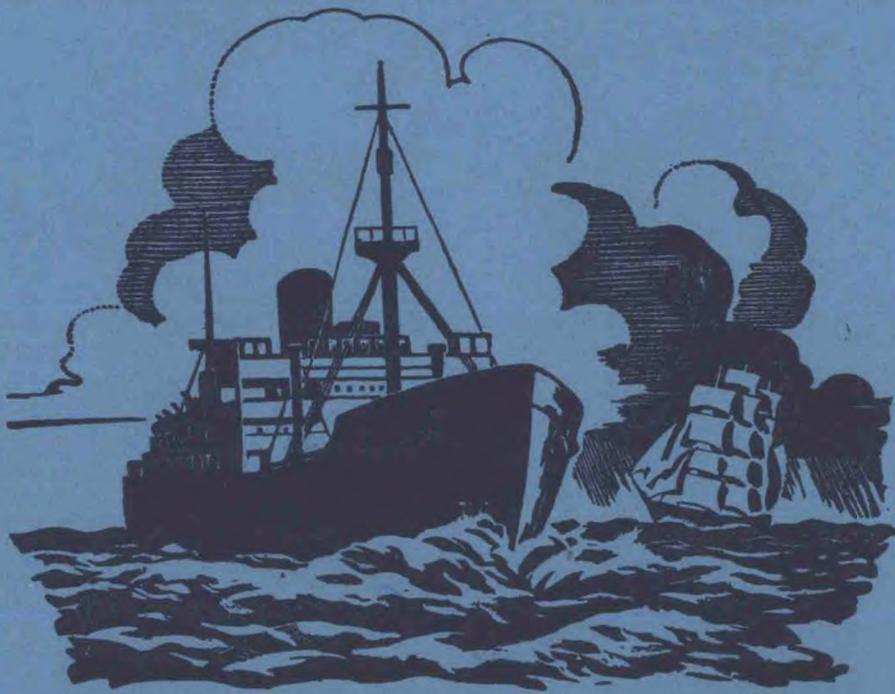


M.O. 566

# The Marine Observer

*A quarterly journal of Maritime  
Meteorology*



Volume XXIII      No. 159

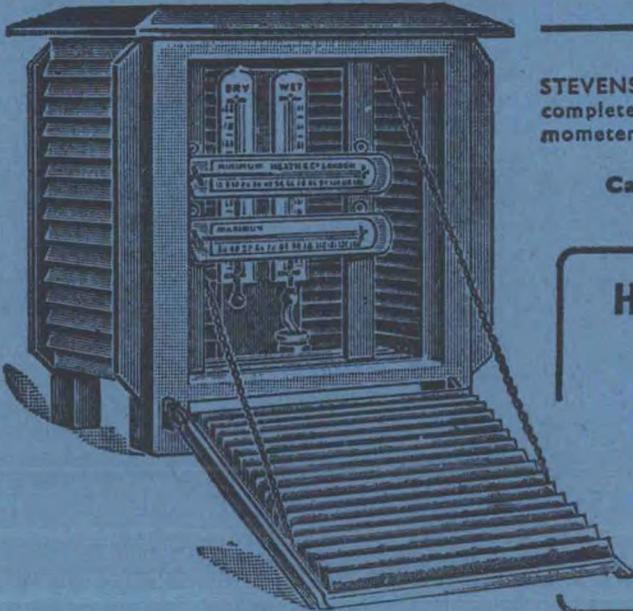
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# THE MARINE OBSERVER

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

VOL. XXIII

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JANUARY, 1953

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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

To all readers of *The Marine Observer* the Director and staff of the Meteorological Office send New Year greetings. May your voyage through the hitherto uncharted seas of 1953 be a pleasant one.

The year 1953 will see the introduction of a new meteorological logbook aboard British selected ships. The new logbook, which will be brought into force early in the year, has been so designed that the order in which the various observations are recorded follow the order of the code used for the ship's radio weather message. The new logbook does away with the necessity of separate books for recording the coded messages, and its introduction will undoubtedly ease the task of the observing officer aboard ship. An explanatory article about the new logbook appears elsewhere in this number.

\* \* \*

Brussels, in August, 1853, was a scene of what was probably one of the first International Scientific Conferences ever to be held—the Maritime Conference for “devising a uniform system of meteorological observations at sea”. This conference was inspired by Lt. M. F. Maury of the U.S. Navy, and it so happens that he was the sole delegate of his country. The other countries which attended were Belgium, Denmark, France, Great Britain, Netherlands, Norway, Portugal, Russia and Sweden. The British Government was represented by Captain F. W. Beechey, R.N., F.R.S., and Captain H. James, R.E., F.R.S.

One of the recommendations of the conference read: “The advantages of concert of action between the meteorologist on land and the navigator at sea were so obvious that, looking forward to the establishment of a universal system of meteorological observation upon both elements, it was thought that the consideration of scales would, with greater propriety, be left for that or some such occasion.” Maury, when commenting later, wrote: “The Conference, having brought to a close its labors with respect to the facts to be collected, and the means to be employed for that purpose, has now only to express a hope that whatever observations may be made will be turned to useful account when received, and not be suffered to lie dormant for the want of a department to discuss them.”

In 1872 the International Meteorological Organisation was formed and held a conference at Leipzig; the Commission for Maritime Meteorology of that organisation held its first conference in the year 1909 in London. In March, 1951, the last conference of the directors of the International Meteorological Organisation was held in Paris, and immediately afterwards the World Meteorological Organisation, which is an inter-governmental specialised agency of the United Nations, held its first congress.

In July, 1952, the Maritime Commission of the World Meteorological Organisation held its first session in the Lecture Hall of the Royal Geographical Society in London, thus carrying on the good work instituted at Brussels 99 years previously. This conference, which lasted about a fortnight, was opened by Mr. George Ward, Under-Secretary of State for Air, who, in his speech of welcome, stressed the value of meteorological information from the oceans, not only for shipping but for almost all other activities, and the valuable contribution which voluntary observers in merchant ships make towards providing this information. The President of the Commission, in his reply, pointed out that there are at present about 2,400 merchant ships of all nations voluntarily co-operating in the selected ship scheme.

Forty-three nations are represented on this Commission and technicians from 21 nations were present at the conference. Many members of the Commission are themselves seamen, the remainder being meteorologists and oceanographers. The primary task of the Commission was to endeavour to rationalise and improve the network of radio weather messages from selected ships in all oceans. To assist in studying this question, maps were produced showing the position of all the selected

ships of the world on a stated day, and the positions from which radio weather messages were received from ships on a stated day. These two maps were studied in conjunction with another map compiled from information supplied by Lloyd's and the G.P.O. concerning the probable density of shipping on commercial routes. These maps made it obvious that the world was divided into three areas: (a) where radio weather messages from shipping were adequate, (b) where the network was inadequate but could be improved, (c) areas where shipping was extremely sparse and little improvement could be expected. The Commission made recommendations whereby steps might be taken to increase the number of selected ships in the world, particularly by those countries which have not so far recruited many such ships and to encourage recruitment by all nations of ships voyaging to the less frequented waters. Other recommendations were made with a view to generally rationalising the network of observations from the oceans. The publication of an International List of selected ships, together with their radio call signs and usual trades, was recommended.

Special arrangements were made for the collection of radio weather messages from whaling ships in the Southern Ocean, which is one of the areas in which shipping is most sparse and which has a very great meteorological significance for the whole world. Whaling ships are known to be very reluctant, for commercial reasons, to disclose their position to their rivals. At the suggestion of the South African Meteorological Service a system of ciphers, whereby the position of the ship is not disclosed in the radio weather message, was approved by the Commission. Reports from whaling ships will be sent to the South African or Australian Meteorological Service, as convenient, and the message will then be deciphered and rebroadcast—omitting the name of the whaling vessel—for the benefit of all Southern Ocean countries. Meteorological Services in the Southern Hemisphere will thus be able to include the reports from the whaling ships in their synoptic maps and this will help them in issuing forecasts for shipping in the Southern Ocean. Information about the identity of individual whaling ships will be safeguarded.

The important question of accuracy of observations was given considerable study. The Commission realises the practical difficulties of making certain observations aboard ship and of the voluntary nature of these observations. Recommendations were made with a view to simplifying procedure and at the same time achieving somewhat greater accuracy and uniformity. It was recommended that all selected ships should record their observations in a logbook which should be in agreement with the international code and the international punch card.

The value of ocean weather ships for making experiments concerning types of instruments and methods of observation at sea was realised, and recommendations were made as to special observations which might be made aboard these ships in the future. It was recommended that research should be carried out on such problems as measurement of rainfall, sea and air temperature, humidity and meteorological factors affecting radio propagation.

The effect of meteorological conditions in relation to the carriage of goods at sea was considered with particular emphasis on damage to cargo from hygroscopic causes. In view of the important economic considerations involved and the present tendency to world food shortage, the Commission decided to establish a working group to study this question, to collect information about this problem generally and to make advice upon the problem available to the shipping interests of all nations.

The Commission approved a new International Ice Nomenclature which had been prepared by a committee of experts whose membership included Admiral Smith of the U.S. Coastguard, who had a lot of experience on the International Ice Patrol, and Professor Sverdrup, the noted Norwegian oceanographer. There has been considerable diversity of opinion about ice terms and it is hoped that this new nomenclature will make things easier for everybody concerned.

Among other questions considered by the Commission were telecommunication problems at sea and the question of further co-ordination of effort between maritime countries in the preparation of marine climatological atlases.

At the conclusion of the conference, Commander Frankcom was re-elected President and Admiral Termijtelen (Netherlands) Vice-President.

The recommendations which the Commission made upon these various subjects were submitted to the Executive Committee of the World Meteorological Organisation at their conference in Geneva in September, 1952. Most of these recommendations were approved and steps are now being taken by the various countries concerned to put the recommendations into effect.

It is hoped that the results of this conference of the Commission for Maritime Meteorology will be that the work of the voluntary observer at sea will eventually be simplified and that accuracy will improve and that at the same time the network of observations will generally become more rational and adequate in all oceans. If this aim is achieved there is little doubt that the services which the meteorologists of the world can provide for merchant shipping and for all other interests will in their turn improve. The Commission for Maritime Meteorology, and indeed the World Meteorological Organisation generally, is appreciative of the fine contribution which voluntary observers in merchant ships make towards improving our knowledge about the meteorology of the oceans.

International meteorology owes its origin to the initiative of a seaman, to the requirements of shipping and to the work of voluntary observers at sea. The hopes expressed in 1853 about "concert of action between the meteorologist and the navigator" and "turning the observations to good account" have been well realised. The extended application of meteorology during the last century, particularly in so far as aviation is concerned, has very much enlarged the scope of international meteorology, but its maritime aspect continues to play an important part. This is not surprising, seeing that the oceans cover three-quarters of the world's surface.

MARINE SUPERINTENDENT.

## Presentation of Barographs to Captains

As reported in the October, 1952, number of *The Marine Observer*, the captains of four voluntary observing ships have been awarded barographs for their long and distinguished service as voluntary observers. The Director of the Meteorological Office hoped to make the presentations to all four recipients on the same day but this was not found practicable. The Honourable Company of Master Mariners kindly invited the Director to make the presentations aboard their Headquarters' ship *Wellington*, an offer which was gladly accepted.

The presentation to CAPTAIN T. V. ROBERTS of the Shaw, Savill Co. was made by Commander Frankcom, Meteorological Office, in the courtroom of the *Wellington* on 29th August, in the presence of Captain Saul (Senior Warden of the Company), Captain Lockhart (Marine Superintendent), Mr. Hodson (London Manager) and others. In making the presentation, Commander Frankcom conveyed the Director's regret that he was not personally able to be present and thanked Captain Roberts and the Shaw, Savill Co. for their long period of co-operation with the Meteorological Office. Captain Roberts has retired from the sea and was sailing for Australia, where he is going to make his home, on 10th September.

The presentation to CAPTAIN E. A. BURTON (New Zealand Shipping Co.), CAPTAIN J. V. LOCKE (Cunard Line) and CAPTAIN E. A. SHERGOLD (Canadian Pacific Steamship Co.) was made in the courtroom of the *Wellington* by Sir Nelson Johnson on 15th October. Captain Burton was recently in command of the *Hinakura* and Captain Locke's latest command was the *Scythia*. Captain

Shergold is now General Manager of the Canadian Pacific Steamship Co. The occasion coincided with a meeting of the Court of the Company, and many members of the Court were able to be present and the Master of the Company, Sir Frederick Bowhill, presided. The Marine Superintendents and representatives of the management of the companies concerned were present.

Sir Nelson Johnson said he was glad of this opportunity, in the appropriate setting of this Headquarters of the Honourable Company of Master Mariners, of thanking all those masters and officers of merchant ships who voluntarily make weather observations at sea. He stressed the fact that the Meteorological Office had, as its first Director in 1854, a seaman and that there had been close association between this Office and the Merchant Navy ever since. He mentioned the work of the World Meteorological Organisation, through its Commission for Maritime Meteorology, in co-ordinating meteorological work at sea for the benefit of all other interests. He instanced some applications of maritime meteorology in the realm of research, particularly with regard to the interchange of energy between the oceans and the atmosphere and to the work which is being done in the United States in the preparation of southern hemisphere synoptic maps, in which the observations of British ships play a major part.

Captain Burton and Captain Shergold have been voluntary observers since 1920, Captain Roberts since 1922 and Captain Locke since 1924. Ships of the New Zealand Shipping Co. and the Cunard Line have been engaged in this voluntary meteorological work since 1869, the Shaw, Savill Co. since 1874 and the Canadian Pacific Steamship Co. since 1904.



## January, February and March

*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.

### CURRENTS

#### West Coast of Central America

M.V. *Agamemnon*. Captain G. Brown. Los Angeles to Kingston, Jamaica.

20th to 23rd January, 1952. 90 miles sw of the Gulf of Tehuantepec the current set  $150^{\circ}$ , 2.5 kt, and between the Gulf of Tehuantepec and 90 miles off Champerico Lighthouse, 1.3 kt. From Champerico Lighthouse to 110 miles off Remedios Point no set or drift was experienced. Off Remedios Point the current set  $175^{\circ}$ , 3.2 kt.

From Remedios Point to 110 miles off the Salvador coast the current set  $090^{\circ}$ ,

2.0 kt. Approaching S. Juan del Sur, 90 miles distant, the current set  $040^{\circ}$ , 0.5 kt. From C. Blanco to C. Burica, the current set  $143^{\circ}$ , 1.4 kt.

*Note.* The above observations were received by courtesy of the U.S. Navy, Hydrographic Office, through the Hydrographer, Admiralty, Whitehall.

The observations of M.V. *Agamemnon* are of interest, as they show that strong currents may occur off this coast in winter. This is one of the areas for which current charts, computed in the Meteorological Office, are not yet available, but the work is now in hand. The region off the west coast of Central America is one in which the current system appears to be very complex. It is the area in which the recurvature northward of the east-going Equatorial Countercurrent of the Pacific occurs. This current turns north-eastward and northward and sets along the west coast of Central America, westward of about longitude  $85^{\circ}$ W. Thence it recurves to the westward and passes into the North Equatorial Current. The latitude of this recurvature westward varies from about  $13^{\circ}$  or  $14^{\circ}$ N in winter to  $18^{\circ}$  to  $20^{\circ}$ N in summer. In winter, between these latitudes, the predominating current is south-easterly as the above observations show, due to the flow of the Mexican Current along the coast, this being a continuation of the south-going California Current. In summer, between these latitudes, the south-easterly flow is replaced by the north-westerly flow of the recurring Countercurrent.

This general outline of the current system is complicated by numerous surface current eddies, and American oceanographers have found evidence that the position of these eddies varies from one year to another.

## CURRENT RIPS

### Off West Coast of Central America

S.S. *Pacific Fortune*. Captain F. H. Perry. San Francisco to Panama. Observer, Mr. G. M. Willoughby.

4th January, 1952, 1200 G.M.T. Numerous patches of ruffled water were observed in a smooth sea over a period of several hours from daylight (1200 G.M.T.). The patches had the appearance of current rips and during the period a set of  $281^{\circ}$ , drift 42 miles, was experienced.

Mid-position of ship:  $10^{\circ} 54' N$ ,  $89^{\circ} 29' W$ .

### Off Coast of Ecuador

M.V. *Biscoe*. Captain W. Orrell. Panama to Antarctic Whaling Grounds. Observer, Mr. B. Mullan, 3rd Officer.

15th January, 1952, 0155 G.M.T. Numerous strong current rips were observed setting in an E'ly direction.

Position of ship:  $02^{\circ} 35' N$ ,  $81^{\circ} 56' W$ .

## LINE OF DEMARCATION

### Caribbean Sea

S.S. *Papanui*. Captain K. Barnett, R.D., R.N.R. Cristobal to Curaçao. Observer, Mr. D. Blackman, 4th Officer.

17th January, 1952, 2200 G.M.T. The vessel crossed a sharply defined line, extending roughly  $285^{\circ}$ – $105^{\circ}$ , from light green into dark bottle-green water. The wind was NE force 6, with a short heavy NE swell, yet no intermixture of water was visible. The sea temperature, which had been constant between  $80^{\circ}$  and  $81^{\circ}$ F, dropped over a period of 20 minutes to  $75^{\circ}$  and steadied at that temperature. At 0030 the sea temperature was  $77^{\circ}$ .

Position of ship:  $11^{\circ} 03' N$ ,  $76^{\circ} 00' W$ .

*Note.* Some observations of lines of demarcation between greenish water and dark-blue water were given in page 189 of the October, 1952, number of this journal. In an appended note, other observations in this region (the Colombian coast of the Caribbean) were referred to, and various causes of the differences of sea temperature encountered were discussed. In the observation of S.S. *Papanui* the light-green water seems rather too far to the westward to be the outflow of the Rio Magdalena and it is possible that it was the water of the east-going Caribbean Countercurrent.

## DISCOLOURED WATER

### North Atlantic Ocean

S.S. *Argyll*. Captain J. Dodds. Durban to Dakar. Observer, Mr. E. C. French, 3rd Officer.

30th January, 1952, 1200 G.M.T. The vessel entered a patch of discoloured water in the shape of an almost perfect isosceles triangle with the apex pointing due S, and length of sides about 1,000 yards. The vessel entered 100 yards from the apex where the colour was greenish-brown. The colour became darker towards the N and at the northern edge was a deep brown. The wind was  $360^\circ$  force 4, with a slight sea and a moderate swell. Sea temperature  $69^\circ\text{F}$ . Course  $360^\circ$ , speed 7 kt.

Position of ship:  $12^\circ 30' \text{N}$ ,  $17^\circ 26' \text{W}$ .

## PHOSPHORESCENCE

### Arabian Sea

M.V. *Richmond Castle*. Captain J. P. Aplin. Mombasa to Aden. Observer, Mr. T. P. Hebden, 3rd Officer.

1st February, 1952, 1925–1938 G.M.T. The sea gave off a strong even light which was different from normal phosphorescence in that the broken sea around the ship and the wave crests gave off no light. The illumination had a brownish tinge and resembled the reflection of arc lights hung over the ship's side when at anchor in a muddy river, but the light was not restricted to the immediate vicinity of the ship. The wind was  $052^\circ$  force 3 to 4 and visibility was good. The sea temperature was  $78^\circ\text{F}$ .

Position of ship:  $10^\circ 10' \text{N}$ ,  $50^\circ 38' \text{E}$ .

*Note.* This type of phosphorescence is that known as "white water" or "milky sea". The even illumination, not increased in wave crests or in the bow wave of the ship, are characteristics of the type. It is mainly, but not entirely, confined to the Arabian Sea, where it and other forms of phosphorescence occur all through the year, but are most prevalent in August. The colour of the "white water" is usually white or whitish and the sea is referred to as resembling milk or snow. The above observation is interesting, showing that the light may at times have a brownish colour.

### South Pacific Ocean

M.V. *Biscoe*. Captain W. Orrell. Antarctic Whaling Grounds to Balboa. Observer, Mr. C. G. Stiff, 2nd Officer.

29th February, 1952, 0800 G.M.T. Ship passed through an area of phosphorescence about 2 miles wide. The sea surface was illuminated by what appeared to be lumps of phosphorescence about 1ft in length and 6 in. in width, of rectangular appearance. The possibility of a large shoal of fish was considered but there was no movement in the lumps.

Position of ship:  $41^\circ 38' \text{S}$ ,  $104^\circ 35' \text{W}$ .

*Note.* The observation of phosphorescence in rectangular patches must be very rare, since this is only the second observation placed on record in this journal, which was first published in 1924. The previous observation was that of M.S. *Alynbank*, on the nights of 21st and 22nd June, 1938, published in Volume XVI, page 51. This was also observed in the South Pacific and was actually in the same latitude as that of M.V. *Biscoe*, the position at 0000 G.M.T. on 22nd June being  $42^\circ 00' \text{S}$ ,  $159^\circ 38' \text{W}$ . Large numbers of patches were seen in most regular rectangular shapes, the approximate size of each being 18 in. long by 4 in. wide.

It is not possible at the present state of their knowledge for marine biologists to say exactly how all the different forms of phosphorescence observed at sea occur, and it is therefore interesting to find that two ships observing at an interval of 14 years in the same ocean have seen an unusual form of phosphorescent patch, of much the same size.

## New Zealand Waters

M.S. *Wairimu*. Captain W. E. Jones. Dunedin to Auckland. Observer, Mr. R. E. Pugh-Williams, 2nd Officer.

8th January, 1952, 1250 G.M.T. We ran into a patch of brilliant phosphorescence some half a mile in diameter. The sight of this brilliant patch was somewhat disconcerting as the silvery streaks gave the appearance of shoal ground, and we were somewhat relieved when almost immediately after sighting we were surrounded with gleaming phosphorescence. There was a moderate sea running with a short ENE swell and heavy rain was falling. The sea temperature, as recorded in the engine-room, was 57°F some 30 minutes before entering, and 56° immediately after leaving the patch. Course 043°, speed 13.5 kt.

Position of ship: 44° 56'S, 171° 47'E.

## WATERSPOUT

### North Atlantic Ocean

S.S. *Fordsdale*. Captain R. S. Mackenzie. Curaçao to Hull. Observer, Mr. R. J. Ryding, 3rd Officer.

8th March, 1952, 1300 G.M.T. A waterspout formed from the base of a Cb cloud, bearing 260°, and extended to a patch of agitated water about half a mile on the port quarter. The formation of the waterspout took about one minute, but lasted for five minutes, when it broke. The column then retreated to within 200 ft of the cloud base and re-formed two minutes later, this time lasting for a period of four minutes. Before breaking up in the last half-minute the upper portion divided into two adjacent columns (see sketch shown opposite). The column of water was travelling at about 20 kt from 020°(T) and inclined to the sea surface about 60°. It was apparently rotating anti-clockwise. The altitude of the cloud base was estimated at 1,500 ft, and the phenomenon was preceded by hail and lightning.

Position of ship: 35° 27'N, 43° 20'W.

S.S. *Regent Hawk*. Captain G. H. Hobson. Grangemouth to Puerto la Cruz. Observer, Mr. R. Armstrong, Chief Officer.

31st March, 1952, 2055 G.M.T. A waterspout formed 2½–3 miles distant bearing SE, from a large Cb base estimated at 2,000 ft. During formation the funnel extended slowly downwards from the cloud base, and as it neared the sea the surface immediately under it became greatly agitated, with spray rising to about 150 ft. After about two minutes the funnel parted about two-thirds of the way down; the upper part receded into the cloud in just under 7 sec. It was observed that the motion of the funnel was anti-clockwise. Cloud,  $\frac{5}{8}$  Cb. Sea slight.

Position of ship: 25° 30'N, 50° 42'W.

## WIND OF STORM FORCE

### North Atlantic Ocean

M.V. *Ruahine*. Captain A. I. Robertson, R.D., Cmde. R.N.R. London to Curaçao.

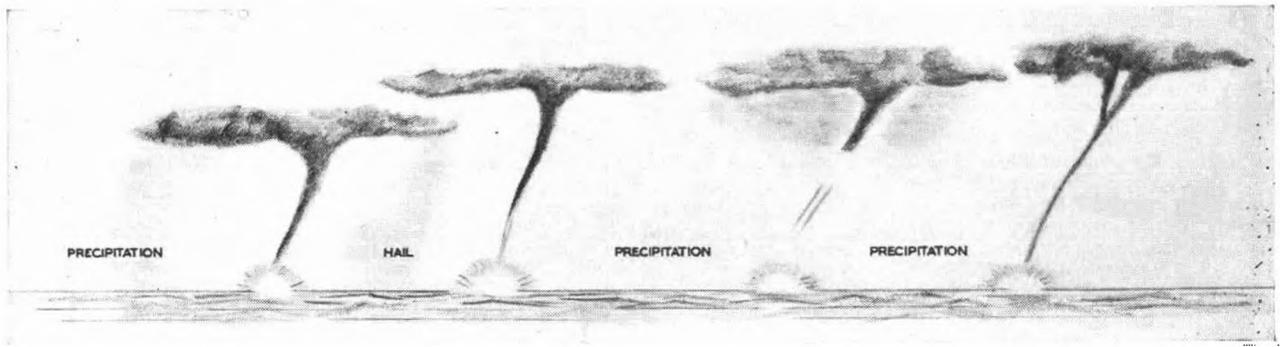
26th February, 1952, 2000 S.A.T. Wind commenced to freshen from ESE force 5. Barometer 1008.8 mb, falling. Sky overcast, moderate sea and confused swell.

2200, wind S, bar. 1003.1, falling steadily. Sky overcast, very rough sea and very heavy SSE'ly swell.

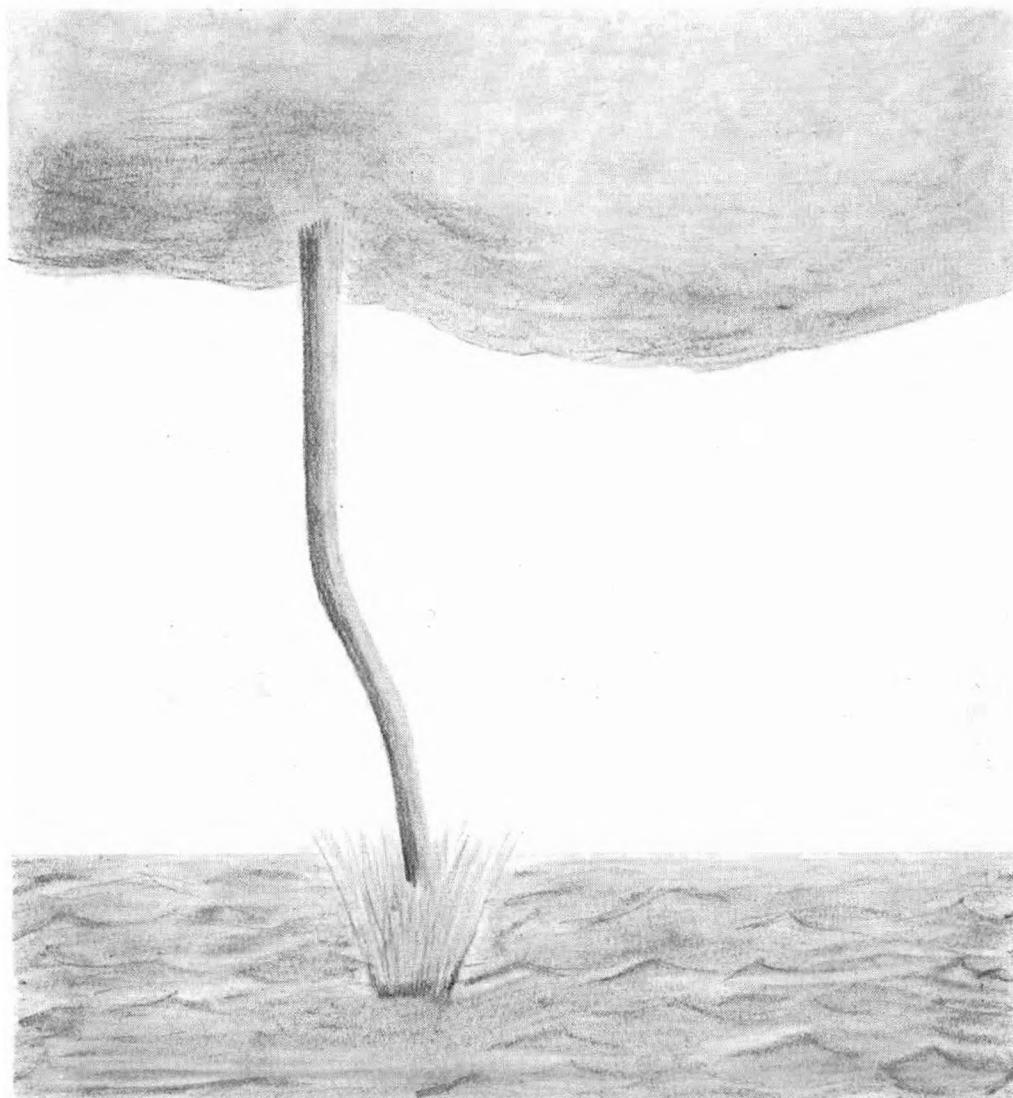
27th February, 0000 S.A.T., at 36° 37'N, 32° 26'W. Wind S force 9, bar. 998.6, falling. Sky overcast with occasional heavy rain squalls. Sea very rough with very heavy deep SSE'ly swell.

0200 at 36° 27'N, 25° 50'W. Wind S'E force 9, bar. 992.2, falling. High sea and very heavy S'ly swell.

0400 at 36° 15'N, 33° 15'W. Wind SE force 9, bar. 986.0, falling. Sky overcast with occasional fierce rain squalls. Sea still high with very heavy SSW'ly swell.



Successive stages of a waterspout observed from S.S. *Fordsdale* at  $35^{\circ} 27'N$ ,  $43^{\circ} 20'W$ , on 8th March, 1952 (see note opposite). Drawing by Mr. R. J. Ryding.



Waterspout observed from S.S. *Regent Hawk* at  $25^{\circ} 30'N$ ,  $50^{\circ} 42'W$ , on 31st March, 1952 (see note opposite). Drawing by Mr. R. Armstrong.



*Photo by R. J. Abbot*

The above photograph was taken from S.S. *Explorer*, Capt. J. L. Curle, off the mouth of the River Amazon ( $00^{\circ} 29'S$ ,  $40^{\circ} 52'W$ ) at 1800 G.M.T. on 6th February, 1952. There was  $\frac{3}{8}$  Cu and Cb with base at 3,000 ft, with  $\frac{2}{8}$  Ac and some Cs, making a total of  $\frac{5}{8}$  cloud. The weather had been squally with passing showers of rain.



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To read the sea surface temperature there is no need to remove the thermometer from the bucket (see page 23).



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**Delegates at the Conference on Maritime Meteorology, London, 1952.**

Back row: Capt. N. F. Benesch (Argentina), Mr. R. F. M. Hay (U.K.), Mr. J. R. Claxton (British West Africa), Mr. C. A. S. Lowndes (U.K.).  
 Third row: Dr. H. Thomsen (Denmark), Prof. M. Tenani (Italy), Mr. P. M. A. Bourke (Ire), Mr. F. Balén Garcia (Spain), J. B. Lopez Cayetano (Spain), Capt. S. Turcio (Uruguay), Dr. R. Frith (U.K.).  
 Second row: Mr. W. Blow (I.T.U.), Dr. B. N. Desai (India), Mr. E. Bruzon (France), Mr. J. A. Van Duijnen Montijn (Netherlands), Cdr. Gámez-Calcano (Venezuela), Lt. Lliberas (Uruguay), Mr. E. Sik (U.S.A.), Mr. J. Blanc de Portugal (Portugal).  
 Front row: Mr. W. F. McDonald (U.S.A.), Cdr. J. Hennessy (U.K.), Mr. G. S. P. Heywood (Hong Kong), Vice-Admiral J. W. Termijtelen, Vice-President (Netherlands), Cdr. C. E. N. Frankcom (President), Mr. K. T. McLeod (Canada), Mr. F. Spinnangr (Norway), Mr. A. H. Gordon (W.M.O. Secretariat), Capt. R. O. Minter (U.S.A.).



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H.M.S. *Glory* experiencing a winter gale in the Bay of Biscay. In a flat calm the surface of the sea would be 40 ft below the flight deck.



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Pilots of the Royal Netherlands Navy receiving a meteorological briefing from an officer of the Naval Weather Service on H.M.S. *Indomitable*. (See article "Meteorology in the Royal Navy", on page 19).

The barometer continued to fall steadily until 1030 when a minimum pressure of 963.5 mb was reached ( $35^{\circ} 30'N$ ,  $35^{\circ} 38'W$ ). The pressure then rose sharply at a rate of 6 mb an hour, the wind veered rapidly to  $w'N$  and increased to a steady force 11. Breaks in the clouds were observed though visibility was reduced by flying spray and rain squalls. The sea was very high and there was a very heavy, steep, confused swell.

The barometer continued to rise sharply with the wind blowing from  $WNW$  force 11, and at 1445 course was altered from  $240^{\circ}(T)$  to  $200^{\circ}$  away from the swell, which was  $WNW$ 'ly, heavy and very steep. At 1510 course was altered to  $180^{\circ}$  to bring the swell on the quarter.

Conditions gradually improved till at 0430 on the 28th a course of  $240^{\circ}(T)$  was resumed with the wind  $NW'W$  force 6, bar. 1013.2, rising. Sea high with a very heavy  $NW$ 'ly swell.

*Note.* A depression centred at about  $32^{\circ}N$ ,  $51\frac{1}{2}^{\circ}W$ , at 1200 G.M.T. on 26th February, 1952, with a central pressure of about 995 mb, deepened rapidly as it moved  $ENE$ 'ward during the afternoon of 26th and morning of 27th and became intense. The *Ruahine* first passed through the warm front of the depression and then passed through the cold front about 1300 G.M.T. on 27th (about 1030 S.A.T.).

### SEVERE STORM South Pacific Ocean

S.S. *Dorset*. Captain A. E. Williams. Hobart to Balboa.

16th March, 1952, 1200 G.M.T. In position  $48^{\circ} 42'S$ ,  $170^{\circ} 00'W$ , course  $084^{\circ}$ , speed 12 kt, a warning was received from New Zealand that a deepening depression, 987 mb, centred approximately  $37^{\circ}S$ ,  $176^{\circ}W$ , was moving  $SE$  at 20 kt. Precursory signs were already evident. By 1800 conditions had deteriorated, the barometer was falling steadily (1 mb per hour), cloud  $Fb$  lowering to 1,500 ft, and wind  $NE$  force 8 with frequent heavy squalls up to force 10. Sea and swell from  $N$  rose considerably, to at least 30 ft. Ship's speed was reduced to 3 kt and course altered to  $040^{\circ}$  to ride out the very heavy swell.

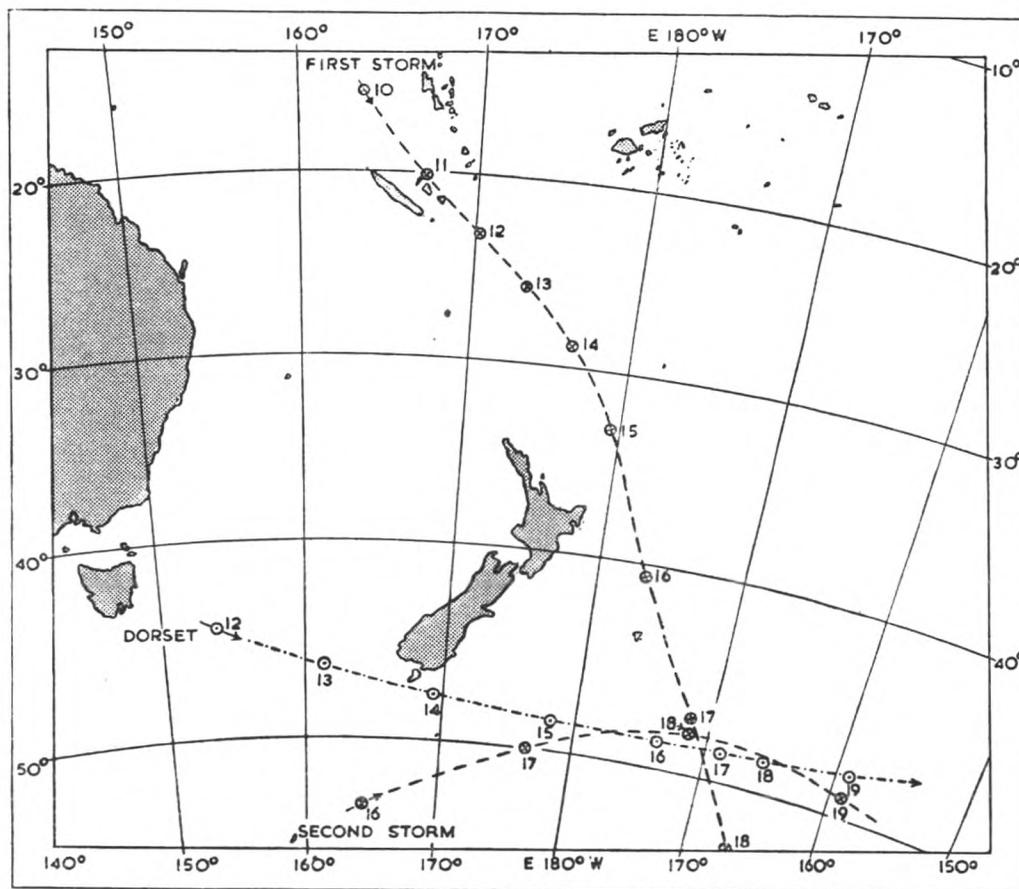
On receipt of later observations from New Zealand the synoptic chart showed that the reported storm centre, 974 mb, would pass approximately 60 miles astern within the next six hours. Weather conditions, however, remained unchanged, the wind showed no sign of backing and the barometer continued to fall.

At 1100 G.M.T., 17th March, in position  $48^{\circ} 25'S$ ,  $169^{\circ} 24'W$ , the barometer began a very rapid fall, while wind remained force 8 to 9. Ship was now hove to as it was evident that the storm centre would pass very close to us. Between 1100 and 1400 the barometer fell from 979.8 mb to 972.2 mb. At 1410 the wind suddenly decreased, breaks in the low cloud were observed and the barometer became steady at 972 mb. At 1420 wind suddenly backed to  $300^{\circ}$  force 9, and the barometer commenced to rise very steeply. Owing to the very heavy  $ENE$ 'ly swell it was not possible to change the course of the vessel without endangering the ship and the deck cargo. The ship accordingly ran with the following wind and rode out the swell which by this time had become a confused head swell. The barometer continued to rise steeply; from 1420 to 1500 it rose 6.5 mb, and from 1500 to 1800 the rise amounted to 6.4 mb.

The following 20 hours brought gradually improved weather conditions; wind remained  $300^{\circ}$  but moderated from force 7 to force 4, which allowed speed to be increased to 13 kt, and visibility increased from 5 to 25 miles. Cloud  $Fb$  at 1,200 ft became  $Cu$  at 5,000 ft with  $As$  and  $Ac$ . Sea and swell remained confused at a height of about 20 ft. Dry bulb temperature remained constant at  $55^{\circ}F$  throughout the storm.

At 1630 G.M.T., 18th March, wind suddenly veered to  $040^{\circ}$  and increased to force 6 to 7. Cloud base lowered with  $Fb$  and heavy rain, while visibility was reduced to 5 miles. The barometer commenced to fall from 997 mb and at 1830 was 991.4 mb. At this time wind increased to moderate to fresh gale, but by 1843

it suddenly decreased and backed rapidly to  $320^{\circ}$ , while the barometer began to rise rapidly. At the same time the rain decreased and finally ceased, cloud became St and Cu and lifted to 4,000 ft, with visibility increasing to 25 miles. By 2000 fair weather conditions prevailed with temperature at  $58^{\circ}\text{F}$ .



0000 G.M.T. positions of S.S. *Dorset* and two storm centres, 10th to 19th March, 1952.

Both of these storms gave excellent examples of all the precursory signs for depressions in the southern hemisphere. Synoptic and ship reports from New Zealand proved very valuable in plotting the progress of the storm centres. It was noted at one time there were three deep depressions in this area, all within 300 miles of each other, which explained why very heavy confused swells were experienced over a period of five days. Maximum speed of the ship was reached only after a further 48 hours after the passage of the last storm.

*Note.* The above observation was sent to the Director of the New Zealand Meteorological Branch, who commented as follows.

The major storm developed gradually from a flat low-pressure area in the Solomon Island-New Guinea area. By 10th March a weak circulation was apparent, but the depression could not be classed as vigorous or active until the 12th, by which time an extensive rain area had developed to the south and south-east of the centre. The wind circulation increased markedly from the 12th, and by the 13th, 0000 G.M.T., easterly gales were being reported from Raoul Island in the Kermadec group. Although the weather was bad over most of the North Island of New Zealand as the centre passed to the east, gales were reported only from a few coastal stations, but several ships in waters east of New Zealand reported moderate to strong gales and heavy seas.

Ships' reports were the chief factor in locating the storm centre south of latitude  $30^{\circ}\text{S}$ , and after it had passed to Chatham Islands at 1200 on the 16th, reports from the *Dorset* were invaluable. Their extra report at 1400 G.M.T. on the 17th of passing through the storm centre was also greatly appreciated and enabled the storm to be more accurately placed in the broadcast map analyses, to the benefit of any other ships in the area.

The second storm described was a small but active depression, the first of a series of "westerly" depressions moving rapidly eastward to the south of New Zealand. This depression had a fairly constant central pressure of 988-990 mb, and an effective circulation of approximately 200 miles diameter, whereas the major centre deepened considerably during its passage from tropical to temperate latitudes and the effective circulation area south of latitude 30°s was from 600-1,000 miles in diameter.

From latitude 25°s there was a marked trough extending north-east from a position several degrees south-east of the depression centre, and having all the appearances of a warm frontal zone. It was in this trough that the third depression mentioned in the report developed.

In a circulation of this size and intensity it is to be expected that frontal zones would not exist near the centre, and therefore the dry bulb temperature on the ship would remain constant over a considerable period of time.

## LINE SQUALL

### North Atlantic Ocean

S.S. *Irish Cedar*. Captain J. P. Kelly. Dublin to Baltimore. Observer, the Master.

28th February, 1952, 2030 G.M.T. A very heavy rain squall occurred. This showed up on radar as a distinct line squall with clear-cut edges, and was accompanied by a smaller line squall, equally distinct and 5 miles from the larger one. They were both lying in a 210°-030° direction and were moving rapidly in a ENE direction. The larger one was 16½ miles long and 1½ miles wide, with a clear-cut eastern edge and jagged western edge; the smaller one was 9½ miles long and ¾ mile wide. The northern end of the smaller one was 5 miles from the southern end of the larger one. These distances were accurately measured on the radar range marker. During the 10-minute period of this passing almost at right angles to the ship's course, the wind increased from force 6 to force 8 accompanied by heavy rain, and after passing, the wind decreased to force 6, and the rain to moderate. The wind veered about 40° from SSE to SSW. There was a sharp, almost vertical rise of barograph trace during the passing of this line squall.

Position of ship: 42° 34'N, 51° 05'W.

## UNUSUAL CLOUD PHENOMENA

### La Romana Harbour

S.S. *Hudson Firth*. Captain J. Gibbons, D.S.C., R.N.V.S.R. Observers, Mr. W. G. Lambert, Chief Officer, and Mr. M. R. Uminsky, 2nd Officer.

6th March, 1952, 1500 G.M.T. A large yellowish cloud was observed approaching from the eastward at an altitude of about 8,000 ft. Apart from this there was 5/8 other cloud present, consisting of 3/8 Cu with some As. At about 1700 the yellowish cloud covered about 6/8 of the sky, looking like a veil of Cs and obscuring the sun, which appeared as a bright red disc and reflecting a copper-coloured light on all white objects (most of the town buildings are white). This condition persisted until sunset at 2300. At 0130 the moon was observed at its zenith shining with a reddish light.

At 1200 on the 7th no trace of the phenomenon remained.

It has been suggested that the cloud may have been from some distant volcanic eruption, but this is doubtful in the absence of any reports of such happenings.

Position of ship: 18° 24'N, 68° 58'W.

## LUNAR RAINBOW

### North Pacific Ocean

S.S. *Pacific Nomad*. Captain W. Hutchinson. Los Angeles to San Francisco. Observer, Mr. J. Cameron, 2nd Officer.

21st February, 1952, 1135 G.M.T. A lunar rainbow was observed, bearing roughly

087°. The colours red, orange, blue and violet were clearly visible and the bow was reflected in the sea. Its altitude was about 8° and the moon was bearing 267°.

Position of ship: 34° 51'N, 121° 04'W.

*Note.* Before so many observations were received from the sea of lunar rainbows showing more or less clearly discernible colour, it was thought that lunar rainbows were white or at most showed traces of faint colour. In the above observation the colours must have been particularly bright to show the violet. The observation of the reflection of the bow on the sea is interesting and unusual.

## SOLAR HALO

### Off Portuguese Coast

M.V. *Sutherland*. Captain R. W. Nicolson. Hull to Dakar. Observer, Mr. P. F. J. Woollett, 2nd Officer.

29th January, 1952, 1545 G.M.T. A partial solar halo was observed with a radius of 18° approximately. The colours orange, yellow and blue could be seen clearly, but faded to white after the first 10 minutes. The halo was visible for about 35 minutes. Sky was 6/8 covered with As and some detached Cu.

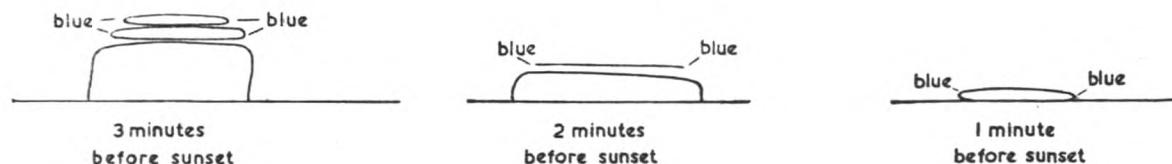
Position of ship: 41° 36'N, 10° 20'W.

*Note.* In Vol. XXII of this journal, No. 156, April, 1952, page 66, an observation of a lunar halo of 16° 44' made by M.V. *Condesa* was published. A note was appended on halos of unusual radii which are occasionally observed. Included in these are the halos of 17° and 19° radius, the former being that seen by M.V. *Condesa*. In both these halos the observed radius is sometimes a little more and sometimes a little less than 17° and 19° respectively. A few observations of halos of 18° radius have been made and two of these were published in pre-war volumes of this journal. In all cases the 18° halo is probably either the 17° or 19° halo as exact measurement of a halo is always rather difficult. The theoretical radii are always calculated from the centre of the sun's or moon's disc and if an observed halo is measured from the edge of this disc this fact should be stated so that the semidiameter, 16', can be added to the measurement given.

## GREEN FLASH

### Off Fremantle

S.S. *Esperance Bay*. Captain T. V. Roberts, R.D., R.N.R. Fremantle to Colombo. Observer, Mr. J. K. Wyles, 3rd Officer.



29th January, 1952. At sunset a blue tinge was noted at the sun's upper limb edges. Refraction distorted the sun's upper half causing it to appear in the form of layers, each layer being tinged with bright blue at the outer edges.

Position of ship: Off Fremantle.

*Note.* This is an interesting observation, as it is unusual in two respects. In the phenomenon of the green flash (so called because the colour usually seen is green), observations of blue or violet coloration are rare, especially the latter, since the rays of light of these colours are nearly always fully absorbed in their horizontal passage through a large thickness of the atmosphere. The other point of interest is that the coloration is rarely seen persistently on any part of the sun which is above the horizon, the normal phenomenon being a coloration which vanishes almost as soon as it is seen, on the upper part of the sun when this is in the act of disappearing below the horizon.

## AURORA

### English Channel

L.V. *Shambles*. Master, Mr. W. C. Moulard. Observers, Mr. J. Rudd, Mr. W. Rowsell and Mr. S. Pocock.

5th March, 1952, 0230 G.M.T. A distinct arc was observed extending down to the horizon and stretching from Anvil Point, bearing E'N 15 miles to the SSE horizon. The arc became faint and then a bright yellow tint spread across it from the seaward end and after about three minutes travelled back and faded. The faint white arc persisted for a time, the whole phenomenon lasting about eight minutes. The sky below the arc was dark and no stars were visible. The weather was showery with about 4/8 cloud at the time. Visibility was good.

An arc had previously been observed on 7th January at 0330 in the same position. It had appeared faintly white, then increased in brightness and faded again, the phenomenon lasting for some four minutes. The sky below the arc appeared brighter than the surrounding sky in this instance.

Position of ship:  $50^{\circ} 31'N$ ,  $02^{\circ} 20'W$ .

## METEOR

### North Atlantic Ocean

M.V. *Sutherland*. Captain R. W. Nicolson. Dakar to Takoradi. Observer, Mr. P. F. J. Woollett, 2nd Officer.

7th February, 1952, 0315 G.M.T. A brilliant meteor was observed near Benetnasch, bearing  $030^{\circ}$ , altitude  $35^{\circ}$ . It was visible for five seconds, travelling westward with a brilliant white head and a white trail  $15^{\circ}$  long. The meteor disintegrated into about six small pieces and disappeared in Gemini, bearing  $340^{\circ}$ , altitude  $35^{\circ}$ . Sky cloudless, and it was about an hour before moonset.

Position of ship:  $05^{\circ} 50'N$ ,  $11^{\circ} 24'W$ .

M.V. *Port Victor*. Captain E. T. N. Lawrey. Port Said to Dunkirk. Principal observer, Mr. R. Bostock.

7th March, 1952, 0200 G.M.T. Off Cape St. Vincent an extremely brilliant meteor, with a green light equal in brightness to the moon on the same night, was observed to cross the sky from SE to NW. It appeared at altitude  $50^{\circ}$ , bearing  $190^{\circ}(T)$ , and disappeared at altitude  $25^{\circ}$ , bearing  $230^{\circ}$ . Light Ci haze.

Position of ship:  $36^{\circ} 40'N$ ,  $08^{\circ} 05'W$ .

### South Atlantic Ocean

M.V. *Durban Castle*. Captain R. A. D. Cambridge, D.S.C., R.D., R.N.R. Cape Town to St. Helena. Observer, Mr. A. Backhouse, 4th Officer.

1st February, 1952, 1936 G.M.T. A brilliant meteor appeared near Capella and disappeared into cloud beneath Jupiter. It moved in a westerly direction at an altitude about  $22^{\circ}$ , and was visible about two seconds. The meteor was coloured blue and changed to green just before passing behind a bank of Sc. Its light was sufficiently strong to occlude that of the moon and Jupiter entirely. The trail of the meteor, which stretched some distance across the sky, was coloured yellow, speckled with red. The moon was bearing  $310^{\circ}$  and the cloud consisted of 3/8 Sc.

Position of ship:  $19^{\circ} 17'S$ ,  $01^{\circ} 45'W$ .



By Lt.-Cdr. L. B. PHILPOTT, D.S.C., R.D., R.N.R.  
(Nautical Officer, Marine Branch, Meteorological Office)

Some of the tablets excavated from old Babylon which have been deciphered by scientists have been found to contain references to the weather, and as far back as the fifth century B.C. the Greeks made regular meteorological observations which were recorded on parapegmata, a kind of weather almanack, fixed on public columns, some of which are still preserved. In these parapegmata, the observations of the wind prevail over all others, for they were of practical use in navigation.

Records of weather at sea were naturally kept from the earliest times, because it was often only by such records that the mariner could account for damage to his ship or cargo or for his delay in reaching port. The Greek poet Aratus some 300 years B.C. offered some sound advice on this subject: "If you have a ship confided to your care, note the precursory signs of the winter wind and tempestuous sea. It is of little trouble and soon becomes of great use to a diligent observer." Saint Paul was an early traveller by sea who noted his weather, and it is recorded that on his voyage from Sidon towards Rome, bearing in mind the contrary winds and the considerable time taken to reach the port of Fair Haven in Crete, he warned his captors: "I perceive that this voyage will be with hurt and much damage, not only of the lading and ship, but also of our lives." However, the wind at the time being fair, no notice was taken of his forecast and after the subsequent storm and shipwreck it was but a small consolation for him to say, "Sirs, ye should have hearkened unto me and not have loosed from Crete".

William Dampier, mariner, was a pioneer in the collection of information about the distribution of wind over the oceans and the discourse on the winds in his book *A Voyage round the World*, published in 1697, was still considered the authority on the subject over 100 years later. So we see that down through the ages mariners have been observing and recording the weather. Unhappily these observations, admirable and accurate though they may have been, were but isolated facts and their usefulness was often impaired for want of other observations with which they could be compared. Above all, they suffered from lack of a constant and uniform system of recording them. With the advance of commerce in the nineteenth century it became more and more necessary that the mariner should have more data about winds and currents in order that he might make his voyages more quickly and economically and with greater safety. The need for a uniform system of recording marine meteorological observations therefore became increasingly felt until, in 1853, thanks to the initiative and insistence of M. F. Maury, an American naval officer, representatives of all maritime nations met at a conference in Brussels "with the object of bringing the subject under the consideration of every maritime nation and the hope of inducing all to adopt a uniform model of logbook". Thus was born, on 4th September, 1853, in the residence of the Belgian Minister of the Interior, the first meteorological logbook, sponsored by the Governments of Belgium, Denmark, France, Great Britain, the Netherlands, Norway, Portugal, Russia, Sweden and the United States. It proved to be a sturdy youngster, and now, nearly 100 years later, one is struck by the resemblance between our present

logbook and the "abstract log" of those days. The first British merchant ship to keep this log was the ship *Flora*, who started it on 1st November, 1853, on a voyage from Liverpool to Adelaide.

In 1874 a meteorological log was drawn up, based on the original abstract log, but incorporating improvements. This was in use right up to 1939. In the latter part of this period, however, wireless telegraphy began to play a part and in 1921 the "Synoptic Form 911" was introduced, providing for observations at certain Greenwich times, instead of at the end of the watch as had hitherto been the custom. A companion form (911A) provided for the coding of the observations for transmission by wireless.

The number of ships using the climatological log was gradually reduced as the number using the synoptic form was increased, until in 1939 only 12 ships were keeping the log, the remainder keeping the form. In 1945, after the war, the use of climatological logbooks was discontinued altogether and all selected ships were asked to keep a synoptic logbook, the arrangement for which was based on Form 911.

The observations recorded in the synoptic logs continued to be used for climatological purposes in the same way as those recorded in the older logbook. The logbooks were rearranged in 1949 to conform with the introduction of the universal code for radio weather messages from ships, resulting from the Washington 1947 Conference of the International Meteorological Organisation.

It has now been decided, partly with the aim of easing the work of the voluntary observer at sea and partly because of the introduction of a new international Hollerith card for maritime purposes, to rearrange the logbook entirely. The new meteorological logbook for use aboard British selected ships will come into force during the early part of 1953. Ships will be notified individually of the date on which the new logbook should be brought into use.

The volume of paper work with which the mariner is confronted nowadays may lead him to regard anything new in this direction with the liveliest suspicion and apprehension. It is hoped, however, that this article will show him how the introduction of the new book should result in an all-round simplification of the voluntary meteorological work which many ships' officers so readily undertake for the benefit of their brother seamen and for humanity in general.

Firstly, then, the meteorological log has been combined with the record of coded messages so there will now be one book instead of two.

Secondly, the general sequence of the observations in the book is the same as that of the coded message. It will therefore be necessary to write down the observation once only and then copy it straight on to the message pad.

Thirdly, the message pad has itself been simplified in that each of the panels will now be printed with its appropriate five-key symbols. Thus no group for which observations have been made will be missed out, nor will the sequence of the groups be disturbed.

Fourthly, though it does not directly concern the observer, it will doubtless be interesting for him to note that the sequence of the observations will correspond with the sequence to be punched on the new international Hollerith card which is being introduced in the Marine Branch of the Meteorological Office at the same time.

If the observer, then, will appreciate these points we feel that he will be kindly disposed to this descendant of the child of 99 years ago when it arrives on board. "Well begun is half done", and a little forewarning of the event with a simple explanation of the new arrangement will doubtless be of use to the voluntary observer.

### **The Logbook**

For ease of reference, in this explanatory article, a page of the logbook is dealt with by sections, with each section containing spaces for the 0000 and the 0600 G.M.T. observations. It will be noted that all the columns are numbered (in the



Special † Phenomena		Temperature of Sea-water	Air-Sea Temperature	Dewpoint	WAVES			ICE †					
General	Detail				Direction from (true)	Period	Mean Max. Height	Kind	Effect on Navigation	Bearing of Ice limit	Distance from Ship	Orientation of limit	
OPTIONAL GROUPS) 9				XVIII	IV	XIX	XX		XXI	XXII	XXIII	XXIV	XXV
			GROUP IO		GROUP II			ICE GROUP					
9S <sub>p</sub> S <sub>p</sub> S <sub>p</sub> S <sub>p</sub>			OT <sub>s</sub> T <sub>s</sub> T <sub>d</sub> T <sub>d</sub>		l <sub>d</sub> w <sub>d</sub> P <sub>w</sub> H <sub>w</sub>			Ice	C <sub>2</sub>	K	D <sub>i</sub>	r	e
9					l								
9			0		l			Ice					
9					l								
9			0		l			Ice					
32	33	34	35	36	37	38	39	40	41	42	43	44	45

COLUMNS 32-45. These again are self-explanatory, the "black out" at the head of column 34 again indicating that this entry does not form part of the radio message. The "dagger" against the words "Special Phenomena" calls attention to a footnote stating that this group is only for use in ocean weather ships. The column for waves has two "compartments", to provide for occasions when waves from more than one direction are being experienced. The double dagger against the word "Ice" calls attention to a footnote stating that a space for recording ice observations is also provided at the end of the logbook.

REMARKS		
Present Weather in Beaufort Notation	Shifts of wind, times of start and finish of rainfall, etc. Special phenomena should be entered briefly. Space for additional remarks is provided at the end of this logbook.	Call sign to which sent, wave length used and time sent (G.M.T.)
46	47	48

COLUMNS 46-48. These columns are entirely self-explanatory, having been lifted bodily out of the present synoptic logbook. Column 46, weather in Beaufort notation, has been retained because the coded data for present weather in column 13, although suitable for transmission by radio and adequate for synoptic purposes, are unsuitable for climatological purposes (i.e. for marine climatological atlases, etc.), as they would not be in line with the previous records, all of which are in Beaufort notation.

As in the case of the logbook at present in use, the new one will have a few pages of explanation and a page from a "model log" is printed therein. At the end will be pages for additional remarks, reports of ice and observations of surface currents, all of which continue to be of importance.

### The Message Pad

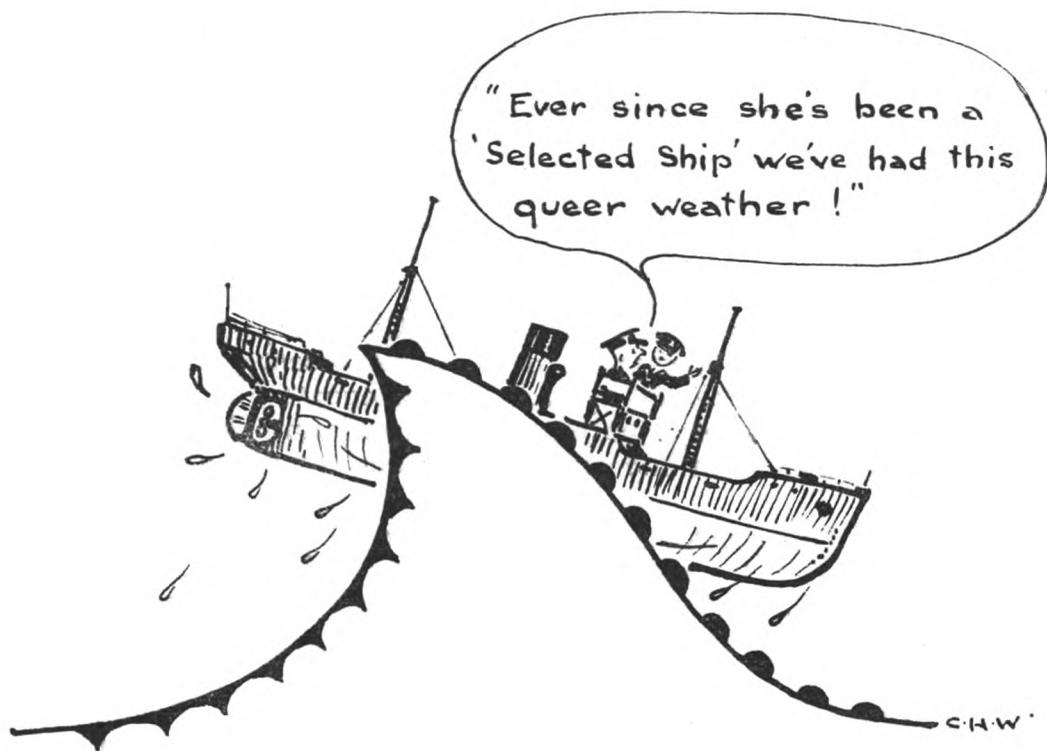
The new message form is arranged as at present, but to facilitate the copying down of the message each group space is printed with its appropriate five-lettered symbols. These of course are not for transmission. Thus the symbols for all possible groups appear on each message form, though in practice many groups may be

omitted. Where such is the case it will be sufficient just to leave the space blank and not fill it with five X's. Two little-known groups figure in this revised message form, namely the groups for waves over 31 ft, and the group for temperatures over 100°F. For the former, after the group  $Id_w d_w P_w H_w$  appears the five-letter word WAVES, which should be sent in plain language; this is followed by a blank space wherein the actual height of the waves should be recorded and transmitted, see Table XX of the code card or of the *Decode* (M.O. 509). For the latter the 100° is neglected in the group PPPTT but the last group of the message form reads DRY TTT; the word DRY should be included in the message in plain language, followed by the actual temperature in whole degrees (see *Marine Observer's Guide*, Part III, Code Tables, page III-4).

### Supplementary Ships

A logbook similarly revised for use by supplementary ships will also be brought into force early in 1953 at the same time as in selected ships. The above comments therefore apply equally to them for the observations which they are asked to make.

In laying this new logbook before the Corps of Voluntary Marine Observers we cannot do better than quote from the minutes of that first international meteorological conference which launched its predecessor so many years ago: "In the compilation of this form the Conference has had carefully in view the customs of the service and the additional amount of attention which these duties will require, and it is believed that the labour necessary for the purpose, at least to the extent specified in the instructions for filling up the columns, is only such as can be performed under ordinary circumstances, and it looks forward with confidence to occasional enlarged contributions from zealous and intelligent labourers in the great cause of science."



## Meteorology in the Royal Navy

This article, written by members of the Naval Weather Service, was contributed at our request by the Director of Naval Weather Service.

The activities of the Meteorological Office are well known to most seamen, and readers of *The Marine Observer* in particular are familiar with the excellent services rendered by that Office to merchant shipping in home waters and the North Atlantic. Few, however, may know of the Naval Weather Service, a similar though smaller organisation. This is to be expected, since the sole function of the Service is to supply the weather information required by the Royal Navy in all parts of the world, and this information is transmitted only through naval channels.

From its earliest days, in common with other seafarers, the Navy has taken not only a keen but also an active interest in meteorology. With ships dependent on the wind for their motive power, the prevailing weather was of paramount importance in determining naval strategy and tactics, and as early as 1066 we find Harold compelled to keep his fleet in being and his levies mobilised throughout the early summer because a prevailing southerly wind might bring Duke William of Normandy at any moment.

Until the advent of wireless telegraphy the sailor was entirely dependent on his own good lookout and his weather-lore in making his forecasts. It is not therefore surprising to find strong naval representation in the ranks of the pioneer workers in the field of meteorology, and in this connection the names of Beaufort and Fitzroy come immediately to mind.

Admiral Sir Francis Beaufort is of course best known as the originator in 1805 of the famous scale of wind force which bears his name and which ever since has been in world-wide use. The scale was first based on the behaviour of sailing ships at sea, but for obvious reasons corresponding criteria based on the state of the sea surface were subsequently adopted and seem likely to be used for many years to come. Beaufort also gave his name to a special weather notation, in which letters of the alphabet were used to indicate the current weather conditions. In the words of Sir Napier Shaw, Beaufort's contribution to the organisation of meteorological observations at sea has been of the greatest value to meteorologists for more than a hundred years on account of the practical value of definition and brevity in meteorological records.

Approximately 50 years after Beaufort devised his wind scale, Admiral Fitzroy began to play a leading part in the development of meteorology. By this time it had become clear to the government of the day that the weather was a matter of importance, particularly to seamen, and a Meteorological Department of the Board of Trade was established in 1854 with Admiral Fitzroy at its head. Thus, to the Navy fell in effect the distinction of providing the first Director for the Meteorological Office, although he was not then known by that title. Fitzroy has been described as "a man of science and an experienced sailor", a most happy combination! He had long been aware of the need for a mercury barometer suitable for use at sea, and on taking office one of his first tasks was the construction of such an instrument and the compilation of a set of rules for its use. In common with others, he fully appreciated the possible uses of the electric telegraph in meteorology, and in 1860 he initiated the collection of daily weather reports from a number of stations in the British Isles. Daily weather maps were constructed and issued to the press for publication together with Fitzroy's forecasts of the weather he expected. Simultaneously, a storm warning organisation was established. The publication of forecasts prior to the development of a satisfactory technique evoked much hostile criticism from scientists of the day, but Fitzroy was unperturbed and continued to issue his forecasts and storm warnings as long as he held office. In 1866, shortly after his death, both the forecasts and the storm warnings were suppressed by his successors, but the latter were soon resumed in response to public demand.

With the successful application of the steam engine to the propulsion of ships and the consequent obsolescence of sail, the Navy became for a time less dependent upon the elements, and interest in meteorology decreased correspondingly. The development of aircraft as weapons of war, however, and their operational dependence on weather conditions, provided a marked stimulus, and the First World War accordingly saw the establishment in 1916 of an organisation at the Admiralty to meet the weather requirements of the Navy. This took the form of a Meteorological Section of the Naval Air Department under Captain Lord Dunboyne, but it was soon transferred to the Hydrographic Department under Captain Douglas, well known as the originator of the Douglas Sea Scale. In 1919 the Meteorological Office, as we now know it, was established at the Air Ministry, and in August, 1920, when it was considered that the need for a separate naval organisation no longer existed, the Royal Naval Meteorological Service was transferred to the Meteorological Office and renamed the Naval Services Division. Thus the first Naval Meteorological Service came to an end.

In 1921 Commander (later Captain) L. G. Garbett, C.B.E., R.N. (Retd.), was appointed in charge of the new Division of the Meteorological Office and remained responsible for the next 26 years for the growing organisation required to meet the Navy's ever-increasing needs. By 1928 the foundations of satisfactory peace-time organisation had been laid. Aircraft carriers had been supplied with the necessary offices; instruments and equipment and trained personnel had been provided. By 1932 special synoptic messages for the use of the Fleet had been organised on a uniform basis on all stations, the messages being compiled in meteorological offices of the British Empire as appropriate and broadcast by W/T on naval frequencies at fixed times. In 1934 the Board of Admiralty again signified its recognition of the importance of weather to a modern fleet by authorising "the establishment of a self-contained, fully equipped and adequately staffed forecasting service within the Fleet", and from this the setting up of a separate Naval Meteorological Service followed as a matter of administrative convenience. This took place in 1937, when the Naval Meteorological Branch of the Hydrographic Department was formed, and simultaneously the Naval Division of the Meteorological Office was closed.

The international tension prevailing in 1937 left no doubt that the first task of the new Naval Meteorological Service must be the establishment of a peace-time organisation which would permit of a change to war conditions with a minimum of dislocation. The Munich crisis of 1938 provided a useful opportunity of testing war plans and the experience then gained did much to ensure a smooth transition from peace to war organisation 12 months later. From September, 1939, to the end of the war the story is one of rapid growth, during which a major difficulty was the entry and training of personnel at a rate sufficient to meet the continually increasing commitments. The fulfilment of these requirements during the six years of hostilities necessitated a ninefold increase in the strength of the Naval Meteorological Service. By 1945 the number of ships and air stations with fully equipped and independent forecasting organisations had increased to 70 and 60 respectively.

It is impossible in an article of this nature to give a detailed account of developments in the Naval Meteorological Service during the war; a general review of its activities must therefore suffice. Operations which not only ranged throughout the Seven Seas but which also involved craft of all sizes and were often entirely novel in concept, clearly demanded meteorological information of a most varied nature and called for considerable effort in research and investigation. For example, when it was appreciated that enemy submarines were being fuelled at sea, requests were made for the delineation of areas in which this refuelling was most likely to take place, for here it was considered the quarry could be hunted with the greatest chance of success. After careful examination of the available statistical data, information was supplied regarding the ocean areas where winds are light and seas

are calm, with the gratifying result that a number of U-boats with their attendant oilers were subsequently intercepted and sunk in these regions. The successful operation of aircraft carriers necessitated the careful study of swell, while the increasing use made of small craft during the war placed further emphasis on the urgent need for the development of a satisfactory technique for forecasting sea surface conditions, both in the open sea and close in shore. By June, 1944, this task had been completed, with results that were of great importance in the Normandy and Pacific landings.

In these and other instances the basic statistical information had been derived in the Meteorological Office from weather logs contributed over many years by voluntary marine observers in merchant ships.

The advent of radar provides a further illustration. In the investigation of the various propagation problems which arose, the Naval Meteorological Service made a valuable contribution by carrying out detailed observations of temperature and humidity gradients in the lowest layers of the atmosphere in the Irish Sea area. Furthermore, it was soon appreciated that use could be made of radar to provide meteorological data not hitherto obtainable. As the type of radar target used at land stations was not suitable for the balloons used at sea, attention was devoted to the development of a target, which could be carried aloft by hydrogen filled balloons of relatively small size and followed by ships' radar to great heights in all weather conditions. The outcome of these efforts was the invention of a metallised nylon mesh cover which could be placed over the balloon as it was being filled and gave a satisfactory radar echo. Meteorological officers at sea were thus able to determine the winds in the upper atmosphere in their vicinity, even in bad weather, an advance which was of particular value in operations involving carrier-borne aircraft.

In addition to meeting the immediate operational requirements of the Navy, the Naval Meteorological Service was called upon to play a leading part in several special expeditions during the war. For example, the weather reporting stations at Tristan da Cunha, at Spitzbergen and in the Falkland Islands Dependencies were all set up under the supervision of Naval meteorological officers. On the surrender of the Japanese in 1945, the Navy re-established the Royal Observatory, Hong Kong, and provided all weather information, including typhoon warnings, required by both civil and military authorities until the Colonial Government was able to resume control in 1946. During this period the Navy also re-established the key weather observation station at Pratas Islands, whose reports are of vital importance to the Colony during the typhoon season.

Another special commitment arose in respect of the invasion of Normandy, for which the Navy, in co-operation with the U.S. Navy, established a network of weather reporting stations in the North Atlantic, an organisation without which the invasion would have been a pure gamble with the elements. The burden of responsibility for the issue of the vital forecasts on which this operation, possibly the most important in the history of the world, was first postponed and then 24 hours later irrevocably launched, fell jointly on the shoulders of the U.S. Air Force Weather Service, the Meteorological Office and the Naval Meteorological Service. The outcome of this great operation is too familiar to call for comment, but it is perhaps not sufficiently understood how much its success depended on the accuracy of the weather forecasts provided.

A recent development has been a change of name to "Naval Weather Service" and the separation of the headquarters organisation from the Hydrographic Department and its establishment as a separate Admiralty Department, the Naval Weather Service Department, directly responsible to the Vice-Chief of the Naval Staff.

These changes have not, however, affected the essential conditions under which the Naval Weather Service has always operated and will continue to operate. Its activities are confined to meeting naval operational requirements which cannot be adequately covered by the Meteorological Office. The utmost care is taken to avoid

all duplication of effort and to make the fullest use of facilities that can be obtained from other sources. Thus the Naval Weather Service is only incidentally responsible for the supply of basic data, where the necessary facilities have in any case to be provided for other reasons in H.M. ships and R.N. air stations; it relies on the Meteorological Office for synoptic and statistical information, instrumental equipment and development and for fundamental research, and it is organised to make use wherever possible of international collective broadcasts.

In peace the officer complement of the Naval Weather Service is provided almost entirely from Instructor Branch and W.R.N.S. officers, who are university graduates in mathematics or the physical sciences, and the duties of meteorological assistants are carried out by naval airmen and W.R.N.S. ratings. The ladies are not yet allowed to go to sea but supply a large part of the complement at air stations. The Service is also fortunate in having a reserve of experienced meteorological officers of the R.N.V.R. Special Branch, who keep up to date by regular refresher training. The basic training of meteorological officers and ratings is given at the R.N. School of Meteorology near Haverfordwest in Pembrokeshire.

At present it is necessary to provide full-time meteorological organisations only in aircraft carriers and Fleet flagships and at naval air stations. The requirements of other large units of the Fleet are met by part-time organisations. The smaller units rely entirely on forecasts from shore weather centres. These centres also prepare fleet weather messages for broadcast over naval channels for the benefit of part-time organisations, which cannot cope with the volume of meteorological traffic issued on the international broadcasts. Two centres are maintained by the Naval Weather Service—one in the Malta for Mediterranean Fleet weather messages, and the other in the Admiralty for the Home Fleet weather messages and to provide weather information for the Naval Staff. In other parts of the world where they are necessary, fleet weather messages are prepared by the appropriate Commonwealth and Empire Meteorological Services, assisted in some cases by Naval Weather Service personnel.

The job of the naval meteorologist afloat is an exacting one. Complements and office accommodation are necessarily cut to a minimum in warships. The world-wide commitments of the Royal Navy and the high mobility of naval forces demand that the meteorological officer be prepared to forecast all over the globe, usually from inadequate information, and often to adjust his ideas from one region to another very different one at short notice. Unlike his shore counterpart, he cannot hope to acquire local knowledge by years of experience in one place. These difficulties are inevitable and are mitigated to some extent by the relatively less complex weather conditions over the open sea and by the preparation of weather handbooks for all the areas in which he is expected to serve.

#### ERRATUM

*The Marine Observer*, Vol. XXII, No. 156, April, 1952, page 66. The colour photograph of a green flash in the Antarctic taken by Mr. Masao Hanzawa of Central Meteorological Observatory, Tokyo, was observed in lat.  $63^{\circ} 39'S$ , long.  $115^{\circ} 59'E$ , not  $15^{\circ} 59'E$  as printed.

# Hints on Observing

## 2. SEA SURFACE TEMPERATURE

By Cdr. C. H. WILLIAMS, R.D., R.N.R., and Capt. J. R. RADLEY

(Cdr. Williams and Capt. Radley are the Port Meteorological Officers at London and Southampton respectively)

An observation that has been systematically recorded in meteorological logbooks of voluntary observing ships for pretty well 100 years is the temperature of the sea surface water. It is an important item in marine meteorology, both for climatic and for synoptic uses, and its usefulness overlaps on to other sciences such as oceanography, particularly the study and charting of ocean currents. The equipment used has been simple—a small canvas draw-bucket and an ordinary Meteorological Office sea water thermometer. With certain improvements in the bucket and the thermometer the observations are still made in this way in modern ships.

As will be shown later, however, the single-skin canvas bucket is not the ideal receptacle, and improvements could well be made in the design of the thermometer. Improved methods of making the observations are under active consideration by the Meteorological Services of most countries which own shipping and co-operate in the selected ship scheme.

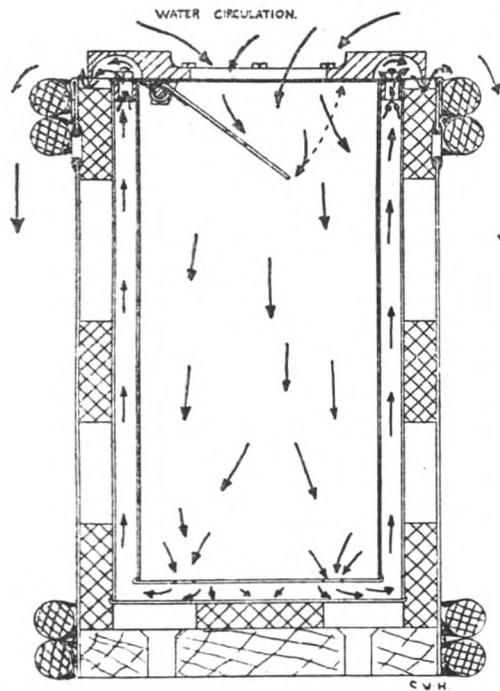
### The Bucket Method

All thermometers must be properly exposed and read with care if the figures given in a meteorological logbook and in a weather message are to be of practical value. In order to obtain good readings of sea surface temperature it is important that: (*a*) the thermometer used is a good one of known accuracy; (*b*) the temperature of the water is carefully read as soon as possible after the sample has been hauled up, allowing, however, sufficient time for the thermometer to adjust its temperature to that of the water (the thermometers supplied by the Meteorological Office take only 30 seconds to adopt the temperature of the water); (*c*) the canvas bucket when not in use is hung upside down in a shaded place; (*d*) the canvas bucket is insulated to some extent from outside influence—experience has shown that this is very desirable.

In the case of (*a*), the thermometers supplied on loan to ships by the Meteorological Office are first-class instruments made to conform to a strict specification of accuracy. They can easily be read to 0.5°F. As for (*b*) we can rely on the integrity of the officers of the Voluntary Observing Fleet. Most will realise the need for accuracy, and it is just as easy to read the instruments correctly as it is to read them incorrectly. Regarding (*c*) and (*d*) the Meteorological Office has carried out considerable research into the subject of sea water buckets, as was shown in the article published in this journal in April, 1949, entitled "A new Bucket for Measurement of Sea Surface Temperature", by O. M. Ashford, B.Sc. This referred to the Mark III bucket, and a considerable number of ships were equipped with it.

Owing to defects in its strength, and hence its longevity, no more of these special insulated buckets of the present design will be made for the present; it was expensive to produce and it has therefore been decided that a more robust and more economical design is necessary. The present stock of Mark III buckets is now exhausted, and as existing buckets of this type aboard selected ships become worn out they will be temporarily replaced by the Mark II canvas bucket, having a single canvas wall and a hinged top, pending the production of the new type of "insulated" bucket which is still in the experimental stage. On occasions when no Meteorological Office buckets are available, masters of selected ships are requested to make arrangements for getting canvas buckets made aboard the ship as an interim measure. A drawing of the Mark III bucket is shown above to emphasise its principle, and it is perhaps pertinent to note here the errors which are inherent in the "bucket" method of taking sea temperature observations.

As was shown in *The Marine Observer* article mentioned above, the more important of these errors are due to the fact that: (a) the initial temperature of the bucket is generally different from that of the sea; (b) evaporation may change the temperature of the water in the bucket before the reading is taken, particularly if the wind is strong and there is much difference between air and sea temperature (convection and conduction can also have some effect); (c) the initial temperature of the thermometer and its wooden protector may be different from that of the water sample and it may take an appreciable time to assume the true water temperature. Some of these possible errors can largely be eliminated by allowing the bucket to tow through the sea for a minute or two and by then taking the reading fairly quickly, with the bucket in a position sheltered from the wind, so as to lessen the risk of cooling or heating errors due to outside influences. The thermometer should be read while still immersed in the water in the bucket, or partly so, allowing sufficient time for the instrument to adjust itself to the new temperature.



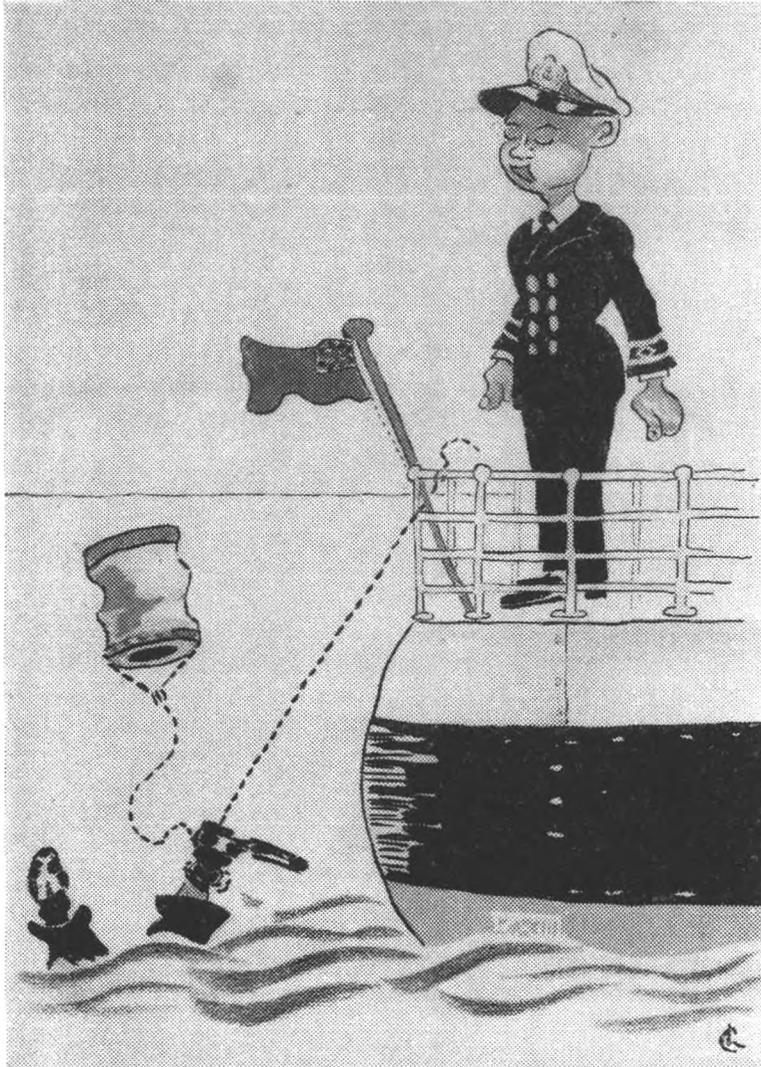
The primary purpose of the spring lid of the Meteorological Office bucket is to ensure that the contents are not lost by the bucket being capsized as it is hauled up the ship's side, but the lid does at the same time tend to insulate the water from outside influences.

### Engine-room Intake

If, when making up a ship's weather report, the temperature of the engine-room intake water is used instead of that of the sea surface obtained by bucket, it has been found from experience that an appreciable error can occur, from a variety of causes. The primary fact is that the intake temperature recorded in the engine-room is not the temperature of the sea *surface* water. (See the *Marine Observer's Handbook*, Seventh Edition, 1950.)

The sea temperature which is of interest to a meteorologist is, of course, that where the water touches the air, that is to say, the actual surface water and not the water at a depth of 20 ft or more, as is often the case with engine-room intake water. In relatively calm weather it is possible that there may be an appreciable difference between the sea temperature at the surface and that at the depth of the intake. On a warm, sunny, cloudless day, for example, the surface layers of the water may be

warmed. In very cold weather it is possible for a layer of cold water of relatively low density to be at the surface, relatively warm water of high density being at the depth of the intake. There is at present considerable uncertainty about the question of such gradients, but the problem is being investigated. In winds of force 4 or more and the corresponding sea disturbance, it is probable that water down to the depth of the engine-room intake (say 20 ft) is fairly well mixed, so that a temperature gradient in depth is not so likely as in light winds and calm. Even this, however, is not certain.



*No no, Ponsonby, SURFACE temperature.*

While it may be true that in a rough sea there is often little or no difference in temperature between the surface water and that at 20 ft depth, there are other factors which may affect the accuracy of observations taken at the condenser intake. For instance, the engine-rooms of some ships are very hot, while others are relatively cool. The position of the intake thermometer varies considerably in different ships; in some it is close to the ship's side, in others it may be nearly amidships in a pipe that has a winding path for a length of 20 ft or so. These factors would certainly have some effect upon the readings, although the flow of water through the intake is usually so fast that the effect would probably be small.

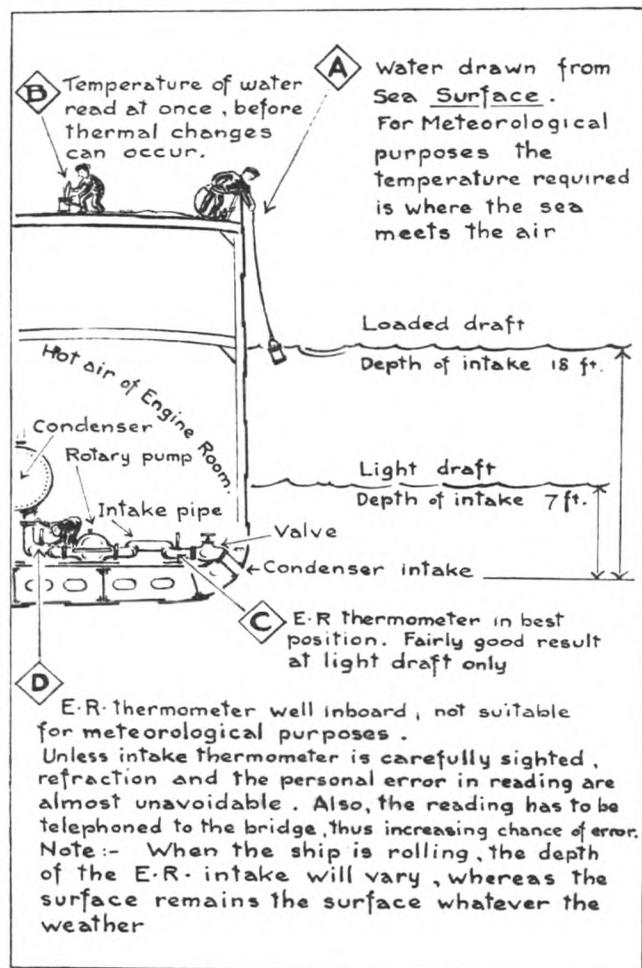
The methods of obtaining this intake water temperature also vary. In some ships

a socket is fitted in the intake pipe and a thermometer in a brass holder remains permanently screwed into the socket. In others the thermometer is placed in the socket shortly before the reading is taken. Others are in positions awkward to get at, which may make accurate reading difficult and an error due to parallax more probable. In some engine-rooms the method is to hold a thermometer for a few moments under a jet of water from a tap in the intake system. Obviously in this last case the accuracy of the result would vary somewhat with different persons.

It should also be remembered that the interest of the engineer officer in this matter is different to that of the navigator and the meteorologist. The engineer's interest is naturally in the temperature of the water as it affects the efficiency of his engines, i.e. its temperature as it enters the condenser or a cooling system, and not so much the temperature of the sea water outside the ship.

There are, of course, other defects in the use of engine-room intake temperatures for meteorological purposes:

- (a) The engine-room thermometer may or may not be very accurate. It is necessary therefore that, as a precaution, it should be checked by comparison with a Meteorological Office instrument, and a note made in the meteorological log accordingly.
- (b) The deck officer making up the weather message gets the observation "second hand".
- (c) There are risks of phonetic errors in passing the reading by telephone to the bridge.



Therefore, even in ordinary weather at sea, the intake method is not as reliable as the bucket method, and when the sea is calm the intake temperature should certainly not be used if it can possibly be avoided.

In ships such as large, fast passenger liners where for some reason it is not possible to use the bucket method and where the engine-room intake is therefore used, this fact should always be noted in the meteorological logbook. It is important that in such cases the accuracy of the intake thermometer should be checked against a Meteorological Office tested instrument, and this should also be noted in the logbook.

### Accuracy of the Reading

In the old climatic meteorological log in use up till 1939, in which observations were entered every four hours at the ends of the watches, the sea temperature was frequently noted to an accuracy of  $\frac{1}{2}^{\circ}\text{F}$ . It was agreed internationally at Washington in 1947 that sea and air temperature should be read to the nearest  $\frac{1}{5}^{\circ}\text{F}$ , and this

instruction is given in the *Marine Observer's Handbook*. We realise that there are times when it is difficult to exactly attain this degree of accuracy, but it should, nevertheless, be fairly easy to read the thermometer to the nearest  $\frac{1}{4}^{\circ}\text{F}$ , and it is suggested that 0.2, 0.5 and 0.8 of a degree is a reasonable sub-division for accurate reading.

### **Coding the Observation**

Present-day synoptic weather messages from ships at sea include two figures representing the code symbols  $T_s T_s$ , the difference between air temperature and sea temperature in whole degrees Fahrenheit. This should be reported as accurately as possible.

The reason that the International Code for radio weather messages from ships includes the element  $T_s T_s$  instead of separate readings of air and sea temperature, is that more useful and accurate information can be conveyed to the meteorologist thereby. For instance, supposing there is an air temperature of  $55.6^{\circ}\text{F}$  and sea temperature of  $56.3^{\circ}\text{F}$ . By use of the existing code system the air temperature (TT) is coded as 56, and  $T_s T_s$  in this case ( $55.6 - 56.3 = 0.7$ ) would be 1° (to the nearest whole number) and coded as 51 (as the air temperature is below that of the sea). Thus, by the use of four code figures we have indicated the approximate air temperature and the existing difference between air and sea temperature, the significant reading which the meteorologist wishes to know. Had the air and sea temperature observations been read to only the nearest degree they would both have been logged as 56, and  $T_s T_s$  would have been coded as 00, which would have conveyed a wrong impression to the meteorologist.

Navigating officers, accustomed as they are to careful work in computing the ship's position, which entails the accurate reading of sextants, chronometers, compass bearings, etc., will readily appreciate the need for reading the meteorological instruments to as great a degree of accuracy as the instruments allow. As in navigational work, inaccurate readings of any instruments are not only slovenly but are misleading to the user.

### **Use in Ships**

Information about changes of sea temperature can be useful aboard a ship in connection with the anticipation of fog and also for the care of cargo. The visibility often deteriorates as the ship steams into colder water, and improves as she enters warmer water. A sudden fall of sea temperature when air temperature is relatively warm and moist will cause the air in contact with the water to be cooled towards its dew point and will almost certainly cause fog to be formed. Quite a small change in temperature is sufficient to cause the formation or the dispersal of fog.

A fall in sea temperature may so cool the ship's side that the relatively warm air in the hold adjacent to the side falls in temperature sufficiently to reach its dew point and thus cause "sweating". Although the air temperature over the open ocean normally tends to follow the sea temperature, there are areas where local falls in sea temperature occur rather suddenly without necessarily an accompanying drop in air temperature (at the boundary of the Gulf Stream and Labrador Current for instance, or in areas where upwelling of cold water from the depths occurs). Steaming from cold water suddenly into relatively warm water will cause the air in the hold in the vicinity of the ship's side to be warmed; the danger in this case might be that this air would have its dew point raised above the temperature of some of the relatively cold cargo in the hold (canned goods, etc.) and "sweat" might be deposited on this cargo as the result. In either case ventilation, natural or controlled, might prevent damage. In refrigerated ships, no matter how good the insulation, a prolonged rise of sea temperature will inevitably bring a greater

burden upon the refrigerating machinery; this would be important in a ship carrying chilled meat or some of the more delicate fruits where a variation of temperature in the hold of even  $\frac{1}{2}^{\circ}\text{F}$  might be harmful.

### **Use in Forecasting**

All seamen realise the importance to navigation and to the shipping industry in general of timely warning of fog (and of clear weather), particularly in coastal areas. Accurate reports of sea surface temperature are essential for successful forecasts of sea fog, since changes in temperature and humidity of the air adjacent to the sea surface which lead to fog formation or clearance, partly depend on whether the sea is markedly colder or warmer than the overlying air.

The forecasting of low cloud also depends to some extent on the same factors as the forecasting of fog, i.e. the relative differences between the temperature and dew point of the air and the temperature of the sea surface. Although the forecasting of low cloud is of little interest to the seaman, it is of vital importance to the aviator since landing a plane in very low cloud is almost as difficult as in fog.

A knowledge of sea surface temperature is also important for predicting showers or thunderstorms. If the sea is warmer than the air at the surface, then it will heat the air by contact. This air, being warmer than the air immediately above it, will then tend to rise, thus producing uprising currents of air, i.e. convection. The eventual formation of convectional clouds and showers and the levels at which they occur depends on the dew point of the air. In general, although it depends on other factors as well, the higher the sea surface temperature is above the air temperature, the more numerous and severe will be the showers, and the greater will be the likelihood that some of them will develop into thunderstorms.

### **Ocean Climate Atlases**

In addition to the immediate uses to which ships' sea temperature reports are put by weather forecasters ashore and by the ships themselves, there is the future use of the data for climatic purposes and the compiling of meteorological charts of the oceans.

Atlases of monthly ocean charts showing, among other items, the maximum, minimum and mean sea surface temperatures are published by the Meteorological Office. These charts have been constructed from data supplied by voluntary observers in merchant ships over a considerable number of years. The continuous collection of such data is, of course, a long-term affair and the observations made at the present day will make possible the production of improved meteorological atlases in the future.

The safe and efficient carriage of cargoes on long ocean voyages is a matter of professional interest to all officers of merchant ships, ship owners, shippers, consignees, etc. As mentioned above, a knowledge of the temperature of the sea water through which the ship is passing or is about to pass can enable precautions to be taken against damage to cargo by "sweating" of holds. In the case of oil tankers it is desirable when loading to know the highest temperature of the sea likely to be experienced on the forthcoming voyage.

Therefore the continued receipt from observers at sea of reliable sea surface temperatures together with other weather observations is not only of value for weather forecasting, but will enable the accuracy of the marine meteorological atlases to be steadily improved, for the benefit of navigators and others in the shipping industry, as well as for meteorologists, oceanographers and others interested in the science of the oceans.

# North Atlantic Hurricanes and Tropical Disturbances 1951

A report by the U.S. Weather Bureau on the hurricane season 1951 in the North Atlantic is given on the Pilot chart of the North Atlantic for August, 1952, published by the U.S. Navy Hydrographic Department. The following summary of this report may be of interest to readers of *The Marine Observer*.

A remarkable feature of the 1951 hurricane season, and one which broke all records as far as is known, was its early commencement in May. After this storm there were none until August, the most likely month for the hurricane season to begin. There had previously been seven May storms since 1887, but these were only tropical disturbances, none reaching hurricane force. The greatest number of tropical storms occurs in September on an average, and a greater percentage of the storms reaches hurricane intensity than in the other months. During the last 20 years, 54 per cent of the storms in August reached hurricane intensity, 60 per cent in September and 52 per cent in October. Over a 65-year period ending with the year 1951, however, the percentages for August, September and October are 65, 58 and 43, respectively. In the early years the greater frequency of August storms, as recorded, was apparently due to the fact that a higher percentage of them was of sufficient violence to make history, and also to the greater likelihood of recurvature into the Atlantic in September and October before reaching the United States or the West Indies, thus escaping detection at a time when communication and shipping were less developed.

The number of storms occurring in each month during the period 1887 to 1951, and the number reaching hurricane intensity, are given below.

**Number of Tropical Storms in North Atlantic 1887 to 1951 inclusive (65 years),  
and the number of known hurricane intensity**

	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number of storms . .	8	27	34	112	160	131	29	2	503
Number of known hurricane intensity . .	1	11	15	73	93	56	9	0	258

The hurricane in May, 1951, possessed other peculiarities in addition to its arrival early in the season. First, it was not tropical in any true sense of the word, since it formed near latitude 30° 00' N. Second, it formed in modified maritime polar air. Nevertheless it possessed all the characteristics of a true hurricane.

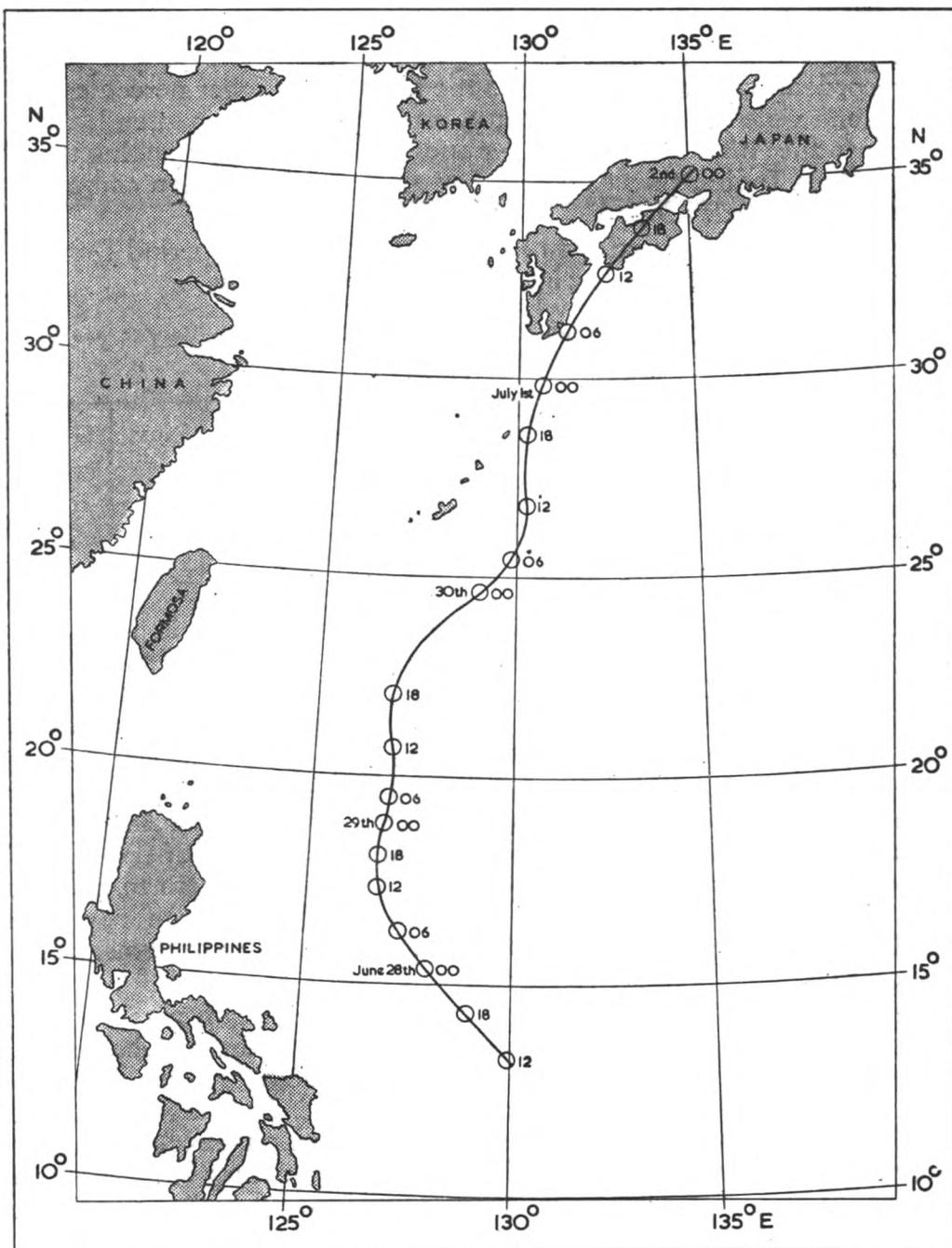
For the United States this was the mildest hurricane season since 1930; only one storm reached the coast and there was no loss of life. However, there were only two tropical storms in 1930 as compared with 10 in 1951. When we consider the amount of damage though, it was the mildest season since 1939. Some of the coastal areas of Jamaica and Mexico did not fare so well; the hurricane of 15th to 22nd August caused the greatest loss of life since the great Atlantic hurricane of 1944, the total of dead in Jamaica being 152 and in Mexico 90. The amount of damage from this storm was estimated to be over £7,000,000.

All except two of the 10 storms detected during the season reached hurricane intensity at some time during their course. The one storm that reached the United States coast crossed the Florida Peninsula on 2nd October, but did not reach hurricane intensity until it had left the east coast and moved NE'ward over the Atlantic. Two storms, the third and seventh of the season, reached the Mexican coastline and passed inland. The fourth storm caused damage and loss of life in islands of the Lesser Antilles. The small hurricane of 12th to 16th October developed in the north-western Caribbean Sea and moved N'ward to within 60 to

80 miles of the Isle of Pines. The May storm passed close to the Bahamas and within 70 miles of Cape Hatteras. Three other storms followed nearly parallel courses NW'ward and then NE'ward well out in the Atlantic, and the last one of the season, 15th to 20th October, formed and ran its course in an area about half-way between the American coast and Bermuda.

During the years 1932 to 1951 inclusive, the number of storms experienced was an average of 10 a year, of which about five a year attained hurricane intensity. The worst year was 1933, when there was a total of 21 storms, 10 of which reached hurricane force, and the best year was 1939 when there were only five storms, two reaching hurricane force. During this period no storms were reported in December and three storms in May, and only one of these reached hurricane force. Thus June to November continue to mark the limits of the normal hurricane season in the Caribbean.

Individual reviews of all North Atlantic hurricanes and tropical disturbances that occurred during the 1951 season are also given in the report. P. R. B.



## Irregular Typhoon Tracks

The following note has been received from the Naval Weather Service.

Until very recently, meteorologists have considered that the standard textbook picture of a smoothly recurving track gave an adequate description of the path followed by most typhoons and similar types of storm. Since the war, however, the movement of tropical storms has been the subject of theoretical investigation in the U.S. and articles published there have aroused considerable interest.

The latest theory suggests that at some point in its path before recurving, the track followed by the typhoon will become "wavy", the oscillatory motion having a small amplitude equivalent to one-third to two-thirds of a degree of latitude. Such a small departure from a regular track explains why these predicted excursions have not been previously detected. Only the advent of radar aids and aircraft reconnaissance flights has enabled accurate plots to be kept of the motion of storm centres. The period of oscillation about the mean path has been deduced as two to three-and-a-half days, but examples described in the U.S. and the case reported here give a shorter period.

The Commanding Officer, H.M.S. *Glory*, has kindly supplied the details of typhoon "Kate" reproduced opposite, the time covered being from 1200 G.M.T. on 27th June, 1951, to 0001 G.M.T. on 2nd July, 1951. The location of the centre is marked every six hours.

The wave-like motion of the storm is clearly shown and the variations in period and amplitude are interesting. Theoretically, small intense storms should have a smaller amplitude and a shorter period than larger, less intense storms. According to the Commanding Officer, H.M.S. *Glory*, the typhoon weakened during the few days under review. An examination of the chart shows that initially the period and amplitude were about 30 hours and 20 miles, which changed to approximately 35 hours with an amplitude of 40 miles by 30th June. These amplitudes agree well with the range expected on theoretical grounds.

## Weather Bulletins for Whaling Expeditions

As mentioned on page 3, whalers in the Southern Ocean are now equipped with a full set of meteorological instruments and send weather reports to Sydney or Cape Town with their "position groups" in a special cypher. We have recently received details from the South African Weather Bureau and the Australian Meteorological Branch of the weather bulletins which it is intended to issue to whaling expeditions.

The South African bulletin is broadcast from Cape Town Radio at 2130 G.M.T. daily on 148 kc/s (ZSL), 4,725 kc/s (ZSL 2), 8,333 kc/s (ZSL 3) and 16,670 kc/s (ZSL 5); the area covered is between 60°W and 90°E south of 30°S.

The Australian bulletin is broadcast from Canberra VNCN at 1530 G.M.T. daily on 2,628 kc/s, 5,560 kc/s, 10,485 kc/s and 13,920 kc/s; the area covered is between 90°E and 180° south of 50°S.

The bulletins consist of an inference of the positions of centres of depressions and anticyclones and their expected direction and speed of movement. The broadcasts will take place only when whaling expeditions are south of 40°S, i.e. from mid-November to mid-March approximately.

It is hoped that these broadcasts will prove of great use to ships in the Southern Ocean.

## Physics in Industry

Notes on the Fourth Industrial Physics Conference at the Royal Technical College, Glasgow, in June, 1952.

That mankind owes much to physicists for the well-being which is now enjoyed in everyday life was amply shown at the Fourth Industrial Physics Conference at Glasgow. The conference was opened by LORD BILSLAND, who stressed the importance of the physicist in modern industry and the necessity of applying scientific research in industrial undertakings. In order to re-establish our economy, British scientists should give to industry all their scientific knowledge and experience.

Following the opening speech, a summary of the relation of physicists to metallurgy was given by SIR ANDREW McCANCE, of Colvilles Ltd., the great steel works lying to the south of Glasgow. Sir Andrew told of the history of steel production and gave an account of the part physicists play in modern processes. In the early days the temperature of molten steel was assessed by the appearance of the bricks surrounding the furnace, thus indicating when the steel was ready for tapping and running into moulds. The men doing this were apparently quite accurate as a rule, but there were occasions when they were not so, and then the results were poor. Physicists therefore came to the aid of the steel maker and developed the pyrometer, which became a very accurate instrument for measuring high temperatures. The speaker went on to describe various other methods developed by physicists for determining the constituents of the steel, flaws in the finished article, etc.

Then followed a very interesting and invigorating lecture on meteorology by SIR ROBERT WATSON-WATT. The chairman, in introducing the speaker, reminded the conference of the great benefits Sir Robert had given industry by his researches into the various branches of physics, including electronics and radar; but he was also a meteorologist. He said that in the school where Sir Robert commenced his education, the rector discovered that he had a great aptitude for writing, and recommended that he should take up journalism, prophesying that one day he might even become editor of the *Glasgow Herald*.

Sir Robert, on opening his speech, remarked that the prophesy that he might one day become editor of the *Glasgow Herald* was just another forecast that had gone wrong. He said he was not there to describe the physical processes of meteorology but to invite a discussion from industrialists as to their meteorological requirements in their specialised industry; resident meteorologists inside industrial undertakings might not be a bad idea. The great desire for long-range forecasts, not only by industrialists but by the public in general, was next brought into the picture but Sir Robert stated that the longest reliable forecast was for 24 hours; a three-day forecast could be given under ideal conditions when stability prevailed; a five-day forecast was a dream; and for a five-week forecast it was necessary to use climatological averages. The idea of an electronic computation of the weather was mentioned but it was pointed out that it could not take account of all the complex changes that take place in the atmosphere. The great value of meteorology in transport was remarked upon: how every airport had its resident meteorologist, how shipping was informed, how the new U.S. liner *United States* applied aerodynamics to defeat wind resistance on the superstructure. Rainfall forecasts are of great importance in hydro-electric schemes to control the level of water in reservoirs. The application of meteorology to the handling of freight (which is of major importance to the seaman) was mentioned, how it was necessary to know the highest likely dew point for ports in which various cargoes were loaded and the effect of weather on the transport of cargoes. As an example, Sir Robert mentioned the ruination of a pineapple cargo by even a light shower of rain.

SIR NELSON JOHNSON, in replying to Sir Robert, remarked on the vast progress in meteorology during this past decade, how vast statistics of weather records had been accumulated, how important advances in the technique of observation through the use of radio-sondes, distant recording stations, radar, etc., had regrettably not

led to the expected improvement in forecasts. The Hollerith punched-card system, which for many years had been applied to the use of observations from the sea, was now becoming popular for land observations. He did not agree with Sir Robert that each industrial concern should have its own meteorologist (they would not have at hand the large amount of data available at the Meteorological Office) but agreed that it would be a good idea for meteorologists to study the requirements of industrialists.

A very informative talk on some applications of physics to naval architecture was given by PROFESSOR ROBB of the University of Glasgow, on the morning of Thursday, 26th June. Professor Robb said that it was imperative for physicists to make a deep study into hydrostatics, particularly dynamical stability, in order that a fuller knowledge of the behaviour of ships in a sea way might be gained. He argued that very little was known of a ship in oscillation, that statical stability was insufficient for a ship subjected to dynamical movement at sea. He quoted the formula  $BM = I/V$  for obtaining the position of the metacentre for a ship at rest in still water as misleading, because a ship oscillating at sea cannot have a constant value for the waterplane. This is continually changing and the formula

$$BM = \frac{I}{V} \left( 1 + \frac{1}{2} \tan^2 \theta \right)$$

where  $\theta$  is the angle of heel, was more accurate for a ship at sea. The conception that a ship will turn turtle when the centre of gravity (G) is above the metacentre (M) is not always correct. Many ships make voyages with G over the original M, and M has a very definite locus.

Professor Robb continued by pointing out that many problems in aerodynamics and naval architecture are similar. Some of the problems which confronted naval architects in experiments with models in the testing tank were next mentioned, mainly with regard to the under-water skin resistance of the models. It was necessary to separate laminar from the turbulent flow of the water in the boundary layer in order that the resistance of the under-water skin for only one type of motion could be studied. The point when laminar flow breaks down into turbulent flow was not known, and must be found for a proper knowledge of the effects to be gained. During the subsequent discussion it was argued as to which of the various factors caused the greatest resistance to a ship's hull when under way; Professor Robb considered that pure friction on the under-water surface was 70 to 80 per cent and waves caused by wind give a resistance of 20 to 30 per cent. During the discussion I was unable to ask Professor Robb about the value of actual wave observations to naval architects, owing to the great number of young naval architects propounding their various theories, but I had the opportunity to ask afterwards. He said that wave observations are of value providing they have an accuracy of not less than 90 per cent. The most important factor from a naval architect's point of view was period or length, but, to be accurate, these measurements should preferably be made from stationary ships. Measurements have been made but there is a great insufficiency of observations.

A survey of physics in transport was given by Mr. M. G. BENNETT and Mr. T. A. EAMES, both of the Physics Division of the Research Branch of the Railway Executive. Mr. Bennett gave a general discussion of the application of physics in transport in the future, and pointed out the need for efficient physicists. The importance of meteorological forecasts was mentioned; it was pointed out that forecasts are of importance mainly when fog or icing conditions are expected. The danger of ice to point systems and signalling methods is very great, and of course fog is always an enemy to transport. Mr. Eames then explained some of the problems that had been solved by his department, and stated that new problems are constantly occurring and new methods being introduced. One of the examples he mentioned was the research into refrigerated cars for transport of perishable goods. He dwelt mainly on the problem of design of this special type of rolling

stock and the necessity to ensure that the system was foolproof and that the goods remained in perfect condition throughout their journey.

Among the many complicated and technical exhibits were some that were of interest to seamen. These were orthodox clinometers for measuring the angle of heel in heeling experiments. There were graphical illustrations of experiments on laminar and turbulent flows on model hulls, showing the two types of boundary layer flows. Illustrations were shown of the damage caused by cavitation on propeller surfaces owing to incorrect pressure distribution. Experiments on the hull vibration caused by the effect of entrained water on hulls in both deep and shallow water were illustrated. Exhibits on another stand showed photographs of methods used to test bulkheads in passenger ships for their fire resistance qualities, as laid down in the 1948 International Conference for the Safety of Life at Sea.

The most interesting exhibit as far as navigation is concerned was a radar navigational chart comparison unit, which enables an image of the chart in use to be superimposed on the P.P.I. The chart is seen on the P.P.I. through various lenses which can be adjusted to suit the range scale in use at the time. A spot light indicating the ship's position is reflected from the centre of the P.P.I. on to the chart underneath the instrument. By this means the master standing alongside the officer operating the radar and chart comparison unit can trace the progress of his ship along a course line. Another vessel approaching could be followed by its reflected image on the chart, and not only its relative course and speed observed, but also its true course and speed. It would appear that this apparatus will be a great boon to vessels navigating in narrow waters in poor visibility.

There were also many electronic devices on show which have a bearing on marine work but space does not permit an account of them here.

R. R.

## The Coastguard Service

The Meteorological Services of the world do their best to warn shipping of impending bad weather, but once the bad weather arrives it is up to the navigational ability of the master, combined with the seaworthiness and power of his vessel, to keep out of trouble. When off the east coast of Scotland a prolonged NE'ly gale is notoriously unpleasant, and it was in such circumstances that the Norwegian M.V. *Vildfugl* was stranded on the rocks at Fifeness at about 2 a.m. on 28th May, 1951.

Coastguards were quickly on the scene and took immediate steps to rescue the crew, because it was obvious that with the prevailing weather the vessel would probably quickly break up. After firing three rockets they got a line across to the ship and eventually the whip block was secured aboard, but owing to the short time available it was not possible to anchor the hawser ashore, so the coastguards had to use a "human anchor" to keep the hawser taut and they got most of the crew ashore with the breeches buoy in this manner. By 3.52 a.m. the whole of the crew had been saved. As a result of this the Ministry of Transport Shield for the best wreck service of the year has been awarded to the Crail (Fife) Life-Saving Appliances Company.

It is interesting to note that during the year ended 31st March, 1952, life-saving action was taken in 657 cases in which vessels or aircraft were either observed or reported to be in distress. The life-saving apparatus was taken into action on 69 occasions and the number of persons brought to safety was 77, including 54 by use of the breeches buoy.

This little note tends to bring to our notice the fact that despite the modern types of propelling machinery in ships, the design of the vessels themselves and the navigational aids with which they are equipped, the weather remains a very important item in the life of a seaman.

C. E. N. F.

## Weather in Connection with the Efficient Working of Ports

One sometimes hears the comment that weather forecasts and other meteorological information are not of much practical value as far as cargo work is concerned. A little thought, however, would seem to show that bad weather can have a very adverse affect upon cargo work, even if only because it slows up the rate of work due to the discomfort. There is no doubt whatever that a lot of damage occurs if one does carry on working certain cargoes in rain.

It is interesting to note that in the published report of the Ports Efficiency Committee, one of the causes which are stated to have contributed to the improvement in port working during the year 1952 is "the weather has been consistently good in the first half of the year".

### Book Reviews

*The Observer's Book of Ships.* By Frank E. Dodman. 5 $\frac{3}{4}$  in.  $\times$  3 $\frac{1}{2}$  in. pp. 192. Illus. Frederick Warne & Co., Ltd. London, 1952. 5s.

Once the habit of observation has been acquired there is literally no limit to the subjects to which it may be applied. For this reason alone we would welcome this latest addition to the Observers Pocket Series, for it would seem that an officer who is a keen observer of ships will almost certainly become a keen observer of all things which affect ships, of which, even in these days of full-powered steamships and radio aids, the chief is perhaps weather.

An almost unbelievable amount of information is packed into this little book and a very wide field is covered. In less than 200 pages a place is found for details of merchant ships, warships, sailing yachts, fishing and harbour craft, tugs, dredgers, all rigs of sailing ships, ensigns, flags and funnels, shipping companies with particulars of their normal trade and system of naming their ships, together with notes on tonnage, the Plimsoll line and various historical types of ships. The text of such information is supported by 79 pages of line drawings and silhouettes, and in addition there are 16 colour plates and 16 black-and-white half-tones. The professional seaman might well find this book of practical value, if only to settle the inevitable argument in the watch below. To those who do not necessarily occupy themselves in great waters but who are just fond of "messaging about in boats . . . or with boats" the book will undoubtedly commend itself, whilst casual travellers by sea, occasional visitors to the docks, the officer's family or even seaside holidaymakers will find that it contains much to help them to a fuller enjoyment of their contacts and local conversation.

Though most of the information could undoubtedly be found elsewhere if one had enough time and access to enough books, there is one feature which must be unique; with the coloured plates of flags and funnels is also given the colours of the ventilators, boot topping and topsides, a very useful addition.

In a small work with such a large compass, small errors and omissions are almost inevitable. A little confusion may arise in the mind of the layman when he reads on page 13 of the Ministry of Transport's connection with the Plimsoll line, for the accompanying illustration shows a Lloyd's Register marking though no mention is made of either this or other classification societies to whom the authority may be delegated. We are surprised to find such a well-known house flag as that of the Union Steam Ship Company of New Zealand, whose trade is in the Pacific and Indian Oceans, described as belonging to the "United Steamship Company of New Zealand Ltd.", which mythical company is said to run from London and Southampton to New Zealand via the Panama Canal (page 25), while perhaps rather too much emphasis is laid on *Cutty Sark* at the expense of, say, *Ariel*, *Lightning* and *Thermopylae* (pages 113 and 115). It seems also a little unfair to lay

the charge of undermanning his ships at the feet of the "shipowner from the Baltic Aland Islands" who did so much to keep alive the spirit of sail between the wars (page 117), and incidentally there is no mention of the Ocean Weather Ships nor yet of this newest ensign.

L. B. P.

*Report on the Snow Survey of Great Britain for the Season 1950-51.* By E. L. Hawke and D. L. Champion. *J. Glaciol., London.* II, 11, March 1952. pp. 25-38. *Illus.* British Glaciological Society, London.

As in the year 1949-50, this latest report upon the snow survey of Great Britain includes observations from coastal waters around the British Isles. In addition to the Trinity House light vessels and lighthouses which make observations for the British Glaciological Society, a number of merchant ships voyaging in coastal waters are also co-operating. Surprisingly little is known about precipitation at sea. It is interesting therefore to see practical use being made of these snowfall observations from our coastal waters. These observations only refer to occasions when snowfall is observed and do not record amount of snow, for no really suitable gauge has been evolved for recording the amount of snowfall or rainfall aboard ship. The report shows that the first snowfall at sea in 1950 was recorded at the Humber and Dowsing light vessels on 28th October, and that as late as May snowfall was observed at five stations, including Round Island, Scilly Isles. It is of interest that during this month the mean sea surface temperature off Lands End was as high as 50°F, which makes a report of snow, even in the form of a shower, rather a striking occurrence.

From the maps it is difficult to say whether there are more days of snow in coastal waters than on adjacent coasts. It is only by the accumulation of reports over several years that questions of this nature can be answered. Snowfall at sea was most widespread in December.

R. F. M. H.

*The Mercantile Marine Atlas.* 14th Edition. By G. Goodall. 21 in. × 15½ in. pp. viii + 36 + 43 double page lithoplates. George Philip & Son, Ltd. London, 1952. £12 12s.

This 14th Edition of the *Mercantile Marine Atlas* (the 1st Edition came out in 1904) is an elegant though rather massive production and will undoubtedly be of great value to those responsible for the operation of ships. The atlas is extremely well produced, as it needs to be at a cost of 12 guineas. Each map is printed on heavy cartridge paper and the maps have been so mounted that they lie flat when the book is opened—a very convenient arrangement. The main part of the atlas consists of 25 large-scale charts which concentrate attention to the seaboard and the oceans so that the interior of the map is not overcrowded with details. Innumerable shipping routes are very clearly shown, together with distances and mail-boat times, and all the sea areas are gridded, for every degree of latitude and longitude. Main lighthouses, light vessels, etc., are marked and there are some extremely good inset charts giving detail of no less than 129 of the main ports inserted on various charts. The flags, national and mercantile, make a colourful display and emphasise the extraordinary variety of new flags which have come into use relatively recently. In the International Code of flags, it is noted that none of the substitutes is given. There is a useful map of British railways, a transport map of central Europe and a map showing Europe's overland and sea communication with the East. There are also detailed diagrammatical maps concerning the Panama and Suez Canals and some interesting maps of the Polar regions, on which the routes taken by various explorers are shown. Very practical and comprehensive are the communication maps of all oceans which include graphical information about the principal shipping lines and their routes, ocean depths, iceberg limits, the principal ocean currents,

principal railways and principal radio stations. Inset diagrams show spring rise of the tides and visibility of the land of varying heights from the ship's deck. Finally there are some interesting maps showing trade and shipping routes; commercial development; standard times; principal air routes; location of embassies, consulates, etc.; and there are some useful supplementary tables, including alternative spellings of place names.

In a comprehensive and rather expensive atlas of this nature the meteorological information given is rather disappointing. One has to search rather carefully through the various maps to find information about ice limits and ocean currents; for example, on the Arctic and Antarctic maps limits of "drift ice" are shown, but one feels that a reference to the source of the information might be useful. One questions the accuracy of some of the ice limits; for example, "drift ice" limits are shown south of Iceland and nearly down to the Shetlands, and in the Antarctic the limits come surprisingly close to Cape Town. On the "communication maps" the Equatorial limit of icebergs is also rather surprising and one suspects it is based upon obsolete data. In the Baltic the dates of opening and closing of ports is clearly shown and it would obviously be too complicated to depict specific ice limits in this area.

It would perhaps be advantageous in any future edition of the atlas if maps could be included showing average, maximum and minimum sea and air temperatures in all oceans, the notorious fog areas of the world, and prevailing winds and wind force figures, together with some information about hurricane seasons. It would seem that such information would be of considerable interest and value to ship owners, marine superintendents and others concerned with the operation of shipping.

This atlas would no doubt be a useful addition to the library of a passenger ship—or indeed of any ocean-going ship—for it contains a wealth of useful information for anybody interested in the sea.

C. E. N. F.

*The Use of Radar at Sea.* By the Institute of Navigation. 9 $\frac{3}{4}$  in.  $\times$  6 $\frac{1}{2}$  in. pp. xvi + 279. *Illus.* Hollis & Carter, Ltd. London, 1952. 30s.

The reviewer's impression on reading the first three chapters of this book is that it is rather heavy going, apart from the beginning of the first chapter, which leads up in a very interesting and practical way to the general theory of radar and discusses its history. Chapter 4, however, leads us into "Propagation of waves and response of targets", and thereafter the book becomes of absorbing interest and one begins to realise what a lot there is to this question of radar and how important it is that the navigator should be *au fait* with the various limitations and idiosyncrasies of this "magic eye". This is not the sort of book one can settle down to read with one's feet on the mantelpiece (or lying in one's bunk). To get anything out of the book the reader needs to really study it, but there is no doubt whatever that any officer at sea whose ship is fitted with radar would do well to study this thorough treatise upon the subject.

The Ministry of Transport appreciate the value of radar as a navigational aid and require masters and mates to have practical knowledge of it for their examinations. At a recent inquiry about a collision in fog in the St. Lawrence both ships were found equally at fault for not making proper use of radar.

As the Preface tells us, the book has been produced by the Institute of Navigation primarily to help the seagoing user and as a manual of instruction in navigation schools. It has been written by a committee of 13 individuals, who are members of the Institute and specialists either in radar itself or in its application. Captain F. J. Wylie, of the Radio Advisory Service, was primarily responsible for the rather difficult task of blending the work of so many individuals into one comprehensive volume, and an excellent job he has made of it.

This book is divided into 17 chapters; the first three chapters concern the equipment itself; Chapters 4 and 5 discuss propagation of waves, response of targets and radar meteorology; Chapters 6 and 7 discuss the interpretation of the display and the question of unwanted echoes; Chapters 8, 9 and 10 are concerned with the practical uses of radar as an aid to navigation; Chapter 11 describes such items as the use of radar reflectors. The remaining chapters discuss such miscellaneous items as shore-based radar, radar logs, maintenance, details of the equipment circuits, etc. There are seven useful appendices, concerning such items as radar photography, formulae and a glossary of terms. The book is illustrated with numerous diagrams, tables and photographs of P.P.I's.

On studying this book one is impressed with the thought that here are shown numerous cases of the application of elementary science to the job of a navigating officer at sea. Radar has undoubtedly come to stay as an aid to navigation and no navigator can say now that he has no need for a knowledge of elementary physics and meteorology. In almost every chapter in this book some reference is made to the adverse or benevolent effects of meteorology upon the performance of radar, in fact one is impressed with the fact that meteorology is the most important factor concerned; it is meteorological conditions which necessitate the use of radar and which govern its effectiveness.

Like all scientific aids, in order to get the best practical value out of the radar set the user needs to know something about the theory of radar itself, the rudiments of the set, detail of its operation and to be fully aware of its operational limitations. The book succeeds in bringing home the fact that radar is only an aid to navigation and that it is only by constant practice, familiarity with the particular set supplied and a combination of meteorological appreciation and sea sense that one can get the true value out of a radar set. In the wrong hands there is little doubt that radar can be a danger rather than a blessing.

The "operational" chapters of the book (Chapters 4-11) are very comprehensive and well illustrated and should provide any radar user with a wealth of practical information. Each chapter of the book has a helpful introductory paragraph which summarises its content. The controversial topic of radar and "rule of the road" is dealt with realistically and the views expressed are in accordance with those of the Ministry of Transport. Good advice is given about practising with the radar in good visibility, "which will pay a handsome dividend when fogs blot out the fo'c'sle head". The important question of interpretation of the display and the infinite variety of target behaviours are matters which are rightly stressed again and again. The Introduction to Chapter 8 gives seamanlike advice: "To use every available means of checking a doubtful position is the essence of careful navigation. Radar is one of these means. . . . The radar set does not always produce clearly defined answers; its evidence requires interpretation, and interpretation needs skill, experience, commonsense and caution."

There are a few criticisms. Although considerable detail seems to be given about the electronics of a radar apparatus, no reason seems to be given for the existence of such an important phenomenon as side-lobes. In the chapter on "Collision Warning", the explanation of the relative motion drawings—always rather a difficult subject—is not clear. It would perhaps be an advantage in future editions if a brief recapitulation were given at the end of those chapters which are "heavy going" to anyone but a radio enthusiast.

This book was written by experts having a first-hand knowledge of the user's difficulties. An intelligent study of it will undoubtedly help many a navigating officer in putting to proper use the radar instrument which science has designed for his use.

C. E. N. F.

## Letters to the Editor

### THE EARLY DAYS

Sir,—The following true story may be of interest.

I was attached to the R.M.S. *Arcadia*, P. and O. Line, in 1913 as wireless operator under a dear old captain, Captain Barcham, when I was instructed to copy the first weather reports broadcasted by Ushant Radio. I received same and took it to the captain feeling ever so proud. He read it and frowning screwed it up in a small ball saying, "I have navigated my ship for 20 years without wireless and will continue to do so", and threw it in the wastepaper basket.

On my last voyage on the R.M.S. *Pretoria Castle*, January, 1952, your weather bulletins from Madeira to Southampton every 12 hours were anxiously awaited, a private copy to the captain, Captain Wren, D.S.O., and another copy to the navigating officer within a minute or so after receiving same, and if missed—what a row!

Southsea, Hants.

H. Oliver, M.B.E.  
(Radio Officer).

### ANOTHER SATISFIED CUSTOMER

Sir,—Some time has elapsed since we became members of the Corps of Voluntary Marine Observers, and I feel that you should know that the varied discussions, differences of opinion and the day-to-day classification of the elements in compiling our weather reports has had the effect of greater care being taken resulting in a higher standard of efficiency, and has given us a real understanding of "weather" and an interest that was hitherto absent. As we are on the "bulk sugar trade" between the English Channel and the West Indies, the plotting of lows, highs, fronts and ridges is of great value in planning our route, taking advantage or avoiding action as far as is possible. Sometimes, of course, the weather catches us unawares, but this happens less frequently than previous to our enrolment in the Corps, and the advantage to the ship is beyond question.

We plead guilty to a certain amount of superiority on being able to inform other vessels, at their request of course, that their aneroid is not quite correct, and of informing them what the reading should be, together with the information that this is from a "Met. Office" barometer.

S.S. *Hudson Firth*  
Off Fayal.

Captain J. Gibbons, D.S.C., R.N.V.S.R.

### THE SOUTHERLY ROUTE

In the winter of 1951 Captain L. Rowe of the S.S. *Greystoke Castle* (Moller Line) discussed with the Marine Branch a suitable route across the North Atlantic for a cargo ship, flying light and trimmed well by the stern. We have his permission to publish the letter he wrote after he had made the passage, together with his track chart, and we feel that the following extract will be of interest to other shipmasters faced with the problem of making the best of this notoriously unpleasant passage.

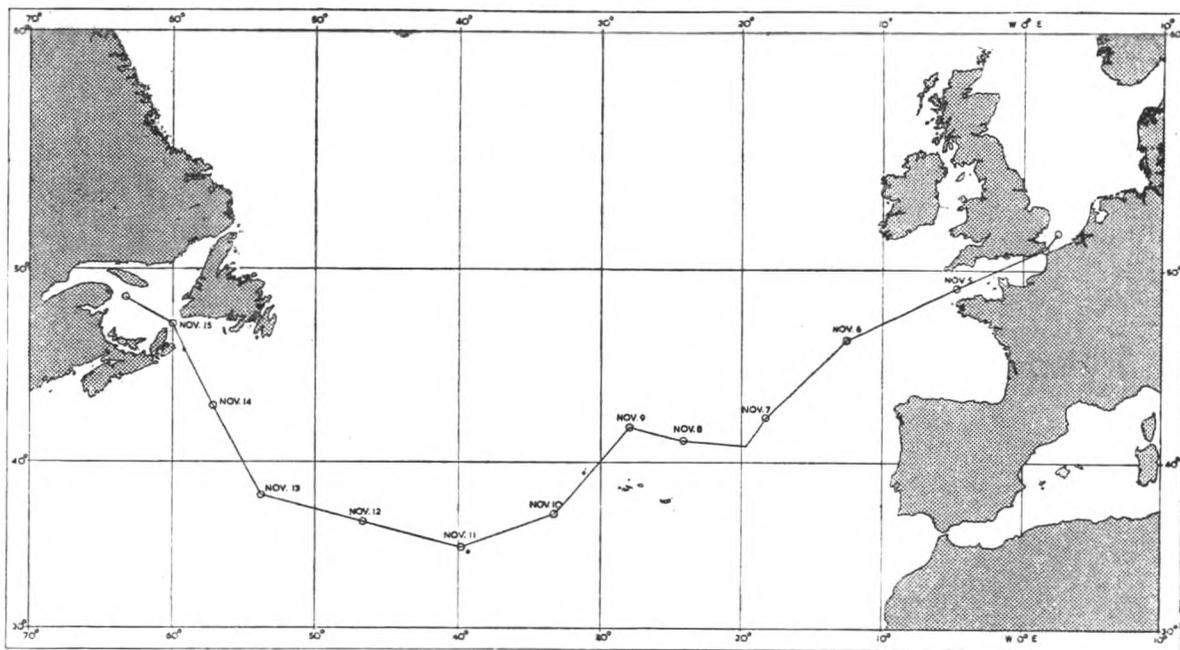
*Greystoke Castle* is not an observing ship, but we are glad to be able to publish the practical observations of a shipmaster of a route which we have always considered worth while.

Sir,—My experience of sailing the Atlantic dates some years back when I was an apprentice in small tramp vessels of about 5,000 tons deadweight, low power and loaded to full winter marks when leaving Fowey, Cornwall, with china clay for Portland, Me. In those vessels the masters took the great circle or mercator tracks and in each winter that I sailed they always encountered abominable weather. In one particular instance the vessel became so damaged that she lay from 10 to 14 days in mid-Atlantic with disabled steering gear before patching up and going into

St. John's, Newfoundland, for three weeks' repair. Such can be the outcome of not studying the weather from the material the meteorological services have collected!

I rather fancy from recollection that those captains failed to muster up enough moral courage to give the southerly track a trial, because of their underlying apprehension that criticism of a drastic nature would arise on the grounds of having steamed a longer distance. One of the older masters did, I remember, take an Azores passage over, and by the turn of misfortune encountered damaging weather in the vicinity of those islands. The word soon got round and was duly marked by the other captains, the result being that the shorter distance northerly tracks were adhered to by the other vessels. Eventually, however, that particular vessel made her last northerly winter track to Cape Race and foundered with her clay cargo and all hands, the weather being so bad that none of the vessels picking up her distress call could get near her.

*Greystoke Castle* sailed out of the English Channel on 5th November, 1951, after passing Dover on the night of the 4th when the weather was turning most unpromising. She was in an extremely light condition, and such is her construction that the surfaces of her hull are added to by a high superstructure, which all adds up to an immense surface for windage to come into effect. From the enclosed chart you can tell the track we sailed on. Between the English Channel and the



Azores the weather was most foul and unpromising. The intention was to work down, eastward of the Azores, to 35°N, but on 7th November, as darkness was falling, the radio warned me of a large derelict ahead but in an uncertain position. Under the circumstances the radar was not able to afford us any assurance of picking it up, so course was reshaped to the westward to keep clear. That was the first warning put out by *Bustler* about his tow, the Brazilian battleship, having broken adrift. From 9th November improvement set in; at that stage of the passage hope had left us for any decent weather but in this we were most pleasantly surprised. A favourable weather lay-out developed and, instead of carrying on as anticipated, course was first shaped WNW'ly and then, when it was apparent that the good weather was to hold, the track was set right up to the Cabot Strait. Actually, from passing the island of Flores until we reached Cabot Strait the ship experienced most satisfactory weather and steaming conditions. I rather remember from the

reports received aboard that bad weather prevailed up in the north during the time of our Azores to Cabot Strait passage, and had the vessel been set on the great circle to Cape Race from the English Channel she would have been buffeted and delayed and caused me days of anxiety on the score of "will the fuel last?"

Unhesitatingly I would repeat the track I used in November, 1951, if required to perform this voyage under a similar condition of ship and winter season.

I have just this voyage been able to acquire (after a struggle) your *Currents, Indian Ocean*, a publication that I have used with much satisfaction in my former seagoing and in the war on the South Africa to Middle East run. In fact I used it so keenly as to sail off the naval route up the African coast to Guardafui and be in the swim of the current. By taking that action I could clip off a full day on the Lourenço Marques to Guardafui leg, which I considered justification when surface raiders could have picked us off at will.

I am now on my way to Australia via the Cape, and at the request of South Africa the vessel is sending in messages as a special Met. ship while in the Indian Ocean. I sincerely trust that our shaky barometer will not prove too sore a trial to their station officers.

S.S. *Greystoke Castle*.

Captain L. Rowe.

## Personalities

APPOINTMENT.—It is with pleasure that we record the announcement in the *London Gazette* that CAPTAIN C. E. DUGGAN, R.D., R.N.R., master of the S.S. *Empress of Scotland*, has been appointed Royal Naval Reserve Aide-de-Camp to Her Majesty the Queen, the appointment to date from the 14th June, 1952. We wish to congratulate him on being selected for this honour.

He was in command of the same ship when she brought the Queen and the Duke of Edinburgh home from Canada in 1951. Readers of this journal may remember that Captain Duggan was one of the four captains awarded barographs in January, 1950, for their long and excellent work as voluntary observers for the Meteorological Office.

RETIREMENT.—CAPTAIN W. E. HEAVEY, M.B.E., Dockmaster of the Royal Groups of Docks, retired from the service of the Port of London Authority in June, 1952, on reaching the age limit.

William Everard Heavey first went to sea in 1905 in the barque *Cupica* of Liverpool, and after serving in several steamers obtained his master's certificate in 1913. During the First World War he obtained an American master's licence, and commanded a vessel under the U.S. Shipping Board.

In 1922 Captain Heavey joined the Port of London Authority as a surveying officer, was made an assistant dockmaster in 1924 and dockmaster in 1935.

In 1951 he was awarded the M.B.E. for his services. He was always most helpful to the Port Meteorological Office in its work.

We wish him health and happiness in his retirement.

C. H. W.

RETIREMENT.—CAPTAIN F. L. SAMPSON, D.S.C., retired from the sea in August last after 40 years at sea, the whole of which was served with the British India Steam Navigation Company.

Captain Sampson first went to sea in 1912 as a cadet in the *Chanda*, and after obtaining his second mates' certificate in 1916, passed for master in 1922, being promoted to master of the *Baroda* in 1932. He subsequently commanded the *Barala*, *Egra*, *Neuralia*, and in 1938 was appointed to the *Dilwara*, which ship he commanded for 14 years until his retirement. Altogether he commanded troopships for 16½ years.

Captain Sampson was awarded the D.S.C. in 1941 for his part in the evacuation

of Imperial and Australian troops from Kalamata in Greece to Alexandria, during which operation he was commodore of convoys.

He has been observing for the Meteorological Office since 1930, and many of the logs returned by him have been classed "Excellent".

Since his retirement Captain Sampson has been appointed Sea Transport Officer at Liverpool, where his experience in troopships will be a valuable asset.

We wish him every success in his new appointment and in the future years of retirement.

J. R. R.

**RETIREMENT.**—CAPTAIN T. V. ROBERTS, R.D., R.N.R., has recently retired from the Shaw, Savill & Albion Co., Ltd., after nearly 50 years in that service, 30 of which were in command.

Thomas Victor Roberts first went to sea as an apprentice in the Company's four-masted barque *Mayfield*, under his father's command.

In 1909 he was fourth officer of the *Miltiades*, of the Aberdeen Line, a company associated with Shaw Savills. During the 1914-18 War he served with the Royal Naval Reserve, and after that war was appointed to command of the *Miltiades*.

Captain Roberts has been a voluntary observer for the Meteorological Office since 1922, when his first meteorological logbook was received from the S.S. *Euripides*. Since then he has contributed 47 logbooks, many of which were classed "Excellent". Among his commands were the *Hobsons Bay*, *Largs Bay*, *Arawa*, *Corinthic* and *Esperance Bay*.

On Friday, 29th August, 1952, at a short ceremony on board the *Wellington*, Headquarters' ship of the Honourable Company of Master Mariners, Captain Roberts was presented with an inscribed barograph by the Meteorological Office in recognition of his long association with the office.

We wish him health and happiness in his retirement.

C. H. W.

**RESIGNATION.**—CAPTAIN N. F. ISRAEL, D.S.C. and two bars, who has been in command of *Weather Observer* since the ship was first taken over from the Admiralty for duty as a weather ship in the spring of 1947, has recently resigned his command in order to take up an appointment ashore with the Admiralty, after 39 voyages in command of the weather ship. The *Weather Observer*, formerly H.M. Corvette *Marguerite*, was the first of the British ocean weather ships to take up duty in the Atlantic. Her renaming ceremony was performed by the Secretary of State for Air in the London Docks on 31st July, 1947, and she commenced duty at Station "Jig" (position 53° 50'N, 18° 40'W) on 10th August, 1947.

Captain Israel has served many years in corvettes, having commanded one for some considerable time during the war when he was on escort duty with Atlantic convoys. As a result of his successes against U-boats he was awarded the D.S.C. and two bars. Captain Israel has undoubtedly had a fair share of knocking about the Atlantic in small ships, and we wish him every success and happiness in his new appointment in a stone frigate.

C. E. N. F.

**OBITUARY.**—It is with regret that we record the death, in May, 1952, at the age of 78, of CAPTAIN WILLIAM HENDERSON, of Ardbeg, Buteshire, Scotland.

Captain Henderson was for 11 years the Meteorological Office Merchant Navy Agent for the Clyde area, a post from which he retired in June, 1946. He will no doubt be remembered by many ships' officers.

He had first gone to sea as an apprentice in the sailing ships of the Ben Line, and had then joined the Canadian Pacific Steamships and later the Allan Line, in both of which companies he held commands, and from which a number of meteorological logbooks were contributed by him.

For a number of years he had actively interested himself in the local Boy Scout Movement.

C. H. W.

# Southern Ice Reports

During the year 1952

DATE	POSITION		DESCRIPTION	DATE	POSITION		DESCRIPTION
	LAT.	LONG.			LAT.	LONG.	
<b>JANUARY</b>							
<i>S.S. Polar Maid</i>							
10	52 40S	37 17W	10 large bergs.	7	70 10S	171 30W	Numerous bergs, bergy bits and growlers.
24	55 00S	39 18W	5 bergs.	8	70 45S	175 06W	Numerous bergs, bergy bits and growlers. Large area of pack ice.
25	56 12S	40 03W	Several bergs.		70 45S	175 30W	5 flat topped bergs, 4 pinnacled bergs and growlers in sight. Bergs approx. 40-50 ft long.
26	58 25S	41 42W	Several bergs.	9	70 40S	176 00W	Bergs and growlers.
27	59 29S	42 30W	2 bergs, numerous growlers.	10	70 30S	176 25W	Bergs, bergy bits and growlers.
	60 40S	43 14W	Numerous bergs and growlers. Pack ice to S.	11	79 30S	176 30W	Bergs, bergy bits, growlers and brash. No bergs more than 300 ft long, 50 ft high.
	60 49S	44 24W	Numerous bergs and growlers. Variable in size and widely scattered.	12	70 30S	176 30W	Bergs, bergy bits, growlers and brash.
28	61 53S	48 43W	Numerous bergs and growlers. Widely scattered.	13	70 45S	177 20W	Bergs, bergy bits, growlers and brash.
29	63 03S	51 08W	Numerous bergs and growlers.	14	70 45S	177 20W	Small rugged bergs approx. 200 ft long, 100 ft high, and growlers.
	63 35S	49 19W	Numerous bergs and growlers and pack ice.	16	70 45S	174 40W	More than 60 large tabular bergs, mostly about 800 ft long, 300 ft high (radar measurements).
<i>S.S. Southern Garden</i>							
6	54 45S	30 30W	Numerous bergs, bergy bits and growlers.	17	71 00S	173 00W	80 bergs, one 1 mile long, and many tabular bergs.
7	54 46S	23 45W	Several bergs, bergy bits and growlers.	19	70 43S	173 33W	8 tabular bergs, brash and growlers. Largest berg 1,000 ft long, 200 ft high (measured by radar). Remainder approx. 200 to 500 ft long, 150 ft high.
8	54 47S	17 20W	6 bergs and several growlers.	20	67 35S	157 30W	2 tabular bergs approx. 300 ft long, 100 ft high.
12	54 34S	07 25E	1 berg.	21	67 10S	155 00W	3 pinnacled bergs, rugged on western side but sheer on eastern side. Only occasionally reflected on radar.
13	54 54S	13 40E	7 bergs and several bergy bits and growlers.		66 40S	153 38W	1 pinnacled berg and 1 large tabular berg approx. 600 ft long, 400 ft high.
14	55 35S	19 25E	Numerous bergs, bergy bits and growlers.	22	65 00S	147 00W	3 pinnacled bergs.
15	56 18S	25 19E	Numerous bergs, bergy bits and growlers.		64 40S	145 20W	1 rugged berg, approx. 500 ft long, 150 ft high.
16	57 00S	31 18E	11 bergs and several bergy bits sighted.	<i>M.V. John Biscoe</i>			
17	57 38S	37 20E	7 bergs and several growlers.	2	Hope Bay, Graham Land, Antarctic Sound.		Loose pack ice.
18	58 18S	43 38E	2 bergs sighted.				Loose pack ice, only with a NE'y wind.
26	63 16S	85 12E	Numerous bergs, bergy bits and growlers.	<i>S.S. Polar Maid</i>			
27	63 22S	92 42E	Numerous bergs, bergy bits and growlers.	1	62 30S	47 15W	1 berg sighted on radar. Several large bergs. Many appeared stranded on island.
28	63 26S	100 13E	Numerous bergs, bergy bits and growlers.		60 45S	43 50W	1 large berg.
29	63 28S	108 18E	Numerous bergs and growlers.	2	58 57S	41 25W	Several medium bergs. Very widely scattered.
30	63 47S	116 20E	Numerous bergs and growlers.	3	56 19S	37 59W	Occasional medium size bergs. Very widely scattered.
31	63 23S	119 00E	Several bergs and growlers.	8	53 29S	36 26W	1 berg.
<i>S.S. Southern Opal</i>							
10	55 29S	33 49W	1 growler and 1 berg, 100 ft long, 200 ft high (estimated).	9	53 04S	36 25W	1 berg.
13	55 15S	33 33W	2 bergs, 100 ft long, 200 ft high and 150 ft long, 200 ft. high.		52 50S	36 16W	3 bergs.
30	54 50S	31 46W	Several bergs.		52 35S	36 00W	5 bergs.
31	55 11S	27 00W	Several bergs.		51 39S	36 06W	1 berg.
<b>FEBRUARY</b>							
<i>M.V. Biscoe</i>							
4	65 25S	152 00W	2 small bergs, approx. 500 ft long, 100 ft high.		50 40S	35 42W	1 berg.
	65 38S	154 10W	1 medium berg. Radar measurements 1,000 ft long, 200 ft high.		50 20S	35 36W	1 berg.
5	65 50S	153 48W	1 small berg, approx. 300 ft long, 80 ft high.		50 05S	35 33W	1 berg.
6	69 18S	168 00W	2 large bergs, approx. 2,500 ft long, 200 ft high.				
	69 40S	170 30W	Numerous large bergs and growlers.				

DATE	POSITION		DESCRIPTION	DATE	POSITION		DESCRIPTION
	LAT.	LONG.			LAT.	LONG.	
<i>S.S. Southern Garden</i>							
1	64 28S	121 00E	Several bergs and growlers.	6	59 44S	07 37E	Numerous bergs.
2	64 39S	121 49E	Several bergs and growlers.		59 44S	07 37E	Several bergs and growlers.
3	64 31S	121 30E	Several bergs and growlers.	7	59 41S	17 20E	Numerous bergs and growlers.
4	64 19S	119 29E	Several bergs and growlers.		59 41S	19 42E	Few bergs.
5	64 04S	119 00E	Several bergs and growlers.		59 46S	25 20E	Few bergs and several growlers.
6	64 06S	115 55E	83 bergs observed at noon. Bergy bits and growlers.	8	60 08S	29 25E	Several bergs.
7	64 15S	113 34E	Numerous bergs, bergy bits and growlers.		60 19S	31 38E	Few growlers.
8	64 55S	111 20E	Numerous bergs and growlers. Open pack to SE.	10	60 27S	33 30E	Few bergs.
9	64 41S	108 09E	Numerous bergs, growlers and open pack.		61 45S	47 04E	1 berg.
10	64 14S	104 12E	Numerous bergs and growlers.		61 54S	49 02E	1 berg.
11	64 03S	100 37E	Numerous bergs and growlers.	11	62 14S	52 57E	1 berg.
12	63 43S	97 18E	Several bergs and growlers.	12	62 58S	66 11E	1 berg.
13	63 31S	91 20E	Numerous bergs and growlers.	15	64 32S	80 50E	Several bergs.
14	63 25S	83 57E	Numerous bergs, growlers and loose drift ice.	16	64 32S	81 45E	Several bergs.
15	64 34S	81 02E	Several bergs and growlers.		64 25S	79 13E	Several bergs.
16	64 25S	81 23E	Numerous bergs and growlers.	17	64 19S	77 24E	Several bergs.
17	64 13S	76 39E	Several bergs and growlers.		63 55S	73 38E	Few bergs.
18	63 46S	71 12E	10 bergs and several growlers.	18	63 50S	71 01E	Few bergs.
19	63 23S	69 33E	6 bergs.	19	63 50S	70 52E	Few bergs.
20	63 32S	65 57E	4 bergs.		63 34S	70 09E	1 berg.
21	63 26S	58 29E	12 bergs.		63 34S	69 51E	1 berg.
22	63 21S	50 37E	1 berg.	20	63 34S	71 18E	Few bergs.
23	63 21S	42 28E	2 bergs and 3 growlers.		63 42S	69 28E	1 berg.
24	63 18S	35 13E	4 bergs and several growlers.		64 20S	67 26E	Few bergs.
25	63 15S	27 12E	1 berg.	21	64 26S	67 11E	1 berg.
26	63 16S	20 24E	5 bergs and several growlers.	25	64 13S	66 56E	1 berg, few growlers.
27	63 14S	13 48E	Numerous bergs and growlers.		64 38S	59 10E	1 berg.
28	63 13S	06 53E	Numerous bergs, bergy bits and growlers.		64 17S	57 00E	2 bergs.
29	61 53S	00 10W	Numerous bergs, bergy bits and growlers.	<b>MARCH</b>			
<i>S.S. Southern Opal</i>							
1	56 25S	22 12W	Few bergs.	<i>S.S. Southern Garden</i>			
2	58 04S	15 36W	Few bergs.	1	60 48S	05 47W	Several bergs, bergy bits and growlers.
	58 46S	13 32W	1 berg and a few growlers.	2	59 47S	10 53W	Several bergs, bergy bits and growlers.
3	59 49S	08 36W	Numerous bergs and growlers.	3	58 42S	15 40W	Numerous bergs, bergy bits and growlers.
	59 45S	06 00W	Few bergs.	4	57 32S	20 49W	Several bergs and growlers.
4	59 52S	00 03W	Numerous bergs and growlers.	5	56 47S	23 07W	10 bergs and several growlers.
	59 52S	01 40E	Many bergs and growlers.	6	56 06S	27 02W	3 bergs and several growlers.
5	59 52S	05 27E	Several bergs and growlers.	<i>S.S. Southern Opal</i>			
				1	63 58S	21 26E	1 berg.
				2	63 58S	16 25E	Several bergs and growlers.
					63 58S	14 40E	Several bergs.
				3	63 36S	13 06E	2 bergs and 2 growlers.
					62 37S	05 56E	1 berg.
				4	62 20S	02 13E	1 berg.
					62 10S	00 48E	3 bergs.
					61 40S	01 02W	2 bergs and 2 growlers.
				5	60 57S	05 38W	1 berg.
				6	60 25S	08 57W	Several bergs and growlers.
					60 14S	10 09W	Several bergs.
				7	59 08S	13 48W	1 berg.
					58 44S	15 14W	3 bergs.
					58 12S	16 45W	Several bergs.
				8	57 02S	19 43W	Several bergs.
				9	55 28S	25 11W	Several bergs.

Reports of ice for January, February and March previous to 1952 will be found in *The Marine Observer*, Vol. XXII, No. 155, page 50.

## 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.

### Ice Observation

Drifting ice, derelicts and other floating dangers to navigation are reported by all means of communication at the disposal of the master.

See Chapter 12, pages 96-98 of the *Marine Observer's Handbook*, Seventh Edition.

It is also desirable that more detailed information than can be given in a TTT wireless message should be available to the Meteorological Office for the purpose of research, and for Admiralty Charts and Sailing Directions.

Marine observers will greatly assist by noting the conditions of ice, either drifting or fast, in the pages provided at the end of the logbook (Form 911), or on Form 912, which may be supplied to the captain of any British ship on application to a Port Meteorological Officer or Merchant Navy Agent.

Observing ships using the Trans-North Atlantic tracks are requested to record not only when ice is encountered, but also when they have passed through the ice region during the ice season without encountering ice. In this case a "nil" report should be returned, since it is desirable as far as possible to determine when tracks have been clear of ice.

## 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.)

Commander J. Hennessy, R.D., R.N.R., Deputy Marine Superintendent. (Telephone : Harrow 4331, Ext. 323.)

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 617, Royal Liver Building, Liverpool, 3. (Telephone : Central 6565.)

**Thames**.—Commander C. H. Williams, R.D., R.N.R., Port Meteorological Officer, Room 20, Ibex House, Minories, London, E.C.3. (Telephone : Royal 1721.)

**Bristol Channel**.—Mr. J. C. Matheson, Port Meteorological Officer, 2 Bute Crescent, Cardiff. (Telephone : Cardiff 4474.)

**Southampton**.—Captain J. R. Radley, Port Meteorological Officer, 50 Berth, Old Docks, Southampton. (Telephone : Southampton 4295.)

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

**Forth.**—Captain G. More, "Craigneuk", Dechmont, West Lothian. (Telephone: Dechmont 19.)

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

**Tyne.**—Captain F. B. West, Custom House Chambers, Quayside, Newcastle-on-Tyne. (Telephone: Newcastle 23203.)

## SOME ATLASES PREPARED IN THE MARINE BRANCH OF THE METEOROLOGICAL OFFICE AND PUBLISHED BY HER MAJESTY'S STATIONERY OFFICE

### Atlantic Ocean

Monthly Meteorological Charts of the Atlantic Ocean (M.O. 483, 1948). 19 $\frac{3}{4}$  in.  $\times$  24 in. £2 15s. (1s. 1d.).

Monthly Sea Surface Temperatures of the North Atlantic Ocean (M.O. 527, 1949). 19 $\frac{3}{4}$  in.  $\times$  12 $\frac{1}{4}$  in. 10s. (3d.).

Quarterly Surface Current Charts of the Atlantic Ocean (M.O. 466, 1945). 22 $\frac{1}{2}$  in.  $\times$  17 $\frac{3}{4}$  in. 12s. (6d.).

Monthly Ice Charts of Western North Atlantic (M.O. 478, 1944). 12 in.  $\times$  7 $\frac{1}{2}$  in. 4s. (2d.).

### Indian Ocean

Monthly Meteorological Charts of the Indian Ocean (M.O. 519, 1949). 15 $\frac{1}{4}$  in.  $\times$  22 in. £3 3s. (11d.).

Indian Ocean Currents (M.O. 392, Second Edition 1939, reprinted 1950). 30 in.  $\times$  20 in. 10s. (3d.).

### Pacific Ocean

Monthly Meteorological Charts of the Eastern Pacific (M.O. 518, 1950). 17 in.  $\times$  23 $\frac{1}{2}$  in. £4 4s. (1s. 4d.).

Monthly Meteorological Charts of the Western Pacific (M.O. 484, 1947). 16 $\frac{3}{4}$  in.  $\times$  24 in. £2 2s. (1s.).

Monthly Sea Surface Temperatures of Australian and New Zealand Waters (M.O. 516, 1949). 19 $\frac{3}{4}$  in.  $\times$  12 $\frac{1}{4}$  in. 10s. (3d.).

Quarterly Surface Current Charts of the Western North Pacific Ocean, westward of long. 160°W, with Monthly Chartlets of the China Seas (M.O. 485, 1949). 21 in.  $\times$  16 in. £1 5s. (5d.).

South Pacific Ocean Currents (M.O. 435, 1938, reprinted 1944). 34 $\frac{1}{2}$  in.  $\times$  24 in. 7s. 6d. (6d.).

### Arctic Ocean

Monthly Ice Charts of the Arctic Seas (M.O.M. 390a, revised 1944). 12 in.  $\times$  7 in. 3s. 6d. (2d.).

*Prices in brackets give postage (inland)*

Publications in this list are obtainable direct from H.M. Stationery Office at the addresses shown on the title page, or from any bookseller.

FLEET LIST (Great Britain)  
VOLUNTARY OBSERVING SHIPS

The following is a list of British ships voluntarily co-operating with the Marine Branch of the Meteorological Office. The names of the Captains, Observing Officers and Senior Radio Officers are given as ascertained from the last written returns received. The date of receipt of the last return received is given in the third column.

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

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

Excellent awards are made at the end of each financial year. The names of the Captains, Principal Observing Officers and Senior Radio Officers gaining these awards are published in a special list in *The Marine Observer*.

It is requested that prior notification of changes of service, probable periods of lay-up, transfer of Captain, or other circumstances which may prevent the continuance of voluntary meteorological service at sea, may be made to the appropriate Port Meteorological Officer or Merchant Navy Agent. Captains are requested to point out any errors or omissions which may occur in the list.

Selected Ships

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS/MANAGERS
<i>Accra</i>	GJSW	4.7.52	A. G. Baptiste	J. O. Jones, R. Poutney	J. Stuart	Elder Dempster Lines, Ltd.
<i>Afghanistan</i>	GNYB	4.7.52	R. Connacher	J. Arthur, S. W. Jones, J. Salter	E. M. Petrie	F. C. Strick & Co., Ltd.
<i>Ajana</i>	GKVV	30.6.52	F. W. Mould	R. Brewster, I. S. McLean, J. Walters	J. D. Milton	Trinder Anderson & Co.
<i>Ajax</i>	GIXM	26.1.52	H. S. Wood	A. Raitton, C. McKinnon, J. Dwyer	A. B. Martin	A. Holt & Co.
<i>Akaroa</i>	GMLP	15.7.52	J. W. Hart	P. G. Clifford, A. E. Smith, P. M. Williams	J. Reynolds	Shaw, Savill & Albion Co. Ltd.
<i>Alcantara</i>	GLQR	7.6.52	H. D. Hooper	R. Turner, J. Jones, J. Thwaited	R. Hammond	Royal Mail Lines, Ltd.
<i>Alsatia</i>	MABL		J. G. Bradley, R.D., R.N.R.	A. Bull, R. Mansan, F. Diggle, D. Roston	J. Hinds	Cunard Steamship Co., Ltd.
<i>Amakura</i>	MCPN	19.10.52	S. Armitage	K. Garrett, G. Meudell, J. H. Donaldson	I. R. Davies	Booker Bros., McConnell & Co., Ltd.
<i>Andes</i>	GQCV	11.6.52	G. A. Bannister	S. Gibson, G. Wright, R. R. L. Williams, M. L. Thomson		Royal Mail Lines, Ltd.
<i>Andria</i>	GDWM	24.9.52	W. B. Tanner, R.D., R.N.R.	P. J. R. Lawley, H. Dormer, J. Cosnett	W. Smith	Cunard Steamship Co., Ltd.
<i>Apapa</i>	MACE	12.8.52	C. H. Sweeney	J. R. Marking, S. Owen, W. M. Crossman	L. Francis	Elder Dempster Lines, Ltd.
<i>Arabia</i>	GLKF	31.7.52	J. Chapman, R.D., R.N.R.	J. R. Turner, E. D. Hall, K. H. Nelson	G. Gilling	Cunard Steamship Co., Ltd.
<i>Arabistan</i>	GCKK	10.3.52	J. E. Cooke	D. Calvert, T. Dumont, A. Norris	G. Adamson	F. C. Strick & Co., Ltd.
<i>Araby</i>	GMZL	6.5.52	F. J. Swallow	J. Chester, A. Acason, K. Finlison	T. Welsh	Royal Mail Lines, Ltd.
<i>Arakaka</i>	GDEV	1.10.51	J. A. Carter	—, Angecowsky, K. W. Leadbetter, —, Lane	J. Fraser	Booker Bros., McConnell & Co., Ltd.
<i>Arawa</i>	GSMN	30.6.52	W. G. West	—, Billinghamurst, B. Hammond, R. T. Welch, —, Hutcheson	P. W. Booth	Shaw, Savill & Albion Co., Ltd.
<i>Argentina Star</i>	GTFK	18.5.51	E. R. Pearce, O.B.E.	D. Sinclair, W. Sturrock, J. Parker	M. Sheahan	Blue Star Line, Ltd.
<i>Argyll</i>	GBWB	30.6.52	J. Dodds	T. R. Rowe, B. Woolett, C. Younger	G. Lawrie	B. J. Sutherland & Co., Ltd.
<i>Ariguani</i>	GMBL	30.6.52	C. S. Gracie	R. M. Burns, A. Thompson, N. Abbott	A. N. Taylor	Elders & Fyffes, Ltd.
<i>Armadales</i>	GMCN	4.8.52	C. Parry	A. B. Baines, J. Brocklesby, H. R. Coates	E. W. Harle	Trinder, Anderson & Co.
<i>Arundel Castle</i>	GCZL	28.5.52	W. S. Byles, R.D., R.N.R.	M. C. Long, M. R. Harry, J. Robson	E. Pitt, D.S.C.	Union Castle Mail S.S. Co., Ltd.
<i>Ascenta</i>	GKNJ	11.7.52	A. MacKellar, R.D., A.D.C., Cmdr., R.N.R.	K. P. Wilkinson, P. J. Kendal, A. G. Broster		Cunard Steamship Co., Ltd.
<i>Ashburton</i>	GNJN	9.10.52	D. M. Steven	A. Robinson, R. Mattingley, H. McGill	P. Milligan	Trinder Anderson & Co.

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS/MANAGERS
Asia ..	GLJV	18.12.51	R. Conway, O.B.E., R.D., R.N.R.	D. Allwater, D. Ridley, P. J. Oglivey .. G. P. G. Ellis, P. King, D. Howells .. G. B. Payne, R. J. Luke, N. W. Green .. D. W. Owen, S. Waldron, J. O'Sullivan .. T. S. Hayward, J. G. Beck, J. Tierney .. D. O. Tourrell, E. J. Harrison, J. Parker .. S. Garside, A. Moore, G. Read .. J. D. Francis, M. L. De Lacroix, J. N. Thatcher	J. Marshall .. B. A. Long .. R. T. Farrell .. A. R. Smith .. R. Knight .. J. H. Summers .. R. Barrett ..	Cunard Steamship Co., Ltd. Cunard Steamship Co., Ltd. Royal Mail Lines, Ltd. Tankers, Ltd. Shaw Savill & Albion Co., Ltd. Union Castle Mail S.S. Co., Ltd. Elder Dempster Lines, Ltd.
Australia Star	GYCS	22.9.52	R. White, D.S.C.	G. T. King, I. Mackintosh, J. Hutton, R. Middleton	J. P. Connolly	Anglo-Saxon Petroleum Co., Ltd.
Australind	GJKF	19.3.52	E. L. Ridout	F. W. Wray, D. Giles, —, Smith	N. Aldersley	Blue Star Line, Ltd.
Avonstone	GBSV	9.9.52	A. D. Niblett	S. T. Burt, J. Logie, J. Gardiner	R. Brown	Trinder Anderson & Co.
Avondene	MAWG	18.7.52	W. Hall	I. Daniel, E. T. Milford	L. R. Bradley	Purvis Shipping Co., Ltd.
Balantia	GBNM	9.4.52	W. B. Tennent	A. Fletcher, M. L'arrive, —, Thornell	C. Cowen	Dene Shipping Co., Ltd.
Baron Elphinstone	GCCD	23.7.52	A. Campbell	G. Harris, E. Jones, J. Rennie	P. McCarthy	Royal Mail Lines, Ltd.
Baron Fairlie	GLCY	6.9.52	T. R. Reid	R. W. Forbes, J. Gordon, —, Gardner	G. K. Wild	H. Hogarth & Sons
Baron Macleay	GKXW	12.9.51	D. MacGregor	I. G. MacGregor, J. Minnaids, T. Isbister	M. D. Johnson	H. Hogarth & Sons
Baron Murray	GIFB	6.10.52	L. G. Robb	G. E. Woods, C. W. Noakes, G. Hogg	J. A. Sutherland	H. Hogarth & Sons
Baron Renfrew	GYDR	13.8.52	G. D. Drysdale	P. Turnbull, E. Griffiths, I. Mackay	D. Macrae	H. Hogarth & Sons
Bassano	GNXK	28.7.51	F. Briggs	J. R. Drinkwater, F. Barnes, B. Wilkinson	J. B. Smith	Ellerman's Wilson Line, Ltd.
Beaverburn	MAGB	15.7.52	R. A. Leicester, O.B.E.	S. Fieldhouse, T. F. Hercus, R. J. Stewart	T. Ainsworth	Canadian Pacific S.S., Ltd.
Beaverford	MQJG	15.7.52	N. W. Duck, D.S.C., R.D., R.N.R.	G. Parry, —, Walgate, G. Palmer, R. Kennedy	R. J. Cummings	Canadian Pacific S.S., Ltd.
Beaver Glen	GBCP	1.3.51	W. R. Thorburn	J. Hooley, J. Walker, R. Stewart	A. E. S. Thompson	Canadian Pacific S.S., Ltd.
Beaverlake	GBCQ	28.7.52	C. L. de H. Bell, D.S.C., R.D., R.N.R.	A. L. Gwynne-Harrison, J. D. Jeavons	A. Mackay	Watts, Watts & Co., Ltd.
Beckenham	GCGK	28.7.52	T. V. Cameron	J. Waling, J. G. Morris	J. C. Willson	Alfred Holt & Co., Ltd.
Bellerophon	GGCM	12.8.52	W. T. D. McMillan	J. Collister, D. A. Forrester, A. M. Brown	R. Dixon	Wm. Thomson & Co.
Benary	GCTZ	20.8.52	T. Sutherland	M. Barwick, S. B. Gilliat, W. I. Eynon	J. Kemp	Wm. Thomson & Co.
Benadoran	GCJN	11.8.52	A. Pienderleith	M. Matnie, W. D. Cowie, —, Edwards	F. G. Hayes	Wm. Thomson & Co.
Bennevis	MAGG	22.5.52	R. L. Chalmers	A. McKenzie, A. Hall, I. Donaldson	E. Carruthers	Wm. Thomson & Co.
Benvenuto	GCDZ	26.1.52	J. C. Allan	G. Reid, A. McLean, N. J. Mackie	D. Milne	Wm. Thomson & Co.
Bennyvis	MYPW	11.9.52	K. Hardie	A. Gladstone, A. MacKinnon, A. Syme	J. Harrison	Hector Tankers, Ltd.
Biscoe	GDCW	2.5.52	W. Orrell	C. G. Staff, D. J. MacKinnon, A. Wilkin-son, B. Mullian	P. Evans	Blue Star Line, Ltd.
Brasil Star	GTLF	30.8.52	G. C. Barnard	M. Stessor, D. M. McPhail, E. A. Davies, R. G. Taylor	A. Newton	Ellerman's Wilson Line, Ltd.
Bravo	GLDZ	19.3.52	H. Hill	G. W. Forward, B. Nicolle, G. F. Reed	A. R. G. Murray	Blue Star Line, Ltd.
Brisbane Star	GZCJ	28.7.52	S. Foulkes	T. V. Anderson	A. V. Chappel	Charles Hill & Sons
Bristol City	GUAY	30.6.52	A. L. Webb, O.B.E.	D. M. Wilton, W. H. Stoodley, R. L. Whitman	J. R. S. Kidson	Cunard Steamship Co., Ltd.
Britannic	GDXF	1.10.52	R. Sell, R.D., R.N.R.	—, Douglas, M. M. Blackman, —, Nicholson	E. C. Taylor	British Tanker Co. Ltd.
British Colonel	GFDB	7.3.51	W. L. Pugh	D. J. Burgess, G. T. H. Skeuse, J. R. Lynn		

British Consul	GCXT	J. Copeman	W. A. M. Hare, J. A. P. Farrett, J. E. Kemp	H. Thompson	British Tanker Co., Ltd.
British Dragoon	MAGP	J. C. Lawrence	G. Bodley, M. D. Perry, G. W. Reeve	H. W. Barker	British Tanker Co., Ltd.
British Endeavour	GFCN	J. R. Georgeson	A. Woodcock, S. T. Robinson, J. H. Armstrong	R. Read	British Tanker Co., Ltd.
British Endurance	MLZM	R. T. C. Wright	K. Curtis, J. Brown		British Tanker Co., Ltd.
British Escort	GCRB	L. V. Potts	D. W. Evans, F. G. Ball, C. Richards		British Tanker Co., Ltd.
British General	GCDJ	G. E. Hodgson	J. Baird, R. C. Donovan, F. Millington		British Tanker Co., Ltd.
British Gratitude	MAGQ	R. L. Friendship	L. Mackay, J. Kemp, N. Rutherford	J. Borders	British Tanker Co., Ltd.
British Marquis	GWVL	S. C. Wall	R. Mowbray, A. C. Tantram, M. Philip	T. Tuilock	British Tanker Co., Ltd.
British Patience	GUFF	S. Bruce	F. Terry, R. G. Twist, J. Taylor	K. Miller	British Tanker Co., Ltd.
British Piper	GDNN	S. L. Mea	J. May, P. D. Walker, I. McL. Ferrier	C. A. McGill	British Tanker Co., Ltd.
British Power	GZGG	A. J. Lawson	S. C. Davies, C. G. Sherbourne, J. Sweeney	J. A. Jardine	British Tanker Co., Ltd.
British Resource	GFCD	F. W. Walton	N. Griffiths, J. Horner, R. Morrison	J. Stewart	British Tanker Co., Ltd.
British Statesman	GJNR	A. H. Mewby	G. H. Forster, D. Jefferies, C. J. Richmond	G. Wrang	British Tanker Co., Ltd.
British Swordfish	GCOV	H. A. May	C. D. Ratcliff, R. J. Bland, A. Jewers	A. Evans	Royal Mail Lines, Ltd.
Brittany	GMZS	G. M. Fletcher	J. Clarke, A. H. Brown, K. Robson	C. Carnwell	Walter Runciman & Co., Ltd.
Brockleymoor	GDWP	F. Bradfield	J. Murden, N. F. Fair, J. Rowntree	T. Wright	Lampert & Holt Lane, Ltd.
Byron	CNFL	J. Byrne, O.B.E.	C. J. D. Sutherland, G. H. Percy, G. W. Luke	A. Henderson	Cairns, Noble & Co.
Cairnavon	GFJN	J. W. Scott	W. N. Gordon, J. Hogg, J. Aitchison	T. W. Lawson	Cairns, Noble & Co.
Cairnahu	GPBB	J. W. Scott	W. E. N. Gordon, R. L. Edwards, B. W. Emery	F. Goodrum	Cairns, Noble & Co.
Cairnesk	GMKR	J. Hogg	J. Lobb, J. E. Porter, W. P. Wallace	E. Johnston	Cairns, Noble & Co.
Cairngowan	GNZZ	J. G. Foster	W. S. Thompson, O.B.E., J. McDade,	J. Cragge	Anchor Line, Ltd.
Caledonia	GCKR	D. Blair	D. Lamont, J. Dunning, R. Harrison,	D. Thomson	Anchor Line, Ltd.
Cameronia	GDXS	A. C. Johnson	J. McIver, J. Henderson, R. Harrison,		
Canton	GDDT	E. R. Bodley, D.S.O.	W. Hallum		
Cape Clear	GCKN	J. R. McIntyre	A. Langley, E. C. Jones, D. M. Johnstone,	M. J. Murphy	P. & O. Steam Navigation Co.
Cape Grafton	MAIF	C. A. Jones	G. B. Thom	D. G. Lang	Lyle Shipping Co., Ltd.
Cape St. Mary		J. A. Robson	J. S. Taylor, A. M. Fraser, D. Fox	A. Hudson	Lyle Shipping Co., Ltd.
Capetown Castle	GKGM	H. A. Deller	F. Saunders, E. Rebane, E. Neave		West African Fisheries Research Institute
Carrnavon Castle	GJSL	J. F. Oakley	J. Arnold, G. J. Wright, J. McCarthy		Union Castle Mail S.S. Co., Ltd.
Captain Cook	GLBX	J. Cook	G. R. W. Archer, O. Gillson, P. Truman		Union Castle Mail S.S. Co., Ltd.
Caronia	GYKS	R. G. Thelwell, O.B.E., R.D., R.N.R.	I. Hunter, N. Dalziel, A. McLean		Donaldson Bros. & Black, Ltd.
Carthage	GRNX	R. G. Freeman	N. MacAlister, J. A. P. Matthews, J. R. Finlay		
Caslon	MCJR	J. M. Cherry	P. J. Stead, B. B. Jones, — Hansing		Cunard Steamship Co., Ltd.
Cavina	GKJV	T. H. Bull	P. Coles, R. Rawlings, W. Coull		P. & O. Steam Navigation Co.
Caxton	GCDX	J. Wilson	J. Nicolson, G. Wallis, W. Littlewood		Runciman (London) Ltd.
Ceramic	GFLM	F. A. Smith	E. Frazer, J. F. Thompson, S. R. Reid		Eiders & Fyffes, Ltd.
Chantala	GQMR	H. F. Collinson	P. Marsland, G. Perry, J. D. Haberfield		Runciman (London), Ltd.
Chepman	GFVR	F. Hamilton	W. L. Larbey, F. W. Hodgson		Shaw Savill & Albion Co., Ltd.
Cheshire	GLXV	P. H. Potter	P. R. Robinson, J. W. Peck, M. Lightfoot		British India Steam Nav. Co., Ltd.
Chindwara	GFRT	B. A. Rogers, D.S.C., R.D., R.N.R.	P. W. J. Crossley, D. Shaw, K. T. Stoneley		Runciman (London), Ltd.
Chitral	GLKN	J. C. W. Last	F. Bell, B. Brooking, — Perry, — Feltham		Bibby Bros. & Co.
Cilicia	GDGL	E. J. Stormont, M.B.E.	W. G. Constantine, — Beaumont		British India Steam Nav. Co., Ltd.
Cingalese Prince	GFRC	J. D. Fraser	D. McLeod, G. Ramage, M. McFarlane, A. McLean		P. & O. Steam Navigation Co.
			H. E. Jennings, T. J. Sax, R. Harcus, D. Lewis	F. Alcock	Anchor Line, Ltd.
				S. A. Rowlinson	Prince Line, Ltd.

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS/MANAGERS
<i>City of Barcelona</i>	GTKR	4.8.52	N. Groundwater	C. A. Quinn, W. James, M. S. Lewis	T. Berry	Ellerman Lines, Ltd.
<i>City of Birmingham</i>	GZLR		T. F. Labey	H. M. Farquhar, R. Tyrell, A. A. C. Mason		Ellerman Lines, Ltd.
<i>City of Bristol</i>	CCPN	17.3.52	W. Nimmo, M.B.E.	J. Tattersall, J. Drummond, B. Waugh	J. Bartlett	Ellerman Lines, Ltd.
<i>City of Calcutta</i>	GLYX	23.10.52	M. L. Hernan, M.B.E.	D. Wardlaw, J. P. McIntyre	J. J. Sheehy	Ellerman Lines, Ltd.
<i>City of Cape Town</i>	GBBQ	7.7.51	W. R. Pinchbeck	W. I. Lee, M. B. Perry, D. R. Townson	A. L. Pews	Ellerman Lines, Ltd.
<i>City of Carlsle</i>	GBJK	30.6.52	W. A. Hannah, O.B.E.	D. Williams, J. Tervis, J. Powell	A. W. Dobbie	Ellerman & Bucknall S.S. Co., Ltd.
<i>City of Chester</i>	MAHN	22.11.51	R. W. Cromie	N. Paskin, A. A. Ramsden, J. Parsons	A. R. Child	Ellerman Lines, Ltd.
<i>City of Delhi</i>	GLEW	3.10.52	F. M. Womersley	H. Swinney, H. Brown, A. Huber	H. Brown	Ellerman Lines, Ltd.
<i>City of Dieppe</i>	GSVQ	15.12.51	E. G. Chapman	T. Rigg, M. D. Langran, R. Thubron	D. C. Clayton	Ellerman Lines, Ltd.
<i>City of Durham</i>	GBJM	4.7.52	T. G. Mathias	A. G. Hine, G. Stewart, G. Grenfell	T. Mills	Ellerman Lines, Ltd.
<i>City of Evansville</i>	GINF	9.9.52	A. M. Westlake	W. Cannell, K. Jones	K. Lancashire	Ellerman Lines, Ltd.
<i>City of Johannesburg</i>	GBKW	12.6.52	T. H. S. Speakman	J. B. Hutching, J. A. McLeod	A. R. Henderson	Ellerman Lines, Ltd.
<i>City of Khar'toum</i>	GBZC	5.5.52	J. A. Kinley	B. Walker, I. McDermid, T. R. Phinn, D. W. Asquith		Ellerman Lines, Ltd.
<i>City of Lille</i>	GSLN	22.5.52	W. A. Owen	W. R. Strachan, R. M. Bellhouse, G. H. Trevitt	A. Twistleton	Ellerman Lines, Ltd.
<i>City of New York</i>	GLYQ	14.8.52	S. L. Hoare, O.B.E.	N. Parkin, J. L. Blanche, D. G. Mathias	C. Pickles	Ellerman Lines, Ltd.
<i>City of Paris</i>	GFQM	19.9.52	— Armstrong-White	E. Orr, P. Faulkner, K. Matheson	T. Gaffney	Hall Line, Ltd.
<i>City of Pretoria</i>	GBLN	13.8.52	A. G. Freeman	J. A. Buchanan, C. Craddock, M. McDonald	B. J. Holyoake	Ellerman Lines, Ltd.
<i>City of Swansea</i>	GBZT	4.9.52	F. J. H. T. Vizer	T. R. Phinn, F. C. O'Neil, R.D., R.N.R., G. R. Rainier, W. Tooley	K. G. Arthur	Ellerman & Bucknall S.S. Co., Ltd.
<i>City of Sydney</i>	GSFM	6.7.52	H. G. White	M. W. Hartley, H. A. Jones, G. A. R. Davis	R. L. Mullins	Ellerman Lines, Ltd.
<i>City of Windsor</i>	GJYR	24.7.52	T. L. Vaughan	T. Dickson, H. Lewis, B. Torrance	D. A. De Barre	Ellerman Lines, Ltd.
<i>Clan Brodie</i>	GKPD	17.11.51	B. Vernon-Browne	E. Coote, B. Abbott, M. Knib-Young	J. Huyton	Ellerman & Bucknall S.S. Co., Ltd.
<i>Clan Buchanan</i>	GKNM	5.7.52	J. Forster	B. Edwards, B. H. McGill, H. R. Long	— McKelvie	Cayzer Irvine & Co., Ltd.
<i>Clan Campbell</i>	GDZK	4.3.52	H. C. Simpson	— Luborsky, R. Greene, A. Mair	W. Harper	Cayzer Irvine & Co., Ltd.
<i>Clan Ceatlan</i>	GFBX	31.7.52	J. McCrone	W. S. Clarke, N. Wallace, J. A. Brown	R. F. Cole	Cayzer Irvine & Co., Ltd.
<i>Clan Chisholm</i>	GFBY	19.3.52	G. Vernon-Greene	C. A. Thomas, W. W. S. Arnott, P. MacNiven	E. J. Shillabeer	Cayzer Irvine & Co., Ltd.
<i>Clan Davidson</i>	MAWU	11.7.52	T. A. Watkinson	D. S. Williams, J. Molyneux, P. C. W. Hoblyn	H. G. P. MacNamara	Cayzer Irvine & Co., Ltd.
<i>Clan Forbes</i>	GPGB	15.7.52	W. R. Woodruffe	J. C. Walters, H. I. S. White, S. M. Grant	J. E. Appleton	Cayzer Irvine & Co., Ltd.
<i>Clan Macaulay</i>	GZCS	7.8.52	A. G. Storkey	G. M. Silvers, J. Gibson	W. G. Peddie	Cayzer Irvine & Co., Ltd.
<i>Clan MacDonald</i>	GCPG	18.1.52	A. Hogg	G. S. Gann, J. W. MacDonald, T. Hunter	W. H. Saville	Cayzer Irvine & Co., Ltd.
<i>Clan MacDougall</i>	GFBO	18.7.52	F. MacMillan	A. Elston, G. R. Thomas, D. W. Stewart	G. Martyn	Cayzer Irvine & Co., Ltd.
<i>Clan Mackinnon</i>	GK LX	15.4.52	S. R. J. Woods, D.S.C., R.D., R.N.R.	F. G. King, W. J. Allan, B. J. Marete	C. E. C. Crw	Cayzer Irvine & Co., Ltd.
<i>Clan MacLaren</i>	GSSC	13.8.52	J. C. Scott	A. S. W. Grant, W. Freestone, C. Marshall	A. Halcrow	Cayzer Irvine & Co., Ltd.
<i>Clan Macrae</i>	MAHP	31.7.52	E. Coulthart	R. S. Schoofing, L. Pitts, J. Hogg	R. Moore	Cayzer Irvine & Co., Ltd.
<i>Clan MacTavish</i>	GUBB	28.7.52	E. Gough, O.B.E.	P. L. Plateau, J. L. Easton, C. C. Atkinson	D. C. Phillips	Cayzer Irvine & Co., Ltd.
<i>Clan Shaw</i>	GBYW	24.10.51	F. J. E. Houghton	G. G. Greenfield, A. M. Kennedy, E. M. Phelps	W. A. Ellmers	Cayzer Irvine & Co., Ltd.
<i>Clan Sutherland</i>	GFWZ	7.6.52	H. J. Anchor, O.B.E., A.D.C., R.D., R.N.R.	L. W. Gibbins, — Ward, — Cathro, — Messenger	G. H. Hudd	Cayzer Irvine & Co., Ltd.
<i>Clan Urquhart</i>	GFBK	19.5.51	T. A. Inman, O.B.E.	L. S. Jones, G. Dilks, G. E. Trawsdale	W. Gay	Cayzer Irvine & Co., Ltd.
<i>Clearpool</i>	MAHQ	17.3.52	G. R. Cobb	E. M. Stewart, J. B. Forrest, K. E. Ward	A. J. MacIntyre A. M. Morris	Sir R. Ropner & Co., Ltd.

Clydebank	..	GKLM	15.7.52	P. D. MacFarlane	H. K. Stevens, C. V. Sawyer, A. H. Whitelaw	G. Murphy	Andrew Weir & Co., Ltd.
Columbia Star	..	GQGT	8.4.52	F. Hambridge	J. W. Poole, T. Thornton, D. Hastie, J. H. Dyer	T. Lynch	Blue Star Line, Ltd.
Conitabank	..	GKLI	6.2.51	J. Townsley	J. Donald, W. Ellarby, J. P. Edmunson	R. Bodeman	Andrew Weir & Co., Ltd.
Condesa	..	MAHU	11.9.52	H. Heal	R. Tinnmouth, N. H. England, T. McNamara	D. Lindsay	Furness-Houlder Argentine Lines, Ltd.
Consuelo	..	GCGQ	29.8.52	H. Greenhill	J. A. Pettigrew, A. T. Jardine, J. A. Green	D. Withers	Ellerman's Wilson Line, Ltd.
Corfu	..	GRNW	11.7.52	E. F. Ferraby	D. J. Knight, G. E. Howe, D. A. Babelay	J. T. Macdonald	P. & O. Steam Navigation Co.
Corinthic	..	GZYL	3.9.52	A. C. Jones	B. Tomalin, T. Ogier, C. Perry	W. E. G. Richards	Shaw, Savill & Albion Co., Ltd.
Corrales	..	GSJL	30.6.52	J. Kinsley	E. Whitehouse, D. Howell, G. Gannicliffe	A. G. T. Evans	Elders & Fyffes, Ltd.
Corrientes	..	GFPT	28.7.52	K. McLeod	A. C. Henderson, H. Leitch, J. H. Stark	N. W. Wilding	Donaldson Bros. & Black, Ltd.
Couलगorm	..	MAHZ	7.6.52	J. C. Skears	H. Young, C. Hardy, R. Weigold	R. Seward	Lambert Bros., Ltd.
Craftsman	..	GPZT	30.6.52	T. B. Littlechild	F. R. Robinson, C. B. Thomson, F. C. Deakin	— Greason	T. & J. Harrison, Ltd.
Crofter	..	MNGX	..	S. Diamond	W. T. Ellis, J. W. Cubbin, W. Tinkler	T. Laing	Federal Steam Nav. Co., Ltd.
Cumberland	..	GPYV	20.10.52	J. S. Oxnard	N. Selwood, A. Faulkner, R. Holdsworth	G. Lowe	Booth S.S. Co., Ltd.
Cuthbert	..	GFNW	23.7.52	R. G. Roberts	M. S. Ready, N. F. Sharpe, G. Smythe	F. Murrant	Pacific Steam Navigation Co., Ltd.
Cuzco	..	GKPF	28.5.52	G. D. S. Eckford	H. T. Cunliffe, W. Johnston, G. Pattison	M. R. Carney	Ropner Shipping Co., Ltd.
Daleby	..	MFBV	17.9.52	J. Kenny	E. H. Williams, E. A. Snaith, A. Oates	V. J. Warton	Sir William Reardon Smith & Sons, Ltd.
Dallas City	..	GCLS	17.3.52	D. W. Boutcher	R. Duggan, W. Cross, C. McClusky	..	..
Darro	..	MAID	11.7.52	T. Powell	K. R. Jones, W. A. Kennedy, J. M. Jones, D. Thomas	J. Heeney	Royal Mail Lines, Ltd.
Debrett	..	GRPR	26.4.52	D. C. Roberts	R. M. Dunning	C. Eyre	Lampport & Holt Line, Ltd.
Deerpool	..	GKDY	21.3.52	C. H. Churchill	J. W. Tinnmouth, A. Dekonski, R. A. Vans, E. M. Stewart	A. Owen	Sir R. Ropner & Co., Ltd.
Defoe	..	GNWF	20.8.52	W. J. M. Ankers	D. Cordova, J. G. Roberts, R. F. Mason	J. Brown	Lampport & Holt Line, Ltd.
Delane	..	MMNW	7.10.52	E. L. Jermyn	D. S. Leicester, A. Corlett, N. Garvey	— Brown	Lampport & Holt Line, Ltd.
Delitian	..	GJSQ	4.7.52	J. S. MacMillan	J. McCormick, S. P. Ewing, J. Johnston	W. J. Read	Donaldson Bros. & Black, Ltd.
Delius	..	GZSY	30.6.52	A. W. Mitchell	E. D. Spooner, D. S. Sapp, I. B. Owen	D. Powell	Lampport & Holt Line, Ltd.
Delplic	..	MBLQ	..	C. L. Carroll, D.S.C., R.D., R.N.R.	..	..	..
Denbighshire	..	GQGW	19.9.51	J. Simpson	J. Jackson, W. Solley, A. Lewis	H. Heapy	Shaw, Savill & Albion Co., Ltd.
Desecado	..	MAIH	30.6.52	H. E. Sang	I. Holt, S. C. Parsons, M. W. Roberts	I. S. Humphrey	Glen Line, Ltd.
Devis	..	GFKT	26.2.52	W. Gillespie	R. Garcia, W. J. Neill, D. B. Smith	— Prior	Royal Mail Lines, Ltd.
Devon	..	GDRF	25.9.52	A. Hocken	J. Weston, B. Whybrow, J. Crewdson, J. Campbell, N. Collett	J. Tomlinson	Lampport & Holt Line, Ltd.
Devonshire	..	GTTV	11.9.52	A. Beharrel	— Gatis, J. W. MacKinlay, — Pennington	G. Talbot	Federal Steam Nav. Co., Ltd.
Ditweara	..	GYQV	9.8.52	M. Williams	S. D. Lester, I. K. Bowerman, E. C. Plowman	S. J. Taylor, M.B.E.	Bibby Bros. & Co.
Discovery II	..	GWVM	17.12.51	J. F. Blackburn, D.S.O., Cdr., R.N.	B. Q. Dunham, G. H. Selby-Smith, P. A. Masters	P. Blackburn	British India Steam Nav. Co., Ltd.
Dominion Monarch	..	GRGG	12.8.52	D. Aitchison	R. J. J. Theakston, C. A. Brodie, G. B. Broom	..	National Institute of Oceanography
Dorset	..	GZFO	10.10.52	A. W. Williams	D. Nicholson, W. Dawes, A. Marsh	F. Harford	Shaw, Savill & Albion Co., Ltd.
Drina	..	MAIL	22.11.51	T. R. Miller	J. Fox, M. Perrins, A. F. Nottage	M. A. Calder	Federal Steam Nav. Co., Ltd.
Duke of Athens	..	GMYS	11.6.52	T. Walton	T. D. Wright, T. Owen, E. J. Griffiths	A. Humphries	Royal Mail Lines, Ltd.
Dunedin Star	..	GKKT	7.6.52	J. Davis	C. Davies, G. Miles, A. J. Edwards	E. J. O'Connor	Trent Maritime Co., Ltd.
Dunera	..	GBBR	3.10.52	A. A. Kay	F. Hills, C. R. S. Monk, M. J. Hine, B. Davies	R. B. Read	Blue Star Line, Ltd.
Dunkery Beacon	..	GUFS	8.5.52	A. C. E. Green	A. Tatchell, J. Twite, D. Berwick	T. Shannon	British India Steam Nav. Co., Ltd.
Durango	..	MAIM	7.6.52	H. Wright	J. H. Elsom, B. Y. Harrison, J. Connell, L. B. Fenner	G. Delahoy	Phs. Van Ommeren (London), Ltd.
Durban Castle	..	GPGP	11.3.52	R. A. D. Cambridge, D.S.C., R.D., R.N.R.	A. Backhouse, R. Beaumont, J. James	H. Davies	Royal Mail Lines, Ltd.
..	..	..	..	..	..	J. Eager	Union Castle Mail S.S. Co., Ltd.

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS/MANAGERS
<i>Durenda</i>	GFSL	21.11.50	A. H. Usher	H. R. Smith, D. A. C. Windle, G. A. Hankins	T. Welsh	British India Steam Nav. Co., Ltd.
<i>Durhan</i>	GWWK	15.4.52	N. L. Warren	J. Rollinson, J. Nocton, D. Moran, A. W. Cripps	J. F. McNeil	Federal Steam Nav. Co., Ltd.
<i>Eastbank</i>	GFKR	12.8.52	R. Smith	C. G. Watterson, H. Gunton, F. B. Rodgers	J. Carolan	Andrew Weir & Co., Ltd.
<i>Edenfield</i>	GFJF		J. Hempsey	W. Campbell, F. B. Fairweather, J. Swindles	M. Wilson	Hunting & Son, Ltd.
<i>Edinburgh Castle</i>	GOHN	10.10.52	T. W. McAllen	J. V. Coles, J. Archibald, K. J. Barry, J. Drought	J. Hodgson	Union Castle Mail S.S. Co., Ltd.
<i>Egidia</i>	GJZD	16.8.52	J. L. Gibson, O.B.E.	R. Jones, W. B. Sawyers, R. L. Richards, T. Patience	P. McBride	Anchor Line, Ltd.
<i>Elysia</i>	GJZK	6.10.52	D. MacVicar	D. Ballantyne, H. Keenan, O. J. McLarty, W. Carmichael	W. Hier	Anchor Line, Ltd.
<i>Empire Forsey</i>	GMFW	24.9.52	J. O. Diver	G. F. Harris, J. Anderson, R. A. Game, G. Shaw	P. Maloney	P. & O. Steam Navigation Co.
<i>Empire Halladale</i>	GPVQ	4.3.52	D. Barelay	H. A. Cameron, G. Murdoch, R. E. Garisch, D. Miller	D. Robson	Anchor Line, Ltd.
<i>Empire Orwell</i>	GRCB	22.5.52	N. W. Smith	E. W. Woodcock, D. Blois, P. Watts, J. R. English	A. C. Shippam	Orient Steam Nav. Co., Ltd.
<i>Empire Patrai</i>	GDKL	18.9.51	R. J. Young	S. O. Nazar, A. Honnor	C. J. Higginson	Fenton S.S. Co., Ltd.
<i>Empire Pride</i>	MAJB	28.5.52	G. Dobson, R.D., R.N.R.	R. Hammond, B. M. Bessant, B. Wilcock	D. Alcock	Bibby Bros. & Co.
<i>Empire Star</i>	GCDP	22.9.52	F. M. Johnson, M.B.E.	B. G. Knights, J. Greenwood, D. C. Maycock	W. J. Fitzgerald	Blue Star Line, Ltd.
<i>Empire Viceroy</i>	MAJN	6.4.51	J. B. S. Bland	A. M. Brockwell, C. D. Mason, J. W. Abbott	W. Clarke	Pandelis Shipping Co., Ltd.
<i>Empress of Canada</i>	GSVR	1.9.52	J. P. Dobson, D.S.C., R.D., R.N.R.	D. E. Rae, J. Mackay, D. Bottomley	J. M. Butterworth	Canadian Pacific S.S., Ltd.
<i>Empress of France</i>	GNTV	12.9.52	C. L. De H. Bell, D.S.C., R.D., R.N.R.	I. Ferguson, C. Beck, P. Bagnall	C. H. Roberts	Canadian Pacific S.S., Ltd.
<i>Empress of Scotland</i>	GMLV	6.10.52	C. Duggan, R.D., R.N.R.	G. Brooks, —, Savage, —, Saddington	W. Campbell	Canadian Pacific S.S., Ltd.
<i>English Star</i>	MFSS		L. Vernon	G. Seave, G. Cameron-Smart, L. Graham, E. Neale	G. Allen	Blue Star Line, Ltd.
<i>Erodona</i>	GZLQ	19.3.52	J. A. Thompson	J. Mackie, K. Eastwood, R. W. Denmark	R. Pattinson	Anglo-Saxon Petroleum Co., Ltd.
<i>Esperance Bay</i>	GSMP	29.8.52	H. C. Smith	J. Yarwood, G. H. Moss, A. Durrell, J. S. McEwan	H. J. Lyon	Shaw, Savill & Albion Co., Ltd.
<i>Essex Trader</i>	GCMS	21.3.52	D. G. Evans	D. A. Owen, E. Jones, E. Whislay	H. Tubbs	Trader Navigation Co., Ltd.
<i>Esso Glasgow</i>	GTXC	30.6.52	J. W. Smith	I. Duncan, R. Prest, W. R. Hook	P. Young	Esso Transportation Co., Ltd.
<i>Esso Plymouth</i>	GYSX	11.9.52	E. Orr	B. Curling, J. Godden, B. Cullingford	J. Heron	Esso Transportation Co., Ltd.
<i>Etivebank</i>	GDMK		D. Gillies	P. Ryan, A. Tavendale, E. N. Jolly, J. McInnes	S. Sproat	Andrew Weir & Co., Ltd.
<i>Eucadia</i>	GIZL	5.2.52	D. Morrison, O.B.E.	R. Murdoch, C. Boyle, A. Macadam	—, Roberts	Anchor Line, Ltd.
<i>Explorer</i>	GYJX	29.4.52	G. I. Jones	R. Patmore, D. O. Lindsay, R. H. Douglas	J. McCarthy	T. & J. Harrison, Ltd.
<i>Factor</i>	GPZV		E. B. Stephens	F. C. Meakin	W. Foster	T. & J. Harrison, Ltd.
<i>Famad Head</i>	GNOQ	25.9.51	W. J. Leinster	N. K. Alwood, W. R. Nelson, J. Martin	W. Blanchard	G. Heyn & Sons, Ltd.
<i>Flamenco</i>	GCBV	10.3.52	P. L. Hockey	W. J. Campbell, A. B. Powell, T. B. A. Wyness, W. J. Houghton		Pacific Steam Nav. Co., Ltd.
<i>Franconia</i>	GBRQ	7.11.51	J. W. Caunce	J. C. Nicholson, J. Wise, —, Hungerford-Morgan		Cunard Steamship Co., Ltd.

<i>Fremantle Star</i>	6.10.52	C. Horton	Drummond, —, Jenkins, —, Tonkin	Stewart	Blue Star Line, Ltd.
<i>Fresno City</i>	23.9.52	J. D. Lloyd	A. H. Bailey, I. C. Hughes, B. G. Sharp	D. B. Strang	Sir William Reardon Smith & Sons, Ltd.
<i>Geologist</i>	12.9.52	A. E. Jackson	R. Maycox, D. V. Jones, J. C. Farmer	J. J. Downey	T. & J. Harrison
<i>Georgic</i>	20.2.51	W. M. Stuart, O.B.E.	I. K. Bryce, R. J. Manson, M. Ridge	G. Hill	Cunard Steamship Co., Ltd.
<i>Glaucus</i>	26.8.52	H. S. Wood	J. Bold, D. R. Hayward, R. A. Goldsby, G. N. Moss	F. M. Shannon	A. Holt & Co.
<i>Glenarney</i>	22.7.52	L. M. Anderson	V. Moore, H. K. Timbrell, G. King	J. F. Wilson	Glen Line, Ltd.
<i>Glenbank</i>	16.4.52	W. J. Greig	F. B. Rodgers, D. C. Broome, A. F. Wigham	R. Bradshaw	Andrew Weir & Co., Ltd.
<i>Glenorchy</i>	2.8.52	P. Cross	T. P. Welch, L. Henshall, —, Ross	L. Sayers	Glen Line, Ltd.
<i>Gloucester</i>	8.10.52	J. Taylor	A. W. Hibble, R. Hales, R. A. Martin, B. Crust	R. W. Smith	Federal Steam Nav. Co., Ltd.
<i>Golfito</i>	25.8.52	S. A. Sapsworth	R. Young, R. L. Leech, W. Littiewood, K. I. Leslie	H. Palmer	Elders & Fyffes, Ltd.
<i>Gothic</i>	21.10.52	A. V. Richardson	L. M. Howells, J. A. Williams, J. Murchison	W. Duguid	Shaw, Savill & Albion Co., Ltd.
<i>Gracia</i>	22.9.52	J. McInnes	J. Aitken, G. E. Waddell, D. G. Hall	S. Taylor	Donaldson Bros. & Black, Ltd.
<i>Granford</i>	3.10.52	E. C. J. Morgan	I. Brown, L. T. Edwards, D. Styles	G. F. Cowie	Goulandris Bros., Ltd.
<i>Great City</i>	31.7.52	H. Sharp	H. Justen, A. J. Millward	W. Graham	Sir William Reardon Smith & Sons, Ltd.
<i>Haparangi</i>	19.2.52	R. G. Rees	S. R. Bridgeford, J. Marshall, J. Ramsey, J. Baxter	S. A. Sorrell	New Zealand Shipping Co., Ltd.
<i>Harpalycus</i>		R. Stott, O.B.E.	B. O'Sullivan, J. G. Neilson, F. Fowler	P. Goss	J. & C. Harrison
<i>Hartington</i>		G. Jones	I. C. Castle, W. R. Vickers	P. Moss	J. & C. Harrison
<i>Helicina</i>	25.8.52	J. A. Thomson	W. Lloyd, C. D. Atkinson, D. H. White	A. G. Johnson	Anglo-Saxon Petroleum Co., Ltd.
<i>Herdsman</i>	1.11.50	T. E. Steel	H. Lawton, H. Jones, C. Arden	P. Roberts	T. & J. Harrison
<i>Herefordshire</i>	31.7.52	H. B. Peate, D.S.C., R.D., Cdr. R.N.R.	H. Traynor, O. C. Ashcroft, P. J. Sedgewick	J. Desborough	Bibby Bros. & Co.
<i>Hertford</i>	24.7.52	H. N. Lawson	M. J. Blake, A. B. Stalker, S. Oates, J. Varney	W. Rollason	Federal Steam Nav. Co., Ltd.
<i>Highland Brigade</i>	7.6.52	A. N. Anderson	R. D. H. Manley, E. J. O'Keefe, J. Lenfesty	F. Dunns	Royal Mail Lines, Ltd.
<i>Highland Chieftain</i>	28.12.51	W. H. Grimshaw, O.B.E.	R. M. Box, J. C. Egan, B. A. Wood, C. L. Earl	F. Goodall	Royal Mail Lines, Ltd.
<i>Highland Monarch</i>	30.4.52	H. G. Whittle, O.B.E.	R. R. Thompson, J. T. Jones, W. B. Baxter	T. Maudsley	Royal Mail Lines, Ltd.
<i>Highland Princess</i>	5.7.52	S. J. G. Hill	D. Stratton, D. B. Cairns, R. B. Dales, C. B. Lambert	T. Tynan	Booth S.S. Co., Ltd.
<i>Hilary</i>	26.1.52	E. Jones	G. Calvert, R. G. Halliday, P. Harris	J. F. Clark	P. & O. Steam Navigation Co.
<i>Hildebrand</i>	27.8.52	J. Whayman, D.S.C., R.D., R.N.R.	A. Niblock, H. Nish, E. D. Edwards	J. Treby	New Zealand Shipping Co., Ltd.
<i>Himalaya</i>	17.12.51	S. W. S. Dickson	Houghton, R. A. Gibbons	D. E. Hoddling	Federal Steam Nav. Co., Ltd.
<i>Hinakura</i>	16.8.52	E. A. Burton	M. Algar, J. Glover, —, Groenhart	A. C. Wallace	New Zealand Shipping Co., Ltd.
<i>Hororata</i>	30.6.52	E. H. Hopkins	F. Taylor, P. Davison, E. Cooper, D. J. Caldwell	I. Wilman	New Zealand Shipping Co., Ltd.
<i>Huntingdon</i>	16.4.52	P. S. Calcutt	A. Rollinson, K. J. Field, P. Oppen	D. Reynolds	Blue Star Line, Ltd.
<i>Hurunui</i>	30.6.52	H. E. Reilly	D. Newman, R. Lully, D. Burdett	A. E. Adams	G. Heyn & Sons, Ltd.
<i>Hycania</i>	30.6.52	J. M. Robertson	J. Gibby, D. G. Mason, J. Knox	P. C. Kelly	Andrew Weir & Co., Ltd.
<i>Imperial Star</i>	7.6.52	G. C. Goudie	R. Bayley, D. Brewster, A. Payne, R. Stark	E. Brown	Kaye, Son & Co., Ltd.
<i>Imshoven Head</i>	27.3.52	R. A. Ferguson	I. R. Smith, F. Austin, K. Kelly	—, Neaber	Sir Wm. Reardon Smith & Sons
<i>Interpreter</i>	22.7.52	H. Coates	D. Sims, A. H. Hughes, G. Harvey		
<i>Inverbank</i>	14.9.51	R. A. Lorrains	J. A. Niblock, H. M. Stephens, J. Aldiss		
<i>Yamatca Producer</i>	17.10.52	G. E. M. Jenkins	J. A. Whitehouse, C. P. Gray, T. A. Kidd		
<i>Jersey City</i>		R. E. Shilstone	A. R. Bisett, J. Vaughan, D. A. Macdonald		

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS/MANAGERS
<i>Yesmore</i>	MAOF	11.6.52	R. E. Holland	P. Fryer, R. Gibson, R. Douglas	J. Mathieson	Furness Withy & Co., Ltd.
<i>John Hiscoe</i>	VPNE	31.7.52	W. Johnston	M. R. Brown, H. Preece, C. Le Page Croft	W. Bonner	Government of the Falkland Islands
<i>John Holt</i>	GNEF	1.10.52	F. Sherrington	R. J. Griffiths, J. H. Sawyer, —, Harding	J. H. Sheary	John Holt Line, Ltd.
<i>Kaipaki</i>	GQGJ	19.3.52	N. Fraser	L. Morris, H. Adler, B. Tong	A. Hudson	Trinder Anderson & Co.
<i>Katuna</i>	GQGG	21.1.52	S. Clappitt	T. G. Wilson, J. Jackson, G. B. Charleson, P. Johnson	S. Woodward	Trinder Anderson & Co.
<i>Kenilworth Castle</i>	MQLP	22.11.51	T. H. Whattley	C. B. Linnell, D. B. Ross	S. N. Crabtree	Union Castle Mail S.S. Co.
<i>Kent</i>	GPDC	28.5.52	W. T. Stevens	P. R. Fletcher, A. B. Moss, B. Allen	T. G. Terrell	Federal Steam Nav. Co., Ltd.
<i>Kenuta</i>	GCBW	23.4.52	J. D. Richards	A. M. Jestico, J. E. Evans, D. S. C., R.D., R.N.R., P. Wheelbourn	C. A. De Vine	Pacific Steam Navigation Co.
<i>King Robert</i>	MAON	11.7.52	G. Craze	G. Dando, P. W. Kidd, A. D. Terras	J. P. Murphy	King Line, Ltd.
<i>King William</i>	GNVF	30.6.52	J. C. Davies	G. B. Craig, T. Fairclough, —, Fawley	T. Homersley	King Line, Ltd.
<i>Kingston Onyx</i>	MILP	21.4.52	A. R. Cornish	J. T. Verrill, C. O. Jones, P. Cresswell	D. Daly	Kingston Steam Trawling Co., Ltd.
<i>Kohistan</i>	GSFZ	17.5.52	A. N. Henderson	A. T. MacDougall, S. J. Jackson, F. Green	A. N. Gilbert	F. C. Strick & Co., Ltd.
<i>Koyan</i>	GKST	8.4.52	W. McIntosh	J. N. Pence, G. W. Spiller, J. V. Fox	G. J. Ingram	P. Henderson & Co.
<i>Lanarkshire</i>	GCTC	11.2.52	A. R. Cossar	H. Traynor, D. Hine, A. C. R. Murray	A. Jones	Turnbull Martin & Co., Ltd.
<i>Lancashire</i>	GLZC	10.9.51	N. F. Fitch	M. L. Wellard, A. Corlett	J. J. Kennedy	Bibby Bros. & Co.
<i>Langton Grange</i>	MAOT	24.7.52	J. R. Faulkner	W. Jones, —, Adlam, W. Clark	D. McKee	Houlder Bros. & Co., Ltd.
<i>Lassell</i>	GFND	10.9.51	C. Underhill	N. Forth, A. McCallum, R. Durling, B. S. Brown	J. J. Kennedy	Lampport & Holt Line, Ltd.
<i>Latia</i>	GLCF	24.7.52	A. E. Bleasdale	F. G. Howard, A. Dorkins, J. Scobbie	D. McKee	Anglo-Saxon Petroleum Co., Ltd.
<i>Laurentia</i>	GNDY	30.6.52	A. Bankier	C. H. Boam, A. Creer, G. Barron	A. Lovack	Donaldson Bros. & Black, Ltd.
<i>Leuernbank</i>	GLPZ	19.10.52	A. T. Stansfield	B. Nicolle, T. Metham, R. Cooper	J. Simpson	Andrew Weir & Co., Ltd.
<i>Linguist</i>	GQBC	13.8.52	W. Weatherall	R. J. Thompson, S. J. Gawlik, M. Muncie	J. W. Bennett	T. & J. Harrison
<i>Livorno</i>	GPWF	25.6.51	G. Schuur	J. J. Rutter, G. Gulsion, L. L. Hunter	W. McParlin	Ellerman's Wilson Line, Ltd.
<i>Lloydrest</i>	MAOY	11.7.52	L. Barwell	G. Dudley, J. Collins, G. Wolstenholme	F. Thornborough	Crest Shipping Co., Ltd.
<i>Loch Avon</i>	GMZT	18.4.52	C. E. Mason	A. N. Brook, H. Nixon, R. H. Atkinson	M. Littlejohn	Royal Mail Lines, Ltd.
<i>Loch Garth</i>	GMZY	3.12.51	J. Smith, R.D., Cdr., R.N.R.	C. A. Brown, H. Grayson, A. H. Benson	D. J. W. Morgon	Royal Mail Lines, Ltd.
<i>Loch Ryan</i>	MAOZ	1.11.51	H. V. Todd, R.D., Cdr., R.N.R.	M. Warrick	W. Clarke	Royal Mail Lines, Ltd.
<i>Lord Gladstone</i>	MAPA	1.11.51	C. L. Brien	B. S. Hollingsworth, J. C. Young, R.D., R.N.R., M. S. Hughes	A. G. Pews	Ships Finance & Management Co.
<i>Lotorium</i>	GBLP	1.6.51	N. Clarke	I. A. MacLaren, H. S. Prestwood, L. J. Saxty	L. Barnett	Anglo-Saxon Petroleum Co., Ltd.
<i>Macharda</i>	GKKF	30.6.52	R. A. Penston	R. E. Allen, R. Floyd, D. Wild	J. Caddy	T. & J. Brocklebank, Ltd.
<i>Magdabur</i>	GBJX	22.5.52	A. Hill, O.B.E.	J. P. Brand, L. Des Landes, P. Briscoe	B. J. Smith, M.B.E.	T. & J. Brocklebank, Ltd.
<i>Mahanada</i>	GOFM	6.3.52	H. C. Kinley	P. J. Pembroke, A. W. M. Adlam	T. Williams	T. & J. Brocklebank, Ltd.
<i>Mahia</i>	GNZY	11.10.52	G. Heywood	R. Munroe, G. Foster, J. Dalby	G. Evans	Shaw, Savill & Albion Co., Ltd.
<i>Mahout</i>	GDZN	7.6.52	W. Gibson	C. S. Macadie, J. Lyle, H. Evans	K. G. Fawcett	T. & J. Brocklebank, Ltd.
<i>Mahseer</i>	GZSV	10.9.52	A. Bain	J. S. Emberton	G. Hazel	T. & J. Brocklebank, Ltd.
<i>Mahsud</i>	GSCP	13.4.50	L. F. Dodson	G. F. Kay, A. B. Davies, J. T. Kirkham	H. D. Kirk	T. & J. Brocklebank, Ltd.
<i>Mather</i>	GSCL	11.7.52	L. E. Jeans	W. G. McFarland, O. Pritchard, L. Fletcher	— Holstead	T. & J. Brocklebank, Ltd.
<i>Makalla</i>	GOFN	3.11.51	T. Eddy	R. E. Roberts, M. Embleton, H. L. Burn	R. Goodson	T. & J. Brocklebank, Ltd.
<i>Maitanicha</i>	GZRD	2.9.52	S. Broughton	J. C. Pears, P. N. Bonney, —, Morris	A. Goodwin	T. & J. Brocklebank, Ltd.
<i>Malmesbury</i>	MAQE		S. W. Howell	N. Oddy, J. Hands, C. W. Trowbridge	H. Burson	Houlder Bros. & Co., Ltd.

<i>Maloja</i>	..	..	..	..	..	..	..	R. I. Pigeon, W. C. Rimmer, W. A. Read, W. H. Bickford	W. Dawson ..	P. & O. Steam Navigation Co.
<i>Manchester City</i>	..	..	..	..	..	..	..	A. W. Swan, A. Cookson, F. Le Messurier	M. Doran ..	Manchester Liners, Ltd.
<i>Manchester Division</i>	..	..	..	..	..	..	..	J. M. Clarke, L. C. Taylor, D. C. Woodall	W. B. McPherson ..	Manchester Liners, Ltd.
<i>Manchester Explorer</i>	..	..	..	..	..	..	..	G. K. Bookler, D. G. Thomas, J. Bone	— MacPherson ..	Manchester Liners, Ltd.
<i>Manchester Merchant</i>	..	..	..	..	..	..	..	D. S. Millard, R. Wadsworth, P. Hargreaves	A. Broadbent ..	Manchester Liners, Ltd.
<i>Manchester Pioneer</i>	..	..	..	..	..	..	..	J. Rushworth, J. Mann, K. W. Rourke	J. Buchanan ..	Manchester Liners, Ltd.
<i>Manchester Port</i>	..	..	..	..	..	..	..	R. Webster, F. N. Fielding, G. R. Clayton	G. Barlow ..	Manchester Liners, Ltd.
<i>Manchester Progress</i>	..	..	..	..	..	..	..	P. Cullen, J. Sullivan, J. E. Askew	W. Critchley ..	Manchester Liners, Ltd.
<i>Manchester Regiment</i>	..	..	..	..	..	..	..	G. S. Garner, J. E. Jones, J. Parish	I. Reid ..	Manchester Liners, Ltd.
<i>Manchester Shipper</i>	..	..	..	..	..	..	..	N. W. Cockshott, F. Lewis, A. H. Varley	E. Ambler, D.S.C. ..	Manchester Liners, Ltd.
<i>Manchester Spinner</i>	..	..	..	..	..	..	..	J. L. McCartney, W. E. Quirk, G. A. Cowell	P. B. McNab ..	Manchester Liners, Ltd.
<i>Manchester Trader</i>	..	..	..	..	..	..	..	G. R. Thompson, G. Clayton, J. L. McCartney	F. J. Fitzgerald ..	Manchester Liners, Ltd.
<i>Mandator</i>	..	..	..	..	..	..	..	P. Manson, C. Gray, J. K. Cooper	A. Rea ..	T. & J. Brocklebank, Ltd.
<i>Manistee</i>	..	..	..	..	..	..	..	R. McKinnon, H. G. Penny, R. G. Dove	R. Kelly ..	Elders & Fyffes, Ltd.
<i>Manitola</i>	..	..	..	..	..	..	..	J. B. S. Purvis, A. T. Wood	.. ..	British India Steam Nav. Co., Ltd.
<i>Marengo</i>	..	..	..	..	..	..	..	B. Thompson, A. Robinson, E. Baker	R. Podmore ..	Ellerman's Wilson Line, Ltd.
<i>Margay</i>	..	..	..	..	..	..	..	M. W. Tappie, B. S. Kenn, J. Jones	E. Leigh ..	Kaye, Son & Co., Ltd.
<i>Marland</i>	..	..	..	..	..	..	..	J. M. Coles, F. Watkins, J. Robertson	D. H. Butterworth ..	T. & J. Brocklebank, Ltd.
<i>Marritia</i>	..	..	..	..	..	..	..	L. Manser, W. Webster, D. McKinnon	D. Hamble ..	Kaye Son & Co., Ltd.
<i>Matara</i>	..	..	..	..	..	..	..	B. E. Kettle, P. Lawrence, F. Attwood, V. H. Vizer	L. Boyce ..	Shaw, Savill & Albion Co.
<i>Matheran</i>	..	..	..	..	..	..	..	W. J. Milne ..	G. W. Hazel ..	T. & J. Brocklebank, Ltd.
<i>Matina</i>	..	..	..	..	..	..	..	H. G. Cresswell, W. Thompson, J. Macarthur	A. C. Knight ..	Elders & Fyffes, Ltd.
<i>Mauretania</i>	..	..	..	..	..	..	..	M. B. Cox, R. L. Joyner, L. Portet, J. Christie	A. Cannock ..	Cunard Steamship Co., Ltd.
<i>Media</i>	..	..	..	..	..	..	..	J. S. Roe, G. W. B. Edwards, B. Coates	A. Hopkins ..	Cunard Steamship Co., Ltd.
<i>Melbourne Star</i>	..	..	..	..	..	..	..	C. Whitaker, G. Hunt, R. B. Escreet	T. Archer ..	Blue Star Line, Ltd.
<i>Mirror</i>	..	..	..	..	..	..	..	J. S. Deane, A. Miller	N. R. Iden ..	Cable & Wireless, Ltd.
<i>Modasa</i>	..	..	..	..	..	..	..	P. Surton, W. Brown, F. G. Hall	P. Sargent ..	British India Steam Nav. Co., Ltd.
<i>Monarch</i>	..	..	..	..	..	..	..	J. A. Hall, J. Pattison, M. Landes	T. Tilley ..	H.M. Postmaster-General
<i>Mooltan</i>	..	..	..	..	..	..	..	D. Akman, L. H. Keltet, J. Jenkins	J. Ormiston ..	P. & O. Steam Navigation Co.
<i>Mulbera</i>	..	..	..	..	..	..	..	M. D. Squibbs, L. R. Holt, J. Chedglewski	L. Phillips ..	British India Steam Nav. Co., Ltd.
<i>Myrtlebank</i>	..	..	..	..	..	..	..	C. T. Lewis, A. Tavendale, A. Szimczacki	F. McGuinness ..	Andrew Weir & Co., Ltd.
<i>Naber Star</i>	..	..	..	..	..	..	..	J. Howarth, D. G. Mallinger, G. Stubbins	R. Millar ..	Blue Star Line, Ltd.
<i>Natitina</i>	..	..	..	..	..	..	..	J. D. Dyson, A. Douglass, B. Bagler, J. Thompson, A. Batey	J. W. Starrs ..	Anglo-Saxon Petroleum Co., Ltd.
<i>New Australia</i>	..	..	..	..	..	..	..	J. F. Mason, H. P. Last, W. W. Scott	J. Marchmont ..	Shaw, Savill & Albion Co., Ltd.
<i>New York City</i>	..	..	..	..	..	..	..	A. Wright, A. Braid, D. Burgoyne	T. Jenkins ..	Charles Hill & Sons, Ltd.
<i>New Zealand Star</i>	..	..	..	..	..	..	..	A. V. Watt, A. E. Williams, T. Ripley	A. B. Ewart ..	Blue Star Line, Ltd.
<i>Newfoundland</i>	..	..	..	..	..	..	..	J. T. Sheffield, L. J. Kew, J. B. Stewart, — Youngblough	T. Cahill ..	Furness Withy & Co., Ltd.
<i>Nordic</i>	..	..	..	..	..	..	..	A. Uden, C. F. Partington, B. H. White	W. L. Stone ..	Prince Line, Ltd.
<i>Norfolk</i>	..	..	..	..	..	..	..	S. R. Harding, J. A. Edmonson, K. W. Mayhew, G. F. Risley	J. D. Turnham ..	Federal Steam Nav. Co., Ltd.
<i>Norwegian</i>	..	..	..	..	..	..	..	— Bailey, J. Stark, R. S. Hopkins	C. Carpenter ..	Donaldson Bros. & Black, Ltd.
<i>Nottingham</i>	..	..	..	..	..	..	..	R. Burton, R. Hood, R. Brown	W. C. Brock ..	Federal Steam Nav. Co., Ltd.
<i>Nova Scotia</i>	..	..	..	..	..	..	..	J. Williams, D. Fuller, G. E. Purrier	R. Carr ..	Furness Withy & Co., Ltd.
<i>Novelist</i>	..	..	..	..	..	..	..	W. L. Ashton, I. G. Macaulay, P. Wesson	J. Robinson ..	T. & J. Harrison
<i>Orari</i>	..	..	..	..	..	..	..	A. Stokoe, J. Loveridge, P. Holloway	— ..	New Zealand Shipping Co., Ltd.
<i>R. G. Freeman</i>	..	..	..	..	..	..	..	..	..	..
<i>E. W. Espley</i>	..	..	..	..	..	..	..	..	..	..
<i>W. Oliver</i>	..	..	..	..	..	..	..	..	..	..
<i>J. L. McLaren</i>	..	..	..	..	..	..	..	..	..	..
<i>E. W. Raper</i>	..	..	..	..	..	..	..	..	..	..
<i>A. Starmier</i>	..	..	..	..	..	..	..	..	..	..
<i>M. E. Bewley</i>	..	..	..	..	..	..	..	..	..	..
<i>H. Hancock</i>	..	..	..	..	..	..	..	..	..	..
<i>E. L. Osbourne</i>	..	..	..	..	..	..	..	..	..	..
<i>W. H. Downing</i>	..	..	..	..	..	..	..	..	..	..
<i>F. D. Struss, O.B.E., D.S.C.</i>	..	..	..	..	..	..	..	..	..	..
<i>W. H. Downing</i>	..	..	..	..	..	..	..	..	..	..
<i>G. A. Jackson</i>	..	..	..	..	..	..	..	..	..	..
<i>R. W. Lundy</i>	..	..	..	..	..	..	..	..	..	..
<i>R. Stone</i>	..	..	..	..	..	..	..	..	..	..
<i>H. Dunkley</i>	..	..	..	..	..	..	..	..	..	..
<i>E. A. Prentice</i>	..	..	..	..	..	..	..	..	..	..
<i>T. Fox-Lloyd</i>	..	..	..	..	..	..	..	..	..	..
<i>H. Bunn</i>	..	..	..	..	..	..	..	..	..	..
<i>R. G. James, R.D., Capt., R.N.R.</i>	..	..	..	..	..	..	..	..	..	..
<i>H. G. Allen, M.B.E.</i>	..	..	..	..	..	..	..	..	..	..
<i>W. Dodds</i>	..	..	..	..	..	..	..	..	..	..
<i>D. W. Sorrell</i>	..	..	..	..	..	..	..	..	..	..
<i>W. T. Fitzgerald, R.D., R.N.R.</i>	..	..	..	..	..	..	..	..	..	..
<i>C. Aldridge</i>	..	..	..	..	..	..	..	..	..	..
<i>J. G. West</i>	..	..	..	..	..	..	..	..	..	..
<i>W. A. Busby</i>	..	..	..	..	..	..	..	..	..	..
<i>J. Betson</i>	..	..	..	..	..	..	..	..	..	..
<i>J. M. Peter</i>	..	..	..	..	..	..	..	..	..	..
<i>E. G. Baines</i>	..	..	..	..	..	..	..	..	..	..
<i>R. J. Owen</i>	..	..	..	..	..	..	..	..	..	..
<i>T. W. Fleming</i>	..	..	..	..	..	..	..	..	..	..
<i>F. Mansfield</i>	..	..	..	..	..	..	..	..	..	..
<i>K. D. G. Fisher</i>	..	..	..	..	..	..	..	..	..	..
<i>F. P. Neil</i>	..	..	..	..	..	..	..	..	..	..
<i>E. N. Rhodes</i>	..	..	..	..	..	..	..	..	..	..
<i>C. H. Kenyon</i>	..	..	..	..	..	..	..	..	..	..
<i>E. J. Jones</i>	..	..	..	..	..	..	..	..	..	..
<i>H. D. Horwood, R.D., R.N.R.</i>	..	..	..	..	..	..	..	..	..	..
<i>R. McNie</i>	..	..	..	..	..	..	..	..	..	..
<i>L. W. Fulcher</i>	..	..	..	..	..	..	..	..	..	..
<i>J. E. Wilson, O.B.E.</i>	..	..	..	..	..	..	..	..	..	..
<i>T. Winstanley</i>	..	..	..	..	..	..	..	..	..	..
<i>— Ramsey</i>	..	..	..	..	..	..	..	..	..	..

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS/MANAGERS
<i>Orcades</i>	MABA	4.7.51	N. A. Whinfield	P. O. Anthony, B. Campbell, P. N. Byers	D. Miller	Orient Steam Nav. Co., Ltd.
<i>Oregon Star</i>	MAPH	19.3.52	M. B. M. Tallack, O.B.E.	P. R. Trehearne, G. Bowden, — Hall	W. Jones	Blue Star Line, Ltd.
<i>Orion</i>	GYKL	25.8.52	N. A. Whinfield	— McKeith, P. P. Blois, J. R. English	— Parrish	Orient Steam Nav. Co., Ltd.
<i>Ormonde</i>	GLYC	30.4.52	C. K. Blake, O.B.E.	R. D. Cookman, A. Bensley, A. J. Field	R. Oakley	Orient Steam Nav. Co., Ltd.
<i>Oronsay</i>	GCNB	8.8.52	T. L. Skirrock, O.B.E.	E. J. Dilnutt, R. D. Cookman, H. Days	N. A. Boon	Orient Steam Nav. Co., Ltd.
<i>Oromtes</i>	GBXM	30.6.52	R. J. Galpin, R.D., Capt., R.N.R.	R. B. Stannard, V.C., D.S.O., R.D., R.N.R., D. Carroll, P. Leighton, C. Charlton	A. Quinton	Orient Steam Nav. Co., Ltd.
<i>Otranto</i>	GFKV	13.10.52	S. S. Burtnand	P. O. Anthony, M. Champneys, G. M. McGowan	C. Seaton	Orient Steam Nav. Co., Ltd.
<i>Pacific Fortune</i>	GBFM	2.10.52	F. H. Perry	R. G. G. Bonney, D. M. Harper, S. N. Coe	J. R. Thomas	Furness Withy & Co., Ltd.
<i>Pacific Importer</i>	GDKV	12.9.52	G. Brown	S. Barlow, D. MacDonald, P. Farthing	F. Hugget	Furness Withy & Co., Ltd.
<i>Pacific Liberty</i>	GDFQ	6.12.51	N. Robertson	A. H. Linden, A. R. Dyson, R. Clothier	E. Cunningham	Furness Withy & Co., Ltd.
<i>Pacific Nomad</i>	GCRZ	1.8.52	G. Cook	E. H. Gregson, G. W. Whitby, P. R. Cable, — Blinksop	J. Dowdall	Furness Withy & Co., Ltd.
<i>Pacific Reliance</i>	GMJK	20.10.52	H. S. Reveley	J. H. Clarke, J. Sims, R. L. Hays, J. F. Faulkner	C. J. Carter	Furness Withy & Co., Ltd.
<i>Pacific Stronghold</i>	GNSQ	21.10.52	A. H. Cooke	K. Macalister, E. Hall, D. Smith	J. Jenkins	Furness Withy & Co., Ltd.
<i>Pacific Unity</i>	GUAN	14.11.50	E. A. Kemp	J. A. Davey, P. V. McCullough, L. Hadley	H. M. Larritt	Furness Withy & Co., Ltd.
<i>Palana</i>	MMBF	6.3.50	F. R. Spurr	— Savage, — Trower, G. E. Harris	H. Olding	P. & O. Steam Navigation Co.
<i>Pampas</i>	GCCL	23.10.52	R. C. S. Wooley, R.D., R.N.R.	J. A. Martin, R. M. Tysor, C. C. Walker	G. Ring	Royal Mail Lines, Ltd.
<i>Papanui</i>	GDJW	12.8.52	T. Alderman, R.D., R.N.R.	I. C. Davidson, R. Loveridge, D. Blackman, G. Poole	W. B. Mate	New Zealand Shipping Co., Ltd.
<i>Paparoa</i>	GBCZ	14.10.52	N. A. Thomas	T. R. Walton, R. E. Donald, W. F. T. Dan, T. G. Fuller	L. Carter	New Zealand Shipping Co., Ltd.
<i>Paraguay</i>	MAQS	31.7.52	W. S. Thomas	P. Campbell, R. Phillips, V. A. Sutton	T. Moorcroft	New Zealand Shipping Co., Ltd.
<i>Paraguay Star</i>	GTNC	31.7.52	D. R. Macfarlane, O.B.E., D.S.C.	J. W. Owen, F. A. Ball, D. Clulow	T. Murdoch	Blue Star Line, Ltd.
<i>Pardo</i>	GMNZ	24.5.51	T. W. Stevens, R.D., Capt., R.N.R.	R. H. Greenall, R. J. Kistler, P. Sykes	P. Everrett	Royal Mail Lines, Ltd.
<i>Parina</i>	GCLQ	3.8.51	G. S. Grant	G. S. Bonner, J. C. Derby, P. Davies	N. Roberts	Royal Mail Lines, Ltd.
<i>Paringa</i>	MMBD	4.10.52	H. P. Mallet	C. J. Morris, A. R. Howard, J. M. Jones	G. Soanes	P. & O. Steam Navigation Co.
<i>Paritua</i>	GSWG	26.8.52	A. B. Faating	A. L. G. Gosset, R. Robinson, — Griffiths	A. Sullivan	Cunard Steamship Co., Ltd.
<i>Perim</i>	GCGB	30.6.52	R. J. F. Paice	F. N. Eagle, C. B. Thompson, P. J. Stead	F. Groves	P. & O. Steam Navigation Co.
<i>Perthshire</i>	GYWK	6.3.52	A. G. McPherson	E. J. E. Owen, R. A. Wilson	F. J. C. Bray	Turnbull Martin & Co., Ltd.
<i>Philomet</i>	GYPV	7.6.52	H. M. Selmer	S. Sanderson, E. Marron, J. Sutherland	R. M. Cathcart	General Steam Nav. Co., Ltd.
<i>Philosopher</i>	MAQV	18.9.52	D. O. Percy	I. Macaulay, E. Williams	W. C. Doyle	T. & J. Harrison
<i>Pilcomayo</i>	GBZX	28.7.52	F. A. C. Thacker	G. Phillips, J. H. Napper, J. Ashworth	A. H. Garden	Royal Mail Lines, Ltd.
<i>Pipiritiki</i>	GDRQ	15.7.52	H. C. R. Dell	D. Crabtree, — Miller-Mead, — Swyer, L. Fancett	T. Ready	New Zealand Shipping Co., Ltd.
<i>Planter</i>	GZSS	2.5.52	A. Robertson	W. C. Johnston, K. G. Watson, G. F. Smith	R. J. McNeil	T. & J. Harrison
<i>Port Adelaide</i>	MGGG	11.7.52	C. R. Townshend	T. Stowell, L. Garnham, E. Chapman	O. Livermore	Port Line, Ltd.
<i>Port Auckland</i>	GWRB	24.7.52	I. G. Lewis, O.B.E.	K. W. Jayne, J. T. Owen, B. Collier	J. S. Skinner	Port Line, Ltd.
<i>Port Brisbane</i>	GWRC	9.5.52	H. Steele, O.B.E.	A. A. Chivers, J. Stannard, R. Long, A. Marriage	W. Parratt	Port Line, Ltd.
<i>Port Jackson</i>	GZKR	21.7.52	P. S. Ball	J. R. King, G. A. Ballinger, E. Wells	R. C. Crompton	Port Line, Ltd.

<i>Port Lincoln</i> ..	..	GFZK	6. 9. 52	G. G. Langford	..	R. Barton, H. J. Holdrup, L. R. David, A. J. Starkey, J. T. McCrane ..	..	P. J. McKcon	..	Port Line, Ltd.
<i>Port Macquarie</i> ..	..	MAQY	11. 7. 52	L. W. Cady	..	J. Sharp, R. King, J. Hammond ..	..	R. Robertson	..	Port Line, Ltd.
<i>Port Napier</i> ..	..	GPKD	11. 9. 52	D. G. Bradley	..	R. V. McKee, W. Wakefield, D. Clarke, M. L. Coombs ..	..	T. Hargrave	..	Port Line, Ltd.
<i>Port Phillip</i> ..	..	MAQZ	11. 6. 52	E. E. Roswell	..	D. Burgess, S. Lunn, N. Wilton ..	..	B. McGovern	..	Port Line, Ltd.
<i>Port Pirie</i> ..	..	GLVQ	24. 10. 52	F. W. Bailey, M.D.E.	..	T. Fairbairn, A. M. Crozier, C. Lancaster, H. R. Long ..	..	W. Sharkey ..	..	Port Line, Ltd.
<i>Port Townsville</i> ..	..	MGCV	10. 4. 52	E. W. R. Young	..	T. B. Milburn, T. E. Packwood, N. B. Hutton, R. B. Jones ..	..	— Jardine ..	..	Port Line, Ltd.
<i>Port Vindex</i> ..	..	MAUW	30. 6. 52	G. Hazelwood	..	C. P. C. Gordon, D. E. Bowden, I. H. North, G. Guest ..	..	F. M. Sharmar	..	Port Line, Ltd.
<i>Port Wellington</i> ..	..	GDNJ	16. 7. 52	E. J. Syvret	..	C. J. H. Gorley, I. H. Stewart, I. M. Mackay, W. P. Russell ..	..	J. B. French	..	Port Line, Ltd.
<i>Port Wyndham</i> ..	..	GYCW	20. 8. 52	D. M. Morgan	..	E. E. Chapman, J. T. Owen, —, Gillings, K. Millar ..	..	I. N. Coultts	..	Port Line, Ltd.
<i>Potaro</i> ..	..	GNLJ	6. 10. 52	E. N. Giller	..	K. Harper, J. F. Anderson, E. D. Long ..	..	T. A. Grindrod	..	Royal Mail Lines, Ltd.
<i>Powell</i> ..	..	GKJL	8. 4. 52	D. Cornwell	..	R. Cardno, J. W. Stewart, M. T. Owen ..	..	A. G. Cope ..	..	United Whalers, Ltd.
<i>Pretoria Castle</i> ..	..	GOAE	15. 9. 52	G. H. Mayhew	..	G. C. Hatcher, E. Hull, T. Thurgood ..	..	J. Gill	..	Union Castle Mail S.S. Co., Ltd.
<i>Radley</i> ..	..	GZZG	2. 5. 50	C. J. Forster	..	H. G. Strickland, D. A. Barfoot, J. D. Todd ..	..	P. Probert ..	..	Stephens, Sutton, Ltd.
<i>Rakaia</i> ..	..	GFGW	27. 3. 52	C. J. Cordran	..	C. S. Keay, F. Allen, A. Collins, R. E. Cooke ..	..	G. Saunders	..	New Zealand Shipping Co., Ltd.
<i>Ramore Head</i> ..	..	MAXX	1. 10. 52	W. A. Haddock	..	J. I. Willison, I. M. Piggot, E. G. Davey ..	..	F. Murrant ..	..	G. Heyn & Sons, Ltd.
<i>Rancho</i> ..	..	GLKW	11. 9. 52	C. F. Halliday	..	W. V. N. Bradford, G. Savage, G. F. Sayer, A. Bousbridge ..	..	R. V. Gregory	..	P. & O. Steam Navigation Co.
<i>Rangitane</i> ..	..	GDBV	22. 9. 52	T. L. Maltby	..	E. Newing, C. S. Single, P. Moulton, A. Stokoe, H. A. Owen ..	..	C. L. Lambe	..	New Zealand Shipping Co., Ltd.
<i>Rangitata</i> ..	..	GSZN	4. 10. 52	G. Kinnel, O.B.E.	..	P. Ogden, A. Elliott, T. Wade, J. Hannah ..	..	J. Grant ..	..	New Zealand Shipping Co., Ltd.
<i>Rangitiki</i> ..	..	GSXW	31. 7. 52	A. E. Lettington, O.B.E., D.F.C.	..	P. R. Fletcher, J. Collins, R. Kinloch, D. Lavard ..	..	D. Charters ..	..	New Zealand Shipping Co., Ltd.
<i>Rangitoto</i> ..	..	GLMV	19. 8. 52	B. Evans	..	T. R. Walton, A. F. Jenkins, R. E. Baker, P. Lay ..	..	G. A. Parker	..	New Zealand Shipping Co., Ltd.
<i>Regent Hawk</i> ..	..	GMND	2. 10. 52	G. H. Hobson	..	Z. Wojewodzki, R. Armstrong, S. Henningway ..	..	R. W. Jones ..	..	Regent Petroleum Tankship Co. Ltd.
<i>Reina Del Pacifico</i> ..	..	GMDP	11. 7. 52	T. J. Naylor	..	R. T. Rley, R. Lewis, A. MacLean, P. Potts ..	..	Lt.-Cdr. J. Butler	..	Pacific Steam Navigation Co.
<i>Rhodesia Star</i> ..	..	GUAX	18. 9. 52	G. L. Evans, O.B.E.	..	K. J. Colombo, A. Morrison, R. H. Jones ..	..	C. I. Roe ..	..	Blue Star Line, Ltd.
<i>Rialto</i> ..	..	GBLV	30. 6. 52	H. Goodman	..	M. Taylor, F. Lewis, F. Rouse ..	..	C. Child ..	..	Ellerman's Wilson Line, Ltd.
<i>Richmond Castle</i> ..	..	GCSP	4. 3. 52	J. P. Aplin	..	I. C. McPherson, T. P. Hebden, J. R. Brooks ..	..	W. A. Plater	..	Union Castle Mail S.S. Co., Ltd.
<i>Ripplingham Grange</i> ..	..	GIGP	19. 9. 52	R. Owen	..	G. Spong, P. Walper, R. Abbott ..	..	L. Varmen ..	..	Houlder Bros. & Co., Ltd.
<i>Rochester Castle</i> ..	..	GZOF	10. 3. 52	H. L. Holland	..	F. J. Pigeon, C. Kelso, J. Cairns ..	..	T. St. J. Coleman	..	Union Castle Mail S.S. Co., Ltd.
<i>Roonagh Head</i> ..	..	GNIN	..	E. W. Black, O.B.E.	..	J. McCormick, J. James, G. Houston ..	..	B. P. Lewis ..	..	G. Heyn & Sons, Ltd.
<i>Roslin Castle</i> ..	..	GYIZ	19. 10. 52	C. E. Lorrains	..	J. R. Brook, A. C. Hinton, M. J. Norman ..	..	A. Stute ..	..	Union Castle Mail S.S. Co., Ltd.
<i>Rowallan Castle</i> ..	..	GDFY	29. 3. 52	T. Allen	..	M. J. Norman, L. R. Steen, G. D. Atwood ..	..	H. Dunning ..	..	Union Castle Mail S.S. Co., Ltd.
<i>Roxburgh Castle</i> ..	..	GBGS	18. 7. 52	G. E. Stephenson	..	G. W. John, Q. Beadon, M. Oates ..	..	F. Broadhurst	..	Union Castle Mail S.S. Co., Ltd.
<i>Royal Star</i> ..	..	MARJ	13. 10. 52	H. W. McNeil	..	E. A. Davies, E. V. Watt, B. I. Abbott ..	..	G. C. Cartwright	..	Blue Star Line, Ltd.
<i>Ruahine</i> ..	..	GKSY	30. 6. 52	A. I. Robertson, R.D., A.D.C., R.N.R.	..	J. Mason, F. Worster, J. Peattie, J. Cosker ..	..	J. Heath ..	..	New Zealand Shipping Co., Ltd.
<i>Runic</i> ..	..	GGCS	..	L. H. Edmeads	..	P. H. Carden, W. A. Hutchison, J. A. Wooler ..	..	A. McMurray	..	Shaw, Savill & Albion Co., Ltd.
<i>Sacramento</i> ..	..	GKCN	9. 9. 52	J. Robinson, M.B.E.	..	J. Howlett, A. K. Blake, M. D. E vans ..	..	A. L. Hall ..	..	Ellerman's Wilson Line, Ltd.
<i>Salacia</i> ..	..	GZRN	7. 6. 52	T. S. Graham	..	J. McCully, G. Manson, W. G. McKean ..	..	G. Fyfe ..	..	Donaldson Bros. & Black, Ltd.

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS/MANAGERS
<i>Salamanca</i>	GLSG	9.1.52	D. W. Hutchinson	R. B. Bryant, E. Swan, A. D. Hutchinson	J. White	Pacific Steam Navigation Co.
<i>Salanery</i>	GBLO	7.11.51	A. G. Litherland	A. C. Gordon, J. H. Allenby, T. Wilcockson	.. Weekes	Pacific Steam Navigation Co.
<i>Satinas</i>	GLLK	29.5.51	R. C. Shellorn	J. T. Bruse, R. K. Thomas, H. McNearne	..	Pacific Steam Navigation Co.
<i>Salween</i>	GFFN	12.8.52	H. V. V. Poole	T. F. Fields, J. Morgan, J. McGeachan, K. Brooks	..	P. Henderson & Co.
<i>Samanco</i>	MARQ	2.4.52	J. Williams	C. Pringle, P. D. O'Driscoll, O. A. Baker	A. H. Brown	Pacific Steam Navigation Co.
<i>Samaria</i>	GJCF	25.9.52	J. V. Locke, R.D., R.N.R.	D. Calvert, M. W. Roberts, O. F. Elson	L. Cassidy	Cunard Steamship Co., Ltd.
<i>San Adolfo</i>	GYKK	26.2.52	S. Miller, O.B.E.	A. Grunson, J. Munday, A. Hiking	E. Bishop	Eagle Oil & Shipping Co., Ltd.
<i>San Cirilo</i>	GZMR	7.5.52	G. R. Pearson	G. Hughes, N. J. Cocker, D. Smith	J. Forrester	Eagle Oil & Shipping Co., Ltd.
<i>San Felix</i>	GFJZ	3.7.51	C. Summers	W. W. Gibb, K. D. Harrison, P. Hodges	F. Devlin	Eagle Oil & Shipping Co., Ltd.
<i>San Velino</i>	GCNY	8.8.51	J. Thompson	W. Richardson, A. Andrews, W. Hughes	D. J. Locke	Eagle Oil & Shipping Co., Ltd.
<i>San Veronica</i>	MASQ	3.9.52	M. A. Connell, M.B.E.	L. F. Lawrence, J. Bright, A. Argent, R. Davies	.. Blake	Eagle Oil & Shipping Co., Ltd.
<i>San Vulfrano</i>	MASR	13.5.52	L. Mays	J. G. Hughes, D. Shales, K. Spenser	H. Sorenson	Eagle Oil & Shipping Co., Ltd.
<i>Sansu</i>	GQQN	..	O. Owens, O.B.E.	W. Knight, A. G. Davies, M. Johnston, R. Martin	A. Smith	Eagle Oil & Shipping Co., Ltd.
<i>Santander</i>	GBNR	1.1.52	G. H. Rice	W. A. Washington, D. I. Jones, G. E. Mitchell	D. Graves	Elder Dempster Lines, Ltd.
<i>Sarmiento</i>	MARW	26.1.52	G. B. Wardale	F. Nuttall, E. J. Pepper, R. J. Clare	G. H. McClelland	Pacific Steam Navigation Co.
<i>Saxon Star</i>	MARX	30.4.52	R. J. C. McDonald	P. King, E. H. Grayson, G. J. Miles	J. J. Hickey	Pacific Steam Navigation Co.
<i>Scythia</i>	GDYP	25.4.52	G. H. Morris	P. S. Taylor, T. Grinrod, J. Harner, A. Christie	A. Brown	Blue Star Line, Ltd.
<i>Selector</i>	MARZ	23.8.52	Lewis-Jones	R. Patmore, —, Heaps	S. R. Brown	Cunard Steamship Co., Ltd.
<i>Settler</i>	GTTX	4.7.52	W. F. Phillips	R. J. Turnbull, G. W. McGuinness, D. W. Johnston	L. C. Pye	T. & J. Harrison
<i>Sherborne</i>	MFDS	3.10.52	G. R. Handcock	F. Gardner, W. Coombes, A. Hutchings	M. O'Donnell	T. & J. Harrison
<i>Shelbank</i>	GDPZ	11.2.52	W. Ford	N. Holiday, C. H. Drummond, B. E. Watson	J. Boucaut	Graig Shipping Co., Ltd.
<i>Silvergata</i>	GMVK	4.12.51	J. Duncan, O.B.E.	J. E. Sellars, D. Ashley, J. Bowman	W. C. Arscott	Andrew Weir & Co., Ltd.
<i>Silverskrok</i>	GCQR	25.4.52	E. Palmer	I. Robertson, F. Hewett, C. Goddard, D. Walker	W. O'Meara	Silver Line, Ltd.
<i>Silversandal</i>	GSFQ	16.4.52	Austin N. Hurst	G. F. Lightfoot, P. R. Miller, A. D. Goddard	D. Stewart	Silver Line, Ltd.
<i>Silvervalnut</i>	GSFT	7.6.52	C. J. Metcalf	J. Meadows, M. Bingham, M. H. F. Smith	B. P. Killeen	Silver Line, Ltd.
<i>Sneaton</i>	GDBS	11.6.52	W. Armstrong	E. Wilson, M. Turtand, W. Atkinson, T. Ellerby	A. Wake	Silver Line, Ltd.
<i>Socotra</i>	MASC	13.5.52	H. R. Banks	J. R. Turner, J. W. C. Bunker	O. Mahoney	Headlam & Son
<i>Somerset</i>	GJMN	8.4.52	H. R. M. Smith	C. A. Miller, P. R. Moulton, K. A. Murray	W. N. Freeman	P. & O. Steam Navigation Co.
<i>South Africa Star</i>	GUAU	4.3.52	R. M. T. Jones	R. Taylor, L. J. Thompson, H. A. Sproul, Cran, B. Pearson	D. Broome	Federal Steam Nav. Co., Ltd.
<i>Southern Atlantic</i>	GBLY	22.7.52	J. O. Bowie	A. D. Petrie, T. Storey, G. Vaughan	B. Hacker	Blue Star Line, Ltd.
<i>Southern Collins</i>	MASE	24.7.52	L. Robertson	A. Aitken, R. Hutcheon, A. Smith	P. Curzon	Chr. Salvesen & Co.
<i>Southern Garden</i>	MASF	24.10.52	W. J. Swanson	W. Scott, S. McGillivray, A. Smith	J. Edmond	Chr. Salvesen & Co.
<i>Southern Venture</i>	GNNM	25.4.52	H. Myhre	J. Balfour, A. Haikness, K. Sherkestad, J. Holtan	G. Campbell	Chr. Salvesen & Co.
<i>Sovac</i>	GDDV	4.12.51	M. W. Wilcox	W. Morton, C. S. Hagger, J. Scollay	I. MacMortan	Chr. Salvesen & Co.
<i>Specialist</i>	GCYF	29.10.51	D. Wolstenholme	R. M. Harrison, W. E. Hinde, T. F. Maddox	W. Holbrook	Vacuum Oil Co., Ltd.
<i>Springfjord</i>	GQKQ	18.1.49	T. R. Mackle	J. Reid	J. Harrison	T. & J. Harrison
					A. Guy	Springwell Shipping Co., Ltd.



NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS/MANAGERS
<i>Vardulia</i>	GCFW	17.5.52	A. N. Sargent, O.B.E., R.D., R.N.R.	C. J. Burtinshaw, J. Clemenson, B. O'Brien	J. Murphy	Cunard Steamship Co., Ltd.
<i>Vestra</i>	MNNB	6.3.52	D. S. Archibald	H. M. Thurd, D. C. White, H. C. Cunier	D. C. White	J. T. Salvesen & Co.
<i>Volo</i>	GPCJ	14.2.52	A. Morrell	E. Beaumont, M. D. Evans, A. L. Telfer	G. Williams	Ellerman's Wilson Line, Ltd.
<i>Waipawa</i>	GWXQ	2.8.52	A. E. Warren	T. J. Whiston, F. Sangster, B. Cavendish-Tribe	J. Houghney	Shaw, Savill & Albion Co., Ltd.
<i>Wairangi</i>	MATX	7.10.52	R. S. Mackenzie	M. D. Johnstone, D. M. Mortimer, E. E. Snaith, J. W. Walker	N. V. Harnell	Shaw, Savill & Albion Co., Ltd.
<i>Waizera</i>	GBJB	31.7.52	P. Campbell	J. Mudd, —, Chaudler, —, Newport, R. Valvona	J. Downie	Shaw, Savill & Albion Co., Ltd.
<i>Walvis Bay</i>	GKBZ	25.2.52	H. Gentles	J. N. Neck, T. Hastings, J. W. Curry	J. T. Macdonald	Sir R. Ropner & Co., Ltd.
<i>Wanstead</i>	GFLS	12.1.52	D. G. Martin	F. O. Shorter, L. W. Crump, D. J. Young	A. H. Stewart	Watts, Watts & Co., Ltd.
<i>Warborough</i>	MALF	11.7.52	N. Thompson	A. Hurst, G. B. Bell, D. Poplewell	S. Wardle	R. S. Dalgliesh, Ltd.
<i>Warwick Castle</i>	GRRJ	18.12.51	L. H. Farrow	—, Taylor, A. George, N. Upham	G. Shaw	Union Castle Mail S.S. Co., Ltd.
<i>Wendover</i>	GFML	31.7.52	W. Donald	R. T. Mudd, D. J. Vincent, M. King	N. Ridley	Watts, Watts & Co., Ltd.
<i>Winchester Castle</i>	GTPZ	16.10.52	G. W. B. Lloyd	J. D. Macmillan, A. D. Mildren, J. Canner	R. Brew	Union Castle Mail S.S. Co., Ltd.
<i>Woodford</i>	GFMM	7.6.52	W. Shields, O.B.E.	M. Diggins, S. Kirby, —, Partridge	W. McKenzie	Watts, Watts & Co., Ltd.
<i>Worcestershire</i>	GFZM	11.9.52	F. V. Brooks	R. Weir, A. M. Maclean, J. Morris	W. Fletcher	Bibby Bros. & Co.
<i>Yoma</i>	GLPN	7.10.52	S. Thompson	J. Thomson, W. Stuart, J. Logan	W. Allen	P. Henderson & Co.
<i>Zealandic</i>	MAGJ	4.10.52	P. F. Owens	J. S. Rutherford, D. Anderton, A. Adams, —, Roberts	A. MacLennan	Rio Cape Line, Ltd.
<i>Zetloun</i>	GCYY	24.9.52	E. W. V. Garratt	J. Dexter, H. C. Pugh, J. Gunn	M. Prior	Baltic Trading Co., Ltd.
<i>*Queen of Bermuda</i>	GZKF		L. F. Banyard, O.B.E.	N. E. James	H. Stennett	Furness Withy & Co., Ltd.

\* This ship has been recruited by the Bermuda Meteorological Service.

### Supplementary Ships

NAME OF VESSEL	CALL SIGN	LAST RETURN RECEIVED	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS/MANAGERS
<i>Belleby</i>	MQJF	11.7.52	S. Richards	N. Grant, R. H. Anderson, E. Noble	I. Isherwood	Ropner Shipping Co., Ltd.
<i>Blatclovea</i>	GLLG	14.10.52	J. McVean	K. Muir, H. Towers, A. Findlay	E. Yard	Clydesdale Navigation Co.
<i>Cape Bryton</i>	GLXG	18.9.52	R. Reid	T. R. Baker, W. J. Clarke, M. Symon	V. Dalton	C. T. Bowring & Co., Ltd.
<i>Cape Howe</i>	GCYP		J. McG. Brown	D. McDiarmid, A. McKendrick, D. F. Storey, A. Hutcheon	J. McDonald	Cape of Good Hope Motorship Co.
<i>Circassia</i>	GZMD					Anchor Line, Ltd.



## MARID SHIPS

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

NAME OF SHIP	CALL SIGN	CAPTAIN	OWNERS/MANAGERS
<i>Actuality</i>	GPPF	W. Conn	F. T. Everard & Sons, Ltd.
<i>Amsterdam</i>	MFBP	C. R. Baxter, D.S.C.	British Transport Commission
<i>Angelo</i>	GQFY	S. N. Stokes	Ellerman's Wilson Line, Ltd.
<i>Ariosto</i>	GKPW	J. R. Stilwell	Ellerman's Wilson Line, Ltd.
<i>Atlantic Coast</i>	GWSY	C. A. Hopkins	Coast Lines, Ltd.
<i>Barra Head</i>	MPQZ	W. Flett	A. F. Henry & MacGregor, Ltd.
<i>Belhaven</i>	MNXZ	P. L. Irvine	London & Edinburgh Shipping Co., Ltd.
<i>Belvooch</i>	MKGV	T. Wallace	London & Edinburgh Shipping Co., Ltd.
<i>Belvina</i>	MLZF	W. Fisher	London & Edinburgh Shipping Co., Ltd.
<i>British Scout</i>	GJKD	W. G. Dunbar	British Tanker Co., Ltd.
<i>Cambria</i>	GBKT	N. L. Williams	British Transport Commission
<i>Clupea</i>	GOAJ	J. Jappy	Fishery Board for Scotland
<i>Corfen</i>	GDJX	S. D. Granger	Wm. Cory & Son, Ltd.
<i>Corfleet</i>	GWTD	A. G. Waller	Cory Maritime Ltd.
<i>Corfoss</i>	MAHX	W. F. Farrant	Wm. Cory & Son, Ltd.
<i>Cormain</i>	MAHT	R. B. Armstrong	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	J. U. Hansen	Wm. Cory & Son, Ltd.
<i>Cormull</i>	MAHS	E. R. W. Allen	Wm. Cory & Son, Ltd.
<i>Corncrake</i>	MJKL	K. W. Carmalt	General Steam Nav. Co., Ltd.
<i>Crane</i>	MMCS	K. Nicholls	General Steam Nav. Co., Ltd.
<i>Drake</i>	MMYC	W. Lockhart	General Steam Nav. Co., Ltd.
<i>Duke of Argyll</i>	GNVX	A. E. Willmott, D.S.C., R.D., R.N.R.	British Transport Commission
<i>Duke of Lancaster</i>	GCPQ	J. Irwin	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. N. Johnson	Ministry of Transport
<i>Empire Gaelic</i>	MAVR	H. T. Green	Ministry of Transport
<i>Explorer</i>	MRCZ	G. B. McLaren	Scottish Home Department
<i>Falcon</i>	MNXL	S. W. Develin	General Steam Nav. Co., Ltd.
<i>Fidra</i>	MKQQ	T. Henry	Scottish Navigation Co., Ltd.
<i>Golden Dawn</i>	MLZV	A. Adamson, M.B.E.	The Captain
<i>Great Western</i>	GWRD	B. H. Mendus	British Transport Commission
<i>Grebe</i>	MAEY	E. C. Painter, D.S.C.	General Steam Nav. Co., Ltd.
<i>Guernsey Coast</i>	MANS	H. Keilit	British Channel Islands Shipping Co., Ltd.
<i>Harrogate</i>	MNDB	J. H. Walters	Wilson's & N.E. Railway Shipping Co., Ltd.
<i>Hibernia</i>	MBMT	R. Woodall	British Transport Commission
<i>Highwood</i>	MLQQ	J. Copeland	High Hook Shipping Co., Ltd.
<i>Horsa</i>	MPFJ	D. Dickson	Currie Line, Ltd.
<i>Isle of Guernsey</i>	GQYJ	F. Breudlay	British Transport Commission
<i>Isle of Jersey</i>	GRBQ	A. Light	British Transport Commission
<i>Isle of Sark</i>	GTSR	C. E. Durley	British Transport Commission
<i>Jura</i>	MARU	L. J. Blanche	Admiral Shipping Co., Ltd.
<i>Kinnaird Head</i>	GCSQ	J. Grant	A. F. Henry & MacGregor, Ltd.
<i>London Merchant</i>	MBRZ	C. A. Piper	London Scottish Lines, Ltd.
<i>Marine Craft Unit</i> (R.A.F.) No. 1102		Ft./Lt. D. A. Koster	Royal Air Force
<i>Melrose</i>	MCFD	G. Simpson	Geo. Gibson & Co., Ltd.
<i>Melrose Abbey</i>	GSYW	J. Laverack	Hull & Netherlands S.S. Co., Ltd.
<i>Minna</i>	GKPS	T. Mather	Fishery Board for Scotland
<i>Moray Coast</i>	MKDL	P. N. Leask	Coast Lines, Ltd.
<i>Narva</i>	GQFP	R. J. McNinch	Glen & Co. (Scottish Nav. Co., Ltd.)
<i>Ocean Coast</i>	GYMP	G. Mearns	Coast Lines, Ltd.
<i>Orsa</i>	MATZ	S. Young	Clydesdale Shipowners Co., Ltd.
<i>Peregrine</i>	GIGM	C. C. Reynolds	General Steam Nav. Co., Ltd.
<i>Rattray Head</i>	GCBR	J. Graham	A. F. Henry & McGregor, Ltd.
<i>Rora Head</i>	MKVB	A. F. Ramsay	N. of Scotland & Ork. & Shet. S.N. Co., Ltd.
<i>Runa</i>	GFSW	J. Gilfillan	Clydesdale Shipowners Co., Ltd.
<i>St. Abbs Head</i>	GODU	P. Stickle	A. F. Henry & MacGregor & 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.
<i>St. Helier</i>	GLBT	R. Pitman, D.S.C.	British Transport Commission
<i>St. Julien</i>	GLBV	L. J. Richardson	British Transport Commission
<i>St. Magnus</i>	GFBK	W. G. Stout	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>Seamew</i>	GBWY	E. C. Painter, D.S.C.	General Steam Navigation Co., Ltd.
<i>Selby</i>	MLFT	A. C. Allen	Wilson's & N.E. Railway Shipping Co., Ltd.
<i>Slieve Bawn</i>	MQCC	W. N. Greenwood	British Transport Commission
<i>Slieve Bearnagh</i>	MLNL	J. B. Williams	British Transport Commission
<i>Slieve Bloom</i>	MQDD	E. A. Horspool	British Transport Commission
<i>Slieve Donard</i>	MQCQ	A. C. Borthwick	British Transport Commission
<i>Slieve League</i>	MQCM	W. E. Meade	British Transport Commission
<i>Slieve More</i>	MQBM	C. A. Winckle	British Transport Commission
<i>Southern Coast</i>	MASD	G. Goldman	Coast Lines, Ltd.
<i>Thelma</i>	MBKK	F. Fairweather	Clydesdale Shipowners Co., Ltd.
<i>Truro</i>	GJTO	H. Dunkley	Ellerman's Wilson Line, Ltd.
<i>Vanellus</i>	GDVV	J. E. Green	British & Continental S.S. Co., Ltd.
<i>Vienna</i>	GTBR	A. Pearson Sutton	Ministry of Transport

## TRAWLERS

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

NAME OF TRAWLER	CALL SIGN	MASTER	OWNERS/MANAGERS
<i>Admiral Sir John Lawford</i>	GMVW	N. Jinks .. ..	Iago Steam Trawler Co.
<i>Boston Typhoon</i> .. ..	MTDR	J. Betty .. ..	Boston Deep Sea Fishing Co.
<i>Carella</i> .. ..	GRRV	T. Harris .. ..	Dinas Steam Trawling Co., Ltd.
<i>Ernest Holt</i> .. ..	GFXD	H. J. Aldiss .. ..	Ministry of Agriculture and Fisheries
<i>Frobisher</i> .. ..	GTRN	T. Sutton .. ..	Short Blue Fishing Co., Ltd.
<i>Lammermuir</i> .. ..	MFCF	R. Cooke .. ..	B. A. Parkes, Ltd.
<i>New Prince</i> .. ..	GBRN	M. Wright .. ..	Heward Trawlers, Ltd.
<i>Red Charger</i> .. ..	GCNF	R. Wright .. ..	Iago Steam Trawler Co., Ltd.
<i>Red Crusader</i> .. ..	GTBP	K. Hames .. ..	Iago Steam Trawler Co., Ltd.
<i>Red Hackle</i> .. ..	MLCX	E. Littler .. ..	Iago Steam Trawler Co., Ltd.
<i>Red Knight</i> .. ..	MBQT	M. Wright .. ..	Iago Steam Trawler Co., Ltd.
<i>Red Lancer</i> .. ..	MKTP	J. Tomlinson .. ..	Iago Steam Trawler Co., Ltd.
<i>Red Rose</i> .. ..	MFMX	J. McKernon .. ..	Iago Steam Trawler Co., Ltd.
<i>Robert Hewett</i> .. ..	MDYS	G. Elliott .. ..	Hewett Fishing Co., Ltd.
<i>St. Amant</i> .. ..	GFVD	J. Dobson .. ..	J. Marr & Son, Ltd.
<i>St. Britwin</i> .. ..	MFJX	J. H. Miller .. ..	T. Hamling & Co., Ltd.
<i>St. Elstan</i> .. ..	GDDL	G. Argumont .. ..	T. Hamling & Co., Ltd.
<i>St. Nectan</i> .. ..	GZJY	L. Abbey .. ..	T. Hamling & Co., Ltd.
<i>Woolton</i> .. ..	MBFN	P. Bedford .. ..	Wyre Steam Trawling Co., Ltd.
<i>Wyre General</i> .. ..	GDXW	R. Hutcheon .. ..	Wyre Steam Trawling Co., Ltd.

## TRAINING ESTABLISHMENTS

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

ESTABLISHMENT	CAPTAIN/SUPERINTENDENT	LAST RETURN RECEIVED
<i>Conway, H.M.S.</i> .. ..	E. Hewitt, R.D., Capt., R.N.R. .. ..	12.8.52
<i>Pangbourne Nautical College</i> .. ..	H. C. Skinner, O.B.E., Cdr., R.N.R. .. ..	31.7.52
<i>Warsash, School of Navigation</i> .. ..	H. S. Stewart .. ..	31.7.52
<i>Moyana</i> .. ..	(Director: G. W. Wakeford) .. ..	8.12.51
<i>South Hill</i> .. ..		
<i>Worcester, H.M.S.</i> .. ..	G. C. Steele, V.C., Cdr., R.N. (Retd.) .. ..	31.7.52

## FLEET LIST (Canada) VOLUNTARY OBSERVING SHIPS

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

NAME OF VESSEL	OWNERS
Selected Ships	
<i>Aorangi</i> .. ..	Canadian Australasian Line.
<i>Canadian Challenger</i> .. ..	"Canadian Challenger", Ltd. (Canadian National Steamships).
<i>Canadian Constructor</i> .. ..	"Canadian Constructor", Ltd. (Canadian National Steamships).
<i>Canadian Cruiser</i> .. ..	"Canadian Cruiser", Ltd. (Canadian National Steamships).
<i>Esso Knoxville</i> .. ..	Imperial Oil, Ltd.
<i>Fort Amherst</i> .. ..	Furness, Withy & Co.
<i>Fort Townshend</i> .. ..	Furness, Withy & Co.
<i>Imperial Alberta</i> .. ..	Imperial Oil, Ltd.
<i>Imperial Charlottetown</i> .. ..	Imperial Oil, Ltd.
<i>Imperial Fredericton</i> .. ..	Imperial Oil, Ltd.
<i>Imperial Quebec</i> .. ..	Imperial Oil, Ltd.
<i>Imperial Toronto</i> .. ..	Imperial Oil, Ltd.
<i>Imperial Winnipeg</i> .. ..	Imperial Oil, Ltd.

**FLEET LIST (Canada)—contd.**

NAME OF VESSEL	OWNERS
<i>John S. Pillsbury</i> .. .. .	Upper Lakes and St. Lawrence Transportation Co. Ltd.
<i>Lady Nelson</i> .. .. .	"Lady Nelson", Ltd. (Canadian National Steamships).
<i>Lady Rodney</i> .. .. .	"Lady Rodney", Ltd. (Canadian National Steamships).
<i>Lake Manitou</i> .. .. .	Western Canada Steamship Co., Ltd.
<i>Lake Minnewanka</i> .. .. .	Western Canada Steamship Co., Ltd.
<i>Lake Pennask</i> .. .. .	Western Canada Steamship Co., Ltd.
<i>Lake Sicamous</i> .. .. .	Western Canada Steamship Co., Ltd.
<i>Lake Winnipeg</i> .. .. .	Western Canada Steamship Co., Ltd.
<i>Lakemba</i> .. .. .	B. C. Ship Chartering Co., Ltd.
<i>Ottawa Valley</i> .. .. .	Montreal, Australia, New Zealand Line, Ltd.
<i>Pinnacles</i> .. .. .	Deep-Sea Tankers, Ltd.
<i>Rupert Island</i> .. .. .	Hudson's Bay Co., Ltd.
<i>Tantara</i> .. .. .	Johnson Walton Steamships, Ltd.
<i>Waihemo</i> .. .. .	Canadian Union Line, Ltd.
<i>Waikawa</i> .. .. .	Canadian Union Line, Ltd.
<i>Wairuna</i> .. .. .	Canadian Union Line, Ltd.
<i>Waitomo</i> .. .. .	Canadian Union Line, Ltd.
Lightships :	
<i>Lurcher Lightship</i> .. .. .	Minister of Transport.
<i>Sambro Lightship</i> .. .. .	Minister of Transport.

**FLEET LIST (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>Kaitoke</i> .. .. .	Union Steam Ship Company of New Zealand, Ltd.
<i>Kawaroa</i> .. .. .	Union Steam Ship Company of New Zealand, 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>Kurou</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>Waimate</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>Waitaki</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>Kaimanawa</i> .. .. .	Union Steam Ship Company of New Zealand, Ltd.
<i>Kaimiro</i> .. .. .	Union Steam Ship Company of New Zealand, Ltd.
<i>Kaitangata</i> .. .. .	Union Steam Ship Company of New Zealand, Ltd.
<i>Kaitawa</i> .. .. .	Union Steam Ship Company of New Zealand, Ltd.
<i>Karepo</i> .. .. .	Union Steam Ship Company of New Zealand, Ltd.
<i>Kartigi</i> .. .. .	Union Steam Ship Company of New Zealand, Ltd.
<i>Katui</i> .. .. .	Union Steam Ship Company of New Zealand, Ltd.
<i>Kawatiri</i> .. .. .	Union Steam Ship Company of New Zealand, Ltd.
<i>Kiwitea</i> .. .. .	Union Steam Ship Company of New Zealand, Ltd.
<i>Konui</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>Viti</i> .. .. .	Tasman Steam Ship Company, Ltd.

## FLEET LIST (Australia) VOLUNTARY OBSERVING SHIPS

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

NAME OF VESSEL	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS/AGENTS
Selected Ships:				
<i>Canara</i>	W. Bird, O.B.E.	T. Woodward, J. D. Campbell, C. C. Springall	P. A. Stuart	British India Steam Nav. Co.
<i>Chupra</i>	J. D. Woods	C. Allerton, H. S. Strawbridge, W. L. Hillcoat	R. C. Whiting	British India Steam Nav. Co.
<i>Idomeneus</i>	J. L. Johnston	W. A. Clark, G. D. F. Cruickshank, P. S. Lombard, G. Moncks	A. N. Williams	A. Holt & Co.
<i>Koolinda</i>	J. S. Airey	J. Paulsen, J. Palfreyman, R. Seaward	H. White	Western Australian State Steamships
<i>Koomilya</i>	F. W. Roberts	C. Stewart, R. Sicking, G. Steinbeck	F. Mackie	McIlwraith, McEacharn, Ltd.
<i>Kooronga</i>	F. McLean	A. D. Hanson, V. Bovell, J. A. Grey	R. M. Rees	McIlwraith, McEacharn, Ltd.
<i>Lawana</i>	L. Fry	C. A. Blow, T. H. Millidge, J. K. Saint	J. Bell	Melbourne Steamship Co., Ltd.
<i>Nellore</i>	T. Mills	A. Johnston, G. Champion, G. Cleveland, K. Skinner	J. Dennison	Eastern & Australian S.S. Co., Ltd.
<i>Orestes</i>	F. J. Cockburn	A. Surtees, G. Kitching, R. Denning, P. Beckett	J. Dennison	A. Holt & Co.
<i>River Burnett</i>	L. G. Ramsay	R. Campbell, H. W. Robinson, T. Beckinsale	F. E. Audsley	Australian Shipping Board
<i>River Clarence</i>	W. W. Fish	A. T. Lake, I. K. S. Adam, S. F. Dockwell	G. Harper	Australian Shipping Board
<i>River Mitra</i>	A. Knight	G. Davies, K. Clarence, W. Wiggins	M. Pearson	Australian Shipping Board
<i>Triadic</i>	A. Rhoades	J. P. Milton, W. L. Harboard, W. B. Jeavons	M. Hayter	British Phosphate Commission
<i>Trienza</i>	P. Richardson	D. Neilson, D. Robb, K. Oliver	J. Ward	British Phosphate Commission
<i>Triona</i>	C. L. Evans	P. W. Thompson, S. E. B. Harris, B. J. Robertson	R. G. Neale	British Phosphate Commission Huddart, Parker, Ltd.
<i>Wanganella</i>	—	—	—	—
Supplementary Ships				
<i>Diomed</i>	A. M. Caird	H. A. Jeffrey, K. W. Dunlop, E. Webb	C. Palmer	A. Holt & Co.
<i>Derrigo</i>				Australian Shipping Board
<i>Kybra</i>				Western Australian State Steamships

## FLEET LIST (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 OPERATORS
<i>Anbing</i>	J. Taylor	W. Pollock, J. F. O'Connor, J. R. Suffren	D. F. MacDonald	China Navigation Co., Ltd.
<i>Anshun</i>	D. McG. Holmes	Ferguson, H. A. Ledtboer, F. T. Guinn	E. G. Inwood	China Navigation Co., Ltd.
<i>Castle Peak</i>	A. L. Waites	T. Hunter, Yuan King Lau, J. K. Chan	Kwok Shek Hee	Mollers' (Hong Kong), Ltd.
<i>Changsha</i>	E. Bruce	V. R. Woolfe, A. W. K. Prosser, W. T. Masters	T. W. Pomeroy	China Navigation Co., Ltd.
<i>Changte</i>	A. M. Tullock	G. D. Davey, R. A. Smith, B. G. White	R. McNamara	Australian Oriental Line
<i>Choy Sang</i>	W. E. Reeve	P. J. Sullivan, J. Taylor, M. J. Pope	R. M. Legg	Indo-China Steam Navigation Co., Ltd.
<i>Chun Sang</i>	D. G. R. Kinnear	J. G. Perrin, P. G. Harkness, K. C. Yeung	E. West	Indo-China Steam Navigation Co., Ltd.
<i>Eastern Glory</i>	H. J. Cairns	I. J. Ashcroft, R. H. McAlister, R. F. Nicholls	C. D. Evans	Indo-China Steam Navigation Co., Ltd.
<i>Eastern Queen</i>	D. G. Burleigh	W. J. Bartlett, J. Krasucki, D. Thompson	R. O. Smith	Indo-China Steam Navigation Co., Ltd.
<i>Eastern Saga</i>	S. Schofield	G. Parish, A. N. Johnston, J. M. Taylor, J. B. Bowman	R. J. Bartlett	Indo-China Steam Navigation Co., Ltd.
<i>Eastern Star</i>	J. H. Fraser	C. Thomson, T. H. Nichols, A. D. Caporn, P. K. Phoenix	A. Smith	Indo-China Steam Navigation Co., Ltd.
<i>Eastern Trader</i>	J. L. Baines	A. C. Tai, Y. S. Loh, S. H. Loo	Simon Chang	Great Southern Steamship Co., Ltd.
<i>Elsheth</i>	E. C. Thomson	D. O. Conway, O. Y. Wellington	K. Y. Pun	Shun Cheong S. N. Co.
<i>E Sang</i>	E. J. Thomson	F. H. Main, M. J. K. Crichton, T. Y. Yuen	W. I. Briggs	Indo-China Steam Navigation Co., Ltd.
<i>Fengting</i>	C. A. N. Baker	I. C. Keddie, A. L. Thomas, S. K. Chen	Leung Cheuk	China Navigation Co., Ltd.
<i>Fengtien</i>	F. Gibbs	A. C. Anderson, L. W. Rothwell, C. F. Chan	Leung Shu Fun	China Navigation Co., Ltd.
<i>Foochow</i>	J. W. Evans	S. H. Liu, P. Baxter, A. P. Sokoloff	Leung Tjeuk Shing	China Navigation Co., Ltd.
<i>Fort Charlotte</i>	F. G. Edwards	J. R. Dixon, R. H. Gollup, J. Logan	G. H. Parker	Royal Fleet Auxiliary
<i>Fukien</i>	A. H. Finnie	I. Hunter, W. N. Murray, J. C. Mark	Leung Man Hin	China Navigation Co., Ltd.
<i>Funing</i>	N. McMillan	G. A. Abbs, D. L. Wilson, F. A. S. Millar	D. E. Favares	China Navigation Co., Ltd.
<i>Hai Lee</i>	J. Hansen	T. K. Pedersen, G. Glasoy, K. Ncss	Wuie Iu Chan	China Siam Line
<i>Hai Meng</i>	T. Stange Olsen	B. Thodesen, A. Holmvik, P. Brandal	Chan Kam Tsun	China Siam Line
<i>Hang Sang</i>	L. F. G. Fotheringham	W. Graham, W. E. MacLackland, Keng Jen Ko	Wong On Chung	Indo-China Steam Navigation Co., Ltd.
<i>Hanyang</i>	R. A. D. Nielsen	A. Harper, W. E. O'Connor, J. H. M. Twilbill	R. A. Wilson	China Navigation Co., Ltd.
<i>Henrich Jessen</i>	O. Osterberg	C. S. Jensen, W. Kronnebitter, Lam Poh Shui	T. G. Oliver	Jebesen & Co., Ltd.
<i>Hermelin</i>	O. Apold	L. Eide, A. Skjervestad, S. Sørvik	Lai Kwong Yin	China Siam Line
<i>Hernod</i>	R. G. G. Stanton	J. Eide, M. Sandvik, R. Grønvald	So Yuet Hand	China Siam Line
<i>Hew Sang</i>	G. W. F. Edwards	L. Ovsiannikoff, J. Adair, W. M. Coates	Chan Kwok Chuen	Indo-China Steam Navigation Co., Ltd.
<i>Hin Sang</i>	G. W. Milbourn	A. A. Watson, M. de Verteuil, J. H. Jeffries	Ma Ping Leung	Indo-China Steam Navigation Co., Ltd.
<i>Hippopotamus</i>	S. Jensen	W. S. E. Cream, Pak Kam Chuen	P. H. Chan	Wallers & Co., Ltd.
<i>Hiram</i>	A. Fieldheim	A. Andersen, H. Fredenborg, O. Sivertsen	H. Fastingsen	China Siam Line
<i>Hoi Houo</i>	Kr. Munkeljeore	O. Ofteidal, O. Urseth, A. Johannesen	A. J. Takvam	Karsten Larssen & Co. (Hong Kong), Ltd.
<i>Hoi Wong</i>	H. Pilling	B. Maeland, A. Vespstad, M. Madsen	Liu Yuk Kong	Karsten Larssen & Co. (Hong Kong), Ltd.
<i>Huanan</i>	R. E. Selwyn Jones	J. R. Keddie, D. S. Southey, J. Robinson	Tsang Kau	China Navigation Co., Ltd.
<i>Hupei</i>	T. C. W. Marr	V. Walker, G. Baxter, R. M. Snowie	J. E. Chew	China Navigation Co., Ltd.
<i>Lok Sang</i>		R. J. Cooper, M. T. G. Fish, C. M. Gibbs		Indo-China Steam Navigation Co., Ltd.
<i>Mut Heng</i>				Chin Seng Hong Shipping Co., Ltd.
<i>Mut Hook</i>				Chin Seng Hong Shipping Co., Ltd.
<i>Nordstjernen</i>	K. A. Nissen	P. A. Perswaid, F. A. Hartmann, S. A. Arneskans	K. I. Danborn	Everett Steamship Corporation
<i>Pakhot</i>	G. T. M. Ramsay	G. S. Ireland, R. E. Easley, V. A. Boutskoi	Leung Kan	China Navigation Co., Ltd.
<i>Poyang</i>	J. W. E. Warrior	S. J. Yeandle, A. Bartley, I. A. Scott	Li San Kau	China Navigation Co., Ltd.

NAME OF SHIP	CAPTAIN	OBSERVING OFFICERS	RADIO OFFICER	OWNERS/MANAGERS
<i>Produce</i>	L. Hetland	J. Aksnes, J. Samuelsen, L. Fagerland	P. Worre	Karsten Larssen & Co. (Hong Kong), Ltd.
<i>Sangola</i>	R. F. Weatherseed	W. S. Maar, J. M. Woolcock, H. L. Thein	S. G. Wessel	British India S. N. Co., Ltd.
<i>Shansi</i>	W. E. Awock	C. N. Stewart, B. J. S. Squire, S. T. Sung	Wai Pun Un	China Navigation Co., Ltd.
<i>Shengking</i>	E. H. Histed	R. Perry, J. R. Brett, S. N. Lai	R. R. Stevenson	China Navigation Co., Ltd.
<i>Shillong</i>	G. A. Wild	B. D. H. Thomson, E. Snowden, J. F. Bannister	M. McKinnon	British India S. N. Co., Ltd.
<i>Simbiang</i>	A. Taylor	A. V. Harrison, D. S. M. Tosh, T. R. Young	Chin Fook On	China Navigation Co., Ltd.
<i>Sirdhana</i>	A. A. Lewis	R. I. Higgin, K. Malsowski, T. K. Kelso, P. A. Berridge	H. M. O. Garman	British India S. N. Co., Ltd.
<i>Soochow</i>	G. P. Cope	D. W. R. Cash, A. O. Atkinson, T. Harrison	U. In San	China Navigation Co., Ltd.
<i>Star Alcyone</i>	C. V. A. Almstrom	K. G. Lindh, S. D. Bayliss, J. O. Blomberg	E. O. Lindahl	Everett Steamship Corporation
<i>Szechuen</i>	D. Needham	W. Davidson, J. Paton, R. A. Burton	Choi Pong Cheung	China Navigation Co., Ltd.
<i>Taiyuan</i>	Y. N. Campbell	A. Watson, D. A. Hutchinson, L. L. Watson	R. M. Inwood	China Navigation Co., Ltd.
<i>Tak Sang</i>	W. T. Rochester	E. M. Norman, C. Przybylinski, K. Y. Feng	P. J. Behan	Indo-China Steam Navigation Co., Ltd.
<i>Thai</i>	E. V. Lieberath	G. H. Drake, R. A. Erickson, K. A. Albertsson	P. G. Nilsson	Everett Steamship Corporation
<i>Wing Sang</i>	H. G. Goddard	J. H. Thomas, J. H. Gould	A. G. Lum	Indo-China Steam Navigation Co., Ltd.
<i>Wo Sang</i>	G. Owens	R. W. E. Little, W. G. White, R. D. A. Owen	K. J. Bourke	Indo-China Steam Navigation Co., Ltd.
<i>Yochow</i>	J. F. Follett	P. H. Ward, S. W. Owen, H. Nightingale	Cheung Shiung	China Navigation Co., Ltd.
<i>Yunnan</i>	D. C. Sim	J. Storey, J. G. de C. Veale, F. Coulson	Yu Pak Pui	China Navigation Co., Ltd.

### FLEET LIST (South Africa)

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

NAME OF SHIP	CAPTAIN	OBSERVING OFFICERS	RADIO OFFICER	OWNERS/MANAGERS
<i>Abraham Larsen</i>	E. Christoffersen	A. Thomas, D.S.C., L. Moon	H. A. Pypers	Union Whaling Co., Durban.
<i>Africana II</i>	R. L. V. Shannon, O.B.E.	P. Sharp, P. Nankin, P. Birch	J. Klosser	Department of Fisheries, Cape Town
<i>Agulhas</i>	D. C. Wallwork	M. Williams, G. P. Brandt, P. Carrington		Van Riebeck Lines, Cape Town.
<i>Aloe</i>	S. S. Edwards	A. Fawthrop		Sarships, Durban
<i>Rasuto</i>	E. Hale	A. A. Ruckbie	C. S. Ehlers	Thesen's S.S. Co., Cape Town
<i>F. T. Bates</i>	R. W. Watson	J. Smith, J. Holt, —, Maktink		S.A. Railways and Harbours, Cape Town
<i>Benin</i>	—, Webber	R. Raimir, R. Parker, D. J. C. Wright	B. D. Jackson	Elder Dempster
<i>Calabar</i>	R. W. Philip	G. D. Duguid, N. T. Casely, R. Daniels	R. Briggs	S.A. Marine Corp., Cape Town
<i>Constantia</i>	F. D. Wilkinson	S. J. Hurst, S. J. Benjamin, S. H. Damp	J. Fluitman	Sarships, Durban
<i>Dalia</i>	E. N. Stewart	B. I. Algear, G. Casey, R. Caracandas	P. Goggin	Irving and Johnson, Cape Town
<i>Gilia</i>	J. Lundberg, M.B.E.	E. Steedman		South African Lines, Cape Town
<i>Kaapland</i>	P. F. M. Buchholtz	A. F. Horden, G. W. Clancy, D. P. Powell	G. Adey	Thesen's S.S. Co., Cape Town
<i>Mashona</i>	P. Bolam	M. T. Scott		Thesen's S.S. Co., Cape Town
<i>Matabele Coast</i>	O. C. Olsen	W. Allen, J. Pols	G. A. Chapman	S.A. Marine Corp., Cape Town
<i>Morgenster</i>	D. W. Thorpe	R. Thompson, A. F. A. Pearson, D. A. Harris	S. P. Garnett	Tristan Development Co., Cape Town
<i>Pequena</i>	A. Soderland			Van Riebeck Lines, Cape Town
<i>Roodewal</i>	G. E. Hime		A. Williams	Tristan Development Co., Cape Town
<i>Tristania</i>	F. Honeyman			Van Riebeck Lines, Cape Town
<i>Vergelegen</i>				S.A. Marine Corp., Cape Town
South African Nautical College <i>General Botha</i>	Captain G. V. Legassick, D.S.C., R.D., Capt. R.N.R.	The Senior Cadets		
Naval Gymnasium, Saldanah Bay	Lt.-Cdr. J. J. C. Rice, V.R.D.	The Senior Cadets		

## FLEET LIST (India)

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

NAME OF VESSEL	OWNERS/AGENTS
<b>Selected Ships:</b>	
<i>Alavi</i> .. .. .	Mogul Line, Ltd.
<i>Bahadur</i> .. .. .	Asiatic Steam Navigation Co., Ltd.
<i>Bombay</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Dara</i> .. .. .	British India Steam Navigation Co., Ltd.
<i>Davessa</i> .. .. .	British India Steam Navigation Co., Ltd.
<i>Dumra</i> .. .. .	British India Steam Navigation Co., Ltd.
<i>Dwaraka</i> .. .. .	British India Steam Navigation Co., Ltd.
<i>Havildar</i> .. .. .	Asiatic Steam Navigation Co., Ltd.
<i>Islami</i> .. .. .	Mogul Line, Ltd.
<i>Jalazad</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Jaladuta</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Jalaganga</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Jalajawahar</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Jalamani</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Jalamanjari</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Jalaprakash</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Jalارشمي</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Jalaveera</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Jalayamuna</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Yehangir</i> .. .. .	Mogul Line, Ltd.
<i>Kampala</i> .. .. .	British India Steam Navigation Co., Ltd.
<i>Karanja</i> .. .. .	British India Steam Navigation Co., Ltd.
<i>Khosrou</i> .. .. .	Mogul Line, Ltd.
<i>Mahadevi</i> .. .. .	Asiatic Steam Navigation Co., Ltd.
<i>Maharaja</i> .. .. .	Asiatic Steam Navigation Co., Ltd.
<i>Mozaffari</i> .. .. .	Mogul Line, Ltd.
<i>Mtwara</i> .. .. .	British India Steam Navigation Co., Ltd.
<i>Nadir</i> .. .. .	Asiatic Steam Navigation Co., Ltd.
<i>Nurjehan</i> .. .. .	Asiatic Steam Navigation Co., Ltd.
<i>Rajula</i> .. .. .	British India Steam Navigation Co., Ltd.
<i>Santhia</i> .. .. .	British India Steam Navigation Co., Ltd.
<i>Shahjehan</i> .. .. .	Asiatic Steam Navigation Co., Ltd.
<i>Singu</i> .. .. .	Burma Oil Co., Ltd.
<i>Subadar</i> .. .. .	Asiatic Steam Navigation Co., Ltd.
<i>Warla</i> .. .. .	British India Steam Navigation Co., Ltd.
<i>Yenang Yaung</i> .. .. .	Burma Oil Co., Ltd.
<b>Supplementary Ships:</b>	
<i>Akbar</i> .. .. .	Mogul Line, Ltd.
<i>Badarpur</i> .. .. .	Burma Oil Co., Ltd.
<i>Begum</i> .. .. .	Asiatic Steam Navigation Co., Ltd.
<i>Bharatjal</i> .. .. .	Bharat Line, Ltd.
<i>Bharatmata</i> .. .. .	Bharat Line, Ltd.
<i>Bharatraja</i> .. .. .	Bharat Line, Ltd.
<i>Bharatrani</i> .. .. .	Bharat Line, Ltd.
<i>Itaura</i> .. .. .	British India Steam Navigation Co., Ltd.
<i>Jaladurga</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Jalagopal</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Jalakendra</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Jalaketu</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Jalatrishna</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Jalamayur</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Jalarajendra</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Jalaratna</i> .. .. .	Scindia Steam Navigation Co., Ltd.
<i>Malika</i> .. .. .	Asiatic Steam Navigation Co., Ltd.
<i>Masimpur</i> .. .. .	Burma Oil Co., Ltd.
<i>Nurani</i> .. .. .	Asiatic Steam Navigation Co., Ltd.
<i>Risaldar</i> .. .. .	Asiatic Steam Navigation Co., Ltd.
<i>Rizwani</i> .. .. .	Mogul Line, Ltd.



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