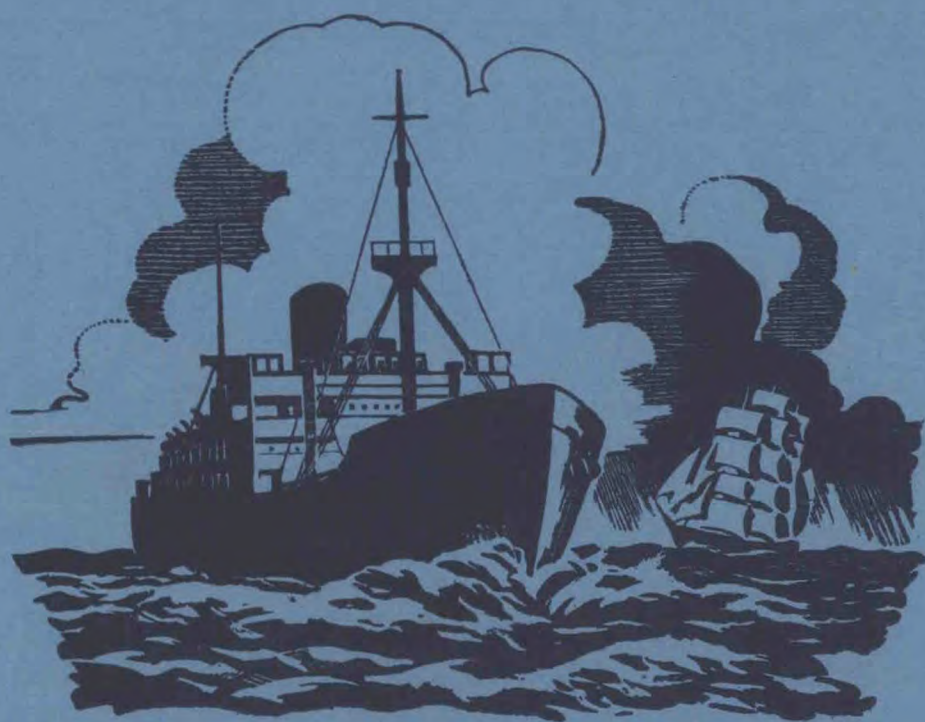


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The Marine Observer



Volume XIX No. 145

JULY, 1949

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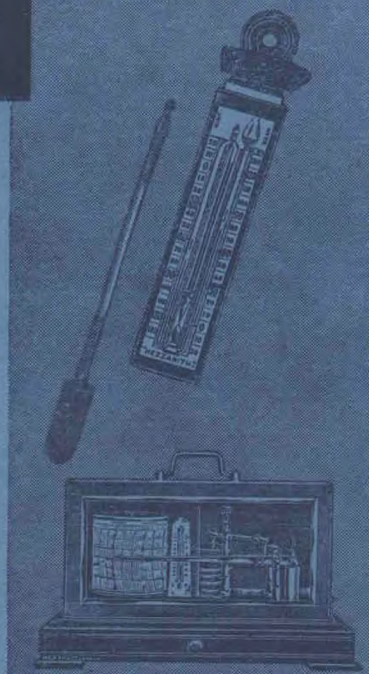
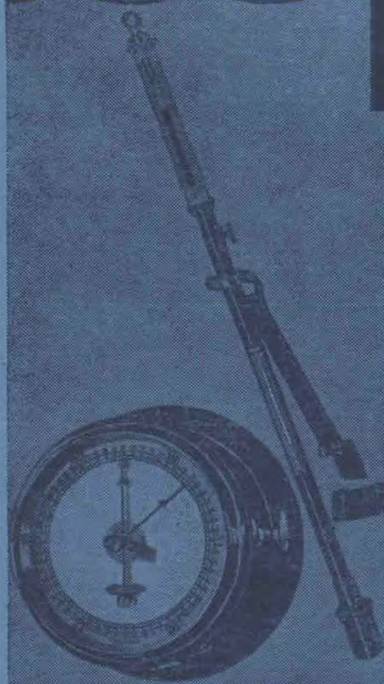
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THE MARINE OBSERVER

A Quarterly Journal of Maritime Meteorology
prepared by the
Marine Branch of the Meteorological Office

VOL. XIX No. 145 JULY 1949

TABLE OF PRINCIPAL CONTENTS

	Page
Editorial	123
Work of the Year (ending 31st March, 1949) of the Marine Branch of the British Meteorological Office and of the Voluntary Observing Fleet	127
List of Captains and Officers to whom the Director of the British Meteorological Office has made Excellent Awards	140
The Marine Observers' Log—July, August and September	145
Aanalysis of Weather Conditions at Station " Jig " in July, 1948. By A. H. Gordon, M.Sc.	158
" Frost Fairs " on the Thames	168
The Effect of Lightning on Ships	170
The Average Rainfall over the Irish Sea. By John Glasspoole, M.Sc., Ph.D. ..	172
Hoisting of the British Ocean Weather Ship Ensign	174
Personnel	176

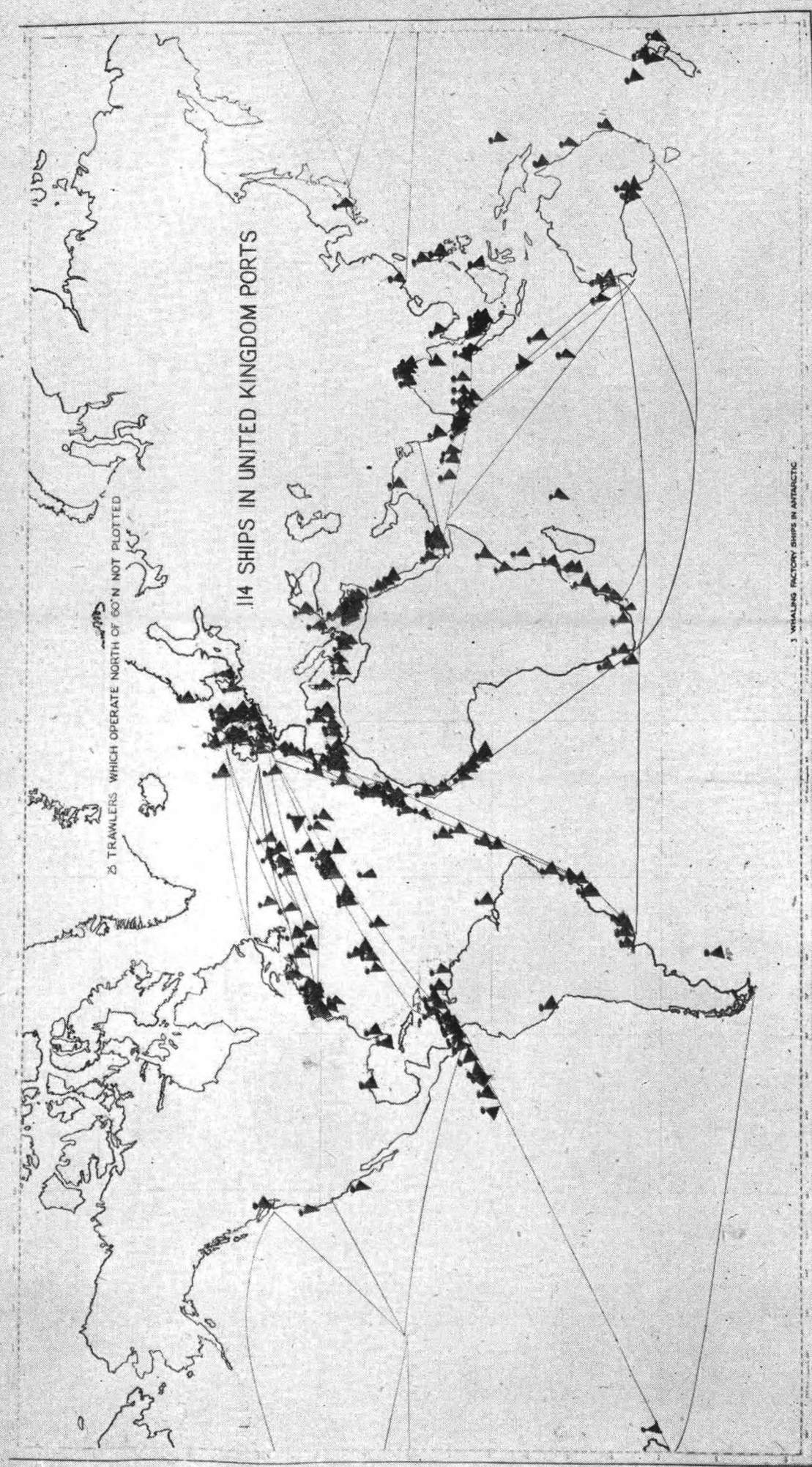
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ESTIMATED POSITIONS OF BRITISH SELECTED SHIPS 3RD JANUARY 1949



EDITORIAL

It is now over three and a half years since the war-time cloak of secrecy about meteorological conditions over the oceans was lifted, and voluntary observers aboard Selected Ships resumed making observations. It seems curious to think of the oceans as they were then—almost in the nature of vast deserts as far as meteorology was concerned. The progress that has been made since that date in providing a network of weather reports from the oceans has certainly been remarkable and there is no doubt that everybody who has an interest in meteorology owes a considerable debt to the officers in merchant ships who have voluntarily supplied the information. On another page in this edition will be found a report upon the activities of British Selected Ships during the year ending 31st March, 1949. The statistical figures contained in that report reflect the unselfish devotion of the masters and officers aboard numerous ships who have voluntarily made observations of the weather at regular intervals, wherever their voyages have taken them. The results of these observations have not only benefited Great Britain and the countries of the British Empire but they have also been transmitted by radio to the Meteorological Service of any country which has asked for them, and they have thus been of benefit to people in various walks of life all over the world.

Five hundred British Selected Ships—of which we might safely say that there are about 250 at sea on any given day (see the map on page 122), some of them in every ocean—is no mean contribution to the meteorological network of the oceans. We have no figures at present of the number of Selected Ships sailing under other flags but we do know some of the British Empire figures—Canada 12, Hong Kong 43, India 10, New Zealand 20.

Suffice it to say, for the moment, that a number of the merchant ships of most nations are actively contributing towards this voluntary international scheme for telling the world about the weather at sea. This is real international co-operation—freely given by the seamen of all nations, and it is something of which we can feel really proud—a fine gesture of unselfishness in a rather selfish world.

But what does it all mean? Are we any better off in the world for having all this information about the weather? The mariner lives so closely with the weather and it so intimately affects his life, his comfort, his very safety, that he is naturally interested in it and he is undoubtedly appreciative of up-to-date weather reports from other ships and of similar reports and accurate forecasts from Meteorological Services ashore. It is true that on many occasions when he is at sea there is not much he can do about it—come blow, fog, or fair weather, for we cannot stop the weather coming—but it is helpful to know what to expect even if it is only to have a special look at the steering gear before nightfall when a gale is forecast. The value of gale warnings to shipping around the coast is obvious.

The statistical summary of shipping casualties for the year 1948, reprinted here by kind permission of the Liverpool Underwriters' Association, emphasises the extent that weather, directly and indirectly, affects the safety and economics of the shipping industry.

CASUALTY RETURNS 1948

The Liverpool Underwriters' Association has issued the following classified Return of Casualties to Motor and Steam Vessels of 500 tons gross register and upwards, which have been posted in the Loss Book during the year 1948.

CLASSIFICATION

NATURE OF CASUALTY	BRITISH				FOREIGN				RESULTS		
	Motor		Steam		Motor		Steam		Total Losses	Partial Losses	Total
	Total Loss	Partial Loss	Total Loss	Partial Loss	Total Loss	Partial Loss	Total Loss	Partial Loss			
Weather damage ..	—	59	—	209	—	104	—	737	—	1,109	1,109
Foundering and Abandonments ..	—	—	2	—	2	—	10	—	14	—	14
Strandings ..	1	59	3	241	4	183	24	646	32	1,129	1,161
Collisions ..	—	109	1	463	1	187	3	729	5	1,488	1,493
Fires and Explosions ..	1	50	3	168	3	55	6	206	13	479	492
Missing ..	—	—	2	—	—	—	—	—	2	—	2
Damage to machinery, shafts and propellers ..	—	202	—	509	—	233	—	600	—	1,634	1,634
Other casualties ..	1	129	—	460	1	242	3	988	5	1,819	1,824
Totals—1948 ..	3	608	11	2,050	11	1,004	46	3,996	71	7,658	7,729

But what about the other users of meteorology? What do they think about ship messages? One only needs to look at the world map to see the answer—"the wide expanse of the oceans" is no mere figure of speech—there is much more water than land. It is instructive to go into the forecast room of any Meteorological Service and watch the weather maps being plotted. Incidentally, the Masters and Officers of merchant ships are welcome visitors at Meteorological Offices. As the synoptic picture unfolds itself, we realise how much the oceans hold the key to the meteorological situation of all countries which have a seaboard and how impossible it is to complete the picture without the maritime observations.

The forecaster, irrespective of nationality, pays great attention to ships' messages and it gives him particular satisfaction when he sees a good spread of reports from the oceans. In the North Atlantic the Weather Ships contribute very materially to the picture, particularly in view of the upper air information which they can provide and because they are fixed in position and report every three hours. These upper air observations—sounding the atmosphere for wind (direction and speed), temperature, humidity and pressure, to a height of about 40,000 ft.—are essential to the modern technique of forecasting and for meteorological research, not only for aviation but for general purposes as well. Very often, however, the real clue to a tricky situation in the ocean lies in the report of a lone merchant ship and in any case it is the merchant ship messages which really make up most of the ocean picture. The weather map, on page 126, illustrates this fact.

But supposing we cannot complete the picture—are we any the worse off? Consider the aviation problem. It would be physically impossible to operate airlines without meteorological information, and even if no aircraft crossed the oceans we would still need to know what was happening at sea to give a clear picture of the future meteorological situation ashore, and there is no doubt that, whether we like it or not, aviation has come to stay and although apparently enormously expensive and uneconomical to operate, air transport is one of the essentials of national life all over the world in this

modern age. The seaman need never really fear that aircraft will put him out of business—on the contrary, it is perhaps rational to suggest that, by fostering trade, aircraft might benefit shipping.

The air navigator's problem is akin to that of the seaman but the medium through which he has to ply on his voyages is a more fickle mistress than the sea—he cannot very well anchor off an airport while he waits for the fog to clear—and despite all the scientific aids at his disposal his individual skill as a navigator and as an airman has still to be called to account: the more one travels by air, the more sympathetic one feels about his problems. The more accurate the meteorological information at his disposal, the greater the safety of the aircraft.

Of the other users of meteorology, transport again is probably one of the most important. Fog, frost, snow and flood can affect all forms of land transport, and it seems that apart from the railways, which manage to continue operation under almost all conditions apart from being completely snowbound or flooded out, there is little that can be done to prevent considerable chaos in thick fog, heavy snowfall or bad ice conditions. Meteorological Services can do much to ease these transport problems, however, by giving adequate warning, and certain measures can be taken in advance to overcome the various problems that arise. It is of interest that in countries like Sweden, when the lakes are frozen over in the winter, arrangements have to be made for roads across the ice instead of boats, and the meteorologist plays his part in this.

I suppose agriculture is the next most important industry which is intimately affected by meteorology, and as so many sailors seem to have a yearning to “swallow the anchor” and become agriculturalists, the voluntary observer at sea should have the interest of the farmer at heart. As far as Britain is concerned, when one thinks of the vagaries of our climate, the importance of weather to the farmer is obvious and one can see that even 12-hour forecasts can be of enormous value to the farmer in planning his work, particularly for haymaking and harvest, and for warnings of frost when fruit is in bud. A greater advantage would be the provision of longer term forecasts but so far this is really only in its infancy. As far as short term (12 hour) forecasts are concerned, one can more or less guarantee an accuracy of about 90 per cent in the United Kingdom.

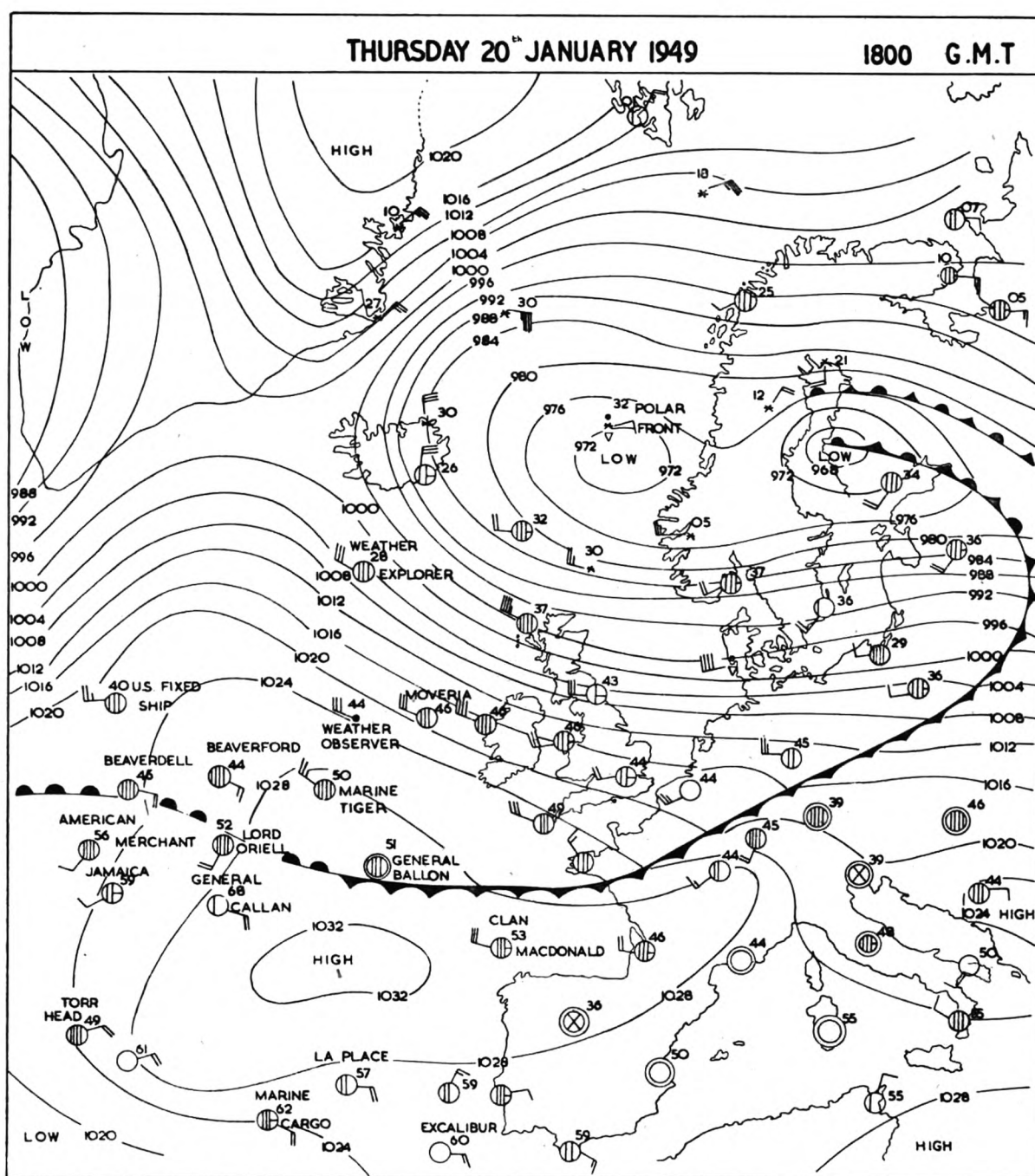
Many other activities are intimately concerned with meteorology and amongst these one might list electricity undertakings, water boards, town and country planning, the film industry, catering and sport. As a matter of interest, the Meteorological Office has recently been asked to give special forecasts for pigeon racing.

One should remember that the above considerations apply to almost every country in the world, and that all these countries are becoming alive to the possibility of increased efficiency as a result of accurate meteorological information. Meteorology is allied to many other sciences—hydrology, oceanography, geology, electrical theory, etc., and apart from its direct applications has many more which are indirect but none the less important. One might say that if more attention had been paid to meteorology and allied sciences there would not have been such catastrophes as the “Dust Bowls” which have occurred in the United States. Meteorology can also undoubtedly contribute materially towards investigations into the health of the world. Science, if properly applied, can be of enormous benefit to mankind.

The Merchant Navy Officer, by becoming a voluntary meteorological observer, does contribute very materially towards the well-being of his fellow men.

On page 140 of this number will be found the names of those captains and officers of the British Voluntary Observing Fleet whose meteorological work during the past year has earned them an excellent award. The Director wishes me to congratulate the recipients and express appreciation to them, and to all those voluntary observers whose names do not happen to appear on the list, for the fine work which they have done during the past year.

MARINE SUPERINTENDENT.



**WORK OF THE YEAR (ENDING 31st MARCH, 1949) OF THE MARINE
BRANCH OF THE BRITISH METEOROLOGICAL OFFICE AND THE
VOLUNTARY OBSERVING FLEET**

1. Synoptic Meteorology

General

The Voluntary Observing Fleet is comprised of the following classes of observing ships :

(a) Selected Ships

These ships are loaned tested meteorological instruments and given instructions and logbooks for taking meteorological observations at standard synoptic hours. The observations are coded and transmitted by radio to meteorological centres for synoptic work and the completed logbooks are returned for climatological purposes.

(b) Supplementary Ships

Supplementary ships make and transmit observations in an abbreviated form at the main synoptic hours. Where the ship's own meteorological equipment is considered adequate no instruments are loaned. Otherwise thermometers or a barometer may be issued to the ship.

(c) Marid Ships

These vessels are equipped with a sea thermometer and canvas bucket. They make and transmit observations of sea temperature in home waters for the benefit of the forecast service.

(d) Light Vessels

Certain Light Vessels have been recruited to provide observations of wind, visibility, air and sea temperature twice daily at 0600 G.M.T. and 1500 G.M.T. for the benefit of the forecast service. These observations are passed by R/T through the nearest coastguard station and thence by telegram to "Weather Wire London."

Number of Observing Ships

Table 1 shows the number of vessels in the respective classes, monthly throughout the year.

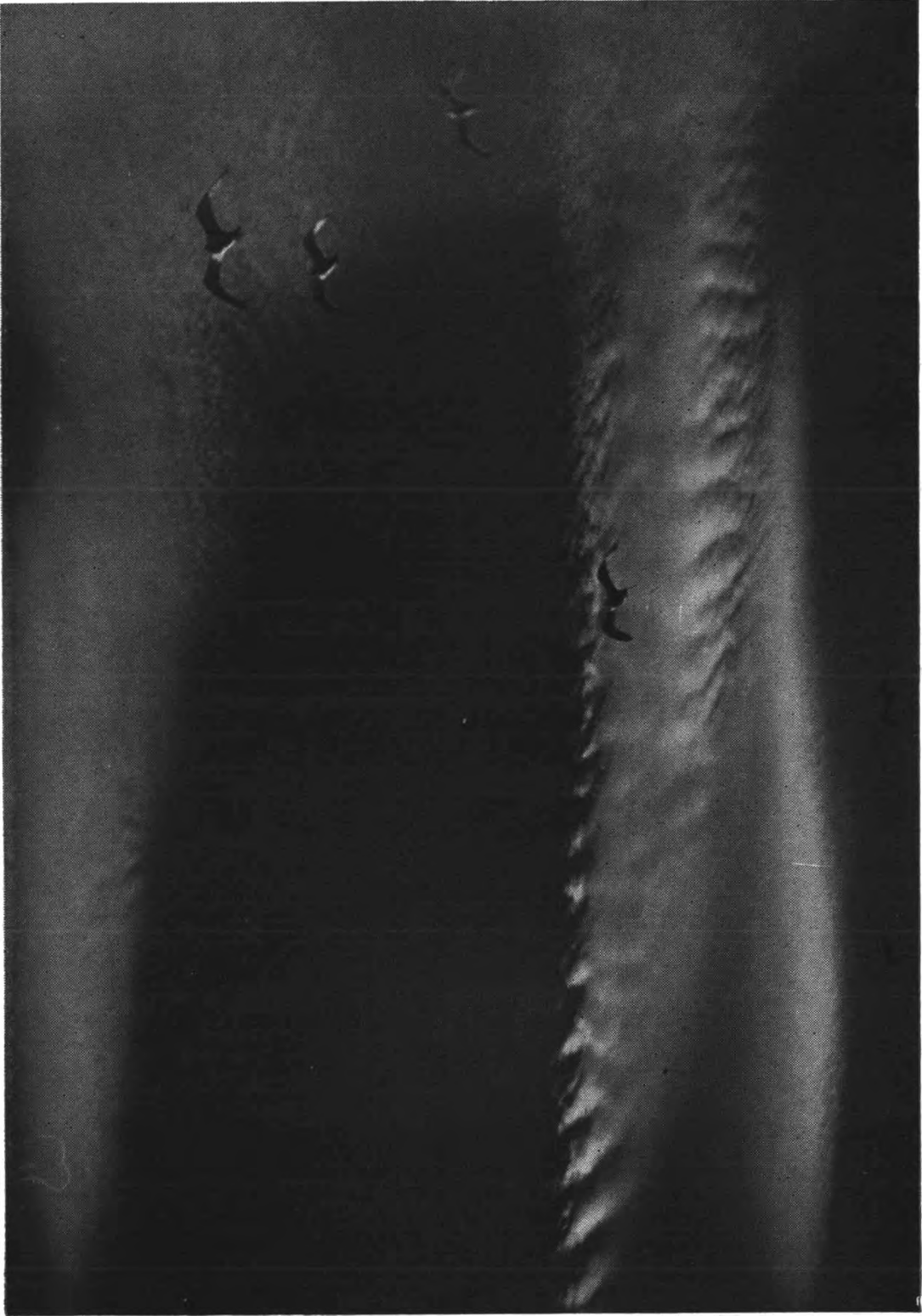
TABLE 1

	1948							1949				
	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
No. of Selected Ships on Fleet List	497	495	495	503	509	509	511	505	509	509	508	510
No. of Supplementary Ships on Fleet List	181	180	179	180	182	182	13	14	14	14	17	17
No. of Marid Ships on Fleet List	82	82	83	84	83	80	81	79	80	82	80	79
No. of Light Vessels on Fleet List	5	5	5	5	5	5	5	5	5	5	5	5

The following comments are pertinent :

(a) As the number of Selected Ships has now reached its desired total, no more will be recruited for the present.

(b) Owing to pressure of work, prior to the appointment of new Port Meteorological Officers at Cardiff, Southampton, and Glasgow, the two Port Meteorological Officers at London and Liverpool have been unable to visit Supplementary Ships. Newly appointed captains and officers



Reproduced by courtesy of O. M. Ashford

ALTOCUMULUS AND CIRROCUMULUS LENTICULARIS

Photograph taken from the *Weather Recorder* off Rathlin Island about 1600 G.M.T., July 25, 1948.

of some of these ships must have been unaware that their ships were listed as Supplementary Ships. A new fleet of Supplementary Ships is now being organised. The eventual aim is to recruit a total of 500 Supplementary Ships.

(c) The "Marid Ships" service has remained unchanged.

(d) The five Light Vessels continue to give good and useful service.

(e) During the year the operation of Ocean Weather Ships by other nations, in the North Atlantic, has added materially to the number of reports received. These reports are not included in the list below.

W/T Reports

Table II shows the numbers of British Selected Ships, Marid Ships, Foreign Ships and Light Vessels reporting to Dunstable, and the number of messages received at the Central Forecasting Office.

TABLE II

	1948									1949		
	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1. <i>British Selected Ships</i>												
No. reporting to Dunstable ..	244	238	228	250	263	251	243	227	215	219	218	220
No. of messages received ..	2,558	2,469	2,485	2,655	2,864	2,477	2,671	2,471	2,427	2,284	2,367	2,300
Daily average ..	85.3	79.6	82.8	85.6	92.4	82.6	86.2	82.4	78.3	73.7	84.5	74.2
2. <i>Marid Ships</i>												
No. reporting to Dunstable ..	28	35	30	34	36	33	32	31	36	32	30	30
No. of messages received ..	194	216	208	236	234	223	196	192	173	162	162	182
Daily Average ..	6.5	7.0	6.9	7.6	7.5	7.0	6.3	6.4	5.6	5.2	5.8	5.9
3. <i>Foreign Ships</i>												
No. reporting to Dunstable ..	85	75	80	132	149	175	131	132	112	153	139	142
No. of messages received ..	423	364	406	599	661	766	608	675	609	862	719	744
Daily average ..	14.1	11.7	13.5	19.3	21.4	25.5	22.5	22.5	19.6	27.8	25.7	24.0
4. <i>Light Vessels</i>												
No. reporting to Dunstable ..	5	5	5	5	5	5	5	5	5	5	5	5
No. of messages received ..	222	242	233	308	307	205	310	275	254	278	247	250
Daily average ..	7.4	7.8	7.8	9.9	9.9	9.8	10.0	9.2	8.2	9.0	8.8	8.0

Equipment

Table III shows the distribution of instrumental equipment on loan to Voluntary Observing Ships.

TABLE III

	1948									1949		
	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1 (a) Full set of M.O. Instruments	347	348	348	357	362	366	373	370	373	377	380	384
(b) Full set of M.O. Instruments (except barograph) ..	13	10	10	10	11	9	9	8	11	10	9	9
(c) Full set of M.O. Instruments (except barometer) ..	86	86	88	89	90	89	83	83	84	83	84	83
(d) Full set of M.O. Instruments (except barometer and barograph) ..	20	20	19	19	19	18	19	18	16	16	15	15
2 M.O. barometer only ..	7	7	6	4	3	3	3	3	3	3	3	3
3 Ship's own barometer only ..	9	9	9	9	9	9	9	8	8	8	8	8
4 Full "trawler" sets ..	15	15	15	15	15	15	15	15	14	12	9	8
5 Full "light vessel" sets ..	5	5	5	5	5	5	5	5	5	5	5	5
6 "Marid" sets ..	82	82	83	84	83	80	81	79	80	82	80	79



Reproduced by courtesy of O. M. Ashford

IN THE REAR OF A COLD FRONT

Photograph taken at 2030 G.M.T. at station JIG, July 18, 1948

2. Ocean Weather Ships

The British Ocean Weather Ship Service

Of the 13 Ocean Weather Ship Stations* agreed at a meeting of ICAO in London in September, 1946, two were allocated as the sole responsibility of the United Kingdom and are situated :

Station I (Item) in 60°00'N., 20° 20'W.

Station J (Jig) in 53° 50'N., 18° 40'W.

During the year each of the four ships (converted ex-naval corvettes of the Flower class) has completed one year's service as a weather ship (nine voyages) as follows :

Weather Observer on 17th August, 1948 (Capt. N. F. Israel, D.S.C.).

Weather Recorder on 18th October, 1948 (Capt. A. W. Ford).

Weather Watcher on 30th November, 1948 (Capt. F. A. Elston).

Weather Explorer on 29th January, 1949 (Cdr. H. R. Wilkinson, R.D., R.N.R.)

Small breaks have occurred in the continuity of manning Station "I." Station "J," however, has been occupied continuously throughout the year.

During the period 1st to 12th July, 1948, *Weather Explorer* (until 5th) and *Weather Watcher* (from 5th) were off station at 61°N., 19°W. in order to be in a position to render maximum assistance to a flight of R.A.F. Vampire aircraft flying to U.S.A. via Iceland. Similarly, from 17th to 26th August, 1948, *Weather Recorder* was off station in the same position for the return flight.

On 1st October, 1948, *Weather Recorder* proceeded in answer to an "S O S" to 61° 22'N., 24° 43'W. where a search revealed no casualty ; she returned to Station "I" on 2nd October, 1948.

From 20th to 26th October, 1948, *Weather Explorer* vacated Station "I" and proceeded to Londonderry to land a Radio Operator suffering with acute appendicitis.

From 26th to 29th January, 1949, Station "I" remained vacant as *Weather Explorer* was obliged to return to Base three days early owing to shortage of fuel occasioned by the very severe weather experienced for most of the voyage.

Two scientific officers sailed in *Weather Recorder* on her seventh voyage to carry out research work during the voyage. Various different items of meteorological equipment have been tested at sea and reports rendered.

Air/sea rescue exercises with R.A.F. Aircraft of Coastal Command and Ocean Weather Ships, designated by code word "Methop," were inaugurated on 7th August, 1948, and have been carried out at intervals since that date. These exercises are considered to be very useful for keeping the ships' companies fully conversant with the air/sea rescue organisation and drill.

The ships have been able to obtain medical advice, by W/T through the Central Forecasting Office, Dunstable, from the Luton and Dunstable Hospital. This advice has been given readily and official appreciation of the services rendered by the doctors has been forwarded to the hospital authorities.

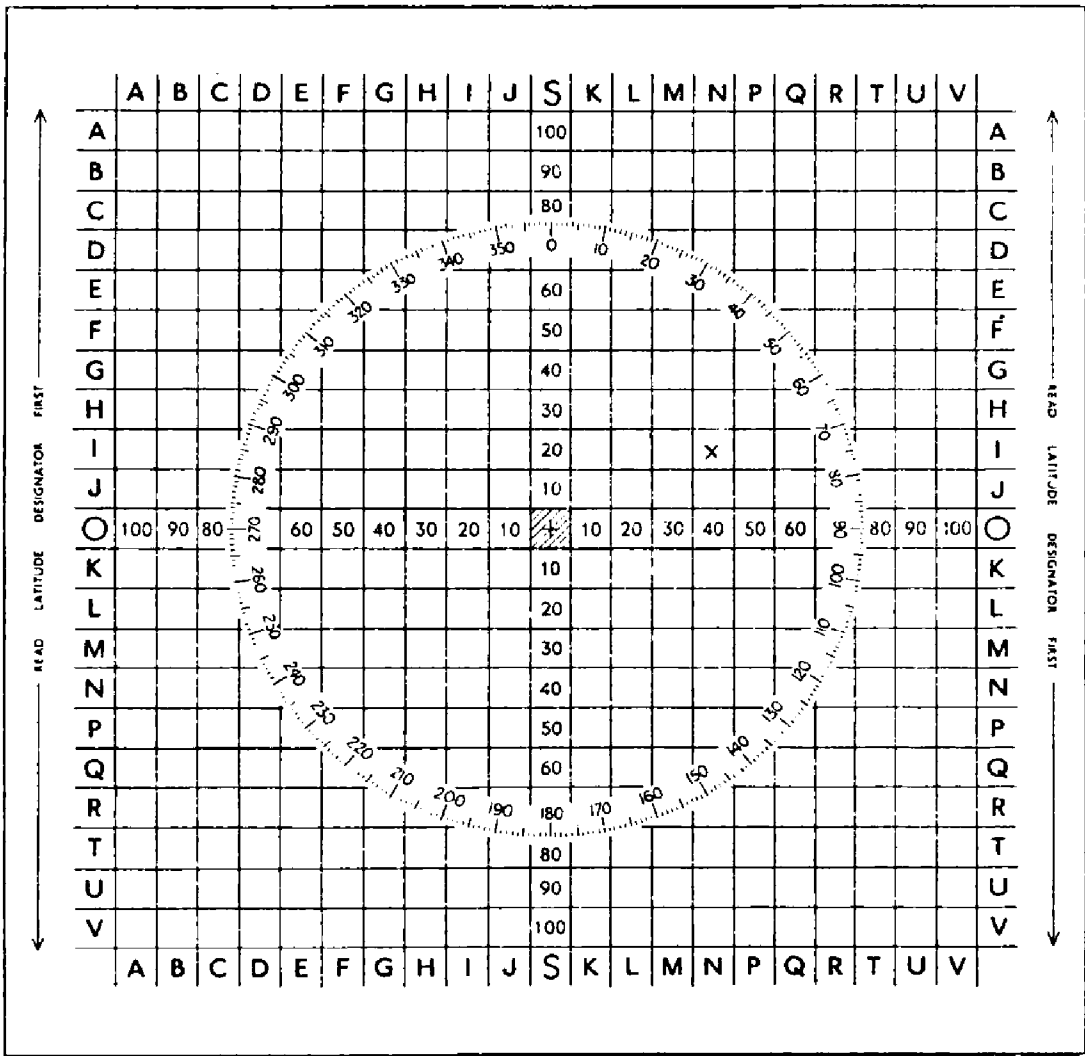
* See page 157.

Ships' officers have been given courses of instruction in cinema operating and in the maintenance of rubber dinghies. Deck officers joining the ships for the first time have been trained in meteorology, radar, and in the operation of the Sperry gyro compass.

Badges and insignia for personnel in Ocean Weather Ships have been obtained and issued. Each ship has been provided with a new ensign—a Blue Ensign defaced with the Ocean Weather Ship badge.

With a view to conserving fuel, tests were carried out with a sea anchor. These tests were not wholly satisfactory, and further tests are to be made.

OCEAN WEATHER SHIPS
POSITION INDICATING GRID



NOTE: The grid lines are 10 nautical miles apart. The latitude designator is always given first.

EXPLANATION

The centre of the grid is the geographical position assigned to, and normally occupied by, the station.

The latitude and longitude designators are always added to the characteristic of the ship's radiobeacon. For example, if the radiobeacon characteristic is QJ and the vessel is on station (i.e. within the ten mile square at the centre of the grid) the transmitted characteristic signal will be QJOS. If the vessel is off station (but within the grid limits) the latitude and longitude designators of the square actually occupied will be added to the characteristic. (The centre of each grid square should be considered the location of the vessel for all computations, thus giving a maximum possible error of 7.5 miles and an average probable error of 2.5 miles.)

Example: If the ship's actual location is at the point marked X on the grid above and the characteristic letters are QJ, the transmitted radiobeacon characteristic would be QJIN. It will be seen that in this position the ship would be about 64° true, 45 miles from its assigned position.

Merchant ships, especially trawlers, have become more and more aware of the existence in the North Atlantic of these Weather Ships and requests for meteorological and navigational information are being received in increasing numbers. No request is allowed to go unanswered.

The "Grid" system of reporting the position of the Weather Ships to aircraft in flight was introduced on 1st December, 1948, and the new Meteorological Code (Washington, 1947) was brought into use on 1st January, 1949.

W/T contact has been made with Ocean Weather Ships of other nations. The navigational aids provided by the Weather Ships are being used with increasing frequency by both civil and R.A.F. aircraft flying over the North Atlantic. 300 contacts with aircraft were made by one ship during her patrol of 21 days. Minor changes have been made in the W/T frequencies used and the following radio facilities are available.

Normal or Non-emergency State

H/F Point-to-point with Dunstable	on 4225, 8705, 11525, 13365 kc/s.
W/T Air Guard (Continuous)	on 2912, 6543, 8485, 11306 kc/s.
VHF World Guard (Continuous)	on 118.1 mc/s. (Civil) 116.1 mc/s. (R.A.F.)
VHF D/F (on request)	as specified by Area Control
MF Beacon (H, H + 20, H + 40 for 6 minutes each)	<div style="display: inline-block; vertical-align: middle;"> <div style="display: inline-block; vertical-align: middle;"> <div style="display: inline-block; vertical-align: middle;">on 406 kc/s at Station "I"</div> <div style="display: inline-block; vertical-align: middle;">on 410 kc/s. at Station "J"</div> </div> <div style="display: inline-block; vertical-align: middle; font-size: 2em;">}</div> <div style="display: inline-block; vertical-align: middle;"> <div style="display: inline-block; vertical-align: middle;">receive on 213 mc/s.</div> <div style="display: inline-block; vertical-align: middle;">transmit on 223 mc/s.</div> </div> </div>
Eureka Beacon (on request)	
Surface Search Radar (as required)	
Maritime Distress Channel (Continuous)	on 500 kc/s.
MF/DF (as required)	
Loran (as required)	

Distress Alert State

As above except that

- VHF/DF is operated continuously,
- MF Beacon is operated as required,
- Eureka Beacon is operated continuously,
- MF/DF is operated continuously.

and the following facility is introduced :

Air/Sea Rescue Guard (continuous) on 6500, 3805 kc/s.

Ocean Weather Ships have been publicised by the press, cinema and B.B.C. A lecture on "Ocean Weather Ships" was given by the Marine Superintendent at a meeting of the Royal Meteorological Society on 16th June, 1948.

Anglo-Scandinavian Ocean Weather Ships

The United Kingdom was also given responsibility, in co-operation with Norway and Sweden, for the joint operation of Station M (Mike) in position 66° 00'N., 02° 00'E.

Two Flower class corvettes were converted at H.M. Dockyard, Chatham, to operate as Ocean Weather Ships on this station. The first of these, *Polarfront I* (ex *Saxifrage*) left Chatham on 24th May, 1948, and the second, *Polarfront II* (ex *Bryony*), on the 31st August, 1948. Both ships called at Rosyth in order to carry out D/F calibrations whilst on route for their base, Bergen, Norway. Both ships are manned by a Norwegian crew.

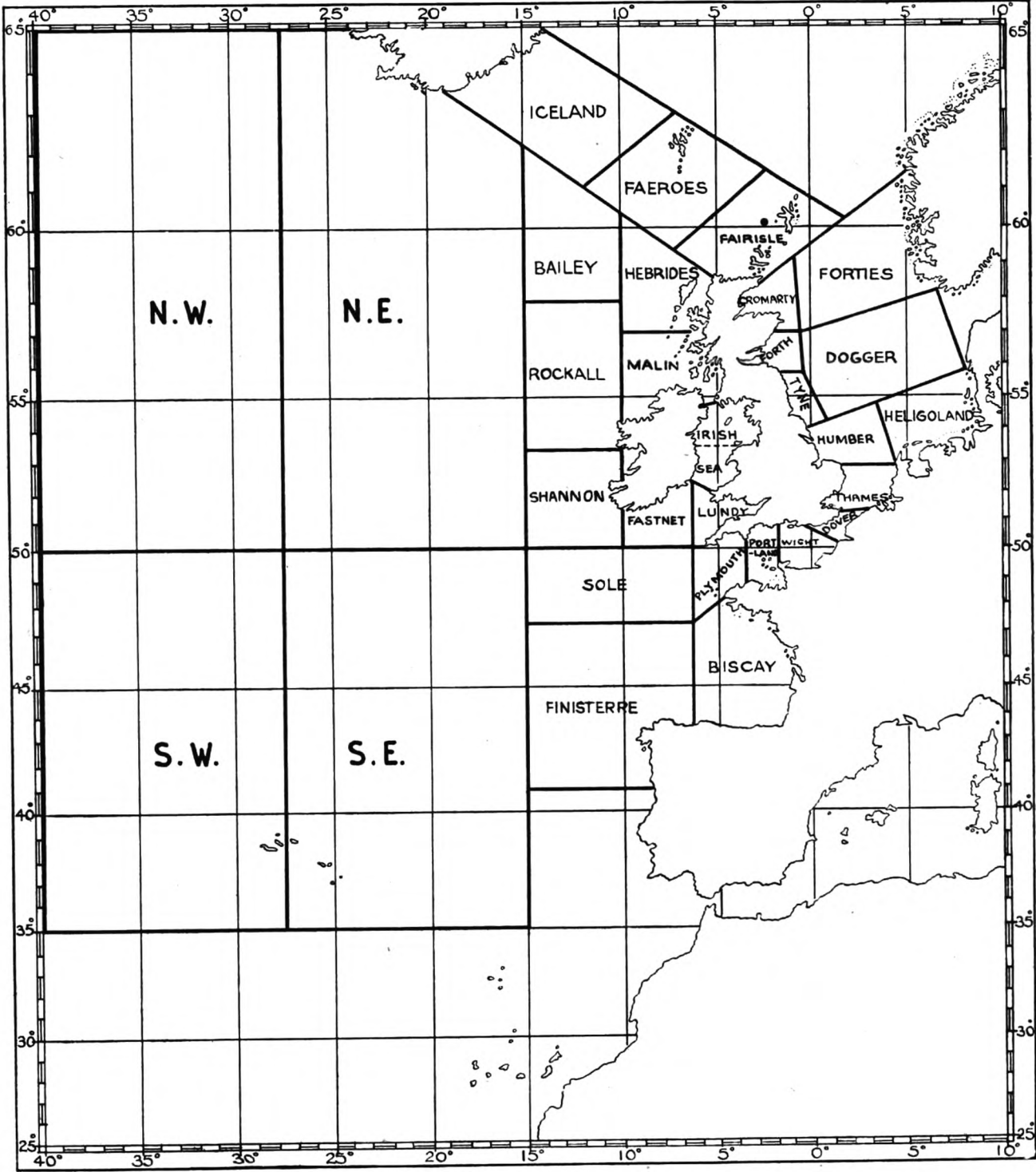
3. Services for the Merchant Navy and Fishing Fleet

Gale Warnings

Gale Warnings Beaufort force 8 and above are broadcast by the B.B.C. on 200 kc/s. (1500 m.) and 1149 kc/s. (261.1 m.) immediately on receipt. They are also repeated by W/T and/or R/T from the following coast stations :

CHART SHOWING THE AREAS USED IN GALE WARNINGS AND WEATHER BULLETINS FOR SHIPPING

EFFECTIVE FROM 1st NOVEMBER 1948



Wick (GKR), Stonehaven (GND), Cullercoats (GCC), Humber (GKZ), North Foreland (GNF), Niton (GNI), Lands End (GLD), Portpatrick (GPK), Burnham-on-Sea (GRL), Valentia (CCK), Malin Head (GMH).

With effect from 1st January, 1949, Storm Warnings (Beaufort Force 10 and above) for the area $35^{\circ}\text{N.}-65^{\circ}\text{N.}$, $15^{\circ}\text{W.}-40^{\circ}\text{W.}$, with the addition of areas Biscay and Finisterre, have been issued in Part I of the Atlantic Weather Bulletin. Warnings issued at other times are transmitted to shipping by the Post Office Station at Portishead in the first available transmission period.

Shipping Bulletins

Shipping Bulletins are issued by B.B.C. broadcast at the following times : 0655 (except Sundays), 0755, 1255, 1755 (clock times). Appropriate parts of the forecasts are repeated by W/T and/or R/T from the coast stations already listed (see Gale Warnings).

The bulletins broadcast from Wick by W/T at 0848 and 2048 include ice warnings for the Iceland area.

During the appropriate fishing season a special forecast for 24 hours, beginning "East Anglian Fishing Forecast," is added at the end of the 0655, 0755 and 1255 shipping forecasts.

The areas used in Gale Warnings and Weather Bulletins for Shipping were amended with effect from 1st November, 1948.

Atlantic Weather Bulletin

This bulletin has been revised with effect from 1st January, 1949, to conform with recent decisions of the International Meteorological Organisation.

The following parts are issued twice daily at 0930 and 2130 G.M.T.

Part I. Storm warnings in plain language. Warnings are issued when the wind is expected to reach Beaufort Force 10 or over in the area concerned. When there are no storms in the forecast area, that fact is indicated by the words "No Storm Warnings."

Part II. Synopsis of weather conditions in plain language.

Part III. Forecasts in plain language for areas Biscay, Finisterre and the NE, NW, SE and SW sections of the region of the North Atlantic from 35°N. to 65°N. , between 15°W. and 40°W. These subdivisions are as shown on the accompanying chart. The forecasts are based on 0600 and 1800 G.M.T. observations and cover a period of twenty-four hours from time of issue.

Part V. Selection of ships' reports based on 0600 and 1800 G.M.T. observations in form : $\text{YQL}_a\text{L}_a\text{L}_a\text{L}_o\text{L}_o\text{L}_o\text{GG Nddff VVwwW PPPTT}$.

Part VI. Selection of shore station reports based on 0600 and 1800 G.M.T. observations in form :

(999II) iii $\text{T}_a\text{T}_d\text{ Nddff VVwwW PPPTT}$.

An analysis message is issued daily at 1145. The message issued prior to 1st January, 1949, at 2345 G.M.T. has been discontinued.

Part IV. Particulars of pressure and frontal systems, including essential isobars in I.A.C. (Fleet).

Local Weather Forecasts

This additional service was introduced in February, 1948. Masters of ships, and others interested in the movements of shipping and in the loading and discharging of cargo, can obtain *local* weather forecasts by telephone from the forecast centre nearest to the port, free of charge.

Weather Forecasts on Request

Special Weather Forecasts for a period not exceeding 36 hours, may be obtained from the Meteorological Office, on request, at any time of the day or night, for areas within the region contained between the parallels of 70°N. and 35°N., and between the meridian of 12°W. and the coasts of Europe. A charge is made for these services.

4. Marine Climatology

Collection of observations

The numbers of Forms 911 and logbooks (Form 911) received each month in the Marine Branch from Selected and Supplementary Ships were as follows :

	1948										1949			
	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total	
Forms	6	2	2	1	2	3	1	1	2	8	4	2	34	
Logbooks	58	78	59	65	91	74	67	40	63	134	73	68	870	

Analysis of Observations

A revised reprint of “ Quarterly Surface Current Charts of the Western North Pacific Ocean ” incorporating monthly chartlets of the China Seas is in the press.

The computation of ocean currents of the western half of the South Pacific Ocean and the extreme eastern part of the South Indian Ocean has been completed, and charting is in progress.

Charts of monthly mean sea temperatures for the North Atlantic have been drawn and are to be published as an atlas.

A summary of the weather and currents at Ocean Weather Station “ Jig,” 53° 50'N ; 18° 40'W. during the first year of operation has been completed.

The sections relating to currents and ice have been entirely re-written for new editions of five Admiralty Pilots. The Marine Branch has also co-operated with the Climatological Branch in revising the meteorological sections of these Pilots.

The section on currents in the Admiralty publication “ Ocean Passages ” was revised and a chart of “ Currents of the World ” drawn for inclusion in this work.

Work on an investigation into the characteristics and distribution of waterspouts over the oceans has been completed.

A preliminary investigation has been made into the diurnal variation of pressure in the Mediterranean Sea.

A comparison of different methods of measuring temperatures and humidity is being carried out on board Ocean Weather Ships.

A harmonic analysis of mean sea temperatures in the North Atlantic as a means of investigating their annual variation is in hand.

Observations have been extracted from logbooks and punched on Hollerith Cards during the year. On all the above work the use of Hollerith Cards has been essential.

5. Special Work

A synoptic investigation into the formation of very deep depressions in the North Atlantic is being made.

A comparison of surface and geostrophic winds over the ocean is in progress.

6. Enquiries

Information, including statistical tables and charts of marine data, has been prepared for the use of Government Departments, Shipping Companies and other interests. Much of it was concerned with investigations into shipping casualties.

7. Publications

The *Marine Observer's Handbook* (7th Edition) is in the press.

The manuscript of the textbook, *Meteorology for Mariners* is nearing completion.

8. International Co-operation

Intergovernmental Maritime Consultative Organisation

The Marine Superintendent, in his capacity as President of the Maritime Commission, represented the International Meteorological Organisation at the International Conference in Geneva, at which the Intergovernmental Maritime Consultative Organisation was formed. The Conference lasted from 19th February until 4th March, 1948.

International Conference on Safety of Life at Sea

The Marine Superintendent, as President of the Maritime Commission of the International Meteorological Organisation, attended the meetings of the "Preparatory Committee of Experts," in London (27th January to 6th February, 1948) prior to the International Conference on Safety of Life at Sea. The Preparatory Committee's work was to study matters concerning co-ordination in the field of aviation, meteorology and shipping, in so far as they concerned safety of life at sea.

The International Conference on Safety of Life at Sea was also held in London from 23rd April until 10th June, 1948. The Marine Superintendent as a member of the British delegation, represented the Meteorological Office. As President of the Maritime Commission, he represented the International Meteorological Organisation. The meteorological provisions of the old Convention were entirely revised and were incorporated in the new Convention.

Miscellaneous

British proposals for an international marine meteorological logbook and Hollerith Cards have been forwarded to Dominion and Colonial Services for comment.

9. Excellent Awards

As a token of appreciation, the Director of the Meteorological Office is arranging to present a book, suitably inscribed, to the captains, principal

observers and senior radio officers of British Selected Ships whose work has been considered of outstanding quality throughout the past year.

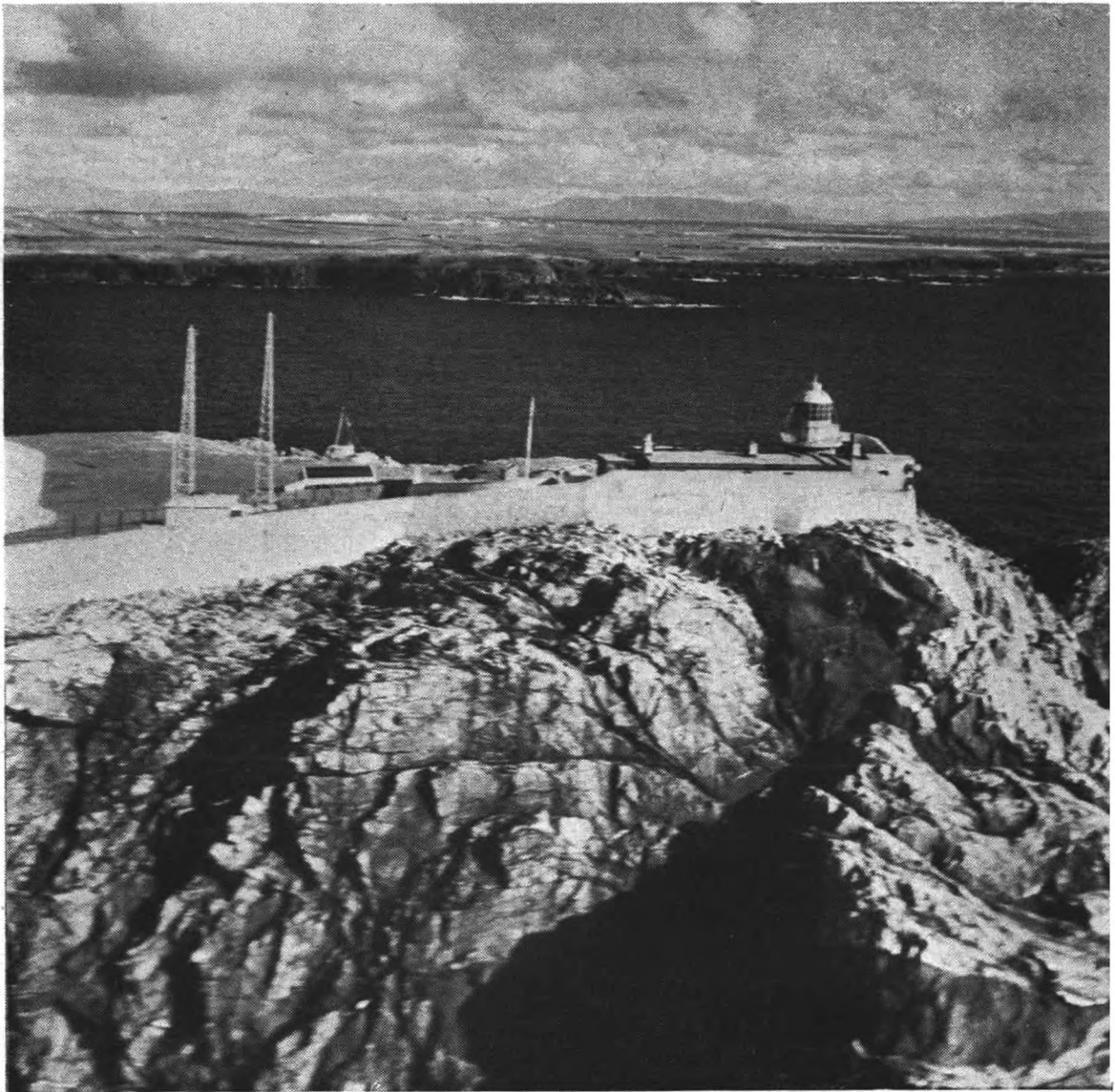
The books selected for the purpose are:

For the captain: *The Navy of Britain*, by Michael Lewis, M.A., F.R.Hist.S.

For the principal observing officer: *The World in the Past*, by B. Webster Smith.

For the senior radio officer: *Wonders of Neptune's Kingdom*, by F. Martin Duncan, F.R.M.S., F.R.P.S., F.Z.S.

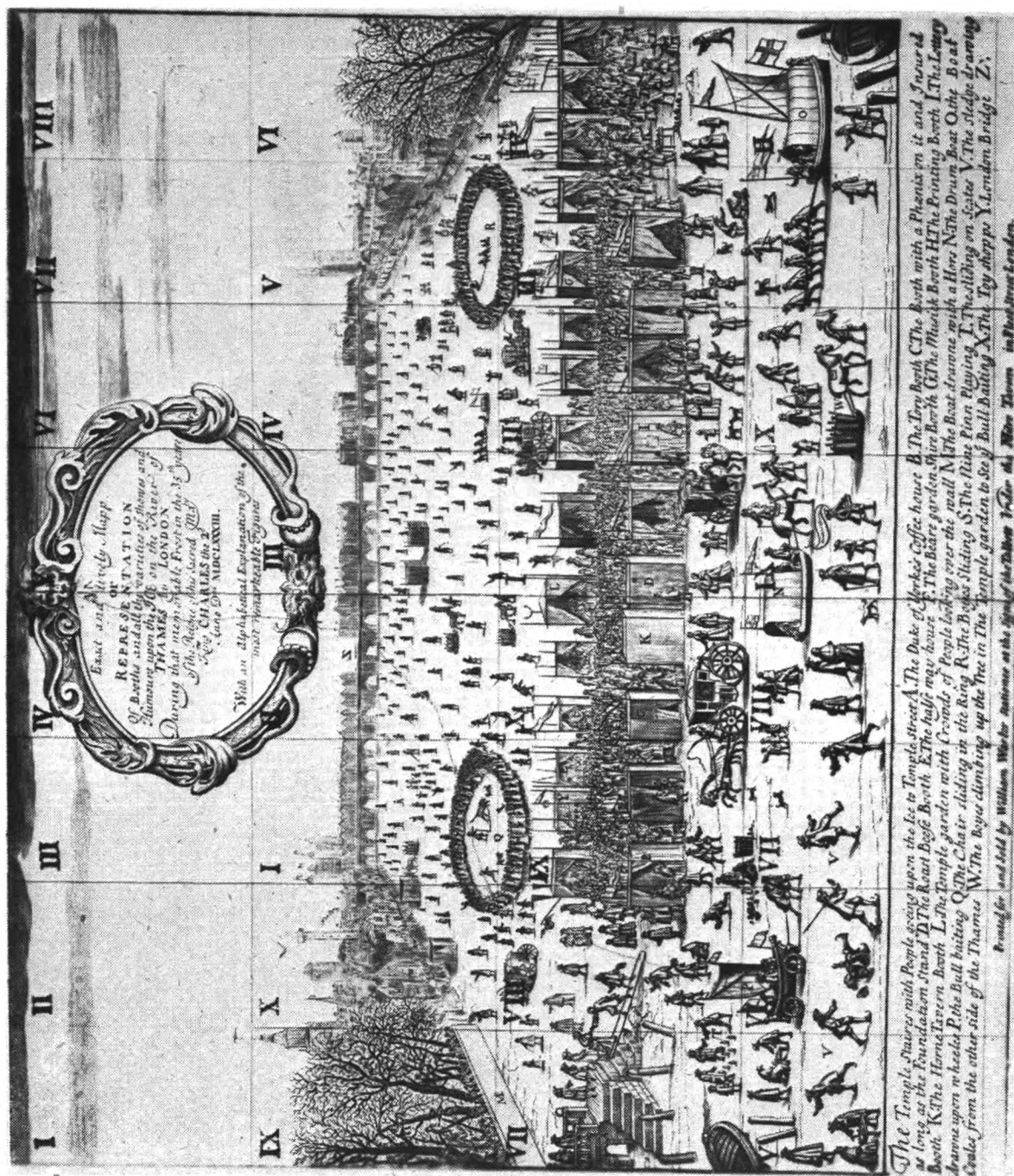
LIGHTHOUSES OF THE BRITISH ISLES



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EAGLE ISLAND

Eagle Island lighthouse is viewed from the west. Mullet can be seen in the background and the hills of Mayo in the distance. The light (lat. $54^{\circ} 17' N.$, long $10^{\circ} 05' W.$) is 220 ft. above sea level.



Frost Fair on the Thames 1683

List of Captains, Principal Observing Officers and Senior Radio Officers, to whom the Director of the British Meteorological Office has made Excellent Awards

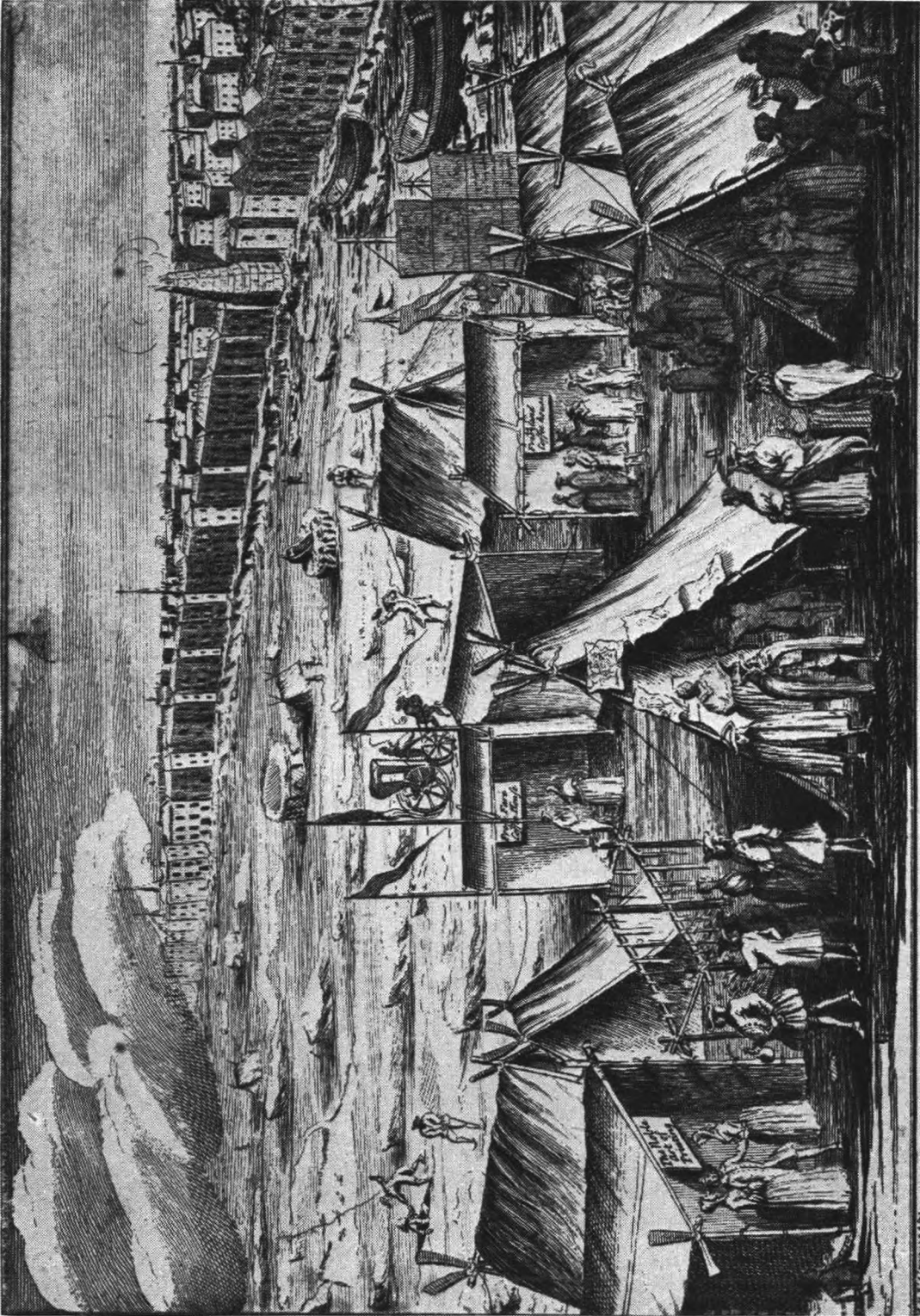
SHIP	CAPTAIN	PRINCIPAL OBSERVING OFFICER	RADIO OFFICER
M.V. <i>Accra</i> ..	C. C. Cave ..	J. R. Smith ..	J. A. Stuart
M.V. <i>Ajax</i> ..	C. H. Whitehouse, O.B.E.	I. McK. Jackson	F. G. Short, O.B.E.
S.S. <i>Akaroa</i> ..	J. Steele ..	J. Tierney ..	J. W. Soulsby
S.S. <i>Argyle</i> ..	J. Dodds ..	T. Rowe ..	J. Downey
M.V. <i>Athelchief</i> ..	J. D. Donovan ..	W. H. Cook ..	J. C. Robinson
M.V. <i>Auricula</i> ..	H. Sangster ..	R. R. Stonehouse	J. Sanderson
S.S. <i>Barjama</i> ..	M. Fraser ..	J. H. Jones ..	T. L. Harcus
S.S. <i>Baron Belhaven</i> ..	H. Morre, O.B.E.	G. J. McIntosh	G. Clarke
S.S. <i>British Commodore</i> ..	N. Pinkney ..	R. Maybourn	G. A. Price
M.V. <i>British Escort</i> ..	H. G. Jeary ..	G. S. Lawson	R. Charleton
M.V. <i>British Marquis</i> ..	J. W. Kemp ..	S. E. Banyard	J. E. Appleton
M.V. <i>Brittany</i> ..	H. A. Wright ..	A. N. Brook	E. E. Clancey
M.V. <i>Brockleymoor</i> ..	D. J. Jones ..	F. W. Gant	N. W. Hodgson
S.S. <i>Caxton</i> ..	J. M. Cherry ..	R. Crawford	A. Austin
S.S. <i>City of Bristol</i> ..	E. Garner ..	R. J. Windsor	B. A. Palin
S.S. <i>City of Calcutta</i> ..	H. A. Hazel ..	I. McDermid	G. C. Fyffe
M.V. <i>City of Chester</i> ..	W. A. Rogerson, O.B.E.	R. M. Faults	J. A. Vallance
M.V. <i>City of Lille</i> ..	E. Scrymgeour ..	H. M. Steele	A. Julius
S.S. <i>Clan Brodie</i> ..	B. Vernon Browne ..	E. J. E. Owen	T. Guffrey
S.S. <i>Clan Buchanan</i> ..	T. W. Inman, O.B.E.	G. I. Hughes	W. Harper
S.S. <i>Clan Chattan</i> ..	H. C. Simpson, O.B.E.	J. W. Ward ..	E. Shillabeer
S.S. <i>Clan Farquhar</i> ..	P. MacMillan ..	E. R. Thorpe	H. O. Francis
S.S. <i>Clan MacNeil</i> ..	S. F. Carter ..	M. T. Morton	G. McCubbing
M.V. <i>Condesa</i> ..	R. Smiles, O.B.E. ..	D. Craven ..	P. Everett
S.S. <i>Consuelo</i> ..	F. Barnard, M.B.E.	G. Saltmarsh	K. K. Klosser

S.S. <i>Coulgorm</i> ..	..	G. Robinson	..	..	T. F. Tuomey	..	R. Andrews
S.S. <i>Deebank</i> ..	..	B. Rivett ..	..	..	D. C. Broome	..	A. A. MacPherson
M.V. <i>Denbighshire</i> ..	..	W. F. Dark ..	..	..	D. F. Maclachlan	..	G. Heapy
M.V. <i>Dikwara</i> ..	..	F. L. Sampson, D.S.C.	..	..	T. E. Harris	..	S. J. Taylor
M.V. <i>Doris Clunies</i> ..	..	J. G. Stevenson	..	..	P. P. Bracewell	..	G. M. Hargreaves
M.V. <i>Drina</i> ..	..	A. N. Anderson	..	..	R. M. Tysoe..	..	N. T. Roberts
M.V. <i>Empire Pride</i> ..	..	E. D. Brand	..	..	R. V. Purkin..	..	J. Prenton
S.S. <i>Eros</i> ..	..	R. C. Vigurs	..	..	B. Noble	..	H. Lammars
S.S. <i>Explorer</i> ..	..	W. F. O'Neill	..	..	G. Cubbin ..	..	G. A. Bart
S.S. <i>Ficus</i> ..	..	I. Thompson	..	..	B. T. Tallack	..	C. C. Wade
S.S. <i>Fort Asiniboine</i> ..	..	A. H. Downs	..	..	G. L. Foster..	..	J. J. Johnston
S.S. <i>Geologist</i> ..	..	W. L. Sawle	..	..	M. Wardle ..	..	M. H. Whitehead
M.V. <i>Gloucester</i> ..	..	H. D. Horwood, R.N.R.	..	..	P. Slocombe	..	R. Devlin
M.V. <i>Haparangi</i> ..	..	C. R. Pitcher, O.B.E.	..	..	J. T. Peattie..	..	J. C. Mathews
S.S. <i>Hilary</i> ..	..	A. Elliott, O.B.E.	..	..	A. S. Frith ..	..	J. Houghney
S.S. <i>Hororata</i> ..	..	A. E. Taylor, R.D., Cdr. R.N.R.	..	..	P. Jeanes ..	..	C. Lambe
M.V. <i>Inishowen Head</i> ..	..	W. A. Haddock	..	..	J. Smyth ..	..	A. J. Cope
M.V. <i>Inverbank</i> ..	..	A. M. Williamson	..	..	H. E. Hoyle ..	..	Wm. Chalmers
S.S. <i>Jamaica Producer</i> ..	..	P. D. Allan, O.B.E.	..	..	E. C. J. Roberts	..	R. Hartley
M.V. <i>Jessmore</i> ..	..	A. C. Bailey	..	..	P. V. McCullough	..	J. J. Sheriden
S.S. <i>John Holt</i> ..	..	John Shaw ..	..	..	W. L. Harrison	..	E. A. Heard
M.V. <i>Kaipara</i> ..	..	T. R. Windus	..	..	N. Fraser ..	..	S. H. Devereux
M.V. <i>Kenikworth Castle</i> ..	..	J. E. R. Wilford	..	..	J. K. Mumford	..	C. Robison
S.S. <i>Kent</i> ..	..	E. H. Hopkins	..	..	R. Sims	..	L. Roberts
S.S. <i>Kohistan</i> ..	..	J. S. Smithson	..	..	W. G. Smith	..	R. Walsh
S.S. <i>Lacklan</i> ..	..	G. K. Billett	..	..	A. P. Watson	..	J. B. Allan
S.S. <i>Lanarkshire</i> ..	..	C. E. O'Byrne	..	..	M. T. Morton	..	S. Money
M.V. <i>Losada</i> ..	..	P. L. Hockey	..	..	G. E. Turner	..	A. Akhurst
S.S. <i>Machaon</i> ..	..	J. L. W. Johnston	..	..	E. R. Pullan	..	— Fisher
S.S. <i>Macharda</i> ..	..	R. A. Penston	..	..	— Kirkham..	..	D. Lloyd
S.S. <i>Mahsud</i> ..	..	R. Humble	..	..	A. Briggs.	..	B. J. Smith
S.S. <i>Malancha</i> ..	..	R. E. Macgregor	..	..	D. C. Carter..	..	A. C. Gavin
S.S. <i>Manchester Trader</i> ..	..	E. W. Raper	..	..	A. C. Caird ..	..

List of Captains, Principal Observing Officers and Senior Radio Officers, to whom the Director of the British Meteorological Office has made Excellent Awards (Continued)

SHIP	CAPTAIN	PRINCIPAL OBSERVING OFFICER	RADIO OFFICER
S.S. <i>Marietta Dal</i> ..	J. G. F. Brighty ..	R. H. Jenkins ..	T. Laing
S.S. <i>Martita</i> ..	H. Bunn ..	C. Ferguson ..	J. J. Hynes
M.V. <i>Nairnbank</i> ..	C. S. Holbrook ..	B. Armstad ..	C. A. Adamson
M.V. <i>Napier Star</i> ..	E. N. Rhodes ..	E. W. Jenkins ..	T. W. Murray
S.S. <i>Nestor</i> ..	E. W. Powell, M.B.E. ..	M. Spencer-Hogbin ..	L. Booth
M.V. <i>New Zealand Star</i> ..	G. Owen, O.B.E., R.D. ..	G. Munro ..	C. J. Carter
M.V. <i>Norfolk</i> ..	A. I. Robertson, R.D., R.N.R. ..	R. S. Luly ..	L. Heath
S.S. <i>Pakeha</i> ..	H. C. Smith ..	A. H. N. Pugh ..	I. G. Lawrie
S.S. <i>Papanui</i> ..	B. Evans ..	T. Train ..	J. Hill
S.S. <i>Paparoa</i> ..	E. Hopkins ..	C. B. Hewitt ..	L. P. Rayner
S.S. <i>Perim</i> ..	J. C. Mellonie ..	P. E. Hewitt ..	F. Groves
S.S. <i>Polar Chief</i> ..	J. J. Smith ..	J. Sutherland ..	G. Lawrie
M.V. <i>Port Chalmers</i> ..	E. T. N. Lawrey ..	J. A. W. Ashbourne ..	E. G. Gunner
M.V. <i>Port Hobart</i> ..	T. F. Kippins, O.B.E., D.S.C. ..	J. D. Aitchison ..	B. Morley-Evans
M.V. <i>Port Lincoln</i> ..	H. H. Smith, O.B.E. ..	D. M. Robinson ..	P. T. McKeon
M.V. <i>Port Macquarie</i> ..	E. E. Roswell ..	H. J. Thompson ..	P. Smyth
M.V. <i>Port Phillip</i> ..	J. G. Lewis, O.B.E. ..	E. G. Gilling ..	B. McGovern
M.V. <i>Port Wellington</i> ..	E. J. Syret ..	E. Newstead ..	J. S. MacPherson
M.V. <i>Port Wyndham</i> ..	H. Steele ..	C. P. Williams ..	J. N. Coutts
M.V. <i>Repton</i> ..	D. Cownie ..	F. L. James ..	W. Keogh
M.V. <i>Robert F. Hand</i> ..	E. J. Instone, O.B.E. ..	J. J. Jones ..	R. Munro
M.V. <i>Roslin Castle</i> ..	H. L. Holland ..	N. E. Upham ..	H. E. Robinson
M.V. <i>Sacramento</i> ..	J. Robinson, M.B.E. ..	A. C. Dick ..	W. Parratt
S.S. <i>St. Loman</i> ..	A. Robinson ..		
S.S. <i>St. Zeno</i> ..	John H. Ellis, D.S.C. ..		

S.S. <i>Salmonier</i> ..	..	J. D. Wilson	..	..	..	J. T. Fyffe	..	..	H. Mackay
S.S. <i>San Felix</i> ..	..	J. B. Macarthy	..	..	..	G. G. B. Putt	..	..	W. Radcliffe
M.V. <i>San Velino</i>	..	H. C. Archer, O.B.E.	..	..	..	J. Dixon	..	..	J. Clark
M.V. <i>San Veronica</i>	..	R. M. Atkinson	..	..	..	J. J. Greene	..	..	D. A. Henderson
M.V. <i>San Vulfrano</i>	..	J. Thomson, O.B.E.	..	..	..	W. F. Hunt	..	..	E. J. Reynolds
M.V. <i>Samanco</i>	..	A. Lyall	..	..	..	C. Stewart	..	..	D. Cross
S.S. <i>Scholar</i> ..	..	D. Wolstenholme	..	..	..	D. T. English	..	..	G. Penston
S.S. <i>Silvercedar</i>	..	J. Thompson	..	..	..	G. K. Harrison	..	..	J. Whyman
S.S. <i>Silverteak</i>	..	—, Metcalf	..	..	..	J. Evans	..	..	S. P. Garnett
S.S. <i>Sneaton</i> ..	..	W. Armstrong	..	..	..	E. Wilson	..	..	A. Carter
S.S. <i>Southern Garden</i> ..	..	W. J. Swanson	..	..	..	J. Jamieson	..	..	J. D. Todd
S.S. <i>Southern Harvester</i>	..	K. Granoe	..	..	..	T. J. Morgan	..	..	J. Spratt
M.V. <i>Suffolk</i> ..	..	E. A. Burton	..	..	..	F. G. Bevis	..	..	J. Turnham
S.S. <i>Swainby</i> ..	..	J. E. Roddam	..	..	..	W. Fallon	..	..	D. Ford
M.V. <i>Taranaki</i> ..	..	F. A. Smith	..	..	..	J. Harrison	..	..	W. J. Quain
M.V. <i>Telemachus</i>	..	J. F. Webster	..	..	..	P. D. F. Cruickshank	..	..	J. Campbell-Wilson
M.V. <i>Waipawa</i> ..	..	R. G. Ireland	..	..	..	G. Watkins	..	..	W. B. Charleton



*The bleak North-East, from rough Tartarian shores,
 O'er Europe's Rindles its freezing rigor pours,
 Separates the flowing blood, in human veins,
 And builds the Silver Thames on icy chains.*

FROST FAIR

*Their usual courses stumbles refuse,
 And every Pond appears a glossy Plain.
 Streets now appear where it late was before,
 And thousands daily walk from shore to shore.*

Frost Fair on the Thames, 1740



JULY, AUGUST AND SEPTEMBER

The Marine Observer's 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.

HAILSTORM Off Coast of Brazil

M.V. Highland Monarch. Captain B. K. Berry, R.D., Capt. R.N.R. Montevideo to Santos. Observer, Mr. J. L. Perkins, Senr. 3rd Officer.

18th July, 1948, 1955 G.M.T. A violent hailstorm occurred lasting about 20 mins. and reducing visibility to 2,000 yds. The majority of the hailstones were irregular in shape, ice chips about $\frac{3}{4}$ in. long, but some were spherical, the largest 2 in. in diameter. This hail appeared on the radar screen as a bright and dense cloud with rapidly pulsating edges. Barometer, 29.70 in. Temperature: air 62° F. remaining constant throughout, wet bulb 60°, sea 62°. Wind SE, force 3-4.

Position of Ship: Latitude 32° 43'S., Longitude 51° 46'W. Course 035°. Speed 14 knots.

UNUSUAL VISIBILITY Cabot Strait

S.S. Tower Grange. Captain E. Fox. Newport, Mon., to Three Rivers. Observer, Mr. R. Clipsham, 2nd Officer.

18th July, 1948, 0050 and 0220 G.M.T. At 0050 Cape Anquille light, charted visibility 16 miles, 115 ft. above sea level, was seen at a distance of 34 miles bearing N × E. At 0220, Cape Ray light, charted as 17 miles, 135 ft. above sea level, was seen at 32 miles bearing ENE. In each observation the light itself was visible. Both lights are of the Group Flashing White character. Lights to SW (St. Paul Island) were visible at the normal expected range only.

Ship proceeding on a 289° course to position 10 miles NNE of St. Paul Island.

Red Sea

S.S. Kohistan. Captain J. S. Smithson. Cardiff to Persian Gulf. Observers, Mr. A. Baird, Chief Officer, and Mr. W. G. Smith, 2nd Officer.

2nd July, 1948. After clearing the Gulf of Suez at 0800 G.M.T. exceptionally good visibility was observed to the westward until after sunset, at

which time the vessel was well south of the Brothers Reef. Throughout the afternoon visual bearings were taken of the Egyptian coast at an average distance of 40 miles. Shortly after sunset a bearing was obtained of Jebel Umm Delfa 7,165 ft., lat. $26^{\circ} 58' N.$, long. $33^{\circ} 29' E.$ at a distance of 115 miles.

Position of ship at the time was lat. $25^{\circ} 49' N.$, long. $35^{\circ} 04' E.$ This was not an occasion when a coastal mountain becomes visible only as the sun sets behind it. Weather conditions at 1600. Barometer 1008.2 mb. Temperature: air $83^{\circ} F.$, wet bulb 76° , sea 81° .

WATERSPOUT

Mediterranean Sea

S.S. *Kohistan*. Captain J. S. Smithson. Port Said to London. Observer, Mr. A. Baird, Chief Officer.

11th September, 1948, 0325 to 0350 G.M.T. A waterspout was observed. Course was altered to pass it to windward and spout passed about 100 yds. off. During a squall, which lasted only a few minutes, wind rose to force 7 and distinctly salt rain fell. Disturbance on sea surface was approximately 30 ft. in diameter. From the base of Cb. at 3,000 ft. a thin pipe reached down towards the sea. At no time did cloud and sea make contact although spray column reached about 300 ft. The pipe assumed various shapes and angles as it passed and spray column had a speed of about 15 kts. Disturbance was in view from 0325 to 0350 during which time spray column reached various heights and degrees of thickness. Barometer 1012.9 mb. Wind NW \times W force 4. Temperature: air $76^{\circ} F.$, wet bulb 67° .

Position of Ship: Latitude $31^{\circ} 47' N.$, Longitude $31^{\circ} 32' E.$

WATERSPOUT AND SQUALL

Australian Waters

S.S. *Kent*. Captain N. A. Thomas. Aden to Wyndham. Observer, Mr. R. Sims, 3rd Officer.

1st July, 1948, 0855 A.T.S. approx. A waterspout was observed to the eastward about 7 miles. Beneath a large piled up Cb. (base 3,500 ft. and top estimated at 10,000 ft.) there was a single Fb., base 1,500 ft. At first a cylindrical funnel descended from the Fb. and at the same time a large mushroom of water and spray rose from the surface of the sea. The funnel descended to a height of 500 ft. and the mushroom rose to about 200 ft.; both varied in length and breadth during their duration. The spout was bent in a WNW'ly direction, the angle between base, top and vertical being about 20° . The spout dispersed and re-formed about four times in 25 minutes and when last seen was 2 miles east of the ship. By 1120 the barometer had fallen 3 mb. and temperature $3^{\circ} F.$, the sky was completely overcast and torrential rain began to fall. Wind increased to NE, 7 and visibility was reduced to 2 cables. The squall lasted about 20 minutes.

Position of Ship: Latitude $11^{\circ} 15' S.$, Longitude $116^{\circ} 05' E.$

ST. ELMO'S FIRE

Off Bristol Channel

S.S. *Afghanistan*. Captain W. A. Chappell. Birkenhead to Port Said. Observer, Mr. J. Linton, 2nd Officer.

2nd September, 1948, 0230 G.M.T. Following a dazzling flash of lightning, there appeared on the forecastle davit two distinct balls of St. Elmo's

Fire, which at first were bright enough to be mistaken for a fishing vessel, as there were several in the vicinity at the time.

Position of Ship : Latitude $51^{\circ} 14' \text{N.}$, Longitude $6^{\circ} 05' \text{W.}$

DISCOLOURED WATER

Caribbean Sea

M.V. *Robert F. Hand*. Captain E. J. Instone, O.B.E. Hull to Aruba, D.W.I. Observer, Mr. J. Jones, 2nd Officer.

6th September, 1948, 1930 to 2000 G.M.T. Passed large areas of discoloured water with several strips of sandy-coloured and light green water E-W, 4 to 5 miles long. Farther east towards the horizon larger areas were observed. Several bottles, coconuts and numerous pieces of bamboo were in the vicinity. Wind E \times N, 3. Sea temperature 80°F.

Position of Ship : Latitude $14^{\circ} 45' \text{N.}$, Longitude $69^{\circ} 00' \text{W.}$

DISCOLOURED WATER AND CHANGE OF SEA TEMPERATURE

Gulf of Aden

S.S. *British Commodore*. Captain N. Pinkney. Aden to Abadan. Observer, Mr. R. Maybourne, 2nd Officer.

17th August, 1948, between 1300 and 1330 G.M.T. A heavy swell developed from ESE against the prevailing wind, which was SW \times W, 5. Between 1330 and 1400 the sea became a deep brown translucent colour with the sea temperature varying rapidly between 70°F. and 80° ; at 1430 the temperature was steady at 69° with a density of 1027 and the sea had the appearance of a well-stained peat stream. By 1500 the swell had subsided and the wind backed to SW \times S, 4.

Position of Ship at 1300 : Latitude $14^{\circ} 00' \text{N.}$, Longitude $49^{\circ} 02' \text{E.}$

PHOSPHORESCENCE

Atlantic Equatorial Waters

S.S. *Lassell*. Captain D. Roberts. Antwerp to Rio de Janeiro. Observer, Mr. J. Bicknell, 2nd Officer.

14th July, 1948, 0404 to 0417 G.M.T. On either side of the ship, stretching in a NE-SW direction, observed well-defined bluish-green bands, about 6 ft. wide and 300 ft. apart. The sea in the vicinity also had considerable phosphorus content but less than the bands. Weather conditions : corrected barometer, 1013.8mb. Temperature : air 80°F. , wet bulb 74° , sea 87° . Wind SE, 4. Sea SE, 4. Swell SE, 4. Sky 9/10 cloudy with As. at 14,000 ft., Cb. and low dark rain clouds (1,500 ft.) moving rapidly to NW.

Position of Ship : Latitude $4^{\circ} 00' \text{N.}$, Longitude $29^{\circ} 42' \text{W.}$ Course 200° . Speed 11 knots.

S.S. *Brasil Star*. Captain G. M. Duff, G. M. London to Rio de Janeiro. Observer, Mr. D. S. Gilmour, 3rd Officer.

5th September, 1948, 0300 G.M.T. Luminosity observed from bridge in parallel "bars" lying about SE-NW. "Bars" appeared as a solid mass from a distance, but resolved into a mass of small particles, each about the size of a pea, as vessel passed through them. This was seen for about 30 mins., after which, although luminosity was still apparent, it was spread evenly in the usual manner. Wind SSE, 4. Sea temperature 81° . Sky clear.

Position of Ship : Latitude $01^{\circ} 00' \text{N.}$, Longitude $29^{\circ} 45' \text{W.}$ Course 205° . Speed 15.5 knots.

M.V. *Darro*. Captain W. H. Grimshaw. South America to United Kingdom. Observer, Mr. W. A. Tresidder, 2nd Officer.

10th September, 1948, 0415 to 0445 G.M.T. Vessel passed through parallel lanes of bright phosphorescence about 30 ft. wide and 500 ft. apart running in a NW-SE direction. There was a low SE'ly swell and smooth sea running at the time with wind NNE, 3.

Position of Ship: Latitude $2^{\circ} 15' \text{S.}$, Longitude $29^{\circ} 15' \text{W.}$ Course 022° . Speed 14 knots.

DRIFT OF RAFT

North Atlantic Ocean

S.S. *Twickenham*. Captain W. D. Shields, O.B.E. Cardiff to Port Sulphur. Observer, Mr. D. A. Forrester, 2nd Officer.

On 3rd July, 1948, at 0900 G.M.T. we sighted a raft in position lat. $31^{\circ} 21' \text{N.}$, long. $69^{\circ} 17' \text{W.}$ On 24th August at 1500 we sighted the same raft in position lat. $31^{\circ} 45' \text{N.}$, long. $70^{\circ} 18' \text{W.}$ On two previous voyages through these waters a set to the N and W has been experienced, so it would appear from the two positions in which the raft was sighted that it had an apparent set and drift of 295° , 57 miles in 52 days 6 hrs., the drift approximately 1.09 miles per day.

ICE

Off the Azores

S.S. *Helicina*. Captain F. T. Vine. Shellhaven to Curaçao. 5th September, 1948, 0940 G.M.T. The captain and three of the ship's officers observed a large growler at a distance of about half a mile, approximately 25 miles off Graciosa, Azores. The growler was about 20 to 30 ft. long and about 4 ft. above water. Later, at 1026, three large pieces were observed almost awash and during the following hour several smaller pieces were sighted. The sea temperature was 72°F. , air 76° , wind SE, 2, swell NW moderate.

On 2nd September, 1948, S.S. *Linga* on voyage from Curaçao to Rotterdam reported "a floating white object" dangerous to navigation in position lat. $39^{\circ} 40' \text{N.}$, long. $28^{\circ} 15' \text{W.}$ at 1700 G.M.T.

Position of Ship: Latitude $39^{\circ} 26' \text{N.}$, Longitude $28^{\circ} 02' \text{W.}$

The following report was received from Captain A. K. Bamberry, Master of M.V. *Flammulina*. 5th September, 1948, 1300 G.M.T. When passing through the Azores, sighted two small growlers, one awash and one about 2 ft. high and 30 ft. long.

Position of Ship: Latitude $38^{\circ} 11' \text{N.}$, Longitude $27^{\circ} 39' \text{W.}$

Note.—The observation of ice near the Azores is unusual. Two previous occurrences have been reported since the year 1919, as follows. On 31st July, 1921, a berg was seen in lat. $37^{\circ} 37' \text{N.}$, long. $27^{\circ} 29' \text{W.}$ On 4th October, 1934, S.S. *Imperial Valley* observed a growler, 15 ft. long by 3 ft. wide, in lat. $36^{\circ} 16' \text{N.}$, long. $29^{\circ} 26' \text{W.}$ Westward of the 40th meridian, ice has been observed still farther south on six occasions since 1919, between latitudes $28^{\circ} 44' \text{N.}$ and $33^{\circ} 43' \text{N.}$

TRADE WIND

Approaching Channel between Teneriffe and Gran Canaria

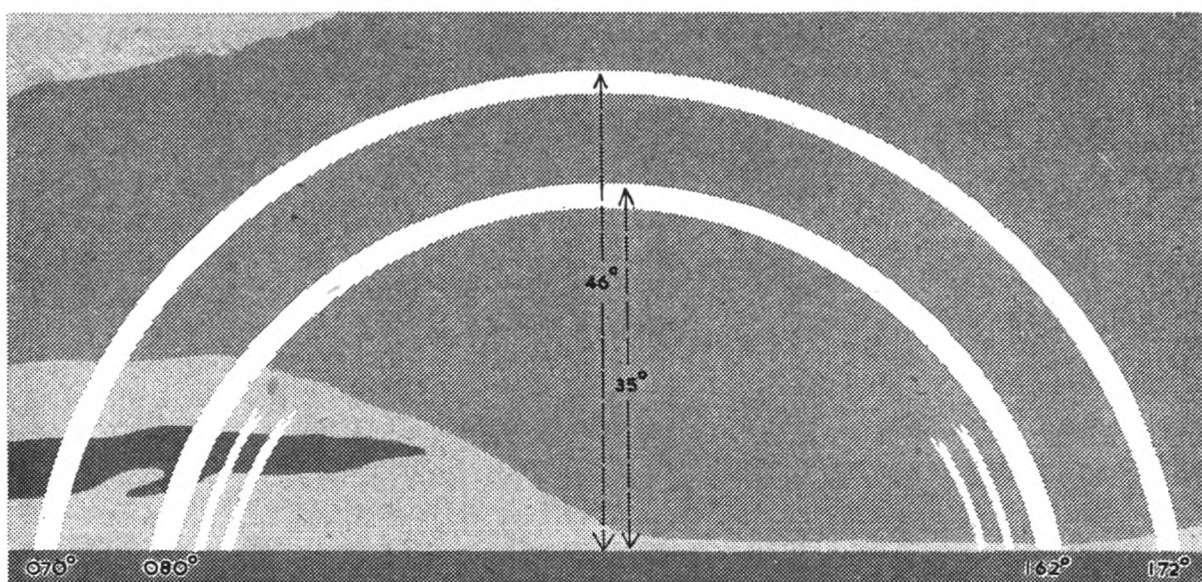
S.S. *Explorer*. Captain W. F. O'Neill. Birkenhead to South Africa. Observers, Mr. G. Gubbin, 2nd Officer and Mr. R. H. Soar, 3rd Officer.

6th August, 1948, 2000 A.T.S. Moderate NE trade wind increased suddenly to force 7 with gusts of force 8. Swell was moderate, but sea was rough and breaking heavily, both coming from NE. Sky remained perfectly clear, visibility good; barometer fell sharply (6 mb. in 3 hours) and the depression of the wet bulb was only 1° . At 0100 A.T.S. on the 7th, the wind suddenly moderated to force 4, as the ship drew away from the islands. Barometer became steady and commenced to rise slowly, sea and swell moderated, visibility remained good and the sky clear although dew was heavy.

RAINBOW

Pacific Ocean

M.V. *Port Lincoln*. Captain H. H. Smith, O.B.E. New Zealand to Balbao. Observer, Mr. D. M. Robinson, 3rd Officer.



2nd July, 1948, 0020 G.M.T. Rainbow observed (as sketch). Primary bow: outer band 35° and inner band $33^{\circ} 05'$ above horizon, $1^{\circ} 55'$ wide. True altitude of sun's lower limb $7^{\circ} 3'$, bearing $30\frac{1}{2}^{\circ}(T)$. Brilliant colours in the usual sequence: violet, blue, green, yellow, orange and red on the outer edge. The red was the brightest and widest band, approx. $30'$, then the violet slightly narrower and not so intense. The green and yellow were of equal width and intensity; but the blue and orange were rather indistinct, especially the orange. Secondary bow: outer band 46° , inner band $43^{\circ} 40'$ above horizon, $2^{\circ} 20'$ wide. Much fainter with only five colours: red, yellow, green, blue and violet on the outer edge. All colours of equal width and intensity. Supernumerary bows: the ends of two bows inside the primary, rather faint yellow with a suggestion of purple at the edges, approx. 1° wide, 2° apart and 2° from the primary. These bows were observed in a bank of Ns. from which moderate rain was falling at some distance from the ship, Other clouds, Sc, As, Ac or high Sc. There was 6/10 of low cloud with an average base level of 2,500 ft., total cloud amount 9/10.

Position of Ship: Latitude $27^{\circ} 08'S$, Longitude $116^{\circ} 57'W$.

GREEN FLASH

North Atlantic Ocean

O.W.S. *Weather Watcher*, Captain F. A. Elston. On station "Item." Observer, Mr. D. Hay, 3rd Officer.

12th July, 1948. The evening was fine, visibility was exceptionally good and an hour or two before sunset there had been small amounts of alto-cumulus lenticularis and cirrocumulus. These had almost dispersed by sunset and the western part of the sky was quite clear by 2230. The sun set at 2237 and had been below the horizon for an appreciable time before a vivid green ray was seen. The ray extended 1-2 degrees above the horizon and was emerald green in colour. It lasted about 8-10 seconds and most nearly can be described as resembling a green aircraft flare hanging in the sky.

Note.—At 2100, the sea temperature was 52° and the dry bulb 54° . The surface pressure was 1019 mb.

The radio-sonde ascent at 2000 showed a shallow layer of cold air from the surface to 935 mb. where a rise in temperature began. The temperature drop in the cold surface layer was 14° . Cold surface air increases the index of refraction and allows the dispersion between the red and green rays of the sun's spectrum to be seen.

AURORAE

Belle Isle Strait

T.E.V. *Beaver Cove*. Captain J. P. Dobson, D.S.C., R.D., R.N.R. Montreal to London. Observer, Mr. R. Gillett, 3rd Officer.

10th August, 1948, 0600 G.M.T. Aurora observed to SE flashing spasmodically at altitude 10° to 15° ; it was white. Magnetic compasses were steady and visibility excellent.

Position of Ship : Latitude $50^{\circ} 10' \text{N.}$, Longitude $59^{\circ} 37' \text{W.}$

North Atlantic Ocean

S.S. *Marietta Dal.* Captain J. G. F. Brighty. Grangemouth to Port Churchill. Observer, Mr. R. H. Jenkins, 2nd Officer.

9th August, 1948, 0000 to 0130 G.M.T. There appeared to be flashes of light coming from the horizon bearing 310° and when right overhead they appeared as high cloud, remained flickering for some moments and then disappeared towards 140° .

Position of Ship : Latitude $58^{\circ} 48' \text{N.}$, Longitude $10^{\circ} 00' \text{W.}$

S.S. *Eastern*, in New Zealand waters reported a faint display of aurora australis on 9th August, 1948, from 0850 G.M.T. onwards. Position of ship, latitude $46^{\circ} 16' \text{S.}$, longitude $170^{\circ} 19' \text{E.}$

M.V. *Silveroak*. Captain W. N. Tulloch. Alexandria to Halifax. Observer, Mr. K. A. Wise, Jnr. 2nd Officer.

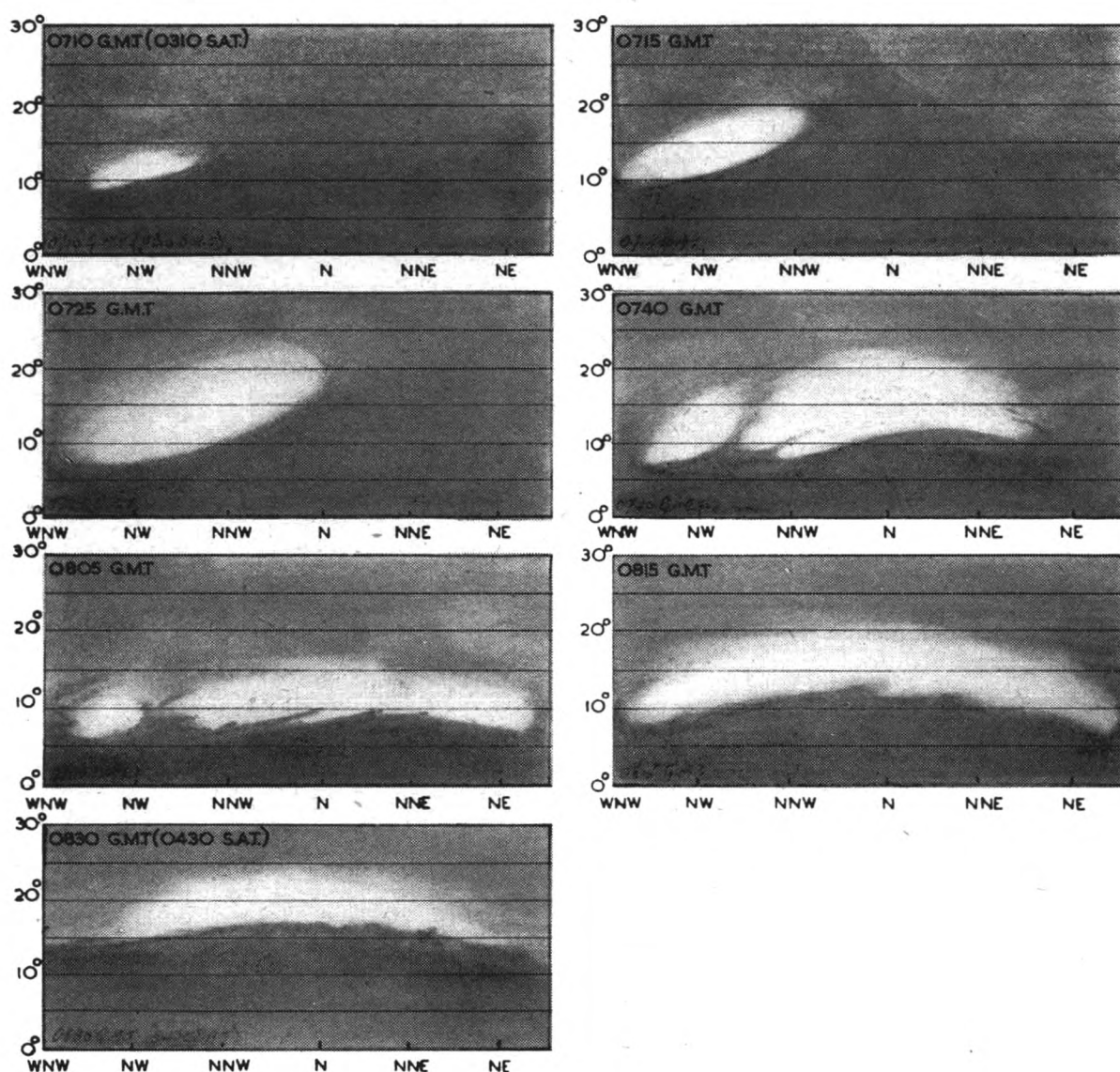
10th August, 1948, 0350 to 0750 G.M.T. Aurora was observed to the northward over a bank of Cb low down on the horizon. A fibrous veil of Ac topped this bank giving the whole the appearance of a fog bank; elsewhere the sky was cloudless. Shortly after 0400 G.M.T. streaks of yellowish light reached an altitude of 30° bearing from 340° to $035^{\circ}(\text{T})$. At 0515, the streaks spread from 320° to 060° and to an altitude of 58° . By this time waves

of light began to sweep across the sky from the north. At 0625, the whole sky was brilliant with the rays streaking well over the observer's zenith bearing from 290° to 104° and at the same time waves of light swept over the whole sky. The waves of light resembled those seen when the sun is low and the light reflected on rippled water. The aurora began to fade at 0635 and little was visible by 0750.

Position of Ship: Latitude $43^{\circ} 40' \text{N.}$, Longitude $61^{\circ} 30' \text{W.}$

Approaches to New York

M.V. *Port Lincoln*. Captain H. H. Smith, O.B.E. London to New York.
Observer, Mr. D. Robinson, 3rd Officer.



16th August, 1948, 0710 to 0830 G.M.T. Aurora observed as illustrated. It increased in size and brightness in a cloudless sky with stars visible right down to the horizon until 0725. From 0740 onwards it began to spread across the northern sky until at 0815 it began to diminish. At 0830 with the break of daylight a bank of Cs was seen to creep up from the northern horizon until the aurora finally faded. At no time were rays of light observed. Weather conditions, cloudless.

Position of Ship: Latitude $40^{\circ} 29' \text{N.}$, Longitude $71^{\circ} 26' \text{W.}$

S.S. *Caxton*. Captain J. M. Cherry. London to Three Rivers. Observer, Mr. R. Crawford, 3rd Officer.

20th August, 1948, 0030 to 0255 G.M.T. At 0030 G.M.T. a few faint rays of auroral light were discernable shooting up towards the zenith. These appeared on different bearings between NW and NE at different times. They seemed to come from below the horizon and did not attain a greater altitude than 45° . By 0100 the display had completely disappeared, leaving a faint diffused light all round the northern horizon. Shortly afterwards a band of auroral light became visible, composed of streaks as shown in Fig. 1.

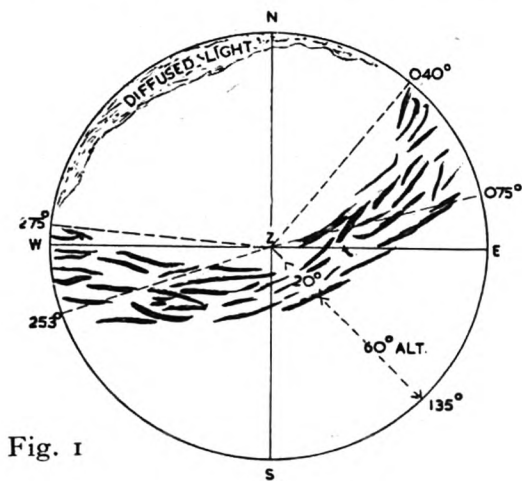


Fig. 1

The band was brightest at 0106 and was then comparable to twice the intensity of the Milky Way on a clear tropical night with no moon. At 0108 a bright patch of diffused light was seen in the NE on the N side of that end of the band. This light had a definite yellow colour and was about twice as bright as the main part of the band. At the westward end of the band at the same time a similar patch was visible, but of less intensity and of a reddish colour. These diffused patches were at their brightest at the time stated. At 0130 several rays were seen shooting up towards the point of maximum altitude of the band. They were between the bearings of 278° and 290° and between altitude 15° and 45° and only lasted for a few minutes. At 0200 the band was reduced in breadth to an average of about 10° in the position shown in Fig. 2. At 0210 it was only 7° wide and its western half appeared as a fairly regular curve, while the eastern half took up a serpentine form across the sky. Its light now appeared to be approximately three times the intensity

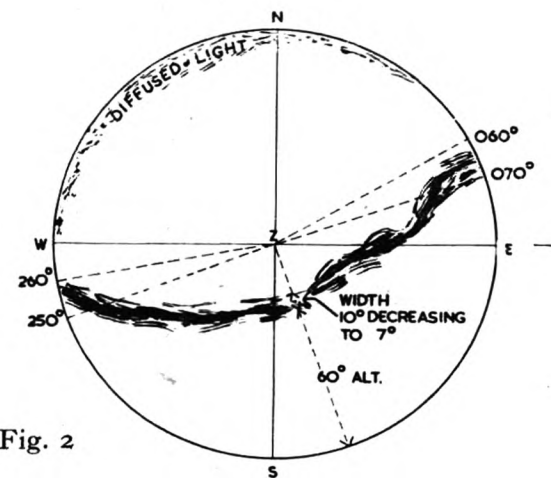


Fig. 2

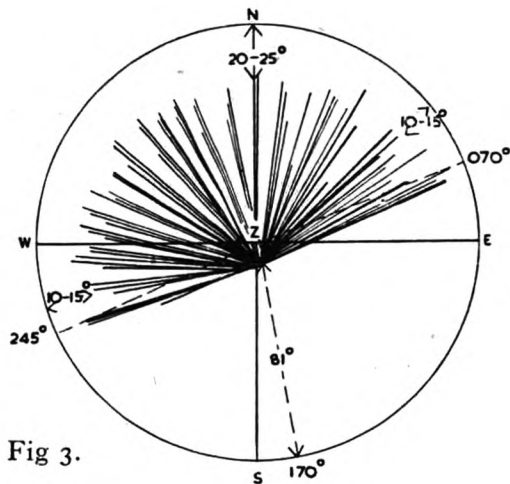


Fig 3.

of the Milky Way. This form gradually disappeared until at 0230 increased activity suddenly took the form shown in Fig. 3, many rays converging to a very clearly defined focal point at an altitude of 81° on the bearing 170° . At 0242 the aurora began to disperse and at 0255 completely disappeared. It may be mentioned that as each change took place it did so within a matter of seconds and then gradually faded out. Sky clear with 4/10 to 3/10 Fc cloud. Full moon.

Position of Ship : Latitude $53^{\circ} 27'N.$, Longitude $38^{\circ} 20'W.$

M.V. *Comanchee*. Captain T. Potts. Glasgow to New York. Observer, Mr. F. P. Barber, 3rd Officer.

30th August, 1948, 0425 to 0450 G.M.T. A lightening of the sky to the northward was observed with rays like searchlights shooting from between 345° to 348° . At 0429 the maximum of luminosity was attained extending from 335° to 030° and reaching an altitude of 15° . The rays continued, some reaching up to 25° , and diverging from their apparent source on the horizon over an angle of about 50° of arc. At 0433 these rays became less evident, dying away to flickers after 3 minutes. With the complete cessation of these flickers, the whole display began to fade. At 0438 the same area began to regain its former brightness with rays now emanating from between bearing 015° to 030° . This recurrence reached a maximum at 0441 and remained for 2 minutes, after which it began to fade and at 0450 the sky was normal again. The recurrence was only about half as bright as the initial display and the rays proportionately weaker. Fine and clear with few scattered clouds round the horizon.

Position of Ship : Latitude $40^{\circ} 29'N.$, Longitude $70^{\circ} 22'W.$

Other reports of aurora on 30th August were as follows :

S.S. *Essex Trader* at 0600 G.M.T. lat. $55^{\circ} 36'N.$, long. $23^{\circ} 22'W.$ "Brilliant aurora."

O.W.S. *Weather Recorder* at 2340 G.M.T. on station "Item," lat. $60^{\circ} 00'N.$, long. $20^{\circ} 00'W.$ "Aurora observed."

S.S. *Caxton*, Captain J. M. Cherry. Dalhousie, N.B. to Glasgow. Observer, Mr. R. Crawford, 3rd Officer.

8th September, 1948, 0030 to 0115 G.M.T. An arc of light could be clearly distinguished on the northern horizon but was not very bright. The greatest altitude of the lower edge was $11^{\circ} 44'$, and the end reached to the horizon at 040° and 295° . The dark segment was noticeable and stars could be seen in it. This arc lasted until 0100 G.M.T. when it began to fade. At 0115 it was barely discernable and at 0130 fog was encountered and observations had to cease.

Position of Ship : Latitude $52^{\circ} 42'N.$, Longitude $52^{\circ} 40'W.$

Approaching Auckland Harbour

M.V. *Rangitata*. Captain G. Kinnell, O.B.E. Wellington to Auckland. Observer, Mr. N. Etherton, 3rd Officer.

8th August, 1948, 0900 G.M.T. A display of aurora australis was observed over an arc 130° – 180° , extending from the horizon to an altitude of 23° . Commencing with a red glow, it increased in intensity and eventually formed a curtain of vertical and parallel shafts of blood-red light over the

whole of the arc. It lasted for about 25 mins., then faded completely. Weather conditions were normal with 6/10 of Sc.

Position of Ship : Latitude $36^{\circ} 48'S$, Longitude $174^{\circ} 52'E$.

New Zealand Waters

S.S. *Vasconia*. Captain G. S. Evans. Lyttelton to Balbao. Observer, Mr. A. R. M. Graham, 3rd Officer.

8th August, 1948, 0845 G.M.T. Aurora australis was observed commencing as a reddish glow bearing about $S40^{\circ}W$. at a mean altitude of 25° . After a few minutes several white rays appeared, one considerably the brightest lasted only about 5 seconds. After 10 mins. the light gradually faded away and reappeared 5 mins. later stretching from its original position to due south of the vessel. The apparent focal point was obscured by a bank of Cu which covered the sky to an altitude of 15° all round the horizon. The lights were brightest at 0922 when three distinct patches could be seen, bounded by whitish rays. The brightest appeared from $S40^{\circ}W$ to $S65^{\circ}W$. Another from $S26^{\circ}W$ to $S35^{\circ}W$ contained rays which reached over 30° in the vicinity of the Southern Cross, and the third patch stretched from $S5^{\circ}E$ to $S15^{\circ}W$. Diffused pink light remained in the south at about 25° , increased in brilliancy and moved rapidly eastwards until it faded away bearing approx. $S30^{\circ}E$ at 0945. During the aurora the red light appeared above, or at the highest parts of the cloud. Behind the cloud, the light was pale. Predominant colour throughout was red with white or blue-white rays. At the brightest moments when the rays became distinct, the main glow appeared more orange. The rays were mostly in fan formation, at times appearing to be parallel and constantly changing in brilliancy and position, often disappearing altogether. The upper edge of aurora had no distinct boundary so altitudes are only approximate. Stars were only obscured at lower levels during brightest periods.

Position of Ship : Latitude $42^{\circ} 28'S$. Longitude $175^{\circ} 45'W$.

Australian Waters

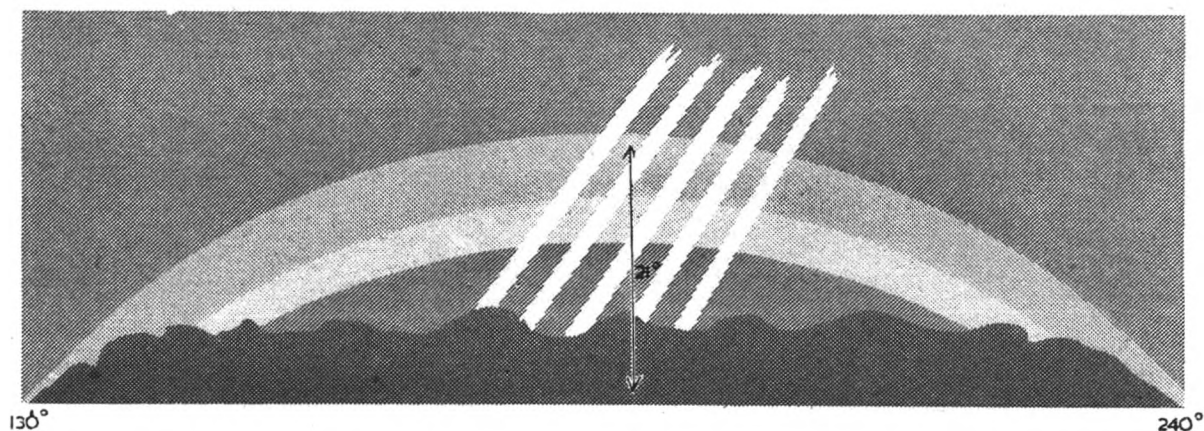
S.S. *Couलगorm*. Captain G. Robison. Bunbury to Sydney. Observer, Mr. W. F. Kelly, Chief Officer.

8th August, 1948, 0845 G.M.T. Aurora australis was observed in the southern sky bearing 145° to 200° . The evening was dark, fine and clear, when a red glow appeared on the horizon and slowly increased until it reached an altitude of 20° , then it changed to a lighter red with brilliant white beams crossing to and fro. This lasted for about 20 mins., then the beams began to flicker and finally disappeared leaving a scene of changing colours, yellow, green and purple predominating. This colourful scene lasted only a few minutes leaving the original red glow which faded out gradually until at 1920 no sign remained ; but the glow reappeared at about 1300 until 1320.

Position of Ship : Latitude $36^{\circ} 18'S$, Longitude $150^{\circ} 16'E$.

S.S. *Orion*. Captain Sir A. J. Baxter, K.B.E., D.S.C., R.D., Cmde. R.N.R. Adelaide to Melbourne. Observer, Mr. D. K. M. Kinloch, Jnr. 3rd Officer.

8th August, 1948, 1205 G.M.T. (2205 A.T.S.). Observed brilliant aurora australis. The moon set at 1156 G.M.T. behind a bank of Cu. and at 1205 the aurora was seen stretching from bearing $130^{\circ}(T)$ to 240° , height at centre



of arc 21° . Upper portion was a deep copper colour changing through paler red to brilliant white at upper edge of cloud bank. Striking through main curtain of aurora were several shafts of brilliant white light. Colours gradually faded until curtain was only silver white and by 1235 aurora had practically disappeared. At 1300 the bank of Cu. had extended 22° above the horizon and from its upper edge, extending a further 18° between bearings 200° and 250° , the aurora reappeared ruby-coloured. By 1310 it had completely disappeared. Cloud Cu. 3/10.

Position of Ship : Latitude $39^{\circ} 53' \text{S.}$, Longitude $143^{\circ} 42' \text{E.}$

S.S. *Orontes*. Captain N. A. Whinfield. Coasting in Australian Waters. Observer, Mr. B. Noble, 3rd Officer.

8th August, 1948, 1300 to 1330 G.M.T. Observed vivid aurora australis in the form of a square with clear centre. The edges were vivid red through which the stars were still visible. The aurora was over an arc of horizon bearing 135° to $225^{\circ}(\text{T})$ from ship, and was between 30° and 24° altitude. The redness disappeared at 1308 G.M.T. and was replaced by a shaft of white light rising from 3° to 15° altitude and about 5° wide. At 1314 this disappeared and left a white glow like a full moon rising behind clouds. At 1330 aurora disappeared entirely. Wind WSW force 4. Slight sea and long low SW'ly swell. Heavy bank of Cu. from 0° to 3° altitude, clear elsewhere.

Position of Ship : Latitude $36^{\circ} 17' \text{S.}$, Longitude $138^{\circ} 39' \text{E.}$

S.S. *Ranchi*. Captain R. E. T. Tunbridge, D.S.C., R.D., Capt. R.N.R., A.D.C. Sydney to Bombay. Observer, Mr. C. E. Waller, 4th Officer.

8th August, 1948, 1830 to 1910 A.T.S. Observed aurora australis in the form of diffused light, dull red and of moderate intensity. Unfortunately cloud limited the observation but as near as could be judged the light covered an approximate arc of horizon 50° – 60° and extended upwards to about 25° – 30° during period of greatest brilliance. Occasionally faint yellowish-white rays were visible for short intervals, greatly fluctuating in intensity but apparently remaining fairly constant in length. These rays were almost vertical but converged slightly towards the horizon resembling a fan. No exceptional errors on magnetic compasses or unusual effects to radio were observed.

Position of Ship : Latitude $38^{\circ} 15' \text{S.}$, Longitude $138^{\circ} 10' \text{E.}$

Other ships reporting aurora on 8th August were :

M.V. *Clan MacDougall* in Indian Ocean, lat. $39^{\circ} 54'S$, long. $101^{\circ} 28'E$. 'Fairly strong aurora australis throughout most of night, few streamers observed.'

M.V. *Sacramento* in North Atlantic, lat. $41^{\circ} 26'N$, long. $63^{\circ} 18'W$. "0000 to 0200 G.M.T. on the 9th, aurora observed to NW in clouds and beams of light"; also on the 10th in lat. $40^{\circ} 30'N$, $73^{\circ} 00'W$. "at 0700 G.M.T. aurora observed to N in fan of beams and moving clouds of white light."

S.S. *Duke of York*, in North Sea, lat. $51^{\circ} 48'N$, long. $02^{\circ} 34'E$. Aurora was observed from about 2330 G.M.T. on 7th August to 0155 on 8th August. Between 0129 and 0149 a broad band and a single streak of light were observed to move slowly eastward, keeping the same relative distance apart, becoming gradually less distinct.

METEORS

Black Sea

S.S. *Tower Grange*. Captain G. Robson. In Black Sea. Observer, Mr. R. Clipsham, 2nd Officer.

8th September, 1948, 0008 G.M.T. Observed brilliant meteor bearing $188^{\circ}(T)$ falling almost vertically towards horizon in the ENE. An orange ball appeared to hang for 30 seconds and was comparable in magnitude to Venus, which was visible. It had a brilliant blue trail of "jagged" appearance which was seen for 2 minutes. Approximate altitude of meteor at disappearance was 26° and the trail, as measured by sextant angle, was 4° long. It was in close proximity to the star β Ceti (Diphda).

Position of Ship : Latitude $44^{\circ} 26'N$, Longitude $30^{\circ} 41'E$.

Indian Ocean

S.S. *Kent*. Captain N. A. Thomas. Sydney to Aden. Observer, Mr. R. Sims, 3rd Officer.

8th September, 1948, 2020 A.T.S. approx. A meteor was observed bearing approx. 20° , altitude 30° . It traversed a S'y course over an arc of about 80° to an altitude of 20° . It was visible for about 5 seconds and was extremely bright, illuminating the whole ship. The meteor appeared as one star of bright blue-white light leaving an incandescent yellowy trail 5° long. About half-way along its track it broke up into five stars leaving a denser trail about 8° long. Each of these stars appeared about twice the size of Venus but with much greater brilliancy.

Position of ship : Latitude $14^{\circ} 39'S$, Longitude $85^{\circ} 33'E$.

Australian Waters

S.S. *Coulgorm*. Captain G. Robison. Sydney to Fremantle. Observer, Mr. T. F. Tuomey, 2nd Officer.

9th September, 1948, 1957 G.M.T. An extremely brilliant meteor was observed bearing 025° , altitude 36° . It arched slightly to the zenith and then travelling east disappeared bearing 100° , altitude 20° , leaving a very distinct trail which remained visible to the naked eye for 17 mins. The meteor was in sight for 3 secs., and the ship and surrounding area were illuminated by its light which at first was a blinding white, dimming to crimson or orange. While the trail was in view it changed from a curve to a wavy line before disappearing.

Position of Ship : Latitude $32^{\circ} 03'S$, Longitude $115^{\circ} 20'E$.

New Zealand Waters

S.S. *Corinthic*. Captain G. M. Robertson, D.S.C. Panama to Auckland via Pitcairn. Observer, Mr. Moore, 5th Officer.

1st August, 1948, 1515 G.M.T. Two very bright meteors were first seen in the constellation Triangulum Australe and moving through the larger of Magellan's Clouds on a course 332° (T), they disappeared at an approximate altitude of 60° . The first meteor was the larger and the second had the magnitude of Jupiter which was -2 . Each meteor trailed a stream of light extending about 15° and the duration of observation was about 3 secs.

Position of Ship : Latitude $41^{\circ} 35' S$., Longitude $176^{\circ} 31' E$.

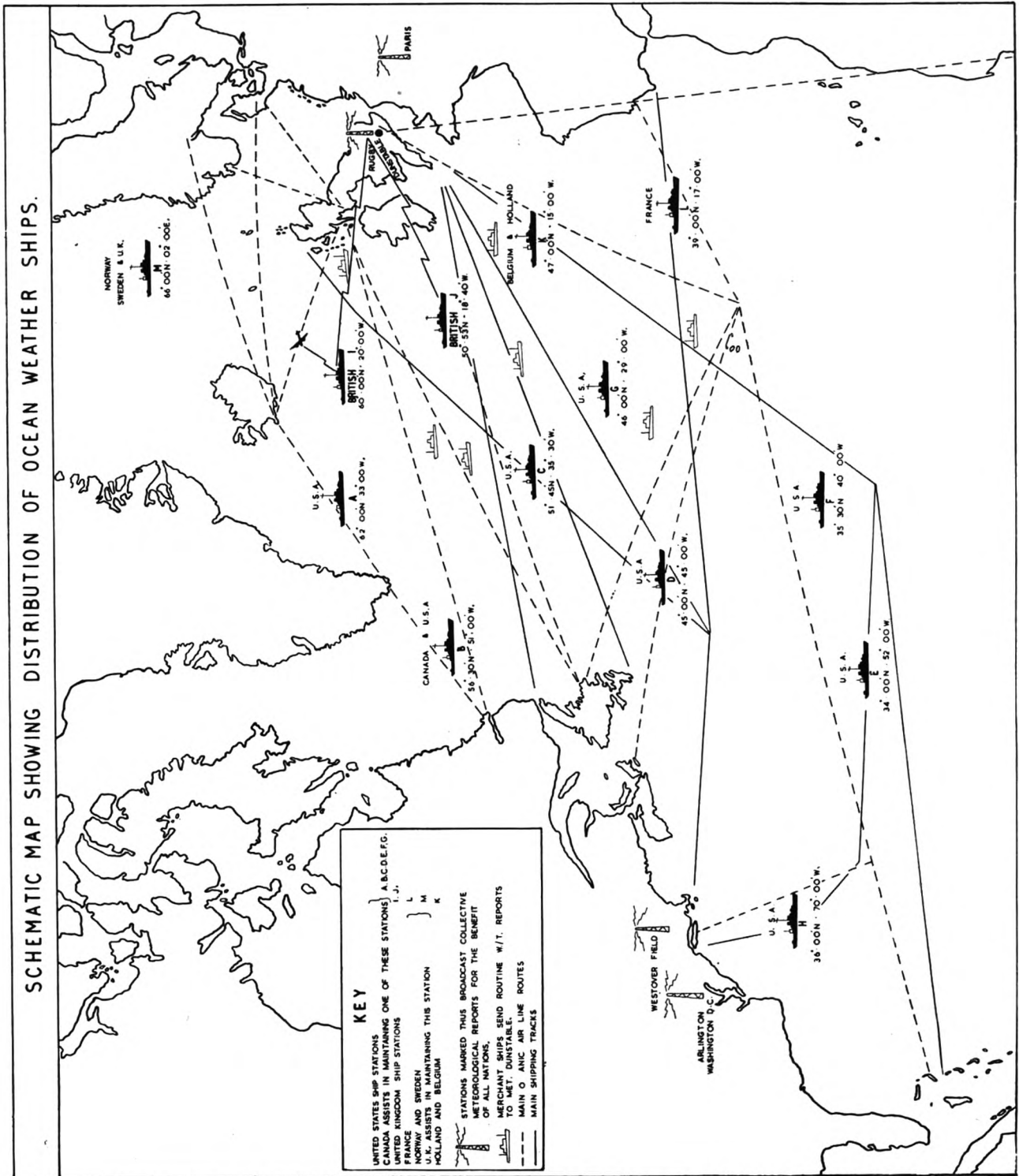


Fig. 1. (see page 158)

ANALYSIS OF WEATHER CONDITIONS AT STATION "JIG" IN
JULY, 1948

By A. H. GORDON, M.Sc.

Introduction

During a voyage made by the writer to station "Jig" at 53° 50' N., 18° 40' W.,* in the Ocean Weather Ship *Weather Recorder* in July, 1948, an attempt was made to analyse the synoptic situation and correlate the weather experienced with the type of pressure system dominating the weather of the station. There is not a great deal of information available concerning the forecasting and incidence of weather conditions in the North Atlantic and it was thought that a comparison of weather conditions experienced in mid-ocean with those normally to be expected over land with a similar type of pressure distribution and form of synoptic analysis might bring out some interesting points. Visual and instrumental observations were made to supplement the routine observations and provide additional data upon which to base the analysis and resultant conclusions. Emphasis was placed on surface rather than upper air data because the former are more directly related to the marine aspects of meteorology.

Pressure Type Frequencies

Approximate values for mean and extreme percentage frequencies for July (period 1911 to 1947, excluding 1915-1918) of various types of pressure systems which dominated the weather of station "Jig" have been derived from "Daily Weather Reports," published by the Meteorological Office and are given in Table 1 below.

TABLE 1. FREQUENCIES OF VARIOUS PRESSURE SYSTEMS DOMINATING WEATHER OF STATION "JIG" IN JULY

	MEAN	MAX.	MIN.	1948
1. Depression or trough (except centre)	61	78	30	66
2. Anticyclone	17	51	0	14
3. Pronounced Ridge	6	16	0	0
4. Weak Ridge	10	21	2	10
5. Depression centre	2	13	0	2
6. Col	3	10	0	6
7. Flat Pressure (no identifiable pressure system) ..	1	5	0	2

A more detailed frequency classification is given in Table 2 for the 10-year period 1938-1947, inclusive. The frequency of fronts passing the station in July, based on the same ten-year period, is given in Table 3. The introduction of frontal analysis into the Daily Weather Reports at the beginning of the past decade enabled these frequencies to be tabulated.

Corresponding values for each specification for July, 1948, are given in column 4 of each table.

*See Fig. 1 (page 157)

TABLE 2. FREQUENCIES OF PRESSURE SYSTEMS DOMINATING WEATHER OF STATION " JIG " in July (1938-1947)

	MEAN	MAX.	MIN.	1948
1. Depression or trough (excluding subdivisions below)	58	74	38	51
2. Waves	2	8	0	5
3. Main warm sector	6	10	2	8
4. Non-frontal Trough	1	5	0	2
5. Anticyclone	12	29	2	14
6. Pronounced Ridge	5	11	0	0
7. Weak Ridge	11	21	6	10
8. Depression Centre	2	8	0	2
9. Col	2	6	0	6
10. Flat Pressure	1	3	0	2

TABLE 3. NUMBER OF FRONTS PASSING STATION " JIG " IN JULY (1938-1947)

	MEAN	MAX.	MIN.	1948
1. Warm Front	3	8	1	7
2. Cold Front	4	8	1	7
3. Occlusions	4	7	0	2
4. Back bent Occlusions	1	3	0	0
5. Secondary Cold Fronts	1	2	0	1

Comparison of the values for 1948 with those of the mean for the preceding years indicates that the depression type of system predominated slightly over the anticyclonic type, largely due to the absence of any cases which could be classified as pronounced ridges. The frequency of other pressure systems during the month did not differ largely from the mean. July, 1948, can therefore be considered a fairly normal month from the pressure distribution point of view.

Although the number of warm and cold fronts passing the station appears large from Table 3, in comparison with the mean for the preceding years, the majority were weak frontal oscillations within a strong anticyclone and caused little or no measurable precipitation.

Surface Wind

Fig. 2 illustrates frequencies of the direction and force of the surface wind for the 21 day period on station in wind rose form. Greatest frequencies

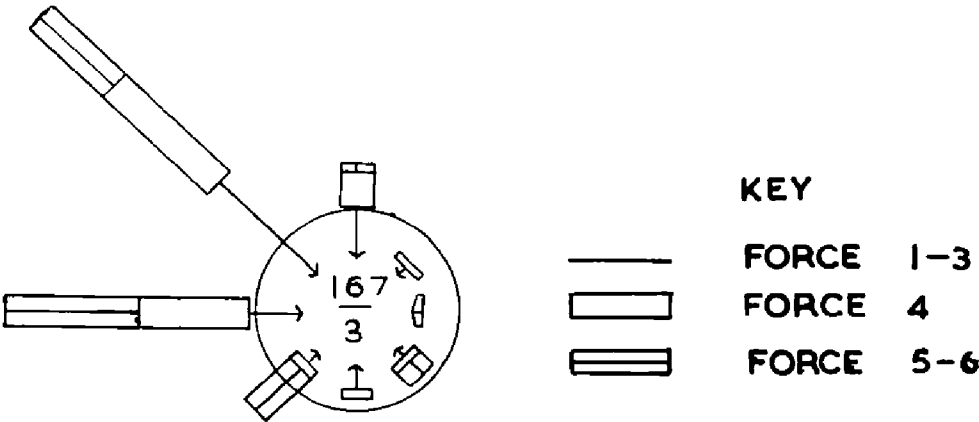


Fig. 2.

were from west to north-west, inclusive, and occurred because of the prevailing position of the semi-permanent Azores anticyclone which was centred a little to the south-west of the station for a considerable part of the period. Fig. 3 illustrates wind force frequencies in a graph where Beaufort force has been plotted against the number of cases.

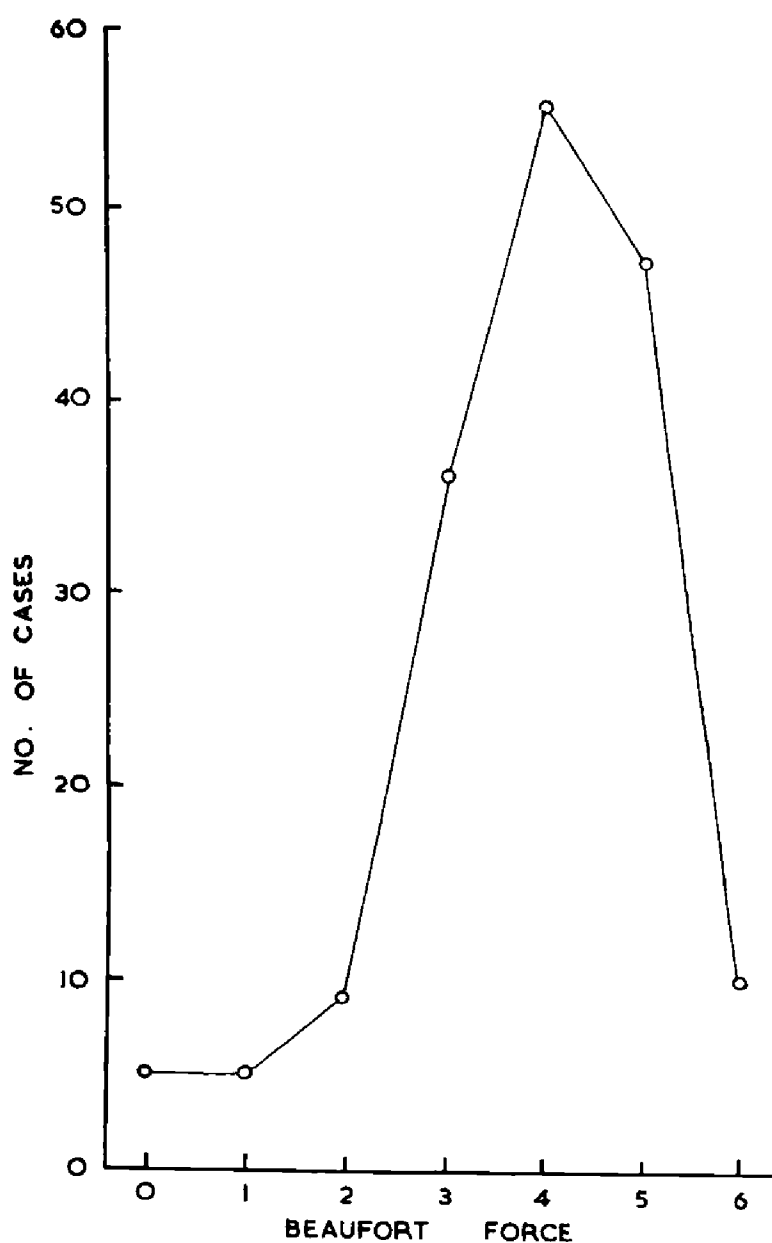


Fig. 3.

The peak frequency is Beaufort force 4. No cases occurred greater than force 6 so that the curve falls off rather rapidly to the right of the peak.

The diurnal variation of wind velocity is shown in Fig. 4. Although this curve indicates a form of diurnal variation of wind speed, comparison with data derived from the earlier voyages in May and June suggests that this form of diurnal variation does not exist as a regular feature of the summer climate of this station but appears here more from chance than from any underlying physical cause.

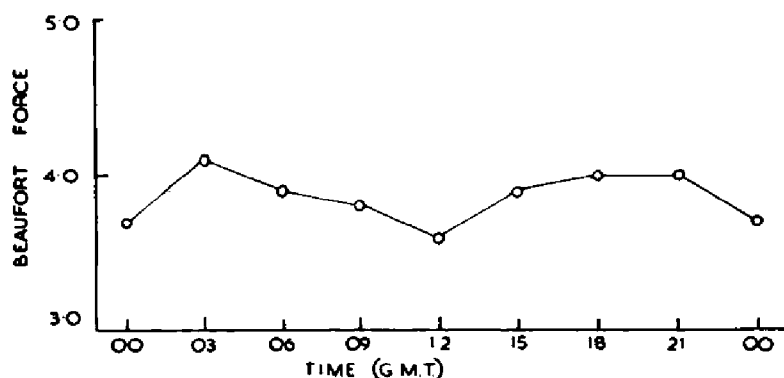


Fig. 4.

Air Temperature

Dry bulb temperatures as measured in a suspended screen exposed to windward on the bridge varied from a maximum of 58.8°F^1 at 1500 and 1800 G.M.T. on the 22nd to a minimum of 51.6° at 0600 on the 14th. Thus the total range throughout the 21-day period was only 7.2° . The maximum temperature was reached at the peak of a small ridge of high pressure as the wind fell light and slowly backed from W'N to a southerly direction. At this time the sky was fairly clear. It was found that the screen temperature rose a degree or two more when the wind was very light (calm or force 1), and when the sun was shining than when the wind was stronger or the sky heavily overcast, regardless of the air mass present. This extra heating was thought to be partially due to warming of the air from the deck and partially due to warming of the air directly or as a result of a slightly higher surface layer sea temperature.

Air temperatures were taken at about six inches from the sea surface from a rubber dinghy between 1500 and 1600 sun time (ship time) on the 8th at which time the centre of the warm anti-cyclone was near the station. A warm sun had been shining through patchy low stratus all day and the wind had been calm or force 1 for several hours. These observations were taken well away from the influence of the ship. They showed local fluctuations between 57° and 59° . The screen on the bridge showed a diurnal variation of 5.5° during the day. The implication of these fluctuations will be discussed further in the next paragraph in conjunction with the taking of similar sea temperature observations.

The minimum temperature, which was recorded on the 14th, occurred in a cool polar air stream with a wind of NNW force 3.

50 per cent of all temperatures recorded at 0600 were the lowest recorded for the day. About a third of those recorded at 1800 were the highest for the day. The mean diurnal variation was 2.5° . The maximum diurnal variations were 5.5° on the 8th, 5.2° on the 22nd and 4.2° on the 4th. All three of these variations occurred during days when the sun was shining bright and the wind was light (force 3 or less). On the 4th the temperature rose 3.1° between 0900 and 1200 with a force 3 wind during a brief period

¹ All Temperatures are given in degrees Fahrenheit.

of clear blue skies. On the 8th it rose 3.8° between 0900 and 1200 with a calm wind and the sun shining brightly through breaks in a sky covered with thin patches of stratus. On the 22nd it rose 3.3° between 1200 and 1500 with a force 3 wind and the sun shining in a clear sky.

All times mentioned are G.M.T., which is one hour later than sun and ship time.

The minimum diurnal variation of temperature was 0.7° on the 12th, which was a day of fresh winds and cloudy skies.

Fig. 5 illustrates the diurnal variation of mean temperature for the 21-day period on station.

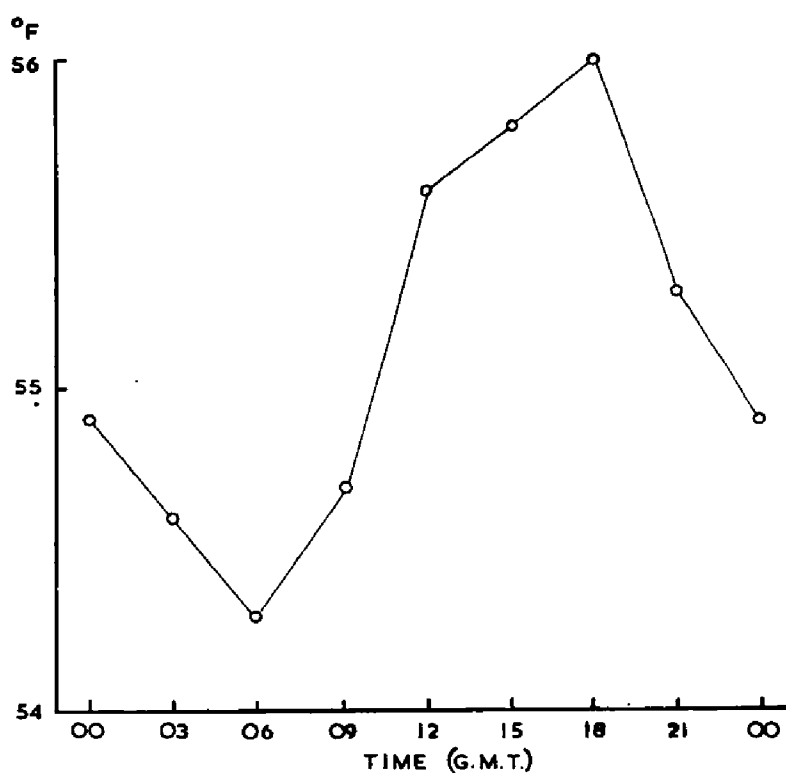


Fig. 5.

The diurnal variation of temperature over the ocean should be a function of the altitude of the sun in the sky, the wind strength and consequent calmness of the sea, the absence of cloud in the sky, the dryness of the air, and the lapse rate. It is not likely that variations would greatly exceed the 5.5° recorded on the 8th when the wind was calm for several hours during the middle of the day, allowing the relatively high altitude sun to heat the air and top surface layer of the water. A drop of temperature at night might occur in mid winter when the nights were longest if the sky was clear, the air dry and the wind and sea calm, but it is difficult to say of what order of magnitude such a diurnal variation would be.

Sea Temperature

The sea temperature measured by the canvas bucket method rose from 55° to 58° during the 21-day period. The maximum and minimum reading were these two limits. On the majority of days there was no appreciable variation of sea temperature. On the 8th, however, a variation of 3° was recorded as illustrated in Fig. 6. On no other day on station did the sea temperature vary by more than 1° and even variations of this order were infrequent.

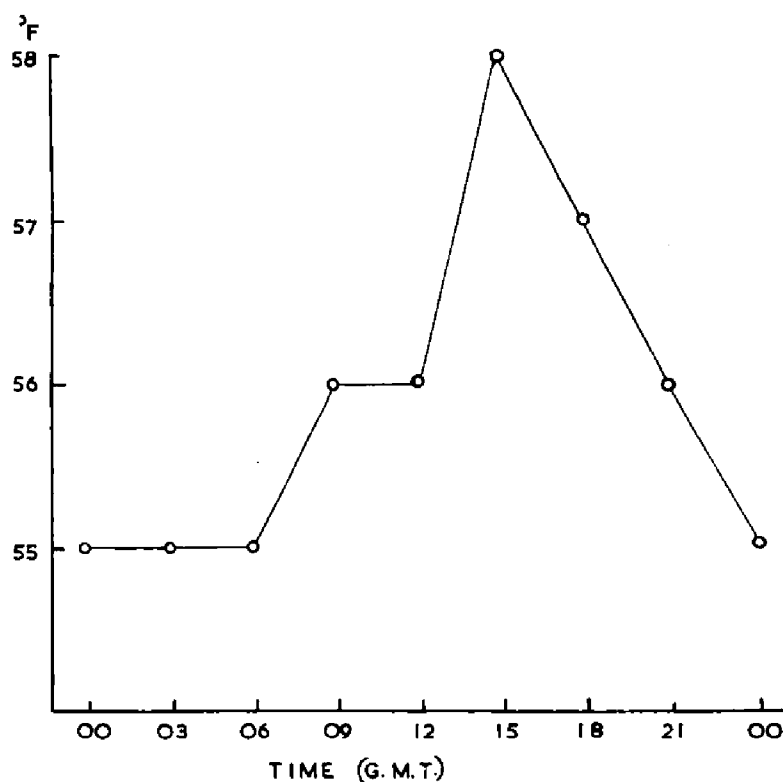


Fig. 6.

Readings of sea temperature were taken from a rubber dinghy, well away from the influence of the ship, between 1500 and 1600 sun time on the 8th, simultaneously with the dry bulb observations mentioned in the previous paragraph. Similar local fluctuations varying between 57° and 59° were recorded. The sea and air fluctuations were not superimposed on one another but varied considerably. Similar observations of sea temperature taken on two other days when the wind was not less than force 3 showed fluctuations not greater than about 0.5° . Simultaneous dry bulb observations showed fluctuations not greater than about 1° .

The results of the observations of sea and air temperatures close to the sea taken on the 8th are interesting. They show that with calm seas and clear skies there can be appreciable heating of the top foot of the sea surface and resultant heating of a similar order of the air in contact with the sea surface.

The results on the 8th occurred with the sun at a maximum altitude of about 35 degrees from the zenith. In regions nearer the equator where the sun's altitude is much greater and even reaches the vertical, the heating effect should be quite pronounced even with a slight wind. If such heating was associated with a suitable unstable lapse rate in the upper layers conditions could become favourable for the development of showers, thunderstorms or even waterspouts. In large areas of such calm, clear conditions in the tropics, the heating could cause convection on a large scale and thus initiate the development of a tropical revolving storm. It is difficult to estimate the order of magnitude of local and diurnal variations of temperature in the tropics, but maximum magnitudes would no doubt show a substantial increase from that recorded on station "Jig." The problem is complicated by increase of sea density due to increased salinity from evaporation and decrease in density due to increase in temperature from heating. If the resultant effect increased the density, the surface layer would sink and be replaced by cooler water from below. This process would tend to control local variations. Local variations would tend to disappear when the wind freshens and mixing of the surface layer of water takes place. Air temperature fluctuations would likewise tend to disappear under these circumstances.

Similar observations of sea and air temperatures taken near the surface in calm, clear conditions from other weather ships stationed nearer the tropics would be of great interest to supplement those made on station "Jig."

Humidity

Relative humidity varied from 100 per cent on several occasions, to a minimum of 63 per cent on the 22nd. Dewpoints varied from a maximum

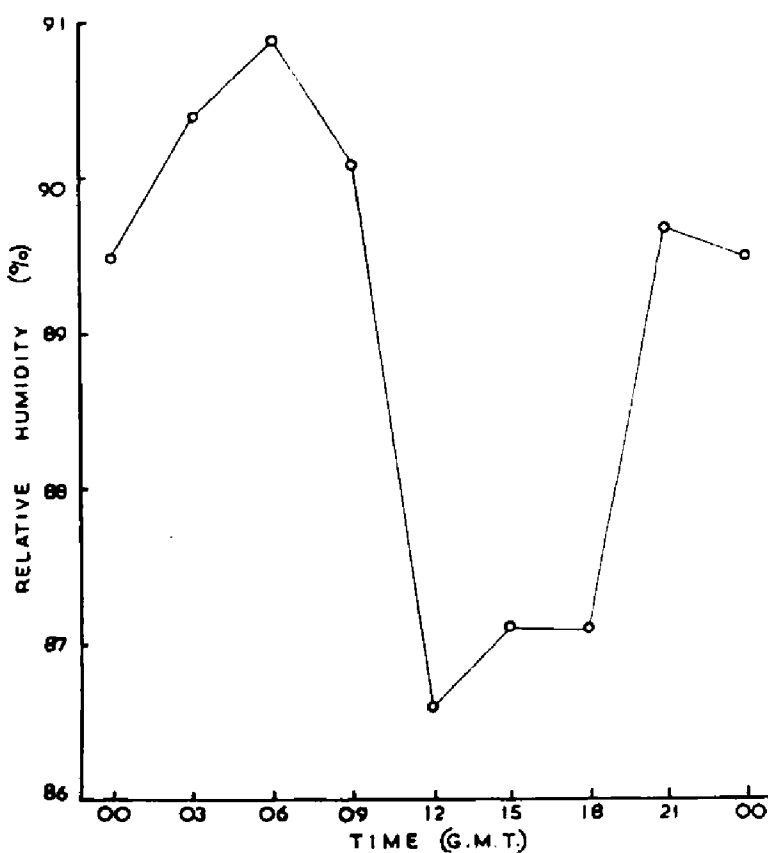


Fig. 7.

of 57°F. on the 17th, 23rd and 24th to a minimum of 45° on the 21st. Fig. 7 illustrates the diurnal variation of mean relative humidity.

The highest mean humidity occurred at the time of lowest mean temperature, while the lowest mean humidity occurred near the middle of the day when the sun was strongest, even though the temperature was not at its maximum. This was to be expected, since it was during the morning hours between 0600 and 1200 that the most rapid rise of temperature occurred. Later in the day when the rise had slackened or become steady, evaporation tended to increase the vapour pressure of the air more rapidly than the saturation vapour pressure increased as a result of any further rise in temperature.

Wet bulb temperatures were recorded at a distance of about 6 in. above the sea surface, simultaneously with the dry bulb and sea surface temperatures, from the rubber dinghy on 8th July. The wet bulb readings remained constant at 56° during fluctuations of relative humidity between 82 per cent and 94 per cent and of vapour pressure between 14.0 and 14.9 millibars.

Cloud

The most noticeable feature regarding cloud was the large amount nearly always present. The sky was 10/10 covered for 52 per cent of the time, 9/10 + or more covered for 76 per cent of the time and 9/10 or more covered for 82 per cent of the time. Only on six occasions was the sky broken to less than 5/10.

The large amount of sky coverage was caused by the type of synoptic situation which prevailed for some time during the period. The dominating Azores anticyclone maintained a weak circulation of air that had become very moist in the surface layer due to a long sojourn over the ocean. This moist surface layer was trapped by an inversion aloft caused by subsidence within the anticyclone. Turbulent mixing within the surface layer caused an almost continuous cloud sheet of low stratus.

Fig. 8 illustrates the diurnal variation of mean cloud amount.

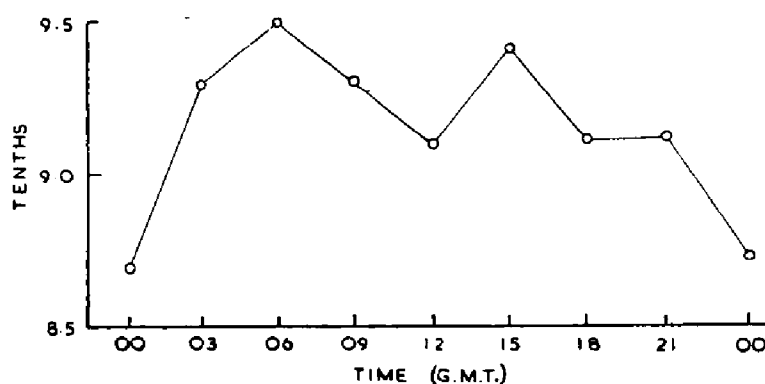


Fig. 8.

In this figure as in several of the other figures illustrated, it is difficult to deduce from the brief period covered whether the curve is a true representation of a physical effect, or whether it is merely a chance distribution unrelated to any mean.

Nevertheless, during the voyage, cloud was definitely observed to be at a maximum in the morning and to break a little towards the middle of the day. The probable explanation of this is that solar heating contributed both directly (on top of the cloud layer) and by reflection and convection from the

sea surface, to break up the cloud. This effect would be a maximum towards midday when the sun was strongest.

Cloud types consisted mainly of stratus and stratocumulus although large cumulus, accompanied by showers, developed during the last few days on station when the air was of fairly recent polar origin.

Visibility

Visibility was generally fairly good. Fog occurred on five occasions during the voyage and was accompanied by winds varying from force 2 to 6. It tended to occur during the hours of darkness, mainly with light winds. This fact suggests that the fog was caused by the cooling of the damp air layer near the sea surface by radiation.

Weather in relation to Pressure Distribution in July

(a) *Depression or Frontal System*

The weather in an ocean area dominated by a depression or frontal system follows very closely to the textbook pattern. Ahead of a warm front, high and medium cloud increase and are followed by low cloud and continuous precipitation in rapid order. No topographical or geographical obstacles exist to alter the natural course and velocity of the front. In the warm sector an overcast sky of stratus accompanied by occasional slight drizzle and moderate or poor visibility occurs. Because of the absence of any appreciable heating of the air from the sun, no lifting or breaking of this sky occurs as over the land during the day. In the rear of the cold front the sky breaks and clears and, later, cumulus cloud forms, although to rather less extent at this time of the year than generally occurs over land, again because of the absence of solar heating. Showers may develop if the air is sufficiently cold aloft to create a suitable lapse rate. The amount of cumulus cloud and the development of showers depend on the humidity content of the air, as determined by its source region and the length of time it has spent over the ocean. In order to obtain permanent sky breaks of 5/10 or less in a circulation without an inversion, the air required to have a dewpoint approximately 9 degrees below the "Jig" sea surface temperature.

Forecasts of weather associated with the passage of frontal systems and depressions over the ocean can therefore be made with accuracy by following the normal rules. Forecasts of cloud and convectional activity can be made from an estimate of the dewpoint and lapse rate in the surface layers of the air expected to cover the station during the period concerned.

(b) *Anticyclone*

Weather in the periphery of an anticyclone is mainly characterised by 10/10 or 9/10 + of low stratus accompanied by periods of drizzle, occasionally of a sharp and showery character. In the warm anticyclone, the air has been over the ocean for some time and surface dewpoints have become high in relation to the sea surface temperature; an inversion is present aloft and thus the damp air, which is cooler at the surface than aloft, becomes trapped there. Mechanical turbulence, resulting from the circulation, creates an adiabatic lapse rate in a shallow layer of about 50 millibars thickness from the surface. This shallow layer is unstable and causes the showery nature of the drizzle. These drizzle showers are clearly visible all round the horizon, particularly if the shallow unstable layer extends much above 50 millibars, which may occur if the wind is force 4 or more causing a greater degree of turbulent mixing.

In the very centre of the anticyclone, where the wind drops to calm, mechanical turbulence ceases, the surface layer becomes stable and the sun tends to break through the low stratus layer. Once the sun breaks through, and even before, reflected light from a calm sea surface becomes quite intense and probably greatly assists the breaking up process from below. This effect was noticed on station on the 8th.

Apart from the extreme centre, therefore, anticyclonic weather in these latitudes in summer is rather similar to the anticyclonic gloom of winter over land. Over the sea the cloud base is lower and the atmospheric pollution which gives the sky its dirty colour over land is absent.

The forecasting of the exact height of cloud base and of visibilities in such anticyclonic conditions at sea would present considerable difficulties. The problem would resolve itself into a minute examination of the temperature and humidity characteristics of the surface air layer.

(c) *Weak Ridge*

Weather within a weak ridge is similar to that experienced in the periphery of an anticyclone—10/10 low stratus accompanied by periods of drizzle. These conditions apply particularly westwards from the axis of the ridge, where the effect of an inversion is felt, to the whole of the remainder of the ridge, where the air is drawn from a southerly point and is therefore warmer and moister. At the extreme eastern edge of the ridge, cloud may break for a brief period to as little as a few tenths. This breaking up of cloud is mainly due to subsidence in the immediate rear of the cold front which precedes the ridge. It does not last long—probably of the order of a quarter to a half hour—before reverting to overcast conditions. In a weak ridge, the air cannot originate from a point sufficiently far north to possess a dew-point that is low enough (in comparison with the sea surface temperature) to permit breaking up of the cloud layer in a permanent manner.

(d) *Depression Centre*

Weather accompanying the centre of a depression is characterised by 10/10 low stratus, which, at frequent intervals, falls to the surface causing thick fog. Occasional light drizzle is also present. The most noticeable feature is the unusual lumpy or hummocky appearance of the sea.

(e) *Col*

This type of pressure distribution may be accompanied by fair weather, good visibility and a mixed and varied condition of the upper sky. High and medium clouds of different types may be present together with scattered or broken lower cloud. Over land the upper sky is often obscured, in col situations, by fog or thunderstorm cloud. On the occasions when a col covered station "Jig" the air was of polar origin and fairly dry. Visibilities were very good.

(f) *Flat Pressure*

The case of flat pressure noted in Tables 1 and 2 occurred after the ship left station so that this case is not discussed.

Conclusions

The major point requiring emphasis is that the brevity of the period covered diminishes the importance of the evidence accumulated to such an extent that the true validity of many of the effects discussed cannot be reliably verified. This does not mean that these effects do not exist, but that in some cases the results may be prejudiced by the existence of a certain type of synoptic situation and may not therefore be truly representative of the meteorology of the station for the period covered.

It is intended to make a further analysis along the lines of that discussed here as soon as a complete year's data becomes available. Additional data accumulated from year to year from this and other ocean weather ship stations throughout the world can be incorporated in subsequent analyses, so that our knowledge of marine meteorology will be continually augmented.

“ FROST FAIRS ” ON THE THAMES

Six old prints depicting the Frost Fairs held from time to time on the frozen River Thames were recently presented to the Director of the British Meteorological Office by Mr. C. E. Britton, and now hang in the Conference Room in Victory House, London.

The pictures show the Thames frozen over during the severe winters of 1683, 1739-40, 1789 and 1814. We see the frozen river covered with the “ Booths and all the varieties of showes and Humours ” which constituted the “ Frost Fairs.” Some of the prints bear statements that they were actually printed on the ice.

The year 1814 marked the last great freeze-up, although the Thames has been frozen over from bank to bank, below Putney, on several occasions since that year. At first glance it would seem that winters were more severe in the past, but it must not be forgotten that the nature of London River itself has changed. The Thames bridges of the past contained many more spans than their modern counterparts causing a slowing down of the currents, thus facilitating the freezing of the lower reaches.

The width of the river has been considerably decreased in recent times by the construction of embankments and this has gone a long way to make the river faster flowing and so less liable to the formation of ice.

Other factors which tend to prevent the freezing of the Thames nowadays are the increased traffic and the numerous factories on the banks which discharge considerable quantities of heated water into the river.

Three of the prints, one dated 1683 and two depicting the Frost Fair of 1739-40, are reproduced here. The remaining prints will be included in the October, 1949, number of *The Marine Observer*.

THE EFFECT OF LIGHTNING ON SHIPS

Captain A. W. Ford, Master of the Ocean Weather Ship *Weather Recorder*, reported that whilst on her station in position 60°N., 20°W., at 0214 G.M.T., 28th December, 1948, the vessel was struck by lightning.

Weather: Wind SE Force 9, Barometer 974.9 mb. at 0000 falling to 958.1 mb. at 0300. Moderate rain with thunder and lightning until 0200, then heavy intermittent rain. At 0230 the wind veered to SW. At 0214 the ship was struck by lightning, a shower of sparks radiated from the vicinity of the windlass, and an explosion occurred similar to the sudden "blowing off" of a boiler. The ship was illuminated by a blinding flash above and below decks. No structural damage was evident, but the V.H.F. Direction Finder aerial was burnt by the electrical discharge and on testing it was found that the Radiogoniometer had been damaged.

A chronometer watch which up to this time had had a steady daily rate of minus 16 to 17 seconds, rapidly gained 44 seconds, and then developed a variable rate of from 52 to 132 seconds gaining, due no doubt to the steel constituents of the watch becoming magnetised. It was later found necessary to replace this instrument.

The ship's chronometer had its rate altered from minus one second to plus three seconds and over the next few weeks settled down with a steady rate of two seconds gaining.

The accompanying table shows the effect the lightning had on the vessel's magnetic compass which was adjusted one week after the vessel was struck and again on 24th March, 1949, ten weeks later. During this period the magnetism introduced by the lightning was considerably reduced and the ship tended to revert to her original magnetic state.

RECORD OF CHANGES IN THE DEVIATION AFTER BEING STRUCK BY LIGHTNING

Ships Head Degrees (True)	Previous adjustment	After Lightning on 28. 12. 48	After adjustment on 1. 1. 49	24. 3. 49	After adjustment on 24. 3. 49
000	3 W.	24 E.	2 E.	8 W.	1 E.
010		24 E.	2 E.	7 W.	1 E.
020	1 W.	28 E.	2 E.	6 W.	2 E.
030		30 E.	2 E.	5 W.	2 E.
040	1 E.	29 E.	2 E.	5 W.	2 E.
050		28 E.	1 E.	4 W.	1 E.
060		24 E.	1 E.	4 W.	1 E.
070	2½ E.	21 E.	Nil	4 W.	Nil
080		14 E.	2 W.	3 W.	1 W.
090	2 E.	7 E.	2 W.	3 W.	1 W.
100		1 W.	2 W.	1 W.	2 W.
110	½ E.	13 W.	2 W.	1 E.	2 W.
120		16 W.	2 W.	1 E.	3 W.
130	1½ W.	23 W.	2 W.	1 E.	3 W.
140		26 W.	2 W.	2 E.	3 W.
150		26 W.	2 W.	6 E.	2 W.
160	2 W.	26 W.	Nil	6 E.	2 W.
170		25 W.	1 E.	7 E.	1 W.
180	1 W.	25 W.	1 E.	10 E.	1 W.
190		21 W.	2 E.	10 E.	Nil
200	2 E.	21 W.	2 E.	10 E.	1 E.
210		21 W.	Nil	9 E.	1 E.
220	2½ E.	18 W.	Nil	8 E.	1 E.
230		16 W.	1 W.	7 E.	1 E.
240		13 W.	1 W.	6 E.	1 E.
250	3 E.	12 W.	1 W.	5 E.	Nil
260		9 W.	1 W.	Nil	1 W.
270	2 E.	5 W.	1 W.	5 W.	1 W.
280		Nil	2 W.	5 W.	2 W.
290	Nil	1 E.	2 W.	6 W.	2 W.
300		5 E.	1 W.	8 W.	2 W.
310	1½ W.	7 E.	Nil	9 W.	1 W.
320		11 E.	Nil	9 W.	Nil
330	3½ W.	15 E.	Nil	9 W.	Nil
340		17 E.	Nil	10 W.	1 E.
350		21 E.	2 E.	9 W.	1 E.

François Arago in his *Meteorological Essays* reports 72 instances of ships being struck by lightning with occasional disastrous effect. An English schooner was sunk in Jamaica Harbour in 1809 and two men of war *Lynx* and *Resistance* disappeared altogether from a convoy after lightning flashes. It is safe to assume that all these reports concerned wooden ships.

The Meteorological Office records show that between 1923-1934 there were five reported cases, all involving steel ships, and possibly all with wooden top-masts. In every case it was the fore top-mast that was struck, usually with localised damage, although the *Royal Transport*, February, 1924, reported that the whole ship was shaken, causing roof of wireless room to leak and damaging wireless installation, and subsequent large deviation on her compass, on N and S courses. It is quite possible that the other ships experienced effect on compasses but failed to report it.

There are several reported instances of lightning affecting the magnetism of a compass needle and in some cases actually reversing the polarity.

To quote François Arago : " About the year 1676 two English vessels were sailing in company from London to Barbados. Not far from the Bermudas a thunderstroke shattered the mast and rent the sails of one of the ships, while the other sustained no damage. The captain of the latter, seeing that his consort had altered her course, as if making for England, asked the cause of this sudden change of purpose, and found, much to his astonishment, that her captain and crew believed themselves to be still following the same course as before."

A comparison of the vessels' compasses showed that lightning had completely reversed the polarity of the compass needle of the vessel struck.

Another instance is that of the brig *Medusa* during a passage from La Guaira to Liverpool when lightning destroyed the magnetism of four compasses on board two of which were on deck and two in the captain's cabin.

From records of wooden ships, one would presume that lightning could not only reverse the poles of a compass but also neutralise the magnetism, or change the magnetic conditions to any intermediate degree from 0° to 180° . The design of compass needles has changed with the years and the old elongated lozenge type which these observations represent are no longer used.

Later reports from the *Weather Recorder* have shown that, in her case, although the ship's magnetism was affected, the magnetic state of her compass needle was not altered.

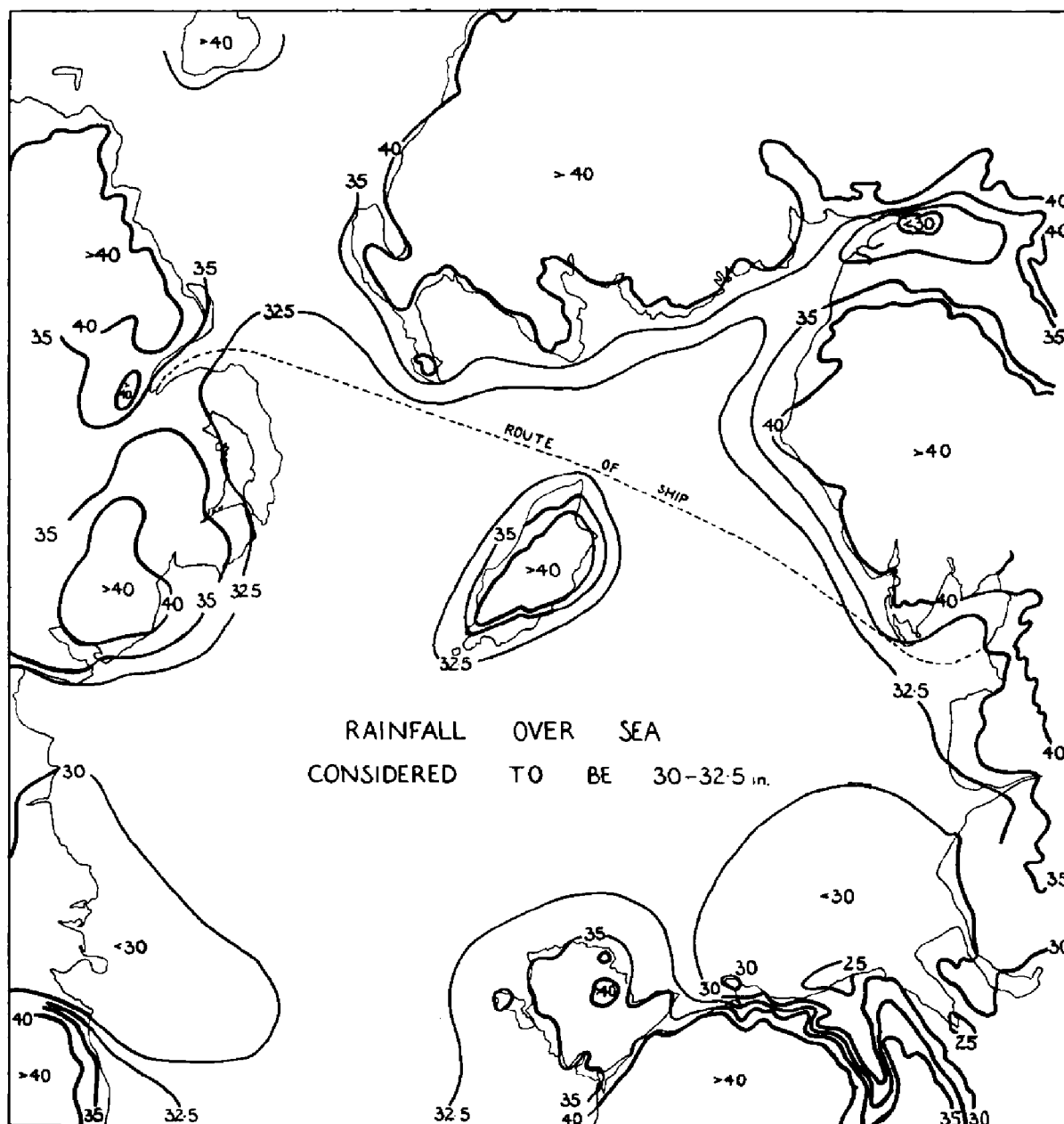
When the *New York* was struck in May, 1827, the metal fittings, nails securing partitions and mathematical instruments were strongly magnetised, the chronometers were seriously affected, probably due to the steel components, particularly its balance wheel becoming magnetised, and a watch on the *Golymin* similarly affected still retained the magnetism so imparted twenty-seven years later.

K. M.

THE AVERAGE RAINFALL OVER THE IRISH SEA

BY JOHN GLASSPOOLE, M.SC., PH.D.

In *The Marine Observer* for July, 1947, a map was given on page 45 showing the distribution of average annual rainfall over England and Wales, but the lines stopped short at the sea. An attempt has been made to continue the lines over the Irish Sea and the result is reproduced below.



Consideration of the distribution as defined over the land shows a number of interesting features which enable the lines to be continued over the sea with some justification.

- (a) The effect of the Snowdonia range in causing a "rain shadow" to the north-east is well defined over the land and enables the 25 in. and 30 in. lines to be continued over the sea at distances from Snowdon similar to those found over the land.

- (b) Similarly the area with less than 30 in. around Dublin, as defined over the land, can be continued over the sea, taking into account the probable effect of the Wicklow Mountains in producing a rain shadow effect with the predominating south-west winds.
- (c) The land stations indicate that the rainfall at the most northerly and southerly points of the Isle of Man is about 33 in. It is reasonable to conclude that the effect of the isolated mountains of the Isle of Man in producing a definite rain shadow would be less than the more massive Snowdonia range. No area with less than 30 in. has therefore been drawn to the north-east of the Isle of Man.
- (d) The 32.5 in. line is defined over the land in sufficient places surrounding the Irish Sea to enable it to be continued over the sea. To the East of the Irish Sea the reasonable assumption is made that the effect of the rising land in producing heavier orographical rainfall becomes apparent some distance to the windward side of the land.

The map as drawn shows therefore the greater part of the Irish Sea with a rainfall of from 30–32.5 in. Some confirmation of this distribution has been obtained from observations arranged by the Marine Branch during the war by which the *Slieve Bearnagh*, plying between Heysham and Belfast, recorded the rainfall daily at 9 hrs. during the years 1939–1944. The route of the ship is shown on the map. A standard 5-in. rain-gauge was mounted on the top rail on “Monkey Island” and to the lee-side to avoid as far as possible the eddy effects of the wind. The working up of the data, which was done jointly by the Marine and Climatological Branches of the Meteorological Office, proved to be very complicated owing to the factors involved, e.g.

- (a) The ship spent part of the time at sea, and part in harbour at Heysham or Belfast.
- (b) The gauge was mounted 35 ft. above the water line.
- (c) In heavy seas there was risk of spray getting into the rain-gauge and the precaution was taken of storing the rain water on such occasions and arranging for the salt content to be determined by the Government Chemist.
- (d) The catch of the gauge, relative to that at land stations, clearly varied with the wind force, as noted each day.

On the average at land stations a rain-gauge exposed with the rim 35 ft. above the ground catches only about 65 per cent of the true rainfall. In sites such as the harbours of Heysham and Belfast the catch of a gauge 35 ft. above ground would be more than 65 per cent, while in sites as exposed as those at sea the amount caught would be less. Although statistical proof is wanting the relative figures might quite well be 80 and 50 per cent. Omitting readings vitiated by (c) it was found that in harbour at Heysham and Belfast the gauge caught about 80 per cent of the rainfall at nearby land stations, while at sea the percentage was only about 43. In so far as the 43 per cent is less than the anticipated 50 per cent, the records demonstrate the smaller rainfall at sea than at the land stations. The conclusion reached from a study of these observations was that the average rainfall along the route of the ship was of the order of 31 to 31½ inches, which fits the map reasonably well, but there were so many uncertainties that no figure can be given with any degree of confidence.

The map is given therefore as defining the probable distribution of the average rainfall over the Irish Sea, based on such information as is available, in the hope that others will be stimulated to tackle further this problem of defining the rainfall over the sea.

Editor's Note

The officers of the *Slieve Bearnagh* will no doubt be interested to see that some results came out of these observations which they took during the war. It seems that although the results are by no means conclusive, the observations made aboard this ship do emphasise the many difficulties involved in making rainfall measurements at sea, for the following reasons :

- (a) The speed of the ship relative to the weather situation.
- (b) The rolling and pitching motion of the ship due to sea and swell.
- (c) The effect of the relative wind on the site of the rain-gauge.
- (d) The difficulty of finding a good site and a good design of gauge for maritime purposes.

It was thought that in an enclosed sea the results would have been fairly conclusive and have given a reasonable picture of the actual rainfall, but topographical and other considerations made comparisons between ship and shore most difficult. Experiments are now being made in Ocean Weather Ships with a view to solving some of the difficulties of rainfall measurement, and the experiments made in the *Slieve Bearnagh* have been found of considerable value in connection with the preparation of this programme.

HOISTING OF THE OCEAN WEATHER SHIP ENSIGN

During the early days of their existence the British Ocean Weather Ships flew the Red Ensign, but it has recently been considered more fitting that being Government Ships they should fly a blue ensign defaced with an appropriate badge, as is customary for other vessels of similar category. A badge was accordingly designed and the new ensign illustrated below was hoisted aboard the *Weather Watcher* and *Weather Recorder* at Greenock on 7th March, 1949. The ceremony was performed by Provost Morris of Greenock, and among those present were Mrs. Morris and senior officials of the Meteorological Office and Ministry of Civil Aviation.

C. E. N. F.





Reproduced by courtesy of O. M. Ashford

ALTOCUMULUS AND CIRROCUMULUS LENTICULARIS

Photograph taken from the *Weather Recorder* off Rathlin Island, about
1600 G.M.T., July 25, 1948

PERSONNEL

CAPTAIN SIR BENJAMIN CHAVE who before retiring from the sea was Commodore Captain of the Union Castle Line has relinquished the post of Marine Agent of the Meteorological Office at Southampton which he has held since 1936. Marine Observers sailing in ships out of Southampton will miss his friendly visits and join with the Marine Branch in wishing him health and happiness in the future. Sir Benjamin will retain his active interest in the shipping affairs of the port and continue to serve as Sub-Commissioner of Pilotage for the Isle of Wight, Portsmouth and Southampton Districts.

J. H.

Transmission of Radio Weather Messages through Ocean Weather Ships

Observing ships in the North Atlantic, equipped only with medium frequency transmitters, may, when out of range of Valentia Radio or Malin Head Radio, send weather reports on 500 kc/s to either of the British Ocean Weather Ships on station in Latitude 60°N., Longitude 20°W., and Latitude 53° 50'N., Longitude 18° 40'W. for relay via Portishead Radio.

To avoid interference and possible confusion at coast stations handling the same class of traffic, reports for relay should not be sent to Ocean Weather Ships from positions within 400 miles of the coast.

As a temporary measure, the northern and southern Ocean Weather Ships will use the call signs MEA and MEB respectively.

Reports should be transmitted as soon as possible after observation times and the letters OBS included in the call immediately after the abbreviation QTC.

Ocean Weather Ships will maintain watch on 500 kc/s for the reception of weather reports at the following times (GMT).

0940-1000 1217-1245 1730-1800 2140-2200

In the event of failure to contact one of the British Ocean Weather Ships, weather reports may be sent to CQ on 500 kc/s for information of shipping in the vicinity.

The attached schedule will perhaps emphasise the reason for the programme outlined above.

SCHEDULE FOR RELAY OF WEATHER MESSAGES THROUGH O.W.S. FROM MERCHANT SHIPS ONLY EQUIPPED WITH M/F W/T TRANSMISSION

Time of Merchant Ship Synoptic Observation	Single Operator Watch Period (E. of 30°W.)	O.W.S. Upper Air Observation.	O.W.S. Weather Messages to Dunstable.	Single Operator M/S traffic to O.W.S.†
00			00-0015	
06	08-10	02-03 08-09	03-0340 06-0615	
12	12-14	14-15	09-0940 12-1215	0940-10 1217-1245
18*	16-18		15-1540	
	20-22	20-21	18-1815 21-2140	* 1730-1800 or { 2140-2200

† Should the merchant ship be unable to contact the O.W.S., she should send her weather message CQ at the first opportunity.

* Instructions have already been given to merchant ships in this area that, in order to clear their 1800 observation during the Single-operator period 1600-1800, that observation can be made at 1730.

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 return received. The date of receipt of the last return received is given in the sixth 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. (See under Notices to Marine Observers.)

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 Captains, 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.

NAME OF VESSEL	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS	LAST RETURN RECEIVED
<i>Acera</i>	C. C. Cave	J. R. Smith, L. Austin, C. Morrison, T. A. Holson	I. A. Stuart	Elder Dempster Lines, Ltd.	18.1.49
<i>Afghanistan</i>	W. A. Chappell	R. L. Cain, J. Linton, K. J. Evans	T. D. Sullivan	Strick Lines, Ltd.	3.1.49
<i>Afax</i>	W. T. Spencer	E. W. Studley, E. B. Bertelsen, C. M. Best, A. S. Curry	C. Calvey	Ocean Steamship Co., Ltd.	28.1.49
<i>Aharoa</i>	J. Steele	P. S. Yeoman, R. Munro, T. de M. Ogier	J. W. Soulsby	Shaw, Savill & Albion Co., Ltd.	22.3.49
<i>Alcantara</i>	B. K. Berry, R.D., Capt., R.N.R.	T. Frazer, G. Wright, P. Driver	R. E. Hammond	Royal Mail Lines, Ltd.	8.3.49
<i>Amatira</i>	M. A. Neeves	D. G. Roberts, C. Eastwood, D. Martin	P. Coghlan	Anglo-Saxon Petroleum Co., Ltd.	
<i>Ameritham</i>	A. Spencer			Thompson S.S. Co., Ltd.	
<i>Andes</i>	D. A. Casey, C.B.E., D.S.O., D.S.C., R.D., Cmde. R.N.R.	F. M. Dickenson, R. Box, J. Ashworth	W. Smith	Royal Mail Lines, Ltd.	4.1.48
<i>Andoni</i>	J. W. Leask	D. W. Falconer	R. F. Barrett	Chr. Salvesen & Co., (Managers)	24.2.49
<i>Apapa</i>	J. J. Smith	J. Jackson, F. P. Garbutt, T. A. Nicholson		Elder Dempster Line, Ltd.	
<i>Aquitania</i>	R. B. G. Woollatt, R.D., Cdr., R.N.R.	E. E. Willis, G. H. Griffiths, J. Mills	S. W. Brown	Cunard White Star, Ltd.	28.10.48
<i>Arabia</i>	G. H. Morris	D. H. Shummin, R. Jones, E. E. Willis	B. H. Long	Cunard White Star, Ltd.	6.1.49
<i>Arabistan</i>	J. H. Metcalfe	R. W. Ruddock, R. P. Aake, J. Curtis	A. Hinchin	Strick Line, Ltd.	10.3.49
<i>Araby</i>	G. H. Taggart	J. A. Phillips, G. G. Chatterley, G. A. Keet, P. J. Robinson	P. Corbishley	Royal Mail Lines, Ltd.	19.10.48
<i>Arakaka</i>	I. A. Carter	S. Armitage, W. Boyle, E. G. Price	T. McBride	Arakaka Steam Shipping Co., Ltd.	10.11.48
<i>Argentina Star</i>	D. R. Macfarlane, O.B.E., D.S.O.	K. White, D. G. Hartie, J. Reeve	C. Hartie	F. Leyland & Co., Ltd.	7.9.48
<i>Argyll</i>	I. Dodds	A. Fielding, T. Rowe, F. Johnson	J. Downey	B. J. Sutherland & Co., Ltd.	20.1.49
<i>Arguon</i>	R. A. Thorburn	L. Scott	A. N. Taylor	Elders & Fyffes, Ltd.	4.1.49
<i>Arcticon</i>	W. Moore	C. A. V. Daly, J. Cubbin, P. O. Donnell	C. Clancy	Charante S.S. Co., Ltd.	20.4.49
<i>Arundel Castle</i>	H. A. Deller	— Walker, — Sayles, K. A. Trowbridge	— Pitt	Union Castle Mail S.S. Co., Ltd.	23.2.49

NAME OF VESSEL	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS	LAST RETURN RECEIVED
<i>Ascania</i> ..	J. Quayle, R.D., Cdr., R.N.R.	J. Boyce, G. H. Drinkwater, J. B. Clennison ..	M. A. Kempe ..	Cunard White Star, Ltd. ..	17.10.47
<i>Ashburton</i> ..	W. F. Mould ..	D. A. Keats ..	J. S. Buchanan ..	Australind S.S. Co., Ltd. ..	..
<i>Asia</i> ..	J. L. Crossdale ..	C. A. Ray, D. S. Lomax, D. J. Steff ..	W. J. Rainey ..	Cunard White Star, Ltd. ..	..
<i>Asturias</i> ..	J. W. Carr ..	F. Williams, G. H. Emerson, K. J. Colombo ..	A. Banberry ..	Royal Mail Lines, Ltd. (Managers) ..	18.3.48
<i>Athelchief</i> ..	A. W. Pegg ..	J. P. Coffey, J. W. Carruthers, T. C. Bennett ..	W. Bradbury ..	Tankers, Ltd. ..	20.4.49
<i>Athelregent</i> ..	C. Ray ..	D. Waite, A. Sugden, E. Peers, C. J. E. Mayers ..	G. H. McClelland ..	Athel Line, Ltd. ..	24.2.49
<i>Athenic</i> ..	D. Aitchison ..	J. N. Carroll, J. W. Webster, J. W. Wood, R. F. Abbey ..	D. Haggart ..	Shaw, Savill & Albion Co., Ltd. ..	20.4.49
<i>Athlone Castle</i> ..	R. Wren, D.S.O. ..	W. B. Fletcher, A. Peers-Jones, H. W. Williams ..	J. H. Summers ..	Union Castle Mail S.S. Co., Ltd. ..	8.1.49
<i>Atlantis</i> ..	D. R. Lee ..	R. Phillips, D. R. Moody, D. Guinness ..	L. G. Hoskins ..	Royal Mail Lines, Ltd. (Managers) ..	28.3.49
<i>Auricula</i> ..	H. Sangster ..	C. K. Powell, R. R. Stonehouse, J. A. Hall, D. B. Davies ..	J. Sanderson ..	Anglo-Saxon Petroleum Co., Ltd. ..	7.2.49
<i>Australind</i> ..	J. F. Wood ..	J. Stevenson, J. B. McCowan, R. Mattingley ..	H. J. Griffiths ..	Australind Steam Shipping Co., Ltd. ..	26.4.49
<i>Avondene</i> ..	W. R. Jones ..	J. R. Dixon, W. Sturrock, G. L. Fraser ..	P. E. Goggin ..	Dene Shipping Co., Ltd. ..	4.1.49
<i>Balanitia</i> ..	F. A. C. Thacker ..	E. E. R. Roberts, R. E. G. Simmons, —, Davies ..	C. James ..	United Baltic Corporation, Ltd. ..	4.1.49
<i>Baltara</i> ..	G. E. Thomas ..	J. Mitchell ..	J. Spicer ..	Ohlson S.S. Co., Ltd. (Managers) ..	23.2.49
<i>Banff Park</i> ..	E. Bursby ..	T. Burke, G. Dunn, R. Rutherford ..	J. Freel ..	Royal Mail Lines, Ltd. ..	20.4.49
<i>Barbana</i> ..	M. Fraser ..	J. H. Jones, T. L. Harcus ..	W. Maclaren ..	Barberry's S.S. Co., Ltd. ..	12.1.49
<i>Baron Macleay</i> ..	A. Campbell ..	R. Pollok, J. Baxter, R. Gunn ..	J. Williams ..	Ellerman's Wilson Line, Ltd. ..	23.2.49
<i>Baskerville</i> ..	E. Pugh, O.B.E. ..	J. Lungley, J. F. Thompson, P. T. Dennison ..	A. D. Gardner ..	Barline Transports, Ltd. ..	14.1.49
<i>Bastano</i> ..	G. Hodgson ..	F. Smith, J. Peck, E. I. Beaumont ..	T. Ainsworth ..	Hogarth Shipping Co., Ltd. ..	26.1.49
<i>Beaconsfield</i> ..	A. E. W. Woodcock ..	A. Cox, A. Ferguson, M. G. King ..	J. A. McAskill ..	Barberry's S.S. Co., Ltd. ..	5.1.49
<i>Beaverburn</i> ..	J. B. Smith, O.B.E. ..	S. Fieldhouse, T. F. Hercus, A. Aikman ..	L. Norton ..	Canadian Pacific Railway Co. ..	11.1.49
<i>Beavercoot</i> ..	C. E. Duggan, R.D., R.N.R. ..	P. F. Williams, R. D. P. Gillett, R. A. Jones ..	W. Poingdestre ..	Canadian Pacific Railway Co. ..	21.9.48
<i>Beaverdell</i> ..	S. W. Keay, O.B.E., L. W. M. ..	R. W. Savage, W. Williams, J. Jaling ..	R. Burch ..	Canadian Pacific Railway Co. ..	7.12.48
<i>Beaverford</i> ..	R. A. Leicester, O.B.E. ..	E. R. Conneron, E. R. Shaw, D. Wallace ..	A. P. Humphries ..	Canadian Pacific Railway Co. ..	19.1.49
<i>Beaverglan</i> ..	J. Soam ..	L. Kinna, D. Bryce, J. Mackay ..	R. Dixon ..	Ben Line Steamers, Ltd. ..	22.3.49
<i>Beaverlake</i> ..	C. L. de H. Bell, D.S.C., R.D., R.N.R. ..	G. W. Bateman, G. Palmer, J. Waling ..	J. Brennan ..	Ben Line Steamers, Ltd. ..	6.8.47
<i>Beckenham</i> ..	D. G. Martin ..	J. W. Gardiner, E. Pearce, J. L. Kirby ..	J. M. Fraser ..	Ben Line Steamers, Ltd. ..	4.11.48
<i>Benarty</i> ..	D. S. Sinclair ..	A. King, R. D. Robb, J. Amos ..	J. L. Wells ..	Ben Line Steamers, Ltd. ..	13.10.48
<i>Benardian</i> ..	J. Cringle ..	R. Winn ..	R. G. Thomson ..	Ben Line Steamers, Ltd. ..	9.3.49
<i>Benledi</i> ..	A. P. Paterson ..	R. M. Drummond, T. P. Barr, J. Scott ..	A. McLennan ..	Ben Line Steamers, Ltd. ..	4.11.48
<i>Benloch</i> ..	J. B. Hastie ..	C. Donnelly, G. Pirie, K. R. Wilson ..			
<i>Benrachie</i> ..	W. C. Wilson ..	W. O. Atkinson, M. J. Peyton-Bruhl, A. Wallace, A. King ..			
<i>Bilbury</i> ..	J. R. Faulkner ..	E. F. Cole, C. H. Long ..			
<i>Black Prince</i> ..	H. J. Pinnel ..	P. M. Giles, G. R. Sherlock, B. S. Biggs ..			

<i>Brasil Star</i>	..	G. Duff, G.M.	..	L. J. Thompson, D. S. Gilmour, D. McPhail	..	F. Leyland & Co., Ltd.	..	12.1.49
<i>Bravo</i>	..	E. Tyler	..	C. Everingham, J. McAndrew, J. H. Spandler	..	Ellerman's Wilson Line, Ltd.	..	19.5.48
<i>Brisbane Star</i>	..	F. N. Riley, D.S.O.	..	P. H. Stark, M. R. Bremberg, G. Munro	..	F. Leyland & Co., Ltd.	..	4.9.48
<i>Britannic</i>	..	H. Dixon	..	M. J. Dodds, R. McDougall, J. Rawlinson	..	Cunard White Star, Ltd.	..	10.4.47
<i>British Colonel</i>	..	E. L. Miller	..	W. S. Jaeger	..	British Tanker Co., Ltd.	..	29.12.47
<i>British Endurance</i>	..	W. Watkin Thomas, O.B.E., D.S.C.	..	A. D. Millar, S. H. Falconer, P. C. Coyne	..	British Tanker Co., Ltd.	..	24.2.49
<i>British Energy</i>	..	J. G. Hill	..	D. Mackay, D. MacKinnon, R. Grant	..	British Tanker Co., Ltd.	..	26.1.49
<i>British Escort</i>	..	H. G. Jeary	..	J. A. G. Miller, G. S. Lawson, J. Mackay	..	British Tanker Co., Ltd.	..	18.12.47
<i>British Hussar</i>	..	J. Picken	..	W. R. Symon, J. A. Picken, D. H. Ferrett	..	British Tanker Co., Ltd.	..	26.4.49
<i>British Lancer</i>	..	W. S. Vittie	..	E. L. Hutchinson, S. E. Banyard, G. Lawrence	..	British Tanker Co., Ltd.	..	4.3.49
<i>British Marquis</i>	..	G. W. Kemp	..	J. Hutchinson, C. D. Bishop-Laggett, J. Macdonald	..	British Tanker Co., Ltd.	..	31.3.49
<i>British Patience</i>	..	F. S. Hall	..	L. McKitchie, H. Haigh, W. Johnston	..	British Tanker Co., Ltd.	..	5.1.49
<i>British Pilot</i>	..	R. O. Cash	..	A. F. Bowan, H. D. Williams, C. A. Patterson	..	British Tanker Co., Ltd.	..	15.10.48
<i>British Piper</i>	..	J. Sanson	..	A. Fraser, P. F. Mason, E. C. Ford	..	British Tanker Co., Ltd.	..	24.2.49
<i>British Power</i>	..	K. M. Mitchell	..	J. A. Macleod, T. Horne, G. A. Gee	..	British Tanker Co., Ltd.	..	2.10.47
<i>British Prestige</i>	..	J. H. Wilson	..	T. Gifford, D. Battel	..	British Tanker Co., Ltd.	..	29.12.47
<i>British Resolution</i>	..	I. Bolger	..	C. V. Harrison, J. B. Hunter, F. A. Lapper	..	British Tanker Co., Ltd.	..	23.2.49
<i>British Statesman</i>	..	W. P. Booth	..	I. Fox, J. Kavanagh, A. N. Brook	..	Royal Mail Lines, Ltd.	..	12.10.48
<i>British Swordfish</i>	..	H. A. Wright	..	F. W. Gant, J. H. Looker	..	Moor Line, Ltd.	..	18.9.48
<i>Brittany</i>	..	D. J. Jones	..	L. A. Sayers, Lt.-Cdr., R.N.R., W. T. Pitcher, B. E. Cole	..	Lampport & Holt Line, Ltd.	..	7.3.49
<i>Brookley Moor</i>	..	J. Whayman, D.S.C. and bar, R.D., R.N.R.	..	F. Gribben, J. Roberts, R. Garcia	..	Henrikson & Co., Ltd.	..	11.1.49
<i>Bronie</i>	..	E. Drinkall	..	C. Sutherland, C. Percy, J. Holland	..	Seddon Fishing Co., Ltd.	..	21.3.49
<i>Brontes</i>	..	G. Bull	..	J. Hogg, W. Errington, J. Baxter	..	Lampport & Holt Line, Ltd.	..	10.12.48
<i>Bulby</i>	..	J. Byrne	..	J. W. Cuthbertson, T. D. Ridley	..	Cairn Line of Steamships, Ltd.	..	19.1.49
<i>Byron</i>	..	A. Henderson	..	T. L. Langlands, J. W. L. Garrie, C. Milne	..	Cairn Line of Steamships, Ltd.	..	14.12.48
<i>Cairnnavon</i>	..	I. G. Foster	..	G. S. Gordon-Christian, J. M. Donkin, F. T. Jones	..	Anchor Line, Ltd.	..	13.2.47
<i>Cairnesh</i>	..	N. E. Forth	..	R. N. Dixon	..	Peninsular & Oriental S.N. Co.	..	14.6.48
<i>Cairnvalonia</i>	..	J. H. Brown	..	D. E. Cormack, G. O. Lambert, I. Thomson	..	Hudson Bros. Trawlers, Ltd.	..	20.4.49
<i>Caledonia</i>	..	G. Stable	..	L. MacEwan, A. George, R. J. King	..	Cape York Motorship Co., Ltd.	..	20.4.49
<i>Canton</i>	..	W. E. Woodall	..	H. Butler	..	Union Castle Mail S.S. Co., Ltd.	..	4.1.49
<i>Cape Mariato</i>	..	H. G. Todd	..	A. Dodd, W. A. Morris, A. A. Abdullah	..	J. Marr & Son, Ltd.	..	21.1.49
<i>Cape York</i>	..	W. D. Roach	..	D. Parsons, P. J. Passmore, D. T. Bolas	..	Carlton S.S., Ltd.	..	19.1.49
<i>Capetown Castle</i>	..	I. Crewdson	..	F. Barber, E. Harvey, T. Burke	..	Cunard White Star, Ltd.	..	22.11.47
<i>Carilla</i>	..	K. Wardale	..	F. Hamilton, R. Crawford, J. G. Wilson	..	P. & O. Steam Nav. Co., Ltd.	..	6.1.49
<i>Carlton</i>	..	D. W. Sorrell	..	E. A. Muir	..	Elders & Fyfe, Ltd.	..	11.2.48
<i>Caronia</i>	..	S. H. French	..	W. Slater, B. P. Payling	..	Runciman's (London), Ltd.	..	15.9.47
<i>Carthage</i>	..	S. A. Sapsworth	..	M. Musson, H. Jennings, H. Bragg	..	Monarch S.S. Co., Ltd.	..	
<i>Carvina</i>	..	I. M. Cherry	..	D. Parsons, I. Newlands, J. Stephenson, B. B. Jones	..	Shaw, Savill & Albion Co., Ltd.	..	
<i>Caston</i>	..	J. H. Keir	..		..	Hadley Shipping Co., Ltd.	..	
<i>Celtic Monarch</i>	..	A. V. Richards	..		..	Prince Line, Ltd.	..	
<i>Ceramic</i>	..	I. F. Auld	..		..		..
<i>Cerinthus</i>	..	F. S. Thornton, O.B.E.	..		..		..
<i>Chinese Prince</i>	..	D. G. H. O. Bailey	..		..		..
<i>Chitral</i>	..		..		..		..

NAME OF VESSEL	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS	LAST RETURN RECEIVED
<i>Chupra</i>	J. D. Woods ..	C. W. Allerton, H. S. F. Strawbridge, W. L. Hillcoat ..	R. C. Whiting ..	British India Steam Nav. Co., Ltd. ..	13.10.48
<i>Clicia</i>	A. C. Johnston ..	J. Henderson, W. Hallum, D. Russell ..	J. Malcolin ..	Anchor Line, Ltd. ..	14.12.48
<i>City of Barcelona</i> ..	E. M. Jenkins ..	A. M. Bowman, R. J. Bindie, E. V. Williams, P. Seiffert ..	J. O'Brian ..	Ellerman Lines, Ltd. ..	5.1.49
<i>City of Bristol</i> ..	E. Garner ..	W. E. James, N. A. C. Smith, R. A. Reid ..	K. P. Grocock ..	Ellerman Lines, Ltd. ..	23.2.49
<i>City of Calcutta</i> ..	H. A. Hazee ..	D. Inglis, I. McDermid, N. Dalziel, A. Bickerton ..	G. C. Fyffe ..	Ellerman Lines, Ltd. ..	12.2.48
<i>City of Capetown</i> ..	W. S. Coughlan, O.B.E. ..	W. E. Fletcher, P. Redhead, A. Ramsden ..	D. R. Crombie ..	Ellerman Lines, Ltd. ..	13.8.48
<i>City of Carlisle</i> ..	L. E. Smith, M.B.E. ..	J. Irvin, W. Taggart, B. Pickering ..	P. J. McKeon ..	Ellerman Lines, Ltd. ..	19.12.47
<i>City of Chester</i> ..	W. A. Rogerson, O.B.E. ..	R. Frame, R. M. Faulda, P. G. Thomas ..	J. A. Vallance ..	Ellerman Lines, Ltd. ..	24.2.49
<i>City of Delhi</i> ..	A. M. Hamilton ..	G. Stewart, I. Wharry, J. Potter ..	A. E. Adams ..	Ellerman Lines, Ltd. ..	25.2.49
<i>City of Derby</i> ..	A. G. Melville, O.B.E. ..	R. Tyrrel, J. Wadleton, R. Huntington ..	R. Macdonald ..	Ellerman Lines, Ltd. ..	18.1.48
<i>City of Dieppe</i> ..	E. G. Chapman ..	A. J. Tyrrell, D. J. Lloyd, A. G. Hine ..	W. Foeter ..	Ellerman Lines, Ltd. ..	15.12.48
<i>City of Dundee</i> ..	F. M. Womersley ..	R. Jones, I. A. Whieldon, L. G. Powell ..	H. M. O'Gorman ..	Ellerman Lines, Ltd. ..	26.1.49
<i>City of Durham</i> ..	T. H. Speakman ..	H. McL. Farquhar, D. S. Taylor, J. W. Terris ..	W. B. Noonan ..	Ellerman Lines, Ltd. ..	21.3.49
<i>City of Evansville</i> ..	F. W. Woods ..	A. Fry, J. Tattershall, J. Checkley ..	I. Ellison ..	Ellerman Lines, Ltd. ..	11.11.48
<i>City of Exeter</i> ..	I. I. Andrew ..	N. Groundwater, D. H. Wardlaw, R. Miller, K. Matheson ..	G. S. Creighton ..	Ellerman Lines, Ltd. ..	16.12.48
<i>City of Hereford</i> ..	G. A. Ring ..	T. Rigg, J. F. Mason ..	S. C. Ombler ..	Ellerman Lines, Ltd. ..	25.1.49
<i>City of Johannesburg</i> ..	A. G. Freeman ..	H. Routledge, H. Lewis, C. Craddock ..	A. R. Henderson ..	Ellerman Lines, Ltd. ..	4.1.49
<i>City of Khartoum</i> ..	J. A. Beynon ..	D. L. Cox, W. Folder, D. A. Appleton ..	J. Dolan ..	Ellerman Lines, Ltd. ..	5.11.48
<i>City of Lille</i> ..	E. Scryneour ..	R. B. May, H. M. Steele, G. S. Garner ..	A. Julius ..	Ellerman Lines, Ltd. ..	29.3.49
<i>City of Lyons</i> ..	H. Johnson ..	A. R. Horan, R. Clark, J. Morrison ..	W. Anderson ..	Ellerman Lines, Ltd. ..	24.2.49
<i>City of Paris</i> ..	H. Percival, O.B.E., R.D., Cdr., R.N.R. ..	G. G. Francia, M. A. Perry, R. N. Caldwell ..	W. Rouffinac ..	Ellerman Lines, Ltd. ..	25.5.48
<i>City of Pretoria</i> ..	T. F. Labey ..	T. C. Dickinson, P. Seiffert, K. Haslam ..	W. Lupton ..	Ellerman Lines, Ltd. ..	18.3.49
<i>City of Swansea</i> ..	G. Vickers ..	B. Walker, J. L. Blanch, E. E. Cooper ..	M. Prior ..	Ellerman Lines, Ltd. ..	5.11.48
<i>City of Sydney</i> ..	J. B. MacLaren ..	E. Bonfield, R. H. Bellhouse, E. Redshaw ..	— McTighe ..	Ellerman & Bucknall S.S. Co., Ltd. ..	4.1.49
<i>City of Tokio</i> ..	R. L. Stewart ..	T. Rigg, M. Graham, E. F. Brick ..	A. C. Macaulay ..	Clan Line Steamers, Ltd. ..	11.2.49
<i>City of Windsor</i> ..	W. S. Doidge ..	W. Kendal, S. F. Nicholson, E. J. E. Owen ..	W. M. Morrison ..	Clan Line Steamers, Ltd. ..	4.1.49
<i>Clan Brodie</i> ..	B. Vernon-Browne ..	J. H. Wright, F. King, L. G. Woolger ..	W. Harper ..	Clan Line Steamers, Ltd. ..	4.1.49
<i>Clan Buchanan</i> ..	T. W. Inman, O.B.E. ..	D. S. Tooh, E. M. Crawley, J. Beynon, I. Hay ..	R. F. Cole ..	Clan Line Steamers, Ltd. ..	5.3.49
<i>Clan Campbell</i> ..	J. A. Forster ..	F. Tinton, J. W. Ward, D. R. Godfrey ..	J. Shillabeer ..	Clan Line Steamers, Ltd. ..	26.4.49
<i>Clan Chattan</i> ..	H. C. Simpson, O.B.E. ..	R. S. Russell, A. G. Allison ..	J. A. Gray ..	Clan Line Steamers, Ltd. ..	4.1.49
<i>Clan Chisholm</i> ..	J. H. Crellin ..	F. C. Doyle, A. T. Campbell, C. J. Abbott ..	W. H. Saville ..	Clan Line Steamers, Ltd. ..	15.12.48
<i>Clan Davidson</i> ..	H. I. Archer, O.B.E., R.D., R.N.R. ..	T. R. Halliday, M. P. R. Turner, J. L. Easton ..	R. G. Gooseman ..	Clan Line Steamers, Ltd. ..	7.12.48
<i>Clan Forbes</i> ..	H. S. Pengelly ..	J. P. Dunphy, F. Lionnet, D. Milner ..	G. Martyn ..	Clan Line Steamers, Ltd. ..	5.11.48
<i>Clan Macaulay</i> ..	A. G. Storkey ..	G. Bagnall, J. C. Montgomery, R. C. Pearce ..	C. E. C. Cr��w ..	Clan Line Steamers, Ltd. ..	18.1.49
<i>Clan MacDonald</i> ..	H. Cater ..	R. Harris, J. A. Baxter, D. Richards ..	R. W. Moore ..	Clan Line Steamers, Ltd. ..	
<i>Clan MacDougall</i> ..	R. P. Galer, C.B.E., R.D., Cdr., R.N.R. ..				
<i>Clan MacLaren</i> ..	E. H. O. Stone ..				

<i>Clan MacNair</i>	..	E. W. Jenkin	..	L. W. Gibbins, A. Graham, P. L. Leslie	R. Dingley	..	Clan Line Steamers, Ltd.	..	4.1.49
<i>Clan MacNeil</i>	..	S. F. Carter	..	J. C. Mathieson, D. F. R. Bussereau, F. Aitchison	A. P. Young	..	Clan Line Steamers, Ltd.	..	7.12.48
<i>Clan Macrae</i>	..	T. W. Ellis, O.B.E.	..	J. D. W. Chapple, R. E. Heywood, J. Nichols	W. Bryce	..	Clan Line Steamers, Ltd.	..	8.3.48
<i>Clan Urquhart</i>	..	C. C. Parfitt	..	W. Graham, M. N. Ure, T. N. Geesin	A. F. MacIntyre	..	Clan Line Steamers, Ltd.	..	8.3.49
<i>Clydebank</i>	..	J. W. Griez	..	G. A. Gregory, A. R. Howson, E. A. D. Vargas	A. G. Roberts	..	Bank Line, Ltd.	..	25.2.49
<i>Clydefield</i>	..	H. Vaughan-Jones	..	W. C. Muir, A. L. Dixon	P. Dwyer	..	Northern Petroleum Tank S.S. Co., Ltd.	..	25.1.49
<i>Columbia Star</i>	..	C. J. W. Jones	..	L. Teasler, A. G. Smith, B. Edginton	J. Lovelock	..	Union Cold Storage Co., Ltd.	..	16.7.48
<i>Comanche</i>	..	T. Potts	..	A. E. Hughes, A. Bovill, F. P. Barber	J. Mongey	..	Anglo-American Oil Co., Ltd.	..	11.2.49
<i>Comedian</i>	..	R. L. Williams	..	D. O. Percy, E. D. Ashdown, D. P. Rennie	A. Copeland	..	Charente S.S. Co., Ltd.	..	13.10.48
<i>Comitebank</i>	..	W. Mendus	..	A. J. Whiston, R. Clark, S. J. East	W. M. Fryer	..	Bank Line, Ltd.	..	16.2.48
<i>Condesa</i>	..	H. Heal	..	R. Tinnmouth, S. Edginton, D. Parkin	J. Bishop	..	Furness-Houlder Argentine Lines, Ltd.	..	20.4.49
<i>Consuelo</i>	..	F. Barnard, M.B.E.	..	C. Everingham, G. Saltmarsh, R. C. Measham	K. K. Klosser	..	Ellerman's Wilson Line, Ltd.	..	12.1.49
<i>Corfu</i>	..	C. S. Parker	..	J. H. Wilde, —, Woodbridge, —, Moore	M. B. Baxter	..	P. & O. Steam Nav. Co., Ltd.	..	16.12.48
<i>Corinthic</i>	..	G. M. Robertson, D.S.C.	..	R. Allen, C. Martin, R. Aitken	J. Couchman	..	Shaw, Savill & Albion Co., Ltd.	..	28.3.49
<i>Corrientes</i>	..	G. Robinson	..	W. F. Kelly, T. F. Tuomey, J. Ridley	R. Andrews	..	Donaldson Bros. & Black, Ltd.	..	16.12.48
<i>Craigfarn</i>	..	W. F. O'Neill	..	W. Tressider, B. T. Harrison, J. C. Derby	A. Broadbent	..	Charente S.S. Co., Ltd.	..	24.2.49
<i>Dallas City</i>	..	W. H. Grimshaw	..	G. T. Clarke, R. Clark, D. C. Broome,	A. A. Macpherson	..	Royal Mail Lines, Ltd.	..	..
<i>Darro</i>	..	I. King	..	A. H. Pickles	T. Stowers	..	Lampport & Holt Line, Ltd.	..	28.3.49
<i>Debreit</i>	..	B. Rivett	..	J. Crowe, P. Leighton, H. Smith	B. Thompson	..	Lampport & Holt Line, Ltd.	..	14.10.48
<i>Debank</i>	..	W. C. Blake	..	M. D. A. Lee, C. T. Skrastrin	R. Pryer	..	Donaldson Bros. & Black, Ltd.	..	11.1.49
<i>Defoe</i>	..	H. Pratt	..	D. Stewart, J. Rodger, J. Wainwright	G. Heapy	..	Lampport & Holt Line, Ltd.	..	22.1.49
<i>Delane</i>	..	R. McNie	..	W. Jones A. Bennett, D. Bottomley	H. Kenny-Levick	..	Glen Line, Ltd.	..	7.2.49
<i>Delilean</i>	..	H. W. Underhill	..	E. G. Painter, D. MacLachlan, L. Henshall	M. Doran	..	McCowan & Gross, Ltd.	..	26.1.49
<i>Delius</i>	..	W. F. Dark	..	E. T. Paddon, E. Racher	L. Brazill	..	Royal Mail Lines, Ltd.	..	4.1.49
<i>Denbighshire</i>	..	G. Smith	..	W. B. Avison, J. H. Napper, J. Holt, F. C. Allwood	A. Williams	..	Lampport & Holt Line, Ltd.	..	21.3.49
<i>Derryclear</i>	..	S. J. Hill	..	D. H. Cordova, G. Shackleton	J. Fletcher	..	Federal Steam Nav. Co., Ltd.	..	9.7.48
<i>Deseado</i>	..	T. J. Sweeney	..	J. Bryant, J. M. Mead, M. Shaw, W. Smith	S. J. Taylor	..	Bibby Line, Ltd.	..	7.12.48
<i>Devis</i>	..	A. Hocken	..	J. Farrow, R. Driver, F. Hughes	J. Murphy	..	British India Steam Nav. Co., Ltd.	..	12.2.49
<i>Devon</i>	..	I. E. Cullen, O.B.E.	..	H. B. Cray, R. Barker, T. E. Harris	J. Cooper	..	Shaw, Savill & Albion Co., Ltd.	..	11.3.49
<i>Devonshire</i>	..	F. L. Sampson, D.S.C.	..	A. H. B. Anderson, A. H. N. Pugh, R. D. Fox	G. M. Hargreaves	..	Donaldson Bros. & Black, Ltd.	..	18.7.47
<i>Dikwara</i>	..	Sir Henry Gordon, K.B., D.S.C.	..	A. J. Dougal, I. M. Macfarlane, E. H. Knox	G. A. Allen	..	Doris S.S. Co., Ltd.	..	3.1.49
<i>Domination Monarch</i>	..	D. Macqueen	..	J. B. Whyte, K. M. Hamilton, W. D. Blingow	G. A. Sutherland	..	Royal Mail Lines, Ltd.	..	4.11.48
<i>Dorelian</i>	..	J. G. Stevenson	..	C. A. Miller, M. Mortimer, P. C. T. Davies	S. J. Hardiman	..	Johnston Warren Lines, Ltd.	..	11.2.49
<i>Doris Clunies</i>	..	A. N. Anderson	..	J. McCool, R. Simmons, P. R. Farthing	D. R. Uglow	..	Lampport & Holt Line, Ltd.	..	31.7.48
<i>Drina</i>	..	R. E. L. Holland	..	K. Quirk, J. S. Peterkin, J. L. Radcliffe	I. S. Humphrey	..	Trent Maritime Co., Ltd.	..	17.7.47
<i>Dromore</i>	..	C. L. Legg	..	T. Walton, L. Labistour, J. G. Perrin	A. S. J. Broadbent	..	Crawford Shipping Co., Ltd.	..	24.2.49
<i>Dryden</i>	..	J. G. Lomas, A.I.N.A.	..	J. D. B. Wylie	H. A. Liggins	..	Houlder Line, Ltd.	..	8.3.49
<i>Duke of Athens</i>	..	A. C. E. Green	..	H. Neal, A. Gibbs, T. C. Mullings	C. Robinson	..	Royal Mail Lines, Ltd.	..	5.1.49
<i>Dunkery Beacon</i>	..	R. S. Grigg, O.B.E.	..	M. W. M. Weekes, J. G. Brennan, M. J. Dean, J. M. Cree	E. C. Bovel	..	Union Castle Mail S.S. Co., Ltd.	..	18.1.49
<i>Dunster Grange</i>	..	W. H. Roberts	..	K. M. Knight, R. G. Patterson	..	..	Federal Steam Nav. Co., Ltd.	..	11.2.49
<i>Durango</i>	..	C. C. Page	..	J. Thornea, J. van der Straaten, G. Dunsford	..	..	Eastern & Australian S.S. Co., Ltd.	..	28.3.49
<i>Durben Castle</i>	..	R. J. Dunning	..	D. Simon, D. Elkington, D. Grant	..	..	..	..	..
<i>Durham</i>	..	H. C. G. Stratford	..	..	..	..	..	..	..
<i>Eastern</i>	..	..	..	..	..	..	..	..	..

NAME OF VESSEL	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS	LAST RETURN RECEIVED
<i>Edinburgh Castle</i>	T. W. McAllen ..	R. J. Taylor, P. S. G. Eckford, J. W. Rogers ..	J. Hodgson ..	Union Castle Mail S.S. Co., Ltd.	26.1.49
<i>Edward East</i>	E. H. Richardson ..	W. Swan, A. C. Bramble, T. M. Webber ..	L. Sutton ..	H. Croft Baker & Sons, Ltd. ..	7.12.48
<i>El Gallo</i>	J. Cook ..	J. Short, A. McCallum, S. Erving ..	L. Hooper ..	Lobitos Oilfields, Ltd. .. Black, Donaldson Bros. & Co. (Managers)	13.1.49
<i>Empire Brent</i>	E. Stormont, M.B.E. ..	G. Ramage, W. A. Brownlie, W. Marshall ..	D. Thompson, M.B.E. ..	Anchor Line, Ltd. (Managers)	7.2.49
<i>Empire Halladale</i>	E. Longster ..	C. McGowan, D. B. Butler ..	T. M. Keddle ..	Bolton S.S. Co., Ltd. (Managers)	19.6.47
<i>Empire Maritaban</i>	E. D. Bland ..	A. F. Cameron, A. Moore, R. V. Perkin ..	T. Prenton ..	Bibby Bros. & Co. (Managers)	18.1.49
<i>Empire Pride</i>	S. J. C. Phillips, C.B.E. ..	M. R. Bremberg, F. P. McGuckin, J. D. Brewster ..	J. Hynes ..	F. Leyland & Co., Ltd. ..	28.10.48
<i>Empire Star</i>	J. Andrews ..	A. C. Cable, A. Purvis, D. L. Jardine ..	R. Porter ..	Penton S.S. Co., Ltd. ..	4.11.47
<i>Empire Tooty</i>	M. D. Mackenzie ..	B. Snell, A. G. Ingram ..	W. Campbell ..	Canadian Pacific Railway Co. ..	15.12.48
<i>Empire Viceroy</i>	J. P. Dobson, D.S.C., R.D. Cdr., R.N.R. ..	A. F. Miller, B. Snell, J. H. Fraser ..	J. M. Butterworth ..	Canadian Pacific Railway Co. ..	4.1.49
<i>Empress of Australia</i>	E. A. Shergold ..	W. R. Owen, R. D. Williams ..	T. Murphy ..	Canadian Pacific Railway Co. ..	19.1.49
<i>Empress of Canada</i>	H. H. Davies ..	G. T. Sharpe, R. M. King, E. Thomson ..	R. T. Jones ..	British S.S. Co., Ltd. ..	13.10.48
<i>Empress of France</i>	R. D. Griffiths, O.B.E. ..	V. Irving, C. P. Turquand, S. Noble ..	H. Lammas ..	Steamship Eros, Ltd. ..	24.2.49
<i>Epsom</i>	R. C. Vigurs ..	D. T. Mouldrey, K. Murray-Brown, D. Wright ..	P. Maloney ..	Aberdeen & Commonwealth Line, Ltd.	16.12.48
<i>Eros</i>	T. V. Roberts, R.D. Cpt. R.N.R. ..	H. P. Ellison, F. Stamps, D. Harris ..	A. B. Pilkington ..	Trader Nav. Co., Ltd. ..	4.1.49
<i>Esperance Bay</i>	C. Arundell ..	V. Bridges, J. Davies, E. Allchin ..	C. C. H. Weeks ..	Anglo-American Oil Co., Ltd. ..	20.1.49
<i>Essex Trader</i>	O. H. Sheppard ..	J. L. Williams, G. Cubbin, R. H. Soar ..	G. A. Bart ..	Inver Transport & Trading Co., Ltd.	6.1.49
<i>Esso Glasgow</i>	T. Watkins ..	A. Fee, T. S. McMaster, R. G. Pass, R. Coffey ..	A. L. Thomson ..	Charante S.S. Co., Ltd. ..	20.4.49
<i>Explorer</i>	W. F. O'Neill ..	P. M. Ralston, G. H. Griffiths, S. Burley ..	W. A. Johnston ..	Ulster S.S. Co., Ltd. ..	2.3.48
<i>Famad Head</i>	W. A. Haddock ..	I. C. Macdonald ..	J. W. Leask ..	Elder Dempster Line, Ltd. ..	21.1.49
<i>Fantec</i>	J. W. Andrew ..	J. S. Dryman, J. W. Phinister ..	J. Knight ..	South Georgia Co., Ltd. ..	18.3.48
<i>Fenja</i>	J. W. Leask ..	M. Harries-Beadnell, R. Welch, A. O. Griffith, B. Clarke-Lens ..	G. K. Ramsey ..	Currie Line, Ltd. ..	5.11.48
<i>Finland</i>	A. Wilson, O.B.E. ..	K. D. A. Lamb, N. MacAlister, H. Parry-Williams ..	J. Sheahan ..	Shaw, Savill & Albion Co., Ltd. ..	11.2.49
<i>Fordale</i>	T. Oliver ..	M. Hehir, J. D. Smythe, D. R. Butten ..	J. K. McCormack ..	Cunard White Star, Ltd. (Managers)	24.2.49
<i>Fort Cadotte</i>	F. E. Patchett ..	A. M. Allan, R. F. Letthead, A. S. Kelly ..	V. P. Manahan ..	J. & J. Denholme, Ltd. (Managers)	16.8.48
<i>Fort Musquarvo</i>	E. A. Stuart ..	J. Farrow, M. V. Mearden, R. J. Ogilvy ..	W. Steele ..	Cunard White Star, Ltd. (Managers)	18.1.49
<i>Fort Nakasley</i>	J. Johnson ..	K. Montgomery, L. Jamieson, J. Horne ..	T. H. Owen Ffoulkes ..	Lytle Shipping Co., Ltd. (Managers)	24.2.49
<i>Fort Spokane</i>	A. B. Fasting, R.D., R.N.R. ..	S. S. Jones, W. P. Davis, M. Keavill ..	M. H. Whitehead ..	Reardon Smith Line, Ltd. ..	6.1.49
<i>Fort Steele</i>	J. S. Binnie ..	L. Richardson, M. Wardle, W. Owen ..	J. Everitt ..	Charante S.S. Co., Ltd. ..	28.3.49
<i>Freno City</i>	H. Fisher ..	D. Aubrey, F. Eastman, S. M. Garide ..	A. G. Hill ..	Anglo-American Oil Co., Ltd.	19.7.48
<i>Geologist</i>	A. E. Jackson ..	J. O. Springall, K. J. Jones, H. P. Williams ..	E. Roberts ..	Cunard White Star, Ltd. (Managers)	31.12.47
<i>Geo. W. McKnight</i>	H. Dixon ..	R. G. Edwards, F. A. S. Millar, H. Bell ..	F. Wilson ..	Ocean S.S. Co., Ltd. ..	11.2.49
<i>Georgic</i>	J. Macarthur ..	C. Lorimer, J. B. Motherall ..	W. Lingbottom ..	Glen Line, Ltd. ..	7.12.48
<i>Glancus</i>	W. E. Coates ..	W. Murphy, D. V. Hoskins ..	E. F. Power ..	Glen Line, Ltd. ..	25.1.49
<i>Glenartney</i>	T. Fraser ..	C. C. J. Neaves, C. J. Sawle, J. F. Parry ..	R. J. Devlin ..	Federal Steam Nav. Co., Ltd.	20.4.49
<i>Glenbank</i>	C. Houghton ..	L. James, P. Slocombe, P. D. Moran ..			
<i>Glenorchy</i>	H. D. Horwood, R.D., Cdr., R.N.R. ..				
<i>Gloucester</i>					

<i>Gracia</i> ..	..	J. McInnes	..	D. M. Allan, G. B. Manson, I. Barbour ..	M. Grant	..	Donaldson Line, Ltd. ...	25.4.49
<i>Guatemal</i> ..	..	H. Coffey, R.D., R.N.R.	..	T. W. C. Rylance, J. Gall, R. B. Dales	W. G. Fitzgerald	..	United Africa Co., Ltd.	18.1.49
<i>Haparang</i> ..	..	C. R. Pilcher, O.B.E.	..	J. R. Ramsay, H. P. Lunn, J. T. Peattie, E. B. Mallett	J. Mathews	..	New Zealand Shipping Co., Ltd.	8.1.49
<i>Harmatris</i> ..	..	A. R. Phelps	..	G. S. Robinson, J. B. Steele	D. J. O'Brien	..	J. & C. Harrison, Ltd.	24.2.49
<i>Helicina</i> ..	..	F. T. Vine	..	W. P. Abley, M. B. Mactavish	A. W. Hutchinson	..	Anglo-Saxon Petroleum Co., Ltd.	25.2.49
<i>Herdman</i> ..	..	W. A. Short	..	J. W. Embledon, K. Cobb	I. Donald	..	Charente S.S. Co., Ltd.	4.3.49
<i>Herefordshire</i> ..	..	T. J. A. Thomson	..	M. C. Mills, W. Thomas, R. Purkiss	F. Greaves	..	Bibby Line, Ltd.	8.1.49
<i>Highland Brigade</i> ..	..	H. D. Hooper, O.B.E.	..	D. Buckle, J. Perkins, C. Wightman	W. Gay	..	Royal Mail Lines, Ltd.	..
<i>Highland Chiefstain</i> ..	..	G. A. Bannister	..	L. W. Green, J. P. Martin, G. W. T. Griffiths, H. R. Wright	T. Desborough	..	Royal Mail Lines, Ltd.	..
<i>Highland Monarch</i> ..	..	B. K. Berry, R.D., Capt., R.N.R.	..	A. Ferguson, J. Perkins, R. Stirling, G. Lillie	L. Cooper	..	Royal Mail Lines, Ltd.	26.1.49
<i>Highland Princess</i> ..	..	P. Cooper	..	M. Wardle, R. Mawley, H. Nixon	J. Goodall	..	Royal Mail Lines, Ltd.	19.5.47
<i>Hilary</i> ..	..	J. Binns	..	H. G. Strickland, D. Barfoot, J. D. Todd	P. Probert	..	Booth S.S. Co., Ltd.	14.12.48
<i>Hopecrown</i> ..	..	Stewart Wilson, O.B.E.	..	W. Thompson, A. Turner, L. Leech	J. Maudsley	..	Clive Shipping Co., Ltd.	7.2.49
<i>Hopepeak</i> ..	..	G. Grindrod	..	W. D. Tulloch, G. I. Outen, G. R. Ballard	C. J. Rees	..	Hopemount Shipping Co., Ltd.	26.5.48
<i>Hope Star</i> ..	..	F. H. Dufton	..	R. Sims, P. Jeanes, M. Wright	C. L. Lambe	..	Walkeend Shipping Co., Ltd.	20.4.49
<i>Hororata</i> ..	..	A. E. Taylor, R.D., Cdr., R.N.R.	..	L. A. Sayers, P. J. Wahlberg, J. Mawhinney	F. N. Baskerville	..	New Zealand Shipping Co., Ltd.	..
<i>Hubert</i> ..	..	J. Whayman, D.S.C., R.D., R.N.R.	..	J. Anderson, N. I. Collett, P. R. Moulton	F. N. Baskerville	..	Booth S.S. Co., Ltd.	25.2.49
<i>Hurui</i> ..	..	F. Loughheed	..	A. Farrell, C. O'Connor, I. Pigott	C. Littleboy	..	New Zealand Shipping Co., Ltd.	15.12.48
<i>Inishoven Head</i> ..	..	G. A. Moore	..	S. Duncan, H. E. Hoyle	E. Murray	..	Ulster S.S. Co., Ltd.	5.1.49
<i>Inverbank</i> ..	..	A. M. Williamson	..	E. G. J. Roberts, F. Saunders, P. R. K. Davis	W. Chalmers	..	Bank Line, Ltd.	28.9.48
<i>Jamaica Producer</i> ..	..	P. D. Allen, O.B.E.	..	D. L. Beynon, J. H. J. Frost, I. Thomas	R. Hartley	..	Jamaica Banana Producers S.S. Co., Ltd.	11.3.49
<i>Jersey City</i> ..	..	J. M. Cox	..	P. V. McCullough, B. A. Gouldstone, E. B. Pratt	C. Codling	..	Reardon Smith Line, Ltd.	19.5.48
<i>Yessmore</i> ..	..	R. E. Holland	..	P. Bathurst, W. L. Harrison, R. E. Griffiths	J. J. Sheridan	..	Johnston Warren Lines, Ltd.	28.3.49
<i>John Biscoe</i> ..	..	H. Kirkwood, Cmdr. R.N.	..	D. M. Steven, J. R. Suffren, F. Le Messurier	P. A. Senior	..	Falkland Islands Dependencies Govt.	..
<i>John Holt</i> ..	..	A. Kennedy	..	C. F. Turner, J. Milne, J. Newing	F. Matthews	..	John Holt & Co. (Liverpool), Ltd.	26.4.48
<i>Kaipaki</i> ..	..	T. Fenwick	..	D. E. Ilsley, R. H. Wakeford, R. J. F. Riley	T. Herbert	..	New Zealand Shipping Co., Ltd.	21.8.48
<i>Kaipara</i> ..	..	G. P. Parkinson	..	J. K. Mumford, J. H. Drummond, I. Bigham	M. S. M. Haning	..	New Zealand Shipping Co., Ltd.	4.1.49
<i>Kaituna</i> ..	..	R. F. Hellings	..	R. W. W. Sims, D. A. G. Dickens, A. B. Stalker	C. Robinson	..	J. Nourse, Ltd.	23.2.49
<i>Kallada</i> ..	..	I. M. Reynolds	..	W. Keith, G. Griffiths, P. Kidd	L. Roberts	..	Union Castle Mail S.S. Co., Ltd.	24.2.49
<i>Kenilworth Castle</i> ..	..	J. E. R. Wilford	..	J. C. Davies, G. F. Hogg, A. J. Moore	W. Fielding	..	Federal Steam Nav. Co., Ltd.	13.10.48
<i>Kent</i> ..	..	N. A. Thomas	..	W. G. Smith, J. E. Belt, P. H. Alexander	P. Kelly	..	King Line, Ltd.	10.10.47
<i>King Robert</i> ..	..	G. Craze	..	J. N. Bridges, D. B. Owen, A. R. Norton, N. J. Blair	P. Goss	..	Shahristan S.S. Co., Ltd.	7.12.48
<i>King William</i> ..	..	A. B. Drever	..	T. Hiatt, W. P. Goldie, P. McMenamin	D. Robbins	..	Vacuum Oil Co., Ltd.	12.1.49
<i>Kohistan</i> ..	..	A. N. Henderson	..	J. Orr, A. Sillars, R. F. Arnold	T. Dunshire	..	Pacific Steam Nav. Co., Ltd.	28.3.49
<i>Lacklan</i> ..	..	A. McCausland	..	A. Maur, M. T. Morton, J. P. McMaster	J. W. Fulton	..	Austin Friars S.S. Co., Ltd.	20.4.49
<i>Laguna</i> ..	..	S. E. Ayland	..	W. H. Malley, J. C. Priest, B. MacKinnon	J. B. Allan	..	Scottish Shire Line, Ltd.	21.6.48
<i>Lambrook</i> ..	..	H. F. McInnes	..		A. Jones	..	Bibby Line, Ltd.	12.2.49
<i>Lanarkshire</i> ..	..	C. E. O'Byrne	..			..		25.4.49
<i>Lancashire</i> ..	..	A. Beharrel	..			..

NAME OF VESSEL	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS	LAST RETURN RECEIVED
<i>Lassell</i>	D. Roberts	S. Dickenson, J. Bicknell, P. V. des Landes	M. Moore	Lampart & Holt Line, Ltd.	13.10.48
<i>Latia</i>	R. S. Walker	W. J. Erskine, R. W. Lumsden, G. A. Hubbard	W. E. Delamere	Anglo-Saxon Petroleum Co., Ltd.	3.11.48
<i>Levernbank</i>	D. Gillies	C. R. Eaddy, C. G. Watterson, D. A. Kiddell	W. C. Doyle	Bank Line, Ltd.	3.11.48
<i>Linguist</i>	A. H. Frew	F. E. Barnes, F. Methan, G. Dineley	L. Bradshaw	Charente S.S. Co., Ltd.	1.6.48
<i>Livorno</i>	E. S. Green	H. D. Lawton	J. Eager	Ellerman's Wilson Line, Ltd.	4.11.48
<i>Llangibby Castle</i>	C. C. Page	H. L. Halcrow, D. W. Verniers, A. H. Benson	M. Riley	Union Castle Mail S.S. Co., Ltd.	25.2.49
<i>Lloydcrest</i>	T. Walker	J. H. Allenby, J. H. Kelly, G. E. Mitchell	J. J. Glynn	Juncrest Shipping Co., Ltd.	18.3.48
<i>Lobos</i>	A. J. Litherland	G. E. Leech, D. S. C., W. M. Morton, J. V. Bradbury, J. M. Ashworth	M. R. Littlejohn	Pacific Steam Nav. Co., Ltd.	16.12.48
<i>Loch Avon</i>	W. W. Lowe	E. A. E. Littlewood, P. J. Reaker, J. K. Cook, L. Oliver	D. Morgan	Royal Mail Lines, Ltd.	12.2.49
<i>Loch Garth</i>	H. G. Whittle, O.B.E.	D. R. Bryden, R. C. Hunnisett, V. Charles	D. Douglas	Royal Mail Lines, Ltd.	4.3.49
<i>Loch Ryan</i>	A. R. Osburn	A. H. Trekelder, J. Janczak, J. S. Armstrong	J. Saidler	Norwood S.S. Co., Ltd.	12.3.48
<i>Lord Gladstone</i>	P. J. Kenny	W. R. Nelson, A. F. James, D. Philpotts	D. O'Callaghan	Ulster S.S. Co., Ltd.	20.4.49
<i>Lord Glenboran</i>	W. J. Leinster	R. M. Hall, R. Harper, C. R. Wilson	C. A. Murphy	Ulster S.S. Co., Ltd.	18.3.49
<i>Lord O'Neill</i>	R. A. Ferguson	R. J. B. Lewis, D. T. Beamish, J. V. Hatfield	G. Surtees	Pacific Steam Nav. Co.	4.1.49
<i>Loriga</i>	J. E. Evans, D.S.C., R.D., Capt., R.N.R.	F. Leicester, G. E. Turner, J. Galston	S. Money	Pacific Steam Nav. Co.	28.3.49
<i>Losada</i>	P. L. Hockey	J. Billett	W. Ogilvie	Aral S.S. Co., Ltd.	14.12.48
<i>Luminous</i>	S. J. Smith	J. Anderson, J. Cook, E. Hill	— Fisher	Ocean S.S. Co., Ltd.	10.3.49
<i>Machoon</i>	I. L. W. Johnston	— Jackson, L. J. S. Saxty, — Kirkham, — Ralli	E. Halton	T. & J. Brocklebank, Ltd.	4.1.49
<i>Macharda</i>	R. A. Penston	N. H. Embleton, J. Robertson, R. J. Ryding	—	T. & J. Brocklebank, Ltd.	8.10.47
<i>Magdapor</i>	A. Hill, O.B.E.	J. Brand, J. C. Long, P. Greenall, G. P. Hurms	T. Williams	T. & J. Brocklebank	16.12.48
<i>Mahanada</i>	J. W. B. Robertson, R.D., R.N.R.	D. L. Campbell, E. G. Anderson, L. Burn	C. W. Jacobs	Shaw, Savill & Albion Co., Ltd.	28.10.48
<i>Mahia</i>	J. W. Hart	I. W. Ross, D. Evans, A. P. Briggs	P. Kinderman	T. & J. Brocklebank, Ltd.	11.3.49
<i>Mahout</i>	R. F. Scoins	J. P. Penbridge, M. H. Taylor, D. L. des Landes	A. G. Lea	T. & J. Brocklebank, Ltd.	12.3.49
<i>Mahsud</i>	R. Humble	C. Grey, J. H. Moore, E. McAulley	A. E. Weston	T. & J. Brocklebank, Ltd.	21.7.48
<i>Mahsar</i>	S. Broughton	R. M. Lucas, J. P. Hackworth, D. Hay	I. Caddy	Prince Line, Ltd.	18.1.49
<i>Makala</i>	T. C. Eddy	W. Gibson, D. S. Carter, J. Kemp	R. Burton	Ellerman's Wilson Line, Ltd.	20.1.49
<i>Malakand</i>	I. Owen	E. Roberts, J. R. Stephens, N. A. Hill	G. Close	Peninsular & Oriental Steam Nav. Co.	9.6.47
<i>Malancha</i>	H. MacGregor	R. M. Sinclair, G. E. Howe, J. C. Jenkins	A. Macbeth	Manchester Liners, Ltd.	8.6.48
<i>Malayan Prince</i>	J. D. Fraser	W. Hine, G. R. Thompson, S. Hinchcliff	H. J. Coates	Manchester Liners, Ltd.	2.2.48
<i>Malmo</i>	J. W. Calvert	W. E. Quick, J. E. Askew, R. Wadsworth	A. R. Evans	Manchester Liners, Ltd.	5.1.49
<i>Maloja</i>	E. J. Parry	M. F. Robinson, C. Cuird, T. H. Lynn	P. Cummins	Manchester Liners, Ltd.	5.1.49
<i>Manchester City</i>	F. L. Osborne	F. Lewis, L. Taylor, C. Marchant	W. C. Critchley	Manchester Liners, Ltd.	5.1.49
<i>Manchester Commerce</i>	H. Hancock	W. R. McLenen, D. Thomas, A. C. Caird	J. Reid	Manchester Liners, Ltd.	4.1.47
<i>Manchester Division</i>	E. W. Espley	F. Lewis, D. Heaton, T. H. Lynn	E. Ambler	Manchester Liners, Ltd.	
<i>Manchester Fort</i>	F. Downing				
<i>Manchester Progress</i>	W. H. Downing				
<i>Manchester Regiment</i>	F. D. Struss, O.B.E., D.S.C.				
<i>Manchester Shipper</i>	J. Barclay				

Manchester Trader	E. W. Raper	W. E. Oliver, P. N. Fielding, A. C. Caird, N. Cockshott	A. C. Gavin	Manchester Liners, Ltd.	
Mandator ..	L. E. Jeans	D. A. Morris, A. W. Wiltshire, J. P. Atwood ..	A. C. Gavin ..	..	12.1.49
Maplebank ..	N. P. McLeod	N. P. McLeod ..	G. W. Hazel ..	T. & J. Brocklebank, Ltd.	11.1.49
Marango ..	F. Ellison	A. Hullerby, R. Tutty, J. Leach ..	J. B. Anderson ..	Bank Line, Ltd.	21.8.48
Marquy ..	E. A. Prentice	C. H. Forster, H. Leadbetter, F. G. Hardy ..	G. Carun ..	Ellerman's Wilson Line, Ltd.	24.2.49
Marretta Dal ..	J. G. F. Brighty	L. D. Forster, R. H. Jenkins, C. Jacob ..	J. McFarlane ..	"K" S.S. Co., Ltd.	24.2.49
Markhor ..	W. Hill, O.B.E.	I. A. MacLaren, J. Ritchie, R. N. Bonny ..	A. Hadden ..	Dalhousie S.S. Co.	7.2.49
Marquise ..	F. C. Jennings	J. Cush, T. Liddle, D. Parker ..	D. Owen ..	T. & J. Brocklebank, Ltd.	4.1.49
Martdale ..	M. Ferguson	H. Jones, J. Tier, L. Marsell ..	K. C. Wright ..	Coolham S.S. Co., Ltd.	
Martland ..	T. Fox-Lloyd	E. L. Jones, P. A. Litherland, W. H. Clifford Hicks ..		"K" S.S. Co., Ltd.	
Martita ..	H. Bunn	E. Prest, D. I. J. Thomson, P. Parker ..	D. H. Butterworth ..	T. & J. Brocklebank, Ltd.	7.12.48
Mataroa ..	S. Oswald	P. M. Williams, J. G. Beck, D. S. Aberdeen ..	A. E. Campbell ..	"K" S.S. Co., Ltd.	
Matheran ..	A. B. Bannatyne, O.B.E.	H. Simpson, B. Dey, P. A. Gunson ..	L. Boyce ..	Shaw, Savill & Albion Co., Ltd.	7.3.49
Matina ..	A. G. Jones	T. C. Crane, J. Nicholson, J. Mayo ..	P. Neisson ..	T. & J. Brocklebank, Ltd.	16.12.48
Maurtania ..	R. C. Thelwell, O.B.E.	N. Carter, J. Ward, J. Mitchell ..	A. C. Knight ..	Elders & Fyffes, Ltd.	6.1.49
Media ..	R.D. A.D.C., R.N.R.	J. A. B. Munro, R. A. Elder, C. H. Cooke ..	F. Clarke ..	Cunard White Star, Ltd.	10.11.48
Melbourne Star ..	C. S. Williams	L. A. Ankers, D. J. Ashworth, W. A. Sparks ..	J. MacArdle, M.B.E.	Cunard White Star, Ltd.	20.7.48
Mening ..	F. N. Riley, D.S.O.	J. Edgar, D. S. Leicester, A. B. Baines ..		Blue Star Line, Ltd.	
Millais ..	D. C. Roberts	R. E. Small, P. B. Henderson, C. E. Burrill ..	J. Brown ..	Lampart & Holt Line, Ltd.	4.1.49
Millais ..	A. R. Bibby, O.B.E.	K. H. Joy, A. Hoar, —, Black-Tuckwell ..	G. Norton ..	Lampart & Holt Line, Ltd.	12.1.49
Mirror ..	S. A. Gammon	A. E. Clay, T. A. Sergeant, P. G. Pattinson, J. A. Clifford ..	J. Crouch ..	Cable & Wireless, Ltd.	5.12.47
Monarch ..	J. P. F. Betson	D. A. Campbell, R. Hopkins ..	E. Robinson ..	Postmaster General ..	18.7.47
Moodian ..	C. H. Baxter	K. M. Maguire, W. J. Neill, R. Cawthorne ..	F. Ash ..	P. & O. Steam Nav. Co.	28.3.49
Moveria ..	T. S. Graham	G. G. Hodgson, J. T. Duncan, F. J. Adamson ..	J. Adamson ..	Donaldson Line, Ltd.	12.2.49
Mertilla ..	W. Gillespie	E. W. Jenkins, J. B. Kennedy, J. Bain ..	N. Kehoe ..	Lampart & Holt Line, Ltd.	12.11.48
Myrtlebank ..	F. Hall ..	P. Kendall, M. Goddard, L. Stephens ..	T. W. Murray ..	Bank Line, Ltd.	23.8.48
Napier Star ..	E. N. Rhodes	N. W. Martin, M. Spencer Hogkin, B. Pays ..	J. E. Conway ..	Union Cold Storage, Ltd.	7.2.49
Natania ..	P. D. Seear	J. B. Stewart, H. T. Sheffield, M. A. Bilitch, L. Rooney ..	L. Booth ..	Anglo-Saxon Petroleum Co., Ltd.	4.1.49
Nestor ..	E. W. Powell, M.B.E.	R. Stewart, G. Munro, F. Wood ..	T. Cahill ..	Ocean S.S. Co., Ltd.	20.9.48
Newfoundland ..	A. T. Church, O.B.E.	J. G. Robinson, A. B. Moss, J. S. Glover ..		Johnston Warren Lines, Ltd.	4.1.49
New Zealand Star ..	G. Owen, O.B.E., R.D., Cdr. R.N.R.	J. Cubitt, C. Masson, J. Witchell ..	C. J. Carter ..	Frederick Leyland & Co., Ltd.	15.12.48
Norfolk ..	A. T. Robertson, R.D., Capt. R.N.R.	H. Wylie ..	J. Heath ..	Federal Steam Nav. Co., Ltd.	12.2.49
Northernland ..	A. E. Williams	J. D. P. Williamson, E. Cunningham, K. Rowland ..	J. Charter ..	Federal Steam Nav. Co., Ltd.	7.12.48
Norwegian ..	J. Pollock	D. O. Percy, G. A. Cain, K. G. Watson ..	W. C. Brock ..	Donaldson Line, Ltd.	
Nova Scotia ..	J. E. Wilson, O.B.E.	P. J. Leech, A. Jewers ..	J. Mathieson ..	Johnstone Warren Lines, Ltd.	5.1.49
Novelist ..	F. E. Steel	A. Mackenzie, W. Pelt, J. Edmondson ..	W. Humphries ..	Charante S.S. Co., Ltd.	21.9.48
Ocean Valley ..	W. McMellin	W. Singleton, T. Wilcockson, P. Wheel- bourn ..	F. Wilman ..	Houlder Bros. & Co., Ltd. (Managers)	25.4.49
Orari ..	E. A. J. Williams	B. A. King, J. B. Olsson, J. Pattison ..	W. McCormick ..	New Zealand Shipping Co., Ltd.	3.1.49
Orbita ..	J. Sutherland	M. R. Wilmshurst, A. Murray, D. K. Kinloch ..	N. Clarke ..	Pacific Steam Nav. Co., Ltd.	3.1.49
Orcades ..	C. Fox, C.B.E.		T. Shannon ..	Orient Line, Ltd.	5.11.48
Orduna ..	J. Whitehouse			Pacific Steam Nav. Co., Ltd.	
Orton ..	T. L. Shurrock, O.B.E.			Orient Steam Nav. Co., Ltd.	11.1.49

NAME OF VESSEL	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS	LAST RETURN RECEIVED
<i>Ormonde</i>	I. E. Goldsworthy, R.D., R.N.R.	C. S. Thomas, R.D., Lt.-Cdr. R.N.R., R. L. C. Kingswood, P. J. Collier	R. Oakley ..	Orient Steam Nav. Co., Ltd. ..	7.12.48
<i>Orontes</i>	N. A. Whinfield ..	Ward ..	F. Murphy ..	Orient Steam Nav. Co., Ltd. ..	4.1.49
<i>Pacific Enterprise</i> ..	M. E. Cogle, O.B.E.	J. Crosthwaite, M. J. Brown, J. T. Cameron	F. F. Cory ..	Furness, Withy & Co., Ltd. ..	1.11.48
<i>Pacific Exporter</i> ..	W. F. Swann ..	D. MacDonald, M. J. Brown, A. Pringle	A. Cary ..	Furness, Withy & Co., Ltd. ..	20.9.47
<i>Pacific Importer</i> ..	B. M. Collard ..	G. Cook, A. Linden, G. Williams	V. Ash ..	Furness Withy & Co., Ltd. ..	8.12.48
<i>Pacific Liberty</i> ..	N. Conbrough ..				
<i>Pacific Shipper</i> ..	E. V. Richards ..	B. A. Newcomb, P. S. Taylor, E. H. Gregson	A. L. Cawley ..	Furness Withy & Co., Ltd. ..	12.2.49
<i>Pacific Stronghold</i> ..	F. H. Perry ..	J. Clarke, D. R. Gibson, —, Keene	S. Vincent ..	Furness, Withy & Co., Ltd. ..	21.1.49
<i>Pacific Unity</i> ..	H. S. Reveley ..				
<i>Pakeha</i>	H. C. Smith ..	H. P. Last, A. H. N. Pugh, A. R. Stephenson	I. G. Lawrie ..	Shaw, Savill & Albion Co., Ltd.	5.1.49
<i>Palacio</i>	J. P. Harris ..	P. McKinley, W. H. Davis, R. Budson	R. McCarthy ..	MacAndrews & Co., Ltd. ..	14.12.48
<i>Palana</i>	F. R. Spurr ..	M. A. Frenfield, G. T. Pape, A. J. Stephenson	H. Olding ..	P. & O. Steam Nav. Co. ..	16.12.48
<i>Palomares</i>	D. L. Thomas, M.B.E.	F. Sznage ..	J. Stone ..	MacAndrews & Co., Ltd. ..	
<i>Pampas</i>	T. Powell ..	K. E. McChure, C. W. Williams, K. R. Towers	H. Booth ..	Royal Mail Lines, Ltd. ..	6.8.48
<i>Papamui</i>	B. Evans ..	G. R. Taylor, E. White, T. Bennett	A. R. Smith ..	New Zealand Shipping Co., Ltd.	13.9.48
<i>Paparoa</i>	E. Hopkins ..	H. A. Owen, C. B. Hewett, W. Dan	L. P. Rayner ..	New Zealand Shipping Co., Ltd.	18.1.49
<i>Paraguay</i>	H. V. Todd ..	C. A. Gibbons, D. Davies, M. Blackmor	P. Goulden ..	Royal Mail Lines, Ltd. ..	21.1.49
<i>Pardo</i>	R. N. Fletcher ..	C. G. M. Smith, M. Hawkins, J. M. Barber	H. J. Coats ..	Royal Mail Lines, Ltd. ..	20.4.49
<i>Parina</i>	J. Smith, R.D., Cdr., R.N.R.	I. T. Jones, R. C. Hummsett	N. H. Crocker ..	Royal Mail Lines, Ltd. ..	21.3.49
<i>Paringa</i>	C. E. Pollitt ..	P. C. Reed, R. Elenor, A. W. Dallas	B. S. Magennis ..	P. & O. Steam Nav. Co. ..	12.2.49
<i>Parthia</i>	G. H. G. Morris ..	K. T. Jones, F. Watts, P. Walton	G. O'Sullivan ..	Cunard White Star, Ltd. ..	2.12.48
<i>Pegu</i>	S. Thomson ..	I. Walker Brown, S. MacColl, —, Crozier	R. Wilson ..	British & Burma Steam Nav. Co., Ltd.	3.3.49
<i>Perim</i>	J. M. Peter ..	R. K. Pannell, P. Hewitt, R. T. Neve	F. Groves ..	P. & O. Steam Nav. Co. ..	28.3.49
<i>Perithshire</i>	A. J. Hogg ..	J. Browne, C. Stonehouse, D. Gedden, M. J. Skillington	F. Rayner ..	Scottish Shire Line, Ltd. ..	4.1.49
<i>Philomed</i>	H. M. Selmer ..			General Steam Nav. Co., Ltd. ..	
<i>Philosopher</i>	H. Coates ..	D. P. Warren, P. Anthony, J. Egan	P. Hampson ..	Charante S.S. Co., Ltd. ..	4.1.49
<i>Pilcomayo</i>	T. Davies ..	P. M. Bushy, S. Oates, D. G. Seward	L. Sayers ..	Royal Mail Lines, Ltd. ..	28.10.48
<i>Pipiriki</i>	R. G. Rees ..	G. W. Sigsworth, G. G. Robins	—, Gagnay ..	New Zealand Shipping Co., Ltd.	23.2.49
<i>Planter</i>	J. Harnden ..			Charante S.S. Co., Ltd. ..	8.6.48
<i>Polar Chief</i>	J. O. Bowie ..	J. Gilman, E. Smith		South Georgia Co., Ltd. ..	
<i>Polar Maid</i>	H. Leask ..			Polar Whaling Co., Ltd. ..	
<i>Port Brisbane</i>	W. G. Higgs, O.B.E.	P. A. N. Thomas, I. H. Stewart, J. A. W. Ashburner	E. G. Gunner ..	Port Line, Ltd. ..	4.3.49
<i>Port Chalmers</i>	E. T. W. Lawrey ..				
<i>Port Hobart</i>	T. F. Kippins, O.B.E., D.S.C.	A. J. Braund, J. D. Aitchison, R. G. Gilling	B. Morley-Evans ..	Port Line, Ltd. ..	16.12.48
<i>Port Jackson</i>	F. W. Bailey, M.B.E.	C. Guest, D. M. Mackeith, R. E. C. Harris	R. C. Crompton ..	Port Line, Ltd. ..	23.2.49
<i>Port Lincoln</i>	H. H. Smith, O.B.E.	G. G. Carter, D. M. Robinson, M. W. Roggert	P. T. McKeon ..	Port Line, Ltd. ..	4.1.49
<i>Port Macquarie</i>	E. E. Roswell ..	R. M. Liley, F. Lascales, H. A. Sproul- Cran	R. Robertson ..	Port Line, Ltd. ..	23.2.49

Port Philip	..	I. G. Lewis, O.B.E.	F. M. Barton, E. G. Gilling, H. R. Long	B. McGovern	Port Line, Ltd.	6.1.49
Port Firie	..	W. J. Enright, O.B.E., R.D., Capt. R.N.R.	R. C. Matthews, A. W. Kensett, H. J. Haldrup	W. Miller	Port Line, Ltd.	25.1.49
Port Wellington	..	E. J. Syrett	J. M. Bedwell, D. Sinclair, E. Newstead	J. S. Macpherson	Port Line, Ltd.	11.2.49
Port Wyndham	..	H. W. Hazlewood	P. R. Lewis, P. G. Henneker, C. M. Watkins	J. W. Coutts	Port Line, Ltd.	20.4.49
Potaro	..	D. R. Miller	R. D. Jones, R. R. Thompson, J. T. Price	T. J. Berry	Royal Mail Lines, Ltd.	11.5.48
Pretoria Castle	..	J. C. Brown, C.B.E., R.D., Capt. R.N.R.	D. Kerrick, A. Peers-Jones, C. J. Willis	H. Oliver	Union Castle Mail S.S. Co., Ltd.	8.1.49
Rakaia	..	J. S. Oxmond	J. Sladen, B. Crust, F. Christall	P. Holmes	New Zealand Shipping Co., Ltd.	3.1.49
Ranchi	..	R. E. T. Tunbridge, D.S.C., R.D., A.D.C.	E. R. Rose, J. Clayton, C. E. Waller	R. V. Gregory	P. & O. Steam Nav. Co., Ltd.	18.1.49
Rangitiki	..	E. Holland, C.B.E.	G. C. Simpson, R. E. Baker, J. E. Crewdson	S. Peeling	New Zealand Shipping Co., Ltd.	18.1.49
Recorder	..	R. F. Longster	H. M. Jones, P. B. Dilleigh	J. Clarke	Charante S.S. Co., Ltd.	8.1.49
Red Charger	..	R. Nash	C. Noble	R. Green	Iago Steam Trawler Co., Ltd.	
Red Crusader	..	B. Rogerson	G. R. Arthur, F. S. Farrar, A. L. Melmes	R. W. Jones	Iago Steam Trawler Co., Ltd.	28.10.48
Red Knight	..	E. Littler	E. Plesance, C. H. Phillips, D. Meardon	J. Moffat	Iago Steam Trawler Co., Ltd.	18.10.48
Red Lancer	..	M. Wright	D. M. Muir, F. L. James, G. R. Watts		Pacific Steam Nav. Co., Ltd.	1.11.48
Regent Hawk	..	J. Ward	K. P. Crompton, P. J. Elliott, A. S. Frier		Bolton S.S. Co., Ltd.	19.1.49
Regina Del Pacifico	..	G. Clixby	J. W. Lewin, W. Kilgour, W. Shaw		Blue Star Line, Ltd.	7.12.48
Rembrandt	..	W. A. Hearl	S. Sloan, K. D. William, L. Gellee		Union Castle Mail S.S. Co., Ltd.	13.10.48
Repton	..	D. Norrie	J. A. Scott	S. Godfrey	Purney Hill S.S. Co., Ltd.	6.12.48
Rhodesia Star	..	C. H. Watson	D. L. Willmott, J. M. Heeley, T. Wadie		Union Castle Mail S.S. Co., Ltd.	22.4.48
Richmond Castle	..	J. A. Sowden	H. Butler, D. Shaw, E. A. Prothero	E. R. Saunders		20.4.49
Richmond Hill	..	J. P. Allen	J. Rattray, I. J. Jones, --- Stoneman	S. Marchant	Houlder Line, Ltd.	22.4.48
Riebeck Castle	..	M. S. Hodson	H. Wilcock	R. Munro	Anglo-American Oil Co., Ltd.	10.11.48
Rimutaka	..	F. B. Clarke, M.V.O., D.S.C., O.B.E.	F. Rossouw, N. E. Upham	H. E. Robinson	Great Northern Fishing Co., Ltd.	
Ripplingham Grange	..	R. Owen	H. N. Dryden, D.S.C., R. Fancourt, R. J. King		Andros Shipping Co., Ltd.	7.3.49
Robert F. Hand	..	E. J. Instone, O.B.E.	T. G. Hughes, M. Rideout, M. Drummond		Union Castle Mail S.S. Co., Ltd.	
Robert Hewett	..	G. Elliott	J. A. Williamson		Union Castle Mail S.S. Co., Ltd.	
Rockside	..	H. L. Holland	A. Mathison, J. T. Hibbert	J. Macfarlane	Currie Line, Ltd.	8.1.47
Roslin Castle	..	J. M. Rayner, R.D., Cdr., R.N.R.	H. Edwards, C. W. Fox, J. Ryley	H. Holdridge	Bolton S.S. Co., Ltd.	18.3.49
Roxburgh Castle	..	G. Aldridge	D. L. Verity	W. Parratt	T. Hamling & Co., Ltd.	
Royal Star	..	E. J. Griffiths	H. Tock, W. R. Vickers, H. Harrison,	D. L. Verity	St. Andrews Steam Fishing Co., Ltd.	10.12.47
Rubystone	..	W. Thom	J. A. Woolner	W. Flood	South American Saint Line, Ltd.	3.1.49
Rutland	..	D. E. Norrie	P. C. Spink	G. Schofield	T. Hamling & Co., Ltd.	4.5.48
Ruydael	..	J. Robinson, M.B.E.	L. Abbey, E. E. White	J. Wilson	Firth Steam Trawling Co., Ltd.	6.1.49
Sacramento	..	J. H. Ellis	G. M. Clark, R. S. Macaulay, I. MacGregor	W. A. Steele	Donaldson Line, Ltd.	4.1.49
St. Apollo	..	A. E. Hall	R. B. Bryant, W. P. Duguid, J. N. Owen	J. Slater	Pacific Steam Nav. Co.	16.7.48
St. Crispin	..	F. Menlight	P. D. O'Driscoll, J. Peters, A. Hudson	H. M. O'Gorman	Pacific Steam Nav. Co.	18.1.49
St. Merriel	..		A. Powell, R. Scaiff, W. A. Johnston		Pacific Steam Nav. Co.	28.10.48
St. Nectan	..					
St. Zeno	..					
Salacia	..					
Salamanca	..					
Salaverry	..					
Salinas	..					

NAME OF VESSEL	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS	LAST RETURN RECEIVED
<i>Salmonier</i> ..	J. D. Wilson ..	J. Brown, J. T. Fyffe, E. H. Booth ..	H. Mackay ..	W. Thomson & Co. ..	16.12.48
<i>Saluta</i> ..	S. Begg ..	D. I. Jones, W. B. Holmes, G. D. Jeffrey ..	A. Hatfield ..	South Georgia Co., Ltd. ..	21.6.48
<i>Samanco</i> ..	A. Lyall ..	Lidgey, Jones, Clark ..	E. P. Bishop ..	Pacific Steam Nav. Co. ..	20.4.49
<i>Samaria</i> ..	J. A. Myles, R.D., Cdr., R.N.R. ..	T. Magee, R. Wilkinson, G. Davies ..	S. G. Whiteford ..	Cunard White Star, Ltd. ..	3.1.49
<i>San Adolfo</i> ..	F. R. H. Atkinson ..	R. B. Wright, R. G. Scarey, D. A. Ward ..	D. W. Powell ..	Eagle Oil & Shipping Co., Ltd. ..	4.3.49
<i>San Cirilo</i> ..	M. A. Connell, M.B.E. ..	R. B. McKenzie, G. G. B. Putt, B. S. Orange ..	W. L. Radcliffe ..	Eagle Oil & Shipping Co., Ltd. ..	28.3.49
<i>San Felix</i> ..	J. B. Macaulay, O.B.E. ..	J. Munday, W. D. Hepworth, R. B. Taylor ..	S. H. Wilson ..	Eagle Oil & Shipping Co., Ltd. ..	20.10.48
<i>San Velino</i> ..	H. C. Archer, O.B.E. ..	R. Auric, J. J. Greener, R. Purvis ..	T. A. Henderson ..	Eagle Oil & Shipping Co., Ltd. ..	20.4.49
<i>San Veronica</i> ..	R. M. Atkinson ..	W. F. Hunt, T. O. Davies, P. Johnson ..	E. J. Reynolds ..	Eagle Oil & Shipping Co., Ltd. ..	28.10.48
<i>San Vulfrano</i> ..	J. Thomson, O.B.E. ..	J. Norman, W. J. Campbell ..	J. C. Tomlinson ..	Pacific Steam Nav. Co. ..	11.2.49
<i>Santander</i> ..	T. I. Naylor ..	T. Hiatt, F. Nuttall, T. A. Ireland ..	N. Roberts ..	Pacific Steam Nav. Co. ..	4.1.49
<i>Santiago</i> ..	G. H. Rice ..	H. Tompsett, D. A. Van der Merwe, L. W. Evans ..	J. C. Kane ..	Frederick Leyland & Co., Ltd. ..	5.3.49
<i>Saxon Star</i> ..	J. D. W. Davies ..	D. T. English, R. E. Harvey, J. M. Doran ..	J. C. Kane ..	Charente S.S. Co., Ltd. ..	4.1.49
<i>Scholar</i> ..	D. Wolstenholme ..	D. R. Rosling, A. R. Graham, D. G. Dalziel ..	B. Netscher ..	Charente S.S. Co., Ltd. ..	11.2.49
<i>Scythia</i> ..	W. M. Stewart, O.B.E. ..	W. G. McGuiness, V. F. Harrison, R. J. Turnbull ..	W. Blanchard ..	Cunard White Star, Ltd. ..	5.1.49
<i>Selector</i> ..	W. H. Slaughter ..	W. Baker, H. P. Roberts, G. Rose ..	J. Macdonald ..	Charente S.S. Co., Ltd. ..	18.3.49
<i>Setiler</i> ..	R. F. Phillips ..	J. H. Tomlinson, M. Rawson Duke, D. E. N. Stone, J. F. Robertson, G. K. Harrison ..	A. Smith ..	Charente S.S. Co., Ltd. ..	18.3.49
<i>Silverbriar</i> ..	T. S. Morgan ..	Paget Clarke ..	T. Coughlan ..	Silver Line, Ltd. ..	20.4.49
<i>Silbercedar</i> ..	J. Thompson ..	N. W. Rothwell, D. M. Lamont, N. C. Jones ..	J. Whyman ..	Silver Line, Ltd. ..	26.1.49
<i>Silberguava</i> ..	W. G. Cole ..	F. E. Godley, K. A. Wise, P. R. Miller ..	R. Burrow ..	Silver Line, Ltd. ..	10.11.48
<i>Sileroak</i> ..	W. N. Tulloch ..	G. Armitage, A. R. Moore, M. Beaumont ..	D. Will ..	Silver Line, Ltd. ..	8.9.48
<i>Silverplane</i> ..	H. Woodrow ..	J. M. Evans, W. Cole, H. Rose, M. Bingham ..	A. B. King ..	Silver Line, Ltd. ..	14.9.48
<i>Silversandal</i> ..	J. H. Leask ..	W. J. Ross, J. B. de Wet, F. A. Ferguson ..	J. Thomas ..	Silver Line, Ltd. ..	4.4.49
<i>Silvertank</i> ..	E. Palmer ..	S. Webb, D. R. Crocker, J. Jameson ..	J. Hands ..	Silver Line, Ltd. ..	28.3.49
<i>Silverwalnut</i> ..	E. L. Tilmouth ..	F. W. M. Pearce, E. Owen, E. Snowden, P. W. F. Holmes ..	A. D. Carter ..	Rowlands & Marwoods S.S. Co., Ltd. ..	6.8.48
<i>Sneaton</i> ..	W. Armstrong ..	D. Davies, W. Martin, A. Robinson ..	H. Camp ..	P. & O. Steam Nav. Co. ..	23.8.48
<i>Socotra</i> ..	C. F. Halliday ..	D. Falconer, D. Moar, G. Reid ..	L. Whittington ..	Federal Steam Nav. Co., Ltd. ..	5.1.49
<i>Somerset</i> ..	P. S. Calcutt ..	W. Scott, A. W. Aitken, E. G. Sutton ..	G. Ballantine ..	South Georgia Co., Ltd. ..	31.3.49
<i>Southern Collins</i> ..	D. Hunter ..	T. J. Morgan, J. T. Petrie ..	J. D. Todd ..	South Georgia Co., Ltd. ..	28.10.48
<i>Southern Garden</i> ..	W. J. Swanson ..	J. Miller, R. Jarrett, L. Ash ..	J. Sprout ..	Sevilla Whaling Co., Ltd. ..	8.6.48
<i>Southern Harvester</i> ..	K. Grande ..	R. J. Abbott ..	E. Hobson ..	Vacuum Oil Co., Ltd. ..	24.2.49
<i>Southern Venture</i> ..	H. Nilsen ..	J. Beam, A. F. Perry ..	J. Glover ..	Charente S.S. Co., Ltd. ..	10.11.48
<i>Sovac</i> ..	H. Anthony ..	J. Reid ..	A. Guy ..	Springwell Shipping Co. ..	18.1.49
<i>Speaker</i> ..	C. C. Heaton ..	P. A. Jones ..	T. W. Bearman ..	Stanhope S.S. Co., Ltd. ..	10.11.47
<i>Specialist</i> ..	L. F. Harriman ..	E. L. Davies, R. S. Drew, N. R. Brown ..	O. R. Wilcox ..	Stanhope S.S. Co., Ltd. ..	4.4.49
<i>Springford</i> ..	T. R. Mackie ..	R. Kerr, R. Hudson, M. Gray ..	J. M. Bannerman ..	Stanhope S.S. Co., Ltd. ..	12.7.48
<i>Stancourt</i> ..	F. H. Wainford ..	A. S. Palethorpe-May, G. A. Winter, A. Graham, W. A. Read ..	P. P. Williams ..	Union Castle Mail S.S. Co., Ltd. ..	23.2.49
<i>Stanhall</i> ..	H. V. Wightman ..	M. H. D'ath, R. L. Pigeon, J. Owen ..	J. Stott, R. S. Riddell ..	Scottish Shire Line, Ltd. ..	12.8.48
<i>Stanhope</i> ..	R. G. Roberts ..	H. Toon, D. G. Daniel, B. S. Mordaunt ..	F. E. Ash ..	P. & O. Steam Nav. Co. ..	10.11.48
<i>Stirling Castle</i> ..	W. A. Pace, O.B.E. ..	J. Laidlow, N. A. Dennis, D. Nicholson ..	H. S. Horn ..	P. & O. Steam Nav. Co. ..	19.1.48
<i>Stirlingshire</i> ..	J. McCrone ..		J. Turnham ..	Federal Steam Nav. Co., Ltd. ..	20.4.49
<i>Strathaird</i> ..	H. S. Allen, R.D., R.N.R. ..				
<i>Stratheden</i> ..	S. W. S. Dickson ..				
<i>Suffolk</i> ..	F. Pover ..				

<i>Suncrest</i> ..	T. G. Barwell ..	T. L. Ison, J. E. Collins, P. Tate ..	J. McMahon ..	Junecrest Shipping Co., Ltd. ..	6.2.48
<i>Sutherland</i> ..	R. W. Nicolson ..	R. Thwaites, A. L. Clemmit, H. Juela-Day ..	I. R. Lloyd ..	B. & J. Sutherland & Co., Ltd. ..	3.3.49
<i>Swaenby</i> ..	J. McClure ..	C. Dick, D. Hogben, J. Walker ..	D. Ford ..	Currie Line, Ltd. ..	31.3.48
<i>Sydney Star</i> ..	J. E. Roddam ..	K. Jackson, A. C. Bolton, W. M. Fallon ..	D. Hoyle ..	Ropner Shipping Co., Ltd. ..	24.2.49
<i>Tactician</i> ..	T. F. McDonald, O.B.E. ..	J. C. Davis, A. Smith, E. Mackintosh ..	W. Williams ..	Frederick Leyland & Co., Ltd. ..	18.1.49
<i>Talca</i> ..	A. Robertson ..	G. F. Penston, H. Cowley, J. G. Jones ..	N. Brewer ..	Charente S.S. Co., Ltd. ..	6.8.48
<i>Tamaroa</i> ..	A. G. Litherland ..	D. I. Jones, J. Butterworth, W. R. Holmes ..	D. MacRae ..	Pacific Steam Nav. Co. ..	6.8.48
<i>Tamela</i> ..	H. J. Cox ..	P. Oliver, F. Packman, A. H. Baber ..	F. Broomfield ..	Shaw, Savill & Albion Co., Ltd. ..	11.1.49
<i>Tarkwa</i> ..	W. Munt ..	P. J. Finan, D. Thompson, A. Langer ..	G. Gilling ..	Elder Dempster Lines, Ltd. ..	14.5.47
<i>Tasso</i> ..	G. D. Simpson ..	R. Munro, G. Moore, A. Bird ..	J. Williamson ..	Elder Dempster Lines, Ltd. ..	6.1.49
<i>Telemachus</i> ..	H. Scarborough ..	D. J. C. Martin, R. Cudbertson, R. Whittleton ..	J. Campbell Wilson ..	Ocean S.S. Co., Ltd. ..	11.2.49
<i>Teuioi</i> ..	G. Brown, M.B.E. ..	A. G. Reed, P. D. F. Cruickshank, E. Brown ..	L. W. Bell ..	Royal Mail Lines, Ltd. ..	6.12.48
<i>Thamesfield</i> ..	H. E. Sang ..	T. A. Buckney, R. J. Kistler, G. F. I. Jamieson ..	T. Carter ..	Northern Petroleum Tank S.S. Co., Ltd. ..	16.12.48
<i>Tinto</i> ..	R. Cunningham ..	J. P. Ross, R. L. Newcombe, P. B. Goldie ..	W. F. Sykes ..	New Zealand Shipping Co., Ltd. ..	10.11.48
<i>Tongariro</i> ..	S. H. Bennett, M.B.E. ..	A. Ledger ..	G. Penkeith ..	Ulster S.S. Co., Ltd. ..	17.3.48
<i>Torr Head</i> ..	— Chadwick ..	E. W. Clubb, D. L. Parkin, S. W. Lambrick ..	L. B. Priestley ..	Tower S.S. Co., Ltd. ..	21.3.49
<i>Tower Grange</i> ..	M. Kennedy ..	D. Gault, A. J. Farrel, W. Greig ..	P. J. Walsh ..	Hain S.S. Co., Ltd. ..	12.2.49
<i>Trestilian</i> ..	G. Robson ..	J. Milne, P. Westcote, R. B. Dawson ..	R. Stewart ..	Hain S.S. Co., Ltd. ..	20.4.49
<i>Trevaylor</i> ..	W. Venables ..	W. Phillips, J. F. Males, E. L. Cussons ..	J. T. W. Nixon ..	Charente S.S. Co., Ltd. ..	10.11.48
<i>Tribeman</i> ..	M. S. Sadler ..	B. Oliver, H. Nicholls, D. R. Jenkins ..	W. G. Fitzgerald ..	Royal Mail Lines, Ltd. ..	31.8.48
<i>Tweed</i> ..	A. Smart ..	W. Lawton, J. S. Jones, J. Adams ..	J. H. Parkes ..	Britann S.S. Co., Ltd. ..	23.2.49
<i>Twitchingham</i> ..	D. R. Miller ..	— Meldrum, J. Chester, D. S. Guinness ..	S. Hewitt ..	Bullard, King & Co., Ltd. ..	25.5.48
<i>Untali</i> ..	W. D. Shields, O.B.E. ..	M. Blair, D. A. Forrester, J. C. Howell ..	A. H. Coxhead ..	Bullard, King & Co., Ltd. ..	12.2.49
<i>Umtata</i> ..	F. E. J. O'Hea ..	J. A. Bensley, F. Evans, D. G. Jupp, D. McNeill ..	I. S. Sprunt ..	Bullard, King & Co., Ltd. ..	11.3.49
<i>Umsinto</i> ..	J. W. Miles ..	B. J. McArel, H. K. Underwood, L. Farrer ..	W. T. Parkinson ..	Cunard White Star Line, Ltd. ..	13.12.47
<i>Valacia</i> ..	F. Harris ..	H. D. Nock, K. Carter, C. R. Dench ..	F. Berry ..	Cunard White Star, Ltd. ..	14.10.48
<i>Vancouver City</i> ..	W. L. P. Cox ..	N. Jones, J. D. Smythe, A. Hoyle ..	W. J. Peat ..	Cunard White Star, Ltd. ..	31.3.49
<i>Vardulia</i> ..	B. Carnafion ..	H. L. Evans, F. English, H. Bailey ..	D. S. Archibald ..	Henrikssen & Co., Ltd. ..	28.12.47
<i>Vasconia</i> ..	J. F. Drake, O.B.E., R.D., R.N.R. ..	J. M. Hughes, I. A. Stewart, A. Bull ..	F. Howell ..	British Transport Commission ..	22.4.48
<i>Vestra</i> ..	G. S. Evans ..	A. L. Davies, R. H. Arnott, A. R. W. Graham ..	G. Williams ..	Ellerman's Wilson Line, Ltd. ..	13.10.48
<i>Victrix</i> ..	D. S. Archibald ..	J. D. Mackenzie, I. Macalpine ..	T. P. Jones ..	Shaw, Savill & Albion Co., Ltd. ..	26.4.49
<i>Vienna</i> ..	E. Garnett ..	C. F. Lawrence ..	W. Charlton ..	Shaw, Savill & Albion Co., Ltd. ..	4.3.49
<i>Viofen Louise</i> ..	A. P. Sutton ..	I. A. Tully, R. Fergus, E. Atkinson ..	H. Jardine ..	Shaw, Savill & Albion Co., Ltd. ..	23.2.49
<i>Volo</i> ..	G. McLeod ..	R. E. Garisch ..	J. Downie ..	Union Castle Mail S.S. Co., Ltd. ..	22.7.48
<i>Waimana</i> ..	A. Morrill ..	T. Briggs, T. A. Firth, T. Johnson ..	W. Allen ..	British & Burnese Steam Nav. Co., Ltd. ..	28.1.48
<i>Waipawa</i> ..	L. J. Hopkins ..	J. W. Payne, A. S. Masters, K. C. Davis ..	T. Richardson ..	—	—
<i>Wairangi</i> ..	R. G. Ireland ..	A. E. Smith, W. A. Hutchinson, J. F. Scott, O. M. Thomas ..	— Shaw ..	—	—
<i>Watara</i> ..	W. G. West ..	D. Hasson, G. Ladge, C. Brodie ..	—	—	—
<i>Watwick Castle</i> ..	B. Forkes-Moffatt ..	E. Smith, J. H. Moore, B. Hammond ..	—	—	—
<i>Winkleigh</i> ..	I. Travner ..	A. M. McLean, B. W. Mitton, R. D. Lofts ..	—	—	—
<i>Yoma</i> ..	T. D. Jones ..	J. Morgan, D. Wilson, J. Kinniborough ..	—	—	—
<i>Zent</i> ..	A. Rowlands ..	A. Bruce ..	—	—	—
<i>Comney, H.M.S.</i> ..	C. R. Hodder ..	—	—	—	—
<i>Pangbourne Nautical College</i> ..	T. M. Goddard, Capt., R.N.R. ..	The Senior Cadets ..	—	—	—
<i>Worcester, H.M.S.</i> ..	H. C. Skinner, O.B.E., Cdr., R.N. ..	The Senior Cadets ..	—	—	—
	G. C. Steele, V.C., Capt., R.N.R. ..	The Senior Cadets ..	—	—	—

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 VESSEL	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS
Anhui	F. H. Hirstad	K. MacLeod, H. M. Stanfield, P. H. Ward	A. Reitan	China Navigation Co., Ltd.
Bris	S. Eidjord	S. Midthassel, A. Reitan, A. Rosselund	..	China Siam Line
Caroline Moller	I. Adam	H. Lamont, D. Conway, U. M. Martin	..	Mollers' (H.K.), Ltd.
Chak Sang	G. W. F. Edwards	F. H. Main, B. D. Johnson, D. Dekker	Im Ki	Indo China Steam Nav. Co.
Choy Sang	L. W. Harrison	J. E. Williams, D. Knight, L. Manser	Chow Tang Wa	Indo China Steam Nav. Co.
Eastern Saga	H. J. Cairns	D. G. R. Kinnear, G. Parish, B. D. Hootson	G. MacDonald	Indo China Steam Nav. Co.
E. Sang	J. Shiell	L. C. Cox, W. J. Bartlett, D. R. McFadzien	Ma Ping Leung	Indo China Steam Nav. Co.
Fengtien	J. McKinlay	C. N. Stewart, V. Walker, C. L. Phillips	..	China Navigation Co., Ltd.
Foochow	E. G. Thomas	A. Watson, L. Walker, G. S. Ireland	Y. S. King	China Navigation Co., Ltd.
Fuh Hsing	M. H. Wallace	V. L. Sargent, C. M. Tso, L. C. Teng	..	Chinese Maritime Customs
Fukien	J. McMillan	J. F. Follett, G. D. O. Rennie, A. Roddis	..	China Navigation Co., Ltd.
Greytoke Castle	S. W. Millwright	W. Stubbs	..	Mollers Castle Line
Hai Lung	M. M. Stewart	P. S. Yee, M. S. Wang	K. S. Wang	Chinese Maritime Customs
Hai Lee	I. L. A. Nilsen	O. Olsen, D. H. Nilsen, J. Mikkelsen	T. Y. Chan	China Siam Line
Hai Yang	W. G. Erwin	J. R. Simpson, H. L. Jeff	Young Shan	Douglas S.S. Co.
Hang Sang	G. Owens	M. I. Groundwater, F. H. Smith, L. I. Ousianidoff	..	Indo China Steam Nav. Co.
Harvard	D. McG. Holmes	L. King, S. H. Liu, P. W. Graham	..	China Navigation Co., Ltd.
Heinrich Jesen	R. Nielsen	C. S. Jensen	C. S. Jensen	China Navigation Co., Ltd.
Hermelin	S. B. Eliassen	G. Karlson, T. Pedersen, K. Andersen	T. Pedersen	China Siam Line
Hinsang	C. R. Harris	J. F. Fotheringham, J. R. G. Findlay, A. Nelson	D. J. Doonan	Indo China Steam Nav. Co.
Hiram	Stange Olsen	T. Torkildsen, J. Jacobsen	K. T. Chan	China Siam Line
Hong Sang	R. E. Agar	R. Goss, J. Barrett, H. B. Vance	E. A. West	Ho Hong S.S. Co.
Hunan	L. V. Rowe	V. R. Woolfe, P. Flory, J. C. Cristal	..	China Navigation Co., Ltd.
Hung Hing	P. L. W. Leguit	R. Apperley-Jones, T. S. Yip, S. C. Wu	S. C. Wang	Chinese Maritime Customs
Hupoh	D. Needham	R. G. W. Gorman, E. W. Woodcock, A. P. Sokoloff	..	China Navigation Co., Ltd.
Kueiyang	I. Taylor	R. F. Malcolmson, C. Beasley, E. Johansen	S. F. Yu	Chinese Maritime Customs
Kut Sang	D. G. Burleigh	L. Moore, T. M. J. Davies, G. Young	..	China Navigation Co., Ltd.
Loh Sang	W. T. Rochester	R. I. Groundwater, E. P. Ladbroke, F. J. R. Jones	T. Crockett	Indo China Steam Nav. Co.
Mau Sang	R. G. Gillespie	R. B. Todd, C. A. S. Bates, J. McK. Marshall	Z. A. Faure	Indo China Steam Nav. Co.
Manchester Castle	A. G. Gorham	J. H. Thomas, R. C. Traill, P. Beck	Y. Lok	Indo China Steam Nav. Co.
Nanchang	W. E. Awcock	W. A. Findley, L. L. Watson, P. Portis, C. Jenkins	..	Mollers Castle Line
Neuchang	I. T. M. Ramsay	B. L. Miller, G. J. Cunderson, J. R. Keddie	..	China Navigation Co., Ltd.
Ninghai	D. C. Cameron	J. W. E. Warrior, E. T. Griffiths, W. Pollock	..	China Navigation Co., Ltd.
Pakhoi	O. Fox	W. Davidson, D. P. Manthorpe, P. Bulatoff	..	China Navigation Co., Ltd.
Poyang	A. Taylor	J. Bunney, H. C. Quick, E. J. Bower	..	China Navigation Co., Ltd.
Sangala	R. H. A. Bond, O.B.E.	C. A. N. Baker, J. Hunter, C. B. Skinner	..	China Navigation Co., Ltd.
Shansi	I. Beck	G. A. Brignall, D. Hargreaves, D. Raine, W. G. White, Cadet J. Ritchie	J. E. Martlieu	British India S.N. Co.
Shanghai	D. Brothie	E. Bruce, J. F. O'Dowd, A. Harper, I. J. McMeekin	..	China Navigation Co., Ltd.
Shirala	G. F. Parker	D. W. R. Gash, W. D. Leighton, N. D. B. Sweeney	..	China Navigation Co., Ltd.
Sinkiang	D. D. Richards	S. Hutton, N. D. Edwards, I. D. McGowan, Cadet N. A. Booker, Cadet W. P. Jones	J. W. Hunter	British India S.N. Co.
		F. Kelly, G. A. Rankin, R. M. Cooper	..	China Navigation Co., Ltd.

<i>Sirdhana</i> ..	H. E. Evans ..	D. M. Reid, G. Usher, J. D. Campbell, Cadet A. B. Weller ..	R. O. Smith ..	British India S.N. Co.
<i>Soochow</i> ..	F. Booth ..	S. Duff, P. T. Yeandle, J. E. Temperley ..	P. Lamb ..	Australian Oriental Line
<i>Stannac 312</i> ..	L. A. Stirling ..	G. Lithgo, A. Meddler ..	..	Standard-Vacuum Oil Co.
<i>Szechuen</i> ..	J. Wilson ..	A. J. Keddie, W. J. Coburn, A. V. Harrison ..	L. Lynch ..	China Navigation Co., Ltd.
<i>Tak Sang</i> ..	E. J. Thomson ..	T. J. Ashcroft, K. P. Wilkinson, P. D. Coles ..	P. K. Ma ..	Indo China Steam Nav. Co.
<i>Tai Chung Shan</i> ..	A. H. Bathurst ..	A. E. Lovegreen, K. Leung, K. K. Li ..	..	Shun Cheong S.N. Co.
<i>Tai Ping</i> ..	J. I. Young ..	J. W. Hurst, S. C. Chan ..	S. L. Pong ..	United Corpn. of China, Ltd.
<i>Tai Po Shan</i> ..	R. Durup ..	E. C. M. Treatrail, L. Ku, S. F. Wang ..	T. M. Cheng ..	Shun Cheong S.N. Co.
<i>Teh Hing</i> ..	C. J. van Es ..	F. Hindle, W. Layfield, A. V. Boutakoi ..	..	Chinese Maritime Customs
<i>Tsinan</i> ..	J. G. Smart ..	R. G. G. Stanton, P. Davison, E. Jones ..	F. G. Hayes ..	China Navigation Co., Ltd.
<i>Wing Sang</i> ..	N. H. King ..	T. C. W. Marr, S. A. Sheridan ..	G. Kneath ..	Indo China Steam Nav. Co.
<i>Wo Sang</i> ..	W. B. B. Paul ..	W. E. Hargreave, R. Tasker, T. R. Young ..	..	Indo China Steam Nav. Co.
<i>Yochow</i> ..	R. O. McKenzie ..	D. Rees, D. T. Le, K. K. Chu ..	S. F. Lai ..	China Navigation Co., Ltd.
<i>Yung Hing</i> ..	..	J. W. Evans, S. J. Yeandle, D. J. Mander ..	..	Chinese Maritime Customs
<i>Yunnan</i> ..	A. Naismith ..	..	..	China Navigation Co., Ltd.

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	CAPTAIN	OBSERVER	RADIO OFFICER	OWNERS
<i>Huia</i> ..	A. J. Matheson ..	..	..	Nobel (Australasia) Proprietary Ltd.
<i>Kaikorai</i> ..	G. S. Beaton ..	B. R. Druce ..	G. M. Gormlie ..	Union S.S. Co. of New Zealand, Ltd.
<i>Kairanga</i> ..	T. S. McNicol ..	A. Mackay ..	B. G. Hart ..	Union S.S. Co. of New Zealand, Ltd.
<i>Karetu</i> ..	W. E. Jones ..	E. W. Robb ..	L. M. Harvey ..	Union S.S. Co. of New Zealand, Ltd.
<i>Karitane</i> ..	G. Evans ..	D. H. Turnbull ..	A. E. Whalley ..	Union S.S. Co. of New Zealand, Ltd.
<i>Kauri</i> ..	A. T. Adam ..	J. C. Young ..	G. M. Throp ..	Union S.S. Co. of New Zealand, Ltd.
<i>Komata</i> ..	F. Chapman ..	E. Clark ..	..	Union S.S. Co. of New Zealand, Ltd.
<i>Kopua</i> ..	A. F. Inman ..	B. E. Avery ..	W. A. Hawkins ..	Union S.S. Co. of New Zealand, Ltd.
<i>Kuroa</i> ..	J. Holm ..	E. R. Warner ..	..	Capt. J. Holm and crew.
<i>Maruha</i> ..	A. R. Russel ..	G. H. Edwards ..	E. H. Ward ..	Union S.S. Co. of New Zealand, Ltd.
<i>Matua</i> ..	L. C. Boulton ..	J. Hare ..	W. A. Taylor ..	Government of New Zealand (Pacific Islands Admin.)
<i>Maui Pomare</i> ..	H. S. Collier ..	E. Anderson ..	A. J. Stanton ..	Government of New Zealand.
<i>Pamir</i> ..	J. Keith ..	..	..	A. F. Watchlin.
<i>Port Waikato</i> ..	N. Worth ..	..	..	Public Works Department.
<i>Ramui</i> ..	W. Grey ..	K. Mitchell ..	J. G. Rea ..	Union S.S. Co. of New Zealand, Ltd.
<i>Wakine</i> ..	C. Burgess ..	D. S. Brayshaw ..	S. J. Waters ..	Union S.S. Co. of New Zealand, Ltd.
<i>Waipori</i> ..	F. W. Gibson ..	J. K. West ..	C. V. Hayes ..	Union S.S. Co. of New Zealand, Ltd.
<i>Waitaki</i> ..	W. Whitfield ..	J. W. Keyworth ..	E. L. Hulme ..	Union S.S. Co. of New Zealand, Ltd.
<i>Waitamata</i> ..	..	..	..	Tasman S.S. Co.
<i>Whakara</i> ..	F. A. Barrett ..	..	..	..

FLEET LIST (India)

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

NAME OF VESSEL	OWNERS OR AGENTS
<i>Akbar</i>	Mogul Line, Ltd.
<i>Alavi</i>	Mogul Line, Ltd.
<i>Aurora Amra</i>	British India Steam Navigation Co., Ltd.
<i>Aronda</i>	British India Steam Navigation Co., Ltd.
<i>Badarpur</i>	Burma Oil Co.
<i>Bamora</i>	British India Steam Navigation Co., Ltd.
<i>Bandra</i>	British India Steam Navigation Co., Ltd.
<i>Barala</i>	British India Steam Navigation Co., Ltd.
<i>Barjora</i>	British India Steam Navigation Co., Ltd.
<i>Barpeta</i>	British India Steam Navigation Co., Ltd.
<i>Begum</i>	Asiatic Steam Navigation Co., Ltd.
<i>Benfield</i>	British India Steam Navigation Co., Ltd.
<i>Canara</i>	British India Steam Navigation Co., Ltd.
<i>Chanda</i>	British India Steam Navigation Co., Ltd.
<i>Dara</i>	British India Steam Navigation Co., Ltd.
<i>Dumra</i>	British India Steam Navigation Co., Ltd.
<i>Dwarka</i>	British India Steam Navigation Co., Ltd.
<i>Egra</i>	British India Steam Navigation Co., Ltd.
<i>Englestan</i>	Bengal Burma Steam Navigation Co., Ltd.
<i>Ethiopia</i>	British India Steam Navigation Co., Ltd.
<i>Havildar</i>	Asiatic Steam Navigation Co., Ltd.
<i>Ikauna</i>	British India Steam Navigation Co., Ltd.
<i>Islami</i>	Mogul Line, Ltd.
<i>Itaura</i>	British India Steam Navigation Co., Ltd.
<i>Itria</i>	British India Steam Navigation Co., Ltd.
<i>Jaladurga</i>	Scindia Steam Navigation Co., Ltd.
<i>Jaladuta</i>	Scindia Steam Navigation Co., Ltd.
<i>Jalaganga</i>	Scindia Steam Navigation Co., Ltd.
<i>Jalagopal</i>	Scindia Steam Navigation Co., Ltd.
<i>Jalajyoti</i>	Scindia Steam Navigation Co., Ltd.
<i>Jalakrishna</i>	Scindia Steam Navigation Co., Ltd.
<i>Jalamani</i>	Scindia Steam Navigation Co., Ltd.
<i>Jalamohan</i>	Scindia Steam Navigation Co., Ltd.
<i>Jalarakshini</i>	Scindia Steam Navigation Co., Ltd.
<i>Jalaratna</i>	Scindia Steam Navigation Co., Ltd.
<i>Jalaveera</i>	Scindia Steam Navigation Co., Ltd.
<i>Jalavihar</i>	Scindia Steam Navigation Co., Ltd.
<i>Jalavijaya</i>	Scindia Steam Navigation Co., Ltd.
<i>Jalayamuna</i>	Scindia Steam Navigation Co., Ltd.
<i>Jehangir</i>	Mogul Line, Ltd.
<i>Kampala</i>	British India Steam Navigation Co., Ltd.
<i>Karanja</i>	British India Steam Navigation Co., Ltd.
<i>Karapara</i>	British India Steam Navigation Co., Ltd.
<i>Khandalla</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>Makika</i>	Asiatic Steam Navigation Co., Ltd.
<i>Masimpur</i>	Burma Oil Co. (Tankers), Ltd.
<i>Nadir</i>	Asiatic Steam Navigation Co., Ltd.
<i>Nawab</i>	Asiatic Steam Navigation Co., Ltd.
<i>Nizam</i>	Asiatic Steam Navigation Co., Ltd.
<i>Nurani</i>	Asiatic Steam Navigation Co., Ltd.
<i>Nurjehan</i>	Asiatic Steam Navigation Co., Ltd.
<i>Palamcotta</i>	British India Steam Navigation Co., Ltd.
<i>Palikonda</i>	British India Steam Navigation Co., Ltd.
<i>Pasha</i>	Asiatic Steam Navigation Co., Ltd.
<i>Pundit</i>	Asiatic Steam Navigation Co., Ltd.
<i>Querimba</i>	British India Steam Navigation Co., Ltd.
<i>Rajput</i>	Asiatic Steam Navigation Co., Ltd.
<i>Rajula</i>	British India Steam Navigation Co., Ltd.
<i>Risaldar</i>	Asiatic Steam Navigation Co., Ltd.
<i>Risrani</i>	Mogul Line, Ltd.
<i>Shahjehan</i>	Asiatic Steam Navigation Co., Ltd.
<i>Shahzada</i>	Asiatic Steam Navigation Co., Ltd.
<i>Shirala</i>	British India Steam Navigation Co., Ltd.
<i>Singu</i>	Burma Oil Co. (Tankers), Ltd.
<i>Sirsa</i>	British India Steam Navigation Co., Ltd.
<i>Tairea</i>	British India Steam Navigation Co., Ltd.
<i>Varela</i>	British India Steam Navigation Co., Ltd.
<i>Varsova</i>	British India Steam Navigation Co., Ltd.
<i>Vasna</i>	British India Steam Navigation Co., Ltd.
<i>Yenangyaung</i>	Burma Oil Co. (Tankers), Ltd.

MARID SHIPS

The following is a list of ships voluntarily observing and reporting sea temperatures from coastal waters of Great Britain.

Captains are requested to point out any errors or omissions in the list.

NAME OF VESSEL	CAPTAIN	OWNERS
<i>Accrington</i>	R. Good	British Transport Commission.
<i>Actuality</i>	J. Lewis	F. T. Everard & Sons, Ltd.
<i>Allurity</i>	A. Fisher	F. T. Everard & Sons, Ltd.
<i>Antwerp</i>	R. V. Adams	British Transport Commission.
<i>Ariosto</i>	W. Hill	Ellerman's Wilson Line, Ltd.
<i>Atlantic Coast</i>	M. Fleming	Coast Lines, Ltd.
<i>Balttraffic</i>	F. Waldron	United Baltic Corporation, Ltd.
<i>Belhaven</i>	R. L. Irvine	London & Edinburgh Shipping Co., Ltd.
<i>Beltravock</i>	T. Wallace	London & Edinburgh Shipping Co., Ltd.
<i>Bury</i>	J. L. Davison	British Transport Commission.
<i>Cambria</i>	A. Marsh	British Transport Commission.
<i>Clupea</i>	I. Macrae	Scottish Home Department (Fishery Division).
<i>Coldharbour</i>	G. L. Hetherington	Coastwise Colliers, Ltd.
<i>Coldridge</i>	F. Granger	Coastwise Colliers, Ltd.
<i>Corfen</i>	E. Allen	Cory Colliers, Ltd.
<i>Corfleet</i>	R. J. Barrow	Concrete Maritime, Ltd.
<i>Corfoss</i>	H. Greiffenhagen, M.B.E.	Cory Colliers, Ltd.
<i>Cornmead</i>	T. Harle	Cory Colliers, Ltd.
<i>Cormist</i>	H. H. Horley	Cory Colliers, Ltd.
<i>Cormoat</i>	R. B. Armstrong	Cory Colliers, Ltd.
<i>Corncrake</i>	W. Aplin	General Steam Nav. Co., Ltd.
<i>Crane</i>	J. S. Lickis	General Steam Nav. Co., Ltd.
<i>Denbigh Coast</i>	O. A. Drake	Coast Lines, Ltd.
<i>Drake</i>	K. Carmalt	General Steam Nav. Co., Ltd.
<i>Duke of Argyll</i>	F. Ardern, D.S.C.	British Transport Commission.
<i>Duke of Lancaster</i>	J. Irwin, R.D., Cdr. R.N.R.	British Transport Commission.
<i>Duke of Rothesay</i>	A. E. Willmott, D.S.C., R.D., Cdr. R.N.R.	British Transport Commission.
<i>Duke of York</i>	M. Arden	British Transport Commission.
<i>Eastern Coast</i>	R. E. Holt	Coast Lines, Ltd.
<i>Eildon</i>	W. Jeffrey	G. Gibson & Co., Ltd.
<i>Empire Cedric</i>	W. N. Johnson	F. Bustard & Sons, Ltd. (Managers).
<i>Empire Doric</i>	H. T. Green	F. Bustard & Sons, Ltd. (Managers).
<i>Explorer</i>	D. C. Sandison	Scottish Home Department (Fishery Division).
<i>Falcon</i>	S. W. Develin	General Steam Nav. Co., Ltd.
<i>Foreland</i>	W. A. Hill	Currie Line, Ltd.
<i>Golden Dawn</i>	A. Adamson, M.B.E., Lieut. R.N.R.	The Captain.
<i>Goldfinch</i>	W. Lockhart	General Steam Nav. Co., Ltd.
<i>Granta</i>	D. A. Hunter	Granta S.S. Co., Ltd.
<i>Grebe</i>	E. C. Painter, D.S.C.	General Steam Nav. Co., Ltd.
<i>Guernsey Coast</i>	H. G. Keilit	British Channel Islands Shipping Co., Ltd.
<i>Harrogate</i>	C. H. Tully	Wilsons & N.E. Railway Shipping Co., Ltd.
<i>Hebridean Coast</i>	T. Stewart	Aberdeen Steam Nav. Co.
<i>Hibernia</i>	W. H. Hughes, D.S.C.	British Transport Commission.
<i>Highwood</i>	J. Coupland	High Hook Shipping Co., Ltd.
<i>Hindlea</i>	A. G. Holder	Walliker & Hindmarsh.
<i>Isle of Guernsey</i>	F. Front	British Transport Commission.
<i>Isle of Jersey</i>	A. L. Light	British Transport Commission.
<i>Isle of Sark</i>	C. E. Durlley	British Transport Commission.
<i>Lairdsburn</i>	J. McColl	Burns & Laird Lines, Ltd.
<i>Lairdwood</i>	I. McGuggan	Burns & Laird Lines, Ltd.
<i>Lapwing</i>	K. R. Nichols	General Steam Nav. Co., Ltd.
<i>London Merchant</i>	C. A. Piper	London Scottish Lines, Ltd.
<i>Melrose Abbey</i>	J. Laverack	Hull & Netherlands S.S. Co., Ltd.
<i>Minna</i>	T. Mather	Scottish Home Department (Fishery Division).
<i>Ocean Coast</i>	G. Mearns	Coast Lines, Ltd.
<i>Otterhound</i>	A. M. Kennedy	Coastal Tankers, Ltd.
<i>Persian Coast</i>	T. Taylor	Tyne-Tees S.S. Co., Ltd.
<i>Petrel</i>	G. C. Longfield, M.B.E.	General Steam Nav. Co., Ltd.
<i>Plover</i>	W. J. Tait	General Steam Nav. Co., Ltd.
<i>St. Andrew</i> .. .. .	.. .. .	British Transport Commission.
<i>St. Julien</i>	L. J. Richardson	British Transport Commission.
<i>Salerno</i>	F. Mason	Ellerman's Wilson Line, Ltd.
<i>Scotia</i>	E. A. Bruce	Scottish Home Department (Fishery Division).
<i>Scottish Co-operator</i>	T. Robertson	Scottish C.W.S., Ltd.
<i>Selby</i>	A. W. Johnson	Wilsons & N.E. Railway Shipping Co., Ltd.
<i>Slieve Bawn</i>	J. Hughes	British Transport Commission.
<i>Slieve Bearnagh</i>	J. Irwin	British Transport Commission.
<i>Slieve Bloom</i>	N. Lloyd-Williams	British Transport Commission.
<i>Slieve Donard</i>	W. Meade	British Transport Commission.
<i>Slieve League</i>	V. S. Phillips	British Transport Commission.
<i>Slieve More</i>	R. Woodhall	British Transport Commission.
<i>Southern Coast</i>	W. Quick	Coast Lines, Ltd.
<i>Wandle</i>	T. W. Corney, M.B.E.	Wandsworth & District Gas Co.
<i>Welsh Coast</i>	M. Fleming	Coast Lines, Ltd.

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
<i>Fort Amherst</i>	Furness, Withy & Co.
<i>Fort Townsend</i>	Furness, Withy & Co.
<i>Imperial Quebec</i>	Imperial Oil, Ltd. (Marine Department).
<i>Imperial Toronto</i>	Imperial Oil, Ltd. (Marine Department)
<i>Lady Nelson</i>	"Lady Nelson", Ltd. (Canadian National Steamships).
<i>Lady Rodney</i>	"Lady Rodney", Ltd. (Canadian National Steamships).
<i>Victoria County</i>	Acadia Overseas Freighters, 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.

LIGHT VESSELS

The following Light Vessels voluntarily observe and report from coastal waters of Great Britain.

NAME OF VESSEL	MASTER
<i>East Goodwin</i>	A. Giblin
<i>Humber</i>	
<i>Newarp</i>	
<i>Royal Sovereign</i>	
<i>Shipwash</i>	H. L. Neale

REPORTS OF PRESENT WEATHER

Shipmasters and fishermen requiring reports of actual weather conditions prevailing at specified places around the coasts of the British Isles may obtain them by telephone from any of the stations in the following lists.

Normally, requests should be made by telephone to nearby coastal meteorological stations. These are listed in *List A* and are stations making regular observations of weather.

If there is no meteorological station in the vicinity of the place from which weather information is required, reports may be obtained from the Naval Shore Signal stations listed in *List B* if appropriately situated.

The various types of stations are distinguished as follows :

Meteorological Office reporting stations	.. .. .	M.O.
Naval Meteorological Service reporting stations	.. .. .	N.M.S.
Royal Naval Shore Signal Stations	.. .. .	R.N.S.S.S.
Coastguard Stations	.. .. .	C.G.
Lighthouses	.. .. .	L.H.
Harbourmasters	.. .. .	H.M.

NAME OF STATION	TELEPHONE NO.	REMARKS
<i>List A</i>		
Scilly	Scillonia 51	C.G.
Lizard	St. Just 228	C.G.
Mount Batten (Plymouth)	Plymstock 2224	M.O.
Portland Bill	Portland 3195	C.G.
Calshot	Fawley 321	M.O.
St. Catherine's Point	Niton 223	R.N.S.S.S.
Thorney Island	Emsworth 380	M.O.
Beachy Head	Eastbourne 687	R.N.S.S.S.
Dungeness	Lydd 229	R.N.S.S.S.
Manston	Ramsgate 196 Ext. 24	M.O.
Shoeburyness	Shoeburyness 277 Ext. 27	M.O.
Felixstowe	Felixstowe 984 Ext. 13	M.O.
Gorleston	Great Yarmouth 2696	H.M.
Spurn Head	Spurn Point 216	R.N.S.S.S.
Flamborough Head	Flamborough 203	R.N.S.S.S.
Tynemouth	North Shields 593	C.G.
St. Abb's Head	Coldingham 27	R.N.S.S.S.
Donnibristle	Inverkeithing 46	N.M.S.
Arbroath	Arbroath 2201	N.M.S.
Rattray Head	Peterhead 186	C.G.
Banff	Banff 15	C.G.
Lossiemouth	Lossiemouth 2121	N.M.S.
Kinloss	Forreo 261	M.O.
Dalcross	Inverness 1820/1/2 Ext. 114	M.O.
Wick	Wick 320	C.G.
Lerwick	Lerwick 239	M.O.
Hatston	Kirkwall 421/3 Ext. 1 and 2	M.O.
Cape Wrath	Dorness 221	C.G.
Stornoway	Stornoway 13	M.O.
Rudh Re	via Gairloch Exchange	L.H.
Benbecula	Benbecula 203 Ext. 3	M.O.
Ardnamurchan	Hoahnich 200	L.H.
Tiree	Scarinish 41	M.O.
Port Ellen (Islay)	8 a.m.—8 p.m. Port Charlotte 213	
	8 p.m.—8 a.m. Port Charlotte 215	
Prestwick	Prestwick 7256	M.O.
Corsewall Point	Stranraer 542/3	L.H.
Port Patrick	Port Patrick 209	C.G.
Mull of Galloway	Drummore 11	L.H.
Wigtown	Wigtown 60	M.O.
Anthorn	Kirkbride 232	N.M.S.
Silloth	Carlisle 2021	M.O.
St. Bee's Head	St. Bees 27	L.H.
Point of Ayre	Kirkandreas 238	L.H.
Ronaldsaway	Castletown 2191 Ext. 8 and 10	M.O.
Squires Gate (Blackpool)	Blackpool (South Shore) 43061	M.O.
Valley	Holyhead 360	M.O.
Aberporth	Day, Cardigan 222	M.O.
	Night, Aberporth 205	
Pembroke (St. Anne's Head)	Pembroke Dock 200	R.N.S.S.S.
Hartland Point	Hartland 35	C.G.
<i>List B</i>		
Dover Pier	Dover 378	R.N.S.S.S.
Dunnett Head	Dunnett 202	R.N.S.S.S.
Needles	Freshwater 119	R.N.S.S.S.
Nells Point	Barry 16	R.N.S.S.S.
Prawle Point	Kingsbridge Trunk-sub. 6	R.N.S.S.S.
Southend	Marine 67690	R.N.S.S.S.

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 abroad are asked to kindly facilitate the despatch and delivery of postal matter, received at their offices from the Meteorological Office and Air Publications and Forms Stores, to their ships abroad.

This matter, addressed to the captains of ships, contains information which is required for the conduct of meteorological work at sea, and is most effective if received by the captains at the earliest possible date.

Much of the information referred to is published in *The Marine Observer* and is of a seasonal nature. This journal also contains advice to observing ships which enables them to perform voluntary service by wireless communication for the benefit of all shipping.

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 Appendix III, pages 106-108 of the *Marine Observer's Handbook*, Sixth 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 the 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.

RETURN OF LOGBOOKS

Owing to the need for strict economy in the use of paper, observing officers should endeavour to fill up their logbooks (Forms 911), before returning them to the appropriate Meteorological Service, except when insufficient space remains for the recording of observations during a further complete passage.

Meteorological Services for Shipping

Captains of British ships are requested to notify the Marine Branch of the Meteorological Office of areas in which meteorological services for shipping appear inadequate. Suggestions for the improvement of these services are always welcome.

Hong Kong Weather Broadcast for Shipping

Station VPS. Cape D'Aguilar.

The frequency of the short wave transmission from this station has been changed from 11200 kcs. to 8502 kcs.

Great Britain

Transmission of the 1800 G.M.T. Radio Weather Message from Single-Operator Observing Ships

In the eastern Atlantic, the 1800 G.M.T. radio weather message is a very important one from the viewpoint of shipping. The 2130 Atlantic bulletin for shipping, as issued from the United Kingdom, is normally based upon the weather map drawn from observations made at 1800. The 2030 coastal forecast issued by W/T and R/T may also be influenced by these observations. The 1800 weather map is at the same time of considerable general value, for if the messages both from ship and shore stations arrive punctually, the map is drawn in sufficient detail to influence the general forecast which is issued in the evening to the press for publication in the morning newspapers.

The attention of voluntary observers is, therefore, drawn to the fact that in single-operator ships, there is no objection to making out the 1800 weather message at, say, 1730, with the object of clearing it by radio before the radio officer goes off watch. In the coded message "GG" should then be coded to give the actual time of the observation to the nearest hour (G.M.T.).

TRANSMISSION OF WEATHER MESSAGES THROUGH DETAILED STATIONS

When transmitting routine weather messages to Meteorological Services, observing ships are specially requested to transmit only through the radio stations detailed in Part II of the "Marine Observer's Guide."

When in a reporting area, messages should be transmitted *only through the radio stations appropriate to that area* (except when using Area Stations for short-wave transmissions).

Transmission of reports through stations other than those detailed, or through stations outside the appropriate reporting area may involve complications in the payment of telegraphic charges.

Gale Warnings and Storm Warnings British Coastal Waters and Eastern North Atlantic

Attention is drawn to the fact that in the weather bulletins issued by the British Meteorological Office for shipping around the coasts of the British Isles, *gale warnings* are issued when the wind is expected to reach *Beaufort force 8 or above*.

The *storm warnings* in the Atlantic Weather Bulletin for Shipping, however, are only issued when the wind is expected to reach *Beaufort force 10 or above*. *Note.*—In some parts of the world *hurricane warnings* are issued; these will infer that a wind of *Beaufort force 12 or above* is expected.

GREAT BRITAIN—LOCAL WEATHER FORECASTS

Masters of ships and others interested in the movements of shipping and in the loading and discharging of cargo can obtain local weather forecasts from the forecast centre nearest to the port, free of charge.

The addresses and telephone numbers of the forecast centres nearest to the main ports of Great Britain are given below, corrected to June, 1949.

PORT	ADDRESS OF NEAREST FORECAST CENTRE	TELEPHONE NO.
Aberdeen	The Meteorological Officer, Dyce Airport, Aberdeenshire	Dyce 332. Ex. 70
Bristol	The Meteorological Officer, Bristol Airport, Whitchurch, Bristol	Bristol 26451. Ex. 22
Cardiff	The Senior Meteorological Officer, Air Traffic Control Centre, Royal Air Force, Eastern Avenue, Barnwood, Gloucester	Gloucester 4465/6/7. Ex. 110.
Dundee	The Senior Meteorological Officer, H.Q. No. 18 Group, Royal Air Force, Pitreavie Castle, Dunfermline, Fife	Inverkeithing 264/5 Ex. 118/9.
Falmouth	The Senior Meteorological Officer, H.Q. 19 Group, Royal Air Force, Mount Batten, Plymouth, Devon	Plymstock 2224. Ex. 108/9.
Glasgow	The Meteorological Officer, Renfrew Airport, Renfrewshire	Renfrew 2352. Ex. 21/3.
Hartlepool	The Senior Meteorological Officer, Royal Air Force, Watnall, Nottingham	Nottingham 45731/5. Ex. 230/1.
Hull	The Senior Meteorological Officer, H.Q. No. 1 Group, Royal Air Force, Bawtry, Doncaster, Yorkshire	Bawtry 363/7. Ex. 105
Inverness	The Senior Meteorological Officer, Royal Air Force, Raigmore, Inverness	Inverness 1853/8. Ex. 114/5/6/7.
Kirkwall	The Meteorological Officer, Hatston Airport, Orkneys	Kirkwall 421. Ex. 2.
Leith	The Senior Meteorological Officer, H.Q. No. 18 Group, Royal Air Force, Pitreavie Castle, Dunfermline, Fife	Inverkeithing 264/5 Ex. 118/9.
London	The Director, Meteorological Office, Air Ministry, Kingsway, London, W.C.2	Holborn 3434. Ex. 629.
Liverpool	The Senior Meteorological Officer, Speke Airport, Liverpool, 19	Garston 1240. Ex. 21/2.
Milford Haven	The Senior Meteorological Officer, H.Q. No. 19 Group, Royal Air Force, Mount Batten, Plymouth, Devon	Plymstock 2224. Ex. 108/9.
Newcastle	The Senior Meteorological Officer, Royal Air Force, Watnall, Nottingham	Nottingham 45731. Ex. 230/1.
Plymouth	The Senior Meteorological Officer, H.Q. No. 19 Group, Royal Air Force, Mount Batten, Plymouth, Devon	Plymstock 2224. Ex. 108/9.
Southampton	The Senior Meteorological Officer, Southampton Airport	Eastleigh 87228. Ex. 10.
Swansea	The Senior Meteorological Officer, Air Traffic Control Centre, Royal Air Force, Eastern Avenue, Barnwood, Gloucester	Gloucester 4465/6/7. Ex. 110.

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

Captains and observing officers of the Voluntary Corps of Marine Observers will always be welcomed at headquarters, where the Marine Superintendent will be pleased to show them how their observations are utilised in meteorological research and weather forecasting.

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.)

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 4, Ibex House, Minories, London, E.C.3. (Telephone : Royal 1721.)

Bristol Channel

Captain R. Reid, Port Meteorological Officer, 2 Bute Crescent, Cardiff. (Telephone : Cardiff 4474.)

Southampton

Captain J. R. Radley, Port Meteorological Officer, 19 Queen's Terrace, Southampton. (Telephone : Southampton 4295.)

AGENTS

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Captain W. W. Elliott, c/o Thomas Hastie & Son, 2-4 Tullis Street, Bridgeton, Glasgow. (Telephone : Bridgeton 3219.)

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Humber

Captain R. E. Dunn, c/o Principal Officer, Ministry of Transport, Trinity House Yard, Hull.

Tyne

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

OFFICERS OF THE METEOROLOGICAL SERVICE OF CANADA

Headquarters

Controller, Meteorological Division, Department of Transport, 315 Bloor Street W., Toronto, 5.

Halifax

O.I.C. Dominion Public Weather Office, 728 Dominion Public Building, Halifax N.S. (Telephone : 3-8314.)

Saint John

Mr. Francis N. Barnes, The Observatory, Saint John, N.B. (Telephone : 3-3500.)

Vancouver

Mr. C. H. Bromley (acting), 815 Bower Building, 543 Granville Street, Vancouver, B.C. (Telephone : PACific 3032.)

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Publications may be ordered directly from the Sales Offices of His Majesty's Stationery Office at the Addresses shown overleaf or through any bookseller

Cloud Forms. Definitions and descriptions, with photographs of clouds. M.O. 233, 6th Edition, 1949. 8vo. 1s. 3d. Postage 1d.

Weather Map. An introduction to modern meteorology. M.O. 225 i, 3rd edition, 1939. 8vo. (see also Meteorological Glossary, in continuation of the "Weather Map") 3s. Postage 2d.

Meteorological Glossary (continuation of the "Weather Map", q.v.). M.O. 225 ii, 3rd edition, 1939. 8vo. 7s. 6d. Postage 5d.

Handbook of Weather Messages, Codes and Specifications. M.O. 510. 8vo.

Part I. Transmission schedules and station index numbers 1949. 2s. 6d. Postage 2d.

Part II. Codes and specifications. 1948. 1s. 6d. Postage 2d.

Part III. Coding, decoding and plotting, 1948. 2s. Postage 2d.

(Amendments issued as necessary and priced separately.)

Instructions for the preparation of weather maps with tables of the specifications and symbols. M.O. 515. 1949. 8vo. 9d. Postage 1d.

International Meteorological Code adopted by the International Meteorological Organisation, Washington, 1947. **Decode for the use of shipping**, incorporating the code for weather reports from and to ships and the analysis code for the use of shipping. M.O. 509. 1948. 9d. Postage 1d.

Meteorological Handbook for Pilots and Navigators. M.O. 448, 2nd edition, 1942. 8vo. 2s. 6d. Postage 2d.

A Short Course in Elementary Meteorology. By W. H. Pick, B.Sc., F.C.P., F.Inst.P. M.O. 247, 5th edition, 1938. 8vo. 2s. 6d. Postage 3d.

Meteorology for Aviators. By R. C. Sutcliffe, Ph.D. M.O. 432, 1940. 8vo. 7s. 6d. Postage 6d.

Meteorological Magazine. 8vo. Published monthly. New series commencing January, 1947. Each 1s. Postage 1d.

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