiser</i>	VGPZ	Canadian National Steamship Co., Ltd.
<i>Canadian Highlander</i>	VCPP	Canadian National Steamship Co., Ltd.
<i>Cyrus Field</i>	GKQC	Western Union Cable Depot
<i>Esso Knoxville</i>	HPTK	Imperial Oil Shipping Co.
<i>Fort Avalon</i>	MBMC	Furness Withy & Co.
<i>Fort Hamilton</i>	GCSS	Furness Withy & Co.
<i>Imperial Alberta</i>	VGSE	Imperial Oil Shipping Co., Ltd.
<i>Imperial Charlottetown</i>	VDWC	Imperial Oil Shipping Co., Ltd.
<i>Imperial Edmonton</i>	VGSJ	Imperial Oil Shipping Co., Ltd.
<i>Imperial Fredericton</i>	VDWB	Imperial Oil Shipping Co., Ltd.
<i>Imperial Toronto</i>	VGSG	Imperial Oil Shipping Co., Ltd.
<i>Lake Kootenay</i>	VDZY	Western Canada S.S. Co.
<i>Lakonia</i>	GCDB	Balfour Guthrie, Ltd.
<i>Lord Kelvin</i>	GDMN	Western Union Cable Depot
<i>Mont Alta</i>	VGVC	Buries, Marks, Ltd.
<i>Ottawa Valley</i>	GKQY	Trinder, Anderson & Co., Ltd.
<i>Paloma Hills</i>	VGGX	Shell Canadian Tankers, Ltd.
<i>Pinnacles</i>	VGGZ	Shell Canadian Tankers, Ltd.
<i>Rincon Hills</i>	VGGY	Shell Canadian Tankers, Ltd.
<i>Rupert's Island</i>	VDXX	Hudson's Bay Co.
<i>Sunjarv</i>	VGVO	Saguenay Terminals, Ltd.
<i>Sunwhit</i>	VCKZ	Saguenay Terminals, Ltd.
Pacific list:		
<i>Angusdale</i>	VGGQ	Lunham & Moore Shipping, Ltd.
<i>Fort Hearne</i>	VCGX	Hudson's Bay Co.
<i>Lakemba</i>	VPKV	B.C. Ship Chartering Co.
<i>Lake Minnewanka</i>	VCNC	Western Canada S.S. Co.
<i>Mossel Bay</i>	GKCB	Western Canada S.S. Co.
<i>Waihemo</i>	ZMJO	Canadian Australasian Line
<i>Waikawa</i>	ZMHU	Canadian Australasian Line
<i>Wairuna</i>	ZMMQ	Canadian Australasian Line
<i>Waitomo</i>	ZMKO	Canadian Australasian Line
Lightships:		
<i>Lurcher</i>		Minister of Transport
<i>Sambro</i>		Minister of Transport

INDIA

Voluntary Observing Ships

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>	GDTT	British India Steam Navigation Co., Ltd.
<i>Daessa</i>	GFSM	British India Steam Navigation Co., Ltd.
<i>Dumra</i>	GMLA	British India Steam Navigation Co., Ltd.
<i>Dwaraka</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 Trader</i>	VWVT	India Steamship Co., Ltd.
<i>Islami</i>	VWJC	The Mogul Line, Ltd.
<i>Jal-duta</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>Jalakirti</i>	VWWD	Scindia Steam Navigation Co., Ltd.
<i>Jalakrishna</i>	VWJM	Scindia Steam Navigation Co., Ltd.
<i>Jalamani</i>	VWJK	Scindia Steam Navigation Co., Ltd.
<i>Jalamanjari</i>	VWWY	Scindia Steam Navigation Co., Ltd.
<i>Jalaprakash</i>	VWYD	Scindia Steam Navigation Co., Ltd.
<i>Jalayamuna</i>	VWJI	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>Maharaja</i>	GNBY	Asiatic Steam Navigation Co., Ltd.
<i>Mozaffari</i>	MACV	The Mogul Line, Ltd.
<i>Nadir</i>	GCDV	Asiatic Steam Navigation Co., Ltd.
<i>Nurani</i>	MAPS	Asiatic Steam Navigation Co., Ltd.
<i>Rajula</i>	GMSN	British India Steam Navigation Co., Ltd.
<i>Santhia</i>	GFSN	British India Steam Navigation Co., Ltd.
<i>Shahjehan</i>	GPIX	Asiatic Steam Navigation Co., Ltd.
<i>State of Bombay</i>	VWWP	Scindia Steam Navigation Co., Ltd.
<i>State of Madras</i>	VWWN	Scindia Steam Navigation Co., Ltd.
<i>State of Saurashtra</i>	VWXY	Scindia Steam Navigation Co., Ltd.
<i>Subadar</i>	MADK	Asiatic Steam Navigation Co., Ltd.
<i>Umaria</i>	GMNS	British India Steam Navigation Co., Ltd.
<i>Warla</i>	GZFC	British India Steam Navigation Co., Ltd.
Supplementary Ships:		
<i>Amra</i>	GNNX	British India Steam Navigation Co., Ltd.
<i>Badarpur</i>	MAUS	Burmah Oil Co., Ltd.
<i>Bharatjal</i>	VWXC	Bharat Line, Ltd.
<i>Bharatmitra</i>	VWYX	Bharat Line, Ltd.
<i>Bharatraja</i>	VWXL	Bharat Line, Ltd.
<i>Bharatrami</i>	VWXM	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 Importer</i>	VWYT	India Steamship Co., Ltd.
<i>Itaura</i>	GMWW	British India Steam Navigation Co., Ltd.
<i>Jalagopal</i>	VWGB	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>	GOFZ	Scindia Steam Navigation Co., Ltd.
<i>Jalapadma</i>	VWYN	Scindia Steam Navigation Co., Ltd.
<i>Jalarajendra</i>	GFPF	Scindia Steam Navigation Co., Ltd.
<i>Jalaratna</i>	VWDS	Scindia Steam Navigation Co., Ltd.
<i>Malika</i>	GCSK	Asiatic Steam Navigation Co., Ltd.
<i>Risaldar</i>	GLVL	Asiatic Steam Navigation Co., Ltd.
<i>Rizwani</i>	VWBF	The Mogul Line, Ltd.
<i>Sofala</i>	GDDP	British India Steam Navigation Co., Ltd.
<i>State of Andhra</i>	VWBD	Scindia Steam Navigation Co., Ltd.
<i>State of Travancore-Cochin</i>	VWBX	Scindia Steam Navigation Co., Ltd.

NEW ZEALAND

Voluntary Observing Ships

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

NAME OF VESSEL	OWNERS
Selected Ships:	
<i>Kauri</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Karitane</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Kaimanawa</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Kaitoke</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Kawaroa</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Kawatiri</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Ken Waihi</i>	Ken Line, Ltd.
<i>Komata</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Kopua</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Koromiko</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Kowhai</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Kurou</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Kurutai</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Matua</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Maui Pomare</i>	New Zealand Government
<i>Monowai</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Tofua</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Waimate</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Waimea</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Waipori</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Wairata</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Wairimu</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Waitemata</i>	Union Steam Ship Company of New Zealand, Ltd.
Supplementary Ships:	
<i>Kaipoi</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Kairanga</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Kaitangata</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Kaitava</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Komui</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Korowai</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Piri</i>	Imperial Chemical Industries, Ltd.
<i>Port Waikato</i>	Holm & Company, Ltd.
<i>Vasu</i>	Tasman Steam Ship Company of New Zealand, Ltd.
<i>Viti</i>	Tasman Steam Ship Company of New Zealand, Ltd.
<i>Waiana</i>	Union Steam Ship Company of New Zealand, Ltd.
<i>Waitaki</i>	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 SHIP	CALL SIGN	OWNERS
<i>Abraham Larsen</i>	GKZB	Union Whaling Co., Durban
<i>Africana II</i>	ZSVK	Division of Fisheries, Cape Town
<i>Aloe</i>	ZSTW	South African Railways Ships, Cape Town
<i>Barrier</i>	ZTCB	African Coasters, Ltd.
<i>F. T. Bates</i>	ZSWW	South African Railways and Harbours
<i>Constantia</i>	ZSRF	South African Marine Corporation, Cape Town
<i>Dalia</i>	ZSDV	South African Railways Ships, Johannesburg
<i>Frances Repetto</i>	ZSNB	
<i>George Irvin</i>	ZSGF	Friarage Steam Fishing Co., Ltd.
<i>Kaapland</i>	ZSRC	South Africa Lines, Cape Town
<i>Mashona Coast</i>	ZSSG	Thesen's Steamship Co., Cape Town
<i>Matabele Coast</i>	CKGD	Thesen's Steamship Co., Cape Town
<i>Morgenster</i>	ZSSJ	South African Marine Corporation, Cape Town
<i>Natal Coast</i>	ZSJZ	Neptune Shipping Co., Durban
<i>Ovambo Coast</i>	ZSSK	Thesen's Steamship Co., Cape Town
<i>Tristama</i>	ZSCW	Tristan Development Co., Cape Town
<i>Vergelegen</i>	ZSSN	South African Marine Corporation, Cape Town

HONG KONG Voluntary Observing Ships

The following is a list of observing ships voluntarily co-operating with the Royal Observatory, Hong Kong.

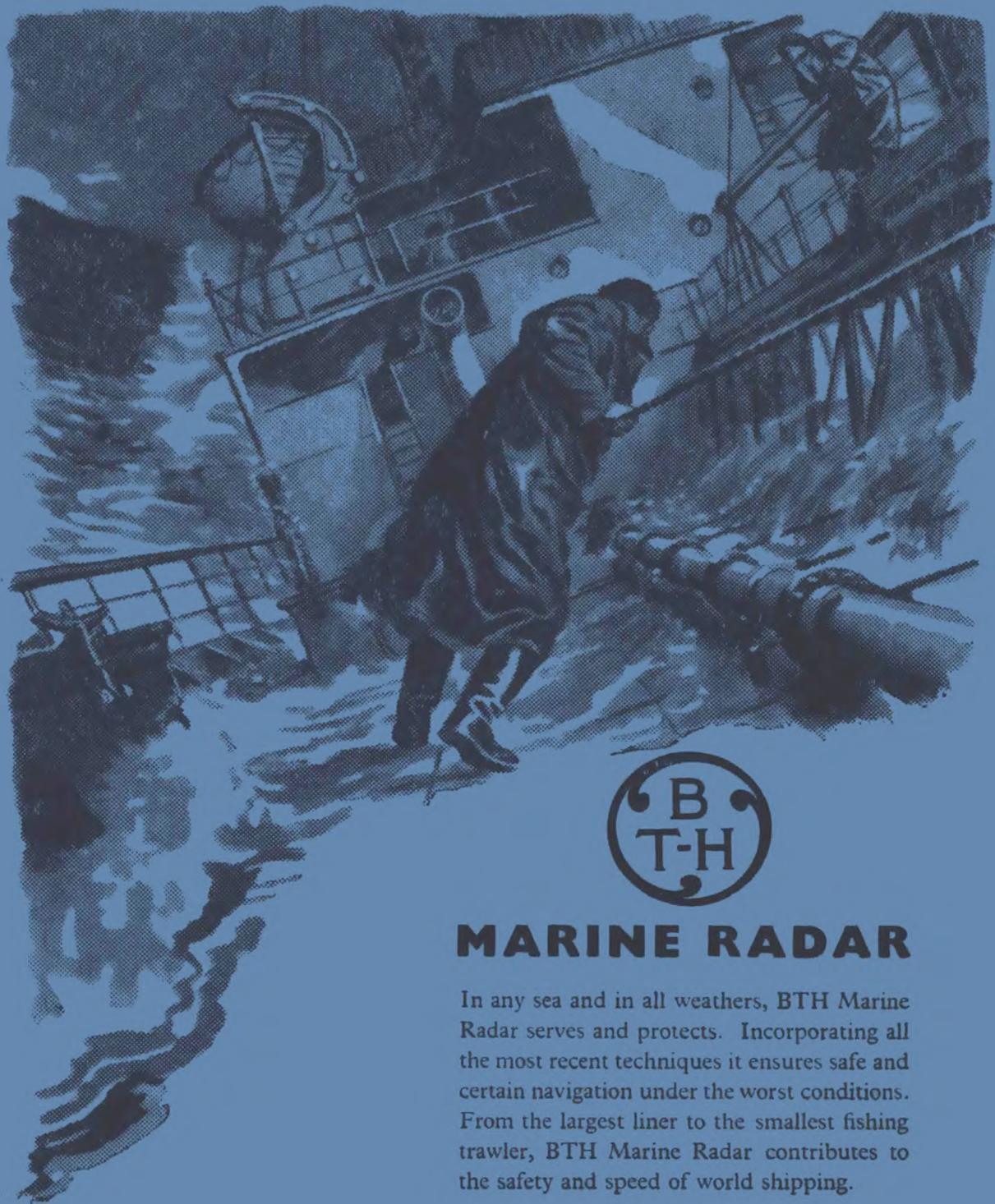
NAME OF SHIP	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	SHIPPING COMPANY OR OPERATOR
Anking	J. McKinlay	J. Hunter, T. A. C. Taylor, C. E. Lingard	Tsin Pun Cheung	China Navigation Co., Ltd.
Arshun	A. Naismith	A. V. Harrison, J. A. McDonald, A. P. Sokoloff	Li San Kau	China Navigation Co., Ltd.
Belinda	A. H. Bathurst	Chan Sai Chung, C. O. Wong, Wong Leung	C. C. Tsui	Shun Cheong Steam Navigation Co., Ltd.
Changsha	F. N. Booth	G. Baxter, J. W. C. Wilby, A. H. McAuley, R. E. Easley		
Choy Sang	P. G. Harkness	R. W. E. Little, C. M. Gibbs, M. Tonner	D. Fong Yan	China Navigation Co., Ltd.
Chung Sang	L. C. Cox	W. E. McLackland, J. B. Fowman, W. M. Pearson	J. D. Clutton	Indo-China Steam Navigation Co., Ltd.
Eastern Glory	H. J. Cairns	J. Taylor, I. D. Patterson, J. McArdie, M. H. Major	D. J. O'Moore	Indo-China Steam Navigation Co., Ltd.
Eastern Queen	S. Schofield	M. J. Pope, J. R. Simpson, A. J. Harrison, D. McCrudden	A. C. Martin	Indo-China Steam Navigation Co., Ltd.
Eastern Saga	E. J. Thomson	J. P. Stormont, J. W. Nugent, C. J. Farren	R. O. Smith	Indo-China Steam Navigation Co., Ltd.
Eastern Star	W. T. Rochester	T. H. Nichols, P. K. Phoenix, K. Sinclair, R. King	H. C. Urquhart	Indo-China Steam Navigation Co., Ltd.
Eastern Trader	A. C. Tai	H. C. Chen, C. H. Huang, Lee King Yue	A. Smith	Indo-China Steam Navigation Co., Ltd.
El Brenon	R. H. Bernhard	H. Redman, Raynaldo Fung	Lee King Yue	Great Southern Steamship Co., Ltd.
Elsbeth	L. W. Rowe	Yangsze Lin, O. Y. Wellington	Chen Yu Tang	Shun Cheong Steam Navigation Co., Ltd.
F Sang	N. H. King	R. K. Learoyd, P. G. Bush, H. Worton	Tsang Chiu Man	Indo-China Steam Navigation Co., Ltd.
Fengrang	J. W. Evans	J. R. Keddie, A. Atkin, J. Keates	P. M. Marley	Indo-China Steam Navigation Co., Ltd.
Fengtien	G. P. Cope	L. L. Watson, J. Kieley, L. J. Wang	Leung Kan	China Navigation Co., Ltd.
Foochow	W. E. Awcock	K. A. Page, P. Y. Lam, C. F. Chan	W. H. Collom	China Navigation Co., Ltd.
Fort Charlotte	H. W. Flint	C. E. C. Phipps, B. M. Stear, A. Hill	A. M. A. Champney	Royal Fleet Auxiliary
Fukien	A. Watson	J. R. Brett, M. D. O'Keefe, B. G. D. Ward	Parkash Chander	China Navigation Co., Ltd.
Funing	H. Pilling	A. W. K. Prosser, E. Clent, C. F. Yang	P. Wu Chi Siang	China Navigation Co., Ltd.
Hai Hing				China Siam Line
Hai Lee				China Siam Line
Hai Meng				China Siam Line
Hang Sang	G. Kinley	J. E. Williams, E. E. Ewhank, K. Y. Feng	Yau Tat Sing	Indo-China Steam Navigation Co., Ltd.
Han Yang	C. A. N. Baker	W. J. Coburn, G. W. Bryant, G. L. Tse	Cheung Shau Wai	China Navigation Co., Ltd.
Henrich Jensen	J. P. Johansen	J. N. Holst, K. C. Kjaer, Lau Wai	Wong Ka Tong	Jebsen & Co.
Helios				China Siam Line
Hermelin				China Siam Line
Hermod				China Siam Line
Hervar				China Siam Line
Hew Sang	E. M. Norman	D. Thompson, Ko Keng Jen, A. Nelson	Chan Kwok Chuen	China Siam Line
Hin Sang	M. J. K. Crichton	L. I. Ovsianukoff, J. H. Gould, T. Y. Yuen	Ma Ping Leung	Indo-China Steam Navigation Co., Ltd.
Hoi Hwai	A. Fieldheim	O. Utseth, A. Vestestad, R. Renning	H. H. Fastingsen	Indo-China Steam Navigation Co., Ltd.
Hoi Wong	M. Bjerkenes	O. Oftedal, R. Økland	A. J. Takvan	Karsten Larsen & Co. (Hong Kong), Ltd.
Hop Sang	R. G. G. Stanton	W. Graham, R. Bromfield, Yeung Koh Ching	W. C. Walker	Karsten Larsen & Co. (Hong Kong), Ltd.
Huanan	R. E. Selwyn Jones	A. Bartley, C. T. Shih, K. Y. Lee	Li Chiu Tsai	Indo-China Steam Navigation Co., Ltd.
Huapeh	W. E. Hargrave	F. T. Guinn, J. E. Lyon, P. Bulatoff	Tsang Kau	China Navigation Co., Ltd.
Jacob Jebsen	R. D. Nielsen	T. Decker, G. Andersen, Fung Chao Hung	E. Belard	China Navigation Co., Ltd.
Lok Sang	W. I. Bartlett	J. M. Marshall, V. W. Pimington, C. Alexander	J. A. Carlan	Jebsen & Co.
Mui Hoek	H. Henneche	Henry Hansen, T. Gregersen, K. Kleaboe	Leung Che Yung	Indo-China Steam Navigation Co., Ltd.
Pakhot	J. W. E. Warrior	W. Davidson, G. Gilroy, C. J. Wong	Lam Bun	China Navigation Co., Ltd.
Poyang	B. McLennan	A. Harper, M. Clent, I. F. Lee	Wai Pun Un	China Navigation Co., Ltd.

<i>Produce</i>	..	..	..	J. Samuelsen, L. Fagerland, A. Sondervik	..	S. C. Ong	..	Karsten Larsen & Co. (Hong Kong), Ltd. Mackinnon, Mackenzie & Co. (Hong Kong), Ltd.
<i>Sangola</i>	..	..	..	J. R. Suffren, S. H. Damp, G. E. Bennett W. J. Windrim, T. F. Woo, Leung Yu P. Flory, I. K. S. Adam, H. M. Wright, J. M. Parker	..	E. G. Inwood Chan So	..	China Navigation Co., Ltd. Shun Cheong Steam Navigation Co., Ltd.
<i>Shansi</i>	..	..	..	D. A. Hutchinson, J. R. Marking, J. R. Kidd R. G. Grasman, F. A. J. Hartmann, E. A. Lindholm W. F. Ringstrom, T. G. Strandlund, S. Soderlund	..	R. A. Gastro	..	China Navigation Co., Ltd. Mackinnon, Mackenzie & Co. (Hong Kong) Ltd.
<i>Shengkang</i>	..	..	..	T. Harrison, I. F. Robertson, C. T. Lu P. W. Graham, Chan Mow Tung, W. B. Cheung R. A. Smith, A. G. Hunt, C. C. Springall	..	Leung Man Hin P. E. G. Wengelin	..	China Navigation Co., Ltd. Everett Steamship Corporation
<i>Sinkiang</i>	..	..	..	D. L. Wilson, L. P. James, R. E. Brooks, M. R. M. Seale	..	Yu Pak Pui K. Y. Pun	..	China Navigation Co., Ltd. Shun Cheong Steam Navigation Co., Ltd. Australia Oriental Line
<i>Sirdhana</i>	..	..	..	W. G. White, G. H. Thompson, A. C. Bromfield P. A. Perswaid, K. A. Albertson, B. H. Johansson J. Adair, J. Parish, A. W. Lloyd-Taylor	..	Leung Shu Fun L. J. S. Cohn	..	China Navigation Co., Ltd. Indo-China Steam Navigation Co., Ltd.
<i>Soochow</i>	..	..	..	J. Adair, J. Parish, A. W. Lloyd-Taylor W. Pollock, B. E. Forrest, R. A. Burton	..	S. A. Erlanson P. J. Behan	..	Everett Steamship Corporation Indo-China Steam Navigation Co., Ltd.
<i>Star Alcyone</i>	..	..	..	N. Nightingale, F. Cunningham, J. K. Chan	..	Yue Shiu Ming Lo Kin Chek	..	China Navigation Co., Ltd. China Navigation Co., Ltd.
<i>Star Betelgeuse</i>	..	..	..		..		..
<i>Szechuen</i>	..	..	..		..		..
<i>Tai Chung Shan</i>	..	..	..		..		..
<i>Tai Ping</i>	..	..	..		..		..
<i>Tai Yuan</i>	..	..	..		..		..
<i>Tak Sang</i>	..	..	..		..		..
<i>Thai</i>	..	..	..		..		..
<i>Wo Sang</i>	..	..	..		..		..
<i>Yochow</i>	..	..	..		..		..
<i>Yunnan</i>	..	..	..		..		..

MALAYA Voluntary Observing Ships

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

NAME OF VESSEL	CALL SIGN	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS
<i>Islander</i>	VSPS	F. C. Gray	J. E. Hall	K. A. Taylor	Boustead Co., Ltd.
<i>Katon</i>	ZBNR	G. Heaton	A. D. Watterson	K. A. Menon	Straits Steamship Co., Ltd.
<i>Kimanis</i>	VSND	R. P. Atkinson	R. G. Ogden, B. F. Rehse	F. M. Fernandez, R. Namesius	Straits Steamship Co., Ltd.
<i>Larut</i>	VPKO	T. Hooper	N. G. Leslie	P. Rozario	Straits Steamship Co., Ltd.
<i>Matang</i>	VSPB	J. M. Harkness	J. C. Officer	J. Sinclair	Straits Steamship Co., Ltd.
<i>Perak</i>	VSPJ				Straits Steamship Co., Ltd.
<i>Perlis</i>	VSRA				Straits Steamship Co., Ltd.
<i>Stanley Angwin</i>	GNXG	C. C. R. Evans	N. H. Smith, K. Matheson, E. Bloomfield	D. Mahony	Cable & Wireless, Ltd.



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