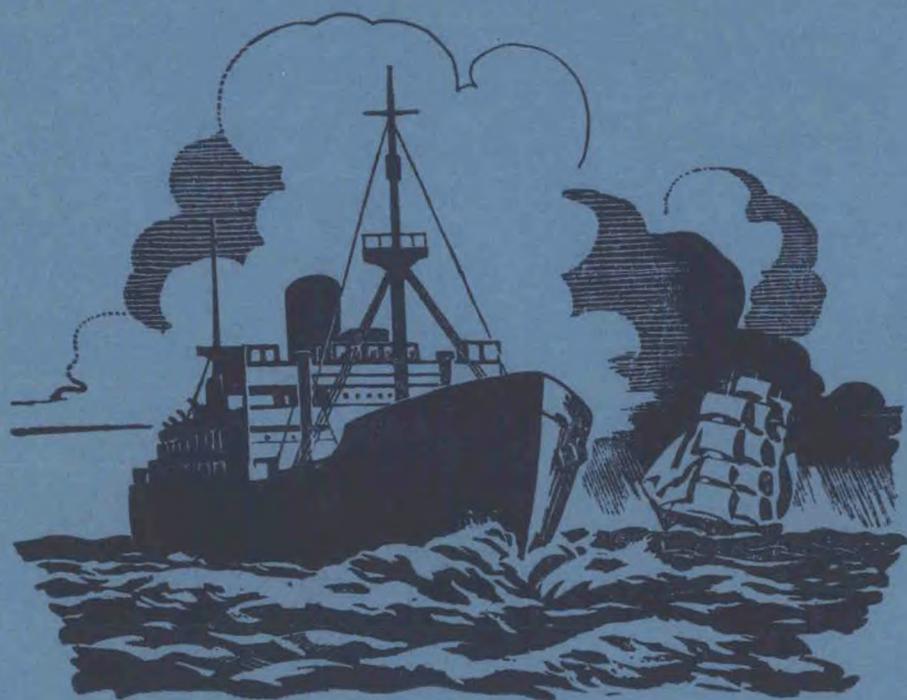


M.O. 493

# The Marine Observer



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# THE MARINE OBSERVER

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## EDITORIAL

On page 121 of this edition will be found the Annual Report of the activities of the Marine Branch of the British Meteorological Office, and of the Voluntary Observing Fleet. This report reflects extremely favourably upon the public-spirited attitude of the masters and officers who serve in merchant vessels, for without their co-operation the report would have very little substance. It is interesting to recollect that British ships have contributed towards furthering our knowledge of meteorological conditions at sea since the year 1855; a wonderful record of voluntary work of considerable scientific value. It is true to say that by far the greater proportion of our knowledge of maritime meteorology is thus due to the work of amateur meteorologists in merchant ships. In this connection, it is only fair to add that the merchant seamen of most maritime countries contribute in a similar manner to our scientific knowledge in co-operating with their national meteorological services—the whole scheme being co-ordinated by the activities of the International Meteorological Organisation. The part played in this service by voluntary observers in vessels belonging to other countries of the British Commonwealth is by no means lost sight of, for it is realised that many such ships are co-operating. We hope to receive reports from these countries as to their maritime meteorological activities from time to time for publication in this magazine.

In considering the activities of the British Selected Ships, it is instructive to recall that, on the outbreak of war in 1939, the average daily number of observations received at the Central Forecasting Office was 33.5, whereas this average reached a maximum of 92.1 in February, 1948. This is a truly remarkable achievement, and it is true to say that the resultant improvement in the network of observations in the Atlantic Ocean is such that considerably greater accuracy in weather forecasting has been made possible. Who knows—if we continue at this rate, the music hall and newspaper cartoonist may have to find another character to supersede the forecaster for their meteorological humour.

In this modern age, accurate weather information plays an important part in all our lives—industry, transport (by air, sea and land), town planning, sport and social activities, all depend, in one way or another, for efficient operation upon meteorological information. One might reasonably reply: “Still, we got on all right without it in the past”; but we are now living in a very competitive age in which the country which applies its scientific knowledge to the best advantage is the most efficient and perhaps the most successful. And we in Britain, faced as we are with a financial crisis of unparalleled gravity, cannot afford to be inefficient. Apt illustrations of the industrial value of accurate weather information might be:

- (a) The snow and frost forecasts which are supplied to road and rail transport, thereby enabling timely steps to be taken to avoid local or widespread shortages of coal or other important commodities.
- (b) The frost forecasts issued for the benefit of agriculturists.
- (c) Special forecasts for the herring fishing fleet.

It is not beyond the realms of possibility that an accurate weather message from a ship in the Atlantic might be the means of enabling fruit farmers in Kent to take precautions to safeguard their strawberries from frost damage.

It is a small world. I read of one farmer who does not trust the meteorologists, but has a cunningly arranged alarm clock which " goes off " if the air temperature becomes as low as 32°F.

It is true that the Ocean Weather Ships, due to the fact that they are more or less fixed and can send in very regular observations both of surface and upper air conditions, are contributing very considerably to our knowledge of conditions in the Atlantic, but these weather ships are necessarily limited in number, and we must still depend for the bulk of our information upon the co-operation of merchant ships. The Meteorological Office realises that the taking, recording, coding and transmitting of the results of these observations takes up quite a lot of the observer's time and requires considerable care and concentration. The records in the possession of the Marine Branch show that this work is, in general, done in a most painstaking manner, and reflects great credit upon the observers.

The meteorological records from ships when received in the Marine Branch are carefully examined, and each year those ships which are considered to have contributed the best series of observations for the year are selected for the receipt of " Excellent Awards." These awards formerly consisted of bound volumes of *The Marine Observer*, but it has been considered that some other award in the form of books of a scientific nature or instruments, to be varied from year to year as necessary, might perhaps be more acceptable to the recipients. The list of ships, with the names of their captains, principal observing officers and senior radio officers who have been selected for the " Excellent Awards " for this year, together with the names of the books for this year's presentation, is given on page 133. On behalf of Sir Nelson Johnson, our Director, I offer the congratulations and warm thanks of the Meteorological Office for a job well done to all those whose names appear in the list. At the same time we extend our sincere appreciation to all those voluntary observers whose names do not appear on the list but who have, nevertheless, loyally co-operated with this department during the year under review.

The International Conference on Safety of Life at Sea, which I mentioned in our last number, opened in London in April. In January I attended a meeting of the Preparatory Committee to consider practical means to obtain co-operation in this subject, in matters concerning the International Meteorological Organisation, the International Civil Aviation Organisation, the International Telecommunications Union and the International Maritime Consultative Organisation.

In February I represented the International Meteorological Organisation at a conference in Geneva, to consider the formation of a permanent International Maritime Organisation under the auspices of the United Nations, the function of this organisation being briefly to consider and make recommendations upon all maritime problems which might need their consideration, including problems connected with safety of life at sea. The conference, which was attended by thirty-four nations, was, it seems, very successful, and a convention was drawn up establishing the new body, which will be called " The Inter-Governmental Maritime Consultative Organisation." It is interesting to note that this is the first time that a permanent international maritime organisation of this nature has been formed—rather a remarkable fact when one considers the international nature of all shipping activities.

Prior to the formation of this new body, any necessary international co-ordination as concerns the International Convention for Safety of Life at Sea was entrusted to the British Government.

Geneva sounds a long way from the sea, but the Swiss Government has for some years now taken an active interest in merchant shipping. Besides the steamers which ply upon her lakes in summer she owns several merchant ships, although she has no seaboard and no ports. She realised that in war-time it would be difficult for a neutral country to persuade the shipping of other countries to carry her essential supplies, so she went into the shipping business herself. Thus we see ocean-going ships flying the Swiss national flag ; it seems that Genoa is the " home " port of these Swiss vessels.

Switzerland is, owing to its geographical position and physical features, an interesting country meteorologically, and its delightful and somewhat varied climate is one of its assets as concerns the tourist traffic. The Swiss are, therefore, meteorologically minded, but they had a hard task in acquiring information about the weather from any of their neighbouring countries during the war, when meteorological information was a secret of great military importance. In their search for meteorological knowledge they devoted considerable time and thought to the development of upper air observations and of electronic meteorology, and made considerable advances in these branches of the work, the results being particularly noteworthy in view of Switzerland's isolated position as concerns scientific and technical co-operation with other countries during the period when the scientists of both the warring sides were wrapped in the cloak of secrecy. Let us hope that the international co-operation in so many spheres of life which is growing up under the auspices of the United Nations will eventually eliminate the risk of further wars, and enable the scientists, merchants and politicians of the world to work consistently for the welfare of mankind. In considering this ideal, the seaman and the meteorologist have much in common—the oceans, like the atmosphere, know no frontiers.

MARINE SUPERINTENDENT.

## **WORK OF THE YEAR (ENDING 31st MARCH, 1948) OF THE MARINE BRANCH OF THE BRITISH METEOROLOGICAL OFFICE AND THE VOLUNTARY OBSERVING FLEET**

### **1. Synoptic Meteorology**

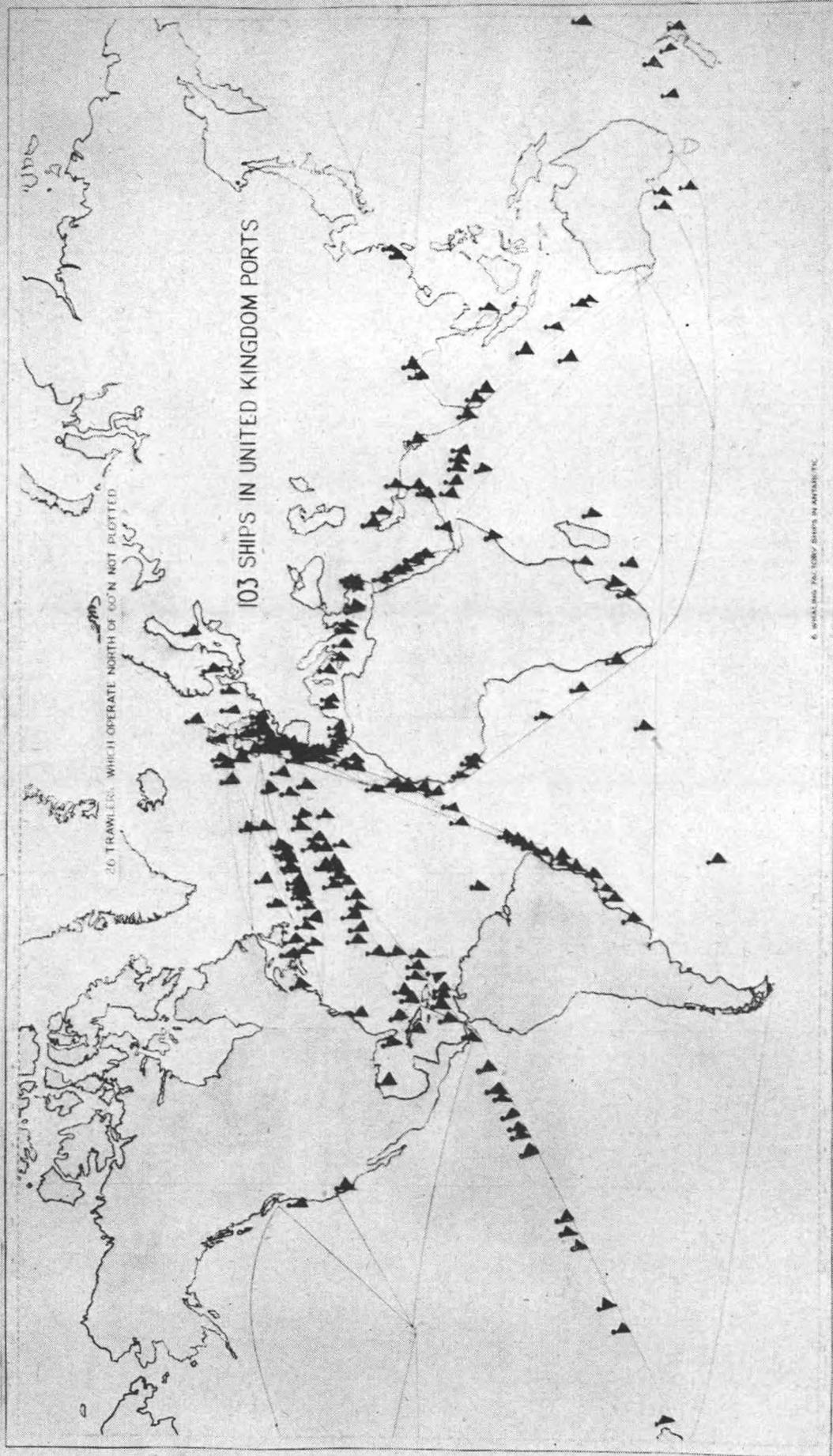
#### *General*

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 transmitted by W/T in the International Code to meteorological centres of all countries which request such reports for synoptic work, and the completed logbooks are returned to the Meteorological Office for climatological use.

ESTIMATED POSITIONS OF BRITISH SELECTED SHIPS 18<sup>TH</sup> FEBRUARY 1948



(b) *Supplementary Ships*

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

(c) *"Marid" Ships*

These "coasting" vessels are equipped with sea thermometer and canvas buckets. 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 Dunstable.

*Number of Observing Ships*

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

TABLE I

	1947									1948		
	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
Number of Selected Ships on Fleet List	424	432	439	445	450	452	458	463	468	473	483	495
Number of Supplementary Ships on Fleet List	193	189	189	191	191	191	195	186	183	182	181	181
Number of "Marid" ships on Fleet List	78	76	78	78	79	80	79	79	79	79	81	80
Number of light-vessels on Fleet List	—	—	—	4	5	5	5	5	5	5	5	5

The following comments are pertinent :

(a) The number of Selected Ships shows a steady increase, reflecting the efforts which have been made to further recruitment, as well as the ready spirit of co-operation amongst the masters and officers of merchant ships.

(b) The number of Supplementary Ships is almost stationary. This is because it has been considered preferable to recruit Selected Ships until the desired maximum number of 500 has been reached. The recruitment of additional Supplementary Ships will then commence.

(c) The "Marid" ship service has continued unchanged.

(d) Five light-vessels were recruited during July and August.

*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

	1947									1948		
	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1. <i>British Selected Ships</i>												
Number reporting to Dunstable	201	217	208	217	216	214	216	215	231	185	251	232
Number of messages received	2219	2552	2340	2410	2233	2348	2487	2405	2375	2278	2672	2681
Daily average	74.0	82.3	78.0	77.8	75.3	78.3	80.0	80.2	76.6	73.5	92.1	86.5
2. " <i>Marid</i> " Ships												
Number reporting to Dunstable	20	28	29	31	30	31	27	22	23	27	27	27
Number of messages received	120	168	180	182	213	179	162	146	141	147	148	148
Daily average	4.0	5.4	6.0	5.9	6.9	6.0	5.2	4.9	4.5	4.7	5.1	4.8
3. <i>Foreign Ships</i>												
Number reporting to Dunstable	—	27	33	51	47	46	45	49	44	55	66	96
Number of messages received	—	151	217	256	240	283	277	346	330	434	405	558
Daily average	—	4.5	7.2	8.3	7.7	9.4	8.0	11.5	10.6	14.0	14.0	18.0
4. <i>Light-Vessels</i>												
Number reporting to Dunstable	—	—	—	—	5	5	5	5	5	5	5	5
Number of messages received	—	—	—	—	254	293	279	238	200	209	283	310
Daily average	—	—	—	—	8.2	9.8	9.0	7.9	9.3	9.6	9.8	10.0

This table takes no account of the weather messages sent in by the ships concerned to meteorological centres of other countries. A study of our records shows that the ships loyally co-operate with other services as necessary during their voyages. The map on page 122 shows the distribution of Selected Ships on 18th February, 1948, and gives an idea of the part which such ships play in world meteorology.

### Equipment

Table III shows the distribution of instrumental equipment on loan to voluntary reporting ships.

TABLE III

	1947									1948		
	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1 (a) Full set of M.O. instruments	267	277	285	291	292	298	304	311	320	327	337	347
(b) Full set of M.O. instruments (except barograph) .. ..	21	17	16	17	19	17	17	17	12	11	11	11
(c) Full set of M.O. instruments (except barometer) .. ..	73	79	81	81	82	80	81	81	81	83	83	86
(d) Full set of M.O. instruments (except barometer and barograph) .. ..	14	16	17	17	18	20	19	20	23	21	21	20
2 (a) M.O. barometer and barograph only .. ..	1	0	0	0	0	0	0	0	0	0	0	0
(b) M.O. barometer only .. ..	13	11	10	9	9	8	8	7	7	7	7	7
3. Ship's own barometer only .. ..	16	13	11	11	11	11	11	11	10	9	9	9
4. Various instruments from various sources .. ..	1	1	1	1	1	1	1	0	0	0	0	0
5. Full "trawler" sets .. ..	18	18	18	18	18	17	17	16	15	15	15	15
6. Full "light-vessel" sets .. ..	—	—	—	4	5	5	5	5	5	5	5	5
7. "Marid" sets (thermometers only) .. ..	78	76	78	78	79	80	79	79	79	79	81	80

## 2. Ocean Weather Ships

### *Historical*

The Ocean Weather Ship Service originated as a result of a meeting of member states of the International Civil Air Organisation held in London during September, 1946. The agreement provided for the establishment of thirteen stationary meteorological ship stations in the North Atlantic, responsibility for which was allocated as follows :

United States .. .. .	7 stations
Canada and United States, jointly .. ..	1 station
France .. .. .	1 station
United Kingdom .. .. .	2 stations
Norway, Sweden and United Kingdom, jointly	1 station
Holland and Belgium, jointly .. .. .	1 station

The duties of the weather ships were defined as follows :

(a) Meteorological observations: surface observations every three hours. Special observations, when necessary, of meteorological phenomena and of important changes in the weather. Upper wind observations by radar methods not less than four times daily. Upper air temperature, pressure and humidity by radio-sonde not less than twice daily.

All the above observations would be reported by radio at the appropriate international hours. In addition, observations from certain merchant ships and other ocean weather ships would be collected and re-transmitted by radio.

(b) Search and rescue services: for aircraft and shipping in distress, as necessary, for which the requisite equipment would be provided aboard the ships. This would entail the provision of special boats and other life-saving equipment, radar and special radio equipment, including beacons on which aircraft could "home."

(c) Navigational aids to aircraft in flight.

(d) Oceanographical and other scientific observations.

### *The British Ocean Weather Ship Service*

The stations allocated to Britain are :

Station I (Item)	Position 60° 00'N., 20° 00'W.
Station J (Jig)	Position 53° 50'N., 18° 40'W.

Four ships are necessary to man these two stations. They are all converted ex-naval corvettes of the "Flower" Class type, having a length of approximately 200 ft. and a displacement of 1,400 tons.

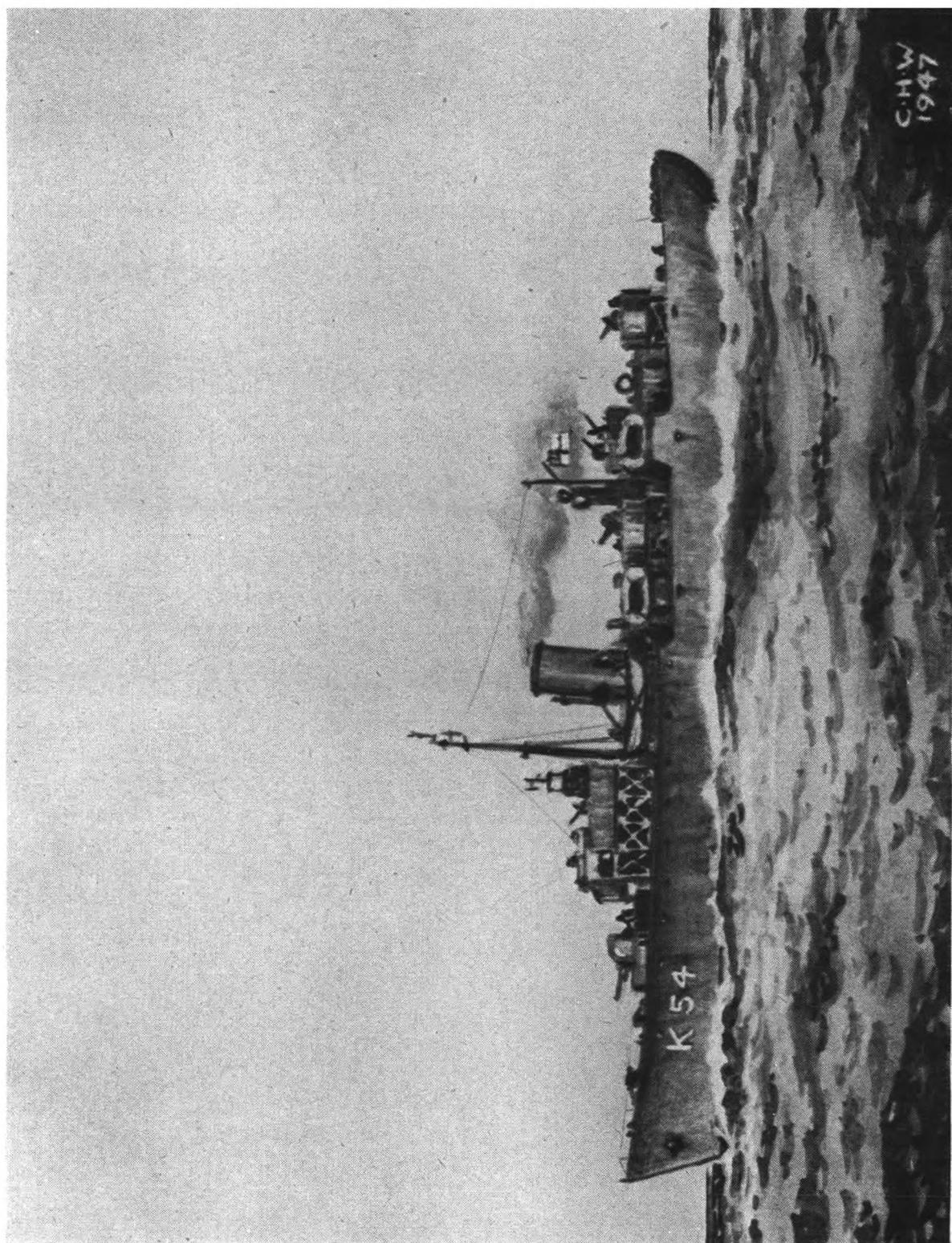
The Ocean Weather Ship Service was inaugurated on 31st July, 1947, in the London Docks, when the ceremony of renaming the first Ocean Weather Ship (*Weather Observer*, Captain N. F. Israel, D.S.C.) was performed by the Secretary of State for Air. Other ships were commissioned as follows :

*Weather Recorder*. 4th October, 1947. (Captain A. W. Ford.)

*Weather Watcher*. 27th November, 1947. (Captain F. A. Elston.)

*Weather Explorer*. 4th February, 1948. (Commander H. R. Wilkinson, R.D., R.N.R.)

FROM H.M. CORVETTE TO OCEAN WEATHER SHIP—(I)



H.M.S. *Marguerite* as she appeared before conversion

The Marine Branch, the Instruments Branch, the Upper Air Branch and the Central Forecasting Office were all concerned in the work of converting these ships to floating meteorological stations. The work of conversion was carried out in H.M. dockyards. Much valuable advice and assistance was given by experts from the Ministry of Transport, Admiralty, G.P.O. Cable-Ship Service and various Air Ministry departments.

Each ship carries the following meteorological staff :

- 1 meteorological officer ;
- 2 assistant meteorological officers ;
- 4 observers.

The Shore Captain (Captain G. W. Steer) at the Ocean Weather Ship Base at Great Harbour, Greenock, is responsible for the day to day administration of the ships.

Stations have been manned as follows :

*Station J (Fig)*

PERIOD	WEATHER SHIP
10th August, 1947-24th August, 1947	<i>Weather Observer</i>
8th October, 1947-28th October, 1947	<i>Weather Recorder</i>
5th November, 1947-24th November, 1947	<i>Weather Observer</i>
24th November, 1947-29th November, 1947 } *	<i>Weather Recorder</i>
6th December, 1947-18th December, 1947 } *	
18th December, 1947-26th December, 1947 } *	<i>Weather Observer</i>
30th December, 1947-11th January, 1948 } *	
11th January, 1948-31st January, 1948	<i>Weather Watcher</i>
7th February, 1948-25th February, 1948	<i>Weather Observer</i>
25th February, 1948-18th March, 1948	<i>Weather Recorder</i>
18th March, 1948-31st March, 1948	<i>Weather Observer</i>

*Station I (Item)*

25th September, 1947-12th October, 1947	<i>Weather Observer</i>
1st December, 1947-20th December, 1947	<i>Weather Watcher</i>
19th January, 1948-4th February, 1948	<i>Weather Recorder</i>
9th February, 1948-22nd February, 1948	<i>Weather Explorer</i>
25th February, 1948-7th March, 1948 } *	<i>Weather Watcher</i>
14th March, 1948-23rd March, 1948 } *	
24th March, 1948-31st March, 1948	<i>Weather Explorer</i>

\*On each of the occasions denoted by an asterisk the voyage was broken in order to land a sick man at Londonderry. On the 11th-12th January, 1948, the *Weather Recorder* rescued the whole crew of the Norwegian steamer *Veni* off the Scottish coast, during a severe southerly gale. Owing to the low visibility prevailing at the time the skilful use of radar contributed much to the success of the rescue.

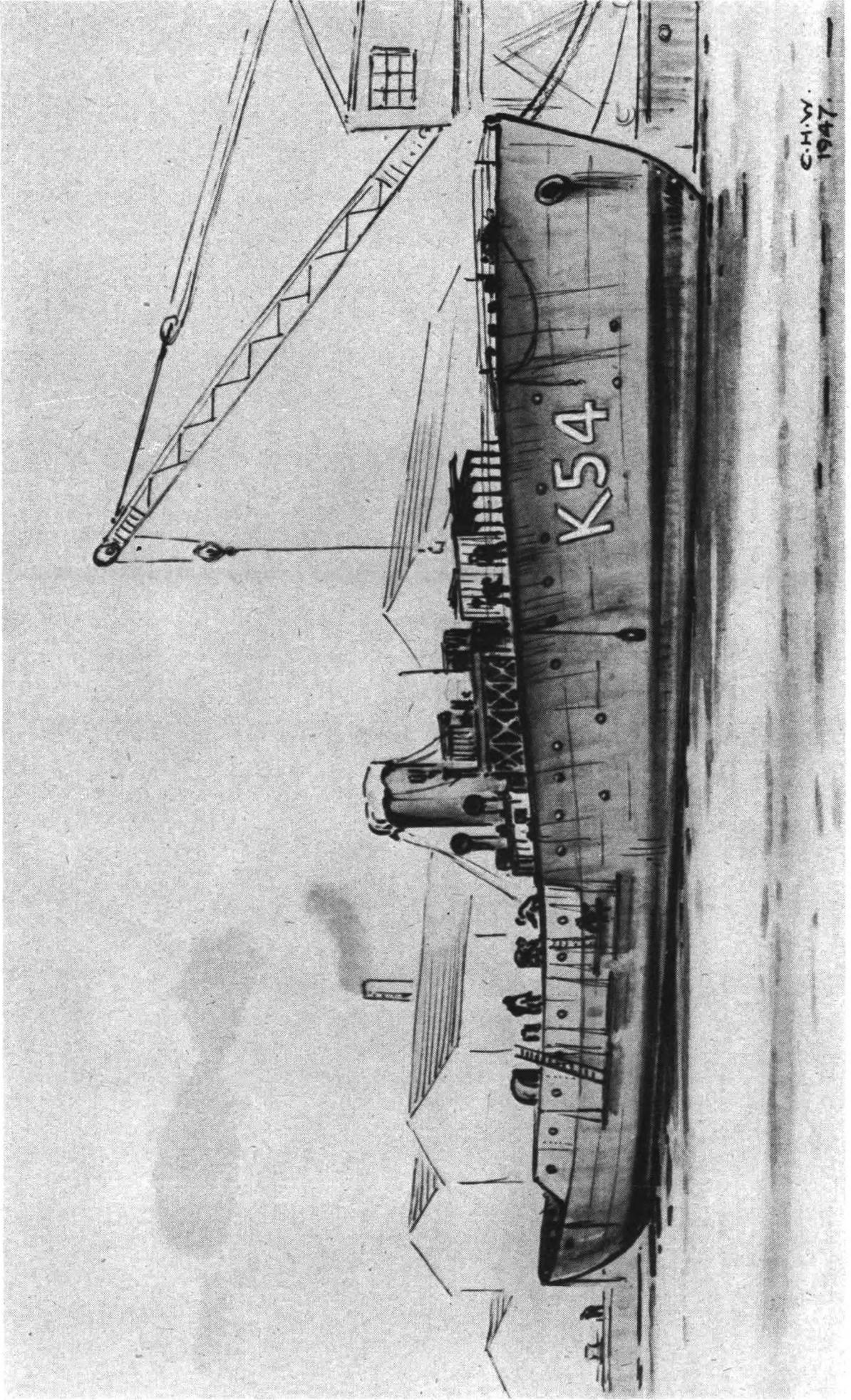
During the above periods the Ocean Weather Ships carried out a full programme of work, forwarding routine surface and upper air reports to the Central Forecasting Office on the point-to-point W/T link provided. These observations were available to all stations of the teleprinter network within half an hour of receipt.

*Available Radio Facilities in Ocean Weather Ships*

(a) *Normal or non-emergency state*

- (1) The Ocean Weather Ship guards continuously one of the following North Atlantic Group "B" frequencies as appropriate to its position and the time of day: 333kc/s., 2912 kc/s., 6543 kc/s., 8485 kc/s., 11306 kc/s.

FROM H.M. CORVETTE TO OCEAN WEATHER SHIP—(II)



H.M.S. *Marguerite* during conversion at Sheerness Dockyard

- (2) Continuous watch is maintained on VHF R/T guard of 118.1 mc/s.
- (3) Watch is maintained on the international distress frequency of 500 kc/s. at international distress hours and as required.
- (4) M.F. Beacon transmission is radiated for six-minute periods at H, H+20, H+40, except during radio-sonde ascents at approximately 0200-0300, 0800-0900, 1400-1500 and 2000-2100 G.M.T.
- (5) The Eureka Beacon is switched on as required by over-flying aircraft.

*(b) Emergency state*

When the Ocean Weather Ship has knowledge that an aircraft is in distress, the following facilities are operated on a continuous basis.

- (1) The appropriate route frequency.
- (2) The R.A.F. Air/Sea Rescue channel of 6500/3805 kc/s.
- (3) International Distress Frequency of 500 kc/s.
- (4) V.H.F. World Guard of 118.1 mc/s.
- (5) V.H.F. D/F 118.1 mc/s.
- (6) M.F. W/T Beacon keyed continuously at the discretion of the master, ocean weather ship, or on request.
- (7) Eureka Beacon switched on continuously.

*Available Meteorological Services from Ocean Weather Ships*

Information is supplied to aircraft as follows :

- (1) Surface observations : comprising surface wind, visibility, state of sea and pressure at mean sea level.
- (2) Upper air observations : comprising state of sky (cloud types, heights of bases and amounts, upper winds for levels 2,000 ft., 5,000 ft., 10,000 ft. and 20,000 ft., and freezing level).

Reports supplied to aircraft in accordance with (1) and (2) above are prepared from the ship's latest available observation.

Routine observations are made as follows :

Surface observations at 0000, 0300, 0600, 0900, 1200, 1500, 1800 and 2100 G.M.T.

Upper air observations are commenced at 0200, 0800, 1400 and 2000 G.M.T., in order that reports may be available one hour later in each case.

**3. Services provided by the Meteorological Office for the Merchant Navy and Fishing Fleet**

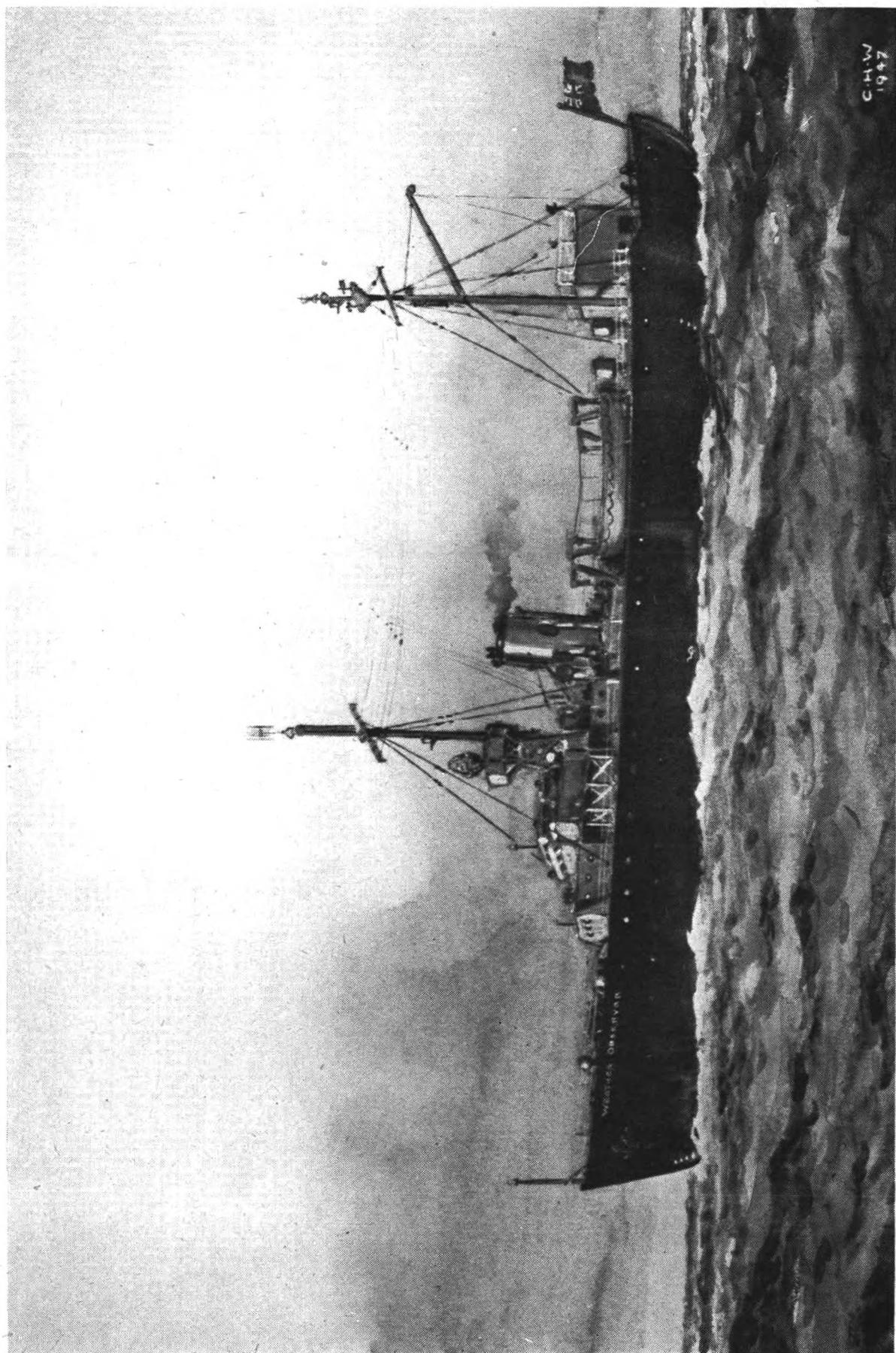
*Gale Warnings*

Gale warnings are broadcast by the B.B.C. on waves 200 (1500) and 1149 (261.1) immediately on receipt. They are also repeated by W/T and/or R/T from the following coast stations : Wick, Cullercoats, Humber, North Foreland, Niton, Lands End, Portpatrick, Valentia, Malin Head.

*Shipping Bulletins*

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

FROM H.M. CORVETTE TO OCEAN WEATHER SHIP—(III)



Ocean Weather Ship *Weather Observer* (late H.M.S. *Marguerite*)

## *Atlantic Weather Bulletin*

This bulletin provides for North Atlantic shipping, twice daily, the following information based on the 0600 and 1800 G.M.T. charts :

- (i) General inference and brief area forecast in plain language for Biscay, Finisterre, and the NE, NW, SE and SW sections of that region of the North Atlantic east of  $40^{\circ}$ W. and north of  $35^{\circ}$ N. Forecasts cover a period of twenty-four hours.
- (ii) A selection of ship and shore station reports.
- (iii) Particulars of pressure and frontal systems enabling a simple weather chart to be constructed by the seaman himself.

### 4. Marine Climatology

#### (i) *Collection of observations*

The numbers of forms 911 and logbooks (form 911) (permanent records of meteorological observations made aboard British selected ships) received each month in the Marine Branch were as follows :

	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
Forms 911	62	47	33	14	12	5	7	12	3	2	4	2	203
Logbooks	27	31	49	52	62	61	56	46	82	53	59	62	646

Two lighthouses abroad, and eleven light-vessels or coast stations in home waters have sent in observations during the year.

Miscellaneous observations received by the Marine Branch from British ships included special reports of surface sea temperature in home waters. Data from several logs received from the Admiralty were punched on to "Hollerith" cards.

#### (ii) *Analysis of Observations*

The charts of sea temperatures for the waters adjacent to the southern half of the African continent have been held up, and those for the North Atlantic have made only slow progress, because of lack of staff and the pressure of other work.

A gratifying number of reports of ocean currents continues to be received from merchant ships as well as from H.M. ships. Many more observations are needed, however, before we can produce monthly current charts for any ocean.

The sections relating to currents and ice have been entirely re-written for new editions of ten Admiralty Pilots. The Marine Branch has also co-operated with the Climatological Branch in re-writing of the text of the meteorological sections of these pilots and has supplied charts of sea areas as required.

The work of computation and charting of ocean currents has been carried out continuously. Work is proceeding on a large area, comprising the western half of the South Pacific Ocean and the extreme eastern part of the South Indian Ocean.

Miscellaneous activities included a study of the diurnal variations of certain meteorological factors in some regions of the North Atlantic ; a

study of the diurnal variation of atmospheric pressure in various regions of the Mediterranean; a comparison of sea temperatures observed by the "bucket" method and those observed from engine intakes; a determination of the probable maximum wet bulb temperatures along the main shipping routes of the world; an investigation into Atlantic weather during December, 1945, from the synoptic standpoint; a note on the best time of year for some tugs to travel from Hong Kong to the Persian Gulf, with comments on the probable weather *en route*; a report on gale frequency in an area near Prince Rupert, B.C., in connection with the "Load-line Convention"; extraction of data of frequency and direction of winds of gale force in part of the coastal waters of Australia.

Much information, including statistical tables and charts of marine data, was prepared for other branches of the Meteorological Office, for other Government offices—particularly the Naval Meteorological Service—for shipping companies and others.

### 5. Special Work

The publication of the new edition of the *Marine Observer's Handbook* was held up because of the probability that changes in the codes for synoptic meteorology would be agreed to at the Toronto and Washington Conferences of the International Meteorological Organisation which were held in the summer of 1947. The revised text is now practically ready for printing.

A new text book, *Meteorology for Mariners*, is in course of preparation.

Much work was carried out in preparation for the International Conference of the Commission for Maritime Meteorology at Toronto and, after the conference, in connection with the implementation of the resolutions. Commander Frankcom, as President of the Maritime Commission, attended this conference and also the Conference of Directors at Washington which followed it.

Lectures have been given on several occasions by members of the Marine Branch to students at the Meteorological Training School. These students included nautical officers of the Ocean Weather Ships.

### 6. Enquiries

Sixty-five major enquiries were dealt with in connection with arbitration arising out of shipping casualties. A number of other enquiries were also dealt with by the branch.

### 7. Publications

Publication of *The Marine Observer* was resumed with the issue of the July, 1947, number.

### 8. Excellent Awards

As a token of appreciation, the Director of the Meteorological Office is making awards to captains, principal observers and senior radio officers of British Selected Ships whose work has been considered of outstanding quality throughout the past year. One of the following books, suitably inscribed, will be presented to each officer:

- (1) *Norton's Star Atlas and Telescopic Handbook*. By Arthur P. Norton, B.A., and J. Gall Inglis, F.R.A.S.
- (2) *Birds of the Ocean*. By W. B. Alexander, M.A.
- (3) *Life of Captain Cook*. By Hugh Carrington.
- (4) *The Seas: our Knowledge of Life in the Seas and how it is gained*. By F. S. Russell, D.S.C., D.F.C., F.R.S., and C. M. Yonge, D.Sc.

The names of the officers to whom these awards have been made are given in the list which follows.

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

SHIP	CAPTAIN	PRINCIPAL OBSERVER	SENIOR RADIO OFFICER
S.S. <i>Andes</i> ..	R. G. Clayton, D.S.C., R.D., Cdre, R.N.R.	R. J. Slagter	W. J. Clarke
S.S. <i>Arakaka</i> ..	D. R. C. Onslow ..	J. A. Carter ..	E. Howes
S.S. <i>Alcantara</i> ..	H. F. Way, Cdr., R.N.R.	A. Barff ..	R. Hammond
S.S. <i>Afghanistan</i> ..	T. H. Farrar, O.B.E.	J. Linton ..	V. D. Slenin
S.S. <i>Beaverlaken</i> ..	J. P. Dobson, D.S.C., R.D., R.N.R.	L. E. McDowell	J. S. Skinner
M.V. <i>Brisbane Star</i> ..	F. N. Riley, D.S.O.	J. V. Rogers	J. D. Eastwood
S.S. <i>Beaverlake</i> ..	C. L. de H. Bell, D.S.C., R.D., R.N.R.	R. Rawlings ..	A. R. Humphries
S.S. <i>Benedi</i> ..	A. P. Patterson ..	G. Speirs ..	B. Saltwell
M.V. <i>British Escort</i> ..	D. F. Ward ..	T. H. Evans	A. Rankin
M.V. <i>British Marquis</i> ..	J. C. Lea, O.B.E.	F. Robinson	W. Anderson
M.V. <i>British Endurance</i> ..	W. Watkin-Thomas, D.S.C., O.B.E.	L. McRitchie	A. E. Adams
M.V. <i>Cheshire</i> ..	F. C. Brooks ..	A. R. Moore..	J. E. Unsworth
S.S. <i>Cavina</i> ..	S. Browne, O.B.E.	D. Clare ..	A. O'Sullivan
S.S. <i>Chitral</i> ..	D. G. H. O. Baillie	D. Parsons ..	A. R. Porter
S.S. <i>Caxton</i> ..	J. M. Cherry ..	R. Crawford	F. Ware
S.S. <i>Cairnason</i> ..	F. S. Usher ..	G. W. Horton	—, Johnston
S.S. <i>Cairnvalona</i> ..	A. Molineux ..	J. W. Cuthbertson	O. R. Thomas
S.S. <i>Corfu</i> ..	C. S. Parker ..	R. F. McNish	J. I. McDonald
S.S. <i>Comedian</i> ..	R. L. Williams ..	V. F. Harrison	E. Heywood
S.S. <i>City of Evansville</i> ..	A. F. Goring ..	K. Dews ..	W. Lupton
S.S. <i>Consuelo</i> ..	F. Barnard, M.B.E.	J. Salvidge ..	D. Withers
M.V. <i>Columbia Star</i> ..	C. J. W. Jones ..	C. G. Lea ..	A. E. C. Clark
M.V. <i>Clydebank</i> ..	W. Broome, O.B.E.	L. Witheridge	E. O'Neill
M.V. <i>Chinese Prince</i> ..	F. S. Thornton, O.B.E.	H. E. Jennings	E. Wearnmouth
S.S. <i>Clan Chisholm</i> ..	J. H. Crellin ..	R. S. Russell	J. A. Gray

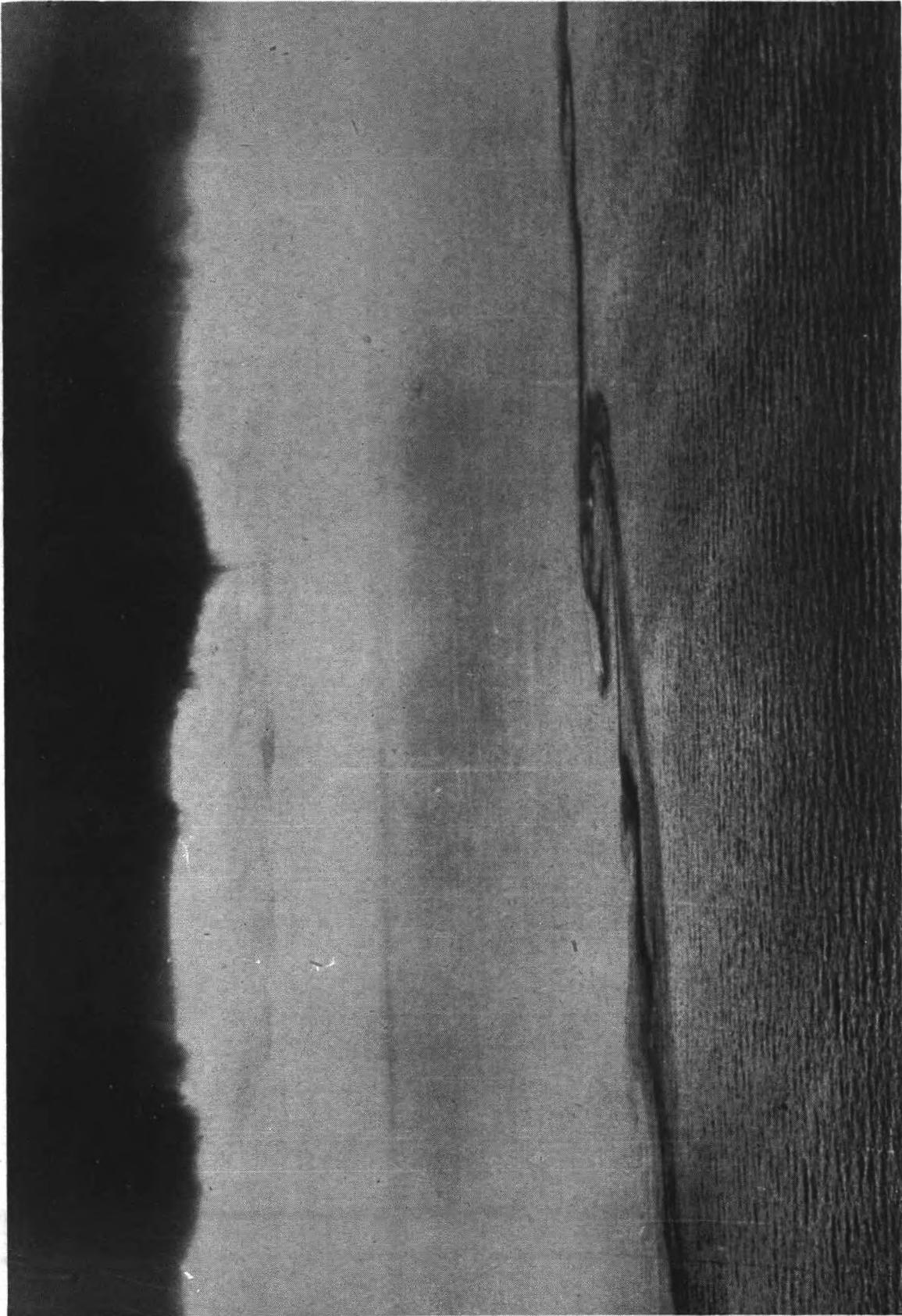
**List of Captains, Principal Observers and Senior Radio Officers, to whom the Director of the British Meteorological Office has made Excellent Awards (Continued)**

SHIP	CAPTAIN	PRINCIPAL OBSERVER	SENIOR RADIO OFFICER
M.V. <i>Dominion Monarch</i> ..	Sir Henry Gordon, K.B., D.S.C.	A. H. B. Anderson ..	J. Murphy
M.V. <i>Drina</i> ..	W. H. Roberts ..	D. N. G. East ..	D. B. Douglas
M.V. <i>Dilwara</i> ..	F. L. Sampson, D.S.C. ..	E. L. Sleeman ..	S. J. Taylor
M.V. <i>Devonshire</i> ..	J. E. Cullen, O.B.E. ..	D. Hine ..	G. Nutter, M.B.E.
S.S. <i>Deebank</i> ..	B. Rivett ..	I. McKay ..	J. Freeman
S.S. <i>Empire Cutlass</i> ..	E. O. Evans ..	D. G. Waters ..	S. Sandham
S.S. <i>Eros</i> ..	R. C. Vigurs ..	A. Hall ..	P. McBride
S.S. <i>Empire Halladale</i> ..	E. Stormont, M.B.E. ..	T. Moodie ..	J. Thomson
S.S. <i>Esso Glasgow</i> ..	C. G. Broughton, M.B.E. ..	P. L. Hopkins ..	C. W. Weeks
M.V. <i>Empire MacDermott</i> ..	D. Hunt ..	F. J. Adams ..	P. Shine
S.S. <i>Ficus</i> ..	S. Thompson ..	S. W. Dean ..	A. S. Stirling
M.V. <i>Fantee</i> ..	A. M. Scobbie, O.B.E. ..	G. H. Griffiths ..	J. J. Gilmore
S.S. <i>Fordsdale</i> ..	R. G. Ireland ..	R. T. Welch ..	H. S. Knight
M.V. <i>Glenbank</i> ..	E. Dibble ..	M. Murphy ..	C. H. Ball
M.V. <i>Hopepeak</i> ..	G. Grindrod ..	J. Dixon ..	R. Gladden
M.V. <i>Inishoven Head</i> ..	W. A. Haddock ..	J. Smythe ..	A. G. Cope
M.V. <i>Inverbank</i> ..	A. M. Williamson ..	J. Mitchell ..	W. Chalmers
S.S. <i>John Holt</i> ..	A. Kennedy ..	W. L. Harrison ..	T. Murdoch
M.V. <i>Jessmore</i> ..	A. C. Bailey ..	S. N. Coe ..	S. Davis
S.S. <i>Kelmscott</i> ..	R. E. Richardson ..	D. Burgess ..	G. Williams
M.V. <i>Kenilworth Castle</i> ..	G. H. Mayhew ..	C. A. Hinton ..	J. Gillespie
S.S. <i>Lancashire</i> ..	H. Kerbyson ..	W. H. Malley ..	A. Jones
M.V. <i>Losada</i> ..	E. Potter ..	G. E. Turner ..	W. L. Parry
S.S. <i>Loch Ryan</i> ..	B. C. Dodds, O.B.E. ..	C. Hartley ..	W. T. Lewis
S.S. <i>Mataroa</i> ..	G. M. Robertson, D.S.C. ..	B. E. Mahy ..	S. O'Neill

S.S. <i>Matina</i> ..	R. A. Thornburn	..	J. Nicholson	..	A. C. Knight
S.S. <i>Mooltan</i> ..	C. H. Baxter	..	P. G. Pattinson	..	F. Ash
S.S. <i>Manchester City</i> ..	F. L. Osborne	..	W. P. Lowthian	..	W. H. Critchley
S.S. <i>Macharda</i> ..	R. A. Penstone	..	J. A. Baker ..	..	G. Caddy
S.S. <i>Manchester Trader</i> ..	E. W. Raper	..	R. H. Hudson	..	G. Penketh
S.S. <i>Malancha</i> ..	A. S. Bain ..	..	D. S. Carter	..	B. Smith
S.S. <i>Martand</i> ..	T. Fox-Lloyd	..	S. S. Allen ..	..	G. W. Hazel
S.S. <i>Makalla</i> ..	J. B. Newman	..	A. W. Fawcett	..	A. N. Orum
S.S. <i>Manchester Progress</i> ..	W. H. Downing	..	A. Cookson ..	..	J. Coates
S.S. <i>Magdapur</i> ..	A. Hill, O.B.E.	..	S. Baxter ..	..	E. Halton, M.B.E.
M.V. <i>Orari</i> ..	F. Pover ..	..	P. L. Kemp ..	..	J. C. H. Mathews
S.S. <i>Orion</i> ..	C. Fox, C.B.E., L.M.	..	G. S. Willis ..	..	N. A. Boon
S.S. <i>Ormonde</i> ..	A. C. G. Hawker, C.B.E.	..	A. M. L. Murray	..	C. T. Seaton
S.S. <i>Pipiriki</i> ..	H. A. Fryer	..	R. Jeffries ..	..	L. Whittingdon
M.V. <i>Port Wellington</i> ..	W. G. Higgs, O.B.E.	..	L. A. H. Sayles	..	J. S. MacPhearson
M.V. <i>Port Hobart</i> ..	T. Kippins, O.B.E., D.S.C.	..	J. Aitchison	..	B. Evans
M.V. <i>Port Lincoln</i> ..	H. H. Smith, O.B.E.	..	C. A. Rhodes	..	F. Griffiths
M.V. <i>Port Chalmers</i> ..	R. S. Durham, O.B.E., D.S.C.	..	D. T. B. Blanford	..	T. Hargrave
M.V. <i>Priam</i> ..	L. W. Kersley	..	R. A. Hansell	..	G. C. Evans
M.V. <i>Pacific Exporter</i> ..	R. E. L. Holland	..	B. A. Gouldstone	..	R. P. McEwan
M.V. <i>Port Macquarie</i> ..	P. L. Hazlewood	..	A. W. Kensett	..	G. W. Bailey
M.V. <i>Port Wyndham</i> ..	H. Steele ..	..	W. Hopwood	..	P. Hobbs
S.S. <i>Paparoa</i> ..	E. A. J. Williams	..	R. L. Daniels	..	J. Jessop
S.S. <i>Queen of Bermuda</i> ..	A. T. Church	..	J. L. Anson ..	..	A. Morris
S.S. <i>Ranchi</i> ..	R. E. Tunbridge, D.S.C., R.D., Capt., R.N.R., A.D.C.	..	R. L. Pigeon	..	R. V. Gregory
M.V. <i>Roxburgh Castle</i> ..	J. M. Rayner, R.D., R.N.R.	..	W. Fletcher ..	..	S. P. C. Harden
M.V. <i>Rochester Castle</i> ..	D. D. MacKenzie ..	..	P. E. Carter ..	..	T. Peake
M.V. <i>Rowallan Castle</i> ..	J. F. Oatley ..	..	P. St. Q. Beadon	..	T. M. K. Knowles
S.S. <i>Regent Hawk</i> ..	J. Ward ..	..	W. Pinder ..	..	J. R. Twidell
S.S. <i>Recorder</i> ..	R. F. Longster	..	S. W. Sigsworth	..	W. E. Duffatt
S.S. <i>Rimutaka</i> ..	P. B. Clarke, M.V.O., O.B.E., D.S.C.	..	D. Dickens ..	..	A. Stenning
M.V. <i>Robert F. Hand</i> ..	E. J. Instone, O.B.E.	..	P. J. Roberts	..	A. L. McIvor
S.S. <i>San Felix</i> ..	J. B. Macarthy, O.B.E.	..	D. Stevenson	..	W. L. Radcliffe

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

SHIP	CAPTAIN	PRINCIPAL OBSERVER	SENIOR RADIO OFFICER
M.V. Sacramento	J. Robinson, M.B.E.	A. C. Dick	W. Parratt
M.V. Sarmiento	M. Armstrong, D.S.O.	J. W. Peck	A. R. Cox
S.S. Strathnaver	R. B. Beck	N. S. Jenner	J. Ormiston
S.S. Southern Opal	J. O. Bowie	G. A. Govan	J. Edward
M.V. Staffordshire	P. H. Potter	J. C. Priest	A. Rodger
M.V. Silvergava	W. G. Cole	N. C. Jones	R. Burrow
M.V. Sydney Star	T. S. Horn, O.B.E.	G. Cameron Smart	H. Lammas
M.V. Santander	J. Sutherland	H. Russell	T. Hills
S.S. Strathmore	D. M. Stuart, D.S.C.	D. M. Noble	J. P. Carey
M.V. Silverteak	E. L. Tilmouth	H. W. McConkey	J. L. Dunnett
S.S. Swainby	C. Yare	J. Bicknell	B. G. Kimble
S.S. Southern Harvester	S. Begg	E. G. Sutton	J. Sprrott
S.S. Southern Venture	H. Nilsen	F. A. Stewart	D. W. Miller
M.V. Stirling Castle	W. D. Roach	G. H. Hill	H. Oliver, M.B.E.
S.S. Thamesfield	D. A. Law	A. D. Lombard	G. Middleton
M.V. Warwick Castle	R. Wren, D.S.O.	J. C. Campbell	R. Brew
M.V. Waipawa	W. G. West	G. Watkins	W. Charlton



(Official U.S. Navy photograph)  
Waterspout in the Gulf of Tonkin, 8th August, 1945. Note the wind shear shown by the band of rougher water parallel to the line of cloud drawn into a spiral eddy system around the base of the waterspout. Other eddies or atmospheric wave motion also appear along the line of shear which may possibly develop into other waterspouts



## JULY, AUGUST AND SEPTEMBER

*The Marine Observer's Log* is a quarterly record of the more 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.

### CURRENT RIPS

#### Australian Waters

The following is an extract from the Meteorological Record of S.S. *Orion*. Captain C. Fox, C.B.E. Fremantle to Colombo. Observer, Mr. G. S. Willis, Jr., 3rd Officer.

29th July, 1947, 0506 G.M.T. (1306 Zone Time). Defined current rip effect observed, with clear-cut line of demarcation between broken and smooth water running for a considerable distance (approximately 5 miles as far as could be seen) in a curve from S to NE through NW. No squalls or variations in wind force.

Weather conditions: barometer 30.21 in. (corrected) steady, then falling slowly (.06 in. in 3 hours). Temperature: air 66°F., wet bulb 52.5, sea 71°. Wind SSW, force 3, steady. Sky partly cloudy, fine weather cumulus 3/10. Visibility very good.

Position of Ship: Latitude 27° 21' S., Longitude 110° 56' E.

#### Atlantic Equatorial Waters

The following is an extract from the Meteorological Record of M.V. *San Cirilo*. Captain T. L. Pearson. Montevideo to Curaçao. Observer, Mr. M. H. Jones, 2nd Officer.

28th September, 1947, 1745 G.M.T. Sighted extensive current rip running 160° to 340°, forming a demarcation line between water of different colouring. Water to W had a brackish appearance.

Position of Ship: Latitude 5° 12' N., Longitude 50° 45' W.

Course 303°. Speed 13.75 knots.

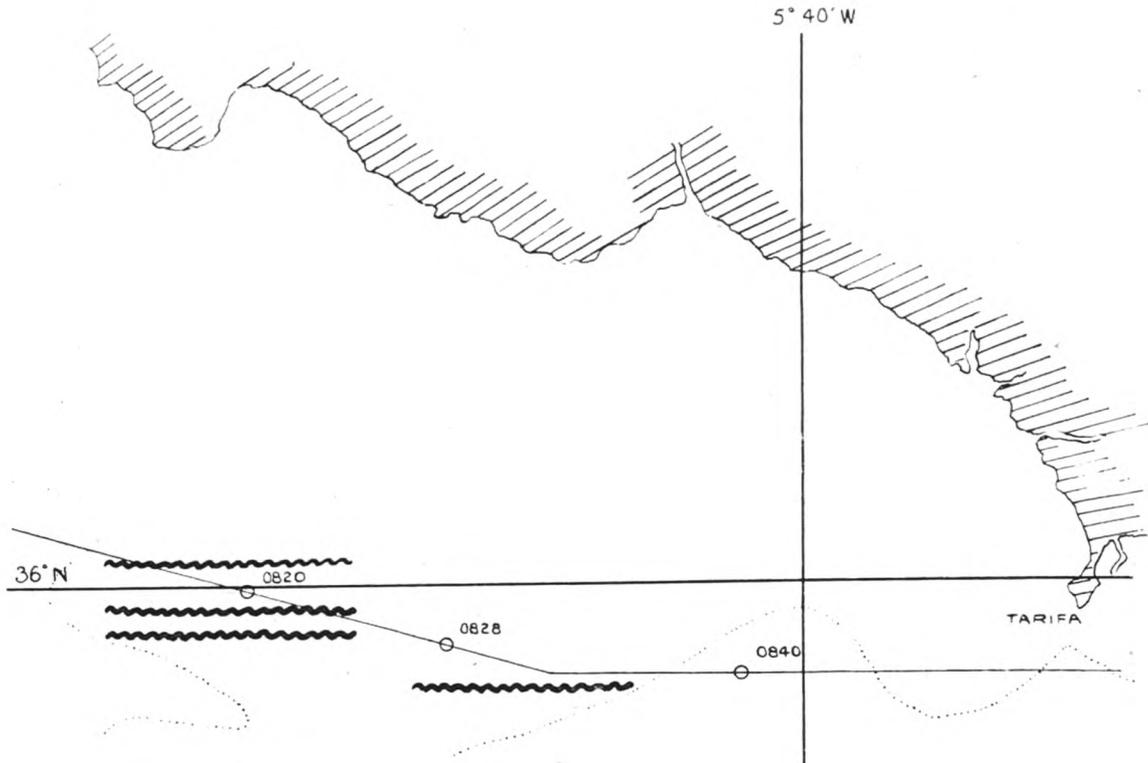
### TIDE RIPS

#### Straits of Gibraltar

The following is an extract from the Meteorological Record of M.V. *Cheshire*.

Captain F. C. Brooks. Liverpool to Port Said. Observer, Mr. T. R. Johnson, 2nd Officer.

5th September, 1947, 0820 to 0830 G.M.T. Very pronounced tide rips observed in the western approaches to the Straits of Gibraltar. Tide rips as shown running practically E to W with areas of calm between, although these areas had a disturbed appearance as if they were caused by two equal and opposite effects resulting in the illusion of calm. The rips observed at 0820 took the form of small violent agitations of water as if boiling vigorously. The rip of 0830 was in the form of a moderate sea, with nearly all waves breaking from the south, although the wind was W, force 3, at the time.



### FALL IN SEA TEMPERATURE Gulf of Aden

The following is an extract from the Meteorological Record of S.S. *Stratheden*. Captain S. W. S. Dickson. Aden to Colombo. Observer, Mr. R. N. Firth, 4th Officer.

10th July, 1947, 0400 to midnight G.M.T. The following observations were taken while rounding Guardafui.

G.M.T.	Lat. N.	Long. E.	Sea temperature °F.
0400	12 23	49 45	88
0800	12 11	51 00	85
1200	11 46	52 12	75
1600	11 28	53 24	77
2000	11 15	54 40	78
0000	11 04	55 53	80

*Note.*—Falls of sea temperature are frequently experienced in the region of Cape Guardafui and the coast immediately southward of it during the southwest monsoon period. This is due to upwelling of colder sub-surface water. Falls exceeding 20°F. have been recorded, the greatest usually being observed off Ras Hafun.

## FALL OF SEA SURFACE TEMPERATURE AND CURRENT EDDIES Westward of Galapagos Islands

The following is an extract from the Meteorological Record of M.V. *Orari*. Captain F. Pover. Balbao to Auckland. Observer, Mr. F. M. Williamson, 3rd Officer.

15th August, 1947, 1515 G.M.T. The ship passed through several lines of plankton, consisting of yellow-coloured microscopic organisms. A few minutes later a well-defined series of current eddies were observed. The ship had been set to the westward during the previous 24 hours. A sea temperature reading was taken and it was 5°F. lower than the previous reading taken three hours before.

Position of Ship : Latitude 00° 19'S., Longitude 96° 11'W.

*Note.*—Falls of sea temperature in the vicinity of the Galapagos Islands are not infrequently observed, and close to the main island a large sea temperature difference has been found between the windward and leeward sides attributed to the upwelling of cold sub-surface water due to the blowing of an offshore wind. The observation of M.V. *Orari* was, however, made too far westward of the islands to be accounted for in this way. A similar observation, somewhat further southward, was made by M.V. *Rangitiki* on 3rd October, 1938. Between noon (D.R. position lat. 4° 07'S., long. 93° 35'W.) and 8 p.m. (D.R. position lat. 4° 58'S., long. 95° 41'W.) sea temperature fell from 68° to 58°. In the region west and south of the Galapagos Islands the cold water of the Peru current is mixing with warmer water to form the beginning of the South Equatorial Current. Presumably streaks or patches of water of different temperatures lie adjacent to one another at times. Differences of direction in these mixing waters would tend to give rise to current eddies. The current observed by M.V. *Orari* from noon on 14th August to noon on 15th August set 222°, 40 miles per day. From noon on 15th August to midnight, the total fall of temperature was 18°, from 78° to 60°.

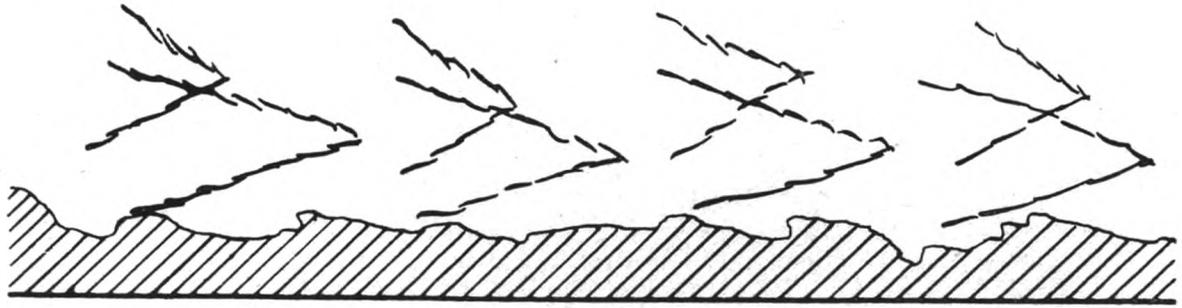
## CLOUD FORMATION

### East Indies

The following is an extract from the Meteorological Record of S.S. *Deebank*. Captain B. Rivett. Colombo to Nauru Island. Observers, Mr. D. Campbell, Chief Officer, and Mr. I. McKay, 3rd Officer.

18th July, 1947, 1200 G.M.T. (0600 A.T.S.). As the sun was setting a most peculiar cloud formation was noticed to the south of the vessel. Along the greater part of the horizon stretched low-lying cumulus cloud, whilst above this, in two layers, were altostratus clouds in the formation illustrated. Weather : Wind W × S, force 4. Cloud 3/10. Barometer 1006.6 mb.

Position of Ship : Latitude 5° 46'N., Longitude 92° 27'E.



## ARCHED SQUALLS

### Arabian Sea

The following is an extract from the Meteorological Record of M.V. *Saxon Star*. Captain D. J. Stratta. Aden to Australia. Observer, Mr. M. McClymont, 2nd Officer.

23rd July, 1947, 2345 G.M.T. Arched squall directly overhead, lying about NNE-SSW, estimated height of base of cloud 1,500 ft. Frequent rain squalls visible along its length. Light rain consisting of large droplets experienced by ship. Wind previous to squall SSW, force 3, freshened to force 5 for only 5 minutes while squall was overhead. Surrounding sky almost entirely clear except for small scattered cumulus fragments.

Course 129°(T). Speed 11 knots.

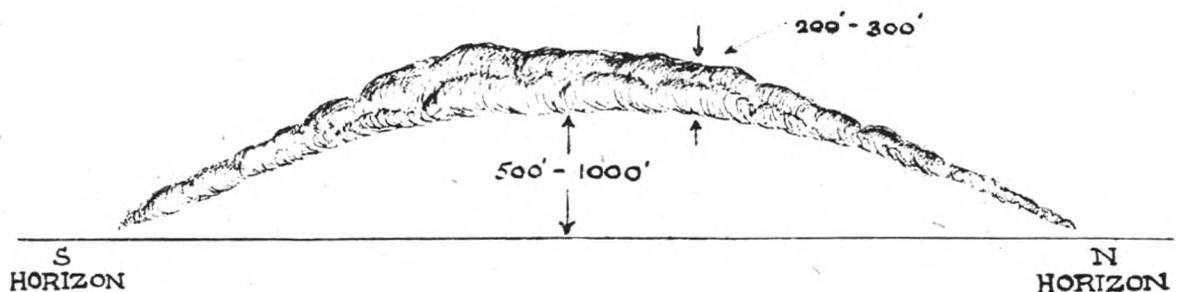
Position of Ship: Latitude 05° 55'N., Longitude 60° 10'E.

### Straits of Gibraltar

The following is an extract from the Meteorological Record of S.S. *Mahout*. Captain T. C. Eddy. Port Said to Dungeness. Observer, Mr. O. Pritchard, 2nd Officer.

19th July, 1947, 1140 to 1150 G.M.T. At 1140 an arc of squall cloud was sighted on the western horizon approaching the ship and moving against the wind. At 1150 the cloud passed over the ship with a heavy shower lasting about one minute, the wind veering to W and freshening. As soon as it was over the wind died down. Weather conditions at 1200: Barometer 1008.5 mb. Temperature: air 80°F., wet bulb 79°, sea 77°. Wind E, force 1.

Position of Ship at noon: Latitude 37° 17'N., Longitude 10° 33'E.



## SQUALL Pacific Ocean

The following is an extract from the Meteorological Record of S.S. *Pipiriki*. Captain R. G. Rees. Balbao to Sydney, N.S.W. Observer, Mr. J. Bryant, 2nd Officer.

13th August, 1947, 0033 G.M.T. Wind suddenly increased from ENE 6 to hurricane force, accompanied by heavy rain. The barometer commenced to fall after wind had reached its height. The wind then veered almost 16 points from a NE'ly to a SW'ly direction and temperature fell 4°F. At the height of the disturbance the wind shifted between NE and SE. The sea was confused and lashed to a white foam which, with the rain, was driven horizontally across the ship. These conditions prevailed for about 30 minutes and then the wind eased to SSE 6/7. The heavy S'ly swell did not increase noticeably. The barometer steadied at 1014.8 mb. having fallen 2.2 mb. and then rose slowly after the disturbance had passed.

Position of Ship : Latitude 24° 23'S., Longitude 155° 21'W.

## FOG Straits of Gibraltar

The following is an extract from the Meteorological Record of S.S. *Clan Chattan*. Captain H. C. Simpson. Gibraltar to London. Observer, Mr. P. W. Howells, 3rd Officer.

11th September, 1947, 1000 G.M.T. approximately. Just after passing through the Straits of Gibraltar a strange layer of fog was sighted on the port bow. It consisted of a solid layer of fog, very thick and black, stretching for about 30 miles and about 1,500 ft. high. The top edge of the bank was practically dead straight. Topping this was a layer of cumulus clouds, about 2,000 ft. thick and stretching over a distance of 35 to 40 miles. The clouds were very white, giving a vivid contrast of black and white. As we passed the layer a very cold wind blew straight off the bank, causing the thermometer to drop 5° quickly. The whole drifted slowly in an easterly direction over the Straits of Gibraltar.

Position of Ship : Latitude 36° 00'N., Longitude 5° 45'W.

## EXCEPTIONAL VISIBILITY Pacific Ocean

The following is an extract from the Meteorological Record of S.S. *Akaroa*. Captain W. J. Williams. Balboa to Auckland, N.Z. Observer, Mr. J. Tierney, 3rd Officer.

2nd August, 1947, 2228 G.M.T. Papa Island, bearing 348°, 51 miles. The high land of the island was observed very clearly and standing well over the horizon. Summit subtended an angle of 0° 08', height of eye 55 ft. Barometer 1020.0 mb. Wind S, force 4. Air temperature 62°F.

Position of Ship : Latitude 28° 25½'S., Longitude 144° 09'W.

## WATERSPOUT

### Caribbean Sea

The following is an extract from the Meteorological Record of S.S. *Swainley*. Captain C. Yare. Vancouver to United Kingdom. Observer, Mr. G. W. Lammond, 1st Officer.

27th July, 1947, 0045 G.M.T. A large waterspout was observed to be forming on the northern edge of large cumulonimbus cloud and its base was within 50 yards of the ship. It was preceded by a vivid flash of lightning. Wind NE, force 5, freshening to force 6 to 7 and maintaining the same direction as the spout passed.

Position of Ship : Latitude  $17^{\circ} 30'N.$ , Longitude  $75^{\circ} 18'W.$

## DUST DEVIL

### South-east Coast of Arabia

The following is an extract from a letter received from Captain F. V. Goodchild, O.B.E., the Master of M.V. *British Baron*.

26th November, 1947, 0620 G.M.T. Off Ras Fartak, about  $8\frac{1}{2}$  miles off the land, saw what appeared to be a sand spout reaching from the sandy shore to the base of fairly heavy Cu. It seemed to be about a mile inland. The column was fairly broad and led up to a line of Cu. with a definite horizontal base running parallel to the coast line. There was very little cloud over the sea, visibility was maximum, sea light, wind E, force 3, aneroid barometer 29.88 (uncorrected) and air temperature  $80^{\circ}F.$  It remained for about 5 minutes before it dispersed. Speed 12 knots. Course  $244^{\circ}.$

Position of Ship : Latitude  $15^{\circ} 29'N.$ , Longitude  $52^{\circ} 15\frac{1}{2}'E.$

*Note.*—This is an interesting observation on account of the great height to which the column reached. It does not seem possible for the coarser sand grains to be carried up to such a height, so that the column was probably composed of fine dust. It is stated that dust devils occasionally reach heights up to 2,000 or 3,000 ft.

## DISCOLOURED WATER

### West Coast of India

The following is an extract from the Meteorological Record of S.S. *City of Sydney*. Captain J. B. Maclaren. Bombay to London. Observer, Mr. L. G. Powell, 3rd Officer.

4th September, 1947. Patches of red observed on the surface of sea and the compasses swerved  $20^{\circ}$  on each side of course. The master's opinion was that the dark red patches were iron ore sweepings coming from the mouth of the Periyar River.

Position of Ship : Latitude  $10^{\circ} 16'N.$ , Longitude  $76^{\circ} 00'E.$

## PHOSPHORESCENCE

### Arabian Sea

The following is an extract from the Meteorological Record of M.V.

*Worcestershire*. Captain R. S. Evans. Bombay to Suez. Observer, Mr. R. S. Fielder, Senr. 3rd Officer.

12th September, 1947, 0400 to 0515 G.M.T. At 0400 sea normal, sky completely covered with stratocumulus at 5,000 ft. approximately. Wind fresh from SW, moderate sea and long heavy SW'ly swell. At 0430 observed a whiteness ahead which at first appeared as a low-lying fog bank. On nearer approach it was seen that the sea itself was quite white and looked like breakers. Soundings were taken but no bottom found at 130 fathoms. Demarcation between normal and white sea was very plain, running NW to SE. Sea temperature before entering this area of whiteness was 76°F. At 0450 vessel entered this area, which stretched from horizon to horizon on both sides, and at 0505 the whole visible ocean was white with more of a diffused light than normal phosphorescence. The crests of waves were visible by their blackness against this uniformly lit sea. Two fish showed up as black and left no trail behind as they swam away. Sea temperature was now 77°. At 0515 vessel commenced to run out of this area, the line of separation was less pronounced on the SW side. Sea temperature started to fall, and by 0700 was 71° and remained steady. Course 250°. Speed 13 knots.

Position of Ship : Latitude 18° 15'N., Longitude 58° 35'E.

#### **Gulf of Aden**

The following is an extract from the Meteorological Record of S.S. *Mahsud*. Captain R. Humble. Aden to Colombo. Observer, Mr. A. P. Briggs, 3rd Officer.

15th September, 1947, 2000 A.T.S. The sea ahead was observed to be gradually changing to a dull phosphorescent glow. At 2015 A.T.S. the glow was similar in intensity to the luminous dial on a watch, and it stretched N and S as far as the eye could see. At 2100 the sea reached its greatest brilliance, making the horizon appear black compared with the water. Above an angle of 10° the stars were easily seen. At 2200 the glow on the sea gave the appearance of shoal water and there was no brilliant phosphorescence sparkle usually seen from the wash of the vessel. Weather conditions : Temperature air 76°F., sea 73°. Wind S'ly, force 4. Sky cloudless. Course 090°. Speed 11 knots.

Position of Ship : Latitude 12° 46'N., Longitude 52° 10'E.

#### **GREEN FLASH**

##### **Gulf of St. Lawrence**

The following is an extract from the Meteorological Record of S.S. *Beaverlake*. Captain C. L. de H. Bell, D.S.C. Montreal to London. Observer, Mr. R. Walgate, 2nd Officer.

2nd September, 1947, 0905 G.M.T. At sunrise, when the upper limb of the sun became visible, brilliant green flash was observed lasting about 1.5 seconds and approximating to the flash of a green-shaded Aldis lamp at one mile range. Weather conditions : Barometer 29.85 in. Temperature : air 47°F., sea 49°. Visibility 9. Sky clear, with traces of Cc. and Ac.

Position of Ship : Latitude 50° 48'N., Longitude 58° 08'W.

## MIRAGES AND GREEN FLASH

### Australian Waters

The following is an extract from the Meteorological Record of S.S. *Orion*. Captain C. Fox, C.B.E. Fremantle to Colombo. Observer, Mr. G. S. Willis, Jnr. 3rd Officer.

28th July, 1947, 1000 G.M.T. (1800 Zone Time). On the departure from Fremantle there was exceptional visibility, with pronounced effect of refraction. The sun had set 13 minutes earlier with a slight green flash, somewhat bluish-green actually. Several objects appeared to NW on the horizon which bore a marked resemblance to icebergs. They were of such a sharp and clearly defined character as to excite comment from all who saw them, and it was difficult to believe that they were fragments of cumulus (possibly tops of cumulonimbus) in an otherwise cloudless sky. Earlier in the day, before A.M. civil twilight under similar weather conditions, a distinct mirage effect had been noted when approaching Rottneest Island. The light was not visible at full range, but when finally picked up as the first light of dawn was coming into the sky, it appeared to be flashing from top and bottom of the lighthouse. No radar reflection appeared on scan until 1705 M.T.S. from lighthouse. Weather conditions: Barometer 30.27 in. (uncorrected) Att. ther. 68°F. Temperature: air 65°, wet bulb 57°. Wind WSW, force 1/3.

Position of Ship: Latitude 31° 48'S., Longitude 115° 42'E.

## LUNAR RAINBOW

### Leaving English Channel

The following is an extract from the Meteorological Record of M.V. *New Zealand Star*. Captain G. Owen, O.B.E. London to Australasia. Observer, Mr. D. J. Thomas, 3rd Officer.

29th July, 1947, 0230 G.M.T. The moon three-quarters full, with an approximate altitude of 25°, was observed dead ahead. Astern of the ship and covering some 3/10 of the sky was a mass of white cumulus. Ahead, was about 2/10 stratocumulus, through a gap in which the moon shone. The remainder of the sky was clear. Immediately astern of the ship was observed a lunar rainbow of a startlingly bright milky hue and, just ahead, another, larger but not so vividly bright as the one astern. These bows appeared to be not much more than the ship's length apart (600 ft.) and both were completely visible throughout their entire arcs. There had been no rain or drizzle for the previous eight hours, the sky being mainly clear of cloud. Neither had there been any suspicion of fog or haze, although these had been experienced 12 hours earlier. These phenomena were also seen by Cadet M. J. Slessor. Course 210°. Speed 16 knots.

Position of Ship: Latitude 47° 45'N., Longitude 06° 00'W.

*Note.*—This observation of the second bow, that ahead of the ship and thus between the moon and the observer, is a very remarkable one, but in the

absence of angular measurements it cannot be fully explained. Two points of interest arise : (i) a rainbow is known to be formed in the position stated, but it is so faint that observations of it are extremely rare—furthermore, according to optical theory it should be of approximately the same size as the primary rainbow, whereas the bow observed was larger; (ii) if conditions were so exceptional that this tertiary bow was fairly bright, one would have expected that the ordinary secondary bow, seen above and outside the primary bow, would have been readily visible. It does not, however, appear to have been seen.

## SOLAR HALO

### Atlantic Ocean

The following is an extract from the Meteorological Record of S.S. *Pipiriki*. Captain R. G. Rees. Newport News to Curaçao. Observer, Mr. M. J. Heron, 3rd Officer.

25th July, 1947, 1630 G.M.T. Pronounced halo visible round the sun. Radius  $22\frac{1}{2}^{\circ}$  and approximate width  $1^{\circ}$ . The inside was white and the outside edge a light violet. At 1645 the colours became more pronounced but only half the halo was visible owing to cloud, and at 1650 it had disappeared. The sky was  $\frac{5}{10}$  covered with light Cc. and Cs.

Position of Ship : Latitude  $32^{\circ} 41' N.$ , Longitude  $73^{\circ} 38' W.$

*Note.*—This is an interesting observation since the visibility of violet colouring on the outer edge of a halo is extremely rare. Even the blue can seldom be recognised. Another unusual feature is the whiteness of the inner edge of the halo, which, if the colouring was so distinct as to show blue or violet, would normally be reddish.

## AURORAE

### Australian Waters

The following is an extract from the Meteorological Record of M.V. *Empire Star*. Captain S. J. C. Phillips, C.B.E. Beira to Melbourne. Observer, Mr. J. T. Brown, 3rd Officer.

15th August, 1947, 1845 A.T.S. Soon after sunset a very bright and well-defined Aurora Australis was seen. A reddish pink glow suffused the sky, fluctuating greatly in brightness and altitude, but remaining between  $135^{\circ}$  and  $220^{\circ}(T)$ . At its brightest it resembled the reflection on cloud of a burning city, although the sky was comparatively clear in the direction of the phenomenon. Reaching a maximum altitude of  $15^{\circ}$ , the glow formed a crude segment of a circle between the bearings. Many beams of white light shooting up from the horizon like searchlights were seen, but these lasted only a few seconds each and were quite distinct from the glow. The aurora was brightest and more constant at the low extremities and lasted until 0815 A.T.S. next morning.

Position of Ship : Latitude  $39^{\circ} 05' S.$ , Longitude  $117^{\circ} 25' E.$

The following is an extract from the Meteorological Record of S.S. *Stratheden*.

Captain S. W. S. Dickson. Aden to Colombo. Observer, Mr. R. N. Firth, 4th Officer.

17th to 18th August, 1947, 2330 to 0115 A.T.S. Aurora Australis was seen, but owing to cloudy conditions observations were not very good. The base of the fractocumulus clouds were tinged with yellow, changing to pale pink, with a background of dull red rising  $10^{\circ}$  to  $15^{\circ}$  from the horizon.

Position of Ship : Latitude  $35^{\circ} 23'S.$ , Longitude  $122^{\circ} 42'E.$

The following is an extract from the Meteorological Record of M.V. *British Pilot*. Captain R. O. Cash. Abadan to Melbourne. Observer, the Master.

22nd August, 1947, 1030 G.M.T. A display of Aurora Australis was observed in the southern sky. This took the form of a red-coloured patch at about  $20^{\circ}$  altitude, which gradually increased in size and intensity until an almost regular arc was formed, measuring  $115^{\circ}$  in azimuth from end to end, and  $40^{\circ}$  in altitude at the summit, with a width of from  $15^{\circ}$  to  $30^{\circ}$ . Colour was a vivid red with what appeared to be a very pale green area surrounding it and broad shafts of white light rising vertically through it from the horizon. Sky beneath the summit was extremely bright down to the horizon clouds at about  $8^{\circ}$  altitude. This effect waned at 1115 and disappeared completely, except for the brightness of the sky, at 1130. A similar aurora appeared again between 1230 and 1340. No unusual radio interference was observed and no extraordinary magnetic deviation. Weather conditions normal. Clear and partly cloudy, with bright "first quarter" moonlight. Wind W, force 4. Air temperature  $50^{\circ}F.$  Barometer 1022 mb., steady.

Position of Ship : Latitude  $36^{\circ} 40'S.$ , Longitude  $126^{\circ} 10'E.$

Note.—M.V. *Rangitata* reported on 22nd August, lat.  $36^{\circ} 02'S.$ , long.  $179^{\circ} 56'E.$  "1000 to 1200 G.M.T., display of Aurora Australis : moderate intensity."

The following is an extract from the Meteorological Record of M.V. *British Endurance*. Captain W. Watkin-Thomas. Port Pirie, Australia, to Abadan. Observer, Mr. A. D. Millar, Chief Officer.

22nd August, 1947, 1100 G.M.T. Aurora observed as a large vermilion red glow in the SSE. This glow was circular in shape and remained bright for 14 minutes, and then disappeared abruptly. At 1245 a vivid vermilion red shaft of light was seen from ESE to SW and remained visible for 4 minutes before disappearing abruptly. No further occurrences were observed.

Position of Ship : Latitude  $35^{\circ} 35'S.$ , Longitude  $125^{\circ} 10'E.$

The following is an extract from the Meteorological Record of S.S. *Nestor*. Captain E. W. Powell. Durban to Fremantle. Observer, Mr. W. A. Clark, 2nd Officer.

24th September, 1947, 1830 G.M.T. Brilliant display of Aurora Australis extending from SE to SW between altitude  $5^{\circ}$  and  $25^{\circ}$ . Bright red with slight curtain and streamer effects which lasted approximately 30 minutes, then faded to dull pink glow. Sky at time, slightly clouded with bright moonlight.

Position of Ship : Latitude  $36^{\circ} 00'S.$ , Longitude  $100^{\circ} 00'E.$

*Note.*—M.V. *Port Macquarie* in Sydney Harbour observed Aurora Australis between 2200 and 2300 G.M.T. on this date.

#### **Approaching Point Aux Basques, Newfoundland**

The following is an extract from the Meteorological Record of S.S. *Leicester*. Captain H. D. Horwood, R.D., R.N.R. London to Newfoundland. Observer, Mr. V. T. Andrews, 3rd Officer.

18th August, 1947, 0040 G.M.T. Two or three faint rays of light were observed above a layer of cloud over the coastline. The rays increased in height, brightness and clarity, and were white to yellow. They quickly appeared over the whole northern skyline, seemed to have a common focal point and were slightly fan-shaped. This effect was reduced as they lost their individuality from about 0300 and became diffused patchy light. "Merry Dancers" was observed continually at the height of this display, with rays reaching observer's zenith. The diffused light gradually faded, and disappeared before dawn. Visibility unusually good, sky nearly cloudless, with low layer of St. over the coastline. There was no apparent change in deviation of the compass and no audibility. Weaker examples of aurora were seen on several following nights.

Position of Ship : Latitude  $47^{\circ} 20' N.$ , Longitude  $58^{\circ} 45' W.$

#### **North Atlantic Ocean**

The following is an extract from the Meteorological Record of S.S. *Cornwall*. Captain J. W. C. Pring. New York to Curaçao. Observer, Mr. J. M. James, 3rd Officer.

13th September, 1947, 0210 G.M.T. Aurora Borealis was seen for about 10 minutes. The sky was reddish, with white rays of light passing through. The display covered  $20^{\circ}$  of the horizon between N and NNE and  $10^{\circ}$  of angle vertically. The night was moonless and cloudless.

Position of Ship : Latitude  $35^{\circ} 40' N.$ , Longitude  $72^{\circ} 28' W.$

Other reports of aurora on 13th September were as follows :

M.V. *Rangitiki* at 0600 G.M.T. in North Atlantic Ocean, lat.  $40^{\circ} 21' N.$ , long.  $72^{\circ} 03' W.$  "Distinct aurora."

S.S. *Beaverdell* at 0000 G.M.T. in North Atlantic Ocean, lat.  $52^{\circ} 07' N.$ , long.  $16^{\circ} 00' W.$  "Northern Lights discernable, shooting rays altitude  $20^{\circ}$ ."

S.S. *Eastern* at 1200 G.M.T. in Australian waters, lat.  $35^{\circ} 25' S.$ , long.  $124^{\circ} 10' E.$  "Aurora Australis visible."

### **METEORS**

#### **Atlantic Equatorial Waters**

The following is an extract from the Meteorological Record of S.S. *Memling*. Captain D. C. Roberts. Rio Grande do Sul to Las Palmas. Observer, Mr. G. T. Piper, 2nd Officer.

24th September, 1947, 0300 to 0500 G.M.T. A large number of meteors were observed on bearings varying between N and NE, in particular, one bearing NNE at 0400 approximately, extremely bright with a distinct greenish

tinge. First observed near the zenith, after descending rapidly to about  $30^\circ$ , it burst into several fragments, at least three of which fell separately for a considerable distance before disintegrating and disappearing. No detonation was heard.

Position of Ship : Latitude  $1^\circ 47'N.$ , Longitude  $29^\circ 12'W.$

#### North Atlantic Ocean

The following is an extract from the Meteorological Record of S.S. *Loch Ryan*. Captain W. H. Grimshaw. London to Bermuda. Observer, Mr. C. Hartley, Snr. 2nd Officer.

5th July, 1947, 0028 G.M.T. A meteor was observed, appearing at an altitude of  $25^\circ$ , bearing  $350^\circ$ , and travelling in a W'ly direction, finally disappearing bearing  $300^\circ$ , altitude approximately  $15^\circ$ . The meteor first appeared with a bright flash, giving sufficient light by which to read a watch, and then continued at a magnitude of about  $-4$ , greenish-white at the commencement, gradually turning to blue. The tail extended  $3^\circ$  to  $4^\circ$ . Duration approximately 10 seconds.

Position of Ship : Latitude  $35^\circ 26'N.$ , Longitude  $55^\circ 30'W.$

#### South African Waters

The following is an extract from the Meteorological Record of M.V. *Kenilworth Castle*. Captain G. H. Mayhew. Mauritius to Lourenço Marques. Observer, Mr. J. C. Forster, 3rd Officer.

7th July, 1947, 1810 G.M.T. The N sector of the sky was lit up by a blue flash lasting 3 seconds approximately. The vessel was lighted as if by daylight when a meteor of approximately  $-5$  magnitude fell from  $25^\circ$  to  $5^\circ$  bearing  $315^\circ(T)$ , duration of flight 4 seconds. The meteor increased in size as it fell and had a tail for the last 2 seconds ; then it burst, emitting red, blue and yellow flashes.

Position of Ship : Latitude  $25^\circ 49'S.$ , Longitude  $37^\circ 07'E.$

### THE MEETINGS OF THE INTERNATIONAL METEOROLOGICAL ORGANISATION IN TORONTO AND WASHINGTON

AUGUST, SEPTEMBER AND OCTOBER, 1947

The meetings of the International Meteorological Organisation (I.M.O.) which were held in Toronto and Washington from the beginning of August to mid-October, 1947, were of unusual interest, not only on account of the results achieved but also because of some of the precedents that were created. It was the first time in its seventy-five-year history that any of the constituent bodies of the I.M.O. had met in the New World, and it was also the first occasion that all ten of the Technical Commissions had met together at the same time.

During the war the activities of the Organisation were seriously curtailed, but as soon as possible after the return of peace, steps were taken to set its

machinery in motion once again. An extraordinary Conference of Directors was held in London in February, 1946, during which new members of the International Meteorological Committee were elected and the Technical and Regional Commissions reconstituted. This Conference thus cleared the way for a resumption of the international procedures in operation before the war and for the world-wide introduction of improvements in the field of scientific meteorology made by certain countries during the war.

The objects of the meetings at Toronto and Washington were therefore to review and consolidate the progress made since the London Conference, to make plans for the future and to consider the structure of the I.M.O. and its relation to other international associations.

The meetings of the ten technical commissions were held in Toronto during August and the first two weeks of September, and were attended by 179 delegates from forty-four countries. The meetings took place in the buildings of the University. The Conference of Directors, under the chairmanship of Sir Nelson Johnson, President of the International Meteorological Organisation, opened in Washington on 22nd September and terminated in mid-October.

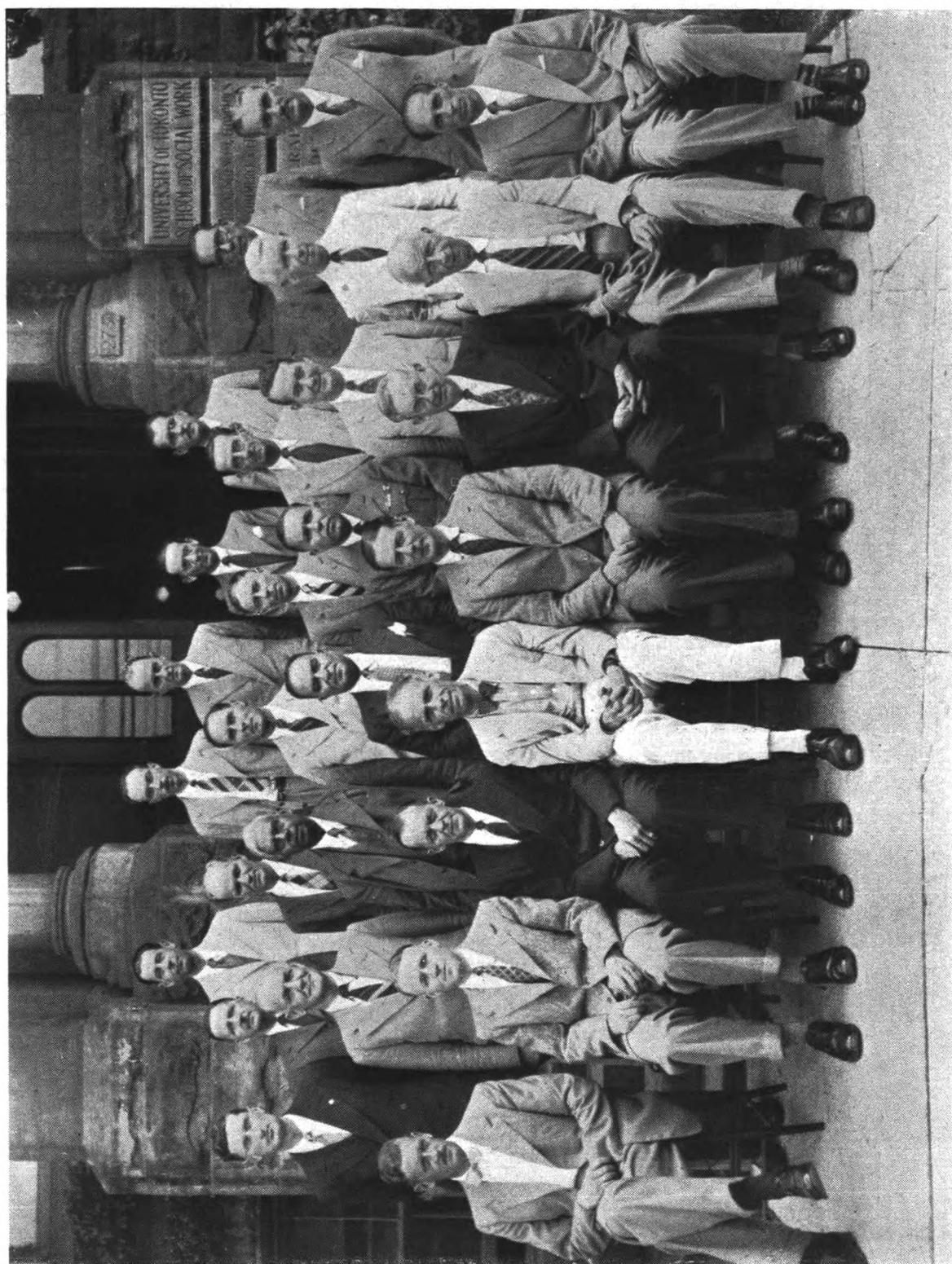
It is the function of the Technical Commissions to consider their respective subjects and to make recommendations on them for consideration by the Conference of Directors. On this occasion over 400 resolutions were submitted by the Technical Commissions to the Conference of Directors. It is, therefore, logical to consider first the work of the commissions by giving a summary of the activities of each one, written by the United Kingdom delegates attending its meetings.

**Aeronautical Commission** (President, Mr. A. H. Nagle, Eire).—This Commission, whose meetings extended over three weeks, prepared, as its most important task, a common text for the International Civil Aviation Organisation (I.C.A.O.) and I.M.O. regulations for the provision of meteorological facilities to international aviation. Taking as a basis the "Recommendations for Standards, Practices and Procedures" produced by the Meteorological Division of I.C.A.O. the Commission agreed the changes which would be necessary to make the text of that document suitable for the I.M.O. publication "Règlement général pour la protection météorologique de l'aéronautique." The text so amended was submitted to the Conference of Directors of the I.M.O. and to the Council of I.C.A.O. for approval.

There was a very detailed discussion on the question of codes for use in the transmission of terminal and route forecasts to ground stations and aircraft and of weather reports to and from aircraft. The agreed codes were later confirmed by the Commission for Synoptic Weather Information of the I.M.O. and by the Meteorological Division of I.C.A.O. at a special meeting held in Montreal on 17th September.

Other matters upon which resolutions were prepared by the Commission were climatological statistics for aeronautical purposes, the qualifications necessary to be held by the meteorological staff engaged in providing the weather service for aviation, the exchange of publications on "pressure-pattern flying" and methods of constructing upper-level charts.

**Commission for Maritime Meteorology** (President, Commander C. E. N. Frankcom, R.N.R., United Kingdom).—In considering the first visit of



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International Meteorological Organisation—Commission for Maritime Meteorology (Toronto, 1947)

this Commission to the American continent it is of interest to note that it was an officer of the U.S. Navy, M. F. Maury, who was instrumental in convening in 1854 the first international meteorological conference, and who was responsible for the commencement of organised meteorological work at sea.

Probably the most important work of the Commission was the creation of a world-wide scheme for improving the network of meteorological reports from ships in every ocean. For these reports meteorologists are largely dependent upon the goodwill of voluntary observers in the merchant ships of all nations. One difficulty in connection with this problem is that, if all the ships of the world sent in messages at each international hour (0000, 0600, 1200 and 1800 G.M.T.) there would still be large gaps in the marine network because ships tend to keep to fixed tracks. There are also serious communication problems to be considered as many ships have limited radio facilities. A number of resolutions were passed whereby maritime countries are encouraged to recruit ships to send in reports, and the oceans have been divided into agreed areas from which ships make their weather messages to selected meteorological centres. In return for these weather messages it is the duty of the meteorological service concerned to issue adequate weather information to the shipping in that area.

Further resolutions on this problem proposed the establishment of meteorological liaison officers to keep contact with merchant shipping in the major ports of the world. To reduce the gaps in the marine network, the Commission recommended the establishment of automatic weather stations on islands and the detection of distant storms by radio means, by microseismic observations and by aircraft reconnaissance. A scheme to provide for the co-operation of whaling vessels in the Antarctic was also put forward.

In co-operation with other Commissions, the Commission made recommendations on methods of obtaining improved accuracy in reports from the sea, and also drew up proposals for an international meteorological publication for the use of seamen. As a result of research carried out during the war by U.S. and British naval experts, considerable interest has been displayed in wave measurement at sea and a new technique has been evolved. The Commission has recommended that, in future, ships shall be requested to report the direction, period and height of waves at sea. It is considered that the reports thus received will not only enable forecasts to be made of wave conditions in distant areas but will be of considerable scientific value. In many parts of the world (e.g. the exposed shores of Portugal, Morocco and the Azores) wave forecasts are of considerable commercial importance. A knowledge of waves is also vital for aircraft operation and is of interest to ship designers. The Commission drew up a simple code for reporting ice at sea and set up a special Committee of experts to revise the present international ice nomenclature, which is somewhat out of date. Recommendations were also made concerning the treatment of marine climatological data.

**Commission for Synoptic Weather Information** (President, Mr. E. Gold, United Kingdom).—The Toronto meeting of the Commission for Synoptic Weather Information (C.S.W.I.) was a momentous one in many ways. To appreciate its special character it is necessary to recapitulate briefly the events of the previous two years.

At the beginning of the war the Copenhagen (1929) code for international

exchange of weather reports was in universal use, and it fulfilled the requirements then existing. During the war, however, the growing needs for increased precision led the allied nations to agree upon certain modifications and additions. In particular it was found necessary to use two code figures instead of one for visibility and height of cloud. Extensive changes were also made in the codes for reporting upper winds, temperatures and humidities, and, in addition, entirely new codes were introduced for the exchange of analyses, reports from aircraft, spheric reports and reports to aircraft in flight. The code situation at the end of the war was therefore exceedingly complex. At the Extraordinary Conference of Directors held in London in February-March, 1946, the I.M.O. provisionally approved a number of the war-time codes, and decided that the C.S.W.I. should meet at an early date to consider the many urgent problems awaiting solution. The C.S.W.I. accordingly met in Paris in June, 1946, faced with the immense task of re-examining practically all the existing weather codes and specifications and recommending new codes for universal adoption; the report of the Paris meeting (I.M.O. Publ. No. 54) runs to nearly 500 closely printed pages. Most of the 56 resolutions were approved at a meeting of the International Meteorological Committee held immediately afterwards.

It was reasonable to suppose that this meeting would have resolved most of the difficulties, but the new Paris codes did not, unfortunately, meet with unqualified approval and it became evident that discussions would have to be re-opened at the Toronto meeting, which had been planned for August-September, 1947.

The meeting was held in the Economics Building of the University from 25th August to 13th September. The discussions were long and arduous, but it is gratifying to record that unanimous agreement was finally reached on the question of a universal code for surface reports, the main subject of contention. The new code retains the more important features agreed at Paris (two figures for visibility, cloud height and wind speed) while at the same time meeting the wishes of those services which do not require reports of barometric tendency in an obligatory group.

Other important changes agreed at Toronto were a new world-wide system of five-figure index numbers for stations, the specification of cloud amount by eighths instead of by tenths, and the specification of surface wind direction by units of ten degrees (scale 01-36) instead of by points (scale 01-32). In a short note it is impossible to list all the subjects discussed, but reference may be made to papers on the synoptic applications of upper air data and spheric observations by Dr. R. C. Sutcliffe and Mr. C. K. M. Douglas respectively, which provided pleasant scientific relief from the discussion on codes and specifications.

**Commission for Instruments and Methods of Observation** (President, Dr. J. Patterson, Canada).—C.I.M.O., to give it its abbreviation, is a new Commission instituted by the Conference of Directors of the International Meteorological Organisation which was held in London in 1946. The first meeting of the Commission took place in Toronto from 4th to 16th August, 1947, under the presidency of Dr. J. Patterson, formerly Controller of the Canadian Meteorological Service. As the Commission was starting from scratch the President had drawn up a formidable agenda of some

120 items and sub-items with a view to surveying the whole field of meteorological instruments and methods. Eight temporary sub-commissions were formed to consider different sections of the field and to discuss the more important items in detail.

The discussions on the various instruments and methods usually turned on questions of standardisation. The general feeling about this was that, although a considerable degree of standardisation of meteorological instruments is desirable, to attempt to standardise the design of relatively new equipment, such as radio-sondes, would tend to discourage further development. It was, however, agreed that intercomparison of different types is necessary, and to facilitate this in the case of radio-sondes a recommendation was made for the development of a simple reference instrument, preferably employing the Olland principle, which would not need elaborate ground equipment and which could therefore be readily used as a standard for comparison by any country.

In barometry it was suggested that a conventional standard of gravity, not subject to revision, should be used and that uniformity of practice between meteorologists and physicists should be the prime consideration in adopting a standard value. A number of recommendations were made on the design of fixed cistern barometers and on the method of reduction of pressure to standard levels. Problems of visibility measurement were considered and some changes in international practice were recommended. The Commission was of the opinion that the estimation of visibility in the day-time at land stations is better done by the simple visual method than by means of a visibility meter. Other items discussed included the standardisation of thermometers and of psychrometric methods. The special needs of aviation both in regard to the measurement of wind and gustiness and to the measurement of cloud height were considered.

It was hardly to be expected that the Commission would, at its first meeting, be able to provide all the answers to the many problems which it reviewed, but a good start was made on the more important items, and a number of resolutions were drafted for submission to the Conference of Directors at Washington in September. In order to facilitate the continuation of work on outstanding problems six permanent sub-commissions were formed and the following Presidents chosen :

Actinometry :	Dr. A. Angström, Sweden.
Atmospheric optics :	Mr. W. E. K. Middleton, Canada.
Barometry :	Dr. K. Langlo, Norway.
Experimental aerology :	Dr. J. Lugeon, Switzerland.
Guide to international meteorological instrument and observing practice :	Dr. F. J. Scrase, United Kingdom.
Station instrumentation and exposure :	Dr. C. F. Brooks, United States.

At the end of the meeting in Toronto, Dr. Patterson was re-elected President of C.I.M.O. and M. E. Papillon was elected Vice-President.

**Aerological Commission** (President, Dr. S. Petterssen, Norway).—Aerology had a definite meaning in the days when observations in the free atmosphere were few and hard to make, but today the methods of observation

have been taken over by the instrument specialists and the discussion and interpretation of the results forms the normal field of activity of the meteorological physicist or weather forecaster.

Thus while the Aerological Commission surveyed during its meetings the instrumental, observational and operational aspects of world aerology, it decided to leave the final consideration of these matters to the appropriate Commissions and to devote the major part of its activity to the scientific and technical use of the collected upper air data.

Some of the matters considered by the Commission were :

- (1) Definitions and specifications of aerological constants and parameters.
- (2) Exchange of aerological analyses between neighbouring areas of the world.
- (3) Development of a precision radio-sonde.
- (4) Value of aircraft reconnaissance flights in obtaining upper air data.
- (5) Arrangement of " International aerological days."
- (6) Use of " swarm " radio-sonde ascents in special weather situations.
- (7) Frequency and times of routine upper air ascents.
- (8) Use of atmospheric-location (sferics) and radar in aerological analysis.
- (9) Use of rockets for upper air sounding.
- (10) Routine upper air observations on Ocean Weather Ships.

Special mention should be made of the brave attack referred to under (1) above on the problem of the definitions and numerical values of certain physical functions and numerical values used in meteorology. One member of the Commission claimed to have come with a determination to take home a definition of " front." It is believed that he failed in that object, but found he had obtained instead a new definition of relative humidity from which he may have realised the amount of work still ahead.

A sub-commission on aerological diagrams gave international blessing to many such forms of diagrams, and its meetings proved of great educational value.

On the question of the best technique for synoptic representation of the three-dimensional atmosphere rapid agreement was reached on the merits of standard isobaric surfaces. The use of standard pressure levels instead of standard heights has thus achieved international recognition 30 years after its recommendation by V. Bjerknes.

Special lectures and discussions were held at which dynamical theories and methods were the main topic, with much reference to vorticity, divergence, dynamic instability and the like, and relatively little to air masses or the polar front.

**Climatological Commission** (President, Dr. F. X. R. de Souza, Brazil).—Met from 4th to 25th August, and discussed a wide variety of subjects. The scope of the Commission was defined as climatological investigation of surface and upper air conditions, the application of climatology to other sciences and various forms of human activity (agriculture, aviation, shipping, industry, engineering, medicine, social science, etc.), rules for the computation and publication of climatological data, maintenance of reliability and homogeneity

of meteorological observations, and dissemination of climatological data by wireless telegraphy and their possible application to seasonal forecasts.

The Commission was greatly concerned with making the most of the great masses of meteorological observations now being accumulated, and recommended the use of standard cards on which the daily observations would be punched for use in tabulating machines. This process has already been widely used in the United States, and has made possible calculations which would otherwise have been too costly in man hours. In the United Kingdom and the Netherlands it has long been used for marine data. A sub-commission was appointed to assemble the necessary technical data for surface observations and to design a standard system for international use. For the rapidly growing mass of upper air data, a series of standard cards designed in the British Meteorological Office was accepted as suitable. The possibilities of machine methods were demonstrated to the Commission by representatives of the International Business Machine Company.

Each meteorological service was also asked to issue an annual volume of climatic statistics according to a standard form, for permanent reference. For immediate use, e.g. in experimental long-range forecasting, the Commission recommended the resumption of the pre-war arrangement by which monthly mean values for a number of selected stations were broadcast not later than the 5th of the following month. The proposed broadcasts will be in code, and give the station number, the mean pressure, temperature and relative humidity, and the amount of rain. For purpose of comparison, normal values are to be included in the first broadcasts, and will also be circulated by post.

The practical use of climatic data was discussed at length, particularly in relation to aviation. In conjunction with I.C.A.O. a standard series of climatological frequency tables was planned to give the best practicable representation of flying conditions at airports.

It was recognised that there is also a wide field for the application of climatology to other human concerns, such as health, agriculture and industry, and a permanent sub-commission was formed to develop these applications.

**Commission for Hydrology** (Vice-President, Dr. M. Bernard, United States).—Met from 4th to 15th August. The President, Dr. Urivayev of the U.S.S.R., was unable to attend, and Mr. Merrill Bernard was elected Vice-President and took the Chair at all meetings. This was the first meeting of a new Commission and some time was spent in defining its scope, which was limited to the purely meteorological aspects, the hydrological cycle of precipitation, in evaporation, transpiration, percolation and surface run-off. The hydrological problems of the different countries proved to be very diverse, some countries being preoccupied with questions of water supply and others with forecasting river levels and floods. Among the matters dealt with in resolutions were co-ordination and exchange of information between countries sharing the same river basin, the standardisation of hydrological instruments and methods, and the compilation of a hydrological glossary and international bibliography. Progress was made in the preparation of a multi-lingual dictionary of hydrology.

On 10th August a party of Commonwealth members of the Commission enjoyed a visit to Niagara and the Queenstown Power Station under the able

guidance of Mr. C. G. Cline of Canada, who aptly termed himself "the delegate for Niagara Falls."

**Commission on Agricultural Meteorology** (Vice-President, Mr. R. Feige, Palestine).—Met from 11th to 23rd August. In the absence of the President, D. V. V. Sinelshikov (U.S.S.R.) Mr. R. Feige (Palestine) was elected Vice-President and presided throughout a very successful meeting. The Commission dealt with phenology, statistical studies of weather and crops, the establishment of networks of "agro-meteorological" stations, long-range forecasts, soil erosion and soil conservation, and also outlined plans for an international journal of agricultural meteorology and for the teaching of agricultural meteorology in agricultural colleges.

Phenological observations are an important part of the data of agricultural meteorology, and suggestions were made for the preparation of an international list and atlas of suitable plants and animals, and the correlation of phenological and crop data. It was also resolved to compare the progress of the various crops at different stages of their growth, obtained by crop and sampling observations, with weather data to establish the minimum requirements of each crop. The Commission recommended the study of advanced statistical methods of analysis in order to make the most of the data so obtained. The meteorological observations required go far beyond the normal practice at crop-weather stations and include continuous measurements of temperature and of soil humidity. The Commission asked the C.I.M.O. to foster the development of a suitable instrument for measuring soil moisture.

The Commission expressed strong views on the necessity for further research in extended range and seasonal forecasts, which could be expected to yield large economic returns, and it formed a permanent sub-commission to encourage agricultural forecasting of all types.

The teaching of agricultural meteorology should form an essential part of training in agriculture, and the Commission went so far as to prepare abstracts of two suitable courses in the subject, elementary and advanced.

**Commission for Bibliography and Publications** (President, M. Mezin, France).—Met from 2nd to 10th September. This Commission was formed in 1929 to prepare a scheme of subject classification based on the Universal Decimal Classification, but its scope has been enlarged to include all matters concerning publications, resulting in a very long agenda. One of the main tasks of the Commission was to reorganise the world exchange of meteorological information—both observational data and papers on original research. This exchange broke down during the war, and has now to be restarted and extended to include the numerous articles of meteorological interest which appear in scientific and trade journals. The latter are often difficult to trace and obtain, and the Commission recommended the wide extension of a practice developed in Norway, where the meteorological service buys reprints of such papers and distributes them freely to other countries.

An essential means of exchanging information is by bibliographies. The Commission has outlined a proposal that each meteorological service should send lists of all meteorological documents appearing in its country to a central authority, which will at short intervals arrange and duplicate them for sale at a small cost. A basis already exists in the "Bibliographie Signalétique" prepared by the National Meteorological Office of France, and

it is hoped that this can be made more complete by international co-operation. It is also hoped to extend the bibliography to include manuscripts, microfilms, motion pictures and catalogues of photographs.

The arrears of the war years received much attention, and the Commission recommended that meteorological services print all important works which appeared in their countries during the war and have not yet been generally issued. If printing is impracticable, microfilm copies should be made for countries requiring them. To this end, each service is urged to arrange for facilities in making and reading microfilms. The occupying governments in ex-enemy countries are urged to do the same.

Another major task was the revision of the classification of meteorological literature. The existing classification has served since 1936, but the great extension of knowledge in the past few years, notably in radio technique for the study of the upper atmosphere, has impelled the Commission to draw up a list of proposed revisions and additions. The changes are being submitted to the International Federation for Documentation, and if accepted will be incorporated in the Universal Decimal Classification and should come into general use in 1949.

The Commission was also concerned with proposals to publish an international journal of meteorology, possibly in sections, each dealing with one branch of the science. Such a journal appears to be especially necessary in the domain of agricultural meteorology (see above). Proposals were also made for the preparation of a glossary of meteorological terms, a multi-lingual dictionary and a manual for meteorological librarians.

**Commission on Projections for Meteorological Charts** (President, Mr. I. R. Tannehill, United States).—The Commissions' main task was to review the decisions taken at its only previous meeting, Salzburg, 1937, on account of the greater map areas now needed by meteorological services in connection with international aviation.

New projections recommended for synoptic charts were :

(a) Stereographic projection for the polar regions on a plane cutting the earth at latitude  $60^\circ$ .

(b) Conformal conic projections for middle latitudes with standard parallels of  $30^\circ$ ,  $60^\circ$  in the northern and  $10^\circ$ ,  $40^\circ$  in the southern hemisphere.

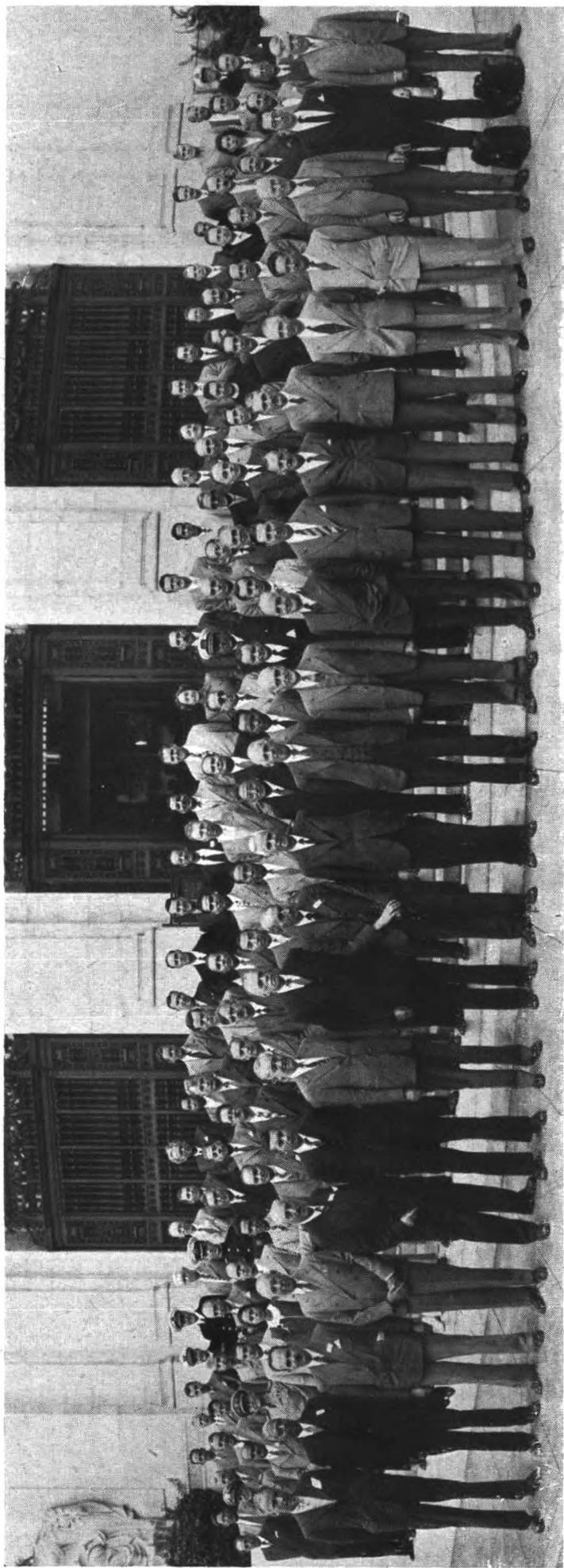
(c) Mercator projection for the equatorial regions with true scale at latitude  $22\frac{1}{2}^\circ$ .

It was suggested that in principle the standard projection for climatological charts should be of the equal area type.

Standard scales were recommended for charts ranging from  $1 : 40 \times 10^6$  for world charts to  $1 : 7.5 \times 10^6$  or  $1 : 10 \times 10^6$  for charts of a continent. The Commission proposed that charts should be printed in the two colours brown (or ochre) and blue when practicable.

A study of requirements for the location of "spheric" and radar observations resulted in the establishment of a sub-commission to examine the use of a special stereographic or gnomonic projection.

An attempt to find a conform projection suitable for a world-wide synoptic chart was unsuccessful.



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International Meteorological Organisation—Conference of Directors (Washington, D.C., U.S.A., 1947)

**Social and other activities.**—The meetings were not all of a scientific nature, our hosts having given much thought and attention to the social side. An official welcome to Canada was given to the delegates by the Dominion Government on 15th August, when the Rt. Hon. J. L. Haley, Minister of Justice, received them, while the Deputy Minister of Transport, Cdr. C. P. Edwards, congratulated them on their work and bade them farewell on behalf of the Government at a dinner on 11th September. Receptions were also held by the Province of Ontario and the City and University of Toronto.

Much time was given to the conference by the Toronto radio stations. Among those who broadcast were Mr. E. Gold and Commander C. Frankcom.

**Conference of Directors** (President, Sir Nelson Johnson, United Kingdom).—The Technical Commissions finished their work in Toronto on 15th September, and a week later the Conference of Directors opened in Washington. The agenda contained, in addition to the examination of some 400 resolutions submitted by the Technical Commissions, a proposal to form a World Meteorological Convention and another to seek affiliation to the United Nations.

With regard to the Convention, the I.M.O. has hitherto been a semi-official association of Directors of Meteorological Services, but the increased importance of meteorology in a number of directions has led to a widespread belief that the I.M.O. should become an intergovernmental organisation which would enhance its status and place it in a more favourable position to enlist official support. The proposal for a convention gave rise to protracted discussion, and it was clear that some of the delegates were not without misgivings as to the wisdom of a change in the existing organisation. Eventually, after safeguards had been provided to ensure the equality of meteorological services on technical matters, a World Meteorological Convention was drafted and signed by 33 countries. It will come into force on ratification by 30 countries, and the World Meteorological Organisation (W.M.O.) will take over the assets and obligations of the I.M.O., which will then cease to exist.

A decision to seek affiliation to the United Nations was quickly reached once the subject of the convention had been settled. With the assistance of delegates from the United Nations who were present at the Conference, a draft agreement was drawn up which, after approval by a majority of members of the I.M.O., will be submitted to the United Nations. If this is accepted the W.M.O. will be linked with the United Nations as a Specialised Agency.

On the technical side, the Conference approved over 200 resolutions of the Technical Commissions, and took note of about an equal number. Two new Commissions were formed, one to study radio-electric meteorology and the other to deal with problems of arctic and antarctic meteorology. At two sessions, attended by delegates from I.C.A.O., measures were agreed upon to co-ordinate the activities of I.C.A.O. and I.M.O. in meteorological matters.

In Washington also, in keeping with the traditional hospitality of our American cousins, a number of very enjoyable social activities were arranged—some formal—others very informal. The highlight of these was a reception by Mr. Truman at the White House.

The Toronto and Washington meetings, considered either separately or as a whole, were most successful, and well repaid the sustained effort that was

required from the delegates. Considerable progress was made both on the technical side and in improving the machinery for applying meteorology to human welfare. One of the most important results was, of course, the signing of the International Convention. This decision to effect a fundamental change in the status of the I.M.O. illustrates the determination of members to adapt the I.M.O. to modern world conditions. Another promising feature was the emphasis placed upon research, and at the meetings of the Technical Commissions it was gratifying to notice that the delegates included a high proportion of younger scientists of marked ability and originality of outlook.

## **SHIPS' OBSERVATIONS AND THE CLIMATOLOGIST**

### **Part I. The Collection of the Observations**

BY H. JAMESON, D.SC.

Meteorological observations, whether taken on land or at sea, may serve one or more of several purposes. If reported to a central meteorological office, and there plotted on synoptic charts, they build up a picture of current weather, or rather, of weather at an instant in the immediate past, from which, used in conjunction with similar earlier pictures, an idea of the trend of the weather, what it is likely to be in the not-too-distant future, can be obtained.

Another purpose in which these observations may play a part is in the compilation of meteorological statistics. If a sufficient number of observations can be collected from one place, or from one sufficiently limited area, they will show among other things what is the most frequent type of weather to be expected, or within what limits any meteorological factor such as temperature or pressure may be expected to vary, at any time of the year. Such statistical information may be of great value in cases where the usual daily forecasts are unavailable or inadequate ; for example, if one requires to know at what time of year the most favourable weather for any operation is likely to occur.

Meteorological observations are also used for research into the causes underlying the changes of weather. Until these causes are better understood, no marked advance in forecasting technique is probable.

Some observations, such as the barometric tendency and characteristic, are as a rule only of use for weather forecasting ; others, such as rainfall observations at those stations reporting rainfall only, are mainly used only for statistics and research.

The collection and study of meteorological statistics is known as climatology. Here we shall deal only with the statistical uses of meteorological observations made at sea ; in other words, with marine climatology.

There is one essential difference between land and marine climatology. On land, except in the Arctic and Antarctic, in desert and other sparsely populated regions, there are regular series of observations, made several times a day over, usually, a long period of years, at definite locations, from

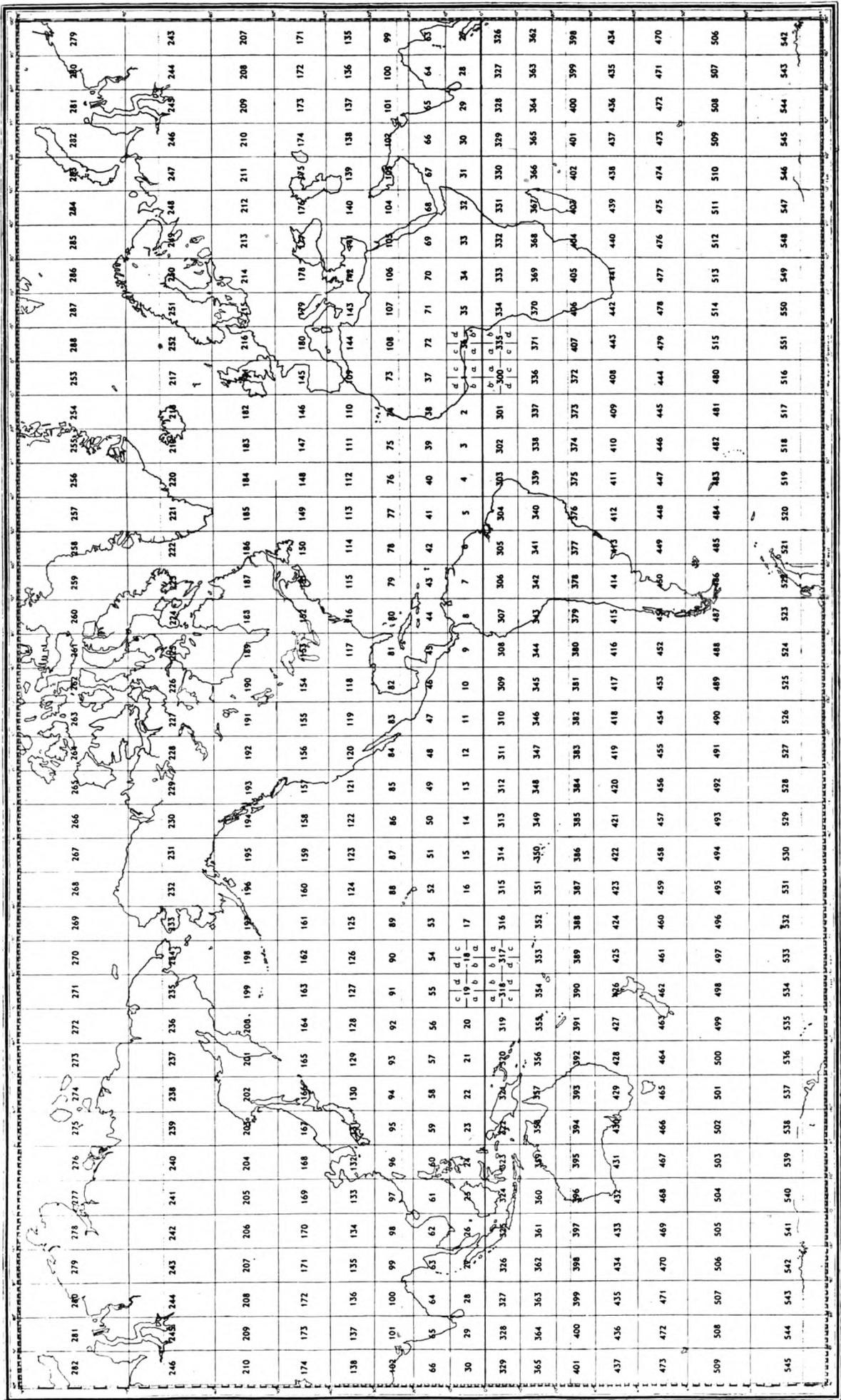


Fig. 1. Marsden Chart of the World

which a relatively complete picture of the climatology of any region can be built up.

At sea the situation is very different. We have to rely on observations from ships, and even on the main shipping routes the chance of getting many observations from one spot, or even from a comparatively small area, say one square mile, is only slight. It is therefore necessary to divide up the ocean into relatively large areas, at the very least into  $1^\circ$  "squares," that is, areas bounded by two meridians  $1^\circ$  apart and by two parallels  $1^\circ$  apart, while  $2^\circ$ ,  $5^\circ$  and even  $10^\circ$  squares are also used. All the observations taken in such a square are grouped together, as if they had been taken in the same spot.

For the purposes of marine climatology, the surface of the earth is divided up into  $10^\circ$  quadrangles bounded by meridians and parallels at intervals of  $10^\circ$ , e.g.  $0^\circ$ ,  $10^\circ$ W,  $20^\circ$ W, etc., for the meridians and  $0^\circ$ ,  $10^\circ$ N,  $20^\circ$ N, etc., for the parallels (see Fig. 1). These quadrangles are known as Marsden squares, named after a former Secretary to the Admiralty, who introduced this system in 1831. As can be seen from the figure, the numbers start both in the northern and southern hemispheres at the intersection of the Greenwich meridian and the equator. In the northern hemisphere the first number (to the west of the origin) is square 1, in the southern hemisphere, square 300.

Each Marsden square is further sub-divided into four  $5^\circ$  squares and one hundred  $1^\circ$  squares. The scheme of labels (number or letter) for these smaller squares depends on whether the longitude is west or east, the latitude north or south. Fig. 2 shows the scheme for each of the four quadrants, N-E, N-W, S-E, S-W. The advantage of this system is that the  $5^\circ$  or  $1^\circ$  square in which a ship happens to be can be quickly deduced from its position, given in the log. The label of the  $1^\circ$  square is at once obtained from the unit figure in the number of degrees of latitude and the unit figure in the number of degrees of longitude, whether the latitude is north or south and the longitude east or west. For example, if a ship's position is given as  $47^\circ 42'$ N.,  $33^\circ 23'$ W., from the Marsden chart (Fig. 1) we see that it is in Marsden square 148, and from the unit figures of the degrees of latitude and longitude that it is in the  $1^\circ$  square 73. The label of the  $5^\circ$  square can be deduced from the  $1^\circ$  square by means of the table below :

<i>1st figure</i>	$1^\circ$ label	<i>2nd figure</i>	$5^\circ$ label
0 to 4		0 to 4	A
0 to 4		5 to 9	B
5 to 9		0 to 4	C
5 to 9		5 to 9	D

The fact that observations over a fairly large area are grouped together, as if they were all taken at one spot, is not such a disadvantage in the open sea as it would be on land, for in general the climate does not change as rapidly with position over the sea as it does over the land. Near the coast, however, and at the boundaries separating water currents of different temperatures, the climate may change rapidly over short distances, and observations in these regions may require special treatment.

Unlike meteorological observations on land, there is no regularity about

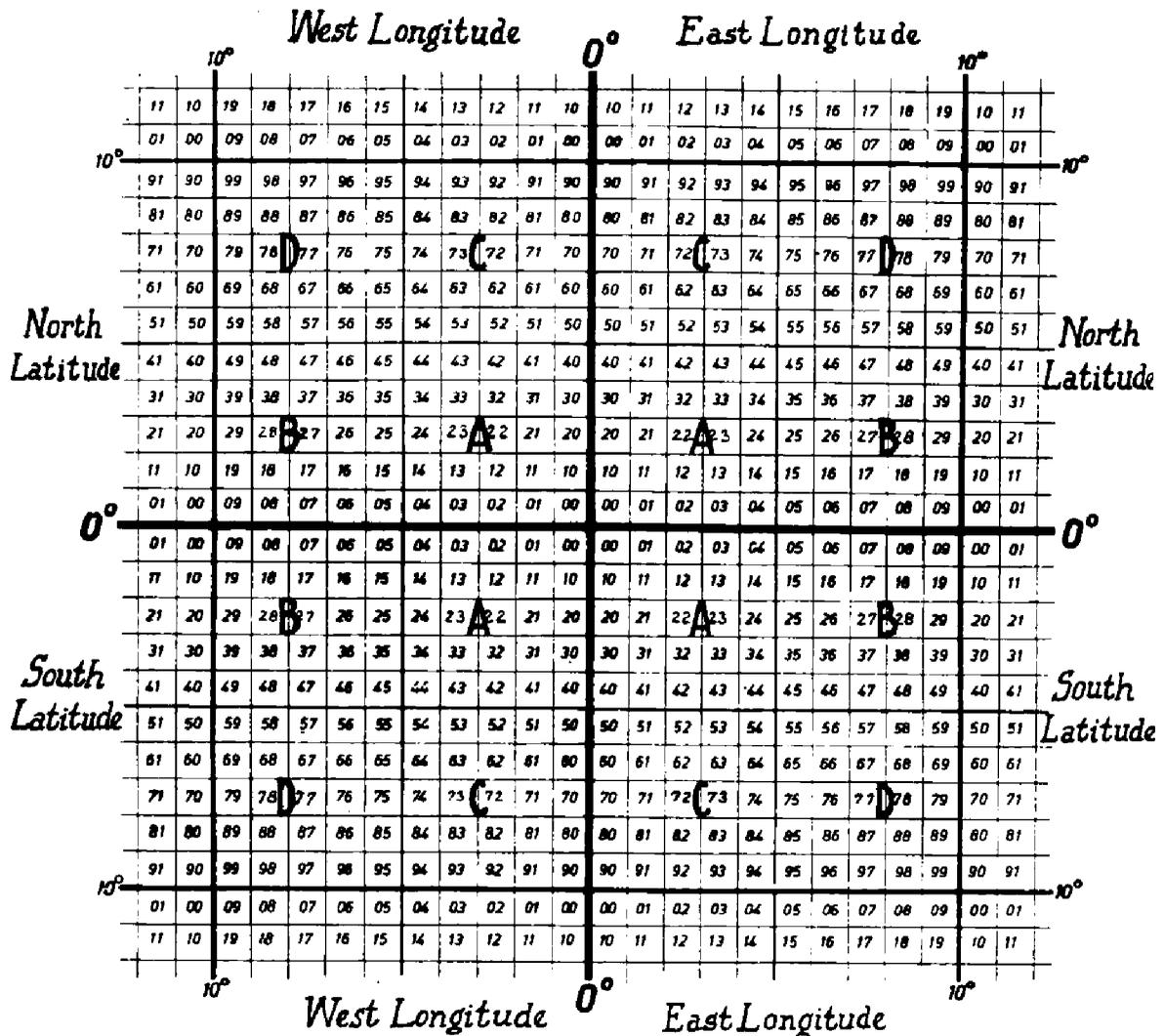


Fig. 2

observations at sea. As a ship taking these observations passes over a particular square a series of observations is obtained at successive intervals of 3, 4, 6, or perhaps 12 hours, and then there may be no further observations in that month for days, weeks, or even years. In effect, we receive samples of the weather, and hope by studying these samples to obtain a reasonable approximation to the results that would be obtainable if regular series of observations were available. The samples obtained are not even random samples, for consecutive observations are liable to give much the same type of weather. This difficulty can be avoided by taking only one observation in each square from each ship, but this would reduce very much the amount of data available for climatological study, which is already hardly adequate over most oceanic regions.

Another difficulty is that observations tend to be taken mainly along the chief shipping routes, so that the number available from neighbouring squares may vary considerably, while over large parts of the ocean few or no observations are available for most of the squares, and those available may all have been taken in a few series of consecutive observations, in two or three years only, and may not give a sample even approximately representative of weather conditions for that particular square.

A recent development in the taking of meteorological observations at sea, which will ultimately be of considerable importance for marine climatology, is the installation of Ocean Weather Ships in the North Atlantic. An account of these ships, by Commander Frankcom, is given in *The Marine Observer* for July, 1947.

These ocean weather ships are comparable with British land meteorological stations of the first order in the regularity and extent of the observations, both surface and upper air, taken by them at what may be regarded, in practice, as a definite location. In the course of a few years there should be available from them, for marine climatology, a mass of new data, which will not only serve to supplement the data received from other ships but will also supply much information which cannot now be obtained, or can only be obtained with great difficulty, from the data available at present. Upper air data are perhaps the most striking examples of such information. It will also be possible to study the changes in mean weather conditions from month to month and from year to year, both at the surface and in the upper air, at these ocean weather stations, a study which may throw some light on the problems of seasonal forecasting for Britain and other parts of Europe.

## AN OCEAN WEATHER SHIP AT SEA\*

BY CAPTAIN A. W. FORD

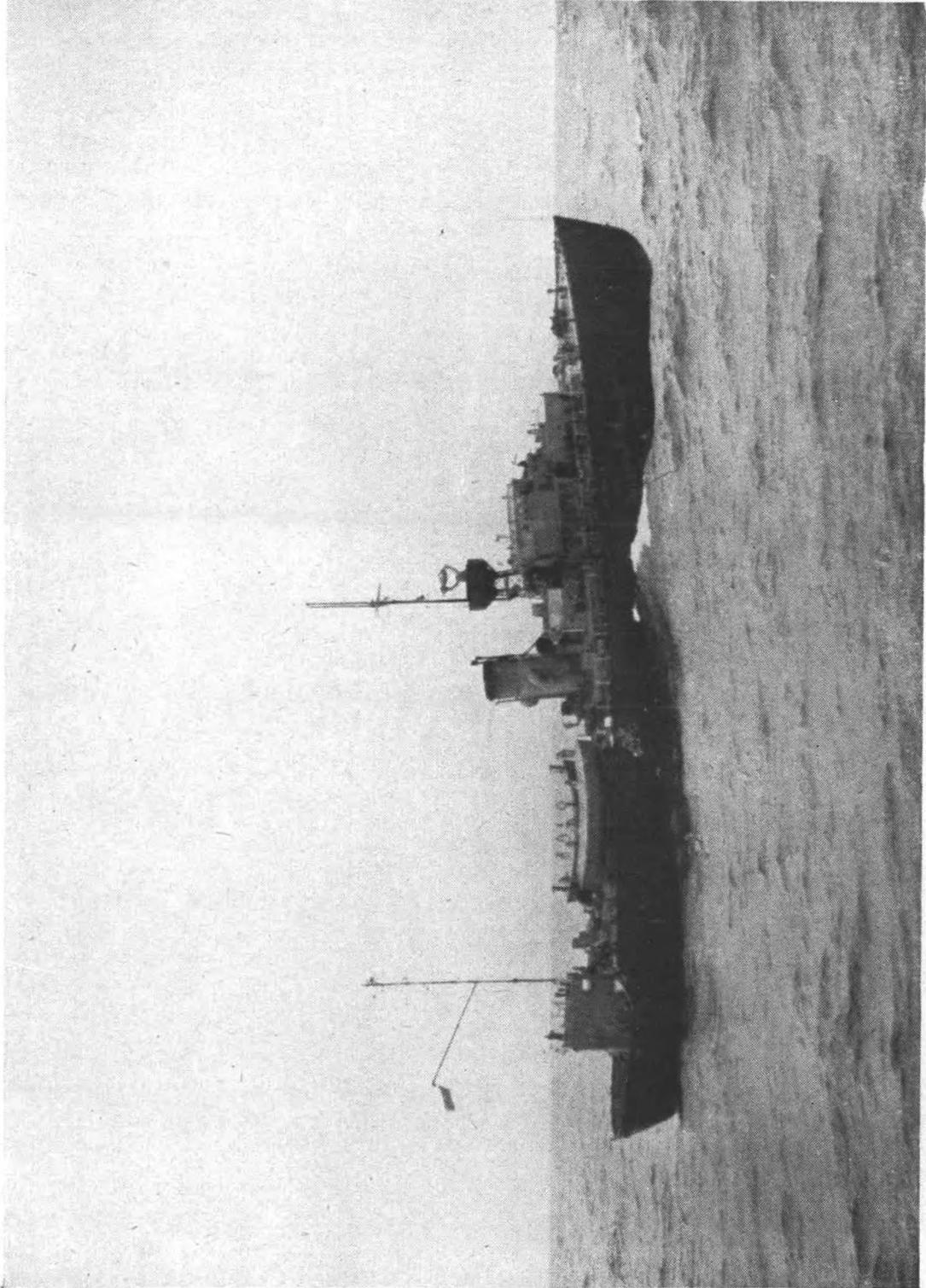
(Master, Ocean Weather Ship *Weather Recorder*)

We pull out of the Great Harbour at Greenock on the first stage of our Atlantic sojourn. The local pilot guides us over to the fleet oiler *Thornol*, usually anchored in the vicinity of the Tail of the Bank at the entrance to the River Clyde. We fill to capacity, some 230 tons of fuel oil. The couple of hours wait alongside the *Thornol* is passed quite pleasantly chatting to the pilot. His first words are invariably: "What on earth do you find to do for twenty-seven days?"

What do we do?

The passage to station is roughly three days; if the Atlantic is kind to us then two-and-a-half days will do the trick; if not, who knows? We have taken as long as five days; five days battling against adverse winds and seas; five days of relentless rolling and pitching; five days of hanging on, of slipping and sliding. It's these five days that send up the mortality rate in the crockery and glassware department. The victualling account decreases directly as the wind and sea increases. Sea-sick pills are in great demand; whether these pills are all they are "cracked up" to be is a matter of speculation. Spend five days on a scenic railway and you will have some idea of the

\*The reader will recollect that the British Ocean Weather Ships were formerly "Flower Class" corvettes. These sturdy little vessels are only 205 ft. in length and of about 1,400 tons displacement, but being designed on the lines of the whaler (high sheer, deep draft and the distinctive whaler-form bow and forefoot) are exceptionally fine seaboats; at the same time they are not renowned for comfort in a seaway. Readers who experienced the joys of Atlantic convoys during the war have vivid recollections of the almost unbelievable aquabatics performed by the corvettes when on escort duty in heavy weather. Captain Ford was in command of a corvette during the war, so he is on familiar "ground."—Ed.



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An Ocean Weather Ship at sea

trip. Once on station we can at least "heave to" and climb over the waves in our own time.

Approaching the station, either Station "J" (Jig) in lat.  $53^{\circ} 50' N.$ , long.  $18^{\circ} 40' W.$ , or Station "I" (Item) in lat.  $60^{\circ} 00' N.$ , long.  $20^{\circ} 00' W.$ , we are in constant touch with the weather ship we are relieving and "home" on their radio beacon. The day dawns and there is our opposite number "raring to go." We pass over our mail for posting at Greenock; if the weather is very rough, by rocket and line, otherwise a rubber dinghy is launched. On one such occasion the rubber dinghy turned a somersault, the two occupants and the mail finishing up in the "ditch"; the second attempt proved successful, but with the mail a little moist—we had a grand two hours of "find the stamps." This operation "rubber dinghy" is always a source of great joy to the ship's companies. Can anything look sillier than rowing around the Atlantic in a rubber dinghy?

Time loses its significance: for the next twenty-one days we "stay put," releasing a balloon every six hours, recording the barometric pressure, temperature and humidity at the various heights, tracking the balloon with radar to obtain the upper winds. The net result is in the hands of the Central Forecasting Office, Dunstable, a little more than an hour after the release of the balloon. Surface observations are made and transmitted to Dunstable every three hours, and significant and sudden changes in the weather whenever they occur.

Station "J," 300 miles west of Ireland, is the really busy station; transatlantic aircraft to and from Shannon and Prestwick airports stream past overhead, each one requesting our radio beacon or a radar fix, the upper winds or may be the barometric pressure. In return they pass us their altitude, course and ground speed, position and any other details of interest, all of which are recorded in our aircraft log. We get to know these aircraft and recognise the different voices; with a high cloud base we can often see them.

Many hours every day are spent checking instruments: the radar, the various W/T sets, radio-sonde, M/F direction-finder, H/F direction-finder, gyro with its nine repeaters, the meteorological instruments, W/T beacons, Loran and even the lifeboat W/T sets. The motto is, "The answer must be right."

Being virtually a stationary Atlantic station and maintaining station by the use of Loran, Consol and astronomical fixes (and indeed maintaining our station is quite a simple matter), we are able to check daily these W/T aids to navigation and submit a comprehensive report to the Ministry of Transport, who are investigating the possibilities of the Consol method as an aid to navigation.

Now we come to the other side of the picture—the weather ship as a rescue unit. Each officer, in addition to being trained in meteorology, radar, Loran, etc., is also trained in air/sea rescue technique, the ships being fitted out for such duties. In addition to our two 30 ft. motor lifeboats, there are the rubber dinghys, rescue-derricks, scramble-nets, floatanets, line-throwing apparatus and, to assist an aircraft in ditching—to lay a path into the wind for him—we have the smoke-floats and flares. All these have to be maintained and kept in good condition, the ship's company having to be kept at concert pitch by frequent drills. These drills can and do assist in keeping up the



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morale of the ship's company ; the drill is often a means of introducing an additional recreation. These drills of course depend on the weather. A bright day with anything up to a moderate breeze and not too much of a sea or swell cannot be disregarded. Such days, especially in the winter months, are few and far between. During the last voyage we did have such a day. The lifeboat was sent away, five rubber dinghies manned and launched, derricks swung out, scramble-nets and floatanets put overboard. The sick-bay, complete with stretcher party, was in readiness. The drill finished up as a dinghy race between the departments of the ship, each rubber dinghy being manned by two members of each department—officers, seamen, stokers stewards and petty officers. The race was over a third of a mile, the start and finish of the course being marked by smoke-floats : prize, 100 cigarettes. The umpire, the 2nd Officer in a lifeboat, cruised astern of the dinghies to pick anybody out of the water should there be an accident. It's no fun getting a ducking in the Atlantic in 60°N. in January. The race began with the firing of a red flare and was a great success, the stewards beating the officers by a short head. Half-an-hour later the stoker's dinghy arrived alongside towed by the lifeboat ; they had lost a paddle. They were greeted with derisive howls from the ship's company. Of course, no dinghy crew would agree unreservedly with the result ; each had been butted or fouled, somehow or other, by some other dinghy. So the race was fought over and over again in the mess decks, a fresh topic, a relief from monotony.

The twenty-one days of station-keeping gradually draw to a close ; the fuel situation is carefully checked and re-checked ; the senior meteorological officer reviews the weather from hour to hour, for to be caught short of fuel with the prospects of an easterly gale for the return passage would spell disaster.

The radio beacon is switched on, our relief appears on the horizon, mail is passed, the ship heads for home and leave.

“ What on earth do we find to do for twenty-seven days ? ”

We find quite a lot to do, and everything we do is often done under the greatest difficulty, on a rolling and pitching platform, where a grab at a stanchion or lifeline becomes an art.

Steaming towards the Irish coast, Tory Island radio beacon is picked up and passed. In the distance we see Rathlin Island, off Londonderry, and still farther on, the Mull of Kintyre. Steaming up the Firth of Clyde civvy suits are resurrected, leave passes and travel vouchers are issued ; store lists, defects lists and voyage reports completed.

Off Kempock Point, Gourock, the pilot boards ; a little farther on, off the Princes Pier, H.M. Customs pay us a visit and grant pratique. Half-an-hour later we are berthed once again inside the Great Harbour. All are happy, and perhaps somewhat tired ; the prospect of a few days' leave is very inviting. The sun may even be shining.

## **SOUTHERN ICE REPORTS**

### **During the Year 1947**

July, August and September. No reports received.

Reports of ice previous to July, August and September, 1947, will be found in *The Marine Observer*, Volume XVII, No. 137, page 41.



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Low stratus cloud at Gibraltar, 18th September, 1946

## OBSERVING WEATHER AT SEA

### (V) Wind

BY T. H. KIRK, B.SC.

Generally speaking it is fairly obvious that the wind is of less importance to the steamship than it was to the sailing vessel, but fresh winds and gales can very much interfere with a steamer's schedule, and by their effect upon the sea can make life very uncomfortable and cause damage to the vessel or endanger the limbs or lives of those aboard—even in the largest vessel. The modern seaman should therefore be just as interested in the wind as were his ancestors.

The universal practice of estimating wind speed at sea arose under circumstances when the seaman had perforce to take note of changes vital to the performance of his ship. The sailing ship served as its own wind-speed indicator, its behaviour under different amounts of canvas speaking eloquently to the attentive, wind-conscious sailor. It was almost inevitable that the first qualitative descriptions, which were undefined except for a vague order of intensity, should be given greater definition in terms of the canvas that could be carried by a standard ship of the period. On this principle Admiral Beaufort constructed his scale of wind force, officially introduced in 1838, basing his definitions on the performance of the man-of-war of his time. It was found comparatively easy to interpret this scale in terms of the performance of other types of ships. In 1906 a "coastal criterion" was introduced to meet the needs of small coasting vessels. A "shore criterion" was also introduced in 1906 to meet the needs of observers ashore. The scale is perhaps aptly illustrated by the accompanying sketches by Commander C. H. Williams, R.D., R.N.R.

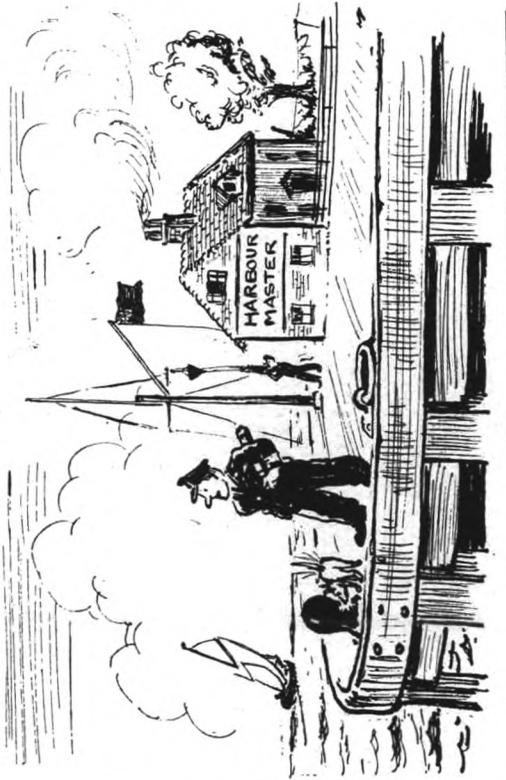
With the introduction of steam, seamen had no longer the performance of the ship to guide them in their estimates of wind force. They had, however, a descriptive scale ranging from 0 (calm) to 12 (hurricane) and, what is perhaps of greater importance, a tradition handed down from sailing-ship days; a common memory enabling them to visualise the conditions associated with any particular wind force.

It appears obvious that, in the absence of other criteria, seamen should visualise each particular wind force in terms of its effect on the sea surface. Only in 1939, however, was a scale introduced internationally, basing the estimation of wind force on the appearance of the sea surface. This scale, which was founded on one originally put forward by the German Merchant Captain Petersen, attempts to identify the original descriptive terms used by Beaufort, e.g. gentle breeze, moderate gale, storm, in terms of elements of everyday observation, e.g. ripples, wavelets, white horses, spray, foam and height of waves.

The full scale at present in use is given below, together with the original descriptive terms used in the Beaufort Scale and the equivalent wind speeds in knots.

In using these criteria it should be remembered that they apply only to the open sea under what may be termed average or normal conditions. Judgment is necessary to decide to what extent they require modification when disturbing factors are present. For example, waves running into shallow water increase their height, and hence their tendency to break. White horses close inshore will therefore not have the same significance as

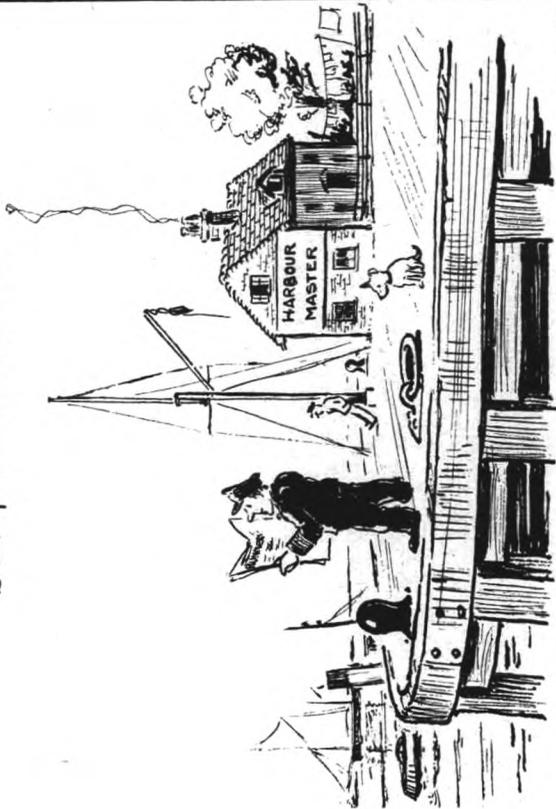
Beaufort Scale 3.



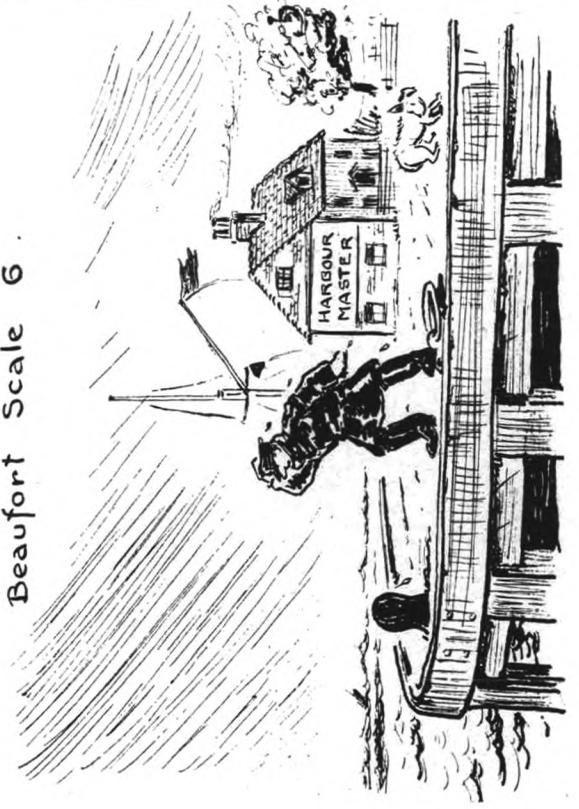
Beaufort Scale 9.



Beaufort Scale 0.



Beaufort Scale 6.



Beaufort Scale Number	Mean Wind Speed in knots	Limits of Wind Speed in knots	Descriptive Terms	Sea Criterion
	Measured at height of 33 ft. above sea level			
0	0	Less than 1	Calm	Sea like a mirror.
1	2	1-3	Light air	Ripples with the appearance of scales are formed but without foam crests.
2	5	4-6	Light breeze	Small wavelets, still short but more pronounced, crests have a glassy appearance and do not break.
3	9	7-10	Gentle breeze	Large wavelets. Crests begin to break. Foam of glassy appearance. Perhaps scattered white horses.
4	13	11-16	Moderate breeze	Small waves, becoming longer; fairly frequent white horses.
5	18	17-21	Fresh breeze	Moderate waves, taking a more pronounced long form; many white horses are formed. (Chance of some spray.)
6	24	22-27	Strong breeze	Large waves begin to form: the white foam crests are more extensive everywhere. (Probably some spray.)
7	30	28-33	Moderate gale	Sea heaps up and white foam from breaking waves begin to be blown in streaks along the direction of the wind. (Spindrift begins to be seen.)
8	37	34-40	Fresh gale	Moderately high waves of greater length; edges of crests break into spindrift. The foam is blown in well-marked streaks along the direction of the wind.
9	44	41-47	Strong gale	High waves. Dense streaks of foam along the direction of the wind. Sea begins to roll. Spray may affect visibility.
10	52	48-55	Whole gale	Very high waves with long overhanging crest. The resulting foam in great patches is blown in dense white streaks along the direction of the wind. On the whole the surface of the sea takes a white appearance. The rolling of the sea becomes heavy and shocklike. Visibility affected.
11	60	56-63	Storm	Exceptionally high waves. (Small and medium-sized ships might be for a time lost to view behind the waves.) The sea is completely covered with long white patches of foam lying along the direction of the wind. Everywhere the edges of the wave crests are blown into froth. Visibility affected.
12	68	64-71	Hurricane	The air is filled with foam and spray. Sea completely white with driving spray; visibility very seriously affected.

on the high seas, and this should be remembered when estimating the force of an on-shore wind experienced close in-shore. With an off-shore wind an additional factor is at work. Waves are not raised instantaneously, but result from the wind blowing over a distance ("fetch") and throughout a period of time. The maximum effect of an off-shore wind can only be reached at some considerable distance off-shore. Close in-shore, therefore, the wind may be stronger than would be estimated from the appearance of the sea surface, using the normal scale.

Wind-driven waves show a greater tendency to break when superimposed on the crests of swell. In particular, if rapid changes of wind are taking place, the cross pattern of waves from different directions will tend to produce more white horses than appropriate to the strength of the wind blowing at the time.

The effect of tidal stream is well known ; wind blowing against the tide producing more disturbance than when running with it. The factors at work here are the speed of the wind relative to the water and the change of depth due to the tide.

The configuration of the coastline obviously influences the appearance of the sea surface close in-shore, river estuaries especially being subject to local effects.

Heavy rain has a damping effect which must be mechanical in character. The smoothing action of oil and other contaminating matter is well known.

It will be appreciated that the intelligent application of the sea criterion affords plenty of scope for the seaman's judgment in a variety of situations. The meteorologist requires accurate wind estimates because wind is intimately related to the pressure distribution (recollect Buys Ballots law ?), and pressure is still the fundamental element in any forecasting technique.

The practical routine of wind estimation will be well known to all seamen. Here, it may suffice to mention that, whenever possible, both direction and speed should be judged from the appearance of the sea surface, taking account, as far as practicable, of the factors mentioned above. Direction obtained directly from the appearance of the sea surface by noting the direction of the ripples and wave fronts, or the faint lines that show along the wind, is of course *true*. When it is impossible to see the sea clearly, as on a dark night, the observer should estimate the *apparent* speed and direction from an exposed position on the bridge, judging as far as possible from the "feel" of the wind. The true wind speed and direction is then obtained by correcting for the ship's course and speed either by using a vector diagram or the table given in the *Marine Observer's Guide*. It is of course obvious that "direction" judged from funnel smoke is *apparent* and not *true*: for example, if in a vessel steaming at 12 knots the smoke rises vertically, there must be a 12 knot breeze from right astern. Wind direction should always be logged and reported relative to the True meridian.

## PERSONNEL

OBITUARY.—CAPTAIN CHARLES EDWARD STUART, R.D., R.N.R., died at the beginning of this year at the age of 76. He first went to sea in 1888 in the Shaw Savill and Albion Line S.S. *Arawa*, and later served in other ships of that company. In 1892 he rejoined the *Arawa* as 5th Officer, and by 1895 had been promoted to 2nd Officer. In that year he joined the Union S.S. Co. and was appointed to their S.S. *Goth*. Three years later Stuart joined the Royal Naval Reserve as a Sub-Lieutenant, and in the 1914-18 war was mobilised for service in the Navy.

After that war he returned to the Union Castle Line and was given command of the S.S. *Huntscraft*, a prize of war. He later commanded a number of the company's passenger ships, including the *Carnarvon Castle* and the *Stirling Castle*. Several of his ships figured in the Meteorological Office Fleet List as Selected Ships. He was Commodore Captain of the Line when he retired under its age limit in 1936.

C. H. W.

OBITUARY.—The death occurred in February this year of CAPTAIN F. MANLEY, R.D., R.N.R., former Marine Superintendent in London of the Cunard White Star Line. He was 69. Going to sea at the age of 15, Manley served in a number of sailing ships, including the *Sierra Cordova*. He

obtained his Master's certificate in 1900 at the age of 21, while serving in the Furness Withy Line.

Joining the Cunard Line in 1902, Manley was appointed 3rd Officer of the *Veria*. By 1907 he was 1st Officer of the *Carpathia*, and in 1911 was Chief Officer of the *Ausonia*.

His first command was the *Phrygia*, in 1913. During the first world war he served as Staff Captain of the *Aquitania* and then again in command of the *Phrygia*, in which ship in March, 1916, he fought a successful action with a German U-boat.

At the end of that war in 1918, Captain Manley was appointed Marine Superintendent in London of the Cunard Line, which post he filled until his retirement in 1944.

Early in the late war he had flown out to Suez to superintend the re-floating of the *Georgic*, which ship had been bombed and burnt out.

C. H. W.

OBITUARY.—With regret we record the death of CAPTAIN J. D. KEATINGE, late Senior Examiner of Masters and Mates at Liverpool. The death occurred in April this year at his home in Prenton, Birkenhead, at the age of 72. He had retired in 1939 after thirty-six years as a Board of Trade Examiner, but returned to duty under the Ministry of Transport when war broke out, and he finally retired in February, 1944.

Keatinge was educated in the *Conway*, and then served his apprenticeship in the sailing ships belonging to Messrs. Lewis, Davis and Company, of Liverpool. He got his Extra Master's (Square Rig) Certificate in 1895, direct from Mate, a rare achievement, and joined the Lord Line of Belfast, where he served as 3rd, 2nd and Chief Officer. In 1898 he left the company to undergo his naval training as an officer of the Royal Naval Reserve, during which he gained considerable experience.

Returning to the Merchant Service, he obtained command of a ship belonging to Mr. R. Jones of Liverpool, and later joined the Cunard Line and served in the *Umbria* and *Lucania*.

In 1903 he was appointed Examiner of Masters and Mates at Liverpool. He was later Superintendent of a Mercantile Marine office, Secretary of the local Marine Board and Registrar of Naval Reserves.

During the first world war he was called up as an R.N.R. officer, and served in the flagship of "I" Squadron as Prize and Boarding Officer, and during the war boarded some 200 vessels.

Among the hundreds of candidates he examined during his long service at Liverpool there will be few who have not pleasant recollections of his helpful and kindly nature. As a former colleague of his, when he was senior examiner there, I well remember his scrupulous fairness, his fondness for strong tea, his Irish humour, and many occasions when he gave a helping hand to a nervous candidate. There are probably many Master Mariners at sea who owe at least some measure of their success to advice given them in the examination room by J. D. Keatinge.

C. E. N. F.

OBITUARY.—It is with regret that we record the death of Mr. W. N. HOLMES, Senior Radio Officer of M.V. *Waiwera*. Mr. Holmes died on the 23rd February, 1948, on a voyage from New Zealand to London.

The Marine Branch of the Meteorological Office sympathises with Captain B. Forbes Moffatt and his officers in the loss of their shipmate.

C. H. W.

OBITUARY.—The death has occurred at Hull of SKIPPER JAMES GIBBS, of the steam trawler *St. Nectan*, one of the Hull trawlers which operate in the Arctic seas. Skipper Gibbs observed for the Meteorological Office in his ship and made routine weather reports by radio as a Selected Ship while on voyages to the far north.

The following notes have been received from Captain R. E. Dunn, O.B.E., the agent at Hull of the Marine Branch of the Meteorological Office.

"Skipper James Gibbs was, at the age of 22 in 1925, in command of S-T *St. Endellion*, owned by Thomas Hamling & Co. of Hull, and had served with the same firm up to the time of his death on the 24th April, 1948, with the exception of

the war years 1939-45. During this period he served as skipper in trawlers at Iceland and also in the Merchant Service, being in two of the Malta convoys which fought their way through at the time of the island's greatest peril. Any one who knew him as I did could not but admire his sterling qualities, and the fishing industry of Hull has lost one of its ablest skippers.

Skipper Jimmy Gibbs, as he was known to his friends, will be missed by many; he was generous and helped many who were in need, and his ready wit and humour will long be remembered by those who knew him." C. H. W.

RETIREMENT.—Early in 1948, CAPTAIN W. WATKIN-THOMAS, O.B.E., D.S.C., retired from the service of the British Tanker Company after twenty-five years with that firm. W. Watkin-Thomas was born in 1886 in Anglesey.

He went to sea at the age of 17. After varied experience at sea, including service as a Lieutenant, R.N.R., in command, during the 1914-18 war, in which he gained the D.S.C., he joined the British Tanker Company in 1923.

Appointed to his first command in that company in 1928, Captain Watkin-Thomas served in various ships. In the recent war his service included several months' duty in north Russian waters, and the ships under his command had a number of encounters with enemy aircraft and submarines.

For his gallantry and devotion to duty he was awarded the O.B.E.

Both before and after the war Captain Watkin-Thomas contributed a number of excellent meteorological records. His last ship was the *British Endurance*.

We wish him health and happiness in his well-earned retirement. C. H. W.

#### LIGHTHOUSES OF THE BRITISH ISLES



Altacarry Head, Rathlin Island Crown copyright reserved  
Rathlin Island is situated off the north coast of Northern Ireland. A light ( $55^{\circ} 18'N.$ ,  $6^{\circ} 10'W.$ ) is exhibited at an elevation of 243 ft. from a white tower with a black band, 88 ft. in height, on Altacarry Head

## 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>Acra</i>	C. C. Cave	C. N. Morrison, G. Reed, P. W. Lillie	J. A. Stuart	Elder Dempster Lines, Ltd.	20.12.47
<i>Admiral Sir John Lumsford</i>	W. B. Hicks	J. Linton, R. L. Cain, H. Wales	F. Dibble	Iago Steam Trawler Co., Ltd.	3.1.48
<i>Afghanistan</i>	S. L. Bashford	I. McK. Jackson, D. L. Emery, C. M. Best	F. G. Short, M.B.E.	Strick Line, Ltd.	10.4.48
<i>Ajax</i>	C. H. Whitehouse, O.B.E.	J. Tierney, J. Scott, M. Brown	J. W. Soulsby	Ocean S.S. Co., Ltd.	10.12.47
<i>Akaroa</i>	W. J. Williams	H. W. Costage, J. McKay, J. Weatherley	J. Evans	Shaw, Savill & Albion Co., Ltd.	11.2.48
<i>Amastra</i>	A. K. Bamberg	E. T. Ward, W. P. Tait	W. C. Sheard	Anglo-Saxon Petroleum Co., Ltd.	22.3.48
<i>Amerstham</i>	A. Spence	F. M. Dickenson, D. Weston, D. M. Davis	W. Smith	Thompson S.S. Co., Ltd.	
<i>Andes</i>	H. F. Way, Cdre., R.N.R.	L. H. Hayman, S. Moffitt, J. W. Baggott	C. G. Forbes	Royal Mail Lines, Ltd.	
<i>Apapa</i>	J. J. Smith	J. H. W. Locke, L. E. P. Givan, E. J. Harding	S. W. Brown	Elder Dempster Lines, Ltd.	
<i>Aquitania</i>	G. E. Cove	E. E. Wilks	A. Hitchon	Cunard White Star, Ltd.	7.1.48
<i>Arabia</i>	G. H. Morris	H. B. Walkins, R. P. Ashe	R. Thorburn	Cunard White Star, Ltd.	18.3.48
<i>Arabistan</i>	J. H. Metcalfe	G. A. Keen	D. K. Murdock	Strick Line, Ltd.	
<i>Araby</i>	G. H. Taggart	J. A. Hogg, J. A. Carter, E. G. Price	A. N. Taylor	Royal Mail Lines, Ltd.	
<i>Arakaka</i>	D. R. C. Onslow	K. White, B. Baillie, J. Allan	H. Hall	Arakaka S.S. Co., Ltd.	29.12.47
<i>Argentina Star</i>	D. R. Macfarlane, O.B.E., D.S.O.	J. Beatson, R. D. Philpott	P. P. Williams	F. Leyland & Co., Ltd.	
<i>Argyll</i>	I. Doods	C. A. V. Daly, R. W. Baldwin, A. Ryan	— Blanchard	B. J. Sutherland & Co., Ltd.	13.12.47
<i>Ariguani</i>	S. Brown	J. Taylor, M. Kenschole		Elders & Fyffes, Ltd.	7.1.48
<i>Arvisan</i>	H. Coates	J. Boyce, G. H. Drinkwater, J. B. Clemenson		Charents S.S. Co., Ltd.	13.12.47
<i>Arundel Castle</i>	C. C. Page			Union Castle Mail S.S. Co., Ltd.	
<i>Ascania</i>	G. N. Jones, O.B.E., D.S.O.				
<i>Asia</i>	J. A. Myles, R.D., Cdr., R.N.R.				17.10.47
<i>Asturias</i>	J. W. Carr	F. A. Irvine	A. Banberry	Cunard White Star, Ltd.	18.3.48
<i>Athelctief</i>	J. D. Donovan	R. C. Stone, J. P. Coffey, B. Jarrett	G. Clarke	Royal Mail Lines, Ltd. (Managers) Tankers, Ltd.	29.10.47

NAME OF VESSEL	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS	LAST RETURN RECEIVED
<i>Athetregent</i>	C. Ray	A. Sugden, C. Ferguson, W. Boyd, S. Barbour	J. D. Dempster	Athel Line, Ltd.	26.2.48
<i>Athentic</i>	D. Aithison	B. E. Mashy, A. E. Smith, D. M. Mortimer, W. Foster	D. Haggart	Shaw, Savill & Albion Co., Ltd.	30.4.48
<i>Athlone Castle</i>	W. D. Roach	J. R. Henderson, D. Lamb, C. E. Walker	R. S. Summers	Union-Castle Mail S.S. Co., Ltd.	8.2.48
<i>Atlantic</i>	W. Shannon	G. Crombie	W. Phelan	W. H. Cockerline & Co., Ltd.	2.3.48
<i>Auricula</i>	J. H. J. Harmling	R. Shaw, N. Douglas, H. Phillips	W. Rollason	Anglo-Saxon Petroleum Co., Ltd.	26.1.48
<i>Australia Star</i>	T. F. Williams, O.B.E., D.S.O.	D. Carstairs, L. Tesier, F. Bale	A. M. Reid	F. Leyland & Co., Ltd.	25.2.48
<i>Australind</i>	J. F. Woods	J. B. McCowan, J. Stevenson, M. A. Hayes	R. Lewis	Australind S.S. Co., Ltd.	13.12.47
<i>Balaena</i>	P. Verik	B. Christensen	J. Spicer	United Whalers, Ltd.	16.10.47
<i>Ballantia</i>	F. A. C. Thacker	R. Box, G. Fraser, R. Newbury	D. Stewart	Royal Mail Lines, Ltd.	28.11.47
<i>Baltara</i>	G. E. Thomas	S. Bayliss	J. Peacock	United Baltic Co., Ltd.	28.10.47
<i>Banoff Park</i>	E. Bursby	T. Burke, G. Dunn, R. Rutherford	W. Maclaren	Sir Eric Ohlson, Bt. (Manager)	28.4.48
<i>Barjama</i>	M. Fraser	W. Fleet, J. Green	G. H. Shilson	Barline Transports, Ltd.	10.12.47
<i>Baron Belhaven</i>	H. Moore	G. J. McIntosh	T. Ainsworth	Hogarth S.S. Co., Ltd.	28.1.48
<i>Baron Napier</i>	J. H. Anderson	J. Scott, A. Brown, K. Krutainis	J. A. McAakill	Hogarth S.S. Co., Ltd.	22.12.47
<i>Basinghall</i>	J. Hall	G. Baxter, J. R. Foster	L. Norton	Bulk Storage Co., Ltd.	11.2.48
<i>Baskerville</i>	G. Blacklock	R. J. Lungley, W. McClean, G. Cunningham	W. Poingdestre	Barberry's S.S. Co., Ltd.	17.3.48
<i>Bassano</i>	G. Hodgson	P. R. Skelton, B. W. Waldie, N. O. Cook	J. S. Skinner	Ellerman's Wilson Line, Ltd.	19.4.48
<i>Beaconsfield</i>	W. D. Shields	R. King	A. R. Humphries	British S.S. Co., Ltd.	9.1.48
<i>Beaverburn</i>	J. B. Smith, O.B.E.	T. F. Hercus, S. Fieldhouse, P. Lepatorel	W. Vaughan	Ben Line Steamers, Ltd.	24.2.48
<i>Beavercoos</i>	J. P. Dobson, D.S.C., R.D., Cmdr., R.N.R.	R. D. P. Gilbert, G. Palmer, J. Besant, B. Q. Dunham	J. Adamson	Ben Line Steamers, Ltd.	13.1.48
<i>Beaverdell</i>	C. E. Duggan, R.D., Capt. R.N.R.	L. E. McDowell, W. Williams, G. Bateman	A. Sektwell	Ben Line Steamers, Ltd.	3.7.47
<i>Beaverford</i>	R. A. Leicester, O.B.E.	D. Wallace, E. R. Shaw, G. H. Devereux	I. M. Fraser	Ben Line Steamers, Ltd.	3.1.48
<i>Beavergreen</i>	J. P. Dobson, D.S.C., R.D., Cmdr.	H. L. Kinna, D. Blais, D. J. Jeavons	E. H. Pickering	Alexander S.S. Co., Ltd.	5.12.47
<i>Beaverlake</i>	C. L. de H. Bell, D.S.C., R.D., R.N.R.	R. A. Jones, W. H. Goughlan, R. Rawlings	F. E. Smith	Rio Cape Line, Ltd.	29.12.47
<i>Beckenham</i>	F. W. Grist	H. Blair, G. Brown, H. M. Fortune	D. J. Eastwood	F. Leyland & Co., Ltd.	5.12.47
<i>Benarty</i>	E. Messarilla	R. D. Robb	R. A. Macleod	British Tanker Co., Ltd.	16.4.47
<i>Benboran</i>	J. Gringale	F. Hamilton	J. Sheehan	British Tanker Co., Ltd.	19.12.47
<i>Benedict</i>	S. Pollock	D. Lear, L. Savers, J. Wood	A. E. Adams	British Tanker Co., Ltd.	10.4.48
<i>Benledi</i>	A. P. Paterson	G. Spears, G. Miller	F. J. O'Commer	British Tanker Co., Ltd.	
<i>Benrooch</i>	J. B. Hastie	G. Pirie, S. Murray, R. D. Robb			
<i>Benrathkie</i>	W. C. Wilson	A. Jones			
<i>Bibury</i>	A. Roche	J. G. Giles, P. M. Giles, B. S. Biggs			
<i>Black Prince</i>	P. F. Owens	D. C. Gilmour			
<i>Brasil Star</i>	G. Duff, G.M.	C. I. W. Fox, C. Everingham, P. Hudson			
<i>Bravo</i>	E. Tyler	M. R. Bremberg, R. H. Stark, G. Munro			
<i>Britanna Star</i>	F. N. Riley, D.S.O.	W. S. Jeager			
<i>British Colonel</i>	E. L. Miller	R. Maybourn			
<i>British Commodore</i>	N. Pinkney	S. H. Falconer, A. D. Millar, P. C. Coyne			
<i>British Endurance</i>	W. Watkin-Thomas, O.B.E., D.S.C.	E. Hornby, D. MacKinnon, F. Darby			
<i>British Energy</i>	J. G. Hill				

<i>British Escort</i>	D. F. Ward	A. E. Marshall, H. Evans, P. S. Morgan	P. Charlton	British Tanker Co., Ltd.	22.4.48
<i>British Hussar</i>	T. J. Picken	J. A. Picken, W. R. Symon, D. H. Ferrett	C. O'Mahony	British Tanker Co., Ltd.	18.12.47
<i>British Lancer</i>	W. S. Vitte	H. Scott, A. Gordon, G. Lawson	D. Golden	British Tanker Co., Ltd.	5.12.47
<i>British Marquis</i>	I. C. Lea, O.B.E.	F. W. Cuffey, C. Robson, J. McLeod	D. R. Small	British Tanker Co., Ltd.	2.4.48
<i>British Patience</i>	R. S. Hall	J. R. Lumley, N. Steadman, B. Peck	A. Noblett	British Tanker Co., Ltd.	8.11.47
<i>British Pilot</i>	R. O. Cash	H. White, A. Brading, J. Milburn	J. Pearcey	British Tanker Co., Ltd.	19.4.47
<i>British Piper</i>	M. W. Good	L. Leybourne, F. Randison, H. Tunnell,	M. Thompson	British Tanker Co., Ltd.	20.12.47
<i>British Power</i>	C. A. Colburn	A. Mitchell	H. Holdridge	British Tanker Co., Ltd.	10.4.48
<i>British Prestige</i>	W. Hill	J. A. MacLeod, A. L. Wheaton, W. Budge	K. Morris	British Tanker Co., Ltd.	2.10.47
<i>British Resolution</i>	J. Bolger	T. Giffard, D. Batel	G. W. Bayliss	British Tanker Co., Ltd.	20.12.47
<i>British Statesman</i>	W. P. Booth	J. B. Hunter, C. V. Harrison, F. A. Lapper	G. Ferrand	Royal Mail Lines, Ltd.	26.2.48
<i>British Swordfish</i>	H. A. Wright	A. N. Brook, J. Fox, W. Morton	I. S. Don	Moore Line, Ltd.	1.3.48
<i>Brittany</i>	D. J. Jones	F. W. Gant, J. H. Looker	F. L. Roberts	Henrikson & Co.	16.1.48
<i>Brockleymoor</i>	E. Drinkall	A. Corart	C. A. Holbrook	Seddon Fishing Co., Ltd.	8.12.47
<i>Bronies</i>	G. Bull	N. E. Forth, G. Percy, J. F. Hoiland	—, Johnson	Larport & Holt Line, Ltd.	2.1.48
<i>Bulby</i>	J. W. Binns	T. D. Ridley, C. Horton, J. W. Cuth-	J. A. Hamilton	Cairn Line of Steamships, Ltd.	13.2.47
<i>Byron</i>	A. Henderson	bertson	R. N. Dixon	Hudson Bros. Trawlers, Ltd.	2.11.47
<i>Carnarvon</i>	A. Molineux	T. Hopkins, J. S. G. Christian, P. G.	J. D. MacKinnon	Hudson Bros. Trawlers, Ltd.	2.11.47
<i>Carnelona</i>	G. Stable	Partinson, J. M. Donkin	J. Gilbert	Cape York S.S. Co. Ltd.	5.12.47
<i>Canton</i>	C. Agersow	L. A. Hamilton	H. Butler	Union-Castle Mail S.S. Co., Ltd.	21.1.48
<i>Cape Barleur</i>	W. E. Woodall	W. E. Woodall, R. N. Dixon	W. A. Brown	Union-Castle Mail S.S. Co., Ltd.	22.11.47
<i>Cape Gloucester</i>	R. A. Cook	G. O. Lambert, D. E. Cormack, R.	M. Ward	Hadley S.S. Co., Ltd.	13.1.48
<i>Cape Mariato</i>	H. C. Hunter	Brewster	J. E. Unsworth	Monarch S.S. Co., Ltd.	21.2.48
<i>Cape Trafalgar</i>	J. C. Brown, C.B.E., R.D.,	F. Tudor, R. Lofts, J. Beytagh	R. C. Whiting	Elders & Fyffes, Ltd.	27.4.48
<i>Cape York</i>	Cmdre, R.N.R.	H. Butler	J. Malcolm	Anchor Line, Ltd.	18.3.48
<i>Capetown Castle</i>	I. Crewdson	D. N. Kernick, W. S. Brown, R. D. Lofts	W. E. G. Richards	Ellerman Hall Line, Ltd.	13.2.48
<i>Caralla</i>	S. A. Sapsworth	D. Clark	W. G. Allen	Ellerman City Line, Ltd.	13.10.47
<i>Carnarvon Castle</i>	J. H. Keir	E. A. Muir	D. O'Leary	Ellerman Line, Ltd.	13.12.47
<i>Cavina</i>	J. F. Auld	W. A. Arthur, W. V. Pike, J. D. Newbury	D. R. Crombie	Ellerman Hall Line, Ltd.	3.3.48
<i>Celtic Monarch</i>	F. C. Brooks	R. D. Fielder, P. Saunders, R. Sly	B. G. Magennis	Ellerman & Bucknall S.S. Co., Ltd.	19.12.47
<i>Cerintus</i>	C. J. P. Martin	H. E. Jennings, P. J. Brenthall, P. B. Eccles	J. A. Vallance	Ellerman Line, Ltd.	15.9.47
<i>Cheshire</i>	M. C. Williams	W. L. Hillcoat, C. W. Allerton, J. F. Willis	J. Appleton	Ellerman & Bucknall S.S. Co., Ltd.	21.9.47
<i>Chinese Prince</i>	R. W. Smart	G. Hamilton, J. Ballantyne, D. Russell	R. Lennox	Ellerman City Line, Ltd.	7.10.47
<i>Chupra</i>	W. G. Watt	R. G. Lewis, A. M. Bowman, A. J. Preston	F. J. FitzGerald	Ellerman City Line Ltd.	20.4.48
<i>Citica</i>	E. Garner	R. J. Windsor, J. B. Somerville, I. W.	G. S. Creighton	Ellerman City Line Ltd.	13.2.48
<i>City of Barcelona</i>	W. H. Matheson, O.B.E.	Jackson			
<i>City of Bristol</i>	F. Tibbetts	T. Lovell, I. McDermid, J. Henderson			
<i>City of Calcutta</i>	W. S. Coughlan, O.B.E.	W. H. Wilson, E. G. A. Smith, F. E. Politt			
<i>City of Camberra</i>	L. E. Smith, M.B.E.	H. Lewis, W. E. Fletcher, A. H. Davey			
<i>City of Capetown</i>	R. Longstaff, D.S.O.	E. J. Beaumont, J. Irvin, B. Pickering			
<i>City of Carlisle</i>	A. M. Hamilton	K. B. James, R. M. Paulds, P. G. Thomas			
<i>City of Chester</i>	A. G. Melville	F. Chisholm, D. J. Inglis, J. A. Potter			
<i>City of Delhi</i>	E. G. Chapman	K. Dobson			
<i>City of Derby</i>	T. H. Speakman	A. G. Willa, R. J. Tyrell, D. J. Lloyd			
<i>City of Dieppe</i>	J. I. Andrew	H. McL. Farquhar, D. S. Taylor, J. W.			
<i>City of Durham</i>		Terris			
<i>City of Exeter</i>		R. Miller, W. Lowe, D. H. Wardlaw,			
		J. W. Morrison			

NAME OF VESSEL	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS	LAWYER RETURN RECEIVED
City of Hereford	G. A. Ring	J. Grinnell, A. Brocklebank, D. B. Roe	J. Schofield	Ellerman Lines, Ltd.	17.9.47
City of Hong Kong	H. Percival, O.B.E.	D. McQueen, B. Hooper, J. M. Cann, L. R. Keith	J. Owens	Ellerman City Line, Ltd.	31.3.48
City of Johannesburg	D. L. Lloyd, Cmdr., O.B.E.	A. R. Tawton, H. Routledge, C. T. Haywood	A. R. Henderson	Ellerman Hall Line, Ltd.	7.4.48
City of Kimberley	I. A. Beynon	D. B. Martin, R. Frame, R. Wakefield	S. Gracie	Ellerman Hall Line, Ltd.	
City of Lille	F. Scrymgeour	R. B. May, H. M. Steele, G. Gardner	A. Julius	Ellerman Line, Ltd.	
City of Lyons	H. Johnson	R. Clark, A. R. Hiram, J. Morrison	J. Anderson	Ellerman Hall Line, Ltd.	17.3.48
City of Paris	T. F. Labey	T. Dickinson, P. Appleton, K. Haslam	J. Mann	Ellerman City	
City of Pretoria	F. C. Dashiely	L. G. Powell, B. Walker, J. L. Blanch	R. Pickering	Ellerman Hall Line, Ltd.	20.5.47
City of Swansea	J. B. MacLaren	M. Graham, T. Rigg, E. F. Brick	A. C. Macaulay	Ellerman Hall Line, Ltd.	2.3.48
City of Sydney	T. G. Mathias	E. J. E. Owen, W. Kendall, J. Baxter, W. Burgess		Ellerman & Bucknall S.S. Co., Ltd.	27.10.47
City of Windsor	B. Vernon-Brown	G. Hughes, F. King, G. Healy	R. J. Jones	Clan Line Steamers, Ltd.	5.11.47
Clan Brodie	T. W. Inman, O.B.E.	D. Steere, A. G. Beynon, J. Hay	W. Harper	Clan Line Steamers, Ltd.	2.4.48
Clan Buchanan	J. A. Foster	J. W. Ward, F. Turton, D. R. Godfrey	R. F. Cole	Clan Line Steamers, Ltd.	11.3.48
Clan Campbell	H. C. Stimpson, O.B.E.	R. S. Russell, A. M. Vaughan, J. Sullivan	J. Shillabeer	Clan Line Steamers, Ltd.	16.9.47
Clan Chaitan	I. H. Crellin	E. R. Thorpe, W. Graham, D. Buserreau	I. A. Gray	Clan Line Steamers, Ltd.	20.4.48
Clan Chisholm	P. MacMilhan	C. Stonehouse, J. West, W. J. Maltman	H. O. Francis	Clan Line Steamers, Ltd.	
Clan Farquhar	H. S. Pengelly	T. R. Halliday, C. G. Smeaton, C. M. Powell	W. H. Saville	Clan Line Steamers, Ltd.	27.10.47
Clan Forbes	A. G. Storkey	J. P. Dunphy, J. Law, D. Milner, T. R. Parsons	R. S. Gooseman	Clan Line Steamers, Ltd.	6.9.47
Clan Macaulay	H. Cater	G. Bagnall, J. C. Montgomery, R. C. Peace	G. Martyn	Clan Line Steamers, Ltd.	6.12.47
Clan Macdonald	R. P. Galer, C.B.E., R.D., Cmdr., R.N.R.	A. Marr, R. Helme, J. Duff	C. E. C. Crew	Clan Line Steamers, Ltd.	30.12.47
Clan Macdougall	W. R. Woodruffe	P. L. Leslie, W. J. Freestone, N. W. Wallace	R. M. Moore	Clan Line Steamers, Ltd.	4.10.47
Clan MacLaren	R. F. Buckley	L. W. Gibbins, S. F. Nicholson, M. T. Morton	D. Munro	Clan Line Steamers, Ltd.	15.11.47
Clan Macnair	S. F. Carter	R. E. Heywood, J. Chapel	G. McCubbing	Clan Line Steamers, Ltd.	13.2.48
Clan Macmill	H. J. Anchor, O.B.E., R.D., Cdr., R.N.R.	M. N. Ure, W. C. Rodger, T. N. Geesin	R. Wealthy	Clan Line Steamers, Ltd.	8.2.48
Clan Macrae	C. C. Parfitt	W. Fromant, L. B. Witheridge, H. Chambers	A. F. MacIntyre	Clan Line Steamers, Ltd.	19.2.48
Clan Macrae	A. S. Reed	G. S. Barker	E. O'Neill	Bank Line, Ltd.	15.4.47
Clan Macrae	H. Vaughan-Jones	K. C. Crompton, A. G. Smith, A. P. Harkness	P. Dwyer	Northern Petroleum Tank S.S. Co., Ltd.	14.11.47
Clan Macrae	C. J. W. Jones	J. Rochford, W. A. Willis, R. J. Sagar	Lovelock	Union Cold Storage Co., Ltd.	10.3.47
Clan Macrae	R. D., Cdr., R.N.R.	D. O. Percy, E. D. Ashdown, D. P. Renvie	W. E. Gilbert	Anglo-American Oil Co., Ltd.	23.10.47
Clan Macrae	C. C. Parfitt	A. J. Winston, R. Clark, S. J. East	M. O'Riordan	Charante S.S. Co., Ltd.	2.4.48
Clan Macrae	A. S. Reed	E. G. J. Roberts, R. F. Martin, A. Byers	W. M. Fryer	Bank Line, Ltd.	16.2.48
Clan Macrae	H. Vaughan-Jones	F. Fletcher, J. Hunter, R. C. Neesham	M. McDougall	Furness-Howler Argentine Line, Ltd.	19.2.48
Clan Macrae	C. J. W. Jones	J. H. Wilde, Woodbridge, Clifford	R. J. H. Carver	Ellerman's Wilson Line, Ltd.	18.3.48
Clan Macrae	J. W. C. Pring	J. M. James, E. White, F. A. Ogden	B. Barter	Shaw, Savill & Albion Co., Ltd.	18.3.48
Clan Macrae	W. Anderson	T. F. Tuomey, W. F. Kelly, J. Ridley	J. D. Charter	Federal Steam Nav. Co., Ltd.	18.3.48
Clan Macrae	G. Robison		R. Andrews	Donalson Line, Ltd.	13.1.48
Clan Macrae				Donalson S.S. Co., Ltd.	

<i>Cuxatitan</i>	A. H. Thompson	C. S. S. Boann, A. P. Sandford	A. J. Long	Charrette S.S. Co., Ltd.	22.4.47
<i>Dario</i>	B. A. Gannon	R. Finch, D. W. Buckle, B. Harrilshon,	F. M. Harford	Royal Mail Lines, Ltd.	20.2.48
<i>Duchbank</i>	B. Rivett	J. M. Barber	J. Freeman	Bank Line, Ltd.	27.1.48
<i>Defoe</i>	W. C. Blake	I. McKay, D. Campbell, T. Ridgeway	W. Auden	Lampport & Holt Line, Ltd.	2.10.47
<i>Delane</i>	T. Major	W. Carlaw, P. Casey, H. Smith			
<i>Delilian</i>	R. McNie				
<i>Delius</i>	H. W. Underhill	R. S. Macaulay, A. K. McFarlane, S. F.	D. Christie	Donaldson Line, Ltd.	26.1.48
<i>Dembigshire</i>	W. F. Dark	Bryce	R. Pryer	Lampport & Holt Line, Ltd.	29.7.47
		R. H. Turner, W. Jones, H. Jones	H. A. Cox	Glen Line, Ltd.	16.3.48
		J. Main, W. S. Hargrave, E. G. Painter,	A. W. Allen	McCowan & Gross, Ltd.	6.9.47
		D. Stanley	L. Brazill	Royal Mail Lines, Ltd.	29.7.47
<i>Derryclare</i>	G. Smith	A. M. Livingston	A. Williams	Lampport & Holt Line, Ltd.	10.12.47
<i>Deseado</i>	B. C. Dodds, O.B.E.	I. H. Napper, W. B. Avison, J. Holt	J. Fletcher	Federal Steam Nav. Co., Ltd.	13.1.48
<i>Devils</i>	A. Bibby, O.B.E.	H. M. Bunker	S. J. Taylor	Donaldson Line, Ltd.	11.12.47
<i>Devon</i>	A. Hooken	S. G. Robinson, J. Bayley, N. A. Dennis	C. M. Kinnsaird	Doris S.S. Ltd.	11.12.47
<i>Devonshire</i>	I. E. Cullen, O.B.E.	D. Hine, J. Farrow, B. McManus	D. B. Douglas	Royal Mail Lines, Ltd.	27.6.47
<i>Ditona</i>	F. L. Sampson, D.S.C.	J. W. Walker, H. B. Cray, J. A. G.	S. J. Hardman	Lampport & Holt Line, Ltd.	17.7.47
		Bridgeman	D. R. Uglow	Trent Maritime Co., Ltd.	7.1.48
<i>Dorelian</i>	D. Macqueen	I. H. Stark, A. Dougal, A. T. Johnston	J. G. Whyte	Houlder Line, Ltd.	18.1.48
<i>Doris Clunias</i>	J. G. Stevenson	J. B. Whyte, F. Newall, P. P. Bracewell	F. Portess	Royal Mail Line, Ltd.	26.2.48
<i>Drina</i>	W. H. Roberts	D. N. G. East, J. Rutter, E. O'Keefe	H. G. Higgins	Union-Castle Mail S.S. Co., Ltd.	26.1.48
<i>Druden</i>	C. L. Legg	K. Quirk, J. S. Peterkin, J. L. Radcliffe	E. R. Saunders	Federal Steam Nav. Co. Ltd.	23.11.47
<i>Duke of Athens</i>	I. G. Lomas, A.I.N.A.	I. Morris, L. Labistour, J. G. Perrin	E. C. Boucel	Eastern & Australian S.S. Co., Ltd.	16.4.48
<i>Dunster Grange</i>	F. W. Kent	D. F. Parker, H. Neal, C. Mullings	D. C. Howell	Lobitas Oilfields, Ltd.	
<i>Durango</i>	W. H. Roberts	J. G. Brennan, M. W. M. Weekes, M. J.	L. Hooper	Donaldson Bros. & Black, Ltd.	
		Dean, J. T. Jones	D. Thomson	(Managers)	21.8.47
<i>Durbin Castle</i>	C. C. Gorringe	I. M. Cairns, L. MacEwan	T. M. Keddle	Anchor Line, Ltd. (Managers)	19.5.47
<i>Durham</i>	R. J. Dunning	R. W. Merry, J. E. Bury, R. D. Parkin	T. Preston	Bullard, King & Co., Ltd. (Managers)	18.2.48
<i>Eastern</i>	M. C. G. Stratford	W. S. Drew, C. D. Dykes, S. W. Mort	A. Morris	F. Leyland & Co., Ltd.	30.4.48
<i>El Gallo</i>	E. H. Richardson	T. Yates, J. S. Adamson	R. Porter	Counties Ship Management Co., Ltd.	4.11.47
<i>Empire Bvent</i>	J. Cook	J. Shorr, A. McCullum, I. Proctor	W. Campbell	(Managers)	31.3.48
		T. Moodie, D. Lamont, D. McLeod	J. M. Butterworth	Canadian Pacific Railway Co. . . .	21.11.47
<i>Empire Haddale</i>	E. Stermont, M.B.E.	G. McGowan, D. B. Butler	H. W. Turner	Canadian Pacific Railway Co. . . .	25.2.48
<i>Empire Kinross</i>	A. Richardson	F. M. Hughes, T. Cooper, J. M. Corro-	H. M. S. Williams	British S.S. Co., Ltd.	7.4.48
<i>Empire Martaban</i>	E. Longater	chim, R. Hammond	P. McBride	Elders & Fyfe, Ltd. (Managers)	7.1.48
<i>Empire Pride</i>	R. S. Evans, O.B.E.	R. H. Hall-Solomon, Lt., R.N.R., J. T.	P. Moloney	Aberdeen & Commonwealth Line, Ltd.	2.2.48
		Brown, F. P. McCuckin	C. C. H. Weekes	Trader Nav. Co., Ltd. . . . .	8.3.48
<i>Empire Star</i>	S. J. C. Phillips, C.B.E.	D. L. Jardine, A. C. Cable, A. Purvis	W. A. Townley	Anglo-American Oil Co., Ltd.	22.4.48
		M. Hurd-Wood, W. Phillips		Inver Transport & Trading Co., Ltd.	27.2.47
<i>Empire Viseroy</i>	M. D. Mackenzie	I. Bryce, J. Bezzant, J. Waling		Charante S.S. Co., Ltd.	
		G. E. Warburton, L. Thompson, D.		Ulster S.S. Co., Ltd. . . . .	
<i>Empress of Australia</i>	H. H. Davis	Seward			
<i>Empress of Canada</i>	E. A. Shergold	V. Irving, C. P. Turquand, T. Lenton			
<i>Empress of Scotland</i>	J. W. Thomas, O.B.E.	D. T. Mouldley, K. Murray-Brown, J. H.			
		Moore			
<i>Epsom</i>	J. W. Cromarty	L. Mitchell, J. Arthur, S. Robinson			
<i>Evos</i>	R. C. Vigners	F. Allen, R. Ledger, P. A. Leighton			
<i>Esperance Bay</i>	T. V. Roberts, R.D., Capt., R.N.R.	W. L. Nelson			
<i>Essex Trader</i>	C. Arundell				
<i>Esso Glasgow</i>	A. C. Burge				
<i>Etrickbank</i>	T. Watkins				
<i>Explorer</i>	W. Moore				
<i>Fanad Head</i>	E. W. Black				

NAME OF VESSEL	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS	LAST RETURN RECEIVED
<i>Fantee</i>	J. W. Andrew	P. M. Ralston, G. H. Griffiths, S. Burley	W. A. Johnston	Elder Dempster Lines, Ltd.	2.3.48
<i>Fenja</i>	J. W. Leask	I. C. McDonald	J. W. Leask	South Georgia Co., Ltd.	5.12.47
<i>Ficus</i>	S. Thompson	B. T. Tallack, G. D. Davidson, J. R. Johnson	J. Moss	Anglo-Saxon Petroleum Co., Ltd.	1.8.47
<i>Finland</i>	A. Wilson, O.B.E.	J. S. Drynan, G. Cross	H. S. Knight	Currie Line, Ltd.	18.3.48
<i>Folda</i>	E. Tulloch	J. F. Cooper, H. Watson		South Georgia Co., Ltd.	
<i>Fordsdale</i>	R. G. Ireland	R. T. Welch, G. B. Moss, G. Lewis		Shaw, Savill & Albion Co., Ltd.	
<i>Fort Assiniboine</i>	A. H. Downes	J. Bearman		Brown, Atkinson & Co., Ltd. (Managers)	2.2.48
<i>Fort Augustus</i>	G. Hornsby	G. Craig, J. Forgie, T. Hyslop	E. W. Divers	Watts, Watts & Co., Ltd. (Managers)	
<i>Fort Cadotte</i>	A. MacKellar, R.D., Capt., R.N.R.	G. Mitchell, K. Lamb, L. Coltham	J. F. Reilly	Cunard White Star, Ltd. (Managers)	13.8.47
<i>Fort Caribou</i>	W. T. Evans	M. O. Hamill, E. C. Leaver, M. E. D. Annett	V. P. Manaham	Goulandris Bros., Ltd. (Managers)	
<i>Fort Musquarro</i>	J. Francis Drake, O.B.E., R.D., R.N.R.	M. Hehir, P. Jackson, J. C. Nicholson	M. J. Sheahan	Cunard White Star, Ltd. (Managers)	
<i>Fort Nakasley</i>	A. Cromarty, O.B.E.	M. MacPhee, A. McFie-Allen, A. S. Kelly	J. F. Norwood	J. & J. Denholm, Ltd. (Managers)	5.12.47
<i>Fort Spokane</i>	J. V. Locke, R.D., Cdr., R.N.R.	J. H. Aldridge, M. V. Reardon, N. R. Haddon	F. MacLaughir	Cunard White Star, Ltd. (Managers)	
<i>Fort Steele</i>	J. S. Binnie	L. Jamieson, J. Horne, K. Montgomery	W. Steele	Lyle S.S. Co., Ltd. (Managers)	
<i>Fort Tonderoga</i>	J. L. Grossdale, R.D., Capt., R.N.R.	J. K. Finlay, T. W. Marshall, J. Robinson	J. E. Conway	Cunard White Star, Ltd. (Managers)	18.2.47
<i>Francconia</i>	C. I. Thompson	P. T. Drake, A. M. Thomson, J. Millington	G. M. Parsons	Charente S.S. Co., Ltd.	18.3.48
<i>Geologist</i>	W. L. Saul	W. E. Hinde		Anglo-American Oil Co.	4.8.47
<i>Geo. W. MacKnight</i>	A. G. Robins	E. Tunnicliffe, F. Bridges, A. L. Searle	R. Wealthy	Cunard White Star, Ltd. (Managers)	20.4.48
<i>Georgic</i>	H. Dixon	J. O. Springall, J. R. Lidgley, K. T. Jones	A. G. Hill	Ocean S.S. Co., Ltd.	31.12.47
<i>Glaucus</i>	W. T. Spencer	J. Lloyd-Jones, G. McInnes, P. Pratt	J. M. Lewis	Glen Line, Ltd.	10.6.47
<i>Glenarney</i>	W. E. Coates	R. Webb, C. Lorimer, R. Passmore	W. Colley	Bank Line, Ltd.	7.4.48
<i>Glenbank</i>	T. Fraser	M. Murphy, J. J. Reed, J. R. Roe	C. H. Ball	Federal Steam Nav. Co., Ltd.	5.3.48
<i>Gloucester</i>	A. J. Angell	B. E. Applegate, G. E. Holland, J. Sassoon	R. J. Devlin	Wyre Steam Trawling Co., Ltd.	10.4.48
<i>Goth</i>	J. E. Bywater	A. Miller, J. Laing	A. Wright	Currie Line, Ltd.	1.2.47
<i>Gothland</i>	D. Sinclair	H. Smallwood, A. V. Jones, D. A. Barfoot	D. Sinclair	Donaldson Line, Ltd.	
<i>Gracia</i>	H. McLachlan	A. E. Pearson, T. Rylance, R. B. Dales	R. A. Bristy	Mediterranean & Atlantic Lines, Ltd.	16.2.48
<i>Granpond</i>	R. W. Watkins	M. Pledger, J. Ramsey, J. Mallett, N. J. Collett	G. Clare	United Africa Co., Ltd.	
<i>Guinean</i>	H. Coffey, R.D., R.N.R.	P. S. Sharer, G. E. Bennison		New Zealand S.S. Co., Ltd.	
<i>Haparangi</i>	C. R. Pichet, O.B.E.	W. Thomas, M. C. Mills, R. V. Purkiss	J. Matthews	Anglo-Saxon Petroleum Co., Ltd.	12.9.47
<i>Helicina</i>	F. T. Vine	R. M. Tyrol	T. W. Corbett	Bibby Line, Ltd.	22.10.47
<i>Herefordshire</i>	T. I. A. Thomson	J. Price, W. R. Brooks, C. B. Lambert	E. Greaves	Royal Mail Lines, Ltd.	
<i>Highland Brigade</i>	H. D. Hooper, O.B.E.	A. Ferguson, J. Perkins, M. Hawkins,	T. Desborough	Royal Mail Lines, Ltd.	29.10.47
<i>Highland Chieftain</i>	G. A. Bannister	G. Lillie	F. Dunk	Royal Mail Lines, Ltd.	
<i>Highland Monarch</i>	D. A. Casey, C.B.E., D.S.O., D.S.C., R.D., Cmdre, R.N.R.	N. L. Tapp, M. Wardle, B. Lambert,	F. Goodall	High Hook S.S. Co., Ltd.	18.2.48
<i>Highland Princess</i>	P. Cooper	R. C. C. Frizell		Booth S.S. Co., Ltd.	19.5.47
<i>Highwear</i>	J. S. Mallaby	A. S. Frith, M.B.E., P. J. Wahlberg, F. J. Forster	J. Houghney		17.11.47
<i>Hilary</i>	A. Elliott, O.B.E.				

<i>Hopetown</i>	T. Georgeson	N. Hanson	W. Thomas	Clive S.S. Co., Ltd.	12.4.47
<i>Hopetown</i>	G. Grindrod	C. E. Pain, J. C. Jackson, F. Rowe	A. Buchanan	Hopemount S.S. Co., Ltd.	8.4.48
<i>Hopetown</i>	F. H. Dufton	C. J. Outen, W. D. Tullock	C. I. Rees	Wallend S.S. Co., Ltd.	20.11.47
<i>Hovort</i>	A. E. Taylor	R. Webster, B. K. Price, P. Jeanes	C. L. Lambie	New Zealand S.S. Co., Ltd.	28.8.47
<i>Horsa</i>	D. Dickson	W. Urquhart, A. Wotherspoon	None carried	Currie Line, Ltd.	8.3.47
<i>Inishopen Head</i>	G. A. Moore	J. Smythe, N. C. Starke, R. McKeague	F. J. Murray	Uister S.S. Co., Ltd.	11.8.47
<i>Inverbank</i>	A. M. Williamson	J. A. Jones, J. Mitchell	W. Chalmers	Bank Line, Ltd.	20.4.48
<i>Jamaica Producer</i>	P. D. Allen, O.B.E.	G. J. Tedd, W. E. Brett, D. G. Clarke, F. Saunders	K. Hartley	Jamaica Banana Producers S.S. Co., Ltd.	22.4.48
<i>Jersey City</i>	J. M. Cox	J. H. J. Frost, D. L. Beynon, T. Thomas	C. Codling	Reardon Smith Line, Ltd.	9.10.47
<i>Yasmore</i>	A. C. Bailey	S. N. Coe, D. G. Waters, K. Rowland	F. Murray	Johnston Warren Lines, Ltd.	29.9.47
<i>John Biscoe</i>	A. F. MacFie, O.B.E.	W. L. Harrison, P. Bathurst, J. Spilman, R. Griffiths	J. O'Hare	Falkland Islands Dependencies Govt.	
<i>John Holt</i>	A. Kennedy	D. M. Steven, J. R. Suffren, F. Le Messurier	P. A. Senior	John Holt & Co. (Liverpool), Ltd.	26.4.48
<i>Kaipaki</i>	T. Fenwick	N. Fraser, D. Ewan, G. B. Thomson	F. Matthews	New Zealand S.S. Co., Ltd.	7.1.48
<i>Kaipara</i>	T. R. Windus	I. Blake, C. F. Turner, W. Howgo	S. H. Devereux	New Zealand S.S. Co., Ltd.	24.2.48
<i>Kainua</i>	R. E. Hellings	R. H. Wakeford	M. Garrett	New Zealand S.S. Co., Ltd.	21.1.48
<i>Kailada</i>	S. Hazard	P. F. Carnochan, J. F. Thompson, A. Ferguson	T. Lewis	J. Nourse, Ltd.	
<i>Kelmiscott</i>	R. E. Richardson	J. Toogood, W. Anson, F. Rossouw, G. Beaumont		Pachesham S.S. Co., Ltd.	3.9.47
<i>Kemitoorth Castle</i>	G. H. Mayhew	D. L. Willmott, G. C. Simpson, C. Masson	A. C. Cockburn	Union-Castle Mail S.S. Co., Ltd.	16.2.48
<i>Kent</i>	E. H. Hopkins	H. Johansen, J. F. Jarvis	E. Dove	Federal Steam Nav. Co., Ltd.	30.9.47
<i>Ketos</i>	G. J. Gjertsen	G. Griffiths, W. Keith, P. Kidd	J. Murphy	United Whalers, Ltd.	
<i>King Robert</i>	G. Craze	A. S. Gittings, J. C. Davies, A. J. Moore	W. Fielding	King Line, Ltd.	10.10.47
<i>King William</i>	J. W. Marwick	R. Cornish	J. Nicol	King Line, Ltd.	7.4.48
<i>Kingston Pearl</i>	A. R. Cornish	C. O. Jones, A. Baird, J. B. Peto	W. Weaver	Kingston Steam Trawling Co.	3.11.47
<i>Kofastan</i>	W. A. Chappel	J. I. W. Reid	R. R. Gill	Shahristan S.S. Co., Ltd.	18.11.47
<i>Lacklan</i>	W. H. Willcox	J. H. Allenby, W. P. Goldie, P. H. Grant	H. E. Morrison	Socomy-Vacuum Transportation Co., Ltd.	
<i>Laguna</i>	R. C. Skilorn	J. Orr, R. L. Snaith, H. P. Winkle	J. Heenay	Pacific Steam Nav. Co.	19.3.47
<i>Lambrook</i>	H. F. McInnes	J. S. Catterall, C. McCullach, D. Crawford	A. Leader	Austin Friars S.S. Co., Ltd.	11.3.48
<i>Lanarkshire</i>	C. E. O'Byrne	W. H. Malley, J. C. Priest, J. W. O-K. Harwood	P. Budge	Scottish Shire Line, Ltd.	18.2.47
<i>Lancashire</i>	A. Kerbyson	J. L. Roberts	A. Jones	Bibby Line, Ltd.	18.3.48
<i>Lassell</i>	D. Roberts	W. J. Erskine, R. W. Lumsden, I. Higgins	J. Gilbert	Lampport & Holt Line, Ltd.	
<i>Latis</i>	P. G. G. Dove	T. Alderman, R. Stewart-Scott, J. Andrews	F. J. Walls	Anglo-Saxon Petroleum Co., Ltd.	7.4.48
<i>Letcher</i>	H. P. Holwood, R.D., R.N.R.	C. G. Watterson, C. R. Eaddy, D. A. Kiddell		Federal Steam Nav. Co., Ltd.	16.2.48
<i>Leverbank</i>	D. Gillies	F. Methan, F. E. Barnes, G. Dineley	W. C. Doyle	Bank Line, Ltd.	26.2.48
<i>Lizorno</i>	E. S. Green	W. J. Damerell, R. Wright, C. M. Hart	L. Bradshaw	Ellerman's Wilson Line, Ltd.	13.11.47
<i>Llangibby Castle</i>	J. B. McReynolds, D.S.C.	H. L. Halcrow, D. W. Verniers, D. W. Falconer	J. Eager	Union-Castle Mail S.S. Co., Ltd.	1.1.48
<i>Lloydcrest</i>	T. Walker	R. T. Riley, P. H. Ray, J. Norman	A. Cape	Juncrest S.S. Co., Ltd.	
<i>Lobos</i>	R. H. Sissons	R. G. Driver, G. E. Leech, D.S.C., J. V. Bradbury, A. H. Hardy	N. P. Sherin	Pacific Steam Nav. Co.	15.1.48
<i>Loch Avon</i>	W. W. Lowe	D. B. Keeffe	M. R. Littlejohn	Royal Mail Lines, Ltd.	18.3.48
<i>Loch Garth</i>	H. G. Whittle, O.B.E.	C. Hartley, N. F. Seaton, M. Dean, R. D. Stirling	D. Douglas	Royal Mail Lines, Ltd.	
<i>Loch Ryan</i>	W. H. Grimshaw	G. B. Medleycott, J. E. Robson, Lt., R.N.R., P. C. T. Davies	J. Coutts	Royal Mail Lines, Ltd.	9.10.47
<i>Lochmonar</i>	H. H. Trewecks				15.12.47

NAME OF VESSEL	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS	LAST RETURN RECEIVED
Lord Gladstone	J. Abuelo	M. M. Osman, W. T. Davies, S. L. Edwards	W. Phelan	Norwood S.S. Co., Ltd.	2-3-48
Lord Glenstoran	W. J. Leinster	R. Coffey, R. M. Hall, A. Brines	S. G. D. Wessels	Ulster S.S. Co., Ltd.	2-3-48
Lord O'Neill	R. A. Ferguson	R. G. Pass, W. R. Nelson	C. A. Murphy	Ulster S.S. Co., Ltd.	11-12-47
Lorrigs	G. B. Wardale	W. E. Molloy, K. Thomas, A. Hudson	J. Sheen	Pacific Steam Nav. Co.	2-12-47
Louisa	P. L. Hockey	G. E. Turner, J. Galston, M. Plewes	F. K. Cowley	Pacific Steam Nav. Co.	13-11-47
Lutesworth Hill	J. Reed	J. S. Henderson, R. W. Curd	R. Penrose	Dorset S.S. Co., Ltd.	4-2-48
Luminous	S. J. Smith	J. Billett		Aral S.S. Co., Ltd.	
Machans	J. L. W. Johnston	D. H. Stewart, C. C. Reeder, J. R. Wells, A. C. Farquhar	A. Akhurst	Ocean S.S. Co., Ltd.	26-4-48
Macharda	R. A. Penstone	J. F. Baker, T. H. Wardle, L. J. S. Saxty	G. Caddy	T. & J. Brocklebank, Ltd.	22-12-47
Magdalen	A. Hill, O.B.E.	S. Baxter, A. Davies, P. A. Litherland	E. Halton	T. & J. Brocklebank, Ltd.	2-12-47
Maharada	J. W. B. Robertson, R.D.				
Maha	J. R.N.R.	P. A. Gussone, J. Brand, J. C. Long	T. Williams	T. & J. Brocklebank, Ltd.	30-12-47
Mahout	J. W. Hart	T. de M. Ogier, C. C. D. Gough	J. J. Nolan	Shaw, Savill & Albion Co., Ltd.	8-10-47
Mahud	T. C. Eddy	A. Anderson, O. Pritchard, G. Sinclair	A. Roberts	T. & J. Brocklebank, Ltd.	16-2-48
Mahar	R. Humble	A. P. Briggs, F. J. Watts	H. Fisher	T. & J. Brocklebank, Ltd.	20-12-47
	J. R. Pajaley	J. P. Pembidge, M. H. Taylor, D. L. des Landes	K. P. Kinderman	T. & J. Brocklebank, Ltd.	18-12-47
Makalla	J. B. Newman	A. H. Fawcett, J. Clarke, J. H. Moore	A. N. Orum	T. & J. Brocklebank, Ltd.	16-10-47
Malakona	H. Owen	J. P. Haskworth, H. Defty, D. Hay	J. Caddy	T. & J. Brocklebank, Ltd.	22-4-48
Malancha	H. MacGregor	D. S. Carter, W. Gibson, J. Kemp	B. I. Smith	T. & J. Brocklebank, Ltd.	13-1-48
Malayan Prince	J. D. Fraser	P. B. Eccles, H. W. Gates, J. R. Stephens	B. Laird	Rio Cape Line, Ltd.	
Mabno	J. W. Calvert	W. P. Lowthian, W. Hine, M. Bewley, B. S. Roberts, R. Wedgworth		Ellerman's Wilson Line, Ltd.	
Manchester City	F. L. Osborne	A. C. Caird, W. E. Quirk, J. E. Askew	W. H. Critchley	Manchester Liners, Ltd.	9-6-47
Manchester Commerce	H. Hancock	H. Nielsen, F. Robinson, D. Thomas	H. C. Evans	Manchester Liners, Ltd.	2-2-48
Manchester Division	E. W. Espley	A. Cookson, F. Lewis, N. Davies	T. Parker	Manchester Liners, Ltd.	2-2-48
Manchester Progress	W. H. Downing		J. Coates	Manchester Liners, Ltd.	
Manchester Regiment	F. D. Struss, O.B.E.				
Manchester Shipper	D.S.C.	E. J. Eccles, J. L. McLaren, D. S. Millard	J. Reid	Manchester Liners, Ltd.	11-12-47
Manchester Trader	I. Barclay	T. H. Lynn, F. Lewis, D. Heaton	E. Amabler	Manchester Liners, Ltd.	14-1-47
Mandator	E. W. Raper	P. N. Fielding, R. Haftman, N. H. Davies	A. C. Gavin	Manchester Liners, Ltd.	12-9-47
	L. E. Jeans	H. F. Ackersley, D. A. Morris, F. P. Atwood	B. Banks	T. & J. Brocklebank, Ltd.	7-4-48
Maplebank	N. P. McLeod	N. P. McLeod	J. B. Andersson	Rank Line, Ltd.	
Marango	E. Edison	H. Riley		Ellerman's Wilson Line, Ltd.	
Margay	E. A. Freatice	M. G. Stevens, W. Forster, J. Bloomfield	J. Moss	"K" S.S. Co., Ltd.	16-4-48
Marinda	A. Croydon	H. C. Coplin	H. C. Coplin	Seddon Fishing Co., Ltd.	
Maribor	W. Hill, O.B.E.	I. A. Macarena, J. Ritchie, R. N. Bonny	G. M. Caddy	T. & J. Brocklebank, Ltd.	27-4-48
Marina	R. J. Hume	R. J. Sinclair, W. Allen	H. A. Reynolds	South Georgia Co., Ltd.	16-3-48
Marquita	F. C. Jennings	D. Hughes, J. Cush, J. Benson		"K" S.S. Co., Ltd.	
Marquale	M. Ferguson	H. Jones, J. Tiers, L. Mansell	D. H. Butterworth	T. & J. Brocklebank, Ltd.	28-4-48
Marrant	T. Fox-Lloyd	E. Watkins, E. McAulley, G. J. Kenyon	A. MacDonald	"K" S.S. Co., Ltd.	
Marvita	H. Bunn	N. White, E. Prest, P. Parker	P. Neeson	T. & J. Brocklebank, Ltd.	21-1-48
Mathewan	A. B. Bannatyne, O.B.E.	H. Simpson, J. A. Miller, A. W. Wiltshire	A. C. Knight	Elders & Fyffes, Ltd.	8-12-47
Maxima	A. G. Jones	B. Hodges, T. C. Crane, A. Walborn			
Mauretania	H. Gratridge, O.B.E.	T. R. Buckingham, K. Milburn, J. R. Lidgley	F. Clark	Cunard White Star, Ltd.	
Medea	C. S. Williams	A. D. Hunt, A. G. Huswayne, M. T. Dodds	W. M. McOrdle, M.B.E.	Cunard White Star, Ltd.	8-3-48

<i>Mentling</i>	D. C. Roberts	G. J. Piper, L. A. Ankers, W. Sparks	F. E. L. Hall	Lampport & Holt Line, Ltd.	25.2.48
<i>Millas</i>	J. F. Byrne, O.B.E.	R. J. Sampson, J. Edgar, D. S. Leicester	A. Hutchinson	Lampport & Holt Line, Ltd.	18.8.47
<i>Mirror</i>	S. A. Gammon	R. E. Small, P. B. Henderson, C. E. Burrill	J. Crouch	Cable and Wireless, Ltd.	5.12.47
<i>Monarch</i>	J. P. F. Betson	K. H. Joy, A. Hoar, Black-Tuckwell	E. Robinson	Postmaster General	18.7.47
<i>Moueria</i>	T. S. Graham	G. E. Waddell, G. B. Manson, R. S. Hopkins	R. H. Hallam	Donaldson Line, Ltd.	25.6.47
<i>Mulbera</i>	M. Williams	A. J. Jarnan, J. B. Purkis, T. R. E. Cundy	T. McMinn	British India Steam Nav. Co., Ltd.	22.4.48
<i>Murillo</i>	W. Gillespie	P. Leighton	N. Kehoe	Lampport & Holt Line, Ltd.	11.11.47
<i>Myrtlebank</i>	F. Hale	G. Hodgson, J. T. Duncan, F. J. Adamson	J. Adamson	Bank Line, Ltd.	22.4.48
<i>Nab Wyke</i>	P. E. Bedford	B. Arntstad, E. Reed, J. Appleby	W. Lay	Wyre Steam Trawling Co., Ltd.	18.12.47
<i>Naimbank</i>	C. S. Holbrooke	S. Harvey, J. Bain	C. D. Grimster	Bank Line, Ltd.	29.8.47
<i>Napier Star</i>	E. N. Rhodes	C. Palmer, J. E. Gill, C. B. Davidson	L. Booth	Union Cold Storage Co., Ltd.	13.2.48
<i>Naticana</i>	W. D. Speakman	W. A. Clark, J. G. Wilson, W. S. Guthrie	J. Cahill	Anglo-Saxon Petroleum Co., Ltd.	10.12.47
<i>Nestor</i>	E. W. Powell	N. A. Blitch, J. B. Stewart, H. T. Sheffield	C. J. Carter	Ocean S.S. Co., Ltd.	17.12.47
<i>Newfoundland</i>	A. Church	D. Thomas, R. Stewart, D. van der Merwe	J. Heath	Johnston Warren Lines, Ltd.	9.4.47
<i>New Zealand Star</i>	G. Owen, O.B.E., R.D., Cdr., R.N.R.	R. S. Luly, H. C. MacP. Douglas, A. B. Moos	J. Hassen	Federal Steam Nav. Co., Ltd.	13.12.47
<i>Norfolk</i>	A. T. Robertson, R.D., Capt., R.N.R.	B. C. Crist, R. Webster, G. Wotton	W. C. Brock	Federal Steam Nav. Co., Ltd.	15.12.47
<i>Northumberland</i>	F. Longheed	H. Wylie	R. Hardman	Donaldson Lines, Ltd.	29.9.47
<i>Norwegian</i>	J. Pollock	A. Pearson, J. Lees, R. I. Heys	G. A. Parker	Johnston Warren Lines, Ltd.	13.11.47
<i>Nova Scotia</i>	J. E. Wilson, O.B.E.	W. G. Jackson	J. R. Kidson	Charente S.S. Co., Ltd.	22.4.48
<i>Novelst</i>	T. E. Steel	R. J. Wilks, T. Shields, P. J. Leech	N. Boon	Shoulder Bros. & Co., Ltd. (Managers)	7.4.48
<i>Ocean Valley</i>	W. MacMellin	F. M. Williamson, L. Ambrose, C. S. Single	R. Oakley	New Zealand S.S. Co., Ltd.	2.2.48
<i>Orari</i>	F. Pover	J. B. Olsson, B. A. King, N. Owen	C. T. Seaton	Pacific Steam Nav. Co., Ltd.	17.12.47
<i>Ordana</i>	W. A. Hearle	B. Noble, C. K. Knight, W. Thompson	J. A. Waddle	Pacific Steam Nav. Co., Ltd.	20.12.47
<i>Orion</i>	C. Fox, C.B.E., L.M.	C. F. Williams, A. M. Murray, D. K. H. Kinlock	R. P. McEwan	Orient Steam Nav. Co., Ltd.	9.4.47
<i>Ormonde</i>	T. L. Shurrock, O.B.E.	L. C. Kingswood, E. V. Harris, Thomas	T. E. Stronge	Orient Steam Nav. Co., Ltd.	13.12.47
<i>Otranto</i>	I. E. G. Goldsworthy	D. M. Morris, Crosthwaite, Cameron	F. Slater	Norfolk & North American S.S. Co., Ltd.	15.12.47
<i>Pacific Enterprise</i>	M. E. Cogle, O.B.E.	H. M. Head, B. A. Gouldstone, G. K. Williams	P. McCarthy	Norfolk & North American S.S. Co., Ltd.	29.9.47
<i>Pacific Exporter</i>	R. E. L. Holland	E. Cunningham	H. Olding	Norfolk & North American S.S. Co., Ltd.	23.4.48
<i>Pacific Importer</i>	J. H. King	W. E. Thomas, R. Hughes, S. G. Edwards	J. Stone	P. & O. Steam Nav. Co.	20.3.48
<i>Pacific Shipper</i>	E. V. Richards	D. R. Gibson	A. R. Smith	MacAndrews & Co., Ltd.	22.4.48
<i>Pacific Stronghold</i>	F. H. Perry	E. Smith, A. H. N. Pugh, A. R. Stephenson	L. P. Rayner	Royal Mail Lines, Ltd.	22.11.47
<i>Pakeha</i>	H. C. Smith	C. A. Ellis, McKinley	E. Pillow	Royal Mail Lines, Ltd.	24.2.48
<i>Palacio</i>	M. H. Atkinson, D.S.C.	P. J. Passmore, M. A. Frenfield, W. B. Vickers	A. MacBeth	Royal Mail Lines, Ltd.	8.11.47
<i>Palena</i>	F. R. Spurr	F. Szanage	Cunard White Star, Ltd.	P. & O. Steam Nav. Co.	16.1.48
<i>Palomares</i>	D. L. Thomas, M.B.E.	C. D. Williams			
<i>Pampas</i>	T. Powell	G. R. Naylor, R. Sims, R. Tomlinson			
<i>Papapani</i>	B. Evans	H. A. Owen, C. B. Hewett, G. J. Keyse			
<i>Paparoa</i>	E. A. J. Williams	G. A. Gibbons, D. E. Hogarth, E. A. Pearce			
<i>Paraguay</i>	H. V. Todd	M. Hawkins, J. Green, S. D. Gibson			
<i>Parado</i>	R. N. Fletcher	R. C. Hunnisett			
<i>Parina</i>	J. N. Duncan	G. P. Blyth, W. N. Eade, J. S. Anderson			
<i>Paringa</i>	C. E. Pollitt				
<i>Paritiga</i>	R. G. Thelwell, O.B.E., R.D., Capt., R.N.R.				
<i>Paritua</i>	A.D.C.				

NAME OF VESSEL	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS	LAST RETURN RECEIVED
<i>Pegu</i>	S. Thomson	J. W. Brown, I. S. MacColl, L. O. Thornton	R. Wilson	British & Burmese Steam Nav. Co., Ltd.	13.10.47
<i>Perin</i>	J. C. Mellonie	R. M. Parnell	F. Rayner	P. & O. Steam Nav. Co.	17.11.47
<i>Pertshire</i>	A. I. Hogg	J. Browne, J. G. Smith, I. W. Bennet	A. Young	Scottish Shire Line, Ltd.	25.11.47
<i>Pikomayo</i>	T. Davies	D. P. Warren, P. Anthony, J. Upton	L. Wittingdon	Royal Mail Lines, Ltd.	
<i>Pipiriki</i>	R. G. Rees	M. J. Heron, J. Bryant, J. Laidlaw		New Zealand S.S. Co., Ltd.	
<i>Planier</i>	J. J. Wallis	J. L. Cuile		Charante S.S. Co., Ltd.	
<i>Polar Chief</i>	A. Goodlan	E. Smith, J. Gilman		South Georgia Co., Ltd.	
<i>Polar Maid</i>	H. Leask	C. M. Watkins, P. A. N. Thomas, M. L. Mitchell	M. J. Sheehan	Polar Whaling Co., Ltd.	
<i>Port Chalmers</i>	E. J. Syvret	P. L. Hollings, J. Rose, H. S. Cran	E. G. Gunner	Port Line, Ltd.	20.12.47
<i>Port Fairy</i>	D. G. H. Bradley			Port Line, Ltd.	29.12.47
<i>Port Hobart</i>	T. F. Kippins, O.B.E., D.S.C.	A. J. Braund, J. D. Aitchison, J. A. Ashburner	B. Morley-Evans	Port Line, Ltd.	29.12.47
<i>Port Jackson</i>	J. G. Thom	D. M. MacKeith, C. Guest, D. Sinclair	A. B. Chelfers	Port Line, Ltd.	17.3.48
<i>Port Lincoln</i>	H. H. Smith, O.B.E.	G. Garling, R. Silvester, D. Robinson	F. Griffiths	Port Line, Ltd.	18.2.48
<i>Port Macquarie</i>	E. Roswell	H. Thompson, T. S. Paton, P. M. Hudson	H. J. Griffiths	Port Line, Ltd.	31.3.48
<i>Port Phillip</i>	J. G. Lewis, O.B.E.	J. C. Howell, F. M. Barton, M. B. Pettigrew	P. Smyth	Port Line, Ltd.	5.3.48
<i>Port Pirie</i>	W. J. Enright, O.B.E., R.D., Cdr., R.N.R.	H. F. Lunn, R. C. Matthews, A. S. Baird	W. Miller	Port Line, Ltd.	17.12.47
<i>Port Wellington</i>	W. G. Higgs, O.B.E.	I. M. Bedwell, R. J. Harris, L. P. H. Sayles	J. S. MacPheanson	Port Line, Ltd.	30.12.47
<i>Port Wynham</i>	H. Steele	W. H. Hopwood, Lawrence, Bell	P. Hobbs	Port Line, Ltd.	18.12.47
<i>Potaro</i>	S. J. G. Hill	T. A. Evans, W. A. Iresidder, W. K. West	C. B. Townley	Royal Mail Lines, Ltd.	13.8.47
<i>Priam</i>	L. W. Kersley	I. Webster, R. A. Hansel, C. H. Jolly	F. Fish	Ocean S.S. Co., Ltd.	10.4.48
<i>Princesa</i>	R. Owen	D. A. Dear		Furness-Houlder Argentine Lines, Ltd.	
<i>Rakata</i>	J. S. Ornard	M. Holden, T. Gibbon, J. Budgell, A. Rollinson	A. Lugar	New Zealand S.S. Co., Ltd.	16.3.48
<i>Rangitata</i>	G. Kinnell, O.B.E.	H. P. Lunn, M. Drake, W. Peto	E. Stride	New Zealand S.S. Co., Ltd.	15.12.47
<i>Recorder</i>	R. F. Longster	G. W. Sigsworth		Charente S.S. Co., Ltd.	22.10.47
<i>Red Charger</i>	R. Nash	C. Noble		Iago Steam Trawler Co., Ltd.	
<i>Red Crusader</i>	B. Rogerson		R. Green	Iago Steam Trawler Co., Ltd.	
<i>Red Knight</i>	E. Lattier			Iago Steam Trawler Co., Ltd.	
<i>Red Lancer</i>	M. Wright			Iago Steam Trawler Co., Ltd.	
<i>Red Sword</i>	J. Tomlinson			Iago Steam Trawler Co., Ltd.	
<i>Regent Hanak</i>	J. Ward			Iago Steam Trawler Co., Ltd.	
<i>Reighton Wyke</i>	C. Whiting	F. S. Farrar, G. R. Arthur, H. G. Gresswell, G. Green	J. R. Twidell	Trinidad Leaseholds, Ltd.	18.3.48
<i>Rembrandt</i>	J. J. Grugan		R. Bell	West Dock Steam Fishing Co.	20.3.47
<i>Repton</i>	D. Cowrie	R. Thompson, T. J. Morgan, M. Barrett	R. Marsden	Bolton, S.S. Co., Ltd.	8.3.48
<i>Richmond Castle</i>	Pettit	E. L. James, D. M. Muir, D. Meardon	W. Keogh	Bagra S.S. Co., Ltd.	4.3.48
<i>Richmond Hill</i>	M. O'Neill	E. H. F. Hall	R. Santillo	Union-Castle Mail S.S. Co., Ltd.	2.2.47
<i>Riebeck Castle</i>	M. S. Hodson	S. Sloan, A. Shafy, L. Gellie	R. White	Putney Hill S.S. Co., Ltd.	6.1.48
<i>Rimutaka</i>	W. Wilson, O.B.E.	J. A. Scott	S. Godfrey	Union-Castle Mail S.S. Co., Ltd.	22.4.48
<i>Ripplingham Grange</i>	L. Bearbank	B. Linklater, I. Cubitt, D. Dickens, T. Train	A. Stenning	P. & O. Steam Nav. Co.	31.3.48
<i>Robert F. Hand</i>	E. J. Instone, O.B.E.	R. Tinnmouth, H. Butler, E. A. Prothero	J. Connolly	Houlder Line, Ltd.	22.4.48
<i>Robert Hewett</i>	G. Elliot	J. Rattray, I. le Cocq, F. Barber	R. Munro	Anglo-American Oil Co., Ltd.	31.3.48
<i>Rochester Castle</i>	D. D. Mackenzie	H. Wilcock		Great Northern Fishing Co., Ltd.	
		P. G. Eckford, G. E. Matthews, E. H. Pickles	K. N. G. Ashford	Union-Castle Mail S.S. Co., Ltd.	14.11.47



NAME OF VESSEL	CAPTAIN	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNERS	LAST RETURN RECEIVED
Stamcourt	F. H. Wainford	R. Muir	N. Crossley	Stanhope S.S. Co., Ltd.	10.11.47
Stanhall	S. G. Larard	J. R. Sims, L. M. Davies	R. Malpin	Stanhope S.S. Co., Ltd.	20.10.47
Stanhorte	R. G. Roberts	E. L. Davies, R. S. Drew, L. E. Scott	J. M. Bannerman	Stanhope S.S. Co., Ltd.	8.11.47
Starling Castle	W. A. Pece, O.B.E.	W. B. Fletcher, E. Hall, J. McAuley	H. Oliver	Union-Castle Mail S.S. Co., Ltd.	20.1.48
Stirlingshire	J. McCrone	A. S. Palethorpe-May, G. A. Winter, A. J. Rutherford	P. Goos	Scottish Shire Line, Ltd.	28.1.48
Strathaird	H. S. Allen, R.D., R.N.R.	M.H. D'ath, R. L. Pigeon, J. Owen	F. E. Ash	P. & O. Steam Nav. Co.	20.4.48
Stratheden	S. W. S. Dickson	M. H. Haggas, J. W. Hamilton, R. M. Sinclair	H. S. Horn	P. & O. Steam Nav. Co.	2.4.48
Strathmore	D. M. Stuart, D.S.C.	C. Barrett, F. G. Kell, D. M. Noble	J. Carey	P. & O. Steam Nav. Co.	28.4.48
Strathnaver	E. Lee	J. Wacker, N. Jenner, J. Wilson	G. Ormiston	P. & O. Steam Nav. Co.	28.1.48
Suffolk	H. E. Reilly, D.S.C., R.D., Cdr. R.N.R.	F. G. Bevis, J. Davison, P. Slocombe	J. Turnham	Federal Steam Nav. Co. Ltd.	1.3.48
Sunrest	L. G. Barwell	J. E. Collins, T. L. Ison, P. Tate	J. McMahon	Junecrest S.S. Co. Ltd.,	6.2.48
Sutherland	R. W. Nicholson	A. L. Clerment, R. Thwaites, R. Edgar	G. S. Denison	B. J. Sutherland & Co., Ltd.	2.4.48
Sutherland	J. McClure	J. Pool, D. C. Thomas, A. Murray	T. J. Melville	Currie Line, Ltd.	31.3.48
Swanby	J. E. Roddam	K. Jackson, R. Dunn, W. M. Fallon	H. W. Dunning	Ropner S.S. Co., Ltd.	3.3.48
Sydney Star	T. S. Horn, O.B.E.	J. C. Davies, J. G. King, J. G. Reeve	W. Bryce	F. Leyland & Co., Ltd.	22.1.48
Tactician	A. Robertson	D. Bloom, D. A. Hancock	P. J. Sanfey	Charante S.S. Co., Ltd.	7.4.48
Taika	A. Lyall	R. A. Mumford, D. S. Jones, J. Peters	F. Broomfield	Pacific Steam Nav. Co.	15.10.47
Tamale	J. J. Smith	P. J. Finan, R. E. Foster	L. Cottell	Elder Dempster Lines, Ltd.	15.5.47
Taranaki	F. A. Smith	T. de M. Ogier, N. E. Wood, C. C. D. Gough	L. Cottell	Shaw, Savill & Albion Co., Ltd.	2.4.48
Tarkava	W. C. Baxter	J. White, C. St. H. Webber, G. H. Griffiths, J. Fraser	C. Forbes	Elder Dempster Lines, Ltd.	12.9.47
Tasso	H. Scarbrough	E. Laverack, K. Allen	L. Richardson	Ellerman's Wilson Line, Ltd.	26.2.47
Tekoura	F. Sutton	P. D. E. Edmonds	D. E. Edmonds	Heward Trawlers, Ltd.	21.2.48
Telemachus	J. F. Webster	P. D. F. Cruickshank, R. H. Masters, R. P. S. Collins, E. Brown	J. C. Wilson	Ocean S. S. Co., Ltd.	5.11.47
Teviot	T. Davies	C. N. Wightman, T. A. Buckney, V. Charles	J. N. Morrison	Royal Mail Lines, Ltd.	19.3.47
Thamesfield	D. A. Law	A. D. Lombard, H. Shaw, T. Shanks	G. Middleton	Northern Petroleum Tank S.S. Co., Ltd.	16.10.47
Tinilo	S. H. Bennett, M.B.E.	A. Ledger	K. H. Brooks	Ellerman's Wilson Line, Ltd.	17.3.48
Tongarivo	A. E. Williams	S. W. Lambrick, D. MacDonald, B. A. Kelly	G. Penketh	New Zealand S.S. Co., Ltd.	8.2.48
Torr Head	M. Kennedy	J. Harper, A. Fee, J. K. McMorrin	W. Butcher	Ularer S.S. Co., Ltd.	25.11.47
Tower Grange	E. Fox	J. A. Burnhapse	W. Baldwin	Tower S.S. Co., Ltd.	16.2.48
Trevillian	C. L. Collings, O.B.E.	E. L. Cussions, W. Bulmer, W. Winter	W. Maconachie	Hain S.S. Co., Ltd.	16.2.48
Treyceley	D. I. Spencer	J. G. Sleight	S. Hewitt	Hain S.S. Co., Ltd.	16.2.48
Tribeham	A. Smart	A. A. Walker, D. A. Forrester, E. Ullmann	A. H. Coxhead	Charante S.S. Co., Ltd.	8.1.47
Twitchenham	F. W. Grist	J. A. Bensley, F. Evans, D. G. Jupp	P. A. Hayes	Britann S.S. Co., Ltd.	13.12.47
Umtaiti	F. E. J. O'Hea	H. J. Thorn, H. K. Underwood, S. A. Scott	M. C. Marshall	Bullard, King & Co., Ltd.	10.4.48
Umtata	J. W. Miles	I. D. Smythe, N. Jones, A. Hoyle	G. C. G. Reed	Bullard, King & Co., Ltd.	26.1.48
Valacia	W. L. P. Cox	F. English, M. J. Cleary, W. Kendall		Bullard, King & Co., Ltd.	
Vancouver City	B. Carnaffan	L. O. Pound, J. Hughes, R. Conway		Bullard, King & Co., Ltd.	
Vardelia	F. E. Patchett	R. H. Arnott, A. L. Davies, R. M. Graham		Bullard, King & Co., Ltd.	
Vasconia	G. S. Evans	I. MacAlpine		Bullard, King & Co., Ltd.	
Vestra	D. S. Archibald			Bullard, King & Co., Ltd.	

<i>Victria</i>	..	E. Garnett	C. F. Lawrence	F. Howell	Henriksen & Co.	28.2.47
<i>Vienna</i>	..	A. P. Sutton	J. A. Tully, W. V. Adams, E. Atkinson..	..	British Railways Eastern (Managers)	..
<i>Vision Louise</i>	..	G. McLeod	R. E. Garisch	..	British Oil Shipping Co.	..
<i>Volo</i>	..	A. Morrill	P. Shalldross, F. Briggs, O.B.E., F. Johnson..	..	..	..
<i>Waiana</i>	..	T. T. Oliver	K. C. Davies, J. W. Paine, A. S. Masters	W. Ellison	Ellerman's Wilson Line, Ltd.	22.4.48
<i>Wasparua</i>	..	W. G. West	G. Watkins, C. Carrol, R. Hamilton, A. Griffiths	G. F. Cockeedge	Shaw, Savill & Albion Co., Ltd.	28.1.48
<i>Wairangi</i>	..	H. S. Cox	E. D. L. Harper, K. Hart, G. Lodge, D. Maason	W. Charlton	Shaw, Savill & Albion Co., Ltd.	20.4.48
<i>Waivera</i>	..	B. Forbes-Moffatt	J. L. Carrol, J. C. Fairgrieve, A. H. Baber	H. Jardine	Shaw, Savill & Albion Co., Ltd.	7.3.48
<i>Warwick Castle</i>	..	R. Wren, D.S.O.	B. W. Mitton, A. M. McLean	G. Palmer	Shaw, Savill & Albion Co., Ltd.	16.3.48
<i>Welsbach</i>	..	J. Bywater	E. Holden	R. Brew	Union-Castle Mail S.S. Co., Ltd.	4.2.48
<i>Winchester Castle</i>	..	L.P. Wilkie	A. Bruce	J. Hodgeson	Wyre Steam Trawling Co., Ltd.	30.12.47
<i>Zent</i>	..	C. R. Hodder	..	T. Richardson	Union-Castle Mail S.S. Co., Ltd.	28.1.48

<i>Conway, H.M.S.</i>	..	T. M. Goddard, Capt., R.N.R.	The Senior Cadets	..	..	10.4.48
<i>Pangbourne Nautical College</i>	..	H. C. Skinner, O.B.E., Cdr. R.N.	The Senior Cadets	..	..	3.4.47
<i>Worcester, H.M.S.</i>	..	G. C. Steele, V.C., Capt. R.N.R.	The Senior Cadets	..	..	7.4.48

### 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>Karanga</i>	T. S. Nicol	A. Mackay	B. G. Hart	Union S.S. Co. of New Zealand, Ltd.
<i>Kararu</i>	W. E. Jones	E. W. Robb	L. M. Harvey	Union S.S. Co. of New Zealand, Ltd.
<i>Karitene</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	W. A. Hawkins	Union S.S. Co. of New Zealand, Ltd.
<i>Kopua</i>	A. F. Inman	B. E. Avery	E. H. Ward	Union S.S. Co. of New Zealand, Ltd.
<i>Kiroro</i>	J. Holm	E. R. Warner	W. A. Taylor	Capt. J. Holm and crew.
<i>Manuka</i>	A. R. Russel	G. H. Edwards	A. J. Stanton	Union S.S. Co. of New Zealand, Ltd.
<i>Matua</i>	L. C. Boulton	J. Hare	..	Union S.S. Co. of New Zealand, Ltd.
<i>Maui Pomare</i>	H. S. Collier	E. Anderson	..	Government of New Zealand (Pacific Islands Admin.)
<i>Panui</i>	J. Keith	..	..	A. F. Watchlin.
<i>Port Waitato</i>	N. Worth	..	..	Public Works Department.
<i>Rorus</i>	W. Grey	K. Mitchell	J. G. Rea	Union S.S. Co. of New Zealand, Ltd.
<i>Waikare</i>	C. Burgess	D. S. Brayshay	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>Waikaiti</i>	W. Whitfield	J. W. Keyworth	E. L. Hulme	Union S.S. Co. of New Zealand, Ltd.
<i>Waitemata</i>	..	..	..	..
<i>Whakabara</i>	F. A. Barrett	..	..	Tasman S.S. Co.

## 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>Imperial Winnipeg</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.

## 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	OWNERS
<i>Bris</i> .. .. .	China Siam Line.
<i>Caroline Moller</i> .. .. .	Moller's (Hong Kong), Ltd.
<i>Chak Sang</i> .. .. .	Indo-China Steam Navigation Co., Ltd.
<i>Choy Sang</i> .. .. .	Indo-China Steam Navigation Co., Ltd.
<i>Eastern Saga</i> .. .. .	Indo-China Steam Navigation Co., Ltd.
<i>E Sang</i> .. .. .	Indo-China Steam Navigation Co., Ltd.
<i>Fengtien</i> .. .. .	China Navigation Co., Ltd.
<i>Foochow</i> .. .. .	China Navigation Co., Ltd.
<i>Fuhsing</i> .. .. .	Chinese Maritime Customs.
<i>Fukien</i> .. .. .	China Navigation Co., Ltd.
<i>Hai Lee</i> .. .. .	China Siam Line.
<i>Hang Sang</i> .. .. .	Indo-China Steam Navigation Co., Ltd.
<i>Hanyang</i> .. .. .	China Navigation Co., Ltd.
<i>Hermelin</i> .. .. .	China Siam Line.
<i>Hin Sang</i> .. .. .	Indo-China Steam Navigation Co., Ltd.
<i>Hiram</i> .. .. .	China Siam Line.
<i>Hong Siang</i> .. .. .	Ho Hong Steamship Co., Ltd.
<i>Hunan</i> .. .. .	China Navigation Co., Ltd.
<i>Hunghsing</i> .. .. .	Chinese Maritime Customs
<i>Hupeh</i> .. .. .	China Navigation Co., Ltd.
<i>Junghsing</i> .. .. .	Chinese Maritime Customs.
<i>Kut Sang</i> .. .. .	Indo-China Steam Navigation Co., Ltd.
<i>Lot Sang</i> .. .. .	Indo-China Steam Navigation Co., Ltd.
<i>Mau Sang</i> .. .. .	Indo-China Steam Navigation Co., Ltd.
<i>Mei Shan</i> .. .. .	Standard-Vacuum Oil Co., New York.
<i>Nanchang</i> .. .. .	China Navigation Co., Ltd.
<i>Nellore</i> .. .. .	Eastern & Australian Steamship Co., Ltd.
<i>Newchwang</i> .. .. .	China Navigation Co., Ltd.
<i>Ninghai</i> .. .. .	China Navigation Co., Ltd.
<i>Pakhoi</i> .. .. .	China Navigation Co., Ltd.
<i>Poyang</i> .. .. .	China Navigation Co., Ltd.
<i>Shansi</i> .. .. .	Australian-Oriental Line, Ltd.
<i>Shengking</i> .. .. .	China Navigation Co., Ltd.
<i>Szechuen</i> .. .. .	China Navigation Co., Ltd.
<i>Tai Chung Shan</i> .. .. .	Shun Cheong Steam Navigation Co.
<i>Tai Ping</i> .. .. .	China Pacific Shipping & Trading Co.
<i>Tai Po Shan</i> .. .. .	Shun Cheong Steam Navigation Co.
<i>Tak Sang</i> .. .. .	Indo-China Steam Navigation Co., Ltd.
<i>Tehhsing</i> .. .. .	Chinese Maritime Customs
<i>Wing Sang</i> .. .. .	Indo-China Steam Navigation Co., Ltd.
<i>Wo Sang</i> .. .. .	Indo-China Steam Navigation Co., Ltd.
<i>Yochow</i> .. .. .	China Navigation Co., Ltd.
<i>Yunhsing</i> .. .. .	Chinese Maritime Customs.

## 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 Railways (Eastern Region).
<i>Actuality</i>	J. Lewis	F. T. Everard & Sons, Ltd.
<i>Adjutant</i>	K. R. Nichols	General Steam Nav. Co., Ltd.
<i>Alouette</i>	L. G. Horsham	General Steam Nav. Co., Ltd.
<i>Antwerp</i>	R. V. Adams	British Railways (Eastern Region).
<i>Ariosto</i>	W. Hill	Ellerman's Wilson Line, Ltd.
<i>Atlantic Coast</i>	M. Fleming	Coast Lines, Ltd.
<i>Bairtraffic</i>	F. Waldron	Union Baltic Corporation, Ltd.
<i>Belhaven</i>	R. L. Irvine	London & Edinburgh S.S. Co., Ltd.
<i>Belvina</i>	J. Phillip	London & Edinburgh S.S. Co., Ltd.
<i>Bury</i>	J. L. Davison	British Railways (Eastern Region).
<i>Cambria</i>	A. Marsh	British Railways (London Midland Region).
<i>Clyde Coast</i>	G. Goldman	Coast Lines, Ltd.
<i>Coldharbour</i>	G. L. Hetherington	Coastwise Colliers, Ltd.
<i>Coldridge</i>		Coastwise Colliers, Ltd.
<i>Corfen</i>	E. Allen	Cory Colliers, Ltd.
<i>Corfleet</i>	R. J. Barrow	Cory Maritime, Ltd.
<i>Corfoss</i>	A. Greiffenhagen, M.B.E.	Cory Colliers, Ltd.
<i>Cormist</i>	H. H. Horley	Cory Colliers, Ltd.
<i>Cormoat</i>	R. B. Armstrong	Cory Colliers, Ltd.
<i>Crane</i>	J. S. Lickis	General Steam Nav. Co., Ltd.
<i>Denbigh Coast</i>	E. C. Maddrell	Coast Line, Ltd.
<i>Drake</i>	K. Carmatt	General Steam Nav. Co., Ltd.
<i>Duke of Argyll</i>	H. Clarke	British Railways (London Midland Region).
<i>Duke of Lancaster</i>	J. Irwin, R.D., Cdr. R.N.R.	British Railways (London Midland Region).
<i>Duke of Rothesay</i>	H. Thompson	British Railways (London Midland Region).
<i>Duke of York</i>	F. Ardern, D.S.C.	British Railways (London Midland Region).
<i>Eastern Coast</i>	R. E. Holt	Coast Line, Ltd.
<i>Eldon</i>	W. Jeffrey	G. Gibson & Co., Ltd.
<i>Explorer</i>	J. Craig	Scottish Home Department (Fishery Division).
<i>Falcon</i>	Kelly	General Steam Nav. Co., Ltd.
<i>Foreland</i>		Currie Line, Ltd.
<i>Goldfinch</i>	W. Lockhart	General Steam Nav. Co., Ltd.
<i>Granta</i>	D. A. Hunter	Granta S.S. Co., Ltd.
<i>Guernsey Coast</i>	F. Lucas, M.B.E.	British Channel Islands S.S. Co., Ltd.
<i>Harrogate</i>	C. H. Tully	Wilson's & N.E. Railway S.S. Co., Ltd.
<i>Highwood</i>	J. Coupland	High Hook S.S. Co., Ltd.
<i>Hirondelle</i>	R. Beatte, M.B.E.	General Steam Nav. Co., Ltd.
<i>Isle of Guernsey</i>	F. Front	British Railways (Southern Region).
<i>Isle of Jersey</i>	A. L. Light	British Railways (Southern Region).
<i>Isle of Sark</i>	C. E. Durley	British Railways (Southern Region).
<i>Lairdsburn</i>	J. McColl	Burns & Laird Lines, Ltd.
<i>Lairdswood</i>	I. McGuggan	Burns & Laird Lines, Ltd.
<i>Lancashire Coast</i>	J. B. Clarke	Coast Lines, Ltd.
<i>Lapwing</i>	K. R. Nicholls	General Steam Nav. Co., Ltd.
<i>London Merchant</i>	C. A. Piper	London Scottish Lines.
<i>M.F.V. 1195</i>	I. McCrae	Scottish Home Department (Fishery Division).
<i>Mallard</i>	H. Clayton	General Steam Nav. Co., Ltd.
<i>Medway Coast</i>	J. Richardson	Coast Lines, Ltd.
<i>Melrose Abbey</i>	J. Laverack	Hull & Netherlands S.S. Co., Ltd.
<i>Mimma</i>	T. Mather	Scottish Home Department (Fishery Division).
<i>Moray Coast</i>	D. Mercer	Coast Lines, Ltd.
<i>Northern Coast</i>		Coast Lines, Ltd.
<i>Ocean Coast</i>	G. Mearns	Coast Lines, Ltd.
<i>Otterhound</i>	A. M. Kennedy	Coastal Tankers, Ltd.
<i>Pass of Ballater</i>	R. Reid	Bulk Oil S.S. Co., Ltd.
<i>Persian Coast</i>	T. Taylor	Tyne, Tees S.S. Co., Ltd.
<i>Petrel</i>	Kelly	General Steam Nav. Co., Ltd.
<i>Plover</i>	J. F. Casey	General Steam Nav. Co., Ltd.
<i>Princess Maud</i>		British Railways (London Midland Region).
<i>Royal Daffodil</i>	A. Paterson, D.S.C.	General Steam Nav. Co., Ltd.
<i>St. Andrew</i>		Fishguard & Rosslare Railway & Harbour Co.
<i>St. Julien</i>	L. J. Richardson	British Railways (Western Region).
<i>Salerno</i>	J. B. Dunkley	Ellerman's Wilson Line, Ltd.
<i>Scottish Co-operator</i>	T. Robertson	Scottish Co-operative Wholesale Society.
<i>Selby</i>	A. W. Johnson	Wilson's & N.E. Railway S.S. Co., Ltd.
<i>Slieve Bawn</i>	J. Hughes	British Railways (London Midland Region).
<i>Slieve Bernagh</i>	A. E. Willmott, D.S.C., R.D., Cdr. R.N.R.	British Railways (London Midland Region).
<i>Slieve Bloom</i>	E. C. J. Manning	British Railways (London Midland Region).
<i>Slieve Donard</i>	N. Lloyd-Williams	British Railways (London Midland Region).
<i>Slieve League</i>	V. S. Phillips	British Railways (London Midland Region).
<i>Slieve More</i>	E. C. J. Manning	British Railways (London Midland Region).
<i>Southern Coast</i>	W. Quirk	Coast Lines, Ltd.
<i>Stork</i>	C. Carr	General Steam Nav. Co., Ltd.
<i>Supremity</i>	S. F. Wilson	F. T. Everard & Sons, Ltd.
<i>Tern</i>	G. Thain	General Steam Nav. Co., Ltd.
<i>Wandle</i>	T. W. Corney, M.B.E.	Wandsworth & District Gas Co.
<i>Welsh Coast</i>	M. Fleming	Coast Lines, 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

## 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.

For this purpose Form 912 is supplied direct to all observing ships plying in regions where ice may be encountered, and this form may be supplied to the captain of any British ship on application to a Port Meteorological Officer or Merchant Navy Agent.

Regular observing ships using the Trans-North Atlantic tracks are requested to send in these forms, 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.

### **Great Britain**

#### **Transmission of Routine Wireless Weather Messages**

When in the reporting area "Great Britain" and transmitting weather messages through British shore stations, observing ships are requested, forthwith, to address their reports to "Weather Wire London" instead of to "Weather Telex Dunstable" as previously.

### **Hong Kong**

#### **Transmission of Routine Wireless Weather Messages**

When in the reporting area "Hong Kong" and unable to contact the detailed radio station Cape D'Aguiar (VPS), observing ships transmitting their messages via Singapore (GYL) are requested to address them to "Royal Observatory, Hong Kong."

### **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.

## **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.

## **THE NEW METEOROLOGICAL CODE (WASHINGTON, 1947)**

Voluntary observing officers are reminded that a new meteorological reporting code, approved by the International Meteorological Organisation, will come into force all over the world at 0001 G.M.T. on the 1st January, 1949.

An article on the code appeared on page 102 of the April, 1948, issue of *The Marine Observer*.

Details of the new code and all the necessary instructions to observers will be issued to all voluntary observing ships in the near future.

## **MARINE METEOROLOGY**

### **Co-operation of British Shipowners, Masters and Mates**

Captains and officers of ships registered in Great Britain and Northern Ireland, who wish to co-operate regularly with the Meteorological Office, should apply to the appropriate Port Meteorological Officer or Agent.

In accordance with the International Convention for Safety of Life at Sea, the Meteorological Office arranges for a number of ships to record meteorological observations at specified hours, throughout their voyage, and to transmit coded observations, by wireless telegraphy, for the benefit of other ships and the various meteorological services.

Ships performing these voluntary duties are known as Observing Ships—the whole as the Voluntary Observing Fleet—and the captains and officers of these ships as the Corps of Voluntary Marine Observers.

The list of observing ships is published in *The Marine Observer*.

The quarterly *Marine Observer* is sent regularly to the captain of every observing ship, for the information and guidance of his observing and radio officers. The captains of observing ships are also supplied on request with charts and atlases, according to trade, as meteorological equipment.

To ensure the accuracy of data collected for the purpose of research and for weather forecasting, ashore and afloat, and to provide a pattern, which may be copied with advantage to all concerned for general use in merchant ships, sufficient tested instruments are lent by the Meteorological Office to the captains of observing ships.

Captains of observing ships are requested to return their Fair Logbooks (Form 911) when full, or when insufficient space remains for the recording of observations during a further complete passage, to the Meteorological Office.

Pages from the Coded Messages Record (Form 911A), when filled, or at the end of each voyage, should be detached, folded, and returned to the Meteorological Office.

The Port Meteorological Officers and Merchant Navy Agents inspect instruments quarterly, when possible, and they will replace, as necessary, any gear lent by the Meteorological Office. These officers will also check the accuracy of ships' barometers.

## 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.

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, Overseas Aircraft Control, Royal Air Force, Eastern Avenue, Barnwood, Gloucester	Gloucester 4465/6/7. Ex. 110/1.
Dundee	The Senior Meteorological Officer, H.Q. No. 18 Group, Royal Air Force, Pitreavie Castle, Dunfermline, Fife	Edinburgh 20624, or Inverkeithing 264/5 or Dunfermline 1324. Ex. 118/9.
Falmouth	The Senior Meteorological Officer, H.Q. 19 Group, Royal Air Force, Mount Wise, Plymouth, Devon	Plymouth 61201 or 61101. Ex. 109/110.
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. 6 and 100.
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	Edinburgh 20624, or Inverkeithing 264/5 or Dunfermline 1324. 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. 14.
Milford Haven	The Senior Meteorological Officer, H.Q. No. 19 Group Royal Air Force, Mount Wise, Plymouth, Devon	Plymouth 61201 or 61101. Ex. 109/110.
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 Wise, Plymouth, Devon	Plymouth 61201 or 61101. Ex. 109/110.
Southampton	The Senior Meteorological Officer, Southampton Airport	Eastleigh 87228. Ex. 10.
Swansea	The Senior Meteorological Officer, Overseas Aircraft Control, Royal Air Force, Eastern Avenue, Barnwood, Gloucester	Gloucester 4465/6/7. Ex. 110/1.

## **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.)

## **AGENTS**

### **Bristol Channel**

Captain E. Hall, Room 120, Exchange, Mount Stuart Square, Cardiff Dock.

### **Clyde**

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

### **Forth**

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

### **Humber**

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

### **Southampton**

Captain Sir Benjamin Chave, K.B.E., Royal Mail House, Southampton.

### **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, Room 111, 8 Harvey Street, Halifax, N.S. (Telephone : 3-8314.)

### **Saint John**

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

### **Vancouver**

Mr. E. B. Shearman, 815 Bower Building, 543 Granville Street, Vancouver, B.C. (Telephone : PACific 3032.)

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