

VOL. VIII. No. 86.

THE MARINE OBSERVER.

FEBRUARY, 1931.

TABLE OF PRINCIPAL CONTENTS.

	PAGE.		PAGE.
Wireless Weather Signals from the Shore	35	Wireless Gale Warnings	52
The Marine Observer's Log (with illustrations)	37	Visual Gale Warnings	53
Hints to Young Officers on the use of Wireless Weather Reports	40	Additional Wireless Telegraphic and Land Line Services performed for Shipping with Charges	55
Southern Ice Reports during the years 1929 and 1930—February... ..	44	Lithographic illustrations after page 56 :—	
Weather Signals, Great Britain and Ireland :—		Chart III.—Ships' Wireless Weather Signals.	
Wireless Stations Detailed to receive Routine Coded Weather Reports from "A Selected Ships"	46	Fog Frequency in the South Atlantic—February.	
Wireless Stations Detailed to receive Routine Coded Weather Reports from "B Selected Ships"	48	Wind, Fog, Mist and Weather for the Region off the coast of Portugal—February.	
"Weather Shipping" Bulletin	50	Typhoons in the Far East during the years 1882 to 1926—February.	

WIRELESS WEATHER SIGNALS FROM THE SHORE.

THE January number was mainly devoted to providing information and guidance regarding Ships' Wireless Weather Signals addressed to all ships and the shore; this, and the remaining numbers for the year will provide information as far as possible of Wireless Weather Signals made to ships by the Meteorological Services of different countries, in geographical order starting with Great Britain.

The International Conference of Safety of Life at Sea which was held in London in 1929 emphasised the value of such signals to navigation, and Article 35 of the Convention, which has yet to be ratified, specifies particularly as to this service as follows:—

"In particular, the Contracting Governments undertake to co-operate in carrying out, as far as practicable, the following meteorological arrangements:—

(a) to warn ships of gales, storms and tropical storms, both by the issue of wireless messages and by the display of appropriate signals at coastal points.

(b) to issue daily, by radio, weather bulletins suitable for shipping, containing data of existing weather conditions and forecasts."

"The information provided for in paragraphs (a) and (b) of this article will be furnished in form for transmission in accordance with Article 31, paragraphs 1, 3 and 5, and Article 19, paragraph 25, of the General Regulations annexed to the International Radiotelegraph Convention, Washington, 1927, and during transmission 'to all stations' of meteorological information, forecasts and warnings, all ship stations must conform to the provisions of Article 31 (2) of those General Regulations."

"Forecasts, warnings, synoptic and other meteorological reports intended for ships shall be issued and disseminated by the national service in the best position to serve various zones and areas, in accordance with mutual arrangements made by the countries concerned.

"Every endeavour will be made to obtain a uniform procedure in regard to the international meteorological services specified in this Article, and, as far as is practicable, to conform to the recommendations made by the International Meteorological Organisation, to which organisation the Contracting Governments may refer for study and advice any meteorological questions which may arise in carrying out the present Convention."

The Weather Signals made through W.T. and signal stations by the British State Meteorological service to shipping are fully described in this number.

Those made by W.T. have been mainly developed since the Great War. They were not established as they are at present until the desires and requirements of the Royal and Merchant Navies and Fishing Fleets had been ascertained. The views of the masters and skippers of every type of sea-going vessel fitted with W.T. or R/T, or which might be so fitted in the future, were obtained before the British Weather Shipping Bulletin was first issued in 1924. This Bulletin has proved successful for the purpose intended and its form has remained practically unaltered since it was first issued on 1st January, 1924. It is significant that at the discussions which took place at the Conference of Safety of Life at Sea in 1929, this Bulletin was cited as an example of what was desirable for shipping and seamen by an active service Master Mariner in the delegation of a foreign country.

At the meetings of the International Marine Meteorological Commission, part of the International Meteorological Organisation referred to in Article 35, we submitted in September, 1929, for consideration the following guiding principles with a view to obtaining the uniformity specified by the Conference of Safety of Life at Sea:—

That in all cases, clear, concise descriptions of weather signals be suitably published for the information of shipping and seamen; and that ample notice be given by means of Notice to Mariners of changes *before* they are made.

Wireless Gale, Storm and Tropical Storm Warnings for Shipping.

That in the case of gales and storms in middle and high latitudes a clear, concise message should be used, specifying as far as possible the nature of the depression, its locality and movement, the wind direction with changes, and a broad estimation of force, over the

area or areas warned, distinction being made between a gale of force 8 and one of force 10 and upwards.

That in the case of tropical storms, i.e., hurricanes, tropical cyclones and typhoons, a clear, concise message should be used, specifying as far as possible the latitude and longitude in whole degrees of the centre, its movement, and intensity of the storm. Such messages should clearly indicate when any part of the information contained is based on deduction, without sufficient actual reported observations to verify position, movement, or intensity.

Routine Wireless Weather Bulletins for Shipping.

That these should be clear and concise, and that when practicable they should contain actual observations of a limited number of suitably disposed coast stations, salient points used for landfall being preferred.

The elements included should only be those necessary for the mariner. Information of visibility to seaward from the station in the International Scale in parts of the world where conditions of visibility vary, and those elements which are necessary for the construction of a simple weather chart in conjunction with "Selected Ships" reported observations, and for general information for safe navigation.

These elements are generally:—

- Station Distinguishing number.
- Wind, True Direction and Force.
- Barometric pressure.
- Weather.
- Visibility.
- Barometric tendency (change of barometer).

On coasts within the tropics, visibility may often be replaced with advantage by departure from the barometric normal for the time of day.

In addition to these actual observations, short period forecasts for defined areas of wind and one or two other elements (preferably visibility) necessary for information in navigation are desirable.

A general statement of prevailing conditions, with general idea of pressure distribution, is an advantage.

A small selection of well-disposed ships' reports repeated after the bulletin is useful. Brevity is necessary in all Wireless Weather Signals.

These and other recommendations concerning Marine Meteorology in aid of navigation are still under consideration.

In the January number the tables of the International Ships' Wireless Weather Code and Decode were given, with which the reports of observations taken at coast stations may be decoded.

The method of decoding coast station reports is described in this number. In the March to December numbers it is intended to give, as information becomes available, Weather Shipping Bulletins made by other countries. It is not intended to publish in this journal any other than the International Ships' Wireless Weather Code adopted by the International Meteorological Organisation at Copenhagen in September, 1929.

London,
14th November, 1930.

MARINE SUPERINTENDENT.

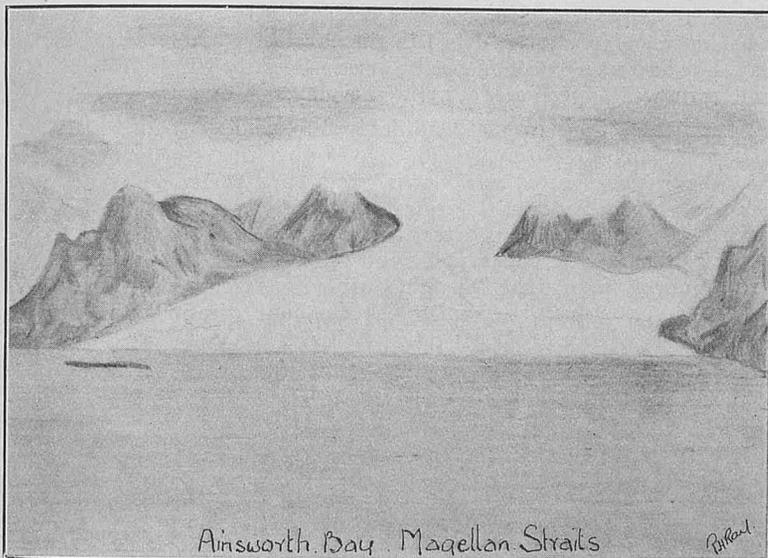
THE MARINE OBSERVER'S LOG.

It is hoped that these pages will be filled each month with a selection of the contributions of Mariners in manuscript, or remarks from the Logs and Reports of regular Marine Observers.
Responsibility for statements rests with the Contributor.

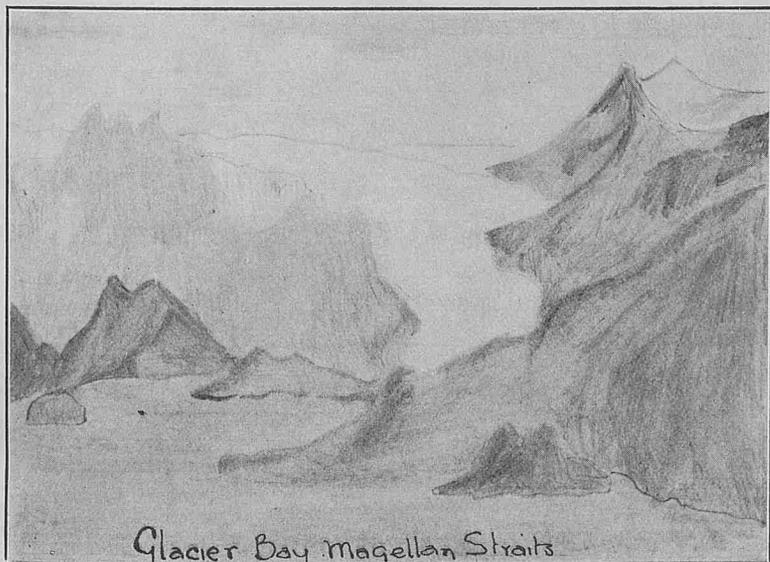
SKETCHES OF GLACIERS.

Ainsworth Bay and Glacier Bay, Magellan Straits.

THE accompanying sketches have been received from s.s. *Orduna*, Captain T. DANIEL, and were made by Mr. P. H. RAY, 3rd Officer, who remarks, "I am forwarding a couple of sketches of glaciers seen in the Magellan Straits. I have tried to make Ainsworth Glacier a little clearer than the snap sent in by Mr. ECKFORD. It is very difficult to include all details as our stay in the Bay is very short.



Ainsworth Bay, Magellan Straits



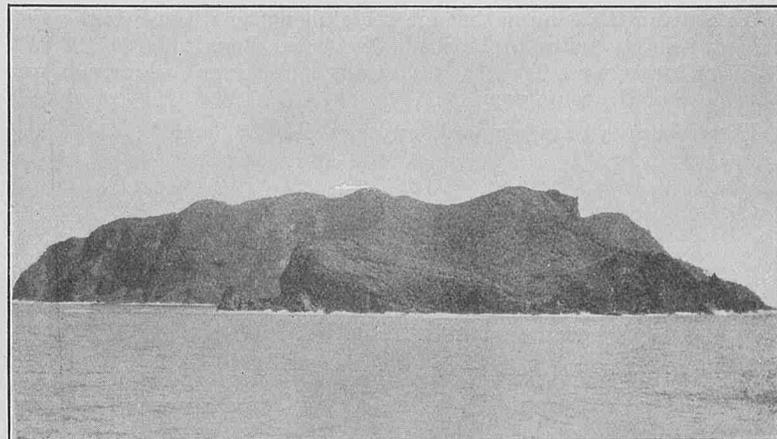
Glacier Bay, Magellan Straits

NOTE.—The photograph by Mr. Eckford was published in THE MARINE OBSERVER for February, 1930, Vol. VII., No. 74, p. 42.

PITCAIRN ISLAND.

South Pacific.

THE following extract and accompanying photographs are taken from the Meteorological Log of s.s. *Tainui*, Captain W. P. CLIFTON MGG, Wellington, New Zealand to Panama, Observer Mr. E. T. BAKER, 2nd Officer.



February 20th, 1930, 5.18 p.m. at ship. Stopped off Pitcairn Island in Bounty Bay with Adams rock distant about one mile. The islanders came off in three boats, one of which is a motor boat, with about thirty people, men and women, in each.

They brought an abundant supply of fruit and curios which they sold or bartered with the passengers.

We discharged about 70 packages of general cargo and supplies for the island, and after being stopped for about an hour and a half, proceeded on our voyage. There is a small wireless set on the island and a watch is kept, so that if it is required to stop at night, a beacon will be lighted on request, for guidance.

DISCOLOURED WATER.

Off Coast of Peru.

THE following is an extract from the Meteorological Report of S.S. *Essequibo*, Captain E. ROBERTS, New York to Peru via Panama, Observer, Mr. L. MARSLAND, 4th Officer.

February 3rd, 1930, at 1.55 A.T.S. in Latitude $7^{\circ} 07' S.$, Longitude $80^{\circ} 32' W.$ Temperature air 78° , sea 68° . Wind S.E. by E. (T) force 2. Slight sea. Sky overcast St.-Cu. and Cu. The ship passed from water of greyish blue colour into water of a brownish red colour, extending to the horizon on each side of the vessel, the weather conditions were exactly the same as when the water was of normal colour.

This water was covered in patches by a peculiar oily green scum, and quantities of small white jelly fish were observed to be round the vessel.

We continued steaming through these phenomenal conditions a distance of thirty miles to Latitude $7^{\circ} 35' S.$, Longitude $80^{\circ} 17' W.$, when at 3.00 p.m., A.T.S., the sea resumed its normal colour, nor was any more of the scum seen.

These changes were gradual, and not clearly defined.

CURRENT RIP AND GULF WEED.

North Atlantic.

THE following is an extract from the Meteorological Report of S.S. *Banbury Castle*, Captain C. E. H. AYLEN, Port Elizabeth, S.A., to Newport News, U.S.A. Observer, Mr. R. E. H. PARTINGTON.

On Wednesday, 5th February, 1930, bound from Port Elizabeth to Newport News in Latitude $24^{\circ} 53' N.$, Longitude $65^{\circ} 23' W.$ at 10.20 a.m. Currents were observed meeting athwart vessel's course, *i.e.*, in a direction 56° and 236° , the estimated difference in the rate of the two currents was about 1 knot. Sea and swell slight. Sea temperature $75^{\circ} F.$, Air $72^{\circ} F.$, Barometer 30.12 in. Clear, cloudy weather. Wind S.E., force 2. Exceptionally large masses of Gulf Weed were observed throughout day and at 3.00 p.m. we passed through a line of weed leading in a 45° and 225° direction, large closely packed masses, 25 yards in diameter, were noted, the whole being connected by weed of similar character, but spaced apart.

TIDE RIP.

Henderson Island, South Pacific.

THE following is an extract from the Meteorological Log of S.S. *Rimutaka*, Captain E. A. HOLLAND, Panama to Wellington. Observer, Mr. E. M. FOSTER.

23rd February, 1930, on rounding South Point, Henderson Island (Latitude $24^{\circ} 25' S.$, Longitude $128^{\circ} 19' W.$) with South Point bearing 340° , $2\frac{1}{2}$ miles, a very heavy tide rip was observed ahead of vessel, having the appearance of surf breaking on a reef. Course was altered to clear this. Temperature, Air 83° , Sea $79\frac{1}{2}^{\circ}$. Specific Gravity, 1026.2.

PHOSPHORESCENCE.

Arabian Sea.

THE following is an extract from the Meteorological Report of S.S. *City of Benares*, Captain J. WYPER, Colombo to Suez. Observer, Mr. R. W. KELLIE, 2nd Officer.

February 3rd, 1930, in Latitude $9^{\circ} 39' N.$, Longitude $63^{\circ} 57' E.$ Course 280° , Speed 12 knots. Wind N. by E., force 3. Sea and Swell N.E.4. Temperature, Air 76° , Sea 79° , cloudy and clear. About 2.10 a.m., middle watch, I saw what I thought to be the lights of several steamers on either bow. The Lascar "lookout" also saw these lights and reported them in the usual manner. These "lights" flashed up and disappeared every few seconds. Some ten minutes later I was amazed to discover that the "lights" were huge phosphorescent "balls" which rose and appeared to burst.

Shortly afterwards we passed through a 100 feet wide belt of bright phosphorescence which stretched in a north and south direction as far as the eye could see. The night was very dark and the sea appeared as a black pall studded by myriad diamonds. The phenomenon lasted about half an hour and was the most wonderful display of phosphorescence I have ever witnessed.

WHIRLWIND.

Suva, Fiji.

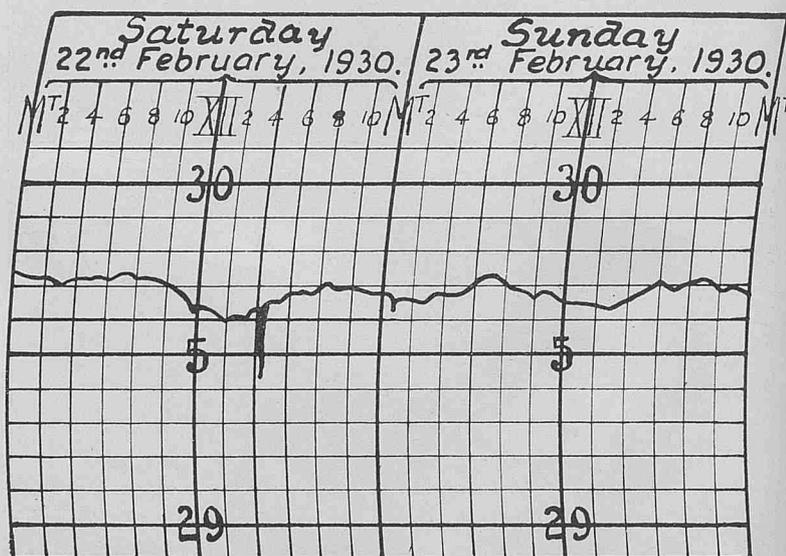
THE following report of a whirlwind at Suva, Fiji, has been received from Captain E. W. G. TWENTYMAN, M.B.E., Harbour Master. Observer, Mr. V. OSBORN.

On Friday night, 21st February, 1930, weather conditions were very unsettled and there appeared to be a cyclonic disturbance N.W. of Suva, apparently moving S.S.E'ly. Very heavy rain fell during the early hours of Saturday morning.

There was a fairly rapid fall in the barometer after 10 a.m. Saturday, but at 5 p.m. it commenced to rise. Squally winds from E.N.E. and rain was experienced during the day.

At 5.40 p.m. the barometer suddenly fell from 29.65 in. to 29.44 in. and rose again to 29.65 in. in approximately one minute. At the same instant a whirlwind or tornado struck the Government Slip and Messrs. Terry & Son's works. It moved in a S.W'ly direction, passing close to this office, where the maximum velocity of wind recorded by Dines' anemometer was 77 miles per hour. This whirlwind appeared to originate near the Tamavua hills, and crossing the Harbour disappeared over the reef a short distance S.E. of the pile light.

Trees in the path of the whirlwind were uprooted or had their branches ripped off; a cement electric light post was broken in two;



two new heavy wooden doors were blown away from the Shell Oil Company's new store; the Auxiliary Ketch *Helena* (59 tons) was lifted bodily off the Government slipway and blown against a shed approximately 10 yards away from slip; several Government offices were unroofed, also workshops; half of Messrs. Terry & Son's works was demolished; two dinghies were seen to be lifted up in the centre of the whirl and carried away, and other minor damage was done to small craft and buildings at Walu Bay.

ST. ELMO'S FIRE.

North Atlantic Ocean.

THE following is an extract from the Meteorological Report of S.S. *Saint Andrew*, Captain E. W. BEARPARK, Montevideo to London. Observer, Mr. J. MEADE, 3rd Officer.

February 11th, 1930, at midnight, A.T.S., in Latitude $38^{\circ} 34' N.$, Longitude $11^{\circ} 31' W.$ Wind S.S.E., force 3, clouds, Cu-Nb. Temperature, Air $53^{\circ} F.$, barometer 29.72 steady. After experiencing a hard hail squall, small jets of electrical flame were observed around the truck of the wooden jackstaff on the forecastle head. Upon examination these were found to be corosants, and when the jackstaff was unshipped and placed in a horizontal position the flames disappeared, but continued their flickering when the staff was re-shipped. The phenomenon lasted about 25 minutes.

VISIBILITY.

Mozambique Channel.

THE following is an extract from the Meteorological Report of S.S. *Hydaspes*, Captain P. E. WILLIAMS, Durban to Aden. Observer, Mr. J. W. CHARLES, 2nd Officer.

February 26th, at 00.52 A.T.S. (25th February, 2222 G.M.T.) in Latitude $18^{\circ} 13' S.$, Longitude $40^{\circ} 33' E.$, observed perfect amplitude of Rigel and of Betelgeuse 14 minutes later. Each star was bright enough to be observed in the azimuth mirror at the time of setting; although two minutes previously were barely visible to the naked eye. δ, ϵ & ζ Orionis (Orion's Belt) were each visible to the naked eye,

up to two minutes before actually setting. Sky was cloudless, except for low-lying Cu. on horizon of the N.E. Quadrant, where continuous lightning was observed throughout the night. Wind E.S.E., 2. Barometer 30.03 (uncorrected), Hygrometer 76° and 84° .

ARC OF LIGHT IN SKY.

South Pacific.

THE following is an extract from the Meteorological Log of S.S. *Port Sydney*, Captain W. G. HIGGS, New Zealand to Panama. Observer, Mr. A. T. C. COOPER, 3rd Officer.

February 11th, 1930, at 11.45 p.m., a bright light was observed on the southern horizon which, after about 30 seconds, formed into an arc, the altitude being about $5^{\circ} 30'$, and the two ends at the horizon bearing 187° and 157° , ship steering 062° in Latitude $26^{\circ} 35' S.$, Longitude $120^{\circ} 05' W.$

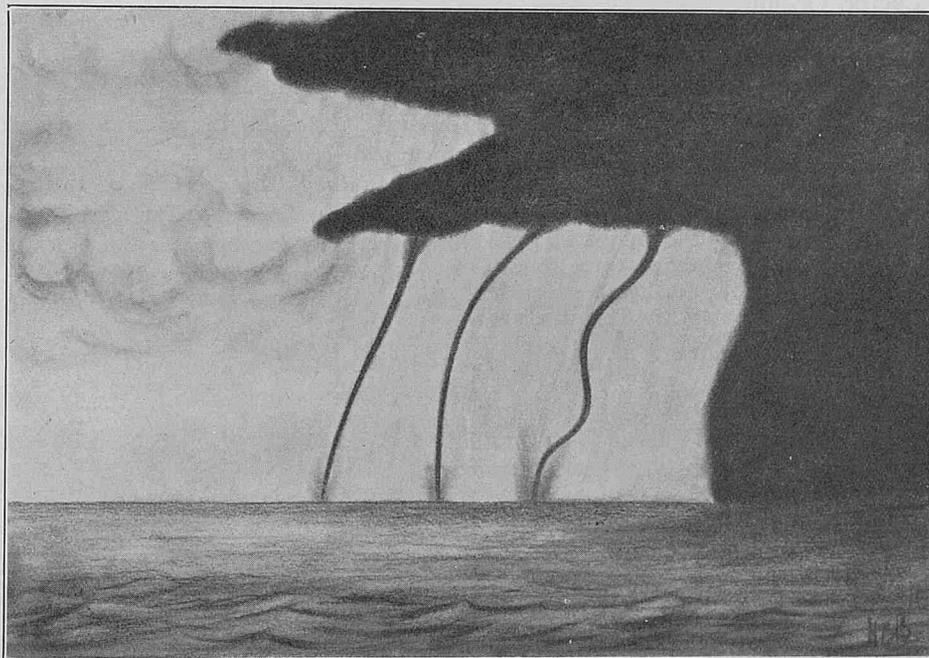
The arc seemed to move round the horizon to the southward for about 10° , the southern end becoming very bright, after which it sank below the horizon at 11.57 a.m.

The moon was in the N.W. behind St-Cu. and Cu-Nb., clouds at an altitude of about 45° , the sky being quite overcast.

WATERSPOUTS.

North Atlantic.

SKETCH made by Captain H. C. BOWER, of Waterspouts observed from S.S. *Patia*, 24th February, 1930, at 1600 G.M.T. in Latitude $32^{\circ} 54' N.$, Longitude $76^{\circ} 01' W.$ The spout on the right of the picture continued working for six minutes.



WATERSPOUTS.

Bay of Bengal.

THE following extract is taken from the Meteorological Report of S.S. *Stockwell*, Captain T. T. COLUMBINE, from Madras to Calcutta. Observer, Mr. G. E. THOMAS, 2nd Officer.

February 3rd, 1930. About Latitude $19^{\circ} 46' N.$, Longitude $87^{\circ} 13' E.$ At 7.30 a.m., encountered a large well-defined waterspout

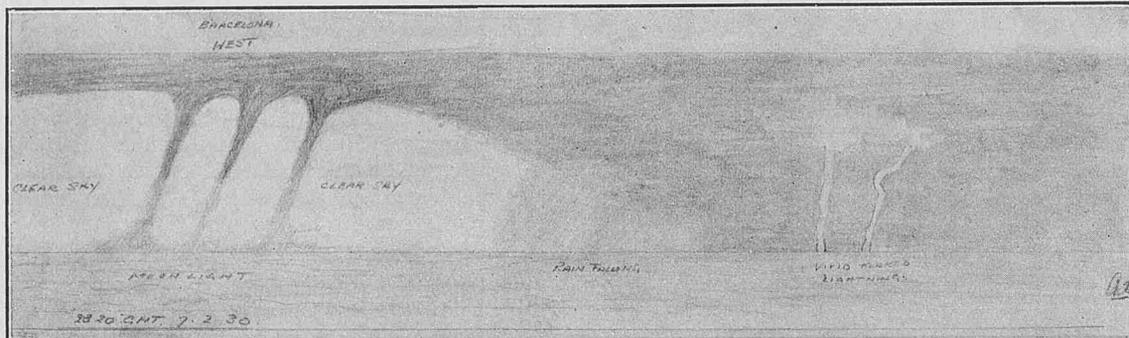
close to vessel on port side. Course was N. $35^{\circ} E.$ (true). Speed, 12 knots. From this time up to 9.00 a.m. we passed seven, all well-defined, and various others in process of formation, some not more than 50 yards away. Cloud form was Cu-Nb. and Nb. At 9.00 a.m. we encountered a torrential rain squall and wind force 8, with a cyclonic movement around the vessel, which continued for about 45 minutes. We ran through numerous heavy rain squalls until 11.00 a.m., when the weather cleared. Temperature fell to 71° at 9.00 a.m. and continued low throughout the day.

WATERSPOUTS. Mediterranean Sea.

THE following is an extract from the Meteorological Log of S.S. *Orama*, Commander H. G. STAUNTON, C.B.E., R.D., R.N.R., Toulon to London. Observer, Mr. J. M. M. SWANSON.

February 7th, 1930. Position at 11.30 p.m., D.R., Latitude 40° 45' N., Longitude 3° 05' E. At 11.20 p.m. observed three complete waterspouts close together, descending from clear defined edge of

heavy nimbus thunder clouds working out from the land to the westward. There were frequent flashes of vivid fork lightning. The sea appeared violently disturbed beneath each waterspout. At 11.30 p.m. they started to bend towards the storm and at 11.35 p.m. disappeared. At 11.45 p.m. the edge of the storm struck the ship as it passed astern with a violent spiral wind full of dust from the land 60 miles away. Wind at 10 p.m., E.S.E., and at midnight, S.E., force 4. Barometer 1011.4 mb. Temperature, Dry Bulb 49°, Wet Bulb 46°, Sea 55°.



METEORS.

South Pacific Ocean.

THE following is an extract from the Meteorological Log of S.S. *Mahana*, Captain J. M. CAMERON, Napier, New Zealand, to Panama. Observer, Mr. A. E. MASTERS, 3rd Officer.

February 20th, 1930, 10.40 p.m. (21st February, 0525 G.M.T.). Latitude 12° 20' S., Longitude 97° 29' W. Observed bright meteor, appearing midway between Capella and Aldebaran, at an approximate altitude of 10°; it travelled toward the horizon at an angle of about 30° to left of perpendicular. During its passage, from 5 to 7 seconds, its brilliant light diminished and brightened three times, having the appearance of three flashes, being at its brightest as it approached the horizon. Cloud at time Cu. 1/10, Air Temperature 73°.

New Zealand Waters.

THE following is an extract from the Meteorological Report of S.S. *Maunganui*, Captain A. T. TOTEN, Sydney to Wellington. Observer, Mr. L. P. BOURKE, 3rd Officer.

At 11.40 p.m., 10th February, 1930 (N.Z. Standard Time) observed brilliant meteorite in position immediately below Rigel—altitude about 27°—bearing 280°. A vivid streak of pale greenish hue marked the pathway of the phenomenon to its point of disappearance about 10° above the horizon. The streak hung in the sky for fully three seconds. The weather was fine and clear and cloudless, the moon being in the western sky and three days before full.

HINTS TO YOUNG OFFICERS ON THE USE OF WIRELESS WEATHER REPORTS.

BY L. A. BROOKE SMITH, MARINE SUPERINTENDENT.

Now that the service of Selected Ships is well established and wireless weather reports are made by them regularly in all parts of the world and the Board of Trade Examiners require a working knowledge of these things by candidates for a master's certificate there are many who wish to have the simplest and most straightforward hints possible.

The Departmental Committee on the Examinations of Masters and Mates, 1927-1928, stated in their report:—

“Our aim throughout has been so to design the syllabuses that candidates shall be led to work intelligently and not as machines. Much of the substance of the examinations is not, or should not be,

a matter of book knowledge, but should be acquired by the observation and common sense of candidates of average intelligence during sea experience. The syllabuses are intended to be directive, so that, when placed in the hands of a prospective candidate for a certificate of competency, they may prove a useful guide as to the kind of knowledge and experience he requires in order to become efficient in his profession. In this way we feel that we can make an important contribution to the problem of training, without in any way going beyond our terms of reference.”

The syllabus for Master (Foreign-going ship) provides for two hours' examination in Meteorology, including Ocean pilotage, the

construction of a simple weather chart, to understand the use of the observation of the change of the barometer by single and collective observations; and to make deductions as to probable changes of weather along the proposed track of his ship; a general knowledge of the system of Wireless Weather Signals (*when* one International system is brought about).

All of which knowledge can only be acquired by observation, intelligent working and experience at sea, aided by books; so that all young officers who aspire to success as Master Mariners in the future will do well not to wait to learn Marine Meteorology at the navigation school, but to study and practice it at sea. Then with the knowledge based on their own observation and experience the Nautical Instructors will be able to teach them as much of the academic part as may be desirable. It will be noted that the required knowledge of the system of Wireless Weather signals was qualified, for when the committee made their report in 1928 there were so many different systems and codes in use that it would have been unfair to expect any Master Mariner to have a general knowledge of them. The committee therefore said *when* one International system is brought about.

On the 1st of May, 1930, one system was introduced for British Ships, and that system is described in a pamphlet, M.O. 329, which may be obtained from H.M. Stationery Office for the sum of three-pence. This pamphlet, entitled **DECODE FOR USE WITH THE INTERNATIONAL CODE FOR WIRELESS WEATHER MESSAGES FROM SHIPS**, gives in a concise form a description of the Selected Ships System, times of observations, schedule for communication, system of control in the congested area of the Eastern North Atlantic, the key for decoding messages and decode tables.

The system of observation, with scales, descriptions of instruments and their care and use, is dealt with in **THE MARINE OBSERVERS HANDBOOK**, 5th Edition.

General Guidance in practical application is given in **WIRELESS AND WEATHER AN AID TO NAVIGATION**, which originally came out in serial chapters in **THE MARINE OBSERVER**, and was printed later in book form at the request of Marine Observers and others who saw the possibilities of the development of this work.

Good Ocean pilotage is largely dependent upon knowledge of wind, currents, and ice, and may best be made a study of at sea when the chart house library with the Admiralty book of Ocean Passages of the World, Pilots, and so on are at hand, which are beyond the means of most officers. By observation and constructing weather charts at sea far more will be learned of the exterior forces which act upon the course of a ship than by a life-time study of books alone.

No intelligent officer need have any doubt as to his capability of passing such a test as is intended in the syllabus quoted above, provided that he has made a habit of keeping his weather eye lifting and applying the knowledge he gains by observation and experience at sea in the execution of his duties as a seaman, navigator, and watchkeeper.

To gain such experience and knowledge it is not necessary to be in a regular observing ship for Selected Ships now regularly communicate by W.T. all the necessary information for practice and application in other ships.

It is not the purpose of these hints to deal exhaustively with the subject of Marine Meteorology for the purpose of study for candidates for a master's certificate, but rather to hint to them and all sea officers who may not be familiar with modern developments how to obtain the necessary information and how to use it.

It will be sufficient here to show how information may be obtained on any day in the Eastern North Atlantic, and how it may be dealt with and applied towards the safe and economical navigation of a ship; for though special regulation of Wireless communication is

necessary in this most congested region of the world the method of dealing with the information received is similar in all parts of the world.

Suppose a ship to be approaching the mouth of the English Channel in the month of February, when of course the Commander will be pleased with any young officer who, without spending much of his time required for his other duties, is able to hand him a weather chart which will show him what weather he may expect approaching the land and getting into crowded waters. The Wireless operator, having listened in to G.K.U for the roll call for the day at 0300, 1030 and/or 2230 G.M.T. on 149 kc/s (2013 m.), has obtained a list of the names of the ships and the order in which they will make routine weather reports to Weather London at 0618 and 1218 G.M.T. by schedule. Such of these ships as have two officers in each watch and can conveniently do so will also report their 0000 and 1800 G.M.T. observations as soon after these times as convenient on 143 kc/s (2100 m.). Thus information from about eight of the best disposed ships in the Eastern North Atlantic may be obtained direct by intercepting it at specified times on a specified wave-length and in a specified order.

As regards suitable information of the conditions actually prevailing at coast stations, and how to get it from amongst the great volume of meteorological reports, many of them too long and complicated for the purpose of the mariner, which are being made through certain W.T. Stations for the many purposes of meteorology, by listening in for G.F.A. at 0900 and 2000 G.M.T. on 4098 m., the British Weather Shipping Bulletin (which always commences with the words "Weather Shipping" and which is fully described elsewhere in this number), may be received. This bulletin gives just those elements observed at a limited number of coast stations which the navigator requires, and no more, in the same code as Selected Ships use, the key to which is given also in this number and will be found at the end of the pamphlet M.O. 329.

The methods of communication are easy, and the decoding of the messages is fully explained in M.O. 329 and in the January Number of **THE MARINE OBSERVER**. The code was not in use until May, 1930.

Taking just those observations required, and no more, from written returns of ships which were disposed much as those are now named daily in the roll call, here is an example in February last year.

Let us suppose that we are on board *Mataroa* at Noon on 21st February, 1930, bound from Wellington, N.Z., to Southampton. After taking the sun's meridian altitude we take the following observations:—

Wind variable, a light breeze. Barometer corrected 30.27, weather cloudy, passing showers.

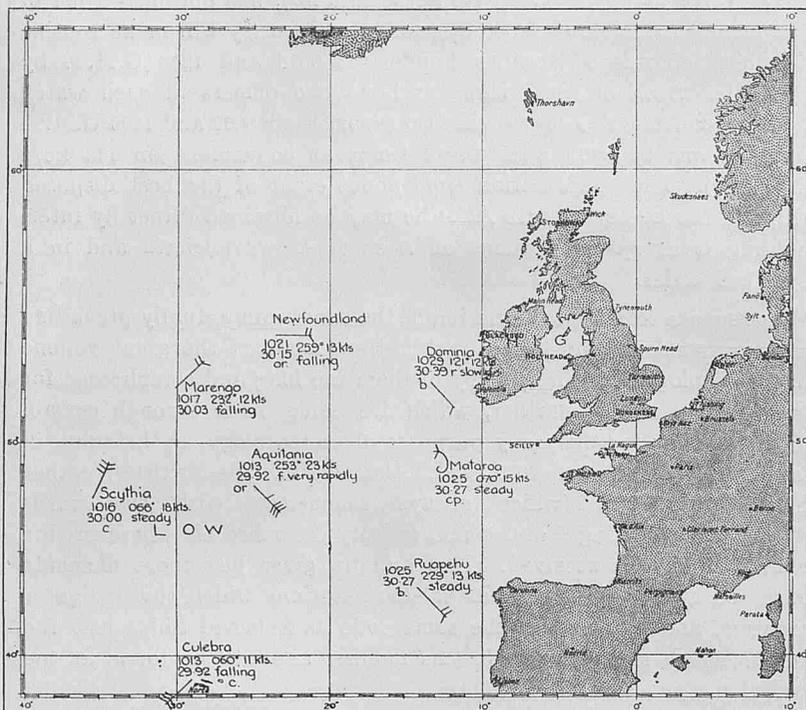
By the time we have worked out the position Latitude 48° 54' N., Longitude 12° 37' W., the bearing and distance and the course and distance made (the ship is making course 070° at a speed of 15 knots) and have carried out the usual noon navigating routine, it would be time for chosen "Selected Ships" to report to Weather London.

WEATHER OBSERVATIONS RECORDED AT NOON, 21ST FEBRUARY, 1930.

Ship.	Position.		Course.	Speed.	Barometer corrected	Barometric Tendency.	Wind.		Weather.
	Lat.	Long.					Dir.	Fee.	
<i>Newfoundland</i> ..	54° 08' N.	23° 31' W.	250°	13	1021 mb. 30.15 ins.	Falling	E.	3	or
<i>Marengo</i>	52° 00' N.	30° 06' W.	232°	12	1017 mb. 30.03 ins.	Falling	N.E.	3	c
<i>Dominia</i>	52° 21' N.	13° 18' W.	121°	12	1029 mb. 30.39 ins.	Rising slowly.	S.E.	1	b
<i>Aquitania</i> ..	48° 11' N.	24° 50' W.	253°	23	1013 mb. 29.92 ins.	Falling very rapidly.	S.E.	7	or
<i>Ruapehu</i>	43° 24' N.	14° 11' W.	220°	13	1025 mb. 30.27 ins.	Steady	S.E.	3	b
<i>Culebra</i>	38° 45' N.	20° 06' W.	060°	11	1013 mb. 29.92 ins.	Falling	S.W.	5	c
<i>Scythia</i>	47° 30' N.	85° 24' W.	066°	18	1016 mb. 30.00 ins.	Steady	N.N.E.	5	c

On a small outline Chart plot the position of your ship and of the reporting ships. At these positions with a protractor lay off wind arrows. These arrows are drawn so that they fly *with* the wind and each of their feathers indicates one of the Beaufort scale; their heads indicate position. Write the name of each reporting ship just clear of her arrow, also her observations briefly and clearly as on CHART I. Don't add anything that is not necessary, for there are a lot of lines to go on the chart and it must be kept as clear as possible for easy reference.

Plotted Observations, Noon, 21st February, 1930.



Weather Chart No. I.

Now pick out the ships reporting the lowest and highest barometers, in this case *Aquitania* and *Dominia* respectively. Follow BUYS BALLOT'S Law. Face the wind at *Aquitania's* position and to the right write the word **LOW**, also face the wind at *Dominia's* position and to the left write **HIGH**. As it happens two ships report equally low barometers; the law of course holds good.

We now see that the wind as represented by the arrows is cyclonic and that the depression is centred somewhere about 700 miles to the W.S.W. of our position; also that the Barometer is Highest somewhere in the region of the British Isles.

Generally the wind blows along isobars inclining towards the low and therefore we can see by the arrows on CHART I how to set about drawing them; it is done this way. For convenience and uniformity in working, it is best to step isobars for every 4 m.b. (.12 ins.) from 1,000 m.b. The lowest reported reading of the barometer is 1,013 m.b. and it is obvious by the force of the wind reported at the same position that there must be lower readings nearer the LOW.

Therefore we take 1012 m.b. as our first isobar. Starting near *Culebra* and following BUYS BALLOT'S Law all the time, we draw roughly with a soft pencil the 1012 m.b. isobar. It passes close to the northward of *Culebra* close to the westward of *Aquitania* and curves round passing between the LOW and *Scythia*.

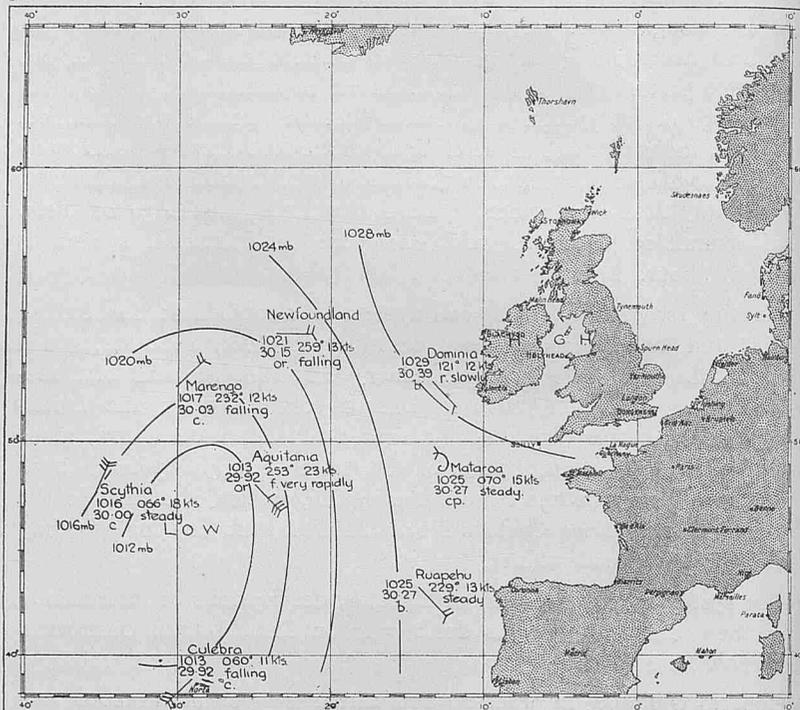
Paying due regard to the force and direction of the winds reported we can now mark out spaces for the 1016, 1020, 1024 and 1028 isobars between the positions of *Aquitania* and *Dominia*.

Having done this aided by the direction and force of the wind indicated by the arrows we rough in the 1016, 1020 and 1024 isobars taking care not to extend them beyond where we have information of the height of the barometer. They are beginning to mark out

the depression more clearly. Now we draw the 1028 isobar remembering that the wind blows along the isobars and towards the LOW and therefore we curve this one, which is the highest, towards the HIGH.

With india rubber and pencil we now fair up all the isobars adjusting the barometric gradient—which is indicated by the spacing of the isobars, so that they are closest together where the wind is strongest and farthest apart where the wind is lightest. Our Chart is now complete as shown in CHART II below.

Noon, 21st February, 1930.



Weather Chart No. II.

Understanding as sea officers do the use of the Sailor's Horn Card, with this chart before us, which represents the actual atmospheric distribution and gives the behaviour of the barometer in each reporting ship, we can form a very good idea of the wind and weather which exists over a great part of the Eastern North Atlantic; and can also form an idea of how the system is moving. Taking into consideration our own course and speed we can see how it is likely to affect the wind and weather which we shall go through in the near future.

The barometric tendencies considered in relation to course and speed as a whole do not seem to show indications of any marked change in the depression; they seem to indicate a movement towards the East, and such is to be expected with the general pressure distribution. On board *Matoroa* on the eastern outskirts of the depression and steaming towards the High we may expect little change in the weather, probably an improvement, and the wind light from the Eastward. The experienced mariner with such a chart before him will see in his mind's eye not merely the depression and anti-cyclone represented on paper but a great expanse of ocean such as he is continuously navigating. He sees the rain, overcast sky, and moderate gale in advance of the centre as reported by *Aquitania*, the fresh N.N.E. breeze and cloudy sky reported by *Scythia* in rear of the depression, and away to the southward blue sky and fine weather which *Ruapehu* is experiencing.

Here is where we can learn so much from drawing simple weather charts at sea, they show us each day what the weather is not only at our own position but over our region and the changes which are taking place.

If certain changes of weather seem on several occasions to follow the same conditions, don't be too sure that they will always do so; or if certain elements seem often to fit one with the other don't be

led to believe that you have discovered a fundamental law. You want to cultivate the habit of accurate observation and sound judgment, and you also have to train your mind and body to be ever ready to make a right decision at any moment and to take action. Therefore, in studying Weather, Ocean Currents, and the like, pick out the *essential* Wireless Weather Reports and don't be led into trying to compass what is the business of the professional Meteorologist, for if you do you may not only cultivate habits of scientific reasoning, but in doing so fail to make yourself an entirely efficient Master Mariner.

All good things in a proper sense of proportion. Marine Meteorology is a useful and fascinating subject, and if properly used is of inestimable value to seamen, but some have suffered by attempting too much, and so it seems but our duty in giving encouragement also to give proper caution.

It is essential that a Master Mariner should have a sound knowledge of the laws of storms, and the elementary physical factors *where they are definitely known*, which contribute to changes of weather and ocean currents, but to attempt more with all his duties, in many cases, would be folly. CHART II has shown us a good deal, and we shall be able to see more in the evening, for after 1800 G.M.T. some of the big ships on the roll call, report, and two hours later we shall be able to get observations from British Coast stations, from the Weather Shipping Bulletin.

In the same way as we drew CHART II we draw CHART III.

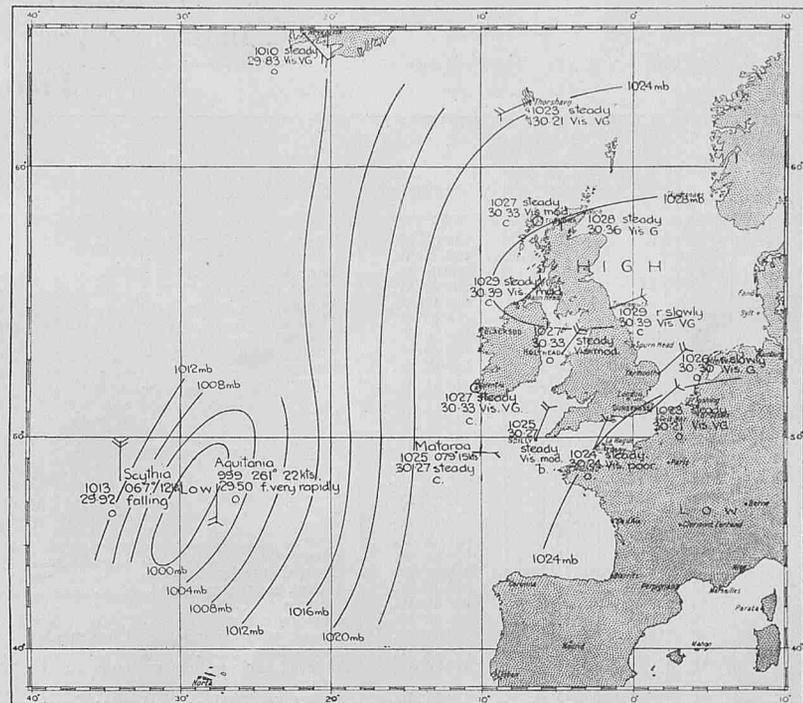
This shows us that the depression travelled Eastward between noon and 6 p.m., and we can now see that there is in fact an anticyclone over Scotland and the North Sea. The barometer tendencies at coast stations indicate that the anticyclone is stable and probably moving slowly Eastward. The depression is also moving Eastward.

Mataroa now only 160 miles from the Bishop Rock Lighthouse, her point of landfall, is particularly interested in the question of visibility. She has at the moment very good visibility and CHART III indicates moderate visibility at Scilly, poor at Guernsey and very good at Dungeness at the time of observation. The wind is N.E.'ly. Gentle and light over the English Channel, and though we have no observations of temperature to go on, it is probable that this N.E. wind is cooler than the southerly winds in advance of the depression, and where they meet visibility may be expected to deteriorate. The official forecast for the southern area "Wind North or North East, light local mist" is seen to be made with good reason. In such circumstances and with such a weather chart and information before him no doubt Captain W. A. R. KERSHAW of *Mataroa*, who has done so much to encourage the practical application of Meteorology to navigation in the ships he commands, would maintain his speed so long as the visibility permitted, until making his landfall, and make any necessary reduction then.

We have taken this example for the month of February because it is typical of the work; there may often be cases where weather charts will enable one to form more definite conclusions; when that is the case, it will be easier to see the factors which indicate the probability of change or continuance of prevailing conditions.

Examples for all parts of the world and under different conditions are given and explained as far as we are able in WIRELESS AND WEATHER AN AID TO NAVIGATION, the scientific accuracy of which,

1800 G.M.T., 21st February, 1930.



Weather Chart No. III.

though in the language of seamen, is vouched for in the foreword by Dr. G. C. SIMPSON, Fellow of the Royal Society and Director of the Meteorological Office. But remember that books can only aid you, you must learn by observation and your own study and commonsense.

In doing our work and particularly in such a profession as that of the officers of the Merchant Navy, upon whom the sea-travelling public depends, and upon whom the nation depends, if we work for personal gain we may fail, if we work for personal kudos we may gain for a time, but if we work for the good of our service, all may gain. The three judiciously blended is the best course to adopt. As we used to say aloft in sail, one hand for the owners and one for yourself.

Marine Meteorology is a difficult subject, and if it is to be of real value in the performance of the duties of masters and mates it must be given its proper place. That place is a branch of seamanship as an aid to Navigation.

Seamanship is an art. Navigation is a science and an art. Meteorology is a science, but surely at sea we should make it an art too.

I think Gilbert said what may be thus interpreted:—
It is purely a matter of skill,
Which all may attain if they will,
And every *mate* must study the knack
If he wants to make sure of his—*Ticket*.

SOUTHERN ICE REPORTS.
During the Years 1929 and 1930.

February.

Year.	Day.	Position of Ice.		Description.	Remarks.	Name of Ship reporting.
		Latitude.	Longitude.			
1929	19	63° 23' S.	61° 05' W.	1 berg, several growlers	.. .. .	R.R.S. <i>William Scoresby</i> .
	19	63° 43' S.	62° 18' W.	1 berg	.. .. .	do.
	18	62° 37' S.	59° 37' W.	2 bergs	.. .. .	do.
	17	62° 53' S.	59° 22' W.	1 berg, many growlers	.. .. .	do.
	17	63° 00' S.	59° 17' W.	5 bergs	.. .. .	do.
	17	63° 10' S.	59° 05' W.	2 bergs	.. .. .	do.
	16	63° 19' S.	58° 50' W.	34 bergs	.. .. .	do.
	16	63° 07' S.	58° 35' W.	5 bergs, many fragments	.. .. .	do.
	15	62° 30' S.	58° 13' W.	2 bergs	.. .. .	do.
	15	62° 11' S.	58° 11' W.	1 berg	.. .. .	do.
	15	62° 08' S.	57° 53' W.	1 berg	.. .. .	do.
	16	62° 56' S.	57° 04' W.	17 bergs	.. .. .	do.
	15	61° 59' S.	56° 25' W.	1 berg	.. .. .	do.
	16	62° 36' S.	57° 41' W.	1 berg	.. .. .	do.
	15	61° 28' S.	56° 15' W.	2 small fragments	.. .. .	do.
	16	62° 52' S.	57° 36' W.	2 bergs	.. .. .	do.
	13	60° 15' S.	54° 10' W.	2 bergs	.. .. .	do.
	13	60° 15' S.	53° 18' W.	2 bergs	.. .. .	do.
	13	60° 18' S.	52° 31' W.	1 berg	.. .. .	do.
	13	60° 18' S.	51° 34' W.	Several small growlers	.. .. .	do.
	13	60° 25' S.	51° 03' W.	1 berg, many growlers	.. .. .	do.
	13	60° 20' S.	50° 51' W.	2 bergs	.. .. .	do.
	12	60° 13' S.	50° 26' W.	Few growlers	.. .. .	do.
	12	59° 45' S.	49° 50' W.	1 berg, many growlers and fragments	.. .. .	do.
	12	59° 34' S.	48° 30' W.	2 growlers	.. .. .	do.
	11	60° 10' S.	47° 30' W.	Cleared pack, numerous bergs and bergy bits.	.. .. .	do.
	11	60° 13' S.	47° 25' W.	Heavy pack ice	.. .. .	do.
	12	59° 35' S.	47° 15' W.	4 bergs, tabular	.. .. .	do.
	11	From 60° 00' S.	46° 52' W.	80 small bergs and bergy bits	.. .. .	do.
		To 59° 44' S.	46° 45' W.	Loose pack to S. and S.E.	.. .. .	do.
	10	59° 38' S.	46° 22' W.	15 bergs	.. .. .	do.
	10	59° 25' S.	46° 12' W.	46 bergs, numerous fragments	.. .. .	do.
	10	59° 20' S.	45° 51' W.	7 bergs medium, many growlers	.. .. .	do.
	9	58° 41' S.	44° 50' W.	Many small growlers	.. .. .	do.
	9	58° 34' S.	44° 47' W.	23 bergs and many growlers	.. .. .	do.
	9	58° 30' S.	44° 40' W.	1 berg, large tabular, 2 small bergs	.. .. .	do.
	9	58° 18' S.	44° 22' W.	1 berg, large tabular, 1 growler	.. .. .	do.
	9	57° 48' S.	43° 40' W.	1 berg, large tabular, 1 large black growler, many fragments in vicinity.	.. .. .	do.
	8	57° 23' S.	42° 47' W.	1 berg	.. .. .	do.
	8	57° 18' S.	42° 40' W.	1 berg	.. .. .	do.
	8	56° 45' S.	42° 20' W.	1 berg	.. .. .	do.
	15-18	20 miles N.W. from Shag Rocks.		1 berg	.. .. .	H.M.S. <i>Despatch</i> .
	7	56° 12' S.	41° 08' W.	1 berg	.. .. .	R.S.S. <i>William Scoresby</i> .
	6	55° 17' S.	39° 50' W.	1 berg	.. .. .	do.
	6	55° 04' S.	39° 40' W.	1 berg	.. .. .	do.
6	54° 03' S.	38° 33' W.	2 bergs	.. .. .	do.	
6	53° 58' S.	38° 23' W.	1 berg	.. .. .	do.	
12-15	From Willis Island to about 7 miles 220° off the Island		1 large berg	.. .. .	H.M.S. <i>Despatch</i> .	
9-12	Off Willis Island		1 berg	.. .. .	do.	
10	52° 57' S.	36° 49' W.	Field ice	.. .. .	do.	
5	54° 05' S.	36° 36' W.	1 small berg	.. .. .	S.S. <i>Lancing</i> .	
5	54° 08' S.	36° 24' W.	1 small berg	.. .. .	R.S.S. <i>William Scoresby</i> .	
9-12	Along N.E. Coast of S. Georgia		Several small bergs	.. .. .	do.	
3	53° 38' S.	35° 45' W.	2 bergs	.. .. .	H.M.S. <i>Despatch</i> .	
3	53° 30' S.	35° 29' W.	1 berg	.. .. .	M.V. <i>Spinanger</i> .	
2	52° 52' S.	35° 50' W.	1 berg	.. .. .	do.	
2	51° 45' S.	31° 57' W.	1 berg	.. .. .	do.	
1930	1	59° 05' S.	53° 15' E.	1 berg	.. .. .	Aux. Bq. <i>Discovery</i> .
	1	60° 06' S.	53° 20' E.	1 berg	.. .. .	do.
	1	59° 18' S.	53° 25' E.	1 berg	.. .. .	do.
	2	58° 04' S.	54° 52' E.	1 berg	.. .. .	do.
	2	57° 32' S.	55° 01' E.	1 berg	.. .. .	do.
	2	57° 33' S.	55° 02' E.	1 berg	.. .. .	do.
	2	57° 50' S.	55° 09' E.	1 berg	.. .. .	do.
	2	57° 25' S.	55° 04' E.	1 berg	.. .. .	do.
	2	57° 23' S.	55° 20' E.	1 berg	.. .. .	do.
	2	57° 50' S.	55° 20' E.	1 berg	.. .. .	do.
	2	57° 11' S.	55° 32' E.	1 berg	.. .. .	do.
	2	57° 17' S.	55° 35' E.	1 berg	.. .. .	do.
	2	57° 10' S.	55° 39' E.	1 berg	.. .. .	do.
	2	56° 54' S.	55° 40' E.	1 berg	.. .. .	do.
	3	55° 09' S.	55° 51' E.	1 berg	.. .. .	do.
	2	56° 50' S.	56° 00' E.	1 berg	.. .. .	do.
	4	54° 02' S.	56° 24' E.	1 berg	.. .. .	do.
	4	53° 51' S.	56° 29' E.	1 berg	.. .. .	do.
	4	53° 19' S.	56° 48' E.	1 berg	.. .. .	do.
	1	69° 50' S.	100° 40' W.	70 bergs, growlers, pack ice	.. .. .	R.R.S. <i>William Scoresby</i> .
	1	70° 00' S.	100° 39' W.	1 berg	.. .. .	do.
	1	69° 43' S.	100° 30' W.	80 bergs, pack ice and growlers	.. .. .	do.
	2	69° 37' S.	99° 00' W.	50 bergs and growlers	.. .. .	do.
	2	69° 13' S.	96° 40' W.	50 bergs, growlers, small ice	.. .. .	do.
	2	69° 14' S.	95° 12' W.	45 bergs, growlers and small ice	.. .. .	do.
2	69° 30' S.	94° 20' W.	26 bergs, growlers, pack ice	.. .. .	do.	

Year.	Day.	Position of Ice.		Description	Remarks.	Name of Ship reporting.
		Latitude.	Longitude.			
1930	3	69° 30' S.	93° 35' W.	20 bergs, growlers, pack ice	Moderate irregular	R.S.S. <i>William Scoresby</i> .
	3	Vicinity of 69° 37' S.	92° 45' W.	34 bergs, growlers, small ice, pack ice ..	Weathered and irregular, numerous growlers and small ice,	do.
	3	Vicinity of 69° 35' S.	91° 35' W.	20 bergs, growlers, small ice, pack ice ..	Moderate irregular, many growlers, much loose ice. Pack heavy but loose at edges.	do.
	3	Vicinity of 69° 30' S.	91° 00' W.	20 bergs, growlers, small ice, pack ice ..	Moderate irregular (1 tabular large), many growlers, much loose ice, pack heavy but loose at edges.	do.
	3	Vicinity of 69° 20' S.	89° 42' W.	12 bergs, growlers, small ice	2 tilted tabular small; remainder irregular small and moderate.	do.
	4	69° 28' S.	88° 42' W.	7 bergs, growlers, small ice	Moderate irregular, few growlers and loose brash ..	do.
	4	69° 30' S.	82° 30' W.	2 bergs, growlers, small ice	Moderate tabular, (partly weathered) tilted	do.
	4	Vicinity of 69° 35' S.	88° 00' W.	10 bergs, growlers, small ice	Irregular moderate, several miles of loose brash outside pack ice.	do.
	5	69° 55' S.	88° 00' W.	1 berg, pack ice	1 berg, small irregular; pack ice very close and heavy ..	do.
	4	69° 40' S.	87° 50' W.	9 bergs, growlers, small ice, pack ice ..	Irregular moderate, several miles of loose brash, outside pack ice.	do.
	4	70° 10' S.	87° 46' W.	5 bergs, growlers, small ice, pack ice ..	Bergs small weathered	do.
	4	70° 10' S.	87° 46' W.	Heavy floes and many larger pieces ..	Pack apparently moving N.W. Heavy floes 2 to 5 ft. out of water.	do.
	6	69° 50' S.	87° 40' W.	1 berg, 1 growler	Small irregular	do.
	6	69° 50' S.	87° 35' W.	4 growlers	Moderate irregular	do.
	6	69° 50' S.	87° 30' W.	1 berg, small ice	Moderate irregular	do.
	6	69° 45' S.	87° 20' W.	2 bergs, 3 growlers	Small, moderate irregular	do.
	6	69° 50' S.	87° 00' W.	2 bergs, 4 growlers	Small, moderate irregular	do.
	7	69° 35' S.	84° 40' W.	2 bergs, a few growlers	Moderate irregular	do.
	7	Vicinity of 69° 30' S.	84° 00' W.	17 bergs, few growlers	Small moderate, irregular	do.
	7	Vicinity of 69° 54' S.	82° 09' W.	20 bergs, few growlers	Small moderate, irregular	do.
	8	70° 34' S.	81° 55' W.	53 bergs, brash ice	Mainly moderate irregular but several moderate large tabular, brash ice, rotten floes.	do.
	9	Vicinity of 70° 15' S.	81° 40' W.	9 bergs, brash ice	Moderate weathered	do.
	7	Vicinity of 70° 15' S.	81° 36' W.	6 bergs, few growlers	2 tabular, 4 irregular all moderate size	do.
	7	70° 31' S.	81° 36' W.	10 bergs, brash ice	Brash ice covers sea for at least 5 miles to South ..	do.
	9	70° 09' S.	81° 32' W.	.. .. .	Cleared brash ice	do.
	9	70° 00' S.	80° 40' W.	1 berg	Moderate irregular	do.
	9	Vicinity of 69° 35' S.	79° 35' W.	5 bergs, few growlers	Moderate irregular	do.
	9	69° 20' S.	78° 45' W.	12 bergs, few growlers	Moderate irregular, 150 ft. to 200 ft. high except 3 moderate irregular, tabular noticeably higher, 200 to 250 ft.	do.
	10	69° 02' S.	77° 40' W.	3 small growlers .. .. .	.. .. .	do.
	10	68° 48' S.	76° 40' W.	Few growlers .. .. .	.. .. .	do.
	10	68° 05' S.	73° 30' W.	1 berg, 3 growlers	Small irregular	do.
	10	67° 52' S.	72° 35' W.	1 berg, 3 growlers	Moderate irregular	do.
	12	66° 17' S.	71° 57' W.	3 bergs, 1 growler	Small irregular	do.
	12	66° 25' S.	71° 45' W.	1 growler .. .. .	.. .. .	do.
	12	65° 58' S.	70° 57' W.	1 berg, 1 growler	Moderate irregular	do.
	11	Off C. Adriasola		Pack ice .. .. .	.. .. .	do.
	11	Off C. Alexandra		18 bergs	Large tabular	do.
	14	4' West of Low Island		1 berg	Moderate tabular	do.
	14	Low Island to Deception Island		6 growlers .. .. .	.. .. .	do.
	14	63° 15' S.	60° 40' W.	1 berg	Moderate tabular	do.
	14	Off Sail Rock		1 berg	Small irregular	do.
	18	5' East of Deception Island		2 bergs	Large tabular	do.
	18	30' South of Nelson Straits		2 bergs	Large irregular	do.
	18	Nelson Straits		1 berg	Small weathered	do.
	18	North End Roberts Island		4 bergs, several bergy-bits	Small, moderate weathered, ashore	do.
	18	10' North of Nelson Straits		5 bergs, several bergy-bits	Small, moderate weathered	do.
	25	30° 50' S.	47° 37' W.	Piece of ice	16 ft. long, 6 ft. wide, 3 ft. high	S.S. <i>Brasilien</i> .
	5	55° 21' S.	36° 47' W.	1 berg .. .. .	.. .. .	R.R.S. <i>Discovery II</i> .
	5	55° 30' S.	36° 45' W.	1 berg .. .. .	.. .. .	do.
	5	54° 48' S.	36° 45' W.	1 berg .. .. .	.. .. .	do.
	5	54° 47' S.	36° 43' W.	1 berg .. .. .	.. .. .	do.
	5	54° 43' S.	36° 40' W.	1 berg .. .. .	.. .. .	do.
	4	55° 34' S.	36° 31' W.	1 berg .. .. .	.. .. .	do.
	4	55° 50' S.	36° 25' W.	1 berg .. .. .	.. .. .	do.
	6	55° 20' S.	35° 42' W.	1 berg .. .. .	.. .. .	do.
	7	55° 50' S.	34° 12' W.	1 berg .. .. .	.. .. .	do.

SUPPLEMENTARY.

During the Year 1928.

February.

Year.	Day.	Position of Ice.		Description.	Remarks.	Name of Ship reporting.
		Latitude.	Longitude.			
1928	11	53° 14' S.	47° 04' W.	Tabular berg, many growlers, and calves.	750 feet long, 100 feet high	R.R.S. <i>William Scoresby</i> .
	11	53° 16' S.	47° 03' W.	Icefield	Ice extending to extreme visibility in N.W. and S.E. direction.	do.
	11	53° 17' S.	47° 02' W.	Berg	Estimated 70 miles long	do.
	14	53° 55' S.	40° 30' W.	Two bergs .. .. .	.. .. .	do.
	29	54° 02' S.	36° 48' W.	Two bergs .. .. .	.. .. .	do.
		(Approximately)				

Note.—This report was received in the Marine Division too late for inclusion in statement of Ice published in the February, 1929, Marine Observer.

Reports of ice previous to February, 1929, will be found in The Marine Observer, Vol. VI, No. 62, pp. 43-45.

WEATHER SIGNALS.

I.—SHIPS' WIRELESS WEATHER SIGNALS.

Urgent Meteorological reports should be made at any time. Any ship at any time encountering a tropical revolving storm should report to all ships and the appropriate station, continuing to report at intervals of three hours so long as the ship remains under the influence of the storm.

Ships experiencing gales in which the wind reaches Force 10 or above in the Beaufort Scale should inform all ships within range.

Ships encountering Ice or other navigational dangers should report immediately to all ships and the appropriate station; see instructions for Danger to Navigation Signals for all ships, pages 31 and 32, Vol. VIII, No. 85.

For full particulars of "Selected Ships" Routine Meteorological Reports with Schedule for Communication, see pages 16 to 19, Vol. VIII, No. 85.

See List of W/T Stations detailed to receive reports from **A Selected Ships** with particulars up to date below, also on Chart III.

In parts of the world where such stations and particulars are not given, British **A Selected Ships** should make their report to **CQ**

on 2100 metres (143 kc/s) as stated on page 18, Vol. VIII, No. 85 (January, 1931, MARINE OBSERVER).

B Selected Ships broadcast their report to C.Q. on 600 m. spark, and these may be intercepted by the stations ringed in on Chart III. In making these reports to C.Q. "B Selected Ships" should make special endeavour to ensure that the report is received at these shore stations. With a view to assisting Meteorological Services who have provided information and to ensuring that routine reports from all "Selected Ships" within range of certain coast stations may be received by those services a list of stations specially detailed to receive reports from "B Selected Ships" is also given on pages 48 and 49. The procedure given on pages 16 to 19, Vol. VIII, No. 85, should be adhered to as far as possible.

According to agreement reached by the International Meteorological Conference, 1929, all arrangements for the co-operation of shipping in Voluntary Marine Meteorological work are to be made through the Meteorological Services of the different countries in which the ships are registered, in accordance with the agreed upon International plan for all parts of the World, following the International Convention for Safety of Life at Sea, 1929.

WIRELESS STATIONS DETAILED TO RECEIVE ROUTINE CODED WEATHER REPORTS FROM "A SELECTED SHIPS."

Request for Information.

THE ATTENTION OF METEOROLOGICAL SERVICES IS INVITED TO THE INVITATION GIVEN ON PAGE 16 OF VOL. VIII, No. 85, JANUARY MARINE OBSERVER.

Ocean.	Station.	Position.	Call Sign.	Frequency and Wave Length.		Area and limits covered by Station.	Telegraphic address of Meteorological Centre.	Information required—Limit of Groups.	Notes.
				For Station to call up "Selected Ships."	For "Selected Ships" to report to Station.				
North Atlantic and North Sea.	Portishead.	Lat. 51° 28' 41" N. Long. 2° 47' 30" W.	GKU.	149 kc/s. (2013 metres).	143 kc/s. (2100 metres).	North Sea and Eastern North Atlantic East of Longitude 40° W. and North of Latitude 38° N., but not within 300 miles of station. (see Chart III).	Weather London.	Weather only, up to seven groups, preferably No. 3 Supplementary Groups.	Control system. "Selected Ships" chosen to report in given order notified by station daily at 2230, 0330, and 1030 G.M.T. Roll call thus—Weather begins—Call signs of chosen "Selected Ships"—Weather ends.
	Chatham Mass.	Lat. 41° 42' N. Long. 70° 00' W.	WCC.		142.9 kc/s. (2098 metres).	North Atlantic West of Longitude 40° W.	Observer Washington.	Weather only. First four groups of observations taken at 0000 and 1200 G.M.T. only required.	No control. All British "A Selected Ships" within area to address their 0000 and 1200 G.M.T. observations to Observer Washington and their 1800 G.M.T. observations to CQ in accordance with schedule.
	Horta, Azores.	Lat. 38° 32' N. Long. 28° 38' W.	CTH.		125 kc/s. (2400 metres).	North Atlantic South of Latitude 38° N. and East of Longitude 40° W.	Radio Horta.	Weather only, up to seven groups, preferably No. 3 Supplementary Groups.	No control—all British "A Selected Ships" within area should report in accordance with Schedule.

WIRELESS STATIONS DETAILED TO RECEIVE ROUTINE CODED WEATHER REPORTS FROM
"B SELECTED SHIPS."

Ocean.	Station.	Position.	Call Sign.	Telegraphic address of Meteorological Centre desiring information.	Information desired.	Notes.
North Atlantic.	Horta, Azores.	Lat. 38° 32' N. Long. 28° 38' W.	CTH.	Radio Horta	Weather only, up to 7 groups, preferably No. 3 Supplementary Groups.	
Indian Ocean.	Calcutta.	Lat. 22° 33' 31" N. Long. 88° 20' 16" E.	VWC.	Weather.	Weather only up to 6 groups, No. 6 Supplementary Groups preferred.	
	Rangoon.	Lat. 16° 45' 57" N. Long. 96° 11' 51" E.	VTR.			
	Madras.	Lat. 12° 59' 17" N. Long. 80° 10' 56" E.	VWM.			
	Bombay.	Lat. 19° 04' 55" N. Long. 72° 49' 54" E.	VWB.			
	Karachi.	Lat. 24° 51' 05" N. Long. 67° 02' 32" E.	VWK.			
	Matara.	Lat. 6° 01' 07" N. Long. 80° 35' 39" E.	GZP.			
	Mauritius.	Lat. 20° 23' S. Long. 57° 35' E.	VRS.	Observatory Mauritius.	Weather 4 universal groups and first of No. 6 Supplementary Groups.	

WIRELESS STATIONS DETAILED TO RECEIVE ROUTINE CODED WEATHER REPORTS FROM
 "B SELECTED SHIPS."

(Continued.)

Ocean.	Station.	Position.	Call Sign.	Telegraphic address of Meteorological Centre desiring information.	Information desired.	Notes.
North Pacific and China Sea.	Cape d'Aguilar, Hong Kong.	Lat. 22° 12' 39" N. Long. 114° 15' 19" E.	VPS.	Royal Observatory.	Weather only, preferably No. 6 Supplementary Groups.	
South Pacific.	Auckland.	Lat. 36° 50' 36" S. Long. 174° 46' 08" E.	ZLD.	Weather Wellington.	Weather only, up to 7 groups.	Apia, Rarotonga and Chatham Island relay to New Zealand. Rarotonga keeps watch 0630 to 1330 G.M.T. Chatham Island 0430 to 1230 G.M.T. Remainder cover schedule. Reports desired through nearest station when "B Selected Ships" are within 1,000 miles of New Zealand.
	Wellington.	Lat. 41° 16' 26" S. Long. 174° 01' 00" E.	ZLW.			
	Awarua.	Lat. 46° 30' 27" S. Long. 168° 22' 21" E.	ZLB.			
	Chatham Island.	Lat. 43° 57' 02" S. Long. 176° 31' 04" W.	ZLC.			
	Rarotonga.	Lat. 21° 11' 54" S. Long. 159° 48' 51" W.	ZKR.			
	Apia.	Lat. 13° 15' 17" S. Long. 170° 49' 42" W.	ZMA.			

II. WIRELESS WEATHER SIGNALS.

Bulletins.

It is necessary to make careful distinction between weather reports and weather forecasts.

A *weather report* is a statement, in plain language or code, of the observed conditions prevailing at a place at a given time.

A *weather forecast* is a statement, usually in plain language, of weather which may be expected at a place or over an area in the near future.

For forecasts issued to shipping by wireless it is usual to publish full descriptions giving abbreviated names of areas with prescribed limits and the length of period; if such published description is not given, the place or area and the period to which the forecasts apply are included in the message.

WIRELESS WEATHER BULLETINS, GREAT BRITAIN AND IRELAND.

C.W. ISSUES "WEATHER SHIPPING" BULLETIN.

W/T Station, Air Ministry. Latitude $51^{\circ} 27' 50''$ N.

Longitude $0^{\circ} 01' 35''$ E.

Call sign G.F.A.

Wave length 4,098 metres, C.W.

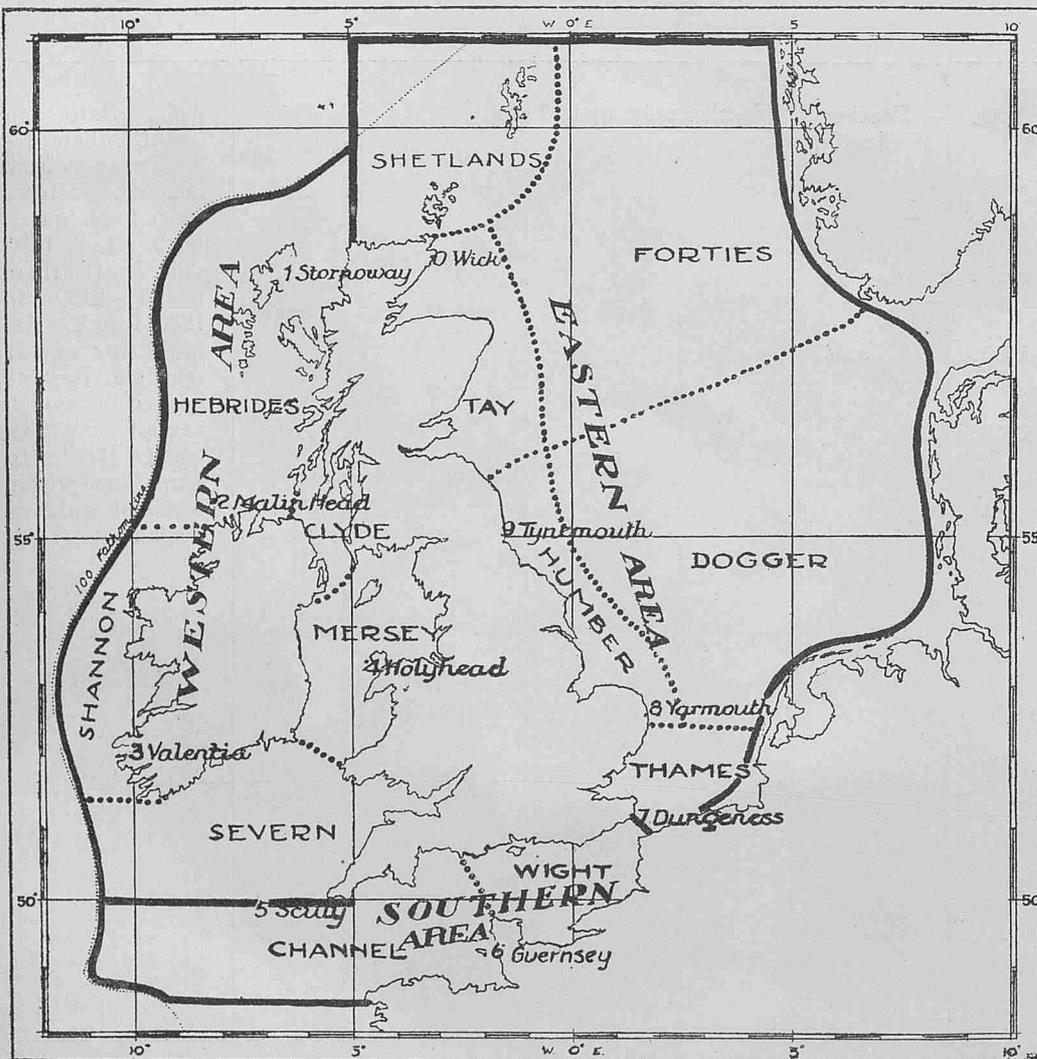
Times of transmission 0900 G.M.T.* and 2000 G.M.T.

The message issued at 0900 G.M.T. is based upon 0700 G.M.T. observations. The message issued at 2000 G.M.T. is based upon 1800 G.M.T. observations.

During the time of S.O.S. lookout, from 0915 to 0918, and 2015 to 2018, there will be a pause in the transmission of these weather signals.

These messages are preceded by the words "Weather shipping" and consist of six parts. Part II. is in code, the remaining parts in plain language.

CHARTLET SHOWING STATIONS, FORECAST AREAS AND DISTRICTS.



Part I. is a general inference of weather conditions over the British Isles, which usually includes information of the pressure system, with whereabouts, which influences the weather.

Part II. is a report in code giving actual observations, with station number, of barometric tendency, barometric pressure, visibility, direction and force of wind, and weather, at the ten British stations shown upon the accompanying Chartlet numbered from 1 to 10 (the initial 1 being omitted in the case of Station 10).

Two stations not shown on the Chartlet also follow in this part. They are No. 1, Reykjavik, Latitude $64^{\circ} 09' N.$, Longitude $21^{\circ} 55' W.$ (approx.) and No. 2, Thorshavn, Latitude $62^{\circ} 03' N.$, Longitude $6^{\circ} 45' W.$ (approx.) preceded by the word "Foreign."

Parts III., IV. and V. are forecasts of wind and visibility for the 12 hours following the time of observations for the areas shown upon the Chartlet.

Part VI. commencing "outlook" is a general statement as to expectation of weather after the period of the forecasts, when it can be made.

Note.—In order to avoid ambiguity between the words Ireland and Iceland the latter word is always repeated whenever it occurs in Part I.

Explanation of Chartlet.

The numbers before the names of the stations indicate their code number (in the event of any station being substituted, the name of the substitute will be given in the message in place of this figure until such time as correction has been adequately made in Notices to Mariners and in THE MARINE OBSERVER).

The boundaries of the areas are defined by the plain black lines and the coast line.

These areas are sub-divided into districts, named after islands, rivers or banks within them, so that they may be readily memorised. The boundaries of these districts should only be taken as an approximate indication of their extent.

These districts are for the purpose of giving information of different weather within an area, without unduly lengthening the wording of a message.

WESTERN AREA.

The sea and coasts eastward of the hundred fathom line from Cape Wrath to Scilly.

DISTRICTS.

HEBRIDES.—That part of Western which lies N. and W. of Bloody Foreland, Rathlin I. and Islay.

SHANNON.—West coast of Ireland from Bloody Foreland to the Fastnet.

SEVERN.—South Coast of Ireland, Bristol Channel, and approaches.

MERSEY.—The Irish Sea and approaches.

CLYDE.—The North Channel and approaches to Clyde.

SOUTHERN AREA.

The English Channel from Dover to the 100 fathom line.

DISTRICTS.

CHANNEL.—West of Portland.

WIGHT.—East of Portland.

EASTERN AREA.

The North Sea south of Lat. $61^{\circ} N.$, and east of Long. $5^{\circ} W.$ to the north and to the Straits of Dover in the south.

DISTRICTS.

THAMES.—Thames Estuary and its approaches.

HUMBER.—East coasts from Yarmouth to Tweed.

TAY.—East coast of Scotland, including Moray Firth.

SHETLANDS.—Orkneys and Shetlands.

FORTIES.—Eastward to Norway and N. of line Tweed to Naze.

DOGGER.—Eastward to coast of Denmark and S. of line Tweed to Naze.

* All times are G.M.T., the day commencing at Midnight, and the hours reckoned from 00 to 23.

DESCRIPTION OF CODE

AND

INSTRUCTIONS FOR DECODING PART II.

Part II of this bulletin is made by using the tables of the Universal International Ships' Wireless Weather Telegraphy Code, the decode tables for which are given in Volume VIII, No. 85, pages 28-31,* and the key is arranged as follows, to follow International agreement. The second group being the same as the third group for "Selected Ships" reports, i.e. :—

D D F w w

and the first group now contains the remainder of the elements which have been given in Part II of this Bulletin since it was established on January 1st, 1924.

The code is arranged in five-figure groups, which are paired. Each pair of groups refers to one station, and contains an odd and an even group.

Odd Groups. The 1st Figure indicates the station to which the pair of groups refers. From 1 to 9 and 0 for British stations. The Foreign groups being numbered 1 and 2 as above and indicated by the word "Foreign."

The 2nd Figure gives the Barometric tendency, Table IX, p. 30, Vol. VIII, No. 85.

The 3rd and 4th Figures indicate the last two whole figures of the corrected barometer reading in millibars.† To convert to inches, see Table VIII, p. 29, Vol. VIII, No. 85.

The 5th Figure gives the visibility, Table XII, p. 30, Vol. VIII, No. 85. Caution is necessary in the use of these visibility reports owing to the conditions of view to seaward at some stations. The visibility reports are landward for Reykjavik.

Even Groups. The 1st and 2nd Figures give the True Direction of the Wind, Table III, p. 28, Vol. VIII, No. 85.

The 3rd Figure gives the force of the wind by Beaufort scale. All forces 9 and above, as 9, see Table V, p. 28, Vol. VIII, No. 85.

The 4th and 5th Figures give the weather, Table VI, p. 28, Vol. VIII, No. 85.

In all cases when a figure cannot be given, a hyphen - - - - - is given to preserve the order.

It will be of assistance in memorising the code if the following initial letters of the various elements are committed to memory.

I_nABBV

DDFww.

Thus I_n = Station.

DD = Wind Direction.

A = Barometric tendency.

F = Wind Force.

BB = Barometric Pressure.

ww = Weather.

V = Visibility.

This description of the British "Weather Shipping" Bulletin will serve as an example of the method of decoding Bulletins for other countries, where the New International Code is in use, given in future numbers.

Though at first decoding may be tedious a little practice will show that this can be done with ease and rapidity.

* The decode tables are published for general information of shipping and seamen in a pamphlet, M.O. 329, which may be obtained from H.M. Stationery Office, price 3d.

† It will be seen that the coded figures may represent two values of barometric pressure, but this only takes place with a very low or very high barometer, so that Mariners will be able to decide which value is intended.

A Sample Message.

Call Sign:—CQ CQ CQ V GFA GFA GFA (repeated twice).
Weather Shipping.

Inference.—A deep depression over the North Channel which is moving East North East will cause strong winds or gales in all districts with much rain at first. Improving weather will spread across the country in its rear.

Station	17995	04153	2193-	28355	34127	26511
Reports.	46976	20835	55137	26716	65197	18641
	77154	20612	87146	18652	97995	20627
	0800-	14656	Foreign	1196-	16212	2005- 00012

Forecasts.—Western Area Districts Mersey Severn Shannon westerly gale veering and moderating visibility becoming good Districts Clyde Hebrides strong northerly winds moderating visibility moderate full stop Southern area strong westerly to north westerly winds District Wight visibility poor District Channel visibility becoming good full stop Eastern Area Districts Dogger Humber Thames southwesterly gales visibility poor Districts Tay Forties southerly winds strong to gale backing visibility poor District Shetlands fresh easterly winds visibility moderate full stop Outlook Eastern Area northerly gales Western Area temporary improvement.

Though these reports are intended for the use of ships at sea, they will be found useful to shipping and seamen at the ports, if intercepted by local wireless receiving stations and passed to Harbour Masters and others responsible for the safety and working of shipping.

SPARK ISSUES.

"WEATHER SHIPPING" BULLETIN.

Certain portions of the "Weather Shipping" Bulletin described above are broadcast by coast W/T stations on spark as follows. The a.m. issues refer to 7 a.m. observations and p.m. issues refer to 6 p.m. observations, all times are G.M.T

For the Western Area.

Valentia, Lat. 51° 56' N., Long. 10° 21' W. (approx.), call sign GCK wavelength 600 metres spark. At 0948 G.M.T. and at 2048 G.M.T.

Seaforth, Lat. 53° 28' N., Long. 3° 01' W. (approx.), call sign GLV wavelength 600 metres spark. At 0930 G.M.T. and at 2030 G.M.T.

Commencing Western Area followed by ten groups of figures which indicate observations made at the five stations numbered 1 to 5 in the "Weather Shipping" Bulletin followed by the word Forecast after which the 12-hour forecast for the Western Area will be given.

For the Southern Area.

Niton, Lat. 50° 35' N., Long. 1° 17' W. (approx.), call sign GNI, wavelength 600 metres spark. At 0930 G.M.T. and at 2030 G.M.T.

Commencing Southern Area followed by six groups of figures which indicate observations made at the three stations numbered 5, 6 and 7 in the "Weather Shipping" Bulletin, followed by the word Forecast, after which the 12-hour forecast for the Southern Area is given.

For the Eastern Area.

Cullercoats, Lat. 55° 02' N., Long. 1° 26' W. (approx.), call sign GCC, wavelength 600 metres spark. At 0948 G.M.T. and at 2048 G.M.T.

Commencing Eastern Area, followed by eight groups of figures which indicate observations made at the four stations numbered 7, 8, 9 and 0 in the "Weather Shipping" Bulletin, followed by the word Forecast, after which the 12-hour forecast for the Eastern Area is given.

WIRELESS TELEPHONY (R/T) ISSUES.

"WEATHER SHIPPING" BULLETIN.

Certain portions of the "Weather Shipping" Bulletin are broadcast from the BRITISH BROADCASTING CORPORATION'S station at **Daventry** by Wireless Telephony as follows:—

Daventry (Midland National). Latitude 52° 15' N., Longitude 1° 08' W. (approx.), wavelength 1554.4 metres (R/T). At 1030 and about 2115 G.M.T. on weekdays and 1030 and about 2100 G.M.T. on Sundays.

This station broadcasts Parts I, III, IV and V of the "Weather Shipping" Bulletin, *i.e.*, a general inference, followed by 12-hour forecasts for the Western, Southern and Eastern Areas, based on observations at 0700 G.M.T. for the a.m. issue and on observations at 1800 G.M.T. for the p.m. issue.

When British Summer time is in operation these issues are made one hour earlier by G.M.T. so that the hours and minutes given by B.S.T. remain the same as in winter when G.M.T. is used.

As changes in the Time of issue of Parts I, III, IV and V through the BRITISH BROADCASTING CORPORATION'S station at **Daventry** are occasionally necessary at short notice, mariners are referred to the "Radio Times," the official organ of the BRITISH BROADCASTING CORPORATION, which is published weekly for notice of the exact times of issue of this message; these are also given in the daily press.

It should be noted that the times given in the "Radio Times" are G.M.T. only when summer time is not in operation, while all times for Wireless Weather Telegraphy in THE MARINE OBSERVER are G.M.T.

It should also be noted that forecasts for the General Public and Farmers are broadcast by Daventry, and as these are for land areas it is necessary to distinguish them from the parts of the "Weather Shipping" Bulletin which give information to Mariners.

WIRELESS GALE WARNINGS.

Spark Issues.

These warnings are broadcast in plain language and refer to the area which lies within about 150 miles of the station broadcasting the warning.

The warnings are broadcast on a wavelength of 600 metres (spark) preceded by the **International Safety Signal TTT** (— — —) repeated at short intervals 10 times on full power; the warning being broadcast **one minute later, once only.**

Stations broadcasting these warnings.

Station.	Call Sign.	Latitude. (approx.)	Longitude. (approx.)
Niton (Isle of Wight) ...	GNI	50° 35' N.	1° 17' W.
Land's End ...	GLD	50° 07' N.	5° 40' W.
Fishguard ...	GRL	52° 01' N.	4° 59' W.
Seaforth (Liverpool) ...	GLV	53° 28' N.	3° 01' W.
Wick ...	GKR	58° 26' N.	3° 06' W.
Cullercoats ...	GCC	55° 02' N.	1° 26' W.
Valentia (Ireland) ...	GCK	51° 56' N.	10° 21' W.
Malin Head (Ireland) ...	GMH	55° 22' N.	7° 20' W.

Example.—"Gale Warning.—Deep depression off N.W. Ireland moving East. Gales from S.E., backing North, probable North of Lat. 54°. Southerly gales veering N.W. other coasts."

Should the warning be broadcast during the period when one-operator ships do not keep watch it will be repeated in the next watch-keeping period for one-operator ships at either of the following times:—

Wick ...	} 0800, 1200, 1600 or 2000 G.M.T.
Land's End ...	
Seaforth ...	
Malin Head ...	
Cullercoats ...	} 0818, 1218, 1618 or 2018 G.M.T.
Niton ...	
Fishguard ...	
Valentia (Ireland) ...	

Gale warnings broadcast at 0800, 0818, 2000 or 2018 G.M.T. will follow the navigational warning, if one is broadcast.

NOTE.—For locating depressions the use of the words Ireland or Iceland is frequent and in order that they shall not be confused when Iceland is appropriate it will be repeated thus—Iceland Iceland.

Wireless Telephony (R/T) Issues.

Gale warnings will be broadcast as necessary by Radio Telephony, by the BRITISH BROADCASTING CORPORATION'S station at **Daventry (Midland National)**, on the wavelength of 1554.4 metres as follows:—

Weekdays.

Immediately after the time signals at 1300, 1645 and 1830 G.M.T. Gale warnings issued at 1300 G.M.T. will be repeated both at 1645 and 1830 G.M.T. and a warning issued at 1645 G.M.T. will be repeated at 1830 G.M.T.

Sundays.

Immediately after the time signal at 1500 G.M.T. only.

When British Summer Time is in operation these issues are made one hour earlier by G.M.T. so that the hours and minutes given by B.S.T. remain the same as in winter when G.M.T. is used.

The warnings will be made in the following manner by word of mouth:—

"The Meteorological Office issued the following gale warning to shipping at 1430 G.M.T. to-day:—'Secondary depression off S.W. Ireland moving North-eastward, Southerly gales expected South of line from Exmouth to Spurn Head.'"

These R/T gale warnings are simply a repetition of the W/T gale warnings at fixed times convenient to the B.B.C.

Changes in the times of issue by R/T of these gale warnings for shipping are necessary at shorter notice than can be given by THE MARINE OBSERVER. Mariners are, therefore, referred to "The Radio Times," the official organ of the BRITISH BROADCASTING CORPORATION, published weekly, for the exact times of issue. The times given in "The Radio Times" are only G.M.T. when summer time is not in operation.

III. WIRELESS TIME SIGNALS.

C.W. Issues.

Rugby W/T station, Lat. 52° 21' 59" N., Long. 1° 11' 12" W., call sign **GBR**, broadcasts Time Signals on a wavelength of 18,750 metres (C.W.) at 1000 and 1800 G.M.T. :—

System Used.—Modified rhythmic type as recommended by the International Time Commission of 1925, consisting of a series of 306 signals emitted in 300 seconds of Mean Time, the concluding signal being the exact hour.

In each series, Signals Nos. 1, 62, 123, 184, 245 and 306 are single dashes (—) of 0.4 sec. duration and commence at the exact minute. Each dash is followed by 60 dots (·) of 0.1 sec. duration.

The commencement of successive signals, whether dot or dash, are equally spaced at intervals of 60/61 parts of one second of Mean Time, i.e. :—

G.M.T.			Signal.		
h.	m.	s.			
9 or 17	55	00	1st signal a dash (-) followed by 60 dots (..... etc.).		
„	56	00	62nd do.	do.	do.
„	57	00	123rd do.	do.	do.
„	58	00	184th do.	do.	do.
„	59	00	245th do.	do.	do.
10 or 18	00	00	306th signal, a dash (-).		

This type of time signal will enable chronometer comparisons of extreme accuracy to be obtained, the method employed being to count the number of intervals from the first dash (-) until coincidence occurs between one of the rhythmic signals and the beat of the chronometer. It is not necessary actually to count the signals. Take the nearest second of each dash by the chronometer, and write down the chronometer time of coincidence. The difference gives the number of the rhythmic signal. For ordinary navigational purposes a comparison obtained by disregarding the dots and using the commencement of the dashes only (given at the exact minute) will be sufficiently accurate.

NOTE.—An article entitled “Greenwich Time” describing how these signals are made, of great interest to navigators, will be found on pp. 159-167, Vol. V, No. 56.

Wireless Telephony (R/T) Issues.

The Time Signals broadcast by the BRITISH BROADCASTING CORPORATION through their Station at **Daventry (Midland National)**, latitude 52° 15' N., longitude 1° 08' W., wavelength 1554.4 metres, may be of utility for rating chronometers at sea in ships which are fitted for R/T reception but have not Wireless Telegraphy on board.

These Time Signals are made at the following times:—

Weekdays.	Sundays.
1030 G.M.T.	1030 G.M.T.
1300 „	1500 „
1645 „	2100 „
1830 „	
2100 „	
2330 „	

When British Summer Time is in operation these issues are made one hour earlier by G.M.T., so that the hours and minutes given by B.S.T. remain the same as in Winter when G.M.T. is used.

The time Signals consist of the automatic transmission by the Standard Clock at Greenwich Observatory, of six dots, representing successive seconds. The final dot is the Time Signal. The amount of lag is less than 0.01 seconds.

The Time Signal will, when necessary, be superimposed on programmes, but the Signals will be loud enough to be easily discernible.

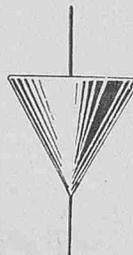
As changes in the times of the BRITISH BROADCASTING CORPORATION issues may be made at shorter notice than can be given by THE MARINE OBSERVER, Mariners are therefore referred to “The Radio Times,” the official organ of the BRITISH BROADCASTING CORPORATION, published weekly, for exact times of issue.

IV. VISUAL GALE WARNINGS.

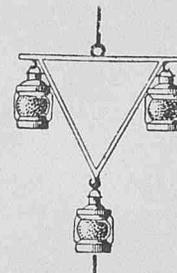
Great Britain and Ireland.

SOUTH CONE.

By Day.



By Night.



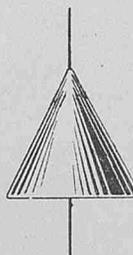
Hoisted for Gales.

Commencing from a southerly point, such gales often veer, sometimes as far as north-west.

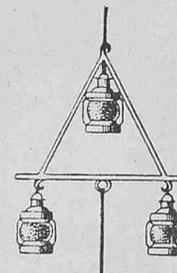
For gales commencing from east or west the S cone will be hoisted if the gale is expected to change to a southerly direction.

NORTH CONE.

By Day.



By Night.



Hoisted for Gales.

Commencing from a northerly point.

For gales commencing from east or west the N cone will be hoisted if the gale is expected to change to a northerly direction.

When one of these signals is hoisted it indicates that a telegram has been received from the Meteorological Office by the station exhibiting the signal, that a gale is expected in the vicinity of the station.

The signal will be lowered when the gale has passed and it is anticipated that there will be a period of not less than 12 hours with winds of less than gale force. The cone is kept flying during a lull of the wind if a renewal of the gale is expected.

At present only those stations marked † in the list show the night signal.

The stations are as follows:—

England, East Coast.

Berwick-upon-Tweed	Whitby
Holy island	Filey
Amble	Scarborough
Blyth	Flamborough head
Tynemouth	Bridlington
North Shields	Aldbrough
Souter point	Spurn head
Sunderland	Hull
Seaham	Goole
Hartlepool	Grimsby
Middlesbrough	Mablethorpe
Redcar	Boston

ENGLAND, EAST COAST—*continued.*

King's Lynn	Kentish Knock light-vessel
Weybourne	Greenhithe (H.M.S.
Cromer	<i>Worcester)</i>
Yarmouth	Chatham
Gorleston	Sheerness
Lowestoft	†Southend
Southwold	Tilbury
Orfordness	Rotherhithe
Ipswich	Reculvers
Felixstowe	Herne Bay
Gunfleet	Margate
Burnham	

England, South Coast.

Ramsgate	Portland
North Goodwin light-vessel	Jersey (Channel Is.)
Deal	Exmouth
Dover	Torquay
Sandgate	Dartmouth
Dungeness	Berry head
Rye	Prawle point
Fairlight	Salcombe
Eastbourne	Plymouth
Beachy head	Devonport
†Newhaven	Rame head
Brighton	Portwrinkle
Littlehampton	Looe
Hayling island	Fowey
Portsmouth	Gorran haven
Southampton	Mevagissey
Calshot	Coverack
Cowes	Pendennis Castle point
Ryde	<i>(Falmouth)</i>
St. Catherine point	Lizard
Needles (Freshwater)	Mullion
Poole	Porthleven
Swanage	Mousehole
St. Alban's head	Tol Peden Penwith
Weymouth	Scilly (St. Mary's)

England, West Coast, and Wales.

Sennen	Newquay (Cardigan)
Godrevy	Aberystwith
St. Ives	Abersoch
Newquay	Carnarvon
Trevoise head	South Stack
Padstow	Holyhead
Port Isaac	Point Lynas
Lynmouth—Foreland	Penmon
Bude	Hilbre island
Hartland Point	Hoylake
Bull point	New Brighton
Ilfracombe	Formby light-vessel
Weston-super-Mare	Crosby light-vessel
Avonmouth	Runcorn
Newport (Mon.)	Liverpool
Cardiff	Preston
Penarth	Blackpool
Nells point	Fleetwood
Barry dock	Heysham
Nash	Morecambe
Briton ferry	Barrow
Mumbles	Walney island
Rhos-sili	Whitehaven
Burry port	†Workington
Tenby	Maryport
Caldy island	Douglas (Isle of Man)
St. Ann's head	Ayre point (Isle of Man)
Fishguard	Ramsey (Isle of Man)

Scotland, West Coast.

Little Ross lighthouse	Campbeltown
Stranraer	Mull of Cantyre
Mull of Galloway	Rinns of Islay
Port Patrick	Rudha Mhail
Corsewall point	Glas island
Ballantrae	Rudh' Re' lighthouse
Ardrossan	Duntulm
Greenock	Stornoway
Kildonan	Ru Stoer (Stoorhead)

Scotland, North and East Coasts, with Orkneys and Shetlands.

Cape Wrath	Freserburgh
Lerwick	Peterhead
Balta sound	Collieston
Whalsey	Aberdeen
Sumburgh head	Girdleness
Fair isle	Stonehaven
Noup head	Gourdon
Kirkwall	Johnshaven
Stronsay (April to Sept.)	Montrose
Stromness (Orkney isles)	Scurdyness
Cantick head	Arbroath
Broughness	Fifeness
Dunnet head	Anstruther
Wick	Methil
Helmsdale	Rosyth (H.M.S. <i>Greenwich</i>)
Tarbetness	Grangemouth
Cromarty	North Berwick
Nairn	Dunbar
Burghead	Cockburnspath
Lossiemouth	St. Abbs head
Buckie	Eyemouth
Port Knockie	Burnmouth
Portsoy	Isle of May
Banff	

Ireland, North and East Coasts.

Malin head	Bangor (Orlock Head)
Portrush	Ballywalter
Ballycastle (Torr Head)	Killough
Blackhead lighthouse	Kilkeel
Belfast	Kingstown

Ireland, South Coast.

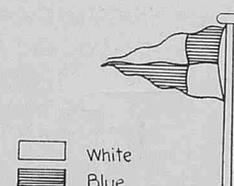
Queenstown	Galley head
Cork	

Ireland, West Coast.

Killybegs (St. John's point)	Loop head
Galway	

By arrangement with the Admiralty, these signals are hoisted in H.M. Fishery Protection Vessels at sea for the area in which they are stationed, inferior to the

Fishery Flag.



SPECIAL SERVICE BY PAYMENT.

Additional Wireless Telegraphic and Land Line Services which are performed for shipping, with charges.

The following list indicates the information which may be obtained on request, at any time, night or day.

Weather Forecasts.

Special weather forecasts can be made at the Meteorological Office for a period of 24 hours for areas within the region contained between the parallels of 70° N. and 35° N. and between the meridians of 12° W. and the coast of the Continent of Europe.

Procedure for Ships at Sea.—Request weather forecast through the nearest coast W/T. station in Great Britain or Ireland, specifying required date and area, and giving ship's name.

Charge.—7s. 6d.

Procedure for Shipowners and Masters of Ships in port about to sail.—Telephone to Meteorological Office (Telephone No. Holborn 3434, Extension 174) or send **reply paid** telegram to Weather, Phone, London (allowing 10 to 20 words as necessary for reply), requesting weather forecast and specifying date and area for which required, and address to which to be sent.

Charges—None, if the information is required immediately and the reply paid telegram covers the telegraphic charges.

If the information is required for a specified day in advance, or for a number of days, a registration fee of 6d. per week (minimum fee 6d.) in addition to cost of telegrams. In this case application for the forecasts may be made by letter.

Procedure for Salvage Officers and others requiring warning of gales or winds from specified directions, or particular kinds of weather.—Write to the Meteorological Office, London, stating the position or locality and the warnings required, with the period.

Charge.—2s. 6d. for each message, plus telegraphic charges.

NOTE.—For Home waters the Areas and Districts used in the British "Weather Shipping" Bulletin may be used with advantage to indicate the localities for which forecasts are required.

Weather Reports.

Information of the actual local weather conditions prevailing at any of the following stations may be obtained:—

Aberdeen.	Hoylake.	Southend.
*Bangor, Co. Down.	Inchkeith.	Spurn Head.
Barry Island.	Kildonan.	†St. Ann's Head.
Beachy Head.	Lizard.	St. Catherines Point.
*Broughness.	*Mumbles.	*Stornoway.
Cape Wrath.	Needles.	*Torr Head.
†Dover Pier.	*Rame Head.	†Tynemouth.
Dunnet Head.	†Portpatrick.	†Wick.
*Holyhead.	Prawle Point.	

* These stations cannot give information about barometric pressure.

† Reports from these stations include information as to the state of the sea.

Procedure for Ships at Sea.—Request through nearest W/T. coast station in Great Britain or Ireland, specifying the name of the station for which observed weather conditions are required.

Charge.—7s. 6d.

Special Notices Regarding Personnel.

The Marine Superintendent will be glad to receive information of special distinctions gained and retirements, &c., of Marine Observers.

 OBITUARY.

Captain C. Maitland.

Captain CHARLES MAITLAND died at Falmouth on 25th November, 1930, at the age of 82.

He was a nephew of Captain FREDERICK MAITLAND, R.N., who commanded H.M.S. *Bellerophon*, when NAPOLEON BUONAPARTE surrendered on board her in 1815.

He went to sea in Devitt and Moore's ship *St. Vincent* in 1866, and remained in their sailing ship service throughout his sea career, with the exception of a year when he commanded Mr. J. D. CLINK's ship *Valkyrie*, of 2,270 tons.

His first command was the *Gateside*, and he also had the *John Rennie*. He commanded both the *Harbinger* and *Hesperus*, carrying apprentices and midshipmen under Lord Brassey's and Sir Thomas Devitt's scheme. He subsequently commanded the *Illawarra*, and later the *Port Jackson*, when he was a member of the corps of Voluntary Marine Observers.

In 1916 he retired, upon the *Port Jackson* being sold.

There was probably no sailing ship master who was so well known in modern times as Captain MAITLAND, and there was certainly no shipmaster who did more towards the sea training of a large number of the leading master mariners of the present day.

Our last recollection of Captain MAITLAND was at Sydney on board his ship the *Port Jackson*, not long before the Great War; and it is one of those memories which we cherish, to see him on board his fine ship and with the youngsters he so well trained.

Captain R. G. Smith.

Captain R. G. SMITH, Commander of the R.M.S. *Cedric*, has retired on reaching the age limit after thirty-three years' service with the White Star Line.

After some years' service in sail he joined the White Star Line in 1897 as fourth officer, and passing through the different grades, attained command in 1912 when he was appointed Master of the *Cevic*.

Since then Captain SMITH has commanded several ships of the White Star Fleet, including the *Canada*, *Regina*, *Canopic*, *Ionic* and *Runic*. He has been a regular member of the Corps of Voluntary Marine Observers since 1922.

Captain G. E. Warner, R.D., R.N.R.

Captain G. E. WARNER, Commander of the R.M.S. *Olympic*, has retired on attaining the company's age limit. At the age of 16 he commenced his apprenticeship serving the whole of his time in the ship *Pericles*, and on its completion was made 3rd mate, in which capacity he served for 18 months. He then joined the Glen Line as 4th Officer and rose to command in that employ, his first ship being the *Glenartney*. In 1904 his services were loaned to the Shire Line, and when this company was absorbed by the Royal Mail Steam Packet Company in 1907, Captain WARNER entered the service of that company.

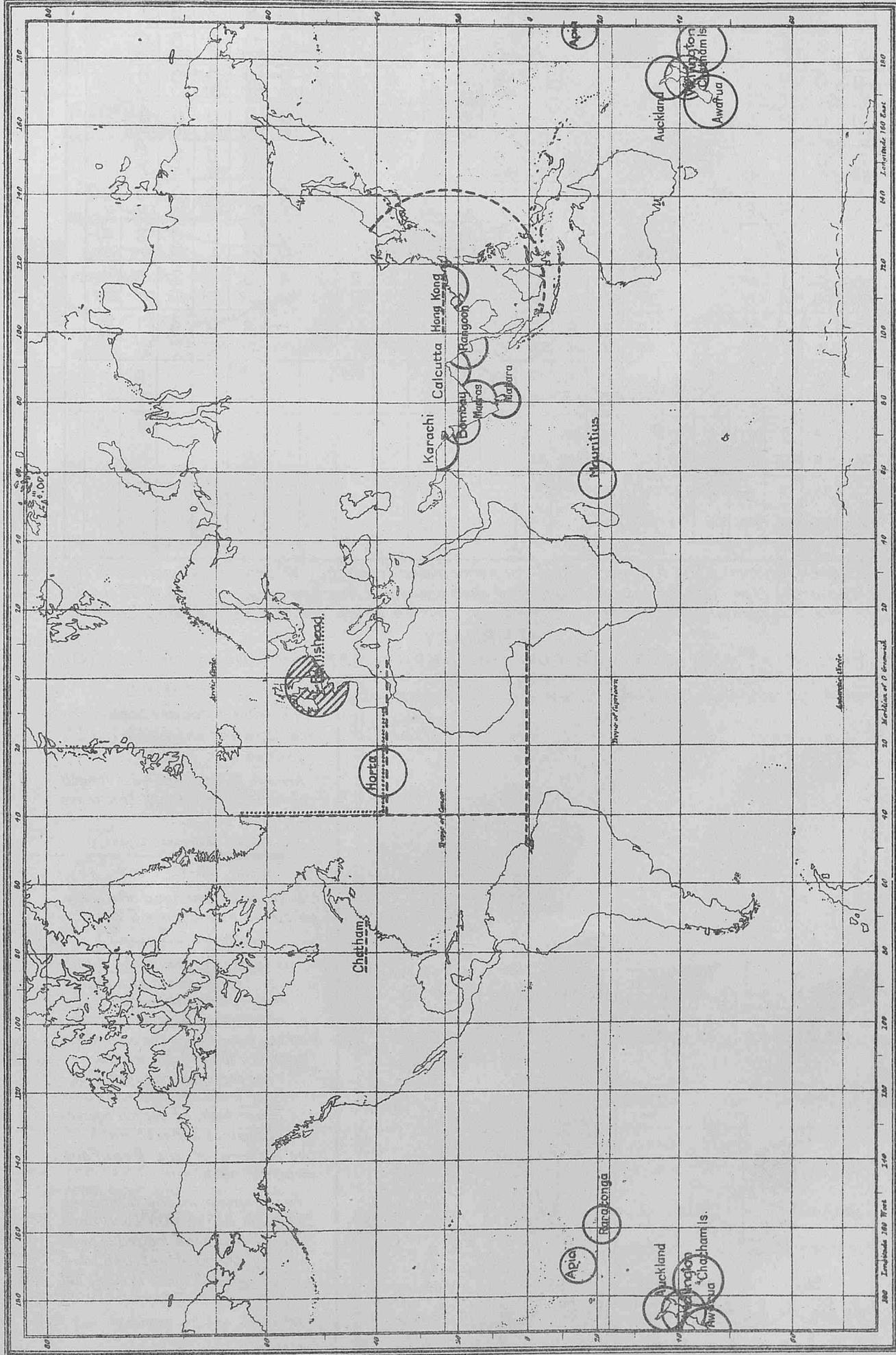
Serving in H.M. Navy throughout the war he returned in 1919 to the Royal Mail, being appointed to command his old ship the *Cardiganshire*. In 1927 when commanding the R.M.S. *Orca* his ship was renamed *Calgaric* and transferred to the White Star Line, Captain WARNER retaining command.

Since then he has commanded the *Baltic*, *Homeric* and *Olympic*. He has been associated with the Corps of Voluntary Marine Observers since 1906.

The Corps of Voluntary Marine Observers join with the Marine Division in wishing these Officers long life and happiness in their retirement.

Chart III— SHIPS' WIRELESS WEATHER SIGNALS.

Stations for Reception of Routine Wireless Weather Reports from "Selected Ships."



The dotted line indicates the area in which British "A Selected Ships" report under control to Fortishead. The small shaded circle indicates the area from which reports are prohibited to Fortishead.

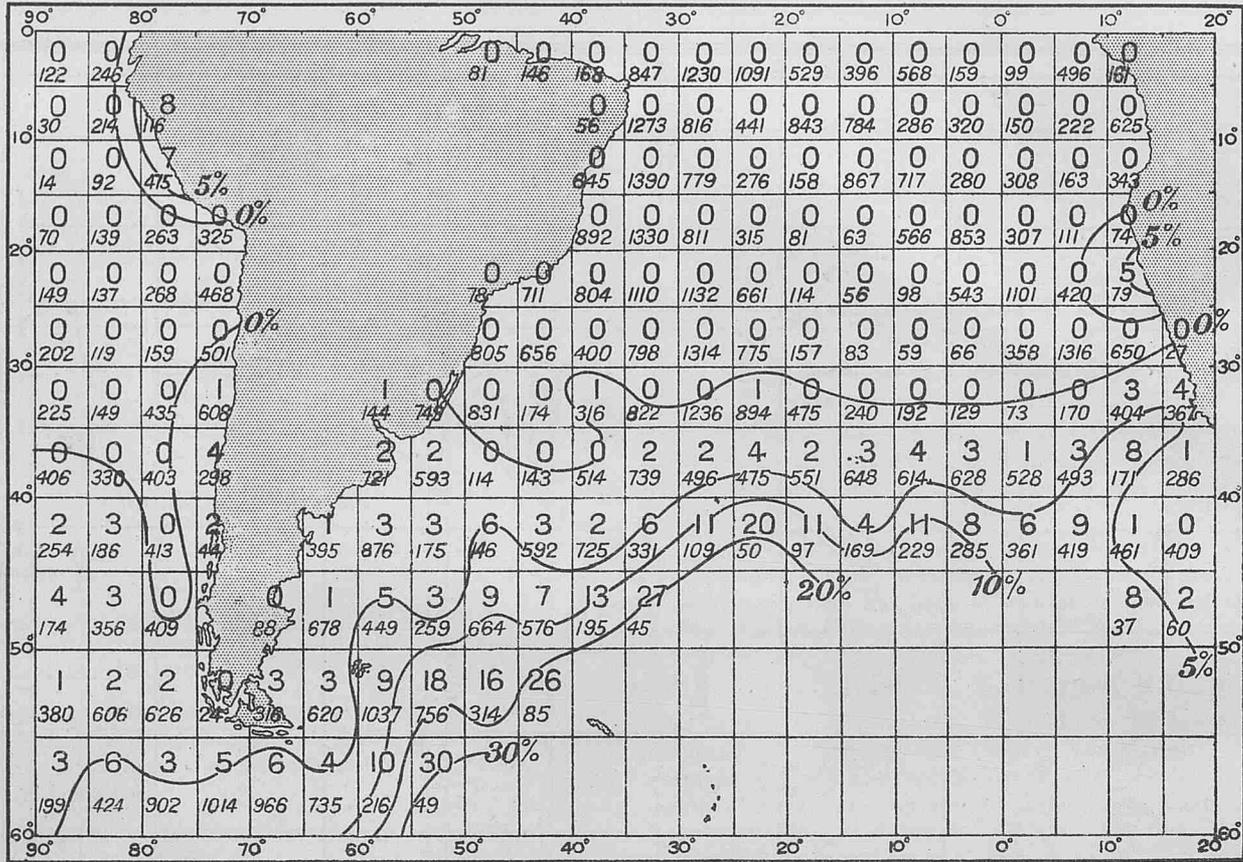


A pecked line indicates the reporting area round stations in other countries to which British "A Selected Ships" should report. The names of such stations being also underlined with a pecked line.



The full-line circles indicate the areas round islands and coast stations which could receive spark "Selected Ships" reports to C.Q.

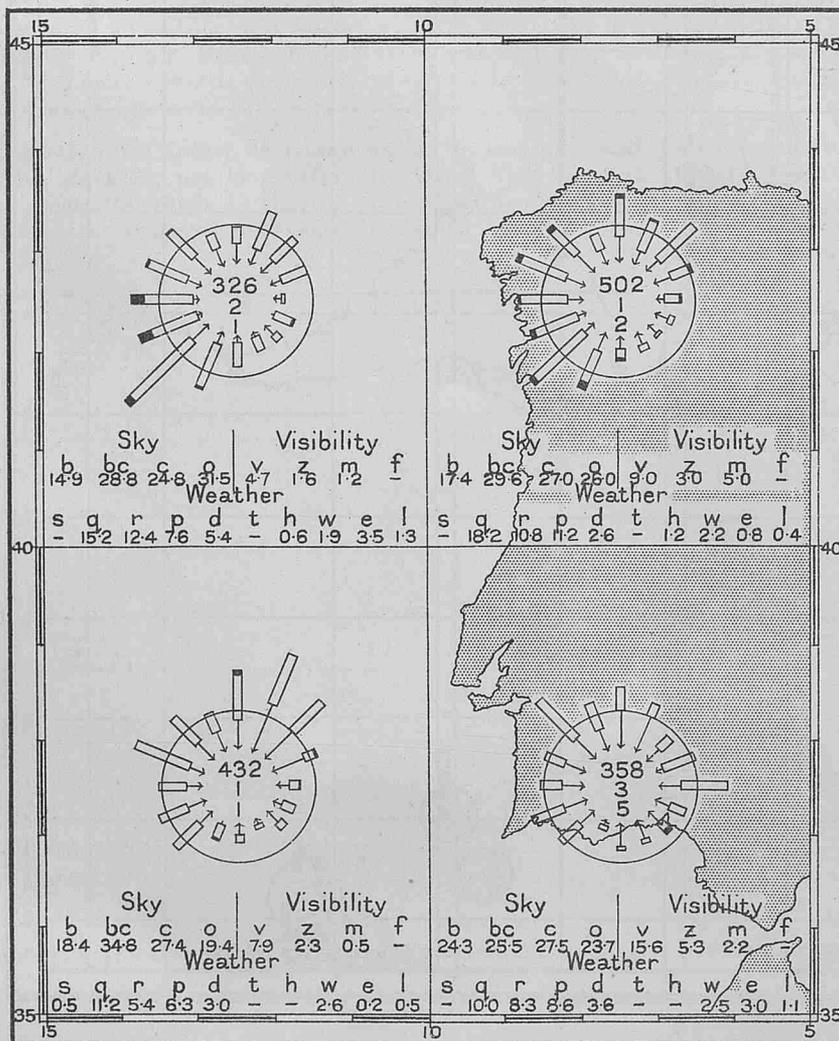
FOG IN THE SOUTH ATLANTIC AND VICINITY OF WEST COAST OF SOUTH AMERICA, PERCENTAGE FREQUENCY.



The upper figures in the 5° squares give the percentage frequency of occasions upon which Fog was logged, the lower figures the total number of observations. Lines are drawn for 0, 5, 10, 20 and 30%. The chart is compiled from observations from British Ships for the period 1855 to 1899.

FEBRUARY

WIND, FOG, MIST AND WEATHER FOR THE REGION OFF THE COAST OF PORTUGAL.



EXPLANATION.

The Wind roses are drawn from Sea observations within the 5° squares.

Arrows fly with the wind, length represents frequency, thickness strength.

Gales. Moderate. Light.
8-12 4-7 1-3

Distance from head of arrow to circle represents 5%,
Scale: 0 10 20%

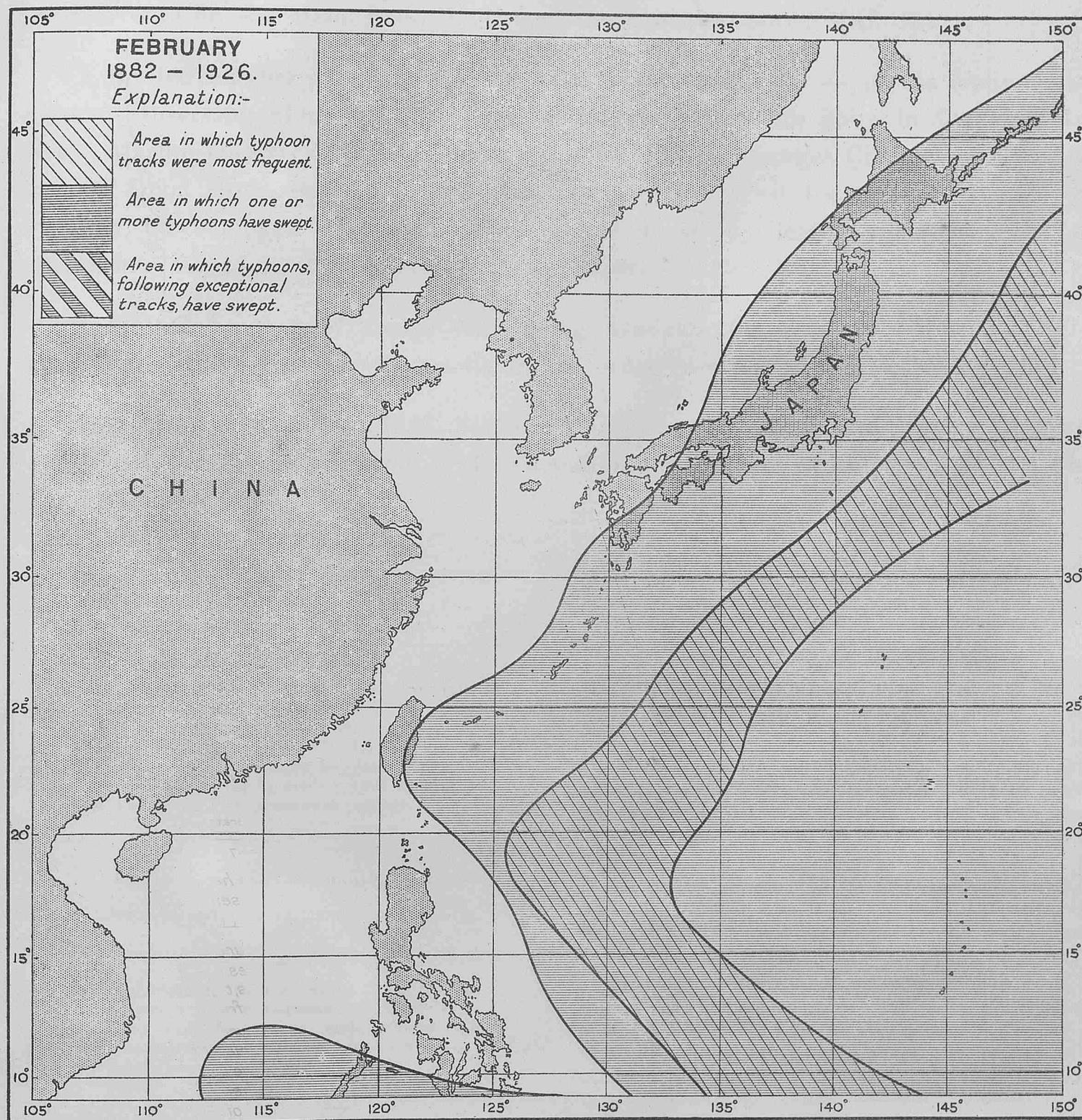
The upper figure in the centre of the rose gives total number of observations, the middle figure the percentage frequency of calms and the lower figure the percentage frequency of variable winds.

The percentage frequency of types of weather are shown in the lower half of each 5° square by the figures beneath each of the letters of the Beaufort weather notation.

For example, in the 5° square Latitude 35° to 40°N. Longitude 5° to 10°W b was logged 24 times in every 100 observations while q was logged 10 times in every 100.

Compiled from observations of British Ships received since the adoption of the Hollerith system of extraction, covering the years 1921-1928.

TYPHOONS IN THE FAR EAST DURING 45 YEARS.



FEBRUARY— Single chart: 23 observations of typhoons.

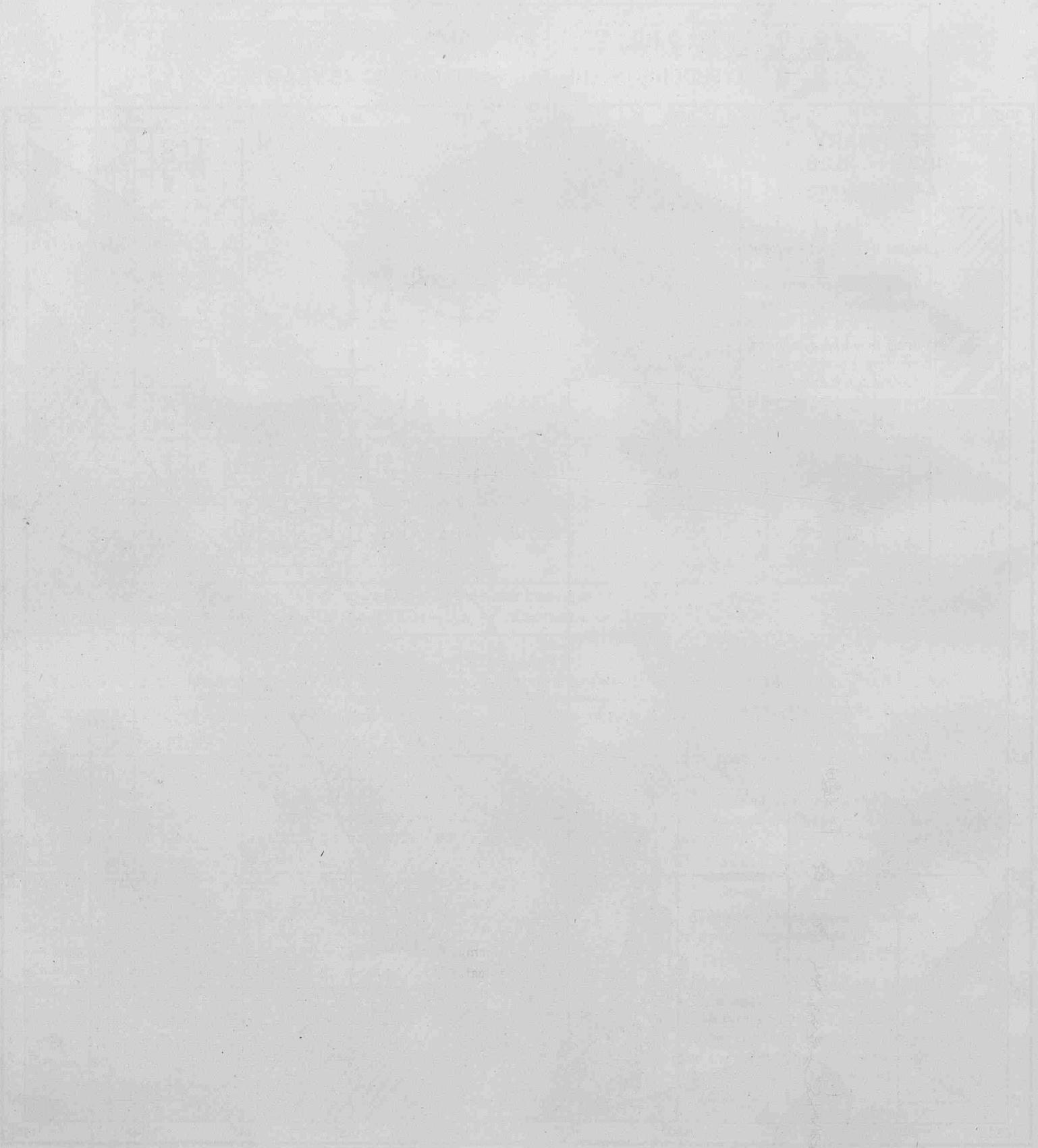
Remarks—The coast of China, with adjacent seas, the Philippines and Kiushiu are free from typhoons, but there are a few instances over the eastern portion of the East China Sea.

Principal Track—between Honshin and the Bonin Islands, but nearer to the latter than in January. Typhoons over this portion of the South China Sea disperse en route.

The winter monsoon continues on the Chinese coast but with decreased strength. Some continental depressions and fog in the Formosa straits and over the south coast of China.

Starting Point—between Guam and Yap.

(From Atlas of the Typhoons of the China Seas, 1882 to 1926, by the Rev. P.E. Gherzi, S.J., Director of Zi-ka-wei Observatory, near Shanghai, China.)



NOTICES.

NEW NORTH ATLANTIC CURRENT ATLAS.

Currents on the Main Trade Routes of the North Atlantic, M.O. 323.

A limited number of copies of this Atlas are available for supply as equipment of Regular Observing Ships. Commanders of Regular Observing Ships in the Fleet List in the Marine Observer using the routes English and St. Georges Channel to Gibraltar, Cape of Good Hope, Brazils, United States of America, West Indies and Panama, who wish to be equipped with this Atlas should make application in writing to the appropriate Agent or Port Meteorological Officer.

A limited number of copies only being available for issue to Observing Ships applications will be dealt with strictly in the order received.

This Atlas is on sale at H.M. Stationery Office, price 6s. 6d., and Marine Observers are invited to call the attention of Commanders and Officers of ships not in the Fleet List to this fact.

POSTAL ARRANGEMENTS.

THE MARINE OBSERVER is published, when circumstances permit, on the first Wednesday of the month previous to that to which the number refers.

If captains of observing ships will forward to the Meteorological Office the particulars required hereunder, endeavour will be made as far as mails permit to post the latest number for use on their homeward passage.

S.S..... Captain.....

Port of Call.....

Date of Homeward Departure.....

Postal Address.....

When this information is not given THE MARINE OBSERVER is addressed to the Commanding Officer, s.s., c/o the owners, and captains are requested to make their own arrangements for forwarding.

DESPATCH OF INFORMATION

REQUIRED IMMEDIATELY FOR THE CONDUCT OF THE WORK AT SEA.

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 Ministry Publication Depot to their Ships abroad.

This matter addressed to the Commanders of Ships contains information which is required for the Conduct of Marine Meteorological Work at Sea and is most effective if received by the Commanders 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 "Selected Ships" which enables them to perform voluntary service by Wireless Communication for the benefit of all shipping.

ICE REPORTS.

Commanders of ships in the Trans-North Atlantic and Southern Ocean Trades are earnestly requested to have the Ice Report Form 912 completed and returned at the end of each passage. A nil return is desired if no ice is seen.

These forms are supplied with THE MARINE OBSERVER each month to regular observing ships in these Trades.

ICE CHART. WESTERN NORTH ATLANTIC.

LETTERS OF TRANSATLANTIC TRACKS INDICATE

- (C) From 1st September to 31st March, inclusive.
- (D) From 15th February to 10th April, inclusive.
- (E) From 1st December to 14th February.

These routes are liable to alteration when, owing to abnormal ice conditions, it is considered advisable by the steamship lines who are parties to the Track agreement.

SYMBOLS USED ON THE CHART

- ▣ Iceberg.
- △ Floeberg.
- ▬ Growler.
- Field Ice, Floe Ice, Pack Ice, Hummocky Ice, Bay Ice.
- Drift Ice, Brash Ice, Sludge Ice, Pancake Ice.
- ⊕ Indicates W/T Ice Warning Station.

PHENOMENAL POSITION OF ICE.

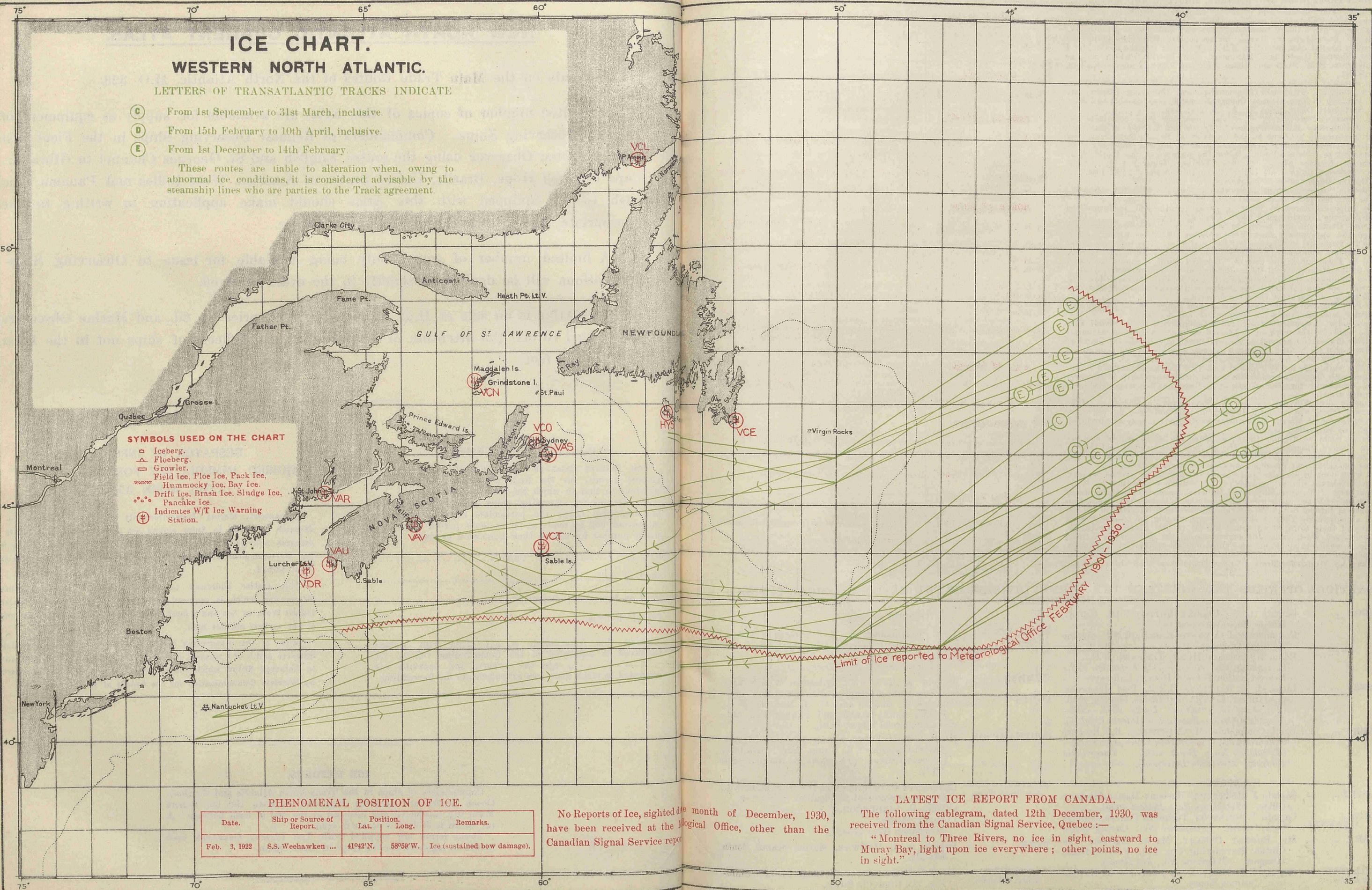
Date.	Ship or Source of Report.	Position.		Remarks.
		Lat.	Long.	
Feb. 3, 1922	S.S. Weehawken ...	41°42' N.	58°59' W.	Ice (sustained bow damage).

No Reports of Ice, sighted during the month of December, 1930, have been received at the Meteorological Office, other than the Canadian Signal Service reports.

LATEST ICE REPORT FROM CANADA.

The following cablegram, dated 12th December, 1930, was received from the Canadian Signal Service, Quebec:—

“Montreal to Three Rivers, no ice in sight, eastward to Murray Bay, light upon ice everywhere; other points, no ice in sight.”



CO-OPERATION OF SHIPOWNERS, MASTERS AND MATES.

Captains and officers who wish to co-operate regularly with the Meteorological Office should apply to the appropriate Port Meteorological Officers or Agents, a list of these gentlemen with addresses is given below. A general description of Marine Meteorological Work, including the particulars desired from intending Marine Observers, is given in Chapter I of THE MARINE OBSERVER'S HANDBOOK, 5TH EDITION, which may be obtained from H.M. Stationery Office direct, or through any booksellers, price 2s. 6d.

The names of vessels regularly observing for the Meteorological Office, London, together with their Commanders and Observing Officers, are given monthly in THE MARINE OBSERVER, which may be obtained from H.M. Stationery Office, price 2s., 2s. 2d. post free.

The Captains and Officers of regular observing ships constitute the Corps of Voluntary Marine Observers. For certain branches of this work tested instruments are lent to the Captains of British ships registered at ports in Great Britain. A certain number of Regular Observing ships are detailed as "Selected Ships" for the purpose of the World Wide Scheme of Routine Ships' Wireless Weather Telegraphy Reporting. These "Selected Ships" are indicated monthly in the "Fleet List" in THE MARINE OBSERVER by a number.

To decode "Selected Ships" reports the pamphlet M.O. 329, price 3d. may be obtained from H.M. Stationery Office.

Only ships registered at Ports in Great Britain will, in future, be included in the Meteorological Office, London, "Fleet List."

Marine Observers are asked to send in their Meteorological Log through the appropriate Port Meteorological Officer or Agent (accompanied by Form 138 in the case of "Selected Ships") at intervals of not more than six months. The Meteorological Record Form 911 (accompanied by Form 138 in the case of "Selected Ships") should be posted direct to the Meteorological Office, London, at the end of each voyage.

When sending in the Meteorological Log or Record, Regular Observing ships will render great assistance if they will notify the Port Meteorological Officer or Agent of their requirements.

The Port Meteorological Officers and Agents inspect official instruments at regular intervals, replacing those which are defective.

Where ships' instruments are found by comparison to be reliable they may be used for the work of "Selected Ships." A reliable mercurial barometer is essential as part of the equipment of a "Selected Ship."

A copy of THE MARINE OBSERVER is sent monthly to the Captain of every observing ship for the information and guidance of the officers doing this work. He is also supplied with THE MARINE OBSERVER'S HANDBOOK and such charts and atlases as are considered necessary as Meteorological equipment for The Work of a Regular Observing ship in a particular trade.

WIRELESS AND WEATHER AN AID TO NAVIGATION, published by H.M. Stationery Office, which affords information and guidance for the practical application of Marine Meteorology to Navigation, may be purchased through any bookseller, price 5s.

Returns made by Regular Observing ships are acknowledged monthly in THE MARINE OBSERVER, and a list of those Commanders and Officers who have performed specially fine work is published yearly in THE MARINE OBSERVER and Excellent Awards are made to them.

The work done by Regular Observing Ships in making written returns, and by "Selected Ships" in broadcasting routine information by W/T, together with "Weather Shipping" Bulletins broadcast from the shore, conforming with the recommendations of the International Convention of Safety of Life at Sea, 1929, provide the necessary information for the use of all shipping. Thus by shipowners encouraging the specialist work in those of their ships whose names appear in THE MARINE OBSERVER, this Voluntary Work under the supervision of the Meteorological Office provides a service to all shipping at minimum cost to the National funds.

Shipowners are asked to facilitate the forwarding of postal matter from the Air Ministry addressed to the Captains of their ships.

DERELICTS AND FLOATING WRECKAGE.

Date.	Position.		Description.
	Latitude.	Longitude.	
NORTH SEA.			
15. 12. 30	53°25'30" N.	4°41' E.	Partly submerged wreckage, dangerous to navigation.
ENGLISH CHANNEL.			
13. 12. 30	50°15' N.	3°12' W.	Apparently derelict barge.
14. 12. 30	50°10' N.	2°16' W.	Dumb steel barge "Byfleet", apparently no-one on board.
14. 12. 30	48°07' N.	5°31' W.	Conical buoy adrift.
20. 12. 30	St. Catherine's Point Lt. Hse. bearing N.16°W.5'.		Drifting buoy marked with black and white vertical stripes.
NORTH ATLANTIC.			
1. 12. 30	42°38' N.	42°07' W.	Large number of heavy baulks of timber, several of which were 50 feet in length.
4. 12. 30	33°02' N.	76°53' W.	Large piece of waterlogged wreckage, 45 ft. by 30 ft. consisting of heavy timbers.
5. 12. 30	26°16' N.	79°52' W.	Launch, marked V. 1990.
7. 12. 30	38°41' N.	74°35' W. (approx.)	Derelict, 80 ft. to 100 ft. long, awash, bottom up.
8. 12. 30	40°19' N.	69°58' W.	Log about 25 ft. long. One end painted red.
9. 12. 30	35°15' N.	75°14' W.	Waterlogged scow, about 20 ft. long.
10. 12. 30	25°30' N.	74°28' W.	Unlighted gas buoy.
23. 12. 30	49°01' N.	7°52' W.	Fairway buoy, covered with marine growth, dangerous to navigation.
26. 12. 30	42°57' N.	9°36' W.	Small black and white checkered buoy with staff about 6 ft. high. Dangerous to navigation.
28. 12. 30	50°56' N.	5°20' W.	Submerged wreckage.
GULF OF MEXICO.			
14. 12. 30	20°00' N.	84°40' W.	Heavy built open native boat, about 40 ft. long, painted black and marked "Galicia".
16. 12. 30	17°45' N.	83°49' W.	Black can buoy with white top.
CARIBBEAN SEA.			
6. 12. 30	12°17' N.	66°59' W.	Large wooden lighter, about 40 ft. long, marked '6' on bow.
6. 12. 30	12°21' N.	65°10' W.	Two heavy wooden lighters marked "Ohio" and "Makonus" respectively.
23. 12. 30	12°39' N.	78°28' W.	Hard object, probably log floating end up.
NORTH PACIFIC.			
3. 12. 30	41°50' N.	124°37' W.	Large piece of wreckage.
3. 12. 30	40°10' N.	173°00' W.	Log 20 ft. long, 2 ft. diameter, covered with marine growth.
5. 12. 30	46°50' N.	124°13' W.	Fishing boat with decks awash.

NAUTICAL OFFICERS AND AGENTS OF THE MARINE DIVISION OF THE METEOROLOGICAL OFFICE, AIR MINISTRY.

LONDON Captain L. A. BROOKE SMITH, R.D., R.N.R.,
Marine Superintendent.
Commander J. HENNESSY, R.D., R.N.R., Senior
Nautical Assistant.
Room 319, Adastral House, Kingsway, W.C.2.
(Telephone No.: Holborn 3434 Extension 421).
Nearest station Temple, District Railway.

THAMES Lieut. C. H. WILLIAMS, R.N.R., Port Meteorological
Officer, Royal Albert Docks, London, E.16.
(Telephone No.: Albert Docks 2659. Tele-
graphic Address: Barometric Aldock, London).

MERSEY Lieut. Commander M. CRESSWELL, R.N.R., Port
Meteorological Officer, Dock Office, Liverpool.
(Telephone No.: Bank 8959. Telegraphic
Address: Meteorite, Liverpool).

Agents.

BELFAST Captain J. MCINTYRE, Harbour Master, Harbour
Office. (Telephone No.: Belfast 4090).

BRISTOL
CHANNEL Captain T. JOHNSTON, Technical College, Cathays
Park, Cardiff. (Telephone No.: Cardiff 6813).

CLYDE Mr. ROBERT CLEARY, Master Mariner, The
Clutha Stevedoring Co., Ltd., Princes Dock,
Glasgow. (Telephone No.: 513 Ibrox).

FREMANTLE ... Captain J. J. AIREY, Deputy Director of Naviga-
tion, Customs House.
W. Australia. (Telephone No.: B 1391).

Agents (contd.).

HONG KONG, Lieut. Commander R. H. CALDWELL, D.S.C.,
China. R.N., Superintendent, Admiralty Chart and
Chronometer Depot, H.M. Dockyard.
(Telephone No.: 108 Dockyard).

HUMBER Captain A. M. BROWN, Ellerman Wilson Line
Office, Hull. (Telephone No.: Central 2180).

FORTH Captains G. BLACK and C. G. BONNER, V.C.,
D.S.C., Leith Salvage and Towage Co., Ltd.,
2, Commercial Street, Leith.

SOUTHAMPTON Mr. R. I. T. MCEWAN, Master Mariner, Gilchrist
Navigation School, 5, Union Bank Chambers,
1, Bernard Street. (Telephone No. Southampton
4277).

SYDNEY, Commander G. D. WILLIAMS, D.S.O., R.D., R.N.R.,
New South Wales. Deputy Director of Navigation.
Captain C. LINDBERGH.
Customs House.
(Telephone No.: B6421).

TYNE Captain J. J. MCEWAN, Marine School, South
Shields.

VANCOUVER, Mr. T. S. H. SHEARMAN, 61, Leigh Spencer Build-
ing, 553, Granville Street.
British Columbia. (Telephone No.: Seymour 3309).

LIST OF VOLUNTARY OBSERVING SHIPS

i

FLEET LIST.

The following is a complete list of ships regularly contributing observations to the Meteorological Office.

The names of the Captains and Officers, as ascertained from logs and records received, are given with the date and description of last log, register or record received up to the time of going to press.

Marine Observers are requested to take this as complete and grateful acknowledgment for the work they have contributed, as it has been found necessary to reduce as far as possible the correspondence of the Marine Superintendent, which was largely composed of letters acknowledging logs and reports, in order that more time may be devoted to obtaining results from the data received.

Only in special cases will individual letters be sent.

Excellent awards will be made at the end of the financial year. The names of Commanders and Officers gaining these awards will be published in a special list in THE MARINE OBSERVER.

Ships not contributing logs or records within a reasonable period will automatically be removed from the list and the free issue of THE MARINE OBSERVER discontinued; it is, therefore, earnestly requested that changes of service, probable periods of lay up or transfer of Commanders may be notified whenever possible.

A waiting list is kept of the names of vessels whose Commanders have offered to regularly co-operate.

The number of voluntary observing ships is limited to a maximum total of 500.

Commanders are requested to point out any errors which may occur in the list.

Explanation of Abbreviations.

Unless otherwise stated, vessels on the following list are s.s.—M.V. indicates Motor Vessel.

M.L. = Equipped with tested Instruments lent by the Meteorological Office for keeping Meteorological Logs.

W.T. = Equipped wholly or partly with tested Instruments lent by the Meteorological Office for reporting in code by W/T in the International Selected Ship system.

No. = No Meteorological Office instrumental equipment on board.

M = Ship's barometer *mercurial*.

A = Ship's barometer *aneroid*.

C.C. = Equipped with tested Instruments lent by the Meteorological Office for making Cross Channel Telegraphic Reports to Weather, London.

To indicate the nature of the wireless apparatus of Selected Ships—

†† preceding ship's name indicates fitted for long range continuous wave transmission and reception.

*† = Short range transmission and long range continuous wave reception.

** = Short range transmission and reception.

The numbers preceding the names of ships are for identification purposes, when observations are re-transmitted in synoptic messages by wireless or cable, and are not intended for use at sea.

Selected Ships.

Those ships in this list which have a number and symbols indicating W/T apparatus before their names are "Selected Ships" invited to make by W/T, reports of observations taken at arranged G.M. Times to "All Ships."

Name of Vessel.	Captain.	Observing Officers.	Meteorological Equipment.	Line.	Last Log, Register, or Record Contributed. Received up to 18.12.30.	Date Received.
233 †† <i>Aba</i> , M.V. ...	Williams, T. E. ...	J. D. Townson, R. Cherry ...	W.T.	Elder Dempster ...	Form 911 6.11.30 to 8.12.30 ...	12.12.30
121 †† <i>Abinsi</i> ...	Sola, P. ...	G. H. Worsley, J. J. Smith. ...	"	"	Forms 911 & 138 31.10.30 to 4.12.30 ...	9.12.30
122 †† <i>Accra</i> ...	Toft, J. T. ...	R. B. Ellis ...	W.T.M.	"	" 8.10.30 to 12.11.30 ...	28.11.30
155 *† <i>Achilles</i> ...	Williams, D. T. ...	C. Broad, R. F. Agar, J. C. Stratford.	M.L.	A. Holt ...	Form 915 1.5.30 to 31.8.30 ...	3.9.30
055 *† <i>Actor</i> ...	Whyte, D. L. ...	"	No. M.	Harrison ...	"	"
123 †† <i>Adda</i> , M.V. ...	Shooter, J. C. ...	J. Boyd, F. C. Langton ...	W.T.M.	Elder Dempster ...	Form 911 & 138 23.10.30 to 24.11.30 ...	28.11.30
050 †† <i>Adriatic</i> ...	Kearney, J., Lt.-Commr., R.N.R.	O. V. Lucas, E. P. Hughes, H. R. Wilkinson.	W.T.	White Star ...	" 23.11.30 to 14.12.30 ...	17.12.30
<i>Aeneas</i> ...	Wallace, W. K. ...	A. McL. Pilcher ...	No. A.	A. Holt ...	Form 911 24.10.30 to 8.11.30 ...	8.12.30
166 *† <i>Agamemnon</i> ...	Beswick, W., D.S.C., Commr., R.N.R.	C. Mackinnon, P. McGilligan.	W.T.	"	Forms 911 & 138 23.10.30 to 10.11.30 ...	2.12.30
<i>Aidan</i> ...	Reynolds, W. H. B. ...	A. A. Gerrard ...	No. A.	Booth ...	Form 911 24.9.30 to 28.11.30 ...	11.12.30
<i>Alaunia</i> ...	Prothero, M. ...	T. O. Ellis ...	" A.	Cunard ...	" 18.11.30 to 6.12.30 ...	8.12.30
<i>Alban</i> ...	Evans, L. ...	J. G. Tippett ...	" A.	Booth ...	" 16.8.30 to 7.10.30 ...	27.10.30
310 †† <i>Alcantara</i> , M.V. ...	Wakeman, E. C. ...	"	W.T.	R.M.S.P. ...	" 25.10.30 to 3.12.30 ...	8.12.30
178 *† <i>Alipore</i> ...	Lyndon, E. P. ...	W. L. Dobbin ...	No. M.	P. & O. ...	" 30.10.30 to 15.11.30 ...	8.12.30
175 †† <i>Almanzora</i> ...	Hannam, F. S. ...	W. D. Lowe ...	W.T.	R.M.S.P. ...	" 14.10.30 to 22.11.30 ...	26.11.30
012 †† <i>Almeda Star</i> ...	Turner Russell, W. ...	E. H. Osgood, H. Metcalf, P. H. Hunt.	No. M.	Blue Star ...	Forms 911 & 138 27.9.30 to 13.11.30 ...	15.11.30
<i>Alonara</i> ...	Scott, L. S. ...	G. Hamilton, A. N. Johnson	" A.	Yeoward ...	Form 911 16.11.30 to 8.12.30 ...	15.12.30
<i>Alynbank</i> ...	Robertson, J. ...	G. E. Beaton ...	" A.	A. Weir & Co. ...	" 30.10.30 to 12.11.30 ...	16.12.30
103 †† <i>Andalucia Star</i> ...	Vernon, R. ...	J. A. Coldwell, T. B. Whetherley, P. Clarke.	" M.	Blue Star ...	Forms 911 & 138 16.8.30 to 1.10.30 ...	6.10.30
<i>Anchises</i> ...	Dunlop, J. K. ...	E. N. Sandon, E. G. Coombe	" A.	A. Holt ...	Form 911 24.2.30 to 5.4.30 ...	10.6.30
<i>Antiochus</i> ...	Dougall, W. T. ...	C. F. Lock ...	" A.	"	" 30.10.30 to 16.11.30 ...	15.12.30
209 †† <i>Aorangi</i> , M.V. ...	Martin W. ...	E. Anderson, J. Watling, R.N. Turner, D.H. Richards, H. Webster.	M.L.	Canadian-Australasian	Form 915 1.5.30 to 15.8.30 ...	11.12.30
120 †† <i>Apapa</i> ...	Hughes, J. ...	J. R. Sergiades, V. Feeney	W.T.M.	Elder Dempster ...	Forms 911 & 138 25.9.30 to 27.10.30 ...	18.11.30
029 †† <i>Appam</i> ...	Beith, A. ...	W. M. M. Hutchings ...	W.T.	Elder Dempster ...	Form 911 1.10.30 to 9.11.30 ...	11.11.30
<i>Araby</i> ...	Lee, J. ...	H. Haigh ...	No. A.	Maclver ...	" 1.9.30 to 20.11.30 ...	26.11.30
115 †† <i>Arandora Star</i> ...	Moulton, E. W. ...	"	" M.	Blue Star ...	"	"
278 *† <i>Architect</i> ...	Mowat, I. ...	A. C. Bannister ...	" M.	Harrison ...	Forms 911 & 138 4.10.30 to 8.12.30 ...	15.12.30
247 *† <i>Argyllshire</i> ...	Page, W. J. ...	D. D. Ingram, D. C. Valt, D. Hayl.	" M.	Federal ...	Form 911 27.5.30 to 1.10.30 ...	10.10.30
293 *† <i>Ariguani</i> ...	Scudamore, J. H. H., D.S.C., R.D., Commr., R.N.R.	G. McKee, W. Ireland, M. H. Thomson.	M.L.	Elders & Fyffes ...	Form 915 1.5.30 to 3.6.30 ...	19.9.30
<i>Ariosto</i> ...	Biggins, R. L. ...	N. F. Hewetson, C. H. Malam	No. A.	Ellerman Wilson ...	Form 911 10.5.30 to 7.8.30 ...	15.8.30
144 †† <i>Arlanza</i> ...	Clarke, E., R.D., Commr., R.N.R.	"	W.T.	R.M.S.P. ...	"	"
091 †† <i>Armada Castle</i> ...	Whitfield, G. J. ...	W. Pace, C. Lloyd, A. H. Parry, E. T. Day.	M.L.	Union Castle ...	Form 915 1.8.30 to 23.11.30 ...	26.11.30
296 *† <i>Arracan</i> ...	Thomson, S. ...	K. Currie, B. Bain, T. B. Wilkins.	"	P. Henderson ...	" 26.3.30 to 5.11.30 ...	11.11.30
<i>Arundel</i> ...	Shaw, B. ...	M. Mahoney ...	C.C.	Southern Rly. ...	Telegraphic Report 18.12.30 ...	18.12.30

Name of Vessel.	Captain.	Observing Officers.	Meteoro-logical Equipment.	Line.	Last Log, Register, or Record Contributed. Received up to 18.12.30.	Date Received.
095 †† <i>Arundel Castle</i> ...	Morton Betts, W. ...	... ..	M.L.	Union Castle ...	Form 911 30.5.30 to 15.6.30 ...	18.6.30
280 †† <i>Astronomer</i> ...	Richards, J. ...	T. R. Hill ...	No. M.	Harrison ...	Forms 911 & 138 4.11.30 to 30.11.30 ...	4.12.30
065 †† <i>Asturias M.V.</i> ...	LeBrecht, H. A. ...	... ..	W.T.	R.M.S.P. Co. ...	... ..	... ..
156 †† <i>Ascanius</i> ...	Wilson, C. A. ...	J. T. Collin, W. J. E. Wright, C. B. Reeder.	M.L.	A. Holt ...	Form 915 1.5.30 to 9.8.30 ...	13.8.30
<i>Atlantian</i> ...	Masters, W. ...	... ..	No. A.	Leyland ...	Form 911 6.10.30 to 12.11.30 ...	25.11.30
<i>Atreus</i> ...	Wilcox, J. H. ...	E. A. H. Gepp ...	" A.	A. Holt ...	... 4.3.30 to 28.6.30 ...	2.8.30
281 †† <i>Auditor</i> ...	Owen, W. T. ...	L. Richardson ...	" M.	Harrison ...	Forms 911 & 138 31.8.30 to 15.11.30 ...	25.11.30
<i>Ausonia</i> ...	Murchie, P.A., R.D., Capt. R.N.R.	E. R. Taylor ...	" A.	Cunard ...	Form 911 15.11.30 to 7.12.30 ...	15.12.30
212 †† <i>Australia</i> ...	Scutt, W. ...	P. McDougal, E. H. Lidstone, A. G. Brooks.	M.L.	British India ...	Form 915 25.7.30 to 1.8.30 ...	16.8.30
010 †† <i>Avelona Star</i> ...	Thomas, R. J. ...	F. N. Johnson ...	No. M.	Blue Star ...	... ..	... ..
124 †† <i>Avila Star</i> ...	Hopper, G.E. ...	A. T. Rouse, W. J. Stratta, C. Barrett, A. Freaque.	" M.	" ...	Forms 911 & 138 25.9.30 to 31.10.30 ...	15.11.30
<i>Balmoral Castle</i> ...	Gilbert, E. F. ...	H. Baty ...	" A.	Union Castle ...	... 21.3.30 to 7.5.30 ...	14.5.30
179 †† <i>Balvanald</i> ...	Short, C. E. ...	H. P. Mallet, G. E. Owen, E. R. Physick.	" M.	P. & O. Branch ...	Forms 911 & 138 12.10.30 to 4.11.30 ...	8.12.30
051 †† <i>Baltic</i> ...	Davies, E. ...	J. H. Walker, J. Law, D. W. Chamberlain.	W.T.	White Star ...	... 10.11.30 to 30.11.30 ...	3.12.30
<i>Bampton Castle</i> ...	James, J. S., D.S.C.	H. R. Graham ...	No. A.	Union Castle ...	Form 911 31.8.30 to 27.9.30 ...	4.11.30
<i>Banbury Castle</i> ...	Aylen, C. E. H. ...	E. Hamlyn, R. C. J. Watt, C. J. B. Thompson.	" A.	" ...	... 13.8.30 to 6.9.30 ...	7.10.30
248 †† <i>Banffshire</i> ...	Westropp, T. G. ...	A. Banks, N. Stewart ...	" M.	Turnbull Martin ...	Forms 911 & 138 28.3.30 to 19.9.30 ...	25.9.30
180 †† <i>Baradine</i> ...	Elliot Smith, H. ...	C. B. Roche, A. G. Jenkins, L. A. Hill, C. F. Halliday, G. L. Farnfield.	M.L.	P. & O. Branch ...	Form 915 1.8.30 to 6.11.30 ...	11.11.30
037 †† <i>Baronessa</i> ...	Compton, R. W. ...	... ..	No. M.	Houlder ...	... ..	... ..
<i>Baron Forbes</i> ...	Cairns, W. ...	L. Maclean, G. J. C. Law ...	" A.	H. Hogarth & Sons ...	Form 911 23.10.30 to 15.11.30 ...	20.11.30
213 †† <i>Barpeta</i> ...	Partridge, H. ...	C. S. Galloway, J. H. Kerr, D. S. Bardsley.	" M.	British India ...	Forms 911 & 138 24.9.30 to 22.10.30 ...	22.11.30
181 †† <i>Barrabool</i> ...	Jack, H. M. ...	J. Paice ...	" M.	P. & O. Branch ...	... 17.6.30 to 14.8.30 ...	19.8.30
070 †† <i>Bajano</i> ...	Swain, F. H. ...	G. M. Binks ...	W.T.	Elders & Fyffes ...	... 31.10.30 to 3.12.30 ...	8.12.30
<i>Baychimo</i> ...	Cornwell, S. A. ...	... ..	No. A.	Hudson Bay Co ...	Form 911 8.7.30 to 29.9.30 ...	6.11.30
059 †† <i>Belgenland</i> ...	Morehouse, W. A. ...	J. R. Loe ...	W.T.	Red Star ...	Forms 911 & 138 6.10.30 to 25.10.30 ...	30.10.30
<i>Benalder</i> ...	Fairweather, J. J. ...	E. D. Copeman ...	No. A.	Ben Line ...	Form 911 10.3.30 to 18.4.30 ...	24.4.30
133 †† <i>Bendigo</i> ...	Wyatt, F. N. ...	J. G. Davies, J. K. Krone, F. Jones.	" M.	P. & O. Branch ...	Forms 911 & 138 12.7.30 to 10.10.30 ...	22.10.30
<i>Bengore Head</i> ...	Milligan, J. ...	C. J. Rea ...	" A.	Ulster S.S. Co. ...	Form 911 12.11.30 to 14.12.30 ...	18.12.30
233 †† <i>Berwickshire</i> ...	Evens, E. H. ...	J. O. Woodall, R. Frankish, C. Allister.	W.T.	Turnbull Martin ...	Forms 911 & 138 31.8.30 to 23.10.30 ...	8.12.30
<i>Brenda</i> ...	Lamont, A. ...	N. Ross ...	No. A.	Scottish Fishery Bnd. ...	Form 911 4.11.30 to 24.11.30 ...	2.12.30
<i>Brighton</i> ...	Munton, G. ...	H. L. Smith ...	C.C.	Southern Railway ...	Telegraphic Report 4.10.30 ...	4.10.30
057 †† <i>Britannic</i> ...	Summers, F. F., R.D., Commr. R.N.R.	J. W. Peters, F. Patchett, A. Thompson.	W.T.	White Star ...	Forms 911 & 138 27.10.30 to 16.11.30 ...	18.11.30
269 †† <i>British Consul</i> ...	Putt, R. O. ...	C. Galley ...	No. M.	British Tankers ...	... 1.11.30 to 28.11.30 ...	11.12.30
311 †† <i>British Dominion</i> ...	Taylor, R. J. ...	J. E. Jones ...	" M.	" ...	... 13.8.20 to 4.10.30 ...	8.10.30
067 †† <i>British Empress</i> ...	Penton, P. M. ...	T. Snowling, J. Dryden, D. Malcolm.	" M.	" ...	... 15.11.30 to 26.11.30 ...	3.12.30
308 †† <i>Bulysses M.V.</i> ...	Head, B. P. ...	G. P. Hansard ...	" M.	Anglo-Saxon Petroleum Co. ...	Forms 911 & 138 2.7.30 to 10.9.30 ...	22.9.30
249 †† <i>Buteshire</i> ...	Gibb, A. W. P. ...	P. McMillan, S. W. Brown, F. C. Doyle.	M.L.	Turnbull Martin ...	Form 915 20.4.30 to 24.8.30 ...	12.9.30
031 †† <i>Caledonia</i> ...	Collie, A. ...	M. J. Harvey, R. Leiper, J. McMillan.	W.T.	Anchor ...	Forms 911 & 138 9.11.30 to 14.12.30 ...	16.12.30
<i>Cambria</i> ...	Copland, C. P. ...	O. W. Ll. Jones ...	C.C.	L.M. & S. Rly ...	Telegraphic Report 22.11.30 ...	22.11.30
250 †† <i>Cambridge</i> ...	Williams, R. ...	H. C. Fryer, F. Pover, D. H. Chadwick, H. Mackillican.	M.L.	Federal ...	Form 915 1.5.30 to 9.8.30 ...	12.8.30
026 †† <i>Cameronia</i> ...	Gemmell, W. ...	D. C. Shedden ...	W.T.	Anchor ...	Forms 911 & 138 16.11.30 to 7.12.30 ...	11.12.30
295 †† <i>Camito</i> ...	Forrester, W. T. O.B.E.	H. H. Dunning, G. M. Roberts, C. E. Stocker, E. P. Witchell, A. H. Peacock, R. R. Taylor.	M.L.	Elders & Fyffes ...	... 30.5.30 to 24.9.30 ...	30.9.30
101 †† <i>Canonesa</i> ...	Brodie, W. H. ...	F. E. Flint ...	No. M.	Furness Houlder ...	Form 911 12.10.30 to 28.10.30 ...	17.11.30
<i>Cape of Good Hope</i> ...	Jacobson, T. A. ...	W. R. G. Carling ...	" A.	Lyle S.S. Co. ...	Form 911 17.9.30 to 7.11.30 ...	13.12.30
282 †† <i>Carinthia</i> ...	Hawkes, W. A., R.D., Commr. R.N.R.	... ..	W.T.	Cunard ...	... ..	... ..
035 †† <i>Carmania</i> ...	Townley, J. C. ...	P. O. Davis, E. R. B. Freeman, J. D. Archer.	"	" ...	Forms 911 & 138 27.10.30 to 14.11.30 ...	18.11.30
092 †† <i>Carnarvon Castle M.V.</i> ...	Owens, G. ...	M. S. Hodgson ...	"	Union Castle ...	Form 915 11.10.29 to 30.11.30 ...	10.12.30
034 †† <i>Caronia</i> ...	Brown, F. G., R.D., Capt. R.N.R.	W. B. Tanner, C. B. Osborne, R. D. McCallum.	"	Cunard ...	Forms 911 & 138 13.10.30 to 1.11.30 ...	4.11.30
<i>Casanare</i> ...	Browne, S. ...	H. Holmes ...	No. A.	Elders & Fyffes ...	Form 911 9.10.30 to 7.11.30 ...	10.11.30
184 †† <i>Cathay</i> ...	Niven, J. D. ...	W. Fitzroy ...	" M.	P. & O. ...	Forms 911 & 138 15.6.30 to 10.9.30 ...	15.9.30
<i>Cavina</i> ...	Riseley, A. D. ...	B. R. Coe ...	" A.	Elders & Fyffes ...	Form 911 19.10.30 to 22.11.30 ...	5.12.30
052 †† <i>Cedric</i> ...	Smith, R. G. ...	H. Denison, G. T. Kavanagh, J. Farrell.	W.T.	White Star ...	Forms 911 & 138 13.10.30 to 2.11.30 ...	4.11.30
157 †† <i>Centaur M.V.</i> ...	Ward Hughes, J. ...	J. Cockburn, B. L. Brind, D. M. McAdam.	M.L.	A. Holt & Co. ...	Met. Log. 19.2.30 to 21.7.30 ...	7.10.30
056 †† <i>Ceramic</i> ...	Lloyd, W. ...	J. A. Webbe ...	W.T.	White Star ...	Form 911 26.8.30 to 9.12.30 ...	10.12.30
<i>Changuinola</i> ...	Thorburn, R. A., R.D., Commr. R.N.R.	H. K. Houghton ...	No. A.	Elders & Fyffes ...	... 20.10.30 to 22.11.30 ...	28.11.30
<i>Chindwin</i> ...	Paterson, G. ...	W. S. Keith ...	" A.	Henderson ...	... 17.2.30 to 24.4.30 ...	19.5.30
<i>Chirripo</i> ...	Sapsworth, S. A. ...	S. Waddington ...	" A.	Elders & Fyffes ...	... 25.7.30 to 10.10.30 ...	16.10.30
192 †† <i>Chitral</i> ...	Siggers, O. ...	T. D. Forbes ...	" M.	P. & O. ...	... ..	... ..
265 †† <i>City of Baroda</i> ...	McMillan, J. ...	H. G. Williams, J. E. Jenkins, R. W. Leese, A. G. Daniells.	M.L.	Ellerman ...	Form 915 13.5.30 to 19.10.30 ...	31.10.30
<i>City of Benares</i> ...	Wyper, J. ...	R. W. Kellie ...	No. A.	" ...	Form 911 5.8.30 to 15.8.30 ...	1.9.30
<i>City of Cambridge</i> ...	Wilson, E. G. ...	H. H. Asher ...	" A.	" ...	... 2.10.30 to 16.11.30 ...	8.12.30
<i>City of Carlisle</i> ...	Mordue, J. A. ...	... ..	" A.	" ...	... 18.10.30 to 1.11.30 ...	24.11.30
268 †† <i>City of Chester</i> ...	Letton, F. W. ...	P. R. Winship, C. W. Nelson, W. V. Highton.	M.L.	" ...	Form 915 5.5.30 to 19.9.30 ...	11.12.30
266 †† <i>City of Exeter</i> ...	Nicholl, L. ...	H. Burns ...	W.T.	" ...	Form 911 & 138 20.10.30 to 29.10.30 ...	15.12.30
<i>City of Hong Kong</i> ...	Walton, H. L., O.B.E., R.D., Commr. R.N.R.	H. Saunders ...	No. A.	" ...	... 27.11.30 to 9.12.30 ...	15.12.30
286 †† <i>City of London</i> ...	Brown, J. G. ...	W. H. Matthews, A. J. Barrett, E. Gillies.	W.T.	" ...	Forms 911 & 138 17.9.30 to 8.10.30 ...	3.11.30
274 †† <i>City of Nagpur</i> ...	Martin, D. ...	J. Campbell, J. W. Wother- spoon, W. Kerr.	"	" ...	... 29.9.30 to 19.10.30 ...	27.11.30
275 †† <i>City of Palermo</i> ...	Pattison, J. B. ...	T. W. Walford ...	No. M.	" ...	Form 911 6.1.30 to 21.3.30 ...	24.3.30
267 †† <i>City of Paris</i> ...	Miller, R. S. ...	E. A. Davidson ...	W.T.	" ...	... 26.2.30 to 8.5.30 ...	12.5.30
270 †† <i>City of Rangoon</i> ...	Jones, P. ...	B. H. Constable, S. A. Martyn, B. McLennan.	M.L.	" ...	Form 915 14.6.30 to 6.9.30 ...	20.9.30

LIST OF VOLUNTARY OBSERVING SHIPS

Name of Vessel.	Captain.	Observing Officers.	Meteoro-logical Equipment.	Line.	Last Log, Register, or Record Contributed. Received up to 18.12.30.	Date Received.
271 *† City of Roubaix ...	Radcliffe, A. V., R.D., Lt.-Com., R.N.R.	J. A. Williams, J. L. Robertson, A. N. G. Jones.	No. M.	Ellerman ...	Forms 911 & 138 14.10.30 to 3.11.30	15.12.30
272 *† City of Singapore ...	Kendall, J. W.	F. Wrigley ...	" M.	" ...	Form 911 18.9.30 to 17.10.30	13.11.30
273 *† City of Valencia ...	Ewing, W.	A. Travis, C. C. Duncan, C. B. P. Bradbury.	" M.	" ...	Forms 911 & 138 6.9.30 to 17.11.30	19.11.30
City of Yokohama ...	Singleton, J. G.	J. Kinley, N. Dawson, H. Nish.	" A.	" ...	Form 911 29.10.30 to 20.11.30	25.11.30
Clan Alpine ...	Waterhouse, J.	S. S. Stammwitz ...	" A.	Clan ...	" 17.11.30 to 5.12.30	17.12.30
Clan Kenneth ...	Young, A. H., R.D., Commr., R.N.R.	T. A. Pearson ...	No. A.	" ...	" 8.11.30 to 19.11.30	27.11.30
Clan Lindsay ...	Malpas, J. H.	T. P. Milne ...	" A.	" ...	" 24.7.30 to 27.8.30	1.9.30
Clan Macalister ...	Stenson, F. J., A.D.C., R.D., Capt., R.N.R.	T. M. Rees Davis ...	" A.	" ...	" 1.11.30 to 22.11.30	16.12.30
Clan MacBean ...	Boag, J.	G. W. Spiller ...	" A.	" ...	" 17.11.30 to 4.12.30	18.12.30
Clan Macbeth ...	Worthington, C. D.	W.R. Woodrifle, A.G. Beynon, H. J. M. Watkins.	" A.	" ...	" 15.10.30 to 7.11.30	11.11.30
Clan Macfadayen ...	Laird, C.	W. C. Dazell ...	" A.	" ...	" 21.9.30 to 22.10.30	4.11.30
Clan Macfarlane ...	Redford, L. F.	W. H. Simpson, H. F. Town	" A.	" ...	" 22.9.30 to 12.10.30	17.10.30
Clan Macgillivray ...	Mackinlay, A.	S. R. J. Woods ...	" A.	" ...	" 12.10.30 to 23.10.30	24.11.30
Clan Macindoe ...	Scott-Smith, H. E. G.	J. W. Thompson, J. West ...	" A.	" ...	" 8.10.30 to 18.10.30	17.11.30
Clan Mackellar ...	Lyall, A. B.	A. V. Howard ...	" A.	" ...	" 6.10.30 to 14.10.30	20.10.30
001 *† Clan Macphee ...	Gourlay, J. B.	E. H. Stone, T. Cornelius, A. Pollock.	M.L.	" ...	Form 915 6.7.30 to 3.10.30	8.11.30
004 *† Clan MacNair ...	Holman, W. G.	" ...	W.T.	" ...	" ...	" ...
Clan Maenoughton ...	Clark, J.	R. C. Steel ...	No. A.	" ...	Form 911 18.5.30 to 19.6.30	28.6.30
Clan Macquarrie ...	West, W. F.	J. H. Thorpe ...	" A.	" ...	" 13.10.30 to 22.11.30	1.12.30
002 *† Clan Macwhirter ...	Low, A.	T. G. Mitchell, M. J. Lewis, L. Grant.	M.L.	" ...	Form 915 10.6.30 to 2.9.30	11.12.30
003 *† Clan Malcolm ...	George, L. S.	A. Lynch, J. W. Jones, H. Hind, W. E. Baker	"	" ...	Forms 911 & 138 12.3.30 to 24.6.30	12.7.30
Clan Morrison ...	Porterfield, W. M. Lt.-Commr., R.N.R.	R. J. Brittain ...	No. A.	" ...	Form 911 7.11.30 to 1.12.30	4.12.30
Clan Murdoch ...	Wynne, R. H.	P. S. Evans ...	" A.	" ...	" 8.11.30 to 18.11.30	26.11.30
Clan Ranald ...	Douglas, R.	J. W. Rennie ...	" A.	" ...	" 7.8.30 to 30.8.30	13.10.30
Clan Ross ...	Neill, G. A.	H. J. Makepeace ...	" A.	" ...	" 6.7.30 to 8.9.30	23.9.30
Clan Sinclair ...	Cater, H.	L. Thomson ...	" A.	" ...	" 4.9.30 to 10.12.30	17.12.30
312 †† Clydefield ...	Love, J. S.	W. J. Brooks, E. Holmes ...	W.T.	Hunting & Son, Ltd.	Forms 911 & 138 28.9.30 to 4.11.30	6.11.30
185 †† Comorin ...	Cartright, C. W. D.S.C.	E. J. R. Worth, H. van Milligen, H. E. James.	No. M.	P. & O. ...	" 21.8.30 to 30.10.30	3.11.30
049 ** Coptic, M.V.	Williams, G.	R. E. Nicholson, T. Davies, T. Burt	W.T.	Shaw, Savill & Albion	" 8.11.30 to 9.12.30	16.12.30
040 †† Corinthic ...	Bowan, H.	R. Orangle, A. Mackie, E. Burt	"	White Star ...	" 21.6.30 to 5.10.30	10.10.30
Cornwall ...	Mac Rae, A. B.	" ...	No. A.	Federal ...	Form 911 12.11.29 to 1.12.29	20.1.30
006 †† Coronado ...	Martin, G. E.	W. J. Dodd, B. E. Druce, F. Heald.	W.T.	Elders & Fyffes	Forms 911 & 138 17.10.30 to 19.11.30	21.11.30
301 *† Culebra ...	Cooke, F.	B. A. Gammon, H. E. Sang, R. J. Finch.	M.L.	R.M.S.P. Co. ...	Form 915 31.8.30 to 7.11.30	15.11.30
251 *† Cumberland ...	Macmillan, D.	A. Taylor, J. Pring, J. K. Macdonald, F. R. J. Wilson.	"	Federal ...	" 1.6.30 to 18.10.30	24.10.30
285 *† Custodian ...	O'Connor, T.	J. Johnson ...	No. M.	Harrison ...	Forms 911 & 138 10.3.30 to 13.6.30	16.7.30
Cyclops ...	Cosker, W.	R. A. Hanney ...	" A.	A. Holt ...	Form 911 17.5.30 to 14.7.30	5.8.30
Dakotian ...	Atkinson, W. H.	R. J. S. Pope ...	" A.	Leyland ...	" 29.8.30 to 24.10.30	28.10.30
Dardanus ...	Christie, W.	J. S. Ogilvie ...	" A.	A. Holt ...	" 23.8.30 to 2.10.30	20.10.30
Darian ...	Hannafor, W.	A. S. Holland ...	" A.	Leyland ...	" 27.9.30 to 8.10.30	14.10.30
302 †† Darro ...	Green, J.	F. J. Swallow, G. B. Medleycott, A. W. Finny.	W.T.M.	R.M.S.P. Co. ...	Forms 911 & 138 15.9.30 to 5.11.30	11.11.30
Davisan ...	Trickey, J.	P. M. Ralston ...	No. A.	Leyland ...	Form 911 29.8.30 to 22.10.30	28.10.30
053 *† Delphic ...	Hodgson, W. S.	J. V. Jones ...	" M.	White Star ...	" 23.2.30 to 31.3.30	11.4.30
303 †† Demerara ...	Mathews, G. P.	T. Deveson, E. N. Gillet, F. Crankshaw.	W.T.M.	R.M.S.P. Co. ...	Forms 911 & 138 17.8.30 to 9.10.30	13.10.30
073 †† Demosthenes ...	Ogilvy, A.	S. A. Fergusson ...	No. M.	Aberdeen Common-wealth.	" 29.3.30 to 12.5.30	15.5.30
003 *† Denis ...	Harris, F. C. P.	A. W. Hanchett ...	W.T.	Booth ...	Form 911 7.10.30 to 15.12.30	16.12.30
304 †† Desado ...	Purvis, A.	H. Fraser ...	W.T.M.	R.M.S.P. Co. ...	" 11.10.30 to 19.11.30	4.12.30
117 †† Desna ...	Huff, G.	G. L. Elliott ...	W.T.M.	" ...	Forms 911 & 138 13.10.30 to 3.11.30	12.12.30
252 *† Devon ...	Kinnell, G.	G. Chaplin ...	No. M.	Federal ...	" 5.10.30 to 10.11.30	15.12.30
Dieppe ...	Lidbetter, W.	E. A. Biles ...	C.C.	Southern Railway ...	Telegraphic Report 18.12.30	18.12.30
284 *† Director ...	Worthington, B.	R. W. Baldwin ...	No. M.	Harrison ...	Forms 911 & 138 29.5.30 to 29.8.30	9.9.30
080 *† Discovery, Auxy. Barque.	King Davis, J.	W. R. Colbeck ...	M.L.	Douglas Mawson Expedition.	" ...	" ...
981 †† Discovery II, R.R.S.	Carey, W. M. Commr. R. N.	J. Irving, A. N. Nelson, R. A. B. Ardley.	"	Falkland Islands Government.	Met. Log. 15.12.29 to 8.5.30	11.9.30
214 *† Domala, M.V.	Kitson, A. G.	E. Powell, A. G. East, J. H. Pratt.	No. M.	British India ...	Form 911 9.3.30 to 15.5.30	21.5.30
Dominta, C.S.	Campos, V., O.B.E., Lt.-Commr., R.N.R.	W. E. Allen, A. S. Muir, W. F. Anderson.	M.L.	Telegraph Construction & Maintenance.	Form 915 5.9.30 to 24.11.30	6.12.30
Dominic ...	Griffith, W.	F. W. Boden ...	No. A.	Booth ...	Form 911 2.4.30 to 19.4.30	26.5.30
Dorelian ...	Hugan, C.	V. W. Bird ...	" A.	Leyland ...	" 10.10.30 to 8.12.30	11.12.30
061 †† Doric ...	Jackson, W. W. P.	R. Hawkins ...	W.T.	White Star ...	Forms 911 & 138 16.11.30 to 5.12.30	8.12.30
Dorington Court ...	Adamson, B.	G. E. C. Garrick ...	No. A.	Haldin & Co. ...	Form 911 31.7.29 to 17.2.30	27.3.30
Dromore Castle ...	Heanly, T. W.	E. Swan ...	" A.	Union Castle ...	" 18.1.30 to 3.7.30	9.9.30
142 †† Duchess of Atholl ...	McQueen, D. S.	G. H. D. Williams ...	W.T. M.	Canadian Pacific ...	Forms 911 & 138 23.11.30 to 27.11.30	2.12.30
152 †† Duchess of Bedford ...	Gibbons, H.	A. Mawsey ...	"	" ...	Form 911 15.11.30 to 2.12.30	5.12.30
151 †† Duchess of Richmond.	Luttes, R. G.	F. H. Steil ...	"	" ...	Forms 911 & 138 2.11.30 to 21.11.30	24.11.30
143 †† Duchess of York ...	Stuart, R. N., V.C., D.S.O., Commr., R.N.R.	N. Scallan ...	"	" ...	" 26.10.30 to 13.11.30	17.11.30
098 †† Dunbar Castle, M.V.	Vincent, E. S., R.D., Commr., R.N.R.	J. Daziel ...	W.T.	Union Castle ...	Forms 911 & 138 2.10.30 to 7.12.30	18.12.30
Dunluce Castle ...	Hutchings, A. H.	A. C. M. Black ...	No. A.	" ...	Form 911 5.9.30 to 13.11.30	19.11.30
Dunrobin ...	Ramsay, J. D.	W. R. Holt, J. J. Butt ...	" A.	Glen & Co. ...	" 6.11.30 to 13.11.30	5.12.30
102 *† Duguesa ...	Williams, W. E.	F. D. Jones ...	" M.	Furness Withy ...	Forms 911 & 138 7.7.30 to 12.9.30	16.9.30
215 *† Durenda, M.V.	Parke, C. E.	J. E. Miles ...	" M.	British India ...	Form 911 2.2.30 to 10.3.30	28.4.30
Edinburgh Castle ...	Kerby, J. H.	F. A. G. Hunter ...	" A.	Union Castle ...	" 18.10.30 to 7.12.30	9.12.30
Egort ...	Nelson, J. A.	J. T. Townson, R. A. Cherry	" A.	Elder Dempster ...	" 16.9.30 to 3.10.30	6.10.30
107 *† El Argentino, M.V.	Ellis, F., D.S.C.	W. Findlay, J. Burch, C. G. Adlard.	" M.	Houlder ...	Forms 911 & 138 2.9.30 to 5.11.30	17.11.30
090 *† Eldon Park ...	Burns, R.	J. Macrae ...	" M.	Denholme S.S. Co. ...	Form 911 23.5.30 to 11.9.30	2.10.30
009 *† Elmworth, M.V.	Wilson, T. P.	J. Whyte ...	" M.	R. S. Dalgleish ...	" 18.6.30 to 9.11.30	4.12.30
158 *† Elpenor ...	Wilson, R. J.	E. Roberts, H. Skinns, A. Pope.	M.L.	A. Holt ...	Met. Log. 27.10.29 to 3.3.30	11.3.30

Name of Vessel.	Captain.	Observing Officers.	Meteoro-logical Equipment.	Line.	Last Log, Register, or Record Contributed. Received up to 18.12.30.	Date Received.
108 *† <i>Elstree Grange</i> ...	Owen, R. ...	P. A. Hawkesworth ...	No. M.	Houlder ...	Forms 911 & 138 9.9.30 to 24.11.30	13.12.30
109 *† <i>El Paraguayo</i> ...	Frost, C. R. ...	W. Palmer ...	" M.	" ...	" " 23.8.30 to 17.10.30	21.10.30
110 *† <i>El Uruguayo</i> ...	McNamara, T. ...	F. E. Hailstone ...	" M.	" ...	" " 29.6.30 to 18.8.30	21.8.30
027 *† <i>Elysia</i> ...	Henderson, F. M. ...	C. Mitchell, J. Herbert, W. Beveridge.	M.L.	Anchor ...	Form 915 17.5.30 to 24.7.30	12.8.30
066 †† <i>Empress of Australia</i> ...	Griffiths, E. ...	... ..	W.T.	Canadian Pacific ...	... ..	... ..
154 †† <i>Empress of Canada</i> ...	Hailey, A. J., Lieut-Com m r., R.N.R.	C. W. G. Patterson, G. M. Fawcett, A. M. Barff.	M.L.	" " ...	Form 915 1.5.30 to 25.7.30	26.8.30
153 †† <i>Empress of Japan</i> ...	Latta, R. G. ...	... ..	... ..	... ..	... ..	... ..
308 *† <i>Essequibo</i> ...	Morgan, D. R. ...	L. Marsland ...	No. M.	R.M.S.P. Co. ...	Forms 911 & 138 20.8.30 to 29.8.30	9.9.30
<i>Eumaeus</i> ...	Hodgson, R. N. ...	R. T. Dryden ...	" A.	A. Holt ...	Form 911 4.11.30 to 1.12.30	5.12.30
078 †† <i>Euripides</i> ...	Cole, N. ...	C. C. Beal, J. Colling, A. Sheridan, R. Morrison, J. Smallwood.	W.T.M.	Aberdeen-Commonwealth	Forms 911 & 138 23.5.30 to 24.9.30	7.10.30
<i>Euryades</i> ...	Ewan, W. B. ...	D. S. Bruce ...	No. A.	A. Holt ...	Form 911 13.10.30 to 27.10.30	28.11.30
<i>Explorer</i> ...	Allan, J. ...	A. Stout ...	" A.	Scottish Fishery Board.	" 1.11.30 to 23.11.30	2.12.30
074 *† <i>Fordsdale</i> ...	Thompson, W. J. ...	F. Vaughan, M. Harris, M. Newton.	" M.	Aberdeen Common-wealth.	Forms 911 & 138 12.10.30 to 7.11.30	17.11.30
<i>Francisco</i> ...	Scales, H. ...	B. Scholefield ...	" A.	Ellerman Wilson ...	Form 911 27.4.30 to 3.6.30	11.6.30
030 †† <i>Franconia</i> ...	Britten, E. T., R.D., Commr, R.N.R.	W. M. Stewart, J. H. Kenworthy.	W.T.	Cunard ...	Forms 911 & 138 15.9.30 to 4.10.30	20.10.30
<i>Freya</i> ...	Angus, W. ...	J. M. Murray ...	No. A.	Scottish Fishery Board.	Form 911 22.9.30 to 3.10.30	7.10.30
159 ** <i>Gascoyne</i> ...	Johnson, L. ...	J. S. Macbryde, C. O. Melson, J. Perry.	M.L.	A. Holt & Co... ..	Met. Log. 22.12.29 to 12.4.30	7.10.30
307 *† <i>Glamorganshire</i> ...	Cornick, A. E. ...	E. Sandys ...	No. M.	R.M.S.P. Co. ...	Form 911 19.3.30 to 9.4.30	12.4.30
125 *† <i>Glenamoy, M.V.</i> ...	Homan, C. E... ..	F. Laycock, G. Morgan, N. B. Jones.	M.L.	Glen Line ...	Form 915 5.5.30 to 5.11.30	18.11.30
<i>Glenbeg, M.V.</i> ...	Newing, L. ...	G. A. C. Barnard ...	No. A.	" ...	Form 911 2.9.30 to 6.12.30	10.12.30
126 *† <i>Glenarry, M.V.</i> ...	Angier, J. ...	J. Tyler ...	" M.	" ...	Forms 911 & 138 26.11.30 to 5.12.30	15.12.30
<i>Gleniffer</i> ...	Baker, W. H. ...	A. H. D. Shaw ...	" A.	" ...	Form 911 11.10.30 to 7.11.30	4.12.30
<i>Glenluce, M.V.</i> ...	Kennett, W. H. ...	J. A. Evans ...	" A.	" ...	" 19.8.30 to 29.8.30	8.9.30
<i>Glenshane</i> ...	Martin, V. F. ...	R. C. Pett ...	" A.	" ...	" 17.5.30 to 23.9.30	27.9.30
<i>Glentworth</i> ...	Kilgour, H. A. ...	A. L. Sanderson ...	" A.	R. S. Dalgleish ...	" 1.5.30 to 28.7.30	7.8.30
<i>Gloucester Castle</i> ...	MacMahon, J. ...	... ..	" A.	Union Castle ...	... ..	... ..
<i>Gloriosa</i> ...	Pool, F. G. ...	S. G. Elliott, W. T. Brown ...	" A.	Stag Line ...	Form 911 6.6.30 to 9.7.30	14.7.30
<i>Guldford Castle</i> ...	Schalefield, H. L. ...	E. Hamlyn ...	" A.	Union Castle ...	" 22.4.30 to 10.5.30	10.6.30
<i>Halesius</i> ...	Hawley, F. J. ...	A. S. P. May ...	" A.	R. P. Houston ...	" 1.9.30 to 25.11.30	28.11.30
111 *† <i>Hardwicke Grange</i> ...	Fowler, W. H. ...	W. L. Baker, A. D. Seybold, W. S. Ellis.	" M.	Houlder ...	" 17.8.30 to 21.10.30	29.10.30
<i>Harmonides</i> ...	Elwell, F. R. ...	R. F. Bell, S. C. Robertson, E. McLachlan.	" A.	R. P. Houston ...	" 4.8.30 to 24.8.30	18.9.30
262 ** <i>Hawraki, M.V.</i> ...	Norton, A. T. ...	R. H. C. Hargraves, H. A. Brockett, A. G. S. Gell.	M.L.	Union S.S. Co., N.Z. ...	Met. Log 24.12.29 to 19.3.30	10.6.30
<i>Herminius</i> ...	Roberts, T. V. ...	F. W. Gilroy ...	No. A.	Aberdeen Common-wealth.	Form 911 24.8.30 to 5.10.30	17.10.30
<i>Herschel</i> ...	Watson, W. W. ...	M. P. Thompson ...	" A.	Lampport & Holt ...	" 21.3.30 to 16.6.30	24.6.30
253 *† <i>Hertford</i> ...	Burton Davies, J. ...	H. Horwood, J. F. Clement, W. N. Jarvis.	M.L.	Federal ...	Form 915 2.2.30 to 20.6.30	25.6.30
<i>Hesione</i> ...	McComish, A. B. ...	W. H. Ball ...	No. A.	R. P. Houston ...	Form 911 15.4.30 to 11.5.30	10.6.30
<i>Hibernia</i> ...	Dudgeon, L. T. ...	A. Marsh ...	C.C.	L.M. & S. Railway ...	Telegraphic Report 18.12.30	18.12.30
182 †† <i>Highland Brigade</i> ...	Lloyd ...	... ..	No. M.	Nelson ...	... ..	... ..
116 †† <i>Highland Chieftain, M.V.</i> ...	Robinson, R. H. ...	W. Irving, W. J. Presland ...	" M.	" ...	Forms 911 & 138 9.10.30 to 23.11.30	1.12.30
099 †† <i>Highland Monarch, M.V.</i> ...	Ashby Graves, F. ...	J. H. Cables, R. Poeden ...	No. M.	" ...	" " 21.9.30 to 12.11.30	15.11.30
079 *† <i>Hildebrand</i> ...	Buck, R. H., R.D., Commr, R.N.R.	R. Thomas ...	W.T.	Booth ...	Form 911 18.9.30 to 27.10.30	5.11.30
075 *† <i>Hobson's Bay</i> ...	Kydd, O. J. ...	J. Worrall, B. Moffatt, C. Carroll, T. Durrant.	M.L.	Aberdeen Common-wealth.	Met. Log. 23.1.30 to 2.5.30	28.5.30
<i>Holbein</i> ...	Gough, W. A. ...	F. Delaney ...	No. A.	Lampport & Holt ...	Form 911 13.4.30 to 10.6.30	3.10.30
054 †† <i>Homeric</i> ...	Bulman, J. B. ...	H. G. Morgan ...	W.T.	White Star ...	Forms 911 & 138 30.10.30 to 5.12.30	8.12.30
<i>Hubert</i> ...	Briscoe, W. ...	G. H. Clark ...	No. A.	Booth ...	Form 911 26.10.30 to 6.11.30	11.12.30
261 *† <i>Huntingdon</i> ...	Field, H. G. B. ...	W. H. Timberlake ...	W.T.	Federal... ..	" 2.8.30 to 9.8.30	18.8.30
289 *† <i>Ingoma</i> ...	Gibbings, W. ...	S. M. Smith, D. D. Kerr, R. Sutcliffe.	No. M.	Harrison ...	Forms 911 & 138 11.10.30 to 20.11.30	24.11.30
<i>Inkum</i> ...	Meethan, J. T. ...	... ..	" A.	J. H. Welsford ...	Form 911 20.11.29 to 17.1.30	18.2.30
<i>Iris, C.S.</i> ...	Hughes, H. R. ...	T. A. Vickers ...	" M.	Pacific Cable Board... ..	" 10.12.29 to 27.12.29	17.3.30
160 *† <i>Ixion</i> ...	Dougall, W. T. ...	G. L. Oldrich, W. H. Deans, Stewart, J. A. ...	M.L.	A. Holt ...	Form 915 19.4.30 to 18.9.30	26.11.30
<i>Jamaica Merchant</i> ...	McCorm, A. Boddie, G. W.	B. W. Smith ...	No. A.	Jamaica Direct Fruit	Form 911 4.10.30 to 31.10.30	8.11.30
072 ** <i>Jamaica Planter</i> ...	Towell, W. C. ...	... ..	W.T.	" ...	Forms 911 & 138 10.9.30 to 26.11.30	18.12.30
<i>Jamaica Producer</i> ...	Gallop, J. W. ...	J. M. Courtney ...	No. A.	" ...	... ..	... ..
<i>Javanese Prince, M.V.</i> ...	Smith, J. ...	S. E. Taylor ...	" A.	Prince ...	Form 911 30.7.30 to 2.9.30	19.9.30
187 *† <i>Jeypore</i> ...	Harris, W. L. ...	H. G. Edwards... ..	" M.	P. & O. ...	Forms 911 & 138 11.10.30 to 25.11.30	16.12.30
188 †† <i>Kaisar-i-Hind</i> ...	Headlam, P. C. R.D., Commr, R.N.R.	T. T. Ferguson, H. Flint, S. Hopkins	" M.	" ...	" " 13.9.30 to 6.11.30	21.11.30
189 *† <i>Kaiyan</i> ...	Cooper, C. P., O.B.E., R.D., Capt, R.N.R.	D. H. F. Armstrong ...	" M.	" ...	" " 22.6.30 to 6.9.30	12.9.30
041 *† <i>Karamea, M.V.</i> ...	McIntosh, A. ...	K. D. Fisher, N. S. Milne, R. L. Rosoman.	M.L.	Shaw, Savill & Albion	Met. Log. 13.5.30 to 22.8.30	4.9.30
217 *† <i>Karapara</i> ...	Maclean, A. ...	M. Rose, R. E. Small, F. B. Johnston, M. E. Potbury.	No. M.	British India... ..	Forms 911 & 138 24.9.30 to 7.11.30	24.11.30
190 *† <i>Kashgar</i> ...	Sudell, F., R.D., Commr, R.N.R.	R. P. Bady, A. J. Nobbs, P. W. Clark.	" M.	P. & O. ...	" " 26.7.30 to 2.11.30	4.11.30
191 *† <i>Kashmir</i> ...	Mallaloe, R., Lt-Commr, R.N.R.	J. Webb ...	" M.	" ...	" " 20.7.30 to 3.10.30	10.10.30
218 *† <i>Khandalla</i> ...	Baird, S.K. ...	R. H. R. Hall ...	" M.	British India ...	" " 11.9.30 to 24.10.30	17.11.30
283 *† <i>Khiva</i> ...	Dawson, E. E. N. ...	E. V. Lewis ...	" M.	P. & O. ...	... ..	... ..
186 *† <i>Kidderpore</i> ...	Woodroffe, S. Y. ...	R. H. Hand ...	" M.	" ...	Form 911 27.6.30 to 9.9.30	4.10.30
169 ** <i>Ktungchow</i> ...	Stringer, C. B. L. ...	O. Fox ...	M.L.	China Nav. Co. ...	Met. Log. 27.10.29 to 30.4.30	26.6.30
193 *† <i>Lahore</i> ...	Hollow, J. H. ...	J. H. Benjamin ...	No. M.	P. & O. ...	Forms 911 & 138 24.3.30 to 16.8.30	21.8.30
<i>Lalande</i> ...	Major, T. W. ...	A. N. Blundell ...	No. A.	Lampport & Holt	Form 911 9.10.30 to 1.11.30	14.11.30

LIST OF VOLUNTARY OBSERVING SHIPS

Name of Vessel.	Captain.	Observing Officers.	Meteorological Equipment.	Line.	Last Log, Register, or Record Contributed. Received up to 18.12.30.	Date Received.
036 † Lancashire ... Lancastria ...	Fountain, C. ... Oram, B. B., R.D., Commr., R.N.R.	W. H. Campe ... H. V. Clarke, P. L. Williams, P. S. Britten.	„ A. W.T.	Bibby ... Cunard ...	13.3.30 to 9.4.30... Forms 911 & 138 6.10.30 to 25.10.30	22.4.30 29.10.30
082 *† Laomedon ... La Paz, M.V. ... Laplace ... Largs Bay ...	Watson, C. J. ... Benson, C. W. ... Hickman, V. G. ... Jermyn, W. M. ...	W. K. Hole ... G. Patt, P. H. Ray ... F. B. Marsden ...	No. A. „ M. No. A. No. M.	A. Holt ... Pacific S.N. Co. ... Lamport & Holt ... Aberdeen Common- wealth.	Form 911 3.8.30 to 24.9.30 ... 30.3.30 to 29.4.30 ... 3.5.30 to 19.8.30... Forms 911 & 138 28.11.29 to 11.7.30	29.9.30 3.5.30 27.8.30 23.8.30
112 *† La Rosarina ... Lassell ... 064 † Laurentic ...	Webb, C. ... Leicester, F. S. ... Binks, J. ...	W. S. Hamblin... C. Cochrane, H. G. Williams, R. Conway.	„ M. No. A. W.T.	Houlder ... Lamport & Holt ... White Star ...	„ „ 5.10.30 to 27.11.30 Forms 911 & 138 1.11.30 to 22.11.30	1.12.30 24.11.30
083 *† Lautaro, M.V. ... Leicestershire ...	Leyne, R. W. ... Griffiths, C. A. ...	G. A. Thexton ... E. D. Brand, H. Kerbyson, A. Thomson.	No. M. „ A.	Pacific S.N. Co. ... Bibby ...	Form 911 12.5.30 to 16.9.30 ... 21.9.30 to 27.11.30 ...	19.9.30 4.12.30
254 *† Limerick ...	Molyneux, P. L. ...	J. Hamblin, G. Shepherd, C. W. Roberts, C. H. Pett.	„ M.	Federal... ..	Forms 911 & 138 24.5.30 to 19.6.30	26.9.30
093 *† Llandaff Castle ... 097 † Llangibby Castle ... 094 *† Llandovery Castle	Attwood J. ... Harvey, H. B. ... Morgan, A. O. R.D., Commr., R.N.R.	T. H. Watley ... H. Warren ... L. H. Farrow, T. C. Goldstone, F. R. Pope.	W.T. W.T. M.L.	Union Castle ... „ „ ... „ „ ...	Form 911 18.7.30 to 22.9.30 ... Forms 911 & 138 16.8.30 to 18.10.30 Form 915 20.9.30 to 24.11.30 ...	27.9.30 23.10.30 3.12.30
216 *† Llanstephan Castle ... 084 *† Lobos, M.V. ... Loch Katrine ... Lochmonar, M.V. ...	Jackson, C. R. ... Grant, F. H. ... Cocks, A. ... Miles, A. G. ...	J. D. Crombie ... R. W. Gill, R. H. Sissons ... M. A. Murch ... F. G. Dawson ...	W.T. No. M. „ A. „ A.	„ „ ... Pacific S.N. Co. ... R.M.S.P. Co. ... „ „ ...	Form 911 6.9.30 to 29.9.30 ... Forms 911 & 138 30.10.30 to 16.11.30 Form 911 5.11.30 to 26.9.30 ...	1.10.30 3.12.30 4.12.30
290 *† Logician ... London Exchange ... Lord Antrim ... Loriga, M.V. ...	Herschel, R. F. ... Griffiths, J. ... Jarvis, F. E. ... Large, E. H., R. D., Commr., R.N.R.	T. Winstanley ... „ „ ... C. A. Milligan ... J. W. Gordon ...	„ M. „ A. „ A. „ A.	Harrison ... Furness Withy ... Ulster S.S. Co. ... Pacific S.N. Co. ...	Form 911 10.10.29 to 1.1.30 ... „ „ ... Form 911 21.9.30 to 4.10.30 ... „ 26.9.30 to 14.10.30 ...	10.1.30 7.10.30 31.10.30
194 † Macedonia ... 013 *† Macharda ... 232 *† Madara ... 048 *† Mahana ...	Dickenson, C. C. ... Hanna, R. G. ... Wright, J. A. ... Cameron, J. M. ...	R. A. B. Kempton ... A. C. Hocking ... C. Cairns ... H. C. Smith, A. E. Masters, M. G. Stuart.	„ M. „ M. „ M. M.L.	P. & O. ... Brocklebank ... British India... Shaw, Savill & Albion	Forms 911 & 138 21.9.30 to 10.12.30 Form 911 9.11.30 to 6.12.30 ... „ 22.9.30 to 23.11.30 ... Form 915 11.4.30 to 4.8.30 ...	13.12.30 10.12.30 27.11.30 9.8.30
141 *† Mahia ... 014 *† Mahronda ... 015 *† Mahsud ...	Andrews, C. M. ... Sharpe, G. ... Kershaw, R. W. ...	G. Sangwin ... W. Le Brocq ... S. Richardson, E. Walker, J. R. Paisley.	W.T. No. M. „ M.	Brocklebank ... „ „ ... „ „ ...	Forms 911 & 138 13.10.30 to 7.11.30 „ „ 18.8.30 to 7.11.30 ... „ „ 27.9.30 to 6.12.30	1.12.30 11.11.30 18.12.30
016 *† Maidan ... 017 *† Maihar ...	Ison, W. A. ... Charlton, W. L. ...	F. Moore ... C. Cadwallar, H. Gillespie, A. D. Spring.	„ M. M.L.	„ „ ... „ „ ...	Form 915 6.7.30 to 25.9.30... „ 15.3.30 to 16.6.30 ...	4.11.30 23.6.30
042 *† Maimoa ... Maimyo ... 018 *† Makalla ... 225 *† Makura ...	Johnson, J. W. ... Smith, G. C. ... Maughan, J. W. ... MacDonald, D. ...	P. Savill, H. G. Withell, A. E. Lockhart. J. L. Rodgers ... E. Williams ... A. P. Cousin, S. H. Crawford, N. H. Pearson, M. V. Langdale.	„ No. A. „ M. M.L.	Shaw, Savill & Albion Brocklebank ... „ „ ... Canadian- Australasian	„ 15.3.30 to 16.6.30 ... Form 911 14.9.30 to 16.10.30 ... Forms 911 & 138 11.5.30 to 5.8.30 Form 915 20.5.30 to 30.8.30 ...	23.6.30 10.11.30 20.8.30 31.10.30
298 *† Malabar, M.V. ... 019 *† Malakuta ... 020 *† Malancha ... 219 *† Malda ... 195 † Maloja ...	Donaldson, A. ... Rothery, S. ... Adamson, F. L. ... Whitham, F. ... Denne, G. H. A. ... Browning, J. B., R.D., Commr. R.N.R.	A. Campbell, L. Millar, G. Hildebrand. H. Simpson ... R. Humble, H. B. Kelly ... D. B. Lattin, W. Davidson ... R. H. Turner, C. H. Hand, E. J. Spurling.	„ No. M. „ M. „ M. „ M.	Burns, Philp & Co. ... Brocklebank ... „ „ ... British India P. & O. ...	„ 9.4.30 to 21.9.30 ... Forms 911 & 138 24.5.30 to 11.10.30 „ 26.7.30 to 30.10.30 Form 138 6.7.30 to 26.9.30 Forms 911 & 138 26.4.30 to 10.7.30	20.11.30 22.10.30 6.11.30 8.12.30 16.7.30
196 † Malwa ... Mamilius ... 114 *† Manchester Brigade	Britten, P. O. ... Cole, N. ... Stott, C. H. ...	P. J. Lawrence ... „ „ ... J. H. Round, E. E. Bonnaud, J. Gregory.	„ M. „ A. M.L.	„ „ ... White Star ... Manchester Liners ...	„ „ 11.8.30 to 13.11.30 Form 915 10.5.30 to 25.11.30 ...	21.11.30 5.12.30
Manchester Hero ... Manchester Producer	Mitchell, G. M. ... Struss, F. D. ...	R. O. Jones ... T. J. Boyd ...	No. A. „ A.	„ „ ... „ „ ...	Form 911 31.8.30 to 11.10.30 ... „ 1.6.30 to 3.7.30 ...	3.11.30 23.7.30
028 † Mandala ... 146 *† Mandasor ... 220 *† Manela ...	Whittingham, A. G., R.D. R.N.R. Richardson, T. Maples, S. H. ...	W. E. F. Powell ... — Madden ... T. M. Robertson, E. W. Cholerton.	„ M. „ M. „ M.	British India... Brocklebank ... British India... Brocklebank ...	„ „ „ „ „ „ Forms 911 & 138 24.5.30 to 11.10.30 Forms 911 & 138 30.11.30 to 10.12.30 „ „ 12.10.30 to 18.11.30 „ „ 14.10.30 to 29.10.30	18.12.30 18.12.30 3.12.30 24.11.30
021 *† Mangalore ... 022 *† Manipur ... 294 *† Manistee ... 221 *† Manora ...	Mallett, R. ... Cochran, G. N. ... Edwards, A. C. ... Hudson, H. T., R.D., Commr., R.N.R.	J. McGilvray, G. E. Jones, A. M. Parry. L. F. Dodson, R. Penston, A. Hill. J. Brawn, D. W. Speirs, D. D. Bangay. H. J. Cholerton, F. E. Cox, C. T. O. Richardson.	„ M. „ M. M.L. No. M.	„ „ ... „ „ ... Elders & Fyffes ... British India... P. & O. ...	„ „ 11.8.30 to 13.11.30 Form 915 10.5.30 to 25.11.30 ... Form 911 31.8.30 to 11.10.30 ... „ 1.6.30 to 3.7.30 ... „ „ 12.10.30 to 18.11.30 „ „ 14.10.30 to 29.10.30 Form 911 20.9.30 to 2.12.30 ...	21.11.30 5.12.30 3.11.30 23.7.30
197 † Mantua ... 299 *† Marella ... 276 *† Marengo ...	Hignett, A. H. ... Mortimer, S. ... Donaldson, A. ... Aspinall, A. E. ...	H. J. Cholerton, F. E. Cox, C. T. O. Richardson. J. Cummings, M. Pemberton, W. D. Colquhoun-Thomas, H. Bryan, G. W. Revell, W. L. Hepson, P. Wright, H. Watkins ...	„ M. M.L. „	P. & O. ... Burns Philp ... Ellerman Wilson ... British India... „ „ ...	Forms 911 & 138 23.3.30 to 26.6.30 Form 915 7.5.30 to 23.8.30 ... Form 915 5.6.30 to 6.10.30 ... „ 24.8.30 to 14.11.30 ...	19.7.30 20.11.30 10.10.30 19.11.30
222 † Margha ... 104 *† Marquesa ... 044 † Matara ...	Pitcairn, C. M. Hemmings, W. H. ... Smiles, R. S. ... Kershaw, W. A. R. ...	„ „ „ „ J. Wetherall ... F. Eadon, H. A. Hill, F. C. Chamby, L. B. Miller.	„ No. M. M.L.	„ „ ... Furness Houlder ... Shaw, Savill & Albion	„ „ „ „ „ „ Forms 911 & 138 22.9.30 to 21.10.30 Form 915 15.8.30 to 23.11.30 ...	25.11.30 27.11.30
023 *† Matheran ... 223 *† Matiana ... 024 *† Matra ...	Mulcahy, J. J. ... Green, F. V. ... Cornish, N. P. ...	S. S. Slade, W. F. Harris, C. B. Rogers. L. A. Bunn, P. M. Wilson, W. Daly.	„ M. „ M. „ M.	Brocklebank ... British India... Brocklebank ... Brocklebank ...	„ „ 18.11.30 to 20.11.30 Form 911 & 138 9.10.30 to 9.12.30 „ „ 10.8.30 to 18.10.30	27.11.30 13.12.30 21.10.30
032 † Mauretania... 287 † Malta ... 071 *† Meltonian ...	McNeil, S. G. S., R.D., Capt., R.N.R. Stewart, A. ... Moore, J. R. ... Carnon, N. R. ...	R. H. C. Crawford, J. G. Wiseman, A. Bridgewater. „ „ „ „ G. Bonfeld, W. R. Vaughan, W. Lawton.	W.T. No. A. „ M.	Cunard ... Canadian Pacific ... Ulster S.S. Co. ... Leyland ...	Form 138 17.11.30 to 1.12.30 ... „ „ „ „ „ „ Forms 911 & 138 13.10.30 to 16.11.30 „ „ „ „ „ „	4.12.30 20.11.30
Mercian ... Meriones ... 255 *† Middlesex ... Minna ...	Hughan, C. ... Hanney, T. W. ... Clarke, P. B. ... Mackenzie, G. G. ...	„ „ „ „ J. Lunnon, J. Ricketts, R. Stephens, J. Halliday. A. M. Campbell	„ A. „ A. No. M. „ A.	A. Holt ... Federal... „ „ ... Scottish Fishery Brd.	Form 911 28.7.30 to 30.9.30 ... Forms 911 & 138 8.7.30 to 12.8.30 Form 911 30.10.30 to 23.11.30 ...	8.10.30 20.11.30 1.12.30

Name of Vessel.	Captain.	Observing Officers.	Meteorological Equipment.	Line.	Last Log, Register, or Record Contributed. Received up to 18.12.30.	Date Received.
264 * ^o <i>Tanda</i> ...	Pilcher, E. T., Lieut.-Commr., R.N.R.	V. C. Lette, R. Lloyd-Harry, B. W. Dun. G. Chadwick-Smith.	M.L.	E. & A. S.S. Co. ...	Form 915 6.6.30 to 3.9.30 ...	31.10.30
165 * [†] <i>Tantalus</i> , M.V. ...	Dodds, R. ...	F. C. Oppen, R. M. Gray, W. J. Ryan.	"	A. Holt ...	" 1.5.30 to 6.9.30 ...	22.9.30
047 * [†] <i>Taranaki</i> , M.V. ...	Wood, C., D.S.C. ...	G. Campbell, W. D. Pim, K. A. Gordon, S. P. Wallis.	"	Shaw, Savill & Albion	" 26.7.30 to 11.11.30 ...	17.11.30
<i>Tarantia</i> ...	Caithness, J. B. ...	J. M. Cherry ...	No. A.	Anchor ...	Form 911 16.9.30 to 15.10.30 ...	20.10.30
<i>Tasmania</i> ...	Williams, J. V. ...	" ...	" A.	New Zealand S.S. Co.	" ...	" ...
<i>Tetresias</i> ...	Wilkinson, W. H. ...	F. Stott ...	" A.	A. Holt & Co. ...	Form 911 21.8.30 to 7.10.30 ...	10.11.30
243 * [†] <i>Tekoa</i> ...	McNish, R. ...	J. G. Phillips, R. Aldridge, E. Mason.	" M.	New Zealand S.S. Co.	Forms 911 & 138 1.10.30 to 1.11.30 ...	8.11.30
<i>Telamon</i> ...	Brown, R. ...	G. Edge ...	" A.	A. Holt ...	Form 911 26.10.30 to 23.11.30 ...	10.12.30
<i>Tetela</i> ...	Brice, E. H. ...	J. W. T'one ...	" A.	Elders & Fyffes ...	" 15.10.30 to 14.11.30 ...	20.11.30
<i>Teucer</i> ...	Davies, J. ...	C. C. L'Estrange ...	" A.	A. Holt ...	" 13.9.30 to 8.10.30 ...	10.12.30
077 †† <i>Themistocles</i> ...	Young, A. D. ...	E. Johansen ...	W.T. M.	Aberdeen Commonwealth	Forms 911 & 138 17.5.30 to 10.7.30 ...	14.7.30
<i>Theseus</i> ...	Carroll, C. G. ...	P. Dunsire ...	No. A.	A. Holt ...	Form 911 5.10.30 to 7.11.30 ...	8.12.30
007 * [†] <i>Thistleglen</i> ...	Whitfield, G.A., O.B.E.	W. H. Gould, S. B. Davis, E. W. Kent.	M.L.	Allan Black & Co. ...	Form 915 26.4.30 to 29.9.30 ...	2.10.30
235 * [†] <i>Tilawa</i> ...	Colborn, E. ...	F. R. B. Langdon, A. S. Jones, J. W. Walker.	No. M.	British India... ..	Forms 911 & 138 10.9.30 to 7.11.30 ...	1.12.30
168 * [†] <i>Tinhow</i> ...	Chicken, W. E. ...	G. W. Seth, P. Aydon, E. Swith.	"	A. Weir & Co. ...	" " 6.8.30 to 12.11.30 ...	16.12.30
161 * [†] <i>Titan</i> ...	Power, J. J. ...	C. C. L'Estrange ...	M.L.	A. Holt ...	Form 911 10.2.30 to 21.5.30 ...	27.5.30
244 * [†] <i>Tongariro</i> ...	Hamilton, F. S. ...	F. S. Cashmore, P. S. Calcutt, E. G. Williams, A. G. Robinson.	"	New Zealand S.S. Co.	Form 915 6.4.30 to 5.8.30 ...	21.8.30
025 †† <i>Transylvania</i> ...	Bone, D. W. ...	A. Middleton, J. A. Leferre, D. I. Chamberlain.	W.T.	Anchor ...	Forms 911 & 138 2.11.30 to 24.11.30 ...	26.11.30
288 * [†] <i>Traveller</i> ...	Barrow, W. T. C. ...	" ...	No. M.	Harrison ...	" ...	" ...
<i>Trecarrell</i> ...	Hunt, D. ...	W. E. McEwan, G. A. Solly... ..	" A.	Hain S.S. Co. ...	Form 911 5.11.30 to 21.11.30 ...	25.11.30
005 * [†] <i>Trematon</i> ...	Mill, C. R. ...	J. Jenkyn, C. M. Quick, R. Stinson, W. B. Paul, T. M. Meakin, R. S. Davies.	M.L.	" " ...	Met. Log. 16.9.29 to 8.3.30... ..	25.3.30
119 * [†] <i>Trojan Star</i> ...	Griffin, G. A. ...	A. G. Sampson ...	No. M.	Blue Star ...	Forms 911 & 138 1.5.30 to 12.6.30 ...	19.6.30
245 * [†] <i>Turakina</i> ...	Ashworth, F. ...	V. V. Johnston ...	" M.	New Zealand S.S. Co.	" " 4.7.30 to 7.8.30 ...	11.8.30
167 * [†] <i>Tyndareus</i>	Findlay, J. ...	J. A. Evans, R. L. Holdstock, M. J. Case, H. Pierpoint.	M.L.	A. Holt ...	Met. Log. 7.1.30 to 1.6.30 ...	20.6.30
<i>Uffington Court</i> ...	Clarke, E. J. ...	E. V. Quickenden ...	No. A.	Haldin & Co. ...	Form 911 29.3.30 to 2.5.30 ...	6.5.30
176 * [†] <i>Ulysses</i> ...	Owen, R. D., O.B.E. ...	J. W. Prior ...	W.T.	A. Holt ...	" 1.5.30 to 14.6.30 ...	17.6.30
113 * [†] <i>Umvey Grange</i> ...	Goodrick, H. P. ...	A. Bradbury, G. T. Hurst ...	No. M.	Houlder ...	Forms 911 & 138 28.9.30 to 5.12.30 ...	9.12.30
039 ** <i>Valacia</i> ...	Gronow, S. ...	J. Kettlewell ...	" M.	Cunard ...	" " 9.5.30 to 19.6.30 ...	5.7.30
292 †† <i>Viceroy of India</i> ...	Ohlson, B. J., D.S.O., R.D., Commr. R.N.R.	A. G. Stansfield... ..	" M.	P. & O. ...	" ...	" ...
<i>Vigilant</i> ...	Simpson, E. S. S. ...	J. Wilson ...	" A.	Scottish Fishery Board.	Form 911 1.11.30 to 30.11.30 ...	3.12.30
206 ** <i>Waitotapu</i> ...	Hender, W. ...	J. L. Russell ...	" M.	Union S.S. Co. of N.Z.	Forms 911 & 138 7.9.30 to 15.10.30 ...	3.11.30
263 ** <i>Wairuna</i> ...	Stewart, A. R. ...	J. E. Warwick, C. T. Robb, G. M. Coote.	M.L.	" " ...	Form 915 4.7.30 to 6.10.30 ...	28.11.30
<i>Warfield</i> ...	Steel, R. ...	A. J. K. Collins ...	No. A.	" " ...	Form 911 29.10.30 to 9.11.30 ...	20.11.30
060 †† <i>Westernland</i> ...	Trant, A. W., O.B.E. ...	W. L. Wood, C. Clark ...	W.T.	Red Star ...	Forms 911 & 138 10.11.30 to 13.12.30 ...	16.12.30
260 * [†] <i>Westmoreland</i> ...	Reilly, H. E. ...	J. D. Marks, K. M. Lloyd Jones, H. Hill.	M.L.	Federal... ..	Form 915 22.5.30 to 26.8.30 ...	2.9.30
<i>William Scoresby</i> , R.R.S.	Irving, J. J. C., Lieut. Commr., R.N.	" ...	"	Falkland Islands Government.	" ...	" ...
096 †† <i>Windsor Castle</i> ...	{ Bickford, C. N. ... { Chave, Sir B., K.B.E.	W. S. Byles, E. H. Dixey, J. Traigner.	"	Union Castle ...	Form 915 1.5.30 to 7.9.30 ...	10.9.30
043 ** <i>Zealandic</i> ...	Gaskell, J. H., R. D., Lieut. Commr. R.N.R.	G. L. Almond ...	W.T.	Shaw, Savill & Albion	Forms 911 & 138 31.10.30 to 4.12.30 ...	10.12.30
<i>Zent</i> ...	Robinson, H. J. ...	J. Hillman ...	No. A.	Elders & Fyffes ...	Form 911 17.9.30 to 17.10.30 ...	27.10.30
<i>Conway</i> , H.M.S. ...	Richardson, F. A., D.S.C., Commr., R.N.	The Senior Cadets ...	Cadets' M.L.	" ...	Cadets' Met. Log. 21.9.30 to 13.12.30 ...	18.12.30
<i>Pangbourne Nautical College</i>	Tracy, A. F. G., Commr., R.N.	" " ...	"	" ...	Cadets' Met. Log. 30.4.30 to 24.7.30 ...	29.7.30
<i>Worcester</i> , H.M.S.	Steele, G. C., V.C., Lieut.-Commr., R.N.	" " ...	"	" ...	Cadets' Met. Log. 9.5.30 to 30.7.30 ...	1.8.30
<i>Abaco</i> ...	" ...	The Keepers ...	Lighthouse Register.	" ...	Lighthouse Register 1.7.29 to 31.12.29 ...	24.3.30
<i>Cay Lobos</i> ...	" ...	" ...	"	" ...	Lighthouse Register 13.9.28 to 12.11.29 ...	16.12.29
<i>Double Headed Shot</i>	" ...	" ...	"	" ...	Lighthouse Register 1.7.29 to 31.12.29 ...	24.3.30
<i>Inagua</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.7.29 to 7.1.30 ...	24.3.30
<i>Sombrero</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.30 to 30.6.30 ...	28.7.30
<i>Watling Island</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.7.29 to 31.12.29 ...	24.3.30
<i>Cape Pembroke</i> (Falkland Is.)	" ...	" ...	"	" ...	Lighthouse Register 1.1.30 to 30.6.30 ...	15.8.30

LIST OF SHIPS CO-OPERATING THROUGH THE METEOROLOGICAL OFFICE WITH THE MINISTRY OF AGRICULTURE AND FISHERIES (FISHERIES LABORATORY, LOWESTOFT) IN THE COLLECTION OF WATER SAMPLES, ETC.

Name of Vessel.	Captain.	Observing Officer.	Line.	Last Case of Water Samples, Reports, etc., received up to 30.11.30.	Date Received
<i>Dartan</i> ...	Hannaford, W. ...	D. G. Longmuir ...	Leyland ...	Water Samples ...	17.10.30
<i>Darro</i> ...	Green, J. ...	F. J. Swallow ...	R.M.S.P. Co. ...	" ...	14.11.30
<i>Davistan</i> ...	Trickey, J. ...	J. Holman ...	Leyland ...	" ...	31.10.30
<i>Dorelian</i> ...	Hugan, C. ...	" ...	" ...	" ...	" ...
<i>Hildebrand</i> ...	Buck, R. H. ...	R. D. Thomas ...	Booth ...	" ...	11.11.30
<i>Mercian</i> ...	Hughan, C. ...	W. Farry ...	Leyland ...	" ...	7.10.30
<i>Nevisian</i> ...	McCormick, J. ...	T. J. Jones ...	" ...	Water Samples ...	24.11.30