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# The Marine Observer



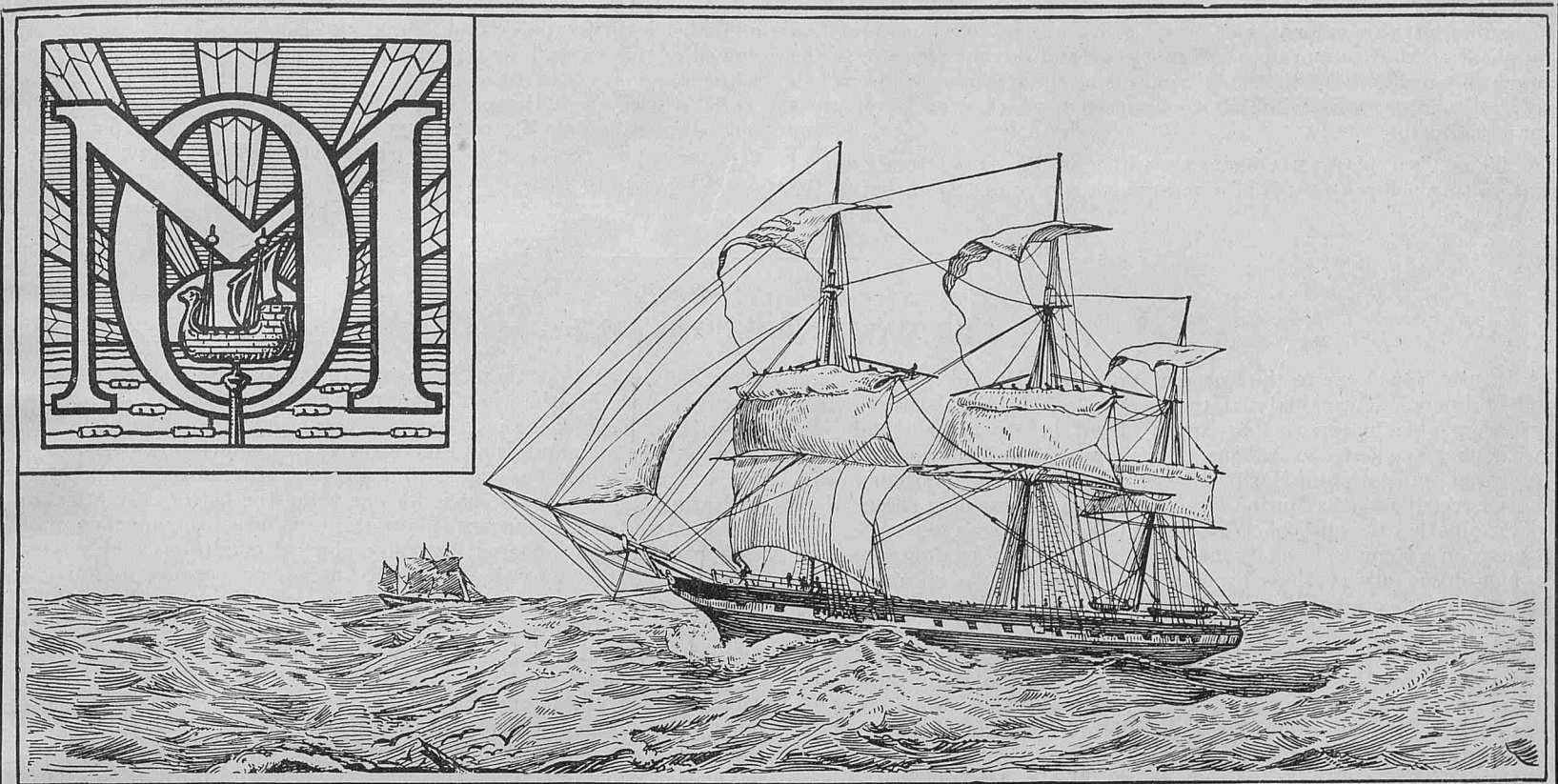
The Review of the  
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Marine Observers

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THE MARINE OBSERVER.

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FOREWORD TO VOLUME IV.

BY DR. G. C. SIMPSON, C.B., F.R.S.

THE year 1926 will long be remembered as one of industrial unrest, both on sea and land, yet in years to come when some curious reader unearths a volume of THE MARINE OBSERVER for 1926 he will find there no reflection of our troubles and anxieties. The great ocean of water and ocean of air go on their several ways unaffected by the disturbance of puny man. On the other hand, neither the sea nor the air are restful; they have their disturbances, and it is good that they have, otherwise the life of the sailor would lose much of its attraction. It is a curious thought that more than three-quarters of the matter in THE MARINE OBSERVER deals with disturbances and the endeavour of man to combat and overcome the effects of those disturbances. As I turn over the pages of the Volume which lies before me my eye catches charts of storms, statistics of fogs and gales and codes of signals designed to give warning of dangers to mariners, but it also catches sight of photographs of beautiful cloud effects and descriptions of phenomena which are wholly delightful.

From this it is clear that the purpose of THE MARINE OBSERVER is two-fold. In the first place it is utilitarian. We set out with the definite object of helping the mariner in his daily work; we try to

show him how he can recognise and circumvent his difficulties and dangers, and we place before him the experience of others so that they may be a help to him in time of need. But in the second place—I am not sure that it ought not to be the first place—we try to raise his interest in the processes of Nature as they are manifested in the atmosphere over the great vacant spaces of the oceans. We all want to know why things happen, and it is this instinctive desire for knowledge which is the great driving force of the human race along its upward path of progress. For many purposes it is sufficient to know what happens, without consideration of why it happens, but this does not lead to progress. For many years we knew the distribution of weather about a cyclonic depression and ABERCROMBIE's system of weather forecasting was based on this knowledge; but we did not know why the weather was distributed in this way. In recent years we have learnt a great deal about the processes which take place in the air currents of a depression and why they behave as they do, and this has led to an understanding of weather processes which is proving invaluable in the detailed forecasting demanded by aviation. I hope, therefore, that we shall always find in THE MARINE OBSERVER



accounts of phenomena which, while having no obvious practical application, add to our store of knowledge and give us pleasure in the mere observing. In the long run even these observations when correctly interpreted will lead to knowledge which may be of great practical value.

Thus THE MARINE OBSERVER while acting as a storehouse of interesting observations is also acting as a source of inspiration to the

specialist in meteorology and in the long run the scientific knowledge gained in this way will be returned to the mariner increased by a profit which none of us can estimate.

It is with these thoughts that I congratulate all those who have helped to make THE MARINE OBSERVER a success during 1926 and they give me confidence in wishing continued success to the new Volume.

October, 1926.

DIRECTOR.

### THE MARINE OBSERVER, 1927.

A HAPPY New Year to the Corps of Voluntary Marine Observers and all Mariners! May this year prove even more than the last—when we were able to report that improvement in observation had been without precedent—to be one of still greater advancement in the practical application of Marine Meteorology as a branch of seamanship.

Of recent months Marine Observers have increasingly shown their determination to establish Wireless and Weather as an aid to Navigation upon a sounder basis by making the practice of sending reports of synchronised observations by Wireless Telegraphy to all ships more general and as many have asked for the serial chapters originally published in the first Volume to be reprinted, these chapters will appear revised in this year's MARINE OBSERVER. Quarterly Charts of Currents on the routes from the Channel to the West Indies and Panama will appear in the February, March, May, June, August, September, November and December Numbers, while monthly charts giving the frequency of Mist and Fog observed to the Northward of the thirtieth parallel of Latitude in the North Atlantic will appear in the remaining Numbers and each month we shall give charts showing the mean sea surface temperature in the South Atlantic.

The Fog and Mist charts of the North Atlantic are made from observations only since 1921 when the HOLLERITH system was established. They are, therefore, based on insufficient data, but we publish them for the following very important reasons.

Firstly, we cannot too often bring to the notice of all Marine Observers that all charts which are made with the aid of the HOLLERITH Machine must depend for accuracy and reliability in the first place upon the observers and that unless the observations are recorded accurately at sea upon a definite plan and we punch the corresponding hole according to the code in the right place on the HOLLERITH card in the Marine Division the charts of the future will be misleading. Hence it is necessary that at observation time careful discrimination between Fog and Mist should be made and the letter *f* or *m* be entered in the Weather column of the Log accordingly. The same remarks apply to all elements, but in logging the weather great care must be exercised in entering only those letters of the BEAUFORT notation which indicate what is observed at the time.

During the last year Meteorological Logs and Reports received indicate that Marine Observers have excelled more than ever in all forms of observation, but there never will be a time when there is not still room for improvement.

Secondly, they serve to keep before all who see THE MARINE OBSERVER how this system has not only reduced the time required for compiling averages once the data has been extracted from the Logs and punched on cards and that by this means interchange of marine data may be promoted between the different maritime nations so that a maximum amount of data may be available for constructing Meteorological Charts of the oceans at a minimum cost, if other Marine Divisions see their way to adopt this system.

Articles on subjects of Marine Meteorology will be written as before by members of the Marine Division and a number of technical experts have kindly undertaken to contribute articles upon matters of interest to seamen, but it is to "The Marine Observer's Log" to which we look with the greatest hope, for here is where Marine Observers can give their first-hand experience. It is they alone who can give accounts of sea phenomena.

Several exceedingly interesting articles have been published in this Journal by technical experts who no longer regularly go to sea and these have been of great value to navigators in active sea service. In recent visits to ships of the observing fleet and in particular the new Cable Ship *Dominia*, Captain V. CAMPOS, I have been struck with the strides which have been made in Mercantile Marine Navigational equipment even in the few short years since I came ashore.

It seems to me that there is a great need for interchange of information concerning the use of these new instruments not only between ships, fortunate enough to possess them, and manufacturers, but between all Commanders and navigating officers of the Sea Services.

Now all good methods of accurate navigation are of great importance to Marine Meteorology because for one thing the better determination of the set and drift of current is important, while astronomical observation is necessarily affected by meteorological conditions and wireless direction finding may be the more necessary because of adverse atmospherical circumstances such as fog, mist, snow or heavy rain. THE MARINE OBSERVER reaches many seamen besides those of our regular corps. Articles by officers of ships fitted with new types of compasses, direction finders, revolution indicators, patent logs, sounding machines and so forth, besides new barometers and meteorological instruments would do more than tend to promote accurate meteorological observation, they would help to improve navigation generally, while furthering meteorology in its aid, and so we urge those who are so fortunate as to be shipmates with new instruments which they can without bias recommend as simple of manipulation and accurate in practice to contribute articles upon them. It is the expert user of an instrument whose views should count and which will be valued.

In the coming year, let us strive hard to do credit to those who established organised Marine Meteorology in Britain; it is to them and the corps of Marine Observers along with them that we owe our knowledge. BEAUFORT devised methods of observation which have stood the test of well over a century, FITZROY gave his life in the cause. TOYNBEE, first organised the work on an all ocean-wide basis in the Mercantile Marine. BAILLIE continued the methods established by TOYNBEE, and CAMPBELL HEPWORTH introduced the system of monthly return of information to all observers. The actual work done ashore in the Marine Division which is mostly shown in this Journal is infinitesimal as compared with that done at sea in the great field of observation which covers all oceans; but the work in the Marine Division has great effect upon that greater work at sea and may this always continue.

It has been natural that each succeeding Marine Superintendent should commence or establish some new form of **The Work**.

TOYNBEE, who was known as one of the most skilled navigators and oceanographers of his day, had spent most of his time at sea in Blackwall East Indiamen where he had seen the need of the navigator for the information of winds, weather and currents in the Doldrums of the Atlantic and the region of the Cape for selecting a route to make a passage under sail. Upon coming to the office he at once set about the construction of Meteorological Charts for these regions; that for the former remains probably one of the most complete works of Marine Meteorology which have ever been accomplished, while the Charts of the Cape region added greatly to our knowledge, and upon them sailing directions have been based.

BAILLIE, having been TOYNBEE's assistant for some years, when he became Marine Superintendent continued along the lines laid down by his late chief. To him we owe the wind rose which bears his name and during his time probably more Meteorological Charts in atlases were compiled and published than in that of any other Marine Superintendent.

CAMPBELL HEPWORTH was the first steamship commander to be Marine Superintendent and so he naturally made changes which more rapid communication made possible, and it is to him that we owe the practice of publishing month by month Ocean Meteorological Charts of normals and averages to which were added information of non-permanent nature which was of value in navigation, provided it



was made available to the Corps of Marine Observers and others interested within reasonable time. From this has come THE MARINE OBSERVER. Meanwhile what may prove to be one of the greatest inventions of all time as an aid to Navigation and Meteorology was made—Wireless Telegraphy. It was only natural that having had this blessing at sea when I came to the office my first endeavour should be to see if it could not be made to further the work of my predecessors. In this the Corps of Marine Observers have given

splendid support and in 1927 we ask them to redouble their efforts and to send in with their Meteorological Logs and Reports examples in the form of Weather Charts made at sea and notes of advantages gained by the practice of Wireless and Weather as an aid to Navigation and so prove beyond doubt the value of this voluntary work to the British Empire.

MARINE SUPERINTENDENT.

London, September, 1926.

### 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.

### TREMENDOUS SEA.

#### North Atlantic.

THE following is an extract from the Meteorological Log of S.S. *Empress of France*. Captain E. GRIFFITHS. Southampton to New York. Observer Mr. E. ROBERTS, 4th Officer :—

"January 31st, 1926. 1.15 a.m. A tremendous sea suddenly piled up ahead of the ship to a height estimated at 80 feet and swept down on the ship causing the following damage. The foremast stays and rigging were carried away, a winch at No. 1 hatch uprooted, derricks unshipped and buckled, No. 3 hatch stove in, forward bulwark flattened and first-class library wrecked on the saloon deck and the starboard wing shelter on upper bridge carried away, this being at a height of 65 feet above sea level. Much minor damage was also inflicted."

"The abnormal height of this sea seemed to be due to the meeting of two seas making it appear like a storm wave of exceptional height."

### HURRICANE.

#### In the South Pacific.

THE following report by Mr. J. R. GREY, Master Mariner, has been received from the Hydrographer of the Navy :—

"In Papetoai Bay, Moorea Island, Tahiti, on January 1st, 1926, at 5.30 p.m. a strong wind from E.N.E. commenced and by 6 p.m. it had reached force 10 and by 7 p.m. was of hurricane force. It continued all night and at daylight on January 2nd the squalls were more frequent and apparently increasing in strength. My yacht *White Heather* was lying in Robinson Cove, usually a snug anchorage, which the strong squalls passing up the bay miss altogether, but on this occasion the wind blew right in and seemed to carry its full force right up to the land. The yacht had two anchors down and 70 fathoms of warp to a large tree stump on the northern horn of the cove, but notwithstanding this I did not expect her to live the storm out as every sea swept her decks. During the gale a considerable swell from N.W. set into Papetoai Bay and this, accompanied by the short sea caused by wind of hurricane force with a fetch of two miles made an ugly sea for a small vessel. A trading schooner anchored in Urufara Bay parted everything and drove up on the beach some 5 feet distant from high-water mark. In my opinion she was in a more sheltered anchorage than my vessel and the reason of her stranding was insufficient ground tackle and lack of attention by her crew."

"The wreck of the French gunboat *Kersaint* was moved by the sea about 100 yards in a southerly direction and now lies in shoal water, she was turned end for end, broken in half, and her forward half now lies bow to sea."

"The directions for entering Papetoai Bay would now be :—'Steer S.S.E. magnetic, passing the wreck cable to starboard, which would clear all dangers.'"

"The storm reached its worst at about 6 p.m. on January 2nd and from then began to taper off; by midnight the wind in the bay was about force 6 and the sea had abated."

"During the storm there was a torrential downpour of rain, over 50 inches fell in 48 hours, great damage being done by washouts and land slides."

"In Papeete the wind was E.N.E. and not more than moderate gale in force, but a tremendous downpour of rain was experienced."

"Outside the reef on the northern end of Moorea, the wind was probably not more than moderate gale in force, but on nearing the land it led up the various bays and valleys with greatly augmented velocity. In Papetoai and Paopao Bays the virgin forests were laid flat and look as though a fire had passed through them."

"Great damage was done to plantations and a great many houses were lifted from the ground and wrecked."

"At 6 p.m. on January 1st the barometer stood at 29.70 in.

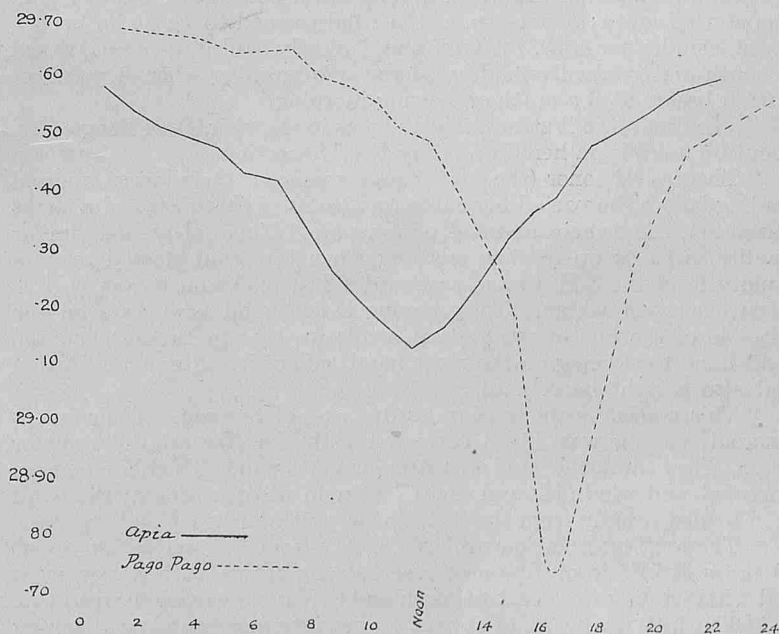
" 9 p.m. " " " 29.60 in.

" Midnight " " " 29.52 in."

"It remained practically stationary until 6 p.m. on the 2nd when it began to rise. At 9 a.m. on January 3rd it reached 29.92 in. From reports given by local schooners arriving from the islands of Maiao (Saunders Island), Huahine, Raiatea and Bora Bora, the damage done to these islands was very severe. The storm apparently increased its violence as it travelled to the West."

The following is an extract from a letter received by Rear-Admiral A. G. HOTHAM, C.B., C.M.G., R.N., Director of Naval Intelligence, from Mr. ANDREW THOMSON, Director of the Apia Observatory, Western Samoa, also forwarded by the Hydrographer of the Navy :—

"Referring to the cyclone which passed the Samoan Islands on New Year's Day, 1926, 'There were nasty squalls from the east, accompanied by heavy rain, from midnight until 4 a.m., the barometer sinking with its diurnal variation from 29.60 to 29.50. From 4.30 until 11, the barometer continued to fall; the wind came from the



165° Meridian Time West

Copy of Graph of Atmospheric Pressure at Apia and Pago Pago, during Cyclone of January 1st 1926.

east and east-south-east, being strongest from 8 to 10.30, reaching velocities from 60 to 75 miles per hour. During this time both the *Lady Roberts* and the *Siliafai*, two small boats in the harbour, were driven ashore and seriously damaged. From 11.45 to 12.30 the wind dropped to a light breeze; temperature rose and the sky cleared except for a few fleecy clouds. The wind then sprang up from the south and south-west, reaching velocities 60-75 miles an hour. This blow was especially disastrous to the plantations, tearing down trees which had been loosened by the morning storm. At 4 the wind had veered round to the west and had fallen to a light breeze. The barometer rising to 29.60 at 4 p.m. Exceptionally clear weather continued during the following week.

"It is evident that the storm centre travelled north of Apia, passing almost directly over Pago Pago and going a little south of Manua. On January 4th there was a 'Low' at Rarotonga, with winds of force 4 from S.S.E., which is probably the remnant of the Samoa storm. This would give a velocity of about 350 miles per day.

"The accompanying Figure is a copy of a graph of the Atmospheric Pressure at Apia and Pago Pago on January 1st, 1926."

#### WILLY-WILLY AT BROOME, N.W. AUSTRALIA.

THE following was received from Mr. P. PENTONY, Master Mariner, resident at Broome:—

"Since the 12th of January, 1926, we had strong S.E. winds with heavy rain squalls and heavy thunder and lightning, sky continually overcast with heavy ragged scud. Mercurial Barometer dropping steadily from 29.85 although ranging steadily 10 to 16 points, till on January 22nd at 10 a.m. the mercury stood at 29.45. On that morning we had telegraph communication to say that a 'Willy-Willy' was approaching, centred at Broome, but all the morning the sky was just the same, a dirty black, S.E. gale of wind, sky with heavy ragged scud well defined, and almost continuous rain, squally but wind steady at S.E. Speed about 40 to 50 miles per hour.

"At 1 p.m. appearance of sky changed getting low and clouds all merged into one greasy mass, and wind increasing rapidly driving the rain almost horizontally and lifting the sand and driving it in clouds.

#### BAROMETER READINGS.

10 a.m. -	-	-	29.45	5 p.m. -	-	-	29.07
11 " -	-	-	29.44	6 " -	-	-	29.06
Noon -	-	-	29.38	7 " -	-	-	29.05
1 p.m. -	-	-	29.32	8 " -	-	-	29.07
2 " -	-	-	29.35	9 " -	-	-	29.10
3 " -	-	-	29.19	10 " -	-	-	29.15
4 " -	-	-	29.11				

"At 5 p.m. the wind started to haul to the southward and at 7 p.m. was almost south; from 4 p.m. the wind seemed to be at its height, about 90 miles per hour. After 7 p.m. it slowly hauled to the westward of south and gradually moderated towards morning when it was just a fresh breeze at 6 a.m. the following morning.

"The first place it struck the land was in the vicinity of Beagle Bay about 66 miles from here in a N. by E.  $\frac{1}{2}$  E. direction.

"There a schooner (the *Mina*) was wrecked; their lowest aneroid reading before she parted her cable was 28.20. This glass had a slight correction, somewhere about 4 or 5 points. There they had similar conditions to us up to that morning when the wind started to haul rapidly from the S.E. to the eastward till at 8.30 a.m. it was E.N.E. when she went ashore. They having a left hand haul were on the left side of the line of progression, while we here in Broome had the right hand haul being on the right hand side of it. Streeter's Station had also a right hand haul.

"This station is about 15 miles due east of Broome. Their lowest Aneroid reading was 28.53 corrected with the Mercurial Barometer here. They think the wind was strongest at 8 p.m. Their houses were unroofed and windmills and trees blown in all directions; the wind then hauled rapidly from the S.E. to the southward.

"The next information we have of it is from Edgars Station about 13 miles S.S.E. from Broome; very strong winds with heavy rains and wind hauling from east to south and S.W.; no barometer readings.

"The last we heard of it was from cattlemen who were coming over land; they were camped about 45 miles S.E. of Broome and they said they had very bad weather with the wind hauling from east to south. They thought the wind was strongest about 2 a.m. on the 23rd.

"From the foregoing I would imagine this 'Willy-Willy' formed

out at sea and struck the land a little to the westward of Beagle Bay, Latitude 16° 54' S., and from there travelled in a S. by E. direction and blew itself out in the bush as we have heard no further news of it. Taking the time that it passed Beagle Bay, 10.30 a.m., to the time it passed Streeter's Station at 9 p.m., about 10  $\frac{1}{2}$  hours, it gives a rate of over 6 miles per hour between the two places.

"Taking the readings of the glass here and at its lowest 29.05 and the reading at Streeter's Station 28.53 points, the difference being 52 points for 15 miles distance, I would imagine another 10 miles would have been the centre, and an additional 15 miles from us to the outer circle, when the glass stood at 29.45, it would give a radius of 40 miles or a diameter of 80 miles for the whole disturbed area.

"Is this not a strange course for a cyclonic storm to take in this Latitude and the conditions immediately preceding the storm peculiar?"

"I have been in Typhoons in the China Sea and Cyclones in the Bay of Bengal, and one hurricane in the West Indies and on each occasion we had always two or three days flat calm and all those storms followed the natural course of cyclonic storms. But this one seems to have steered a course of its own and forced its way through a hard S.E. gale of wind. If it is not too much trouble I would be very pleased if you would give me any information on the subject."

NOTE.—This storm progressed on a normal track for the month of January which with February is a month of maximum frequency.

The centre passed close to and west of Beagle Bay and close to but east of Port Broome. The storm was at this time recurving from a S.W. to a S.E. direction and its centre passed between the two places. The storms of this month originate to the Northward or N.W. of the continent and at first move south along the coast later recurving to S.E. and move inland.

Their average speed is about 200 miles per day but may be as much as 500 miles per day.

The falling barometer from the 12th January onwards was a reliable sign of a disturbance to the northward and Broome being on the line of progression experienced the steady S.E. wind for some days previously.

#### AURORA.

##### Southern Ocean.

THE following is an extract from the Meteorological Log of S.S. *Port Chalmers*, Captain W. J. ENRIGHT, Cape Town to Melbourne. Observer Mr. E. N. ROGERSON, 3rd Officer.

"January 14th, 1926. Mean Latitude 44° 45' S. Longitude 119° E.

"8 p.m. Sky almost cloudless. Cirrus to the southward. Visibility very good.

"8.30 p.m. What appeared to be a heavy dark cloud bank settled down all round horizon. Visibility becoming very poor.

"9 p.m. Observed Aurora bearing from S.E. to S.W. having an arc shape. Moderately brilliant rays of light thrown up to vertically from behind the dark patch on horizon.

The highest altitude reached by the rays being approximately 30° above the horizon at middle of arc. To the S.E. and S.W., many less brilliant rays close together and radiating outward like a fan. The stars could be seen plainly through the rays and also through the dark patch on the horizon, although no break could be detected in same.

At intervals the rays would disappear, leaving a diffused light of altitude 10°.

The colour of the rays was deep blue at the base, gradually becoming more of a white or grey further along the rays.

"3 a.m. Aurora finished."

##### Diffuse Aurora in the North Atlantic.

THE following is an extract from the Meteorological report of S.S. *Colonian*, Captain R. P. GITTENS, Avonmouth to Portland, Me., Observer Mr. T. A. SCHOFIELD MILLER.

"January 26th, 1926, at 2205 G.M.T. in Latitude 44° 44' N.; Longitude 51° 22' W.; observed a brilliant red glow in the sky bearing E.N.E., which gave the impression of a huge fire. Cumulus clouds were passing before it from the N.N.W. and it was reflected faintly



on the clouds to the westward. Stars were also visible through it. The sun had been set almost two hours, but the moon was visible bearing E. by S. By 2230 G.M.T. it had gradually faded away."

### ST. ELMO'S FIRES.

THE following is an extract from the Meteorological Log of S.S. *Empress of Asia*, Captain L. D. DOUGLAS, Yokohama to Vancouver, B.C. :—

"January 20th, 1926, 7.30 p.m. in Latitude 37° 43' N., Longitude 145° 21' E., a great display of St. Elmo's lights was experienced at this time.

"Just before a heavy hail squall the Wireless Aerial was lighted up to the thickness of a 'hawser,' also a light on each truck and one on the Wireless Aerial insulator at the foremast were very prominent. No light showed on the rigging whatsoever.

"The light cast at this time lighted the ship up with much brilliance.

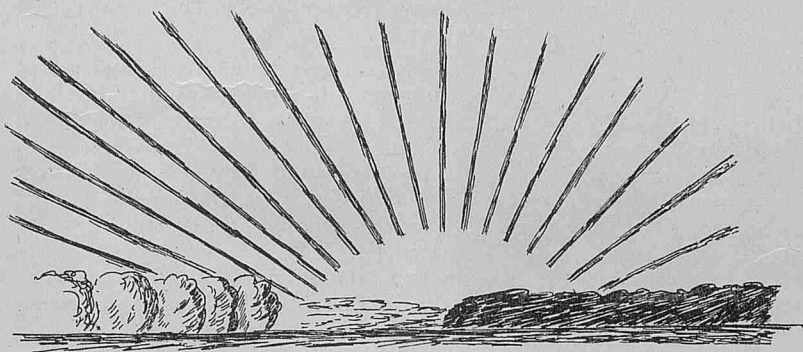
"The same thing was experienced under the same conditions at 7.30 a.m. the following morning, but the light was not nearly so bright."

### RADIATING STREAKS OF CIRRUS.

#### In the South Indian Ocean.

THE following is an extract from the Meteorological Report of S.S. *Olan Lamont*, Captain A. B. McCORNISH, Durban to Mauritius, Observer Mr. C. W. BANBURY, 2nd Officer.

"Sketch of peculiar radiating appearance of Cirrus streaks observed at 0045 A.T.S. on January 25th, 1926, in Latitude 21° 32' S., Longitude 53° 45' E. Bearing of the centre of radiation 45°. Wind South, Force 4. Barometer 1012.5 mbs. Air 80° F. Moon's Altitude 19°, bearing 304° approximate and effectively lighting the scene. The Cirrus streaks were closer and more attenuated to northward. Cumulus and Stratus clouds on the horizon. The phenomenon lasted some fifteen minutes, when Fracto-Cumulus crossed the sky quickly from windward. Fine weather with marked diurnal range."



### SAND DEVILS.

#### Red Sea.

THE following is an extract from the Meteorological Log of H.M.S. *Endeavour*, Captain S. A. GEARY HILL, D.S.O., R.N., surveying the Red Sea and Gulf of Aden, Observer, Lieutenant J. V. TORLESSE, R.N.

"Phenomenon locally termed 'sand devils' were observed in January, 1926. These appear as vertical spouts of sand 30 to 50 feet in diameter and advancing slowly. Several ordinary water spouts on arriving at the beach were observed to change into sand devils and continue on their path as such. This phenomenon is reported by the local authorities to be harmless."

### EARTHQUAKE IN THE SOLOMON ISLANDS, PACIFIC.

EXTRACT from a letter from Mr. FRANK PINCHING, Health Inspector of LEVER'S PACIFIC PLANTATIONS LTD., Gavutu, Solomon Islands, received through the Colonial Office.

"On the 25th January, 1926, at 11.30 a.m. I was on board the a/v. *Miro*, the position of the ship at the time being about two miles north of Bonalli, the Island of Savo, ship's course being east by north.

"The sea was calm, there was a slight wind from the N.N.W.

"Suddenly a shock through the vessel was felt, giving me the impression that the vessel had either struck a floating object or a reef, or that the propeller or rudder had become detached.

"The ship's engine was at once stopped when a further slight shock was felt.

"The rudder and propeller being examined and found in order, the engine was restarted, and the ship proceeded to Gavutu nothing to note occurred on the way.

"Upon arrival at Gavutu I was asked by Messrs. HEWITT and GASKELL if I had noticed anything unusual that morning and I answered in the affirmative, informing them as above.

"Subsequently I was informed by Mr. BRITTON that he had observed a distant tidal wave which occurred at Gavutu between 12.30 and 1 p.m. the sea washing over the staves of the retaining wall in front of No. 4 bungalow.

"NOTE.—Reports indicate that shocks were felt at several islands of the group and at Visale, Guadalcanal, the stone church of the Roman Catholic Mission was destroyed."

### EARTHQUAKE SHOCK.

#### Off West Coast of South America.

THE following is an extract from the Meteorological Report of S.S. *Essequibo*, Captain E. E. DUNCAN, Valparaiso to New York, Observer, Mr. A. LYALL, 3rd Officer.

"January 1st, 1926. In Latitude 23° 26' S., Longitude 70° 42½' W. at 4.30 p.m. Chilean Mean Time experienced an earthquake shock of two seconds duration; soundings as per chart, 385 fathoms."

### DIFFICULTY IN RECEPTION OF W/T MESSAGES FROM CERTAIN COAST STATIONS IN THE CHINA SEA.

THE following is an extract from a letter received from Father E. GHERZI, S.J., of Zi-ka-wei Observatory, Shanghai, China :—

"I am just in receipt of the July Number of THE MARINE OBSERVER and I read with pleasure what you printed about the zone of silence off Foochow for the W/T from the FFZ, Shanghai-Zi-ka-wei Station.

"It seems to be a real fact and we had several steamers, for instance, P. & O. s.s. *Sardinia* and LLOYD-TRIESTINO s.s. *Esquilino* greatly delayed because of not having been able to pick up our typhoon warning off Foochow. The second boat *Esquilino* having received a wrong signal from another broadcasting station almost ran into the centre of a very violent typhoon.

"So I will give you some more zones of silence signalled to me along the China Seas.

"(1) There is a zone of silence along the Anam Coast, between Padaran and Varella Point for the Mytho and Tourane Radio Stations. It is almost impossible to pick them up when on these places.

"(2) It seems there is another zone of silence off the Paracels for the radio stations of Hanoi and environs.

"(3) In the middle of the Formosa Strait both Hong Kong VPS and Shanghai FFZ are lost, up to the Foochow coast.

"(4) To the S.E. of Quelpart Island there is a zone of silence for the Tientsin and Peking Radio Stations.

"(5) Once behind the Shantung Promontory, in the Pechili Gulf, it is very difficult to pick up Shanghai-Zi-ka-wei typhoon warnings and time signals

"(6) Along the Yangtse-kiang River between Nanking and Ching-kiang there is a zone of silence for the Shanghai-Zi-ka-wei Radio Station.

"It would then be very useful to navigation if officers of the steamers going along the China Coast would try to ascertain these zones and to find out the limits in longitude and latitude as has been done for the zone of silence to the S.E. of Ceylon.

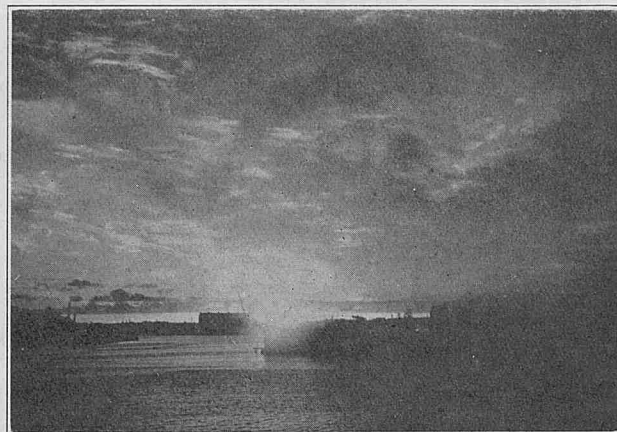
"I will now add that because of this handicap of our warnings I will have our Zi-ka-wei weather forecasts and signals of storms sent on *short wave* (34 metres), beginning July 15th, 1926. These will be preceded by the usual general call and the FFZ initials at 11h. 30m. (G.M.T.).

"Ships having a short wave receiver are cordially invited to repeat these warnings on the 600 metre wave for the benefit of other ships.

"The range of this short wave set is of about 2,000 miles. Having myself been along the China Coast for scientific research I have not found any zone of silence for these short waves. I always received them very easily and strong, although this had been during May and June when statics are very bad on 600 metres wave."

## CLOUD PHOTOGRAPH TAKEN AT SYDNEY, AUSTRALIA.

THE accompanying photograph has been received from Captain T. V. ROBERTS, s.s. *Euripides*, taken while at Sydney.



Sunset at Miller's Point, 7th January, 1926.

## SIR H. ACTON BLAKE.

BY CAPTAIN T. GOLDING, C.B.E., ELDER BROTHER OF TRINITY.

THE subject of this brief memoir was an outstanding figure in the Maritime World and one of the most distinguished men who have sailed under the Red Ensign.

Born October 19th, 1857, the only son of Mr. J. G. BLAKE, of Winchester, he commenced his sea career in 1872 in the ship *Sea Star*, trading to the Far East when modern Japan was emerging from its shell, of which he had many interesting reminiscences.

On obtaining his Board of Trade certificates he joined the BRITISH INDIA COMPANY as a Junior Officer in 1878, rapidly rising to command, commanding, among other vessels, the *Colaba*, *Coconada*, *Bhundara*, &c.

After remaining fourteen years in the BRITISH INDIA COMPANY he resigned in 1892 in order to serve in the Royal Navy as a Lieutenant, R.N.R., continuing to do so until 1894, serving in the following of His Majesty's Ships *Tamar*, *Imperieuse*, *Arethusa* and *Severn*.

He rejoined the Merchant Service in 1895, commanding the following vessels of the AFRICAN STEAMSHIP COMPANY and COMPAGNIE BELGE MARITIME DU CONGO—*Coomassie*, *Angola*, *Albertville*, retiring from the latter service in 1900 on being elected as Elder Brother of Trinity House, of which Corporation he had been a Younger Brother since 1898.

It may be said that his public life now commenced and that up to his untimely death it never slackened. When the Port of London Authority was formed he was the first Trinity House representative on that body. He served on many important Committees set up by the Board of Trade between 1902 and 1925, viz.:—Merchant Service Committee, 1902, Tonnage Committee, 1905, Pilotage Committees, 1913–1919, Mercantile Marine War Risks Compensation Scheme, 1921, Chairman of the Board of Trade Advisory Committee on Pilotage, Chairman of the Dock and Harbour Dues Claims Committee, British Delegate at the International Conference on Safety of Life at Sea, 1914.

On the retirement of Sir GEORGE VYVYAN in 1910 he was elected to the responsible post of Deputy Master of Trinity House, a post which he filled with great distinction for 16 years, during which time it may be said with confidence that the prestige of Trinity House never stood higher, tested as its organisation and resources were by

the Great War. In 1920 at the request of the Board of Trade, he proceeded to Ceylon to report on the whole question of the maintenance and upkeep of the lights on the south coast of Ceylon, Basses, Minicoy, &c., and as the result of his report many important changes in administration were made.

All institutions connected with the welfare and well-being of seamen had his cordial sympathy, he was Vice-President of the following:—

The Sailors' Home, Seamen's Hospital Society, Royal Alfred Aged Seamen's Institute.

He was also the Treasurer of King George's Fund for Sailors and a member of the Committee of Management Royal National Lifeboat Institution and Missions to Seamen. He was a Director of the Royal Exchange Assurance Corporation.

On the occasion of the 400th Anniversary of Trinity House Charter by Henry VIII, in 1914, he was created K.C.V.O., and for his services in the War, the important work carried out by Trinity House, under his direction, he was in 1918 created K.C.M.G.

He married in 1897, Lucy Grace, daughter of Mr. JAMES THIN. His only son, Sub-Lieutenant L. W. A. BLAKE, R.N., a most promising young officer, was killed on active service in August, 1918.

A severe operation was necessary in November, 1925, from which it was thought that he had made a good recovery, and it was hoped that a voyage to the Cape and back, on which he started with Lady BLAKE in February, 1926, would completely restore him to health. Unfortunately this was not to be, and he died suddenly on board the ROYAL MAIL Steamer *Arundel Castle* on March 7th, his body being committed to the sea which he had served so well and truly. Of conspicuous ability and untiring energy, he combined firmness of purpose with great courtesy and personal charm, his motto might well have been "Suaviter in modo, fortiter in re."

In passing he carried with him the affection of his colleagues, the respect of all who came into contact with him and the admiration of the Merchant Service of which he was so distinguished a member.





The Deputy Master of Trinity House 1910-1926.  
CAPTAIN SIR H. ACTON BLAKE, K.C.M.G., K.C.V.O., R.N.R.

## THE PRACTICAL APPLICATION OF WIRELESS TO METEOROLOGY.

BY COMMANDER J. A. SLEE, C.B.E., R.N. (RET.).

IN the following remarks an attempt is made to go a step further towards the practical application of wireless telegraphy as it now stands in relation to meteorological work. The subject appears to divide itself into six separate headings:—

- (1) The handling of messages from stations on shore to ships at a great distance on the high seas.
- (2) The handling of messages from stations on shore to ships fairly close to the coast.
- (3) The handling of messages from stations on shore to small craft near to the coast.
- (4) Distribution of information by selected ships.
- (5) The handling of messages between ships.
- (6) The use of direction finders.

### (1) Long-Distance Messages to Ships at Sea.

The present possibilities are such that the majority of British Merchant Ships can now receive messages from very large high power long wave stations almost anywhere over the ocean. Absolute regularity cannot be guaranteed, but ships fitted with modern receivers (which now form the majority) can read Rugby almost anywhere.

But for weather purposes it is doubtful if any information of great value to a ship, say, in the Pacific, can be transmitted from Rugby. After all, the Master of a vessel is most intimately concerned with the weather which he is likely to encounter in the near future.

It appears possible to organise a distribution of weather messages which would give too wide a dispersion for the use of a mariner. It is clear that for general meteorological purposes the wider the area over which information is drawn, the better from every point of view, but the messages to ships do not need to cover so enormous an area, and therefore weather messages from the very high power stations with almost world-wide range are probably of less service to seamen than would at first sight seem probable.

If such messages are sent at ordinary commercial rates, brevity will be very necessary, on account of the expense which would otherwise be incurred. So far, weather messages are not being sent from these very large high power stations, and from the above it seems that there is no reason why they should be.

Proposals have been made for the transmission from a large station of barometer charts in pictorial form. Such a method is feasible, but the considerable time required to complete the transmission implies very heavy expense at the transmitting end, and suitable receiving apparatus would necessitate considerable expenditure in each ship which desires to receive the picture, and the transmission would be useless to all ships not so equipped. This method, then, appears to be outside the bounds of practical application for the present.

### (2) Messages to Ships fairly close to the Coast.

The range to be covered is moderate and messages can be received by ships with very modest installations. Such messages may take the form of:—

- (a) Definite statements as to the weather at various places, accompanied by localised forecasts.
- (b) A message indicating the barometer, wind, &c., at many points, from which information a weather chart could be drawn up by the recipient.

The class of message described under (a) is of obvious importance and of great utility to all shipping in the neighbourhood, whether the Masters desire to forecast weather more fully or not. These messages are also short, and therefore add but little to the volume of traffic being handled in any particular area.

The form of messages outlined in (b) above is at present of more restricted value, and its length is such that it is not advisable that it should be handled on the ordinary wavelengths. These messages are being made as a regular practice by wireless and can be intercepted

by almost any ships which desire them. The number of ships with receiving apparatus which is inadequate for this purpose is getting daily less and less, and the question of whether or no such messages can be received is one of administration rather than of technical possibilities.

### (3) Messages to Small Craft near to the Coast.

Messages for small ships are best sent by telephony, because we are catering for ships too small to be compulsorily fitted with wireless telegraphy, and therefore in all probability without a telegraphist. Such small ships, employed for the most part upon short voyages close to the coast, are not likely to require messages other than those indicated under (a) of (2) above; indeed, it is possible that a still more localised and simplified service might be of advantage. Messages of this nature are already being capably handled by some of the B.B.C. stations, and it seems probable that the use of this form of weather message may increase.

### (4) Distribution of Information by Selected Ships.

A certain number of selected ships have been requested by the Meteorological Office to transmit to "All ships" daily reports of the weather they are experiencing at definite times, when the ships are clear of home waters. These observations are taken at times which synchronise with those used by the weather service of the nearest coast. The messages are transmitted by the ships on spark (600 metres) or C.W. (2,400 metres) as the captains think most likely to be useful, at the first opportunity after the observations when single operator ships are keeping watch.

### (5) Messages between Ships.

There are very few places nowadays where any ship is not in touch by wireless with at least two others during some portion of the 24 hours, and therefore the master of a ship can usually obtain direct information as to the state of the weather, and the height and recent movement of the barometer in the areas which he is approaching. This information can be obtained by direct question and answer.

Large ships fitted with all the latest appliances may be able to make invaluable forecasts as to the probable weather in their neighbourhood, and such information might be of the greatest value to other less well-equipped ships in their neighbourhood, especially if we consider the case of ships far away from land. Against all this the responsibility for the accuracy of forecasts so made up, and for promulgating them or not promulgating them, is very heavy, and cannot well be thrust on a voluntary organisation, but the value of any work so performed must be very great, especially in mid-ocean.

The captain of a ship is the only person who can be responsible for her safe conduct. He must always make up his own mind as to the advisability of altering course on account of probable bad weather, or of holding on, and though information as to prevailing weather and forecasts of probable changes made by others may be of great assistance to him in forming a decision, yet he cannot rely absolutely on the opinions of anyone but himself.

The next point for consideration is the comparative advantages of organising a service of this nature, so that all ships should inform one another of their weather conditions in accordance with some pre-arranged plan, or of leaving ships which are willing to undertake this duty (or that wish to make up forecasts for themselves) to obtain the information they require from neighbouring ships as and when they think it desirable. The second alternative appears to be the only practicable one. If the enormous number of ships at sea is remembered, the difficulty of organising their signals so as to make them useful and prevent interference is very great, and any mistake in carrying out such an organisation will cause a great deal of trouble and confusion. Trouble and confusion so caused will tend to render



a service, which at present is essentially voluntary, unpopular, and therefore hinder its development.

In short, it seems that if ships which are suitably equipped and which are willing to undertake the work, ask ships in their neighbourhood for such meteorological information as can be procured on occasions when the masters of the well-equipped ships think it desirable to do so, and if these ships then promulgate the result of the study of this information to ships likely to be concerned by it, there is no doubt that a most valuable service will be rendered. When the number of selected ships referred to in para. 4 increases, it will not often be necessary for ships to ask others for the state of the weather they are experiencing.

#### (6) The Use of Direction Finders.

The use of direction finders for meteorological work at sea is but little developed, and presents very serious difficulties. Under conditions in which really bad weather could be expected there is usually an almost continuous series of sounds audible in the telephones, due to atmospherics of all sorts. We have not at present sufficient data to enable us to say what the causes of all atmospherics are. Some of them are undoubtedly due to the same causes as those which produce lightning, either on a small scale or due to the electrical disturbance of the lightning itself. This will include electrical stresses set up by friction between volumes of air moving at different speeds. Electrical disturbances of this nature are going on all over the world. The disturbances caused are in some cases audible in the telephones at great distances, at other times this is not the case and further, some of these disturbances appear to have a fairly well-marked wavelength and others do not. In addition to the above, electrical sounds are often heard in the telephones, which are due to purely local disturbances.

Out of all the noises thus produced, it is impossible to distinguish those emanating from any single source. Obviously then, it is

exceedingly difficult to obtain a bearing by means of a direction-finder of any centre of bad weather, because it by no means follows that this centre of bad weather is the only source of the atmospheric sounds which will be heard in the telephones. Occasions have occurred when the source of atmospherics has showed a well-marked direction, and when this direction has coincided with the direction of the centre of a revolving storm. Again, well-authenticated cases have occurred in which the centre of a revolving storm appears to be unaccompanied by any severe atmospherics.

If it is desired to locate the position of such a disturbance with any accuracy, it becomes necessary for two observers to obtain its bearing at about the same time, and the extreme difficulty of deciding which of the atmospherics which may be heard by any single observer are due to a centre of bad weather, makes it almost impossible for two observers widely separated to observe the same group of atmospherics simultaneously.

Even for such a purpose as fixing the position of a thunderstorm a direction finder is not a very reliable guide, because many thunderstorms are of the nature of a line squall, and there is no means of determining which end of it is the source of any particular group of atmospherics. The evidence is not conclusive that the source of electrical disturbance actually accompanies what is commonly described as a thunder-storm. The rain may be some miles from the electrical centre.

From the above, it seems that a direction finder may be valuable in confirming deductions drawn from the direction of the wind, behaviour of the barometer, &c., but it cannot be regarded as sufficient authority for ignoring such warnings.

The accuracy of a direction finder as such does not enter into the question. Even an inaccurate direction finder would be extremely valuable for this purpose were it but possible to be certain that the bearing taken is indeed that of a centre of bad weather.

25th September, 1926.

## WIRELESS AND WEATHER. AN AID TO NAVIGATION.

By L. A. BROOKE SMITH, MARINE SUPERINTENDENT, METEOROLOGICAL OFFICE.

### Foreword.

THE following chapters are intended to replace and extend *Weather Forecasting in the Eastern North Atlantic and Home Waters for Seamen* and the articles which have appeared upon this subject on the Monthly Charts since May, 1920.

Particulars and descriptions of Weather Reports, Signals and Codes useful to shipping will be given separately, in as concise a form as possible, under "Weather Signals," as they become available, for all parts of the world, if possible in geographical order.

Since the establishment in June, 1921, of the coded Wireless Weather Report, broadcast for shipping through Poldhu, then Clifden and latterly Valentia and Malin Head or Land's End and Malin Head, there has been much evidence that suitably conducted wireless weather reporting can be made of great value to the Mariner.

This message gave actual observations of barometer pressure, wind direction and force, visibility and barometer tendency taken at 0700 and 1800 Civil G.M.T. at Blacksod, Stornoway, Holyhead, Scilly and Dungeness, Coast Telegraphic Weather Reporting Stations, so that the Mariner was given some idea of the conditions upon which the Meteorological Office based its forecast for the Western Coasts which was issued in plain language at the same time. It gave ships near and at a distance a means for comparing barometric pressure which has led to a better understanding of the functions of the barometer as a means of measuring the pressure of the atmosphere and formed a basis from which to extend weather charting at sea.

The period is one of transition in method. Formerly, without distant communication, the Mariner was forced to rely upon his own isolated observations to predict weather, which, in ships proceeding at speed, was extremely difficult and uncertain. Wireless telegraphy has given him a means of communication whereby he may obtain information of existing weather conditions not only along his route, but at positions within range in all directions where there happen to be other reporting ships or stations. With such information and his knowledge gained by long experience the Mariner may obtain a better idea of what conditions he may expect. If he will plot the information and construct a weather chart he will have a graphic representation of the general conditions over a considerable area with detailed information at a number of points at the time of observation. From such a chart, with a knowledge of meteorology, he will generally be able to forecast the weather to be expected along his route for a day or even longer.

It is our aim to give suitable guidance to Mariners for the making of such charts and forecasts by a simple and quick process.

It will first be necessary to give a brief description of the Fundamental Weather systems as determined from charts for Extra Tropical Latitudes; though *The Marine Observer's Handbook* will remain the standard guide to the use of instruments and observation we shall give some brief notes upon special precautions which are necessary for instrumental observation in wireless weather work; then show how charts and forecasts may be made at sea from Wireless

Weather Reports, and using the observations of Marine Observers in all seas from which sufficient synchronised observations are give experiences and suggestions for the application of the method available.

## SECOND EDITION.

### Preface.

Since the first edition of these serial chapters was published in the first Volume of *THE MARINE OBSERVER*, many officers new to the Corps of Voluntary Marine Observers have joined, a considerable number have, therefore, not had complete information upon the subject. There have been many requests for these chapters and some have asked that they might be printed in cheap separate book form so as to be readily procurable by the Officers of the Merchant Service generally.

There have been developments which have been since dealt with in separate articles in later numbers of *THE MARINE OBSERVER*, so that it is intended to revise and improve the arrangement of the chapters in this year's *MARINE OBSERVER*. When that is done will be the time to consider a cheap edition in separate book form.

Many weather charts made by officers at sea with coast station and single ship observations, also quite a number with several ships' reports at a distance, have been returned to the Marine Division proving that weather charting is practical and becoming popular with increasing numbers of officers at sea.

Records of routine reports sent to "All Ships" (C.Q.) in Meteorological Logs and the new edition of the Ship's Meteorological Report (Form 911), show that there is steady progress in this form of observation and communication which is the real backbone of the system.

Every ship of the 500 on the Voluntary Observing Fleet List which has a mercurial barometer is invited to make these standard form plain-language reports to "All Ships" daily as a matter of routine.

Amongst many valuable contributions received we have a Track chart for the round voyage out and home giving the daily positions at the correct time of observation of a ship whose commander has been a pioneer of this system with the Wireless Weather reports sent to C.Q.; also the names of ships which were actually in wireless touch at the time.

This evidence of the number of regular observing ships suitably distributed on any day which are in a position to give essential information and the great number of ships able to receive it is convincing; with good will and the unselfish work of Marine Observers a very effective Weather intelligence service can be established at sea. Many cases have been reported where this work has been a real aid to navigation both as regards safety and economy of time

and fuel. Probably, at the time, those who provide and broadcast the information have no idea how important it may be, and therefore if made a habit of routine in a suitable number of suitably equipped ships it will be the more beneficial to all at sea.

As regards observations from the coast, broadcast from a central station, these, being provided by Telegraphic Weather Reporting Stations and Observatories equipped with instruments of a high order of accuracy especially as regards barometric pressure, provide a sound foundation upon which to extend. The station reports of the British Wireless "Weather Shipping" Bulletin, which Bulletin has replaced all other routine wireless weather messages for the British coasts for shipping, provide the necessary data and no more, in the form most suitable for seamen, this bulletin having been framed and drawn up after obtaining the consensus of their opinion as far as was possible.

This system of broadcasting in one message all the most important facts as regards weather at the coast, as well as official forecasts for adjacent sea districts on a definite plan and in the International Code, is one which it is hoped all maritime countries will adopt. Sweden has already followed by adopting a Wireless "Weather Shipping" Bulletin uniform with that of Britain; so that data for the N.W. coast of Europe is made available to seamen with the least trouble to them. Recently Australia and South Africa have adopted bulletins for shipping, giving observations at coast stations, but we hope that the wish which many British seamen have expressed, that all British Dominions may some day adopt a bulletin similar to that which they advocated and which has proved a success for the British Isles may be fulfilled.

Provision of data by wireless for the coasts of most countries of the temperate zones now exists and it is hoped that progress will soon be made on the coasts of tropical countries, especially where hurricanes are common.

If wireless and weather is an *aid* to navigation, it will be an *essential* to air navigation over the sea, and there is no doubt that aircraft will be used extensively for oversea communication quite soon.

It is therefore in our interests as seamen that wireless and weather as an aid to navigation should be well established upon sound lines as a recognised branch of seamanship. My endeavour has been, and is, to obtain facilities which are practical to seamen and to inform them of these in seamanlike terms.

## CHAPTER I.

### Observation.

The object of the Synoptic Synchronous Weather Chart, simply termed for use at sea "The Weather Chart," is to give a picture of the actual weather conditions over an area at the same moment of time—a bird's eye view. For this purpose only observed facts are required. These facts may be made known to all ships having Wireless Telegraphy receiving gear, by ships having the necessary instruments and equipment, and by coast stations, communicating meteorological observations taken at a certain time and upon a definite plan.

The plan of observation best suited for Wireless reporting at sea

is simply an improvement upon that adopted in all well-ordered ships for logging the weather and full instructions will be found in *The Marine Observer's Handbook*. In this chapter will be shown the precautions which are necessary for instrumental observation and in framing the messages.

Time will be dealt with in a later chapter; meanwhile it is sufficient to say that observations which are broadcast for the purpose of giving data for making Weather Charts should be taken at the same time as those of the nearest coast.



**The Barometer.****Absolute Pressure.**

The isobar is the fundamental feature of the weather chart, and since an isobar is a line drawn through places which have equal barometric pressure, it is necessary that all barometer readings used for drawing isobars should be reduced to one datum.

*Only corrected barometer readings should be transmitted by wireless telegraphy.*

*If the barometer reading is not corrected, it is better not to send it by W/T at all, for an incorrect reading may be very misleading if plotted on a chart.*

The datum for which atmospheric pressure is required is that of sea level at a temperature of 32° F. in latitude 45°.

The Marine Mercurial barometer is the most satisfactory instrument for measuring atmospheric pressure at sea.

**Mercurial Barometer readings should be corrected for—**

(1) Height above sea level, because with height pressure is reduced.

(2) Temperature, because mercury expands with heat and contracts with cold.

(3) Gravity, because due to flattening of the earth at the poles the weight is greater at the poles than at the Equator, and so the height of a column of mercury required to balance the atmospheric pressure in different latitudes will vary. We use the parallel halfway between the pole and the Equator, i.e., Latitude 45°.

**Aneroid Barometer readings** are only corrected for index error and height because difference of gravity does not affect the measurement by these instruments and they are compensated for temperature. The Aneroid is not very reliable for measuring absolute pressure but its deficiencies have been somewhat exaggerated. If constant precautions are taken it may give sufficiently accurate readings for wireless weather work in Middle and High Latitudes. It is not sufficiently constant for comparing with normals in Low Latitudes for the purpose of obtaining warning of tropical revolving storms.

*Be sure to ascertain the Index Error of the Barometer before sailing.*

**To correct a Mercurial Barometer.****Graduated in Inches.****Tables.**

I.					II.				III.	
Temperature Correction.					Height Correction.				Gravity Correction.	
Temperature of attached Thermometer.	Inches.				Height. Ft.	Temperature of Air.				Latitude.
	28·0	29·0	30·0	31·0		20°	40°	60°	80°	
°F.	Ins.	Ins.	Ins.	Ins.		Ins.	Ins.	Ins.	Ins.	°
20	+·022	+·023	+·024	+·024	10	+·012	+·011	+·011	+·010	0
25	+·009	+·010	+·010	+·010	15	+·018	+·017	+·017	+·016	10
30	—·003	—·004	—·004	—·004	20	+·023	+·023	+·022	+·021	20
35	—·016	—·017	—·017	—·018	25	+·029	+·029	+·027	+·026	25
40	—·029	—·030	—·031	—·032	30	+·035	+·034	+·032	+·031	30
45	—·042	—·043	—·045	—·046	35	+·041	+·040	+·038	+·037	35
50	—·054	—·056	—·058	—·060	40	+·047	+·045	+·043	+·042	40
55	—·067	—·069	—·072	—·074	45	+·053	+·051	+·049	+·047	45
60	—·080	—·082	—·085	—·088	50	+·059	+·056	+·054	+·052	50
65	—·092	—·095	—·099	—·102	55	+·065	+·062	+·060	+·057	55
70	—·105	—·109	—·112	—·116	60	+·071	+·068	+·065	+·062	60
75	—·117	—·122	—·126	—·130	65	+·077	+·074	+·071	+·068	65
80	—·130	—·135	—·139	—·144	70	+·083	+·079	+·076	+·073	70
85	—·143	—·148	—·153	—·158	75	+·089	+·085	+·082	+·078	75
90	—·155	—·161	—·166	—·172	80	+·094	+·091	+·087	+·083	80
					85	+·100	+·097	+·093	+·089	85

**Example.**

In Latitude 51° N. barometer reads 30·240 at a height of 36 feet above sea level. The attached thermometer reads 58° F., and the index error is +·005.

	Inches.
Uncorrected reading ... ..	30·240
Index error correction ... ..	+·005
	30·245
*Temperature correction for 58° F. ... ..	—·080
	30·165
*Height correction for 36 feet at air temperature of 58° F. ... ..	+·039
	30·204
*Gravity correction in Latitude 51° N. ... ..	+·014
	30·218
	or 30·22

**Graduated in Millibars.**

The standard temperature of the barometer is given on the Kew Certificate pasted on the inside of its packing case; it should also be engraved on the instrument itself.

**Table of Correction for Gravity.**

(Corrections to be applied to the standard temperature.)

Latitude of Ship.	0°	10°	20°	25°	30°	35°
Correction ... (degrees absolute).	—15·0	—14·0	—11·5	9·5	—7·5	—5·0

Latitude of Ship.	40°	45°	50°	55°	60°
Correction ... (degrees absolute).	—2·5	0·0	+2·5	+5·0	+7·5

**Example.**

Standard temperature of barometer ... ..	284°·2 a
Ship's latitude 52° N., correction ... ..	+ 3°·5 a
	287°·7 a

Divide height of barometer in feet above sea level by 5 and add ... ..

Thus barometer 42 feet ÷ 5 ... .. + 8°·4 a

Adjusted fiducial temperature ... .. 296°·1 a

Subtract observed temperature of attached thermometer at time of observation ... .. —289°·0 a

+ 7°·1 a

Divide by 6 ... .. + 1·2

Call the result millibars and add it to or subtract it from the observed reading of the barometer according to its sign :—

Observed barometric reading ... .. 1017·1 mb.

Correction as above ... .. + 1·2 mb.

Corrected barometric reading ... .. 1018·3 mb.

Broadly, this method is a dodge whereby the index error, temperature, height and gravity are applied. For full particulars, see *The Marine Observer's Handbook*, 4th Edition.

\* When the temperature, height or latitude is not exactly given in the tables the correction is obtained by interpolation.

**To obtain the Index Error of a Barometer.****Mercurial Barometer graduated in Inches.**

The ship's instrument must be compared with a standard barometer, the index error of which is known.

Hang the instrument, of which the index error is required, up side by side with the standard and leave for half an hour so that they may settle.

Read both barometers and correct both readings as explained; the difference between the corrected readings (no index error having been applied to the ship's instrument) will be the correction to be applied for index error of the ship's barometer + if too low, - if too high.

**Mercurial Barometer graduated in Millibars.**

These instruments as at present lent to ships by the Meteorological Office have the index error combined in the corrections explained above; should the index error be found by reliable comparison to have materially changed, the matter should be reported to the Meteorological Office or Agent.

**Aneroid Barometers.**

Hang a mercurial barometer, the index error of which is known, up side by side with the aneroid and allow to settle. Read both instruments, correct the reading of the mercurial barometer as described but apply no correction whatever to the reading of the aneroid; the difference between these readings will be the index error and correction for height above sea level combined for the aneroid. The height of the instruments must not be changed. This procedure should be frequently repeated as the index errors of some aneroids vary from time to time.

**Facilities for Barometric Comparison.**

Standard barometers are kept at the Marine Division, Meteorological Office, Air Ministry, Kingsway, London, W.C. 2, the Port Meteorological Office, Dock Office, Liverpool, and at all important Observatories. The Barometers of telegraphic weather reporting stations in all parts of the world are sufficiently accurate for the purpose of ascertaining the index error of ships' barometers.

When possible the Port Meteorological Officer or Agent boards ships on the list of regular observers to the Meteorological Office, and compares the barometer, but all wishing to derive full benefit from wireless weather reports should make their own comparisons as well as completing and sending in the blue post-card, Form 913, regularly. A further check may sometimes be made at sea by using Coast Weather Reports.

**Example.**

Suppose a ship is doubtful of the index error of her barometer, and she happens to be within 10 miles of Holyhead at 7 a.m. G.M.T. when the wind is light. The barometer reading is noted and corrections applied. On receipt of the morning weather bulletin, described in "Weather Signals," Vol. III., No. 26, which will be repeated in No. 38, Vol. IV., the approximate correct pressure at her position at 7 a.m. will be known and the difference with that observed should be the index error.

Such a comparison is only a check. If the wind is not light it should not be used, for gradient might cause error.

**Conversion of Millibars to Inches.**

It must be clearly understood that if two mercurial barometers, one graduated in inches and the other in millibars, are read at the same place and time, the uncorrected readings will differ. It is only when each reading has been reduced to the same datum that they will agree; the reason being that an inch barometer corrected for index error reads true at 28°·6 F. at sea level in Latitude 45°, while a millibar barometer reads true at its standard temperature, about 285° A. (54° F.) at sea level in Latitude 45°.

Therefore, before converting the reading of a millibar barometer to inches, or vice versa, by the Table, correct it.

**Table IV.—Conversion of Millibars to Inches.**

Equivalent in Mercury Inches at 32°, and Latitude 45° of Millibars.

Mb.	In.	Mb.	In.	Mb.	In.	Mb.	In.	Mb.	In.	Mb.	In.	Mb.	In.
925	27·32	940	27·76	960	28·35	980	28·94	1000	29·53	1020	30·12	1040	30·71
926	27·35	941	27·79	961	28·38	981	28·97	1001	29·56	1021	30·15	1041	30·74
927	27·38	942	27·82	962	28·41	982	29·00	1002	29·59	1022	30·18	1042	30·77
928	27·41	943	27·85	963	28·44	983	29·03	1003	29·62	1023	30·21	1043	30·80
929	27·44	944	27·88	964	28·47	984	29·06	1004	29·65	1024	30·24	1044	30·83
930	27·46	945	27·91	965	28·50	985	29·09	1005	29·68	1025	30·27	1045	30·86
931	27·49	946	27·94	966	28·53	986	29·12	1006	29·71	1026	30·30	1046	30·89
932	27·52	947	27·97	967	28·56	987	29·15	1007	29·74	1027	30·33	1047	30·92
933	27·55	948	28·00	968	28·59	988	29·18	1008	29·77	1028	30·36	1048	30·95
934	27·58	949	28·03	969	28·62	989	29·21	1009	29·80	1029	30·39	1049	30·98
935	27·61	950	28·05	970	28·65	990	29·24	1010	29·83	1030	30·42	1050	31·01
936	27·64	951	28·08	971	28·67	991	29·26	1011	29·86	1031	30·45	1051	31·04
937	27·67	952	28·11	972	28·70	992	29·29	1012	29·89	1032	30·48	1052	31·07
938	27·70	953	28·14	973	28·73	993	29·32	1013	29·92	1033	30·51	1053	31·10
939	27·73	954	28·17	974	28·76	994	29·35	1014	29·94	1034	30·53	1054	31·13
		955	28·20	975	28·79	995	29·38	1015	29·97	1035	30·56		
		956	28·23	976	28·82	996	29·41	1016	30·00	1036	30·59		
		957	28·26	977	28·85	997	29·44	1017	30·03	1037	30·62		
		958	28·29	978	28·88	998	29·47	1018	30·06	1038	30·65		
		959	28·32	979	28·91	999	29·50	1019	30·09	1039	30·68		

**Simplified Method of Correcting Mercurial Barometers.**

A slide which will greatly simplify the correction of the barometer has been invented: it has been tried and used with success by a few vessels on the list of regular observers, and certain modifications have been introduced. It is now intended to issue these slides more widely to ships as the slides become available.

**The Gold Slide Scale Mark III.**

These slides are attached by clips which embrace the cover of the barometer so that the slides can be fitted to any Kew pattern marine mercurial barometer.

The apparatus consists essentially of a thermometer and a slide worked from a rack and pinion. On the slide are engraved scales of height and correction to pressure, while on the fixed part are engraved scales of latitude and temperature, as can be seen in the photograph reproduced here.

**To use the Apparatus.**—Revolve the large milled headed screw until height of the instrument above the water line, indicated on top right-hand scale, coincides with the latitude of the ship (top left-hand scale).

The total correction to be applied to the barometer reading is then read off at the head of the mercury column of the attached thermometer by the scale to the right. The temperature is indicated by the scale to the left.

Barometers with these scales attached should be kept free from exposure to rapid changes of temperature, for these thermometers are rather more exposed than in ordinary barometers.

To test that the thermometer is correctly adjusted when the instrument is first placed in position, set the height scale so that zero height coincides with 45° on the latitude scale. Then read the value of the temperature scale corresponding to zero on the "correction to barometer scale." If this reading of the temperature scale is identical with the standard temperature of the barometer, the apparatus is in correct adjustment.





### Barometer Tendency, or Change in the Barometer.

In the "Laws of Storms," one of the first things experience shows us, is that the barometer falls in a ship hove to in the fore part of a travelling depression, and that when the trough passes and the ship remains stationary in the after part of a travelling depression the barometer rises. We also learn that a ship in the fore part of a travelling depression, steering in the same direction as the depression but at greater speed, will usually have a rising barometer and so on.

Now although the reason of this is well understood by experienced seamen questions indicate that some little help is desirable for younger officers, so we will introduce Captain HENRY PIDDINGTON'S "Sailors' Horn Card" modernized which we shall refer to again in a later chapter. Personally I not only used the "Horn Card" at sea but continue to do so constantly in the Office even when there are weather charts available for it gives one a good idea of the shifts of wind and changes of the barometer in a depression passing a ship under weigh without much mental effort.

#### The Sailor's Horn Card.

The "Horn Card" is simply a transparent diagram representing the approximate average or ideal winds and barometric pressure in a Tropical Revolving Storm upon which the "Laws of Storms" are based; and as Cyclones in higher latitudes though more irregular in shape and often of greater dimensions have similar characteristics, the "Horn Card" may be used as a rough guide for cyclonic depressions in all Latitudes.

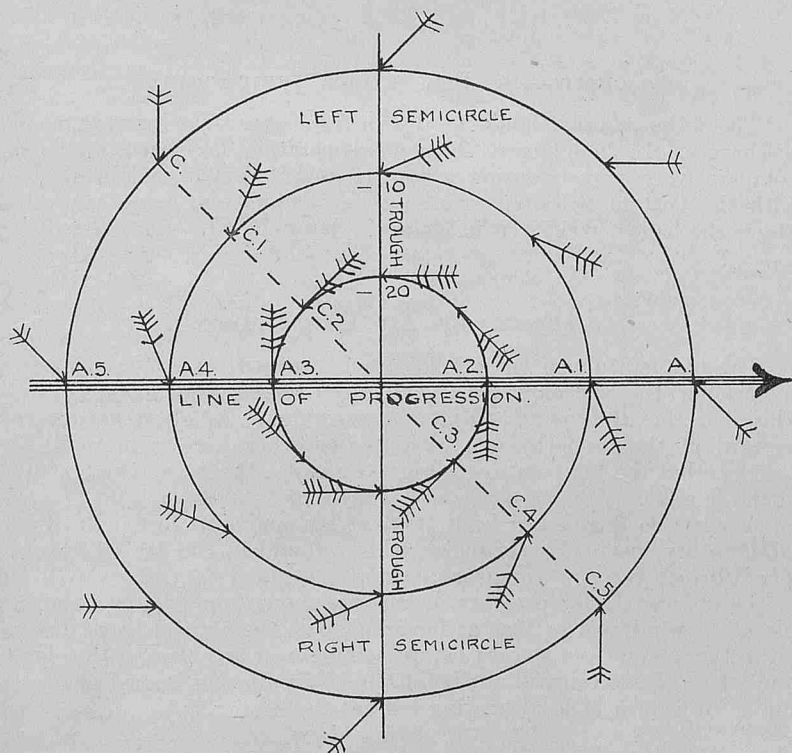


Fig. 1. The Horn Card for Northern Hemisphere.

To construct a "Horn Card" draw concentric circles on a piece of tracing paper or transparent celluloid as in FIGURE 1; these represent lines of equal atmospheric pressure known as isobars. It is not usual to attach any definite value to them but it may be convenient to call the inner circle or isobar — 20 as indicating a barometer 20 millibars or 6/10 of an inch lower than at the outside isobar, and the next circle from the centre — 10 as indicating a barometer 10 millibars or 3/10 of an inch lower than the outer circle or isobar.

To represent the direction and force of the wind in a hurricane, draw wind arrows as in FIGURE 1, those at the inner circle being drawn at a tangent to it or flying at an angle of 8 points to the bearing of the

centre, and in an anti-clockwise direction. The wind arrows at this circle where the barometer is 20 millibars or 6/10 of an inch lower than at the outer edge of the storm may have from 12 to 10 barbs as indicating force 12 to 10.

The wind arrows at the — 10 circle should indicate a direction with an inclination or indraught of about 2 points to the isobar or 10 points from the line of bearing of the centre and may indicate force 9 to 6. The wind arrows at the outer circle should indicate an indraught of about 4 points or make an angle with the bearing of the centre of about 12 points, and should have 5 to 2 barbs. A long thick arrow should be drawn through the centre dividing the cyclone into left and right semicircles and a line at right angles to this also passing through the centre may be drawn to represent the trough and dividing the cyclone into quadrants.

We now have a "Horn Card," winds anti-clockwise for the Northern Hemisphere, and by the simple process of turning this face down the diagram seen through the card of tracing paper or celluloid will also give us a "Horn Card," winds clockwise, for the Southern Hemisphere, FIGURE 2.

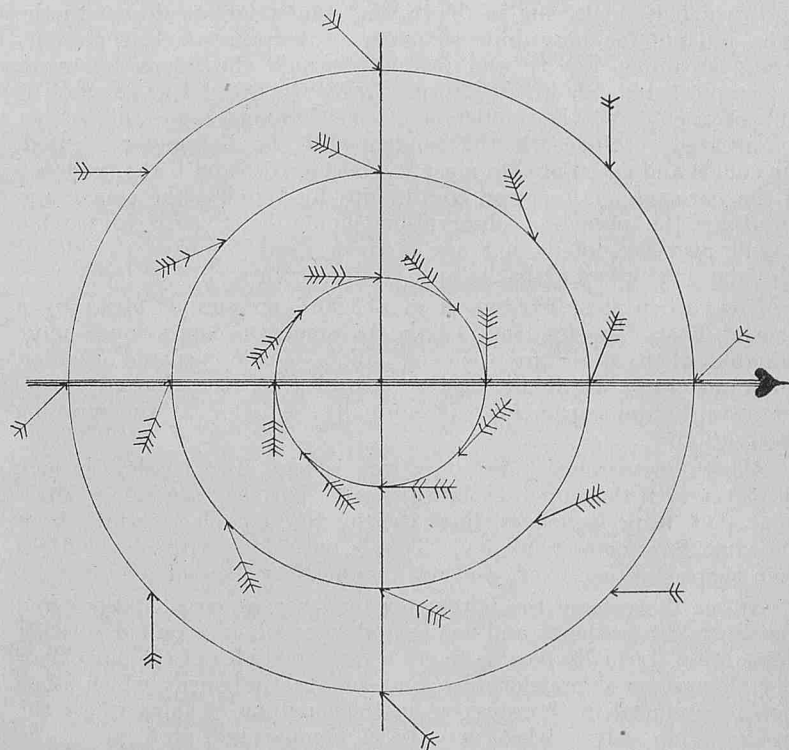


Fig. 2. The Horn Card for Southern Hemisphere.

Let us make it quite clear that this "Horn Card" simply represents approximate average or ideal conditions of wind and barometer in a Tropical Revolving storm and is only for the purpose of explanation and easy visualizing; on no account must it be taken as representing facts in any storm for even a Tropical Revolving Storm is probably seldom quite circular and the barometer and winds may vary considerably with distance from the centre or in different sectors. The weather chart gives the facts.

#### Application of Barometer Tendency at Sea.

On a sheet of white paper let a black dot represent a ship hove to and place A on the "Horn Card" over her; draw the "Horn Card" slowly to the right over the dot so that A1 A2, &c. pass over the dot; this represents a cyclonic depression passing eastward over a ship hove to or a station. It will be seen that the barometer falls until the centre reaches the ship when it rises.

Now if the gradients or distances between the isobars are known and these remain constant the amount of fall or rise of the barometer in a given time should give the rate at which the depression is passing

over the ship A. Should the depression stop moving when it has passed over the ship as far as say A1 (if it remains unchanged in intensity, that is the gradient remains the same) the barometer will be steady. Let a small weight at the end of a piece of twine replace the dot to represent the ship steaming or sailing at speed. Place A on the "Horn Card" over the weight; with the right hand move the "Horn Card" slowly to the right representing a depression moving East as before, and with the left hand, draw the weight slowly to the left so that it will pass under A1, A2, &c. representing a ship steaming West. It will be seen that the barometer falls quicker until the centre is reached and rises quicker after the centre has passed than in the case of a ship hove to. Next draw both the "Horn Card" and the weight, the Horn Card with A5 over the weight to the right at the same speed, the barometer remains steady unless the depression itself is changing in depth. If the weight is next made to move faster to the right than the "Horn Card" it will be seen why a ship overhauling a depression which is unaltering in depth will have a falling barometer. Any case may be illustrated, for example, if the "Horn Card" is moved in a direction to the right and away from you (the line of progression must always be pointed correctly) to represent a depression travelling N.E. which is unaltering in depth, and the weight is drawn to the right and not inclining quite so much away from you to represent a ship steaming E.N.E. and passing through the depression on a line represented on the "Horn Card" by C, C1, C2, &c., it will be seen that the tendency of the barometer is still further complicated. Hence, if the tendency of the barometer is used, the course and speed of ship must be considered; and if the tendency of the barometer is reported to all ships by Wireless the course and speed for the period of observation should be given. In passing it will also be noted that the "Horn Card" makes it evident why the wind veers or backs at a station or in a ship under way.

Now, when the distribution of absolute pressure is given by a weather chart, the tendency of the barometer becomes much more valuable than it is in the case of a single isolated observer. Allowance must be made in low latitudes for the diurnal range, for instance the barometer will normally be rising at the morning observation.

Ashore, meteorologists not only draw isobars, lines passing through all places with the same absolute pressure, but they are able to draw what they term Isallobars, lines passing through places which have the same Barometer tendency. This is only done with observations from shore stations, fixed, and not making way like ships.

At sea if we have the barometer tendency at coast stations and the barometer tendency and course and speed of ships on our weather charts we will usually be able to get a very good idea of the movement and changes in depressions by that natural judgment which is so highly developed in those expert in the handling of ships where the eye so often solves what may be a complicated problem in the parallelogram of velocity or force with accuracy and far quicker than by mathematics.

### The Observation of Barometer Tendency.

In all well ordered ships the barometer is logged at the end of each watch and in unsettled weather it is also noted every two hours, or may be hourly.

By established custom there are, therefore, frequent recorded readings of the barometer from which to ascertain its change.

It is a simple matter with these records to ascertain the change of the barometer for a definite period at any time.

The period established by International agreement for ascertaining the tendency of the barometer at telegraphic weather reporting stations is three hours before the fixed times of observation.

If the same period is used at sea uniformity can be obtained in reports by use of the International Weather Telegraphy Barometer Tendency Table in "Ships' Wireless Weather Signals."

For example, at 0700 G.M.T. when the barometer is read for reporting the absolute pressure, if the difference in the uncorrected readings at 0400 G.M.T. and 0700 G.M.T. is  $+ .03$  inch the tendency will be "Rising slowly."

For general purposes at sea the following interpretation of the Barometer Tendency Table will be convenient and is sufficiently accurate for use between ships:—

	In 1 Hour.	In 3 Hours	In 4 Hours.
Barometer steady—The Barometer has not fallen or risen more than	3 mb. (.01 in.)	5 mb. (.01 in.)	7 mb. (.02 in.)
Barometer rising—The Barometer has risen	2 mb. (.06 in.)	3 mb. (.09 in.)	4 mb. (.12 in.)
Barometer rising very rapidly—The Barometer has risen over	4 mb. (.12 in.)	6 mb. (.18 in.)	8 mb. (.24 in.)
Barometer falling—The Barometer has fallen	2 mb. (.06 in.)	3 mb. (.09 in.)	4 mb. (.12 in.)
Barometer falling very rapidly—The Barometer has fallen over	4 mb. (.12 in.)	6 mb. (.18 in.)	8 mb. (.24 in.)

If a barograph is carried the tendency may be obtained from the trace; for observation of barometer tendency this instrument is most convenient.

### The Thermometer.

To predict visibility we want to know the temperature of the surface over which the wind blows and the temperature of the winds themselves; also their humidity.

Though to observe temperatures at first sight may seem a simple matter, precautions are essential, particularly in steamships.

Progress has been made in temperature observations since the first edition was published and as many ships record observations of the dry and wet bulb thermometers which are sufficiently accurate to give a very good indication of the humidity, we hope to show how these may be used later even though it may be considered that the addition of humidity in wireless reports would lengthen them too much. Each individual ship may be able to use her own observation of humidity with considerable advantage.

If the thermometers used are not officially tested instruments bearing the National Physical Laboratory mark they should be compared with a standard instrument and the index error noted and applied to all readings. For descriptions of thermometers see, *The Marine Observer's Handbook*, 4th Edition.

### To observe the Sea Surface Temperature.

The water sample should be drawn from over-side, forward of all discharges. In high speed ships this operation has been rendered comparatively easy by using a canvas bucket, cylindrical in shape, with the bottom ballasted with sand, a false bottom being sewn in above the ballast to keep it in place.

### To observe the Air Temperature.

The temperature of the air has been measured at sea in the past by placing the thermometer in a louvered screen fixed in one place. This had the disadvantage that the screen was as often as not to leeward of the funnel, boiler casings and other sources of artificial heat, so that the temperature observed was not the true temperature of the free air.

A portable screen has been tried at sea and also tested at Kew Observatory, particulars of which will be found in the 4th edition of *The Marine Observer's Handbook*.

To observe the temperature the thermometer should be in a screen placed to windward so that as far as possible the air will come direct on to the screen from the sea before passing over any part of the ship, and where the screen will not be affected by radiation from decks and hull. Any form of local heating is fatal to accuracy.

### Drafting Reports.

In wireless weather work we should think of what other ships would like to know and remember that brevity and clearness are essential, also that if all the reports received have the elements in the same order they will be more easily and quickly charted than if they are given in different forms. Therefore the columns provided at the end of the Meteorological Log and in the Ship's Meteorological Report Form 911 for recording reports sent to all ships should be used as a key for this will ensure uniformity and the columns are arranged according to the order of importance of the elements. It will generally be an advantage to all ships if reports of ice, derelicts, and floating wreckage seen are added with position, after the meteorological conditions, while if the observations of clouds are included with the present weather they will be of very great assistance to aircraft as well as



giving ships useful information. As comparatively few ships have barometers graduated with millibars, it will assist many if the absolute pressure is given in inches.

*Example.* (Nearest Coast. North America East coast for Time.)

To CQ.

Weather 3045N 6146 W Barometer corrected 3009 ENE3

(To be continued.)

Cloudy CiStr 8 1300 GMT Twenty Eight May Course N49E 13 Steady Current WSW  $\frac{3}{4}$  Knot From 28N 65W to 30N 61W Air 73 Sea 74 Cristales.

NOTE.—The date appears in the middle of this message, the most important elements appearing before it. If abbreviation is desired omit all after date.

## THE "ANTINOE" AND "LARISTAN" GALE.

PREPARED IN THE MARINE DIVISION BY J. HENNESSY, SENIOR NAUTICAL ASSISTANT.

In the North Atlantic the month of January is generally considered the stormiest month of the year, and that of 1926 will probably be remembered amongst seamen as the most boisterous on record.

Throughout the month intense depressions moved across the North Atlantic, causing the Trans-Atlantic steamer tracks to be swept by an almost continuous succession of heavy gales, which covered a large area and often attained hurricane force. Damage sustained by shipping was particularly severe, especially during the latter period of the month, when both the *Antinoe* and *Laristan*, steamers of 2,079 and 4,293 gross tonnage respectively, foundered in the same storm within 340 miles of each other.

Weather Charts for the mornings of the 24th to 27th January, 1926, are made from the Arlington W/T weather reports, and from observations contained in the meteorological logs and reports of observing ships, and show the weather conditions prevailing over the Western North Atlantic during the time the two ships were in distress. The positions of *Antinoe* and *Laristan* shown on the charts are approximate.

On the 21st of the month a depression situated in the western part of the Gulf of Mexico moved rapidly in a north-easterly direction, and at 0800 on the 23rd was centred just east of Newfoundland, having increased greatly in extent and deepened considerably—ships as far east as the 30th meridian reporting winds of gale force.

On this day *Antinoe*, Captain H. TOSE, bound from New York to Queenstown, in approximately Latitude 46° 10' N., Longitude 39° 58' W., with a strong gale blowing from S.W., shipped a heavy cross sea, causing damage to her steering gear which led to the ship's subsequent loss.

WEATHER CHART, 0800, JANUARY 24th. The depression centred off the east coast of Newfoundland remained practically stationary during the past twenty-four hours and maintained its intensity; ships to the south and south-east of the storm's centre reporting gales of storm force from west and south-west accompanied by precipitous seas.

*Antinoe*, hove to, had during the night been continually swept fore and aft by the heavy seas which tore off her hatch tarpaulins. These could only be temporarily re-wedged owing to the constant rush of heavy water on deck. The ship gradually took a 10° list to starboard and at 0300 an S.O.S. was sent out which was picked up by the *Aquitania* and *President Roosevelt*; the latter ship, being the closer to *Antinoe*'s position, proceeded at speed to render assistance. *President Roosevelt*, Captain G. FRIED, guided by Wireless Direction bearings, reached *Antinoe* shortly after noon and "Stood By."

On this day *Laristan*, Captain F. LITTLEHALES, in approximately Latitude 45° 40' N., Longitude 43° 06' W., had a bulkhead on the well deck stove in by a heavy sea, causing the engine room and after holds to become flooded.

WEATHER CHART, 0800, JANUARY 25th. The depression continues to remain practically stationary and ships report little change in the weather conditions during the past twenty-four hours.

Heavy seas swept *Antinoe*'s decks throughout the previous day, all hands being continuously employed making wedges and battening down hatches as the seas tore them adrift. The list on ship gradually increased to 20°, and, owing to continuous snow squalls, *President Roosevelt* lost sight of *Antinoe*.

At 0230 on the 25th heavy seas flooded the engine room and stokeholds putting the main engines out of action. At 0400 the visibility improved and *President Roosevelt* again found and stood by the disabled vessel. By 1500 all *Antinoe*'s boats had been washed overboard, and her list had increased to 25°. *President Roosevelt* pumped oil on sea, and in repeated attempts to rescue the distressed crew lost two of her own hands and three boats.

At 2130 on this day *Laristan* sent out an S.O.S., which was picked up by *Bremen*, Captain R. WURPTS, who immediately proceeded to her assistance.

WEATHER CHART, 0800, JANUARY 26th. During the past twenty four hours the depression moved in a north-easterly direction. Ships west of the 30th meridian, now in rear of storm's centre, report wind veering to north-west, decreasing gradually in force, high seas and heavy swell.

During this day *President Roosevelt* made repeated attempts to rescue *Antinoe*'s crew by means of rocket lines and drifting or towing boats. Towards night *Antinoe*'s auxiliary pumps gave out, and all hatch coverings were washed away. At midnight the list had increased so that ship's starboard side was practically submerged, the seas breaking over her and causing a heavy back wash fore and aft her deck.

At 0500 this day, *Bremen* reached *Laristan* and, as in the case of *President Roosevelt*, found it impossible to man a boat in the heavy seas then running. *Bremen* succeeded in firing a line across the distressed vessel, which was made fast to *Laristan*'s only remaining boat, and seven men getting into her, the boat was hauled across to *Bremen*, and six of the men saved, one man being washed out of the boat and drowned. Greatly hindered by frequent and lasting snow squalls, subsequent repeated attempts at rescue proved futile, although on two occasions lines with life rings attached were successfully shot across *Laristan*, but the crew were evidently in a too weakened condition to avail themselves of this opportunity. When darkness came on *Bremen* stood by to await the first opportunity to man a boat. At 1812 the distressed vessel was visible when a heavy prolonged snow storm commenced. On the visibility becoming clearer nothing could be seen of the *Laristan*, and at daybreak *Bremen*, who had remained near the place all night, noticed a quantity of wreckage. The ship had foundered some time after dark the previous evening, taking with her twenty-four of the crew.

WEATHER CHART, 0800, JANUARY 27th. Since the previous morning the depression has remained stationary. West of the 30th meridian ships report slight moderation in both wind and sea. *Antinoe* was now on her beam ends, and in a sinking condition. It still being too dangerous to launch a manned boat, *President Roosevelt* throughout the day continuously endeavoured to rescue the distressed crew by means of rocket lines, or by circling the wreck with a lifeboat towing astern, hoping to manœuvre it within their reach. Towards evening the weather moderated considerably, and at 1900 a manned boat from the rescuing ship, in charge of Chief Officer MILLER, succeeded in taking off twelve men. At midnight Captain FRIED again sent a manned boat in charge of the Chief Officer, who succeeded in rescuing the remaining thirteen members of *Antinoe*'s crew.

## WEATHER SIGNALS.

UNDER Weather Signals it is intended to publish particulars and concise descriptions of Signals and Codes used for reporting Weather, Ice and Time in four sections.

- I. Ships' Wireless Weather Signals.
- II. Wireless Weather Signals made from the shore to ships and Wireless Weather Signals made ashore which may be useful to ships. (Bulletins and Wireless storm, and ice warnings.)
- III. Wireless Time Signals.

IV. Visual Weather Signals made at the Coast. (Gale and hurricane warnings.)

Sections II, III, and IV will be published as far as possible in geographical order, so that the most used of these signals for all parts of the world may be as complete as possible in each year's Numbers of THE MARINE OBSERVER.

Meteorological Services of Maritime countries are invited to send concise descriptions of such signals made, for which only limited space is available.

## I. SHIPS' WIRELESS WEATHER SIGNALS.

WEATHER Reports between ships at sea and from ships to Weather offices are of three kinds :—

(1) Those which give information of conditions experienced during a passage or part of a passage with conditions prevailing at the time the message was drafted, no attempt being made to synchronise with other observations.

(2) Those which are based upon observations made at arranged times so that they provide synchronised data in a standard form but *not* in code.

(3) Those which are based upon observations made at arranged times so that they provide synchronised data *in code*.

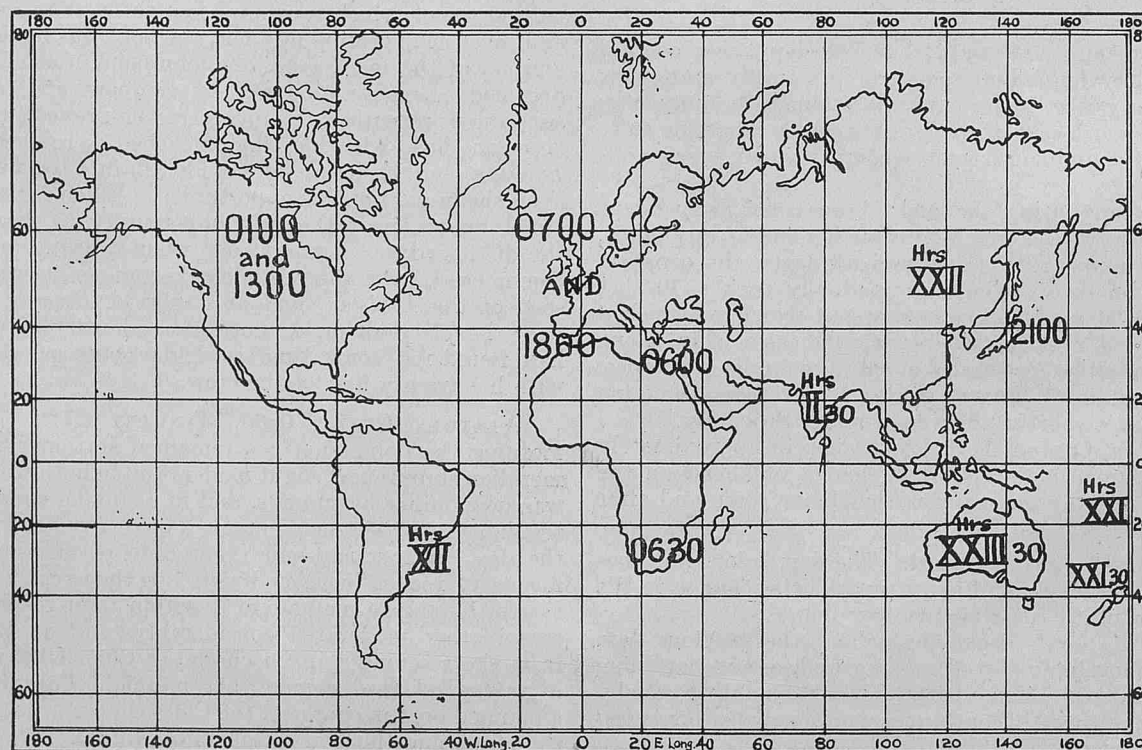
(2) and (3) are essential for the system which is explained in "Wireless and Weather, an Aid to Navigation," in this Journal.

In order that synchronised data may be available over ocean areas, observations made for the purpose of Wireless Weather Reports should be taken at the same time as those of the nearest land weather service. These times are given upon the accompanying Chart of the World.

In order to ensure a regular service of reports which all ships may receive, each of the ships whose names appear in the list of Regular Observing Ships given at the end of each Number of this Journal is invited to make the report described in (2) above daily and to enter it in her Meteorological Log or Meteorological Report, Form 911.

Thus ships on the list with the letters M.L., M., and W.T., after their names are selected ships and upon them the efficiency of this voluntary service mainly depends.

Chart showing Greenwich Mean Times of Shore Observations.



The Arabic figures represent Greenwich mean time at which observations are taken for Daily Weather Reports. Where observations for these reports are timed by local time, the approximate Greenwich mean time is given in Roman figures.



(2) Standard Form not in Code.

TIMES of observation must not be confused with times of transmission of reports. So long as the observations are taken at these fixed times transmission of reports may follow as convenient, which should be addressed to "All ships," and made on the wavelength which the Captain considers most efficient for the purpose, usually 600 m. spark or 2,400 m. C.W.

Wireless Weather Reports should always contain—

- The position at which the observations were taken,
- The corrected barometer reading,
- The direction and force of the wind,
- The present weather,\*
- The Greenwich mean time of observation,
- The date and name of ship sending.

Other information will usually be desired by receiving ships in the following order of importance :—

- Course and speed of ship during last two, three or four hours,
- Tendency or change of the barometer in the last two, three or four hours,
- Current found with latitude and longitude of positions From and To,
- Temperature of the air,
- Temperature of the sea surface,
- Swell and its direction,
- Past weather.

Without using a code, messages may be conveniently framed giving these elements briefly and concisely with sufficient standardisation to enable them to be easily read.

For this purpose the following scales are recommended :—

## The Beaufort Scale of Wind Force.

Admiral Beaufort's numbers.	Seamen's description of wind.	Admiral Beaufort's numbers.	Seamen's description of wind.
0	Calm.	7	Moderate gale.
1	Light air.	8	Fresh gale.
2	Light breeze.	9	Strong gale.
3	Gentle breeze.	10	Whole gale.
4	Moderate breeze.	11	Storm.
5	Fresh breeze.	12	Hurricane.
6	Strong breeze.		

## The Beaufort Notation of Weather.

<b>b</b>	Blue sky.	<b>p</b>	Passing showers.
<b>c</b>	Cloudy.	<b>q</b>	Squalls.
<b>d</b>	Drizzle.	<b>r</b>	Rain.
<b>e</b>	Wet air.	<b>rs</b>	Sleet.
<b>f</b>	Fog.	<b>s</b>	Snow.
<b>fe</b>	Wet fog.	<b>t</b>	Thunder.
<b>g</b>	Gloomy.	<b>tl</b>	Thunderstorm.
<b>h</b>	Hail.	<b>u</b>	Ugly.
<b>kq</b>	Line squall.	<b>v</b>	Unusual visibility.
<b>l</b>	Lightning.	<b>w</b>	Dew.
<b>m</b>	Mist.	<b>z</b>	Dust haze.
<b>o</b>	Overcast sky.		

\* For the purpose of Aircraft it is important that exact information of cloud types and amount should be given.

The direction of movement of the Upper Clouds is of great importance.

## The International Weather Telegraphy Barometer Tendency Table.

Barometer steady. (The barometer has not fallen or risen more than $\frac{1}{4}$ millibar in 3 hours).	
Do. rising slowly. (The barometer has risen 1 to $1\frac{1}{4}$ mb. (.03--04 in.) in last 3 hours)	
Do. rising. Do. do. 2 to $3\frac{1}{4}$ " (.06--10 in.) do.	
Do. rising quickly. Do. do. 4 to 6 " (.12--18 in.) do.	
Do. rising very rapidly. Do. do. over 6 " (.18 in.) do.	
Do. falling slowly. Do. fallen 1 to $1\frac{1}{4}$ " (.03--04 in.) do.	
Do. falling. Do. do. 2 to $3\frac{1}{4}$ " (.06--10 in.) do.	
Do. falling quickly. Do. do. 4 to 6 " (.12--18 in.) do.	
Do. falling very rapidly. Do. do. over 6 " (.18 in.) do.	

For a simplified table see Chapter I., "Wireless and Weather, an aid to Navigation," p. 14 of this Number.

Example of Plain Language Wireless Weather Report in standard form, not in code, recommended (2).

To CQ.

Weather 0745N 8333E Barometer corrected 2980  
SSW4 cloudy cirrus upper strato cumulus lower eight-  
tenths 0230 GMT thirty-first July course N56E 12 rising  
slowly current N32E 2 knots from 6N82E to 7N83E air  
83 sea 83 swell moderate SW past weather overcast  
lightning Yorkshire.

NOTE.—The date appears in the middle of this message, the most important elements appearing before it. If abbreviation is desired omit all after date.

## (3) North Atlantic "Decode."

THE main groups of the code used by a limited number of ships for reporting to the Meteorological Office having been internationalised, the following Decode is published for the information of ships who are able to intercept these reports.

The reports are addressed to Weather London (Meteorological Office, London) and to Government Observer, Washington, D.C. (United States Weather Bureau). Those addressed to Weather London are made to Devizes W/T Station, call sign GKU, on a wavelength of 2,100 metres (C.W.). Those addressed to Government Observer, Washington, D.C., are made to any of the following U.S. Navy radio stations at Bar Harbour, Me., call sign NBD, New York, N.Y., call sign NAH, Norfolk, Va., call sign NAM, or Charleston, S.C., call sign NAO, on a wavelength of 2,100 metres (C.W.). The respective transmissions take place as soon as possible after observation time.

Observations made between the 100-fathom line, British Isles, and 40° W. Longitude are reported to Weather London.

Observations made between Longitude 40° W. and a line, Belle Isle—Virgin Rocks—Sable Island—Cape Hatteras are reported to Government Observer, Washington, D.C.

The times of observation are :—

European land 0100, 0700, 1300 and 1800, G.M.T.

American land 0100, G.M.T. = 8 p.m. 75th Meridian Time.  
and 1300, G.M.T. = 8 a.m. 75th Meridian Time.

Ships at Sea from the 100-Fathom Line British Isles to 40° W. Longitude.  
0700 and 1800, G.M.T.

Ships at Sea from Longitude 40° W. to a Line Belle Isle—Virgin  
Rocks—Sable Island—Cape Hatteras.  
0100 and 1300, G.M.T.

ADDITIONAL reports may be made to Weather London eastward of Longitude 40° W., containing observations made at 0100 and 1300, G.M.T.

A message consisting of figures addressed to Weather London or Government Observer, Washington D.C., may be decoded as follows :—

As the first four groups are international, these groups, in weather reports transmitted by wireless telegraphy to weather offices of maritime countries by ships of all nations, may usually be decoded in the same manner.

Rule up a form, a sample of which is given overleaf, and write the groups of figures and words, in the order received, in the spaces.

THE MARINE OBSERVER  
DECODE FORM.

Code.	Code Figures.					Distinguishing Letter.	Number of Group.	Name of Element and how to decode the Figures.	Message decoded.
	Column Numbers.								
	1	2	3	4	5				
International Weather.	4	*	*	*	*	P	1	Addressed to “ ”.	
	*	1	*	*	*	Q		Day of Week, Table I.	<i>Wednesday.</i>
	*	*	4	5	*	LL		Name of Latitude and Longitude, Table II.	<i>North and West.</i>
	*	*	*	*	8	L		Latitude, degrees.	<i>45°.</i>
	3	8	*	*	*	ll	2	Latitude, approx. minutes (multiply code fig. by 6).	<i>48'.</i>
	*	3	8	*	*	l		Longitude, degrees.	<i>33°.</i>
	*	*	*	0	7	GG		Longitude, approx. minutes (multiply code fig. by 6).	<i>48'.</i>
	2	4	*	*	*	BB		Greenwich Mean Time to nearest hour.	<i>07.</i>
	*	*	1	6	*	DD	3	Barometer, prefix 9 or 10 to code figures and, if desired, convert to inches, Table XIII.	<i>1024mb.</i>
	*	*	*	*	2	F		Wind direction true, Table III.	<i>South.</i>
	1	1	*	*	*	ww		Wind force, Table IV.	<i>2.</i>
	*	*	8	0	*	v		Present weather, Table V.	<i>No change, Cloudy.</i>
	*	*	*	*	4	d	4	Visibility. Table VI.	<i>Very good.</i>
	*	*	*	*	*	K		Swell. Table VII.	<i>Slight.</i>
								Swell—direction from, Table VIII.	<i>South.</i>
Check.	0	*	*	*	*	x	5	Sum of Column 1, less tens.	
	*	9	*	*	*	x		Sum of Column 2, less tens.	
	*	<sup>+3</sup> 1	*	*	*	x		Sum of Column 3, less tens.	<i>Check corrected.</i>
	*	*	<sup>+4</sup> 1	*	*	x		Sum of Column 4, less tens.	
	*	*	*	*	1	x		Sum of Column 5, less tens.	
	2	*	*	*	*	y	6	Sum of Group 1, less tens.	
	*	1	*	*	*	y		Sum of Group 2, less tens.	
	*	<sup>+3</sup> 5	*	*	*	y		Sum of Group 3, less tens.	<i>Check corrected.</i>
	*	*	*	4	*	y		Sum of Group 4, less tens.	
	*	*	*	<sup>+4</sup> 2	*	y		Sum of Group 5, less tens.	
British M.O. Weather.	6	*	*	*	*	C	7	Cloud predominating, Table IX.	<i>Strato-Cumulus.</i>
	*	7	*	*	*	N		Cloud amount, Table X.	<i>Seven-tenths.</i>
	*	*	1	*	*	W		Past weather, Table XI.	<i>Cloudy.</i>
	*	*	*	0	*	U		Unusual phenomena, Table XII.	<i>None.</i>
	*	*	*	*	4	y		Sum of Group 7, less tens.	<i>Group correct by check.</i>
	6	8	*	*	*	TT	8	Air temperature, degrees.	<i>68° F.</i>
	*	*	6	9	*	tt		Sea temperature, degrees.	<i>69° F.</i>
	*	*	*	*	1	y		Sum of Group 8, less tens.	<i>An error in this group.</i>
Space for word if wind force greater than 9.									

The message now reads — *Wednesday, Latitude 45° 48' N., Longitude 33° 48' W., G.M.T. 07 hours, Barometer 1024mb, Wind south force 2, Cloudy weather, Visibility very good, slight swell from south (column check corrected) (Group check corrected), Cloud St.-Cu, amount  $\frac{7}{10}$ ths; past weather, cloudy; No unusual phenomena; (Group correct by check) Air temperature 68° F., Sea temperature 69° F. (An error in group).*



To save space, the groups of figures and their meanings have been inserted in the sample form, in *italics*.

Example :—The following message intercepted : *Weather London 41458 30807 24162 11404 09111 21542 67104 68691.*

These figures having been written in the appropriate spaces, errors made in transmission may be checked by adding together the figures in each *column* of the first four groups, *neglecting the tens*. If the message has been correctly transmitted, the sums of the columns will agree with the corresponding figures of Group 5. If the sums differ, write down (under the original figures in Group 5) the numbers which must be *added* to make them agree.

NOTE.—In all adjustments of check figures, tens and carrying figures must be disregarded entirely; thus for purposes of the check system  $9 + 4 = 3$ , not 13.

Next add together the figures in each group 1 to 5, separately (neglecting tens). These sums should agree with the figures from left to right in Group 6. If they differ, write down (under the original figures in Group 6) the numbers which must be *added* to make them agree.

Group 5 now indicates the *columns* in which there are errors with the numbers to be added to the figures which are in error.

Group 6 indicates the *groups* in which these errors occur.

In the example given we find that 0 in the second column of Group 2 should be 3, and that 4 in the third column of Group 4 should be 8.

In the remaining groups of the message a *double* check is not provided, but the fifth figure in each group will represent the sum of the first four figures, neglecting tens, and if it does not agree it will be known that one or more figures are in error.

The message is next decoded by means of the Tables and Instructions given on the Decode Form.

### Occasional North Atlantic Wireless Link.

British observing ships with mercurial barometers by making reports in Standard form (2) addressed to "All ships" will on occasions in the North Atlantic be able to contribute to the Eiffel Tower messages, p. 66, Vol. III, No. 28, without any additional effort or transmission through the good offices of the French steamship *Jacques Cartier*, call sign FTJ.

The French S.S. *Jacques Cartier* is operated by the Compagnie Générale Transatlantique, and usually trades between Havre and Gulf of Mexico ports. She has been used as a training ship for the French Mercantile Marine and is specially equipped for wireless telegraph long range communication. She transmits weather reports received or intercepted from other ships to Paris and also broadcasts weather information.

### Important.

The code messages made by regular reporting British North Atlantic liners to *Weather, London* through Devizes W/T Station and *Government Observer, Washington, D.C.*, through Bar Harbour, Me., New York, N.Y., Norfolk, Va., or Charleston, S.C. W/T Stations, may be received on occasions by *Jacques Cartier* and re-transmitted through Paris; but it is necessary that direct transmission of these reports from ships at sea should be maintained as laid down in the Register, and described on p. 17 of this Number. They are re-transmitted through the Air Ministry W/T Station for the benefit of all European Weather Services.

## NEW INTERNATIONAL CODE, WEATHER TELEGRAPHY TABLES.

Table I.

P.—Day of the Week.

Code Figure.	Code Figure.
1 = Sunday.	5 = Thursday.
2 = Monday.	6 = Friday.
3 = Tuesday.	7 = Saturday.
4 = Wednesday.	

Table II.

Q.—Quarter of the Globe.

Code Figure.	Lat.	Long.	
1	N.	W.	} Barometer in millibars.
2	N.	E.	
3	S.	W.	
4	S.	E.	
5	N.	W.	} Barometer in millimetres.
6	N.	E.	
7	S.	W.	
8	S.	E.	

Table III.

DD.—Two Figure Compass. True (to nearest point).

Code Figures.	Code Figures.	Code Figures.
00 Calm.	11 S.E. by E.	22 W.S.W.
01 N. by E.	12 S.E.	23 W. by S.
02 N.N.E.	13 S.E. by S.	24 W.
03 N.E. by N.	14 S.S.E.	25 W. by N.
04 N.E.	15 S. by E.	26 W.N.W.
05 N.E. by E.	16 S.	27 N.W. by W.
06 E.N.E.	17 S. by W.	28 N.W.
07 E. by N.	18 S.S.W.	29 N.W. by N.
08 E.	19 S.W. by S.	30 N.N.W.
09 E. by S.	20 S.W.	31 N. by W.
10 E.S.E.	21 S.W. by W.	32 N.

Table IV.

F.—Wind Force.

Code Figure.	Beaufort Number.	Code Figure.	Beaufort Number.
0 = Calm -	- Nought.	7 = Moderate gale -	Seven.
1 = Light air -	- One.	8 = Fresh gale -	Eight.
2 = Light breeze -	- Two.	9 = Strong gale -	Nine.
3 = Gentle breeze -	- Three.	9 = Whole gale -	Ten.
4 = Moderate breeze -	- Four.	9 = Storm -	Eleven.
5 = Fresh breeze -	- Five.	9 = Hurricane -	Twelve.
6 = Strong breeze -	- Six.		

When force 10, 11 or 12, figure 9 transmitted, words "gale," "storm" or "hurricane" respectively, added at end of the message.

Table V.

ww.—Present Weather Scale.

THE figures are grouped to refer to particular phenomena, for example, 20 to 29, Fog or mist. In making these observations the following instruction is given to the observer :—

In selecting the appropriate number for reporting the general character of the weather, no account should be taken of phenomena which occurred more than one hour before the time of observation, but only of phenomena which occurred during the interval of one hour preceding the fixed time of observation.

In deciding on the appropriate term, observers should not be restricted to the difference between the conditions at the instant and the conditions one hour before, but should choose the term to give the best information of the changes taking place.

Code figures.

Table V.

00	Blue sky or some cloud (Cloud 0-5)	Cloud has decreased.
01		No apparent change.
02		Cloud has increased.
03		Precipitation within sight.
04		With solar or lunar halo.
05		After fog or mist or dust storm.
06		After rain or drizzle.
07		After snow, sleet or hail.
08		With or after thunder and lightning in
09		After thunderstorm. [neighbourhood.

Code figures.

Table V.—*continued.*

Code figures.

Table V.—*continued.*

10	Cloudy or overcast (Cloud 6-10)	Cloud has decreased.	
11		No apparent change.	
12		Cloud has increased.	
13		Precipitation within sight.	
14		With solar or lunar halo.	
15		After fog or mist or dust storm.	
16		After rain or drizzle.	
17	Fog or mist	After snow, sleet, or hail.	
18		With or after thunder and lightning in	
19		After thunderstorm.	[neighbourhood.
20		But clear in zenith	- Just begun.
21		And apparently overcast	-
22		But clear in zenith	- Intermittent.
23		And apparently overcast	-
24		But clear in zenith	- For some time.
25		And apparently overcast	- Has become thinner.
26		But clear in zenith	-
27		And apparently overcast	- For some time.
28		But clear in zenith	- For some time.
29		And apparently overcast	- Has become thicker.
30	Passing showers	Slight with rain.	
31		„ hail or rain and hail.	
32		„ sleet.	
33		„ snow.	
34		Heavy with rain has become better.	
35		„ rain.	
36		„ rain has become worse.	
37	Drizzle	„ hail or rain and hail.	
38		„ sleet.	
39		„ snow.	
40		Slight occasional.	
41		„ continuous.	
42		„ but has increased.	
43		Moderate but has decreased.	
44		„ occasional.	
45		„ continuous.	
46		„ but has increased.	
47	Rain	Thick but has decreased.	
48		„ occasional.	
49		„ continuous.	
50		Slight occasional.	
51		„ continuous.	
52		„ but has increased.	
53		Moderate but has decreased.	
54		Moderate occasional.	
55		„ continuous.	
56		„ but has increased.	
57	Snow or snow and hail	Heavy but has decreased.	
58		„ occasional.	
59		„ continuous.	
60		Slight occasional.	
61		„ continuous.	
62		„ but has increased.	
63		Moderate but has decreased.	
64		„ occasional.	
65		„ continuous.	
66		„ but has increased.	
67	Sleet or rain and snow	Heavy but has decreased.	
68		„ occasional.	
69		„ continuous.	
70		Slight occasional.	
71		„ continuous.	
72		„ but has increased.	
73		Moderate but has decreased.	
74		„ occasional.	
75		„ continuous.	
76		„ but has increased.	
77		Heavy but has decreased.	
78		„ occasional.	
79		„ continuous.	

80	Hail or rain and hail	Slight occasional.	
81		„ continuous.	
82		„ but has increased.	
83		Moderate but has decreased.	
84		„ occasional.	
85		„ continuous.	
86		„ but has increased.	
87	Thunderstorm (or Line Squall)	Heavy but has decreased.	
88		„ occasional.	
89		„ continuous.	
90		Slight thunderstorm without hail.	
91		„ „ with hail.	
92		Moderate thunderstorm without hail.	
93		„ „ with hail.	
94		Heavy thunderstorm without hail	} without gale.
95		„ „ with hail	
96		„ „ without hail	
97		„ „ with hail	} with gale.
98		Line squall without hail.	
99		„ „ with hail.	

Table VI.

Code Figure.

v.—Visibility.

Code Figure.	Objects not visible at 50 yards.
0 Dense fog,	
1 Thick fog	1 cable.
2 Fog	2 cables.
3 Moderate fog	$\frac{1}{2}$ mile (nautical).
4 Mist or haze, or very poor visibility.	1 mile (nautical).
5 Poor visibility	2 miles (nautical).
6 Moderate visibility	5 miles (nautical).
7 Good visibility	10 miles (nautical).
8 Very good visibility	30 miles (nautical).
9 Excellent, visibility	Objects visible more than 30 miles (nautical).

Table VII.

K.—Swell.

Code Figure.	
0 No, or slight swell	} and sea smooth to moderate.
1 Moderate swell	
2 Heavy swell	
3 Long low swell	
4 Confused swell	} and sea rough or above.
5 No, or slight swell	
6 Moderate swell	
7 Heavy swell	
8 Long low swell	
9 Confused swell	

Table VIII.

d.—One figure compass. True.

Code Figure.	Code Figure.	Code Figure.
0 = No Swell.	3 = S.E.	6 = W.
1 = N.E.	4 = S.	7 = N.W.
2 = E.	5 = S.W.	8 = N.

Table IX.

C.—Cloud Predominating.

Code Figure.		
1—Cirrus	- - - - -	Ci.
2—Cirro-Stratus	- - - - -	Ci.-St.
3—Cirro-Cumulus	- - - - -	Ci.-Cu.
4—Alto-Cumulus	- - - - -	A.-Cu.
5—Alto-Stratus	- - - - -	A.-St.
6—Strato-Cumulus	- - - - -	St.-Cu.
7—Nimbus	- - - - -	Nb.
8—Cumulus or Fracto-Cumulus	- - - - -	Cu. or Fr.-Cu.
9—Cumulo-Nimbus	- - - - -	Cu.-Nb.
0—Stratus or Fracto-Stratus	- - - - -	St. or Fr.-St.



Table X.

N.—Cloud Amount.

Code Figure.	Code Figure.
0 = No cloud.	6 = Sky 6/10ths covered.
1 = Sky 1/10th covered.	7 = „ 7/10ths „
2 = „ 2/10ths „	8 = „ 8/10ths „
3 = „ 3/10ths „	9 = „ 9/10ths „
4 = „ 4/10ths „	*0 = „ overcast.
5 = „ half „	

\* Usually weather reported by Table V, will indicate which 0 applies here.

Table XI.

W.—Past Weather.

Code Figure.	
0 = Blue sky or blue sky and part cloudy (b or be).	
1 = Cloudy.	
2 = Overcast continuously.	
3 = Fog or mist.	
4 = Thick fog.	
5 = Passing showers.	
6 = Rain or drizzle.	
7 = Snow or sleet.	
8 = Hail or rain and hail.	
9 = Thunderstorm.	

### SPECIAL WEATHER TELEGRAPHY TABLES, NOT NEW INTERNATIONAL CODE.

Table XII.

U.—Unusual Phenomena.

Code Figure.
0 = None of the following remarks appropriate.
1 = Appearances indicate that a tropical storm has formed.
2 = Appearances indicate that a tropical storm is forming.
3 = Heavy squalls during last three hours.
4 = Squally weather.
5 = Barometer <i>falling</i> very rapidly (more than 2 millibars an hour).
6 = Barometer <i>rising</i> very rapidly (more than 2 millibars an hour)
7 = Wind has <i>increased</i> decidedly during the last hour.
8 = Wind has <i>decreased</i> decidedly during the last hour.
9 = Unusually red sunset (or sunrise).

Table XIII.—Conversion of Millibars to Inches.

Equivalent in Mercury Inches at 32°, and Latitude 45° of Millibars.

Mb.	In.	Mb.	In.	Mb.	In.	Mb.	In.	Mb.	In.	Mb.	In.	Mb.	In.
925	27.32	940	27.76	960	28.35	980	28.94	1000	29.53	1020	30.12	1040	30.71
926	27.35	941	27.79	961	28.38	981	28.97	1001	29.56	1021	30.15	1041	30.74
927	27.38	942	27.82	962	28.41	982	29.00	1002	29.59	1022	30.18	1042	30.77
928	27.41	943	27.85	963	28.44	983	29.03	1003	29.62	1023	30.21	1043	30.80
929	27.44	944	27.88	964	28.47	984	29.06	1004	29.65	1024	30.24	1044	30.83
930	27.46	945	27.91	965	28.50	985	29.09	1005	29.68	1025	30.27	1045	30.86
931	27.49	946	27.94	966	28.53	986	29.12	1006	29.71	1026	30.30	1046	30.89
932	27.52	947	27.97	967	28.56	987	29.15	1007	29.74	1027	30.33	1047	30.92
933	27.55	948	28.00	968	28.59	988	29.18	1008	29.77	1028	30.36	1048	30.95
934	27.58	949	28.03	969	28.62	989	29.21	1009	29.80	1029	30.39	1049	30.98
935	27.61	950	28.05	970	28.65	990	29.24	1010	29.83	1030	30.42	1050	31.01
936	27.64	951	28.08	971	28.67	991	29.26	1011	29.86	1031	30.45	1051	31.04
937	27.67	952	28.11	972	28.70	992	29.29	1012	29.89	1032	30.48	1052	31.07
938	27.70	953	28.14	973	28.73	993	29.32	1013	29.92	1033	30.51	1053	31.10
939	27.73	954	28.17	974	28.76	994	29.35	1014	29.94	1034	30.53	1054	31.13
		955	28.20	975	28.79	995	29.38	1015	29.97	1035	30.56		
		956	28.23	976	28.82	996	29.41	1016	30.00	1036	30.59		
		957	28.26	977	28.85	997	29.44	1017	30.03	1037	30.62		
		958	28.29	978	28.88	998	29.47	1018	30.06	1038	30.65		
		959	28.32	979	28.91	999	29.50	1019	30.09	1039	30.68		

### ABRIDGED KEY TO THE NEW INTERNATIONAL CODE.

In view of the extension in the use of the New International Code by weather services, the descriptions (where the New International Code is used) are now published in a concise form by using key letters. Those used for marine work are described below. Where the International Code is *not* used each group will be described in detail.

#### THE KEY LETTERS AND THEIR MEANINGS.

- A = Form of *predominating cloud lowest* in the scale of cloud forms.  
a = Form of *predominating cloud highest* in the scale of cloud forms when more than one type of cloud exists.  
BBB = Pressure in millibars and tenths (initial 9 or 10 omitted), or millimetres and tenths (initial 7 omitted). The values refer to sea level and include all corrections for index error, temperature and gravity.  
BB = Pressure in whole millibars or whole millimetres (initial 9, 10 or 7 omitted).  
b = Amount of barometric tendency during the three hours preceding the time of observation expressed in half-millibars or half-millimetres. For tendencies 10–19 the *second* figure only is reported and 33 is added to the wind direction number (DD). For tendencies 20–29 the *second* figure only is reported and 67 is added to the wind direction number. Tendencies greater than 29 are reported as 29.  
bb = Amount of barometric tendency during the three hours preceding the time of observation expressed in half-millibars or half-millimetres.  
C = Form of predominating cloud, according to the scale of cloud forms, when only one form is reported, as from ships at sea.  
c = Characteristic of barometric tendency during the period of three hours preceding the time of observation.  
DD = Direction of the wind near the ground on the scale (01–32) in which 08 = East, 16 = South, &c., 00 = calm.  
d = Direction from which swell comes, on scale (0–8), in which 2 = East, 4 = South, &c., 0 = no swell.  
F = Force of the wind on the Beaufort Scale. (Forces above 9 are reported as 9 in telegrams, with the actual force in a word at the end, *e.g.*, force 10 is reported at the end as “Storm ten,” force 11 as “Storm eleven.” Ships at sea, however, report “gale ten,” “storm eleven,” “hurricane twelve.”)  
GG = Greenwich Mean Time of observation (01 = 1 a.m., 12 = noon, 13 = 1 p.m., 24 = midnight).  
H = Relative humidity of the air.  
h = Height of base of lowest cloud present.  
I<sub>n</sub>I<sub>n</sub> = Index number of station.  
jj = Meaning varies according to time of observation and between inland and coastal stations, as follows:—

	Inland Stations.	Coastal Stations.
At 0700 G.M.T. - -	jj = mm	jj = SV <sub>s</sub>
At 1800 G.M.T. - -	jj = MM	jj = SV <sub>s</sub>

- K = The characteristic of the swell *in the open sea*.  
K' = Amount and characteristic of barometric tendency expressed by a single figure.  
L = Amount of sky (scale 0–10) covered by cloud form A and all forms of the same layer (*i.e.*, low, medium or high) as A, if “a” refers to a different layer.  
LLL = Latitude in degrees and tenths, the tenths being obtained by dividing the number of minutes by 6 and *neglecting the remainder*.  
lll = Longitude in degrees and tenths, the tenths being obtained as for latitude LLL.  
MM = Maximum temperature in the interval of 11 hours ending at 18 h. G.M.T. (or at one of the hours 1 h., 7 h., 13 h., 18 h. G.M.T., following not less than 4 hours after noon, local time).

- mm = Minimum temperature in the interval of 13 hours ending at 7 h. G.M.T. (or at the hour 13 hours after the time of reporting the maximum temperature).
- N = Total amount of sky covered with cloud. (Scale 0-10).
- P = Day of the week. 1 = Sunday, 2 = Monday, 3 = Tuesday, 4 = Wednesday, 5 = Thursday, 6 = Friday, 7 = Saturday. The day refers to G.M.T. and not to local time, e.g., Sunday means the period from 00 h. to 24 h. on Sunday at Greenwich.
- Q = Quarter of globe in which ship is situated.
- RR = Rainfall (at 7 a.m. for preceding 13 hours and at 6 p.m. for preceding 11 hours).
- R = Amount of rainfall for the preceding 24 hours.
- r = Time of commencement of precipitation.
- S = State of the sea and swell (coast stations).
- TT = Temperature of the air in whole degrees Fahrenheit or Centigrade (50 added to negative values).
- tt = Temperature of the sea (surface water) in whole degrees.
- TTT = Temperature of air in degrees and tenths Fahrenheit or Centigrade (500 added to negative values).
- ttt = Temperature of the sea (surface water) in degrees and tenths.
- V = Visibility or distance at which objects can be seen in daylight (or at which lights can be seen at night).
- v = Visibility at sea from ships at sea.
- V<sub>s</sub> = Visibility towards the sea (from coast stations).
- W = The weather in the interval since the preceding time of report. This interval is 5, 6 or 7 hours for stations reporting 4 times daily.
- ww = The actual weather at the time of observation with which is combined, whenever possible, the general character of the weather.
- w<sub>1</sub> = The initial figure of the code ww, thus indicating the general state of the weather.
- YY = Day of month.

In publishing "Weather Signals" in the Numbers which follow throughout the year for the maritime countries of the world every endeavour is made to make the information accurate and up to date, at the same time giving it as tersely and conveniently as possible for mariners from the many available sources.

Every effort is made to guard against error, and Marine Observers are asked to write in and point out any errors which may appear to them.

#### Special Notices regarding Personnel.

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

#### OBITUARY.

The death of Captain J. DAVIES, formerly Commander of the WHITE STAR Liner *Arabic*, which took place at his home, "West Wood," Galloway Road, Waterloo, on November 10th, 1926, is noted with deep regret.

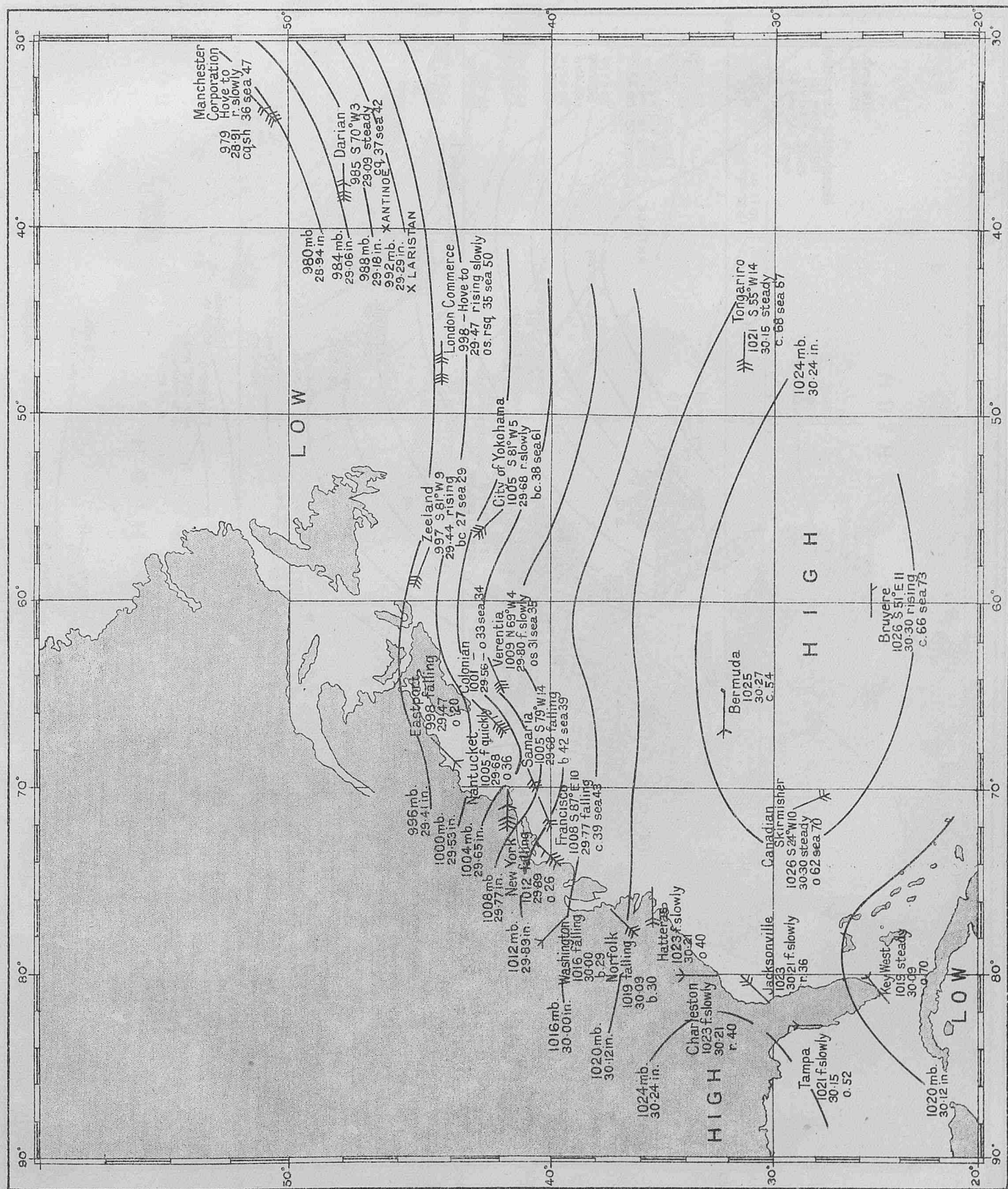
Captain DAVIES went to sea in 1892 and joined the DOMINION LINE as third officer in 1898, obtaining command of the *Welshman* in 1912.

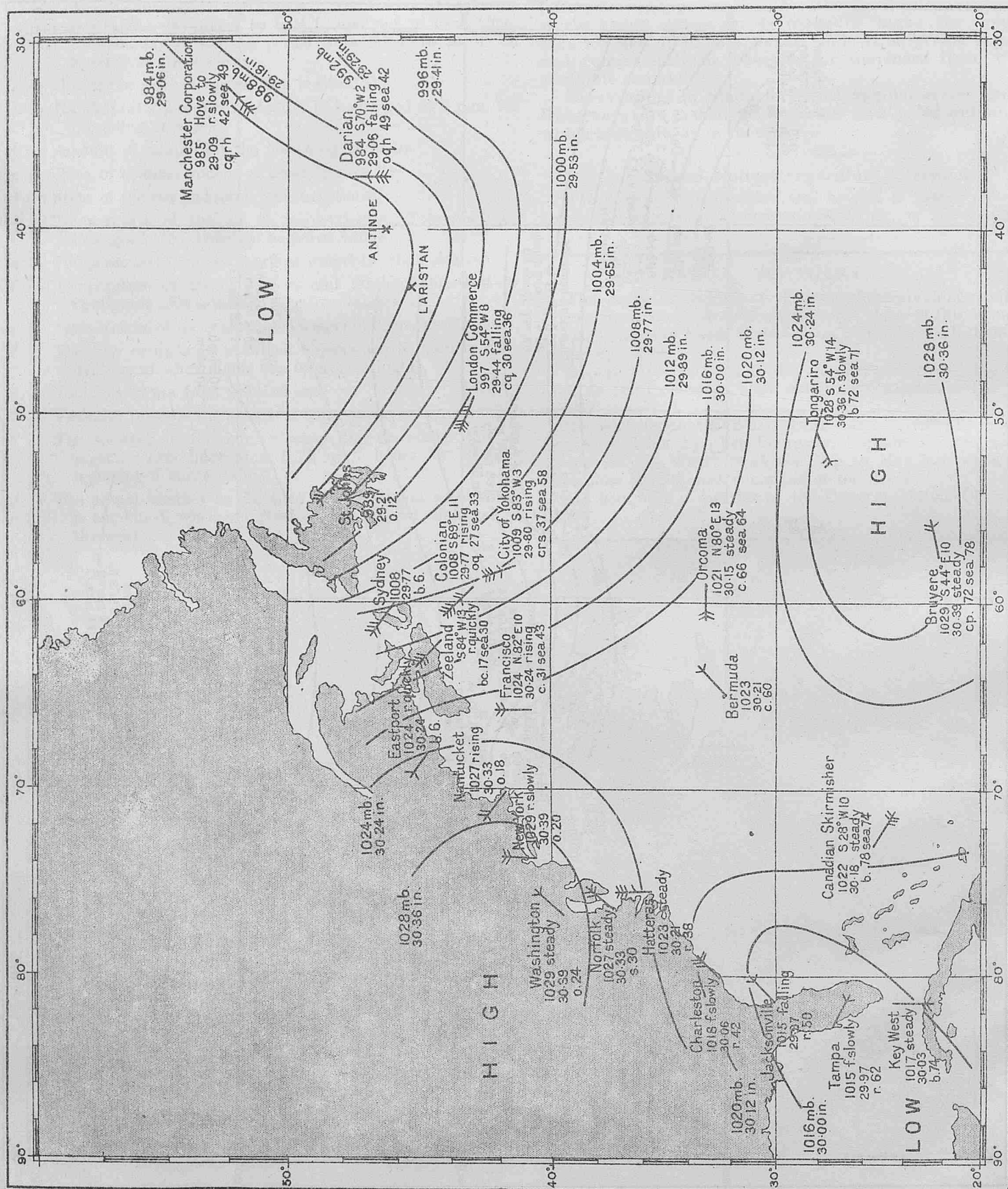
Transferring to the WHITE STAR LINE on the absorption of the DOMINION LINE by that Company, Captain DAVIES commanded several of the WHITE STAR fleet up to May last when ill-health forced him to relinquish command of the *Arabic*.

He had been a member of the Corps of Marine Observers since 1920.



MORNING OF JANUARY 24<sup>TH</sup> 1926.

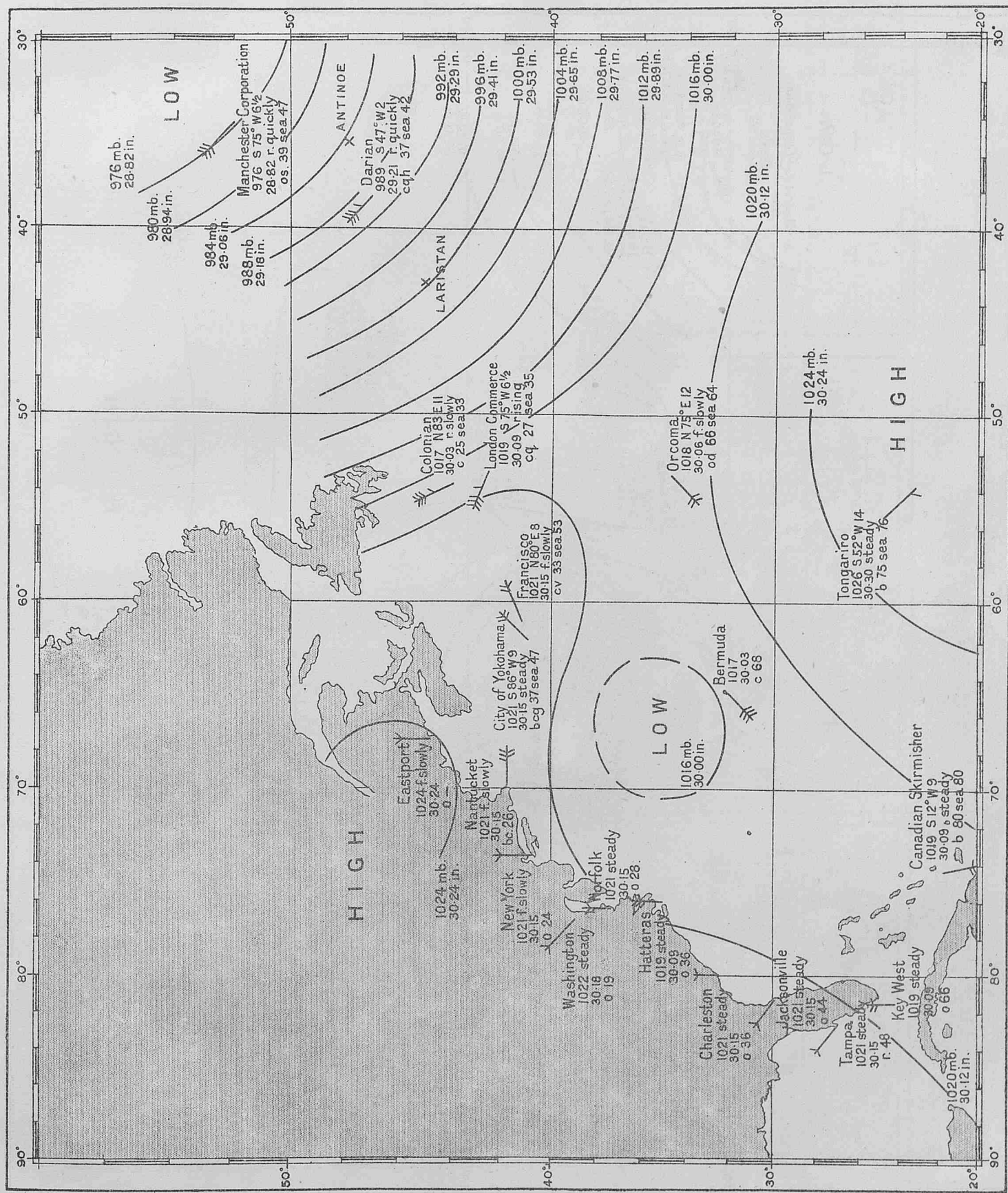




# WEATHER CHART

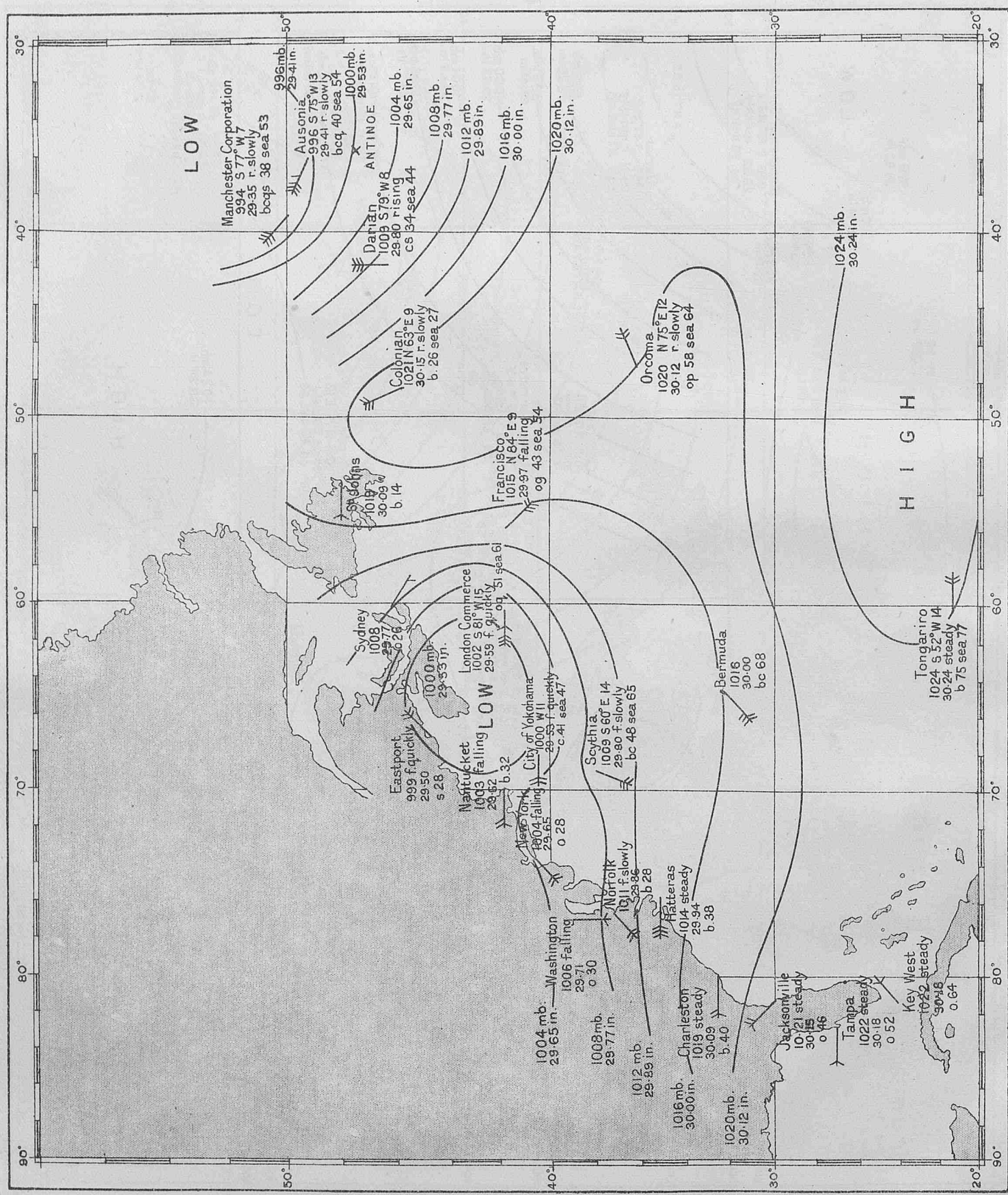


MORNING OF JANUARY 26<sup>TH</sup> 1926.



WEATHER CHART

MORNING OF JANUARY 27TH 1926.

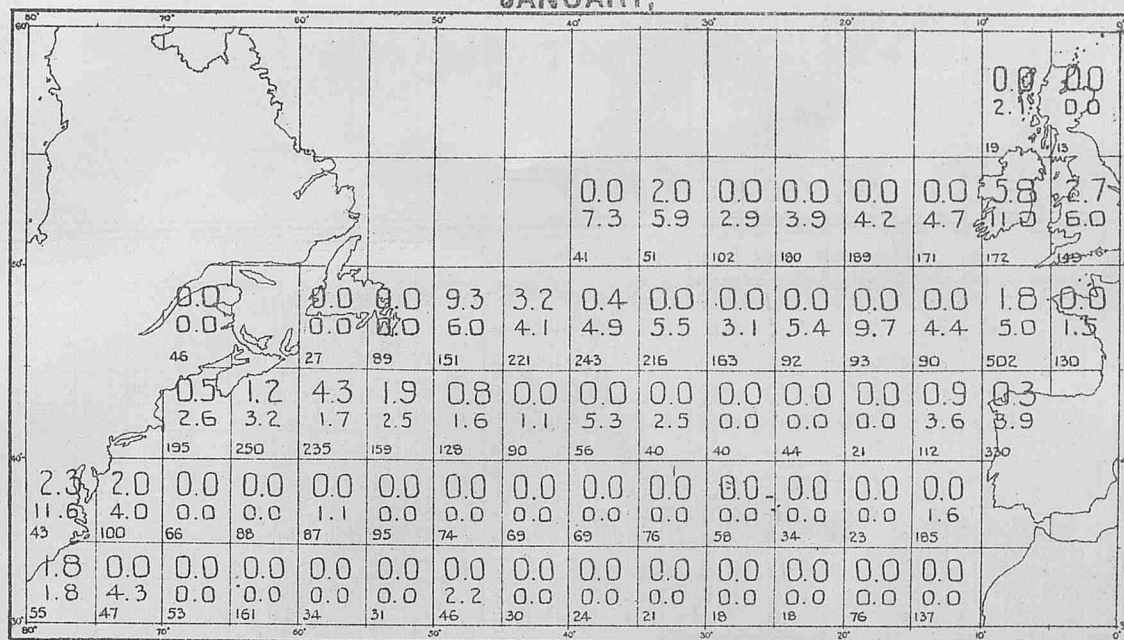


WEATHER CHART

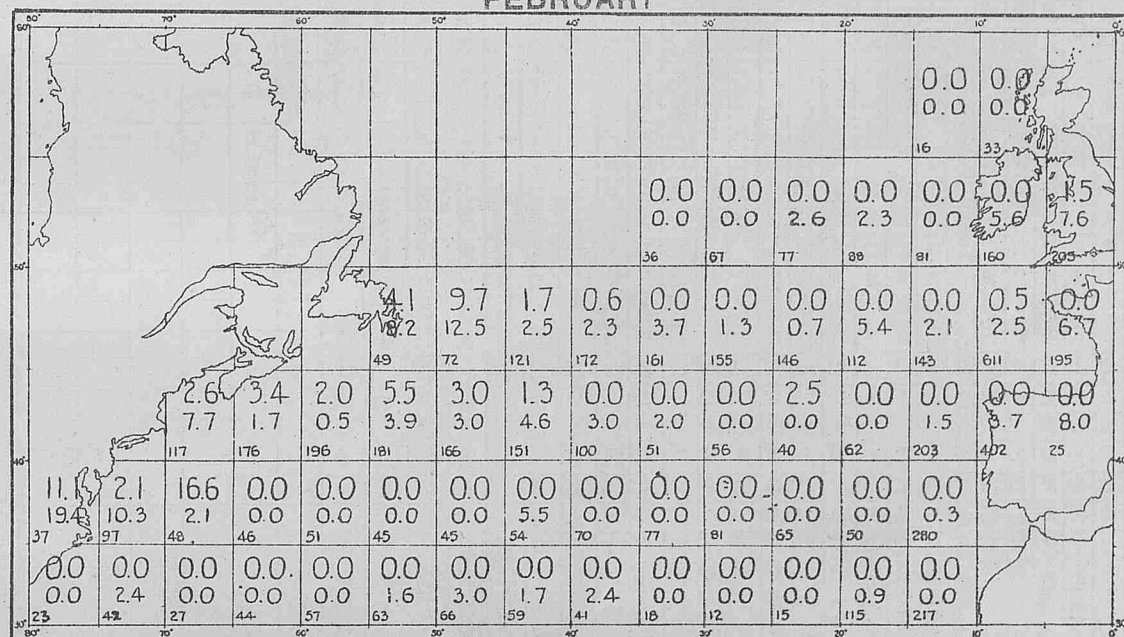


COMPILED FROM OBSERVATIONS FOR THE YEARS 1921-1925.

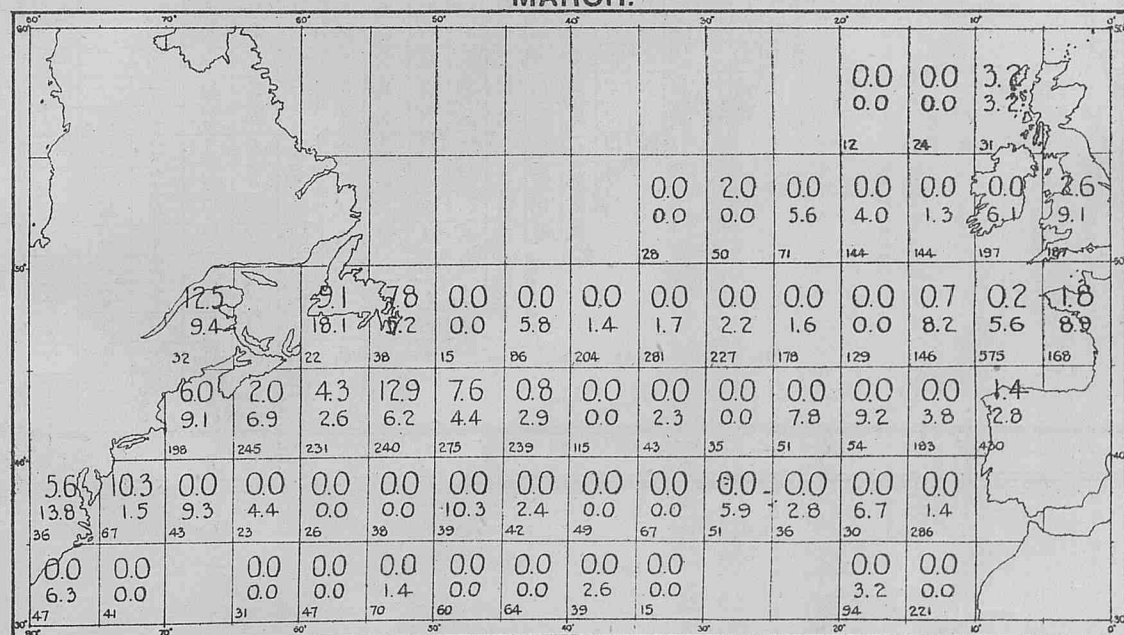
## JANUARY.



## FEBRUARY

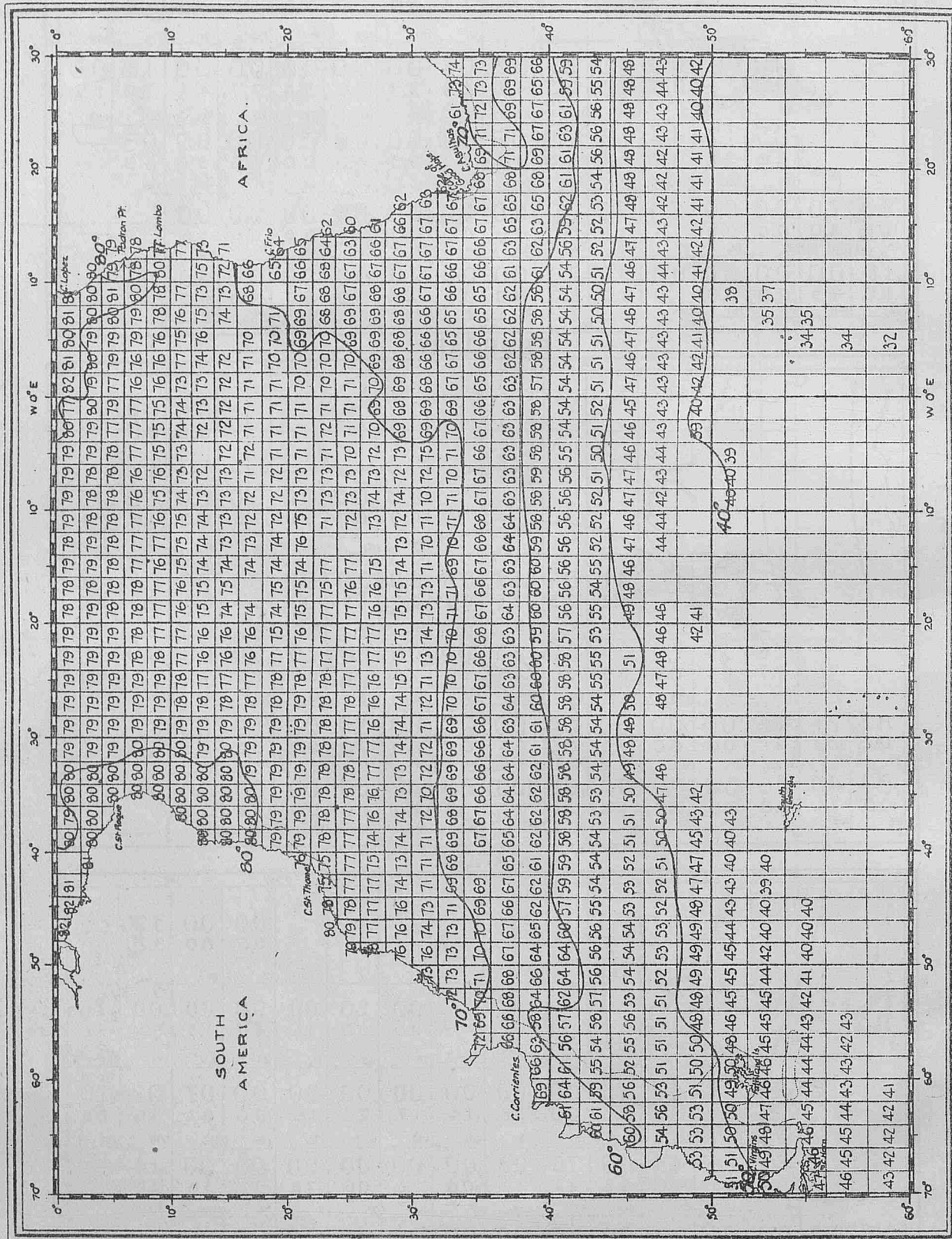


## MARCH.



The upper (large) numbers in the centre of each 5° square show the percentage frequency of observations of fog. The lower (medium sized) numbers in the centre of each 5° square show the percentage frequency of observations of mist. The small number in the lower left hand corner of each 5° square is the number of observations on which the percentage frequency is based.

SOUTH ATLANTIC.  
MEAN SEA SURFACE TEMPERATURES FOR MONTH OF JANUARY.



Computed from observations of British ships during the years 1855 to 1899 except to the Southward and Eastward of Latitude 30° South and Longitude 10° East where the observations are for the years 1855 to 1878.



# NOTICES.

## Wireless and Weather an Aid to Navigation.

The Serial Chapters under this heading are being revised and published in the 1927 MARINE OBSERVER as a second edition.

As proved by the entries at the end of the Meteorological Log and in the new edition of the Ship's Meteorological Report Form 911 a large number of Commanders of ships on the list of Regular Marine Observers are making Wireless Weather reports regularly to "All Ships" of observations taken at the same time as those of the nearest coast.

The Commanders of all the ships whose names appear in the list at the end of THE MARINE OBSERVER with the letters M.L., M., or W.T., after their names in the fourth column are selected ships, and are *invited* to make these reports once daily as a matter of routine to "All Ships" for the general benefit of shipping and seamen. A sample message will be found in "Weather Signals" page 17, and in Chapter I, page 15, of this Number.

The Corps of Marine Observers are requested to bring this system to the notice of Commanders and Officers who do not belong to the regular Corps of Voluntary Marine Observers, and to show them how they may gain by the unselfish work of our Corps.

### 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 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.

### CONVERSION TABLE.

To Convert Inches into Millibars.

Inch.	mb.	Inch.	mb.	Inch.	mb.
27.50	931.2	28.65	970.2	29.85	1,010.8
27.55	932.9	28.70	971.9	29.90	1,012.5
27.60	934.6	28.75	973.6	29.95	1,014.2
27.65	936.3	28.80	975.3	30.00	1,015.9
27.70	938.0	28.85	976.9	30.05	1,017.6
27.75	939.7	28.90	978.6	30.10	1,019.3
27.80	941.4	28.95	980.3	30.15	1,021.0
27.85	943.1	29.00	982.0	30.20	1,022.7
27.90	944.8	29.05	983.7	30.25	1,024.4
27.95	946.5	29.10	985.4	30.30	1,026.1
28.00	948.2	29.15	987.1	30.35	1,027.7
28.05	949.9	29.20	988.8	30.40	1,029.4
28.10	951.6	29.25	990.5	30.45	1,031.1
28.15	953.2	29.30	992.2	30.50	1,032.8
28.20	954.9	29.35	993.9	30.55	1,034.5
28.25	956.6	29.40	995.6	30.60	1,036.2
28.30	958.3	29.45	997.3	30.65	1,037.9
28.35	960.0	29.50	999.0	30.70	1,039.6
28.40	961.7	29.55	1,000.7	30.75	1,041.3
28.45	963.4	29.60	1,002.4	30.80	1,043.0
28.50	965.1	29.65	1,004.0	30.85	1,044.7
28.55	966.8	29.70	1,005.7	30.90	1,046.4
28.60	968.5	29.75	1,007.4	30.95	1,048.1
		29.80	1,009.1		



# ICE CHART. WESTERN NORTH ATLANTIC.

LETTERS OF TRANSATLANTIC TRACKS INDICATE.

(C) From 1st September to 31st January, inclusive.

(E) From 1st December to 14th February, inclusive.

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.

## ROUTE NOTICES.

For latest information *re* Tracks see Board of Trade "Notices to Mariners," 1st November, 1926. pp. 142-6.

## SYMBOLS USED ON THE CHART.

- Iceberg.
- Floesberg.
- 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 DRIFTS OF ICE.

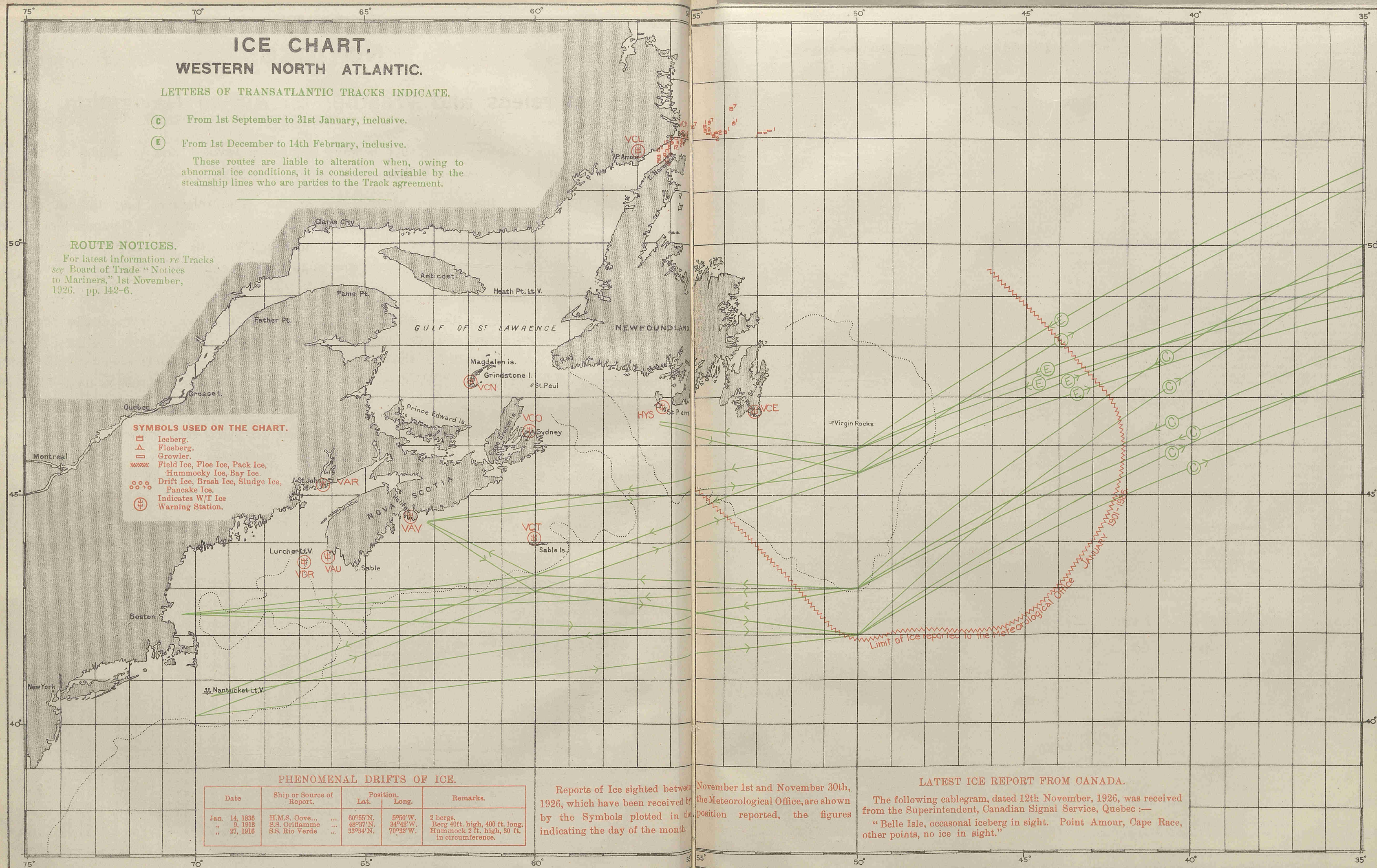
Date	Ship or Source of Report.	Position.	Remarks.
Jan. 14, 1836	H.M.S. Cove...	60°55'N. 59°50'W.	2 bergs.
" 9, 1913	S.S. Oriflamme	48°37'N. 34°42'W.	Berg 40ft. high, 400 ft. long.
" 27, 1916	S.S. Rio Verde	33°34'N. 70°32'W.	Hummock 2 ft. high, 30 ft. in circumference.

Reports of Ice sighted between November 1st and November 30th, 1926, which have been received by the Meteorological Office, are shown by the Symbols plotted in the position reported, the figures indicating the day of the month.

## LATEST ICE REPORT FROM CANADA.

The following cablegram, dated 12th November, 1926, was received from the Superintendent, Canadian Signal Service, Quebec:—

"Belle Isle, occasional iceberg in sight. Point Amour, Cape Race, other points, no ice in sight."





**Co-operation of Shipowners, Masters and Mates.**

The Director of the Meteorological Office is authorised to lend tested Instruments to Captains of British-owned ships who undertake to make 4 hourly observations and keep Meteorological Logs for the Office.

The instruments supplied for this purpose are one barometer, four thermometers with screen, two hydrometers and in some cases a Barograph and rain gauge is added to the equipment.

Tested instruments are also lent to a number of British Atlantic Liners which make special coded W/T weather reports to the Office.

The number of ships co-operating with the M.O. using official tested instruments on loan is limited.

Vessels observing regularly for the Meteorological Office to which office instruments are not lent, keep Form 911, Ship's Meteorological Report, using the ship's instruments, the barometer being compared with Standards. The number of ships regularly contributing approved forms of all descriptions to the Marine Division is limited to 500.

Captains and Officers who wish to co-operate with the Meteorological Office should apply *by letter* to The Director, Meteorological Office, Air Ministry, Kingsway, London, W.C.2; or *in person* between the hours of 10 a.m. and 4 p.m., to the Marine Superintendent at the same address or to any of the gentlemen whose names and addresses are given below acting as agents at the respective ports. A waiting list is kept of the names of ships whose commanders have offered to regularly co-operate.

Marine Observers (*i.e.*, Captains and Officers who regularly observe for the Meteorological Office) will greatly assist if they will send in Meteorological Logs immediately on completion through the Port Meteorological Officer or Agent, at the same time notifying him of any possible instrumental defects.

Defective instruments will then be replaced and new Log Books, etc., provided.

In London and at base ports where there is not an Agency, notification of defects should be sent to headquarters on arrival, with the Meteorological Log.

Vessels making voyages of less than two months' duration are requested to retain their logs until nearly filled up, but the log should be returned in all cases at least twice yearly.

W/T Registers and Forms 911 should in all cases be sent directly to the Meteorological Office, London. The Port Meteorological Officer at Liverpool and the Visiting Officer in London board vessels co-operating with the Meteorological Office, and the agents visit ships at their ports when circumstances permit.

Postage abroad incurred on behalf of the Meteorological Office in returning logs will be refunded. Postage from British Empire ports need not be prepaid, if the envelope is marked O.H.M.S., and addressed to the Director, Meteorological Office, London.

Captains and Officers whether they observe regularly for the Meteorological Office or not are urged to report exceptional phenomena in air or sea. Reports of weather experienced in or near Tropical Cyclones or hurricanes, also abnormal currents are specially desired.

Ships on the List of Voluntary Observers to the Meteorological Office which have a mercurial barometer are indicated by the letters M.L., W.T. and M.

These are selected ships for reporting weather observations made at specified times by W/T to "All Ships," and they are invited to perform this service, which is for the benefit of all shipping fitted for W/T reception.

For sample weather report message see pages 15 and 17 of this Number.

THE MARINE OBSERVER is sent monthly to all ships regularly contributing Logs, Forms and W/T Registers to the Meteorological Office. It is hoped that each ship will preserve *all* her copies. Personal copies of Numbers are sent to those whose special contributions are published in them. A suitable cover may be obtained from H.M. Stationery Office, price 2s.

**LATE PRESS.****DERELICTS AND FLOATING WRECKAGE.**

Date.	Position.		Description.
	Latitude.	Longitude.	
<b>NORTH SEA.</b>			
3.11.26	54°55'N.	0°50'W.	Floating wreckage, apparently part of sailing vessel.
8.11.26	54°23'N.	3°52'E.	Fishing vessel, 2 masts projecting about 6 feet.
11.11.26	52°07'N.	1°50'E.	Heavy mast showing above water, apparently broken mast of sailing drifter, dangerous to navigation.
13.11.26	3 m. E. by S. of Terschelling Lt. Vessel.		Drifting cone buoy, red with white stripe round centre, marked "S" in black.
<b>ENGLISH CHANNEL.</b>			
2.11.26	49°41'N.	2°54'W.	French dandy s.v. <i>Gabi</i> abandoned in sinking condition put on fire, dangerous to navigation.
<b>BRISTOL CHANNEL.</b>			
2.11.26	51°20'N.	5°15'W.	Wreckage cut away from unknown schooner, 2 masts 12 to 15 feet above water, 15 to 20 feet apart with sails, rigging, &c., dangerous to navigation.
<b>MEDITERRANEAN.</b>			
1.11.26	36°47'N.	1°15'W.	Drifting wreck, keel up, painted red, about 2 feet out of water.
<b>RED SEA.</b>			
1.11.26	25°30'N.	35°30'E.	S.S. <i>Sheikh Berkhud</i> on fire, dangerous to navigation.
<b>NORTH ATLANTIC.</b>			
2.11.26	31°08'N.	79°02'W.	Long spar projecting 7 feet out of water.
7.11.26	40°08'N.	70°54'W.	Small flat bottomed skiff about 15 feet long, painted dark colour.
7.11.26	24°58'N.	80°24'W.	Wreckage, apparently bottom of a wooden barge, heavy beams attached, showing little above water.
8.11.26	34°48'N.	48°16'W.	Sch. <i>Valkyria</i> abandoned.
8.11.26	37°13'N.	75°33'W.	Tree trunk about 30 feet long.
15.11.26	50°50'N.	6°30'W.	Two large spars and one small one.
<b>GULF OF MEXICO.</b>			
4.11.26	23°20'N.	83°10'W.	Large tree trunk about 30 feet long, 4 feet in diameter.
6.11.26	28°56'N.	91°48'W.	Log, 40 feet long and 1½ feet in diameter.
<b>NORTH PACIFIC.</b>			
1.11.26	50°29'N.	170°57'W.	Log about 40 feet long and 3 feet in diameter.

## 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.  
Mr. W. T. GRIEVES, Visiting Officer for the Port  
of London.

**LIVERPOOL ...** Lieut. Commander M. CRESSWELL, R.N.R., Port  
Meteorological Officer, Dock Office.  
(Telephone No.: Bank 8959).

**Agents.**

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

**CARDIFF ...** Captain T. JOHNSTON, Technical College, Cathays  
Park.

**GLYDE ...** Captain M. C. CORRANCE, Board of Trade Sur-  
veyor's Office, 73, Robertson Street, Glasgow.

**FREMANTLE.**  
W. Australia.

**HONG KONG,**  
China.

**HULL ...**

**LEITH ...**

**SOUTHAMPTON**

**SYDNEY,**  
New South Wales.

**TYNE ...**

**VANCOUVER,**  
British Columbia.

**Agents (contd.).**

Captain J. J. AIREY, Deputy Director of Naviga-  
tion, Dalgety's Buildings.

Lieut. Commander O. C. G. LEVESON-GOWER,  
R.N., Superintendent, Admiralty Chart and  
Chronometer Depot, H.M. Dockyard.

Captain Geo. B. STURDY, c/o Mr. W. HAKES,  
Commercial Road.

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

Captain D. FORBES, Nautical Academy, 1, Albion  
Place.

Commander G. D. WILLIAMS, D.S.O., R.D., R.N.R.,  
Deputy Director of Navigation, Customs House.

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

Mr. T. S. H. SHEARMAN, Room 40, Post Office  
Building.



# LIST OF VOLUNTARY OBSERVING SHIPS

1

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 reports received, are given with the date and description of last log, register or report 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 reports 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.

Unless otherwise stated, vessels on the following list are s.s.

M.L. = Equipped with tested Instruments for keeping Meteorological Log.

W.T. = Equipped with tested Instruments for making coded W/T reports to the Meteorological Office, London.

No. = Keeps Ship's Meteorological Report Form 911 with ship's instruments. Letter M after No. indicates ship's barometer Mercurial; A. ship's barometer Aneroid.

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

The numbers which appear before the names of ships equipped for making coded W/T reports to the Meteorological Office, London, are used for the purpose of identification when the observations are re-transmitted in synoptic messages by Wireless or Cable.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 12.11.26.	Date Received.
<i>Aba</i> ...	Hughes, J. ...	J. Doyle, L. B. Silvester, S. J. Bristowe.	M.L.	Elder Dempster ...	Met. Log. 28.4.25 to 25.9.26 ...	14.10.26.
<i>Abinsi</i> ...	Millson, H. E. ...	H. H. Burke ...	No. A.	" " ...	Form 911 21.7.26 to 29.8.26 ...	1.9.26.
<i>Achilles</i> ...	Hill, R. ...	D. MacTavish ...	" A.	A. Holt ...	" 8.10.25 to 19.10.25...	18.11.25.
<i>Actor</i> ...	Haylett, E. ...	A. Frew, J. McKay, G. Penston.	M.L.	Harrison ...	Met. Log. 12.5.26 to 2.7.26 ...	14.8.26.
<i>Adda</i> ...	Toft, J. T. ...	E. C. Davis ...	No. M.	Elder Dempster ...	Form 911 24.9.26 to 7.10.26 ...	18.10.26.
50 <i>Adriatic</i> ...	Beadnell, F. E., Capt., R.N.R.	R. G. Roberts, O. V. Lucas...	W.T.	White Star ...	W.T. Reg. 20.9.26 to 9.10.26 ...	11.10.26.
<i>Aeneas</i> ...	Wallace, W. K. ...	J. M. Anderson ...	No. A.	A. Holt ...	Form 911 18.10.26 to 6.11.26...	9.11.26.
<i>Aqapenor</i> ...	Ramsay, J. ...	S. G. Ellams ...	" A.	" " ...	" 21.3.26 to 9.4.26 ...	17.5.26.
<i>Aidan</i> ...	Harris, F. C. P. ...	J. J. West ...	" A.	Booth ...	" 13.8.26 to 11.9.26 ...	16.9.26.
<i>Alban</i> ...	Whayman, W. ...	C. D. Lane, A. T. Douglas ...	" A.	" " ...	" 7.9.26 to 5.10.26 ...	11.11.26.
<i>Albania</i> ...	Gronow, S. ...	L. Harper ...	" A.	Cunard ...	" 6.12.25 to 22.12.25...	4.1.26.
<i>Alipore</i> ...	Harrison, R., D.S.O., R.D., Commr., R.N.R.	D. N. Stafford ...	" M.	P. and O. ...	" 29.8.25 to 22.9.25 ...	24.9.26.
<i>Almanzora</i> ...	Mackenzie, G. A. ...	A. H. Phillipson ...	" A.	R.M.S.P. ...	" 2.6.26 to 24.8.26 ...	14.9.26.
<i>Alondra</i> ...	Prendergast, J. J. ...	H. Peters ...	" A.	Yeoward ...	" 25.9.26 to 7.11.26 ...	9.11.26.
<i>Ampeico</i> ...	Vandenkerckhove, A. ...	A. Aspelagh ...	" A.	American Petroleum...	" 10.10.26 to 31.10.26 ...	2.11.26.
<i>Antiochus</i> ...	Dunlop, S. K. ...	E. T. Bayes ...	" A.	A. Holt ...	" 16.8.26 to 31.8.26 ...	4.10.26.
<i>Aorangi</i> ...	Crawford, E. ...	J. W. Bray, G. H. Kime, H. A. Titchfield, E. Anderson.	M.L.	Canadian-Australasian	" 4.9.26 to 19.10.26 ...	27.10.26.
<i>Appam</i> ...	Yardley, H. A., D.S.C.	Prendergast, Dutton, W. Page	"	Elder Dempster ...	Met. Log. 7.5.26 to 19.8.26 ...	10.9.26.
30 <i>Aquitania</i> ...	Charles, Sir J. T. W., K.B.E., C.B., R.D., Commr., R.N.R.	J. L. Croasdaile, J. Locke, D. MacLean.	W.T.	Cunard ...	" 23.12.25 to 23.5.26...	5.6.26.
62 <i>Arabic</i> ...	Bulman, J. B. ...	S. B. Morfee, M. Bennett, A. F. Butcher.	"	White Star ...	W.T. Reg. 17.10.26 to 1.11.26...	3.11.26.
<i>Arafura</i> ...	Gordon, A. S. ...	J. T. Heddle, G. C. Smith, O. B. Godfrey.	M.L.	Eastern and Australian	" 15.10.26 to 6.11.26...	9.11.26.
<i>Archimedes</i> ...	Downs, E. B. ...	J. M. Edgar ...	No. A.	Lamport & Holt ...	Form 911 20.4.26 to 14.5.26 ...	17.5.26.
<i>Ariguani</i> ...	Scudamore, J. H. H., D.S.C., R.D., Commr., R.N.R.	G. Dobson, S. A. Sapworth, G. McKee, W. E. Butcher.	M.L.	Elders & Fyffes ...	Met. Log. 7.4.26 to 28.6.26 ...	1.9.26.
<i>Armada Castle</i> ...	Millard, A. ...	A. B. Connor, G. D. Pinnick, L. May.	"	Union Castle ...	Form 911 22.3.26 to 9.6.26 ...	16.7.26.
<i>Arracan</i> ...	Willis, M. ...	R. McInnes, M. S. Stuart, C. C. Weir.	"	P. Henderson ...	" 10.4.26 to 8.8.26 ...	18.8.26.
<i>Arundel</i> ...	Short, H. ...	Mr. Hill ...	C.C.	Southern Rly. ...	Met. Log. 17.4.26 to 10.10.26	30.10.26.
<i>Arundel Castle</i> ...	George, J., O.B.E....	C. S. Keen ...	No. A.	Union Castle ...	" 4.1.26 to 11.4.26 ...	26.4.26.
<i>Astronomer</i> ...	Richards, J. ...	H. Thomas, J. Glen, — Winstanley.	M.L.	Harrison ...	Telegraphic Report 11.11.26 ...	11.11.26.
<i>Athemic</i> ...	Davies, E. ...	W. Hill ...	No. A.	White Star ...	Met. Log. 8.9.26 to 24.10.26 ...	26.10.26.
<i>Atreus</i> ...	Salter, G. H. ...	J. C. Podmore ...	" A.	A. Holt ...	" 18.2.26 to 16.6.26 ...	24.6.26.
<i>Atsuta Maru</i> ...	Arakida, R. ...	K. Murazumi ...	" A.	Nippon Yusen Kaisha	Form 911 21.9.26 to 5.10.26 ...	8.10.26.
<i>Auditor</i> ...	Owen, W. T. ...	T. E. Steel ...	" M.	Harrison ...	" 14.8.26 to 21.9.26 ...	9.11.26.
<i>Ausonia</i> ...	Stafford, W., D.S.C., R.D., Lt.-Commr., R.N.R.	E. R. B. Freeman...	" A.	Cunard ...	" 29.7.26 to 10.8.26 ...	16.8.26.
<i>Avon</i> ...	Adam, C., R.D., Commr., R.N.R.	E. S. Dunch ...	" M.	R.M.S.P. ...	" 15.10.26 to 27.10.26	4.11.26.
<i>Balfour</i> ...	Dott, J. ...	S. W. Keay ...	No. A.	Canadian Pacific ...	" 17.10.26 to 6.11.26...	9.11.26.
<i>Balranald</i> ...	Townshend, W. P., Commr., R.N.R.	...	M.L.	P. & O. Branch ...	" 24.3.26 to 2.7.26 ...	17.7.26.
					" 3.9.26 to 1.10.26 ...	6.10.26.



## THE MARINE OBSERVER

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 12.11.26.	Date Received.
51 Baltic ...	White, E. R., Commr. R.N.R.	H. R. Wilkinson, H. C. Gray, D. K. Crawford.	W.T.	White Star ...	W.T. Reg. 4.10.26 to 23.10.26...	27.10.26.
Bambra ...	Turner, J. E. ...	H. W. Norris, J. E. Turner, F. Humble.	M.L.	State Service, Australia	Form 911 4.10.26 to 24.10.26...	27.10.26.
Bampton Castle ...	Hutchings, A. H. ...	J. W. S. Brooks ...	No.	Union Castle ...	Met. Log. 25.11.25 to 3.5.26 ...	15.6.26.
Banbury Castle ...	Singeisen, E. A., D.S.C., R.D., Capt., R.N.R.	C. G. Cuthbertson ...	No. A.	"	" 12.3.26 to 3.7.26 ...	16.7.26.
Banffshire ...	Wynne, R. H. ...	W. F. Lockhead ...	" A.	Turnbull Martin ...	Form 911 5.9.26 to 2.10.26 ...	26.10.26.
Baron Murray ...	Edgar, J. E. ...	W. P. G. Arthur, H. Thompson	" A.	"	" 2.7.26 to 4.8.26 ...	6.9.26.
Barpeta ...	Miller, A. C. ...	G. A. Ramsay ...	" M.	Hogarth & Sons ...	" 8.5.26 to 10.6.26 ...	21.9.26.
Baychimo ...	Cornwall, S. A. ...	E. J. Hankin ...	" A.	British India ...	" 8.9.26 to 8.10.26 ...	1.11.26.
Baymaud ...	Foellmer, G. ...	"	" M.	Hudson's Bay Co. ...	" 10.7.26 to 20.9.26 ...	8.11.26.
Beaufort ...	Rice, W. V., D.S.O., D.S.C., Commr., R.N.	C. R. Brent ...	M.L.	His Majesty's Ship ...	"	"
59 Belgenland ...	Howell, T. ...	C. Murray, J. Cross ...	W.T.	Red Star ...	Met. Log. 16.4.26 to 29.8.26 ...	14.9.26.
Benalder ...	Cole, J. H., D.S.C. ...	T. S. Rawlingson ...	No. A.	Ben Line ...	W.T. Reg. 4.10.26 to 23.10.26...	26.10.26.
Bendigo ...	Nicholl, R. N. C. ...	H. J. Cholerton ...	" M.	P. & O. Branch ...	Form 911 4.10.26 to 23.10.26...	26.10.26.
31 Berengaria ...	Roston, Sir A. H., K.B.E., R.D., Capt., R.N.R.	J. A. Myles, W. C. A. Robson, E. W. Connell ...	W.T.	Cunard ...	" 17.9.26 to 27.10.26...	1.11.26.
Berrima ...	Short, C. E. ...	T. Ferguson ...	No. M.	P. & O. Branch ...	" 4.9.26 to 8.10.26 ...	21.10.26.
Bintang ...	Morzer Bruyns, M. F. ...	M. C. Altins ...	" M.	Nederland ...	W.T. Reg. 3.10.26 to 8.11.26 ...	11.11.26.
Bogota ...	Good, W. J. ...	W. Billington ...	" A.	R.M.S.P. Co. ...	Form 911 24.7.26 to 12.8.26 ...	8.9.26.
Bolingbroke ...	Dott, J. F. ...	C. A. Mott ...	M.L.	Canadian Pacific ...	" 6.10.26 to 21.10.26...	1.11.26.
Borda ...	McQueen, D. ...	"	"	"	Met. Log. 23.1.26 to 31.8.26 ...	8.9.26.
Bothwell ...	Murray, M. F. ...	"	"	"	" 21.5.26 to 19.9.26 ...	21.9.26.
Brandon ...	Holland, R. ...	G. Mowatt ...	No. M.	P. & O. Branch ...	Form 911 9.5.26 to 28.6.26 ...	30.6.26.
Brecon ...	Rothwell, A. J. ...	T. Beck ...	" A.	Canadian Pacific ...	" 6.10.26 to 5.11.26 ...	8.11.26.
Brenda ...	Sargent, A. H., R.D., Lt.-Commr., R.N.R.	"	" A.	"	" 25.7.26 to 25.8.26 ...	27.8.26.
Brighton ...	McCombie, G. ...	F. E. Bevis ...	" A.	Scottish Fishery Board	" 29.6.26 to 27.7.26 ...	3.8.26.
British Advocate ...	Lamont, A. ...	F. R. Ness ...	" A.	Southern Railway ...	" 1.6.26 to 30.6.26 ...	3.7.26.
British Engineer ...	Hill, A. ...	Mr. Munton ...	C.C.	British Tankers ...	Telegraphic Report 13.10.26 ...	13.10.26.
British Soldier ...	Taylor, R. J. ...	M. Kennedy ...	No. M.	"	Form 911 28.8.26 to 10.10.26...	22.10.26.
Bronte ...	Joures, T. W. ...	E. L. W. Evans ...	" M.	"	" 26.1.26 to 9.3.26 ...	12.4.26.
Browning ...	Putt, R. O. ...	H. J. Crangle ...	" A.	"	" 25.8.26 to 26.9.26 ...	19.10.26.
Bruyere ...	Crappier, J. S. ...	W. Jones, H. L. Rudd ...	" A.	Lamport & Holt ...	" 3.10.26 to 14.10.26 ...	18.10.26.
Burma ...	Connorton, W. A. ...	A. B. Murray ...	" A.	"	" 29.3.26 to 1.7.26 ...	5.7.26.
Cambria C.S. ...	Denson, W. ...	R. Mowbray ...	" A.	"	" 20.1.26 to 12.2.26 ...	22.3.26.
Cambria ...	Reid, R. B. ...	J. Henderson ...	" A.	Henderson ...	" 24.7.26 to 10.10.26...	29.10.26.
Cameronia ...	Sherwood, C. A., D.S.C.	A. J. English, B. C. Farrow, C. F. St. John.	M.L.	Eastern Tel. Co. ...	Met. Log. 20.6.26 to 24.8.26 ...	29.9.26.
Camito ...	Telfer, J. E. ...	V. S. Phillips ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report 11.11.26 ...	11.11.26.
Canadian Importer ...	Smart, R. W. ...	A. Morrice ...	No. A.	Anchor ...	Form 911 25.9.26 to 17.10.26...	20.10.26.
Canadian Inventor ...	Forrester, W. T., O.B.E.	W. T. Broome, P. C. Congdon, F. Dudgeon, C. N. Schofield.	M.L.	Elders & Fyfes ...	Met. Log. 21.6.26 to 16.10.26...	30.10.26.
Canadian Miller ...	Forson, A. ...	C. R. Randle ...	No. A.	Canadian Govt. Mercantile Marine.	Form 911 1.9.26 to 1.10.26 ...	26.10.26.
Canadian Scottish ...	Boulton, F. W. ...	D. Grey ...	" A.	"	" 25.8.26 to 4.9.26 ...	22.9.26.
Canadian Skirmisher ...	McConechy, W. T. ...	C. E. Moore, H. Ruegg ...	" A.	"	" 14.3.26 to 23.6.26 ...	15.7.26.
Canadian Winner ...	Wallace, C. ...	A. E. Webster ...	" A.	"	" 17.7.26 to 4.9.26 ...	18.10.26.
35 Carnarvon ...	Millar, W. H. ...	R. J. Watson ...	" A.	"	" 24.7.26 to 4.9.26 ...	16.9.26.
Carnarvon Castle ...	Bisset, C. R. ...	R. Girling, J. Cochrane ...	" M.	"	" 29.8.26 to 9.10.26 ...	2.11.26.
34 Caronia ...	Brown, F. G., R.D., Capt., R.N.R.	L. R. Simpson, W. M. Stewart, P. L. Williams.	W.T.	Cunard ...	W.T. Reg. 17.10.26 to 6.11.26...	8.11.26.
52 Cedric ...	Hague, J. W., Commr., R.N.R.	"	M.L.	Union Castle ...	Form 911 25.7.26 to 13.8.26 ...	20.8.26.
53 Celtic ...	Hossack, W. H., R.D., Capt., R.N.R.	R. F. Bovey, T. Ashcroft, D. Butler.	W.T.	Cunard ...	"	"
Centour ...	Hickson, V. W., Lt.-Commr., R.N.R.	E. A. A. Crowley, J. Farrell.	"	White Star ...	W.T. Reg. 3.10.26 to 23.10.26...	28.10.26.
Ceramic ...	Berry, G. ...	G. T. Kavanagh, J. Peters, F. E. Patchett.	"	"	Form 911 3.10.26 to 23.10.26...	29.10.26.
Chancellor ...	Rose, A. F. ...	L. Johnstone, E. Potts ...	No. M.	"	W.T. Reg. 26.9.26 to 17.10.26...	20.10.26.
Changte ...	Roberts, J., C.B.E., D.S.O., R.D., Capt., R.N.R.	D. W. Chamberlain ...	" A.	A. Holt & Co. ...	Form 911 26.9.26 to 18.10.26...	21.10.26.
China ...	Gibbings, W. ...	L. R. Bull ...	No. A.	White Star ...	W.T. Reg. 11.10.26 to 31.10.26...	3.11.26.
Chindwin ...	Gambrell, F. C. ...	J. Thomas, D. D. Tyer, J. A. Allan.	M.L.	"	Form 911 10.10.26 to 31.10.26...	4.11.26.
City of Benares ...	Cossey, W. F. ...	D. A. C. Butler ...	No. M.	"	" 15.6.26 to 20.8.26 ...	28.9.26.
City of Brisbane ...	Brooks, E. G. ...	J. Hammond ...	" M.	"	" 20.4.26 to 24.5.26 ...	26.5.26.
City of Canterbury ...	Esslemont, C. ...	"	" A.	"	"	"
City of Chester ...	Houghton, W. ...	A. Beaton, J. Cook, W. H. Dalton.	M.L.	"	Form 911 28.7.26 to 14.8.26 ...	21.9.26.
City of Edinburgh ...	Anderson, W. W. ...	C. G. Inglis ...	No. A.	"	Met. Log. 23.4.26 to 11.8.26 ...	22.9.26.
City of Hong Kong ...	Seaborne, F. O., D.S.C.	R. W. Watkin ...	" A.	"	Form 911 30.4.26 to 23.6.26 ...	25.6.26.
City of London ...	Bremner, D. M. ...	E. Womersley ...	" A.	"	" 19.9.26 to 30.9.26 ...	25.10.26.
City of Marseilles ...	Letton, F. W. ...	H. Asher, W. Speakman, H. A. Hazell.	M.L.	"	Met. Log. 19.9.25 to 31.5.26 ...	4.6.26.
City of Rangoon ...	Wyper, J. ...	N. G. Fraser ...	No. M.	"	Form 911 1.10.26 to 19.10.26...	8.11.26.
City of Yokohama ...	Walton, H. L., O.B.E., R.D., Commr., R.N.R.	A. M. Westlake ...	" A.	"	" 24.5.26 to 4.6.26 ...	18.6.26.
Clan Alpine ...	Martin, D. ...	J. J. McTigue ...	" A.	"	" 17.9.26 to 26.9.26 ...	18.10.26.
Clan Lamont ...	Brown, G. ...	W. A. MacAdams, G. F. L. Coates.	" A.	"	Met. Log. 11.4.26 to 18.8.26 ...	20.9.26.
Clan Lindsay ...	Dunning, T. W. J. ...	A. Gibb, V. S. Turner, A. H. Cosker, G. Lawrey.	M.L.	"	Form 911 4.9.26 to 30.9.26 ...	25.10.26.
Clan Macbeth ...	McDonald, W. D. ...	R. A. Fulton ...	No. A.	"	" 4.9.26 to 30.9.26 ...	25.10.26.
Clan Macfadyen ...	Lennox, W. J. ...	G. Short ...	" A.	"	" 27.8.26 to 2.10.26 ...	8.11.26.
Clan Macgillivray ...	Urquhart, P., D.S.C.	P. de Gruchy ...	" A.	"	" 26.8.26 to 10.9.26 ...	20.9.26.
	Worthington, J. H.	T. E. Woodall ...	" A.	"	" 31.8.26 to 20.9.26 ...	25.9.26.
	Young, A. H., R.D., Lieut.-Commr., R.N.R.	W. Hurst ...	" A.	"	" 14.9.26 to 9.10.26 ...	25.10.26.
	Stenson, F. J., R.D., Capt., R.N.R.	H. M. Wavell ...	" A.	"	" 19.9.26 to 13.10.26...	8.11.26.
	West W. F. ...	A. J. Brewer ...	" A.	"	" 9.5.26 to 9.9.26 ...	14.9.26.

## LIST OF VOLUNTARY OBSERVING SHIPS

iii

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 12.11.26.	Date Received.
<i>Clan Macindoe</i> ...	Low, A. ...	J. G. Baillie ...	No. A.	Clan ...	Form 911 22.7.26 to 17.8.26 ...	12.10.26.
<i>Clan Mackellar</i> ...	Scotland, A. ...	D. McAllister ...	" A.	" ...	27.8.26 to 30.9.26 ...	8.11.26.
<i>Clan Mackinnon</i> ...	McLean, J. G. ...	W. F. Isaac, S. Y. Strange, J. E. Clayton.	M.L.	" ...	Met. Log. 25.3.26 to 14.7.26 ...	19.7.26.
<i>Clan Macphee</i> ...	Gourlay, J. B. ...	D. S. Rae, J. O. Woodall, J. J. Millar.	"	" ...	" 6.9.26 to 14.5.26 ...	24.6.26.
<i>Clan Macnaughton</i> ...	Thomson, W. ...	A. J. Storkey, D. MacDiarmid	No. M.	" ...	Form 911 19.6.26 to 29.6.26 ...	14.8.26.
<i>Clan Macnagart</i> ...	Gray, J. N. ...	W. J. Henderson ...	" A.	" ...	" 19.4.26 to 23.5.26 ...	26.5.26.
<i>Clan MacTavish</i> ...	Higgins, C. J. ...	" ...	" A.	" ...	" ...	" ...
<i>Clan Macwhirter</i> ...	Waterhouse, J. ...	R. W. Roberts ...	" A.	" ...	Form 911 16.6.26 to 7.7.26 ...	3.8.26.
<i>Clan Macwilliam</i> ...	Williamson, A. ...	T. B. Cranwill ...	" A.	" ...	" 28.8.26 to 9.10.26 ...	30.10.26.
<i>Clan Malcolm</i> ...	Neill, G. A. ...	S. M. Werrey Easterbrook, H. V. Wightman, H. M. Macrone	M.L.	" ...	Met. Log. 5.5.26 to 5.9.26 ...	25.9.26.
<i>Clan Morrison</i> ...	Porterfield, W. M. ...	L. C. Higgins ...	No. A.	" ...	Form 911 13.9.26 to 2.10.26 ...	25.10.26.
<i>Clan Murdoch</i> ...	Miller, W. ...	P. McMillan ...	" A.	" ...	" 27.6.26 to 25.7.26 ...	26.10.26.
<i>Clan Ranald</i> ...	Laird, C. ...	T. O. Marr ...	" A.	" ...	" 3.8.26 to 25.8.26 ...	9.9.26.
<i>Clan Ross</i> ...	Smith, W. P. ...	D. B. Edgar ...	" A.	" ...	" 7.9.26 to 26.9.26 ...	2.11.26.
<i>Clan Sinclair</i> ...	George, L. S. ...	J. Brittain ...	" A.	" ...	" 28.8.26 to 6.9.26 ...	10.9.26.
<i>Clan Urquhart</i> ...	Gibb, A. F. W. ...	T. G. Mitchell ...	" A.	" ...	" 1.9.26 to 19.9.26 ...	21.10.26.
<i>Colonia, C.S.</i> ...	Carlton, G. F., O.B.E., Commr., R.N.R.	W. E. Allen, R. E. Coad, F. B. Bolingbroke	M.L.	Telegraph Construction & Maintenance.	Met. Log. 13.6.26 to 24.9.26 ...	30.9.26.
<i>Colonian</i> ...	Gittins, R. P. ...	T. A. Schofield-Miller ...	No. A.	Leyland ...	Form 911 26.8.26 to 22.9.26 ...	28.9.26.
<i>Comcrin</i> ...	Borland, J. Mc. I., C.B.D.S.O., R.D., Capt., R.N.R.	E. A. O. Chambers ...	" M.	P. & O. ...	" 24.8.26 to 23.9.26 ...	28.9.26.
<i>Concordia</i> ...	Telfer, J. H. ...	T. Philip, J. McIntosh, J. Mackay.	M.L.	Anchor Donaldson ...	Met. Log. 3.4.26 to 20.8.26 ...	27.8.26.
<i>Corinthic</i> ...	Hart, F. ...	E. Burt, J. Warltire, V. Evans.	"	White Star ...	" 17.7.26 to 30.10.26 ...	8.11.26.
<i>Cornish City</i> ...	James, D. P. ...	" ...	No. A.	Reardon Smith ...	" ...	" ...
<i>Cornwall</i> ...	Haines, F. P. ...	R. Gowthorpe, W. Thompson	" A.	Federal ...	Form 911 26.9.26 to 8.11.26 ...	11.11.26.
<i>Crauford Castle</i> ...	Morgan, A. O., R.D., Commr., R.N.R.	J. E. R. Wilford ...	" A.	Union Castle ...	" 19.6.26 to 17.7.26 ...	21.7.26.
<i>Cristales</i> ...	Isaacson, J. M. ...	S. Browne, R. Southerland, D. M. Baker.	M.L.	Elders & Fyffes ...	Met. Log. 17.3.26 to 19.7.26 ...	21.7.26.
<i>Culebra</i> ...	Mackay, A. S., R.D., Commr., R.N.R.	P. Cooper, H. V. Todd, C. A. Payne, F. G. Dawson.	"	R.M.S.P. Co. ...	" 11.1.26 to 14.6.26 ...	22.6.26.
<i>Cumberland</i> ...	Davies, B. J. ...	" ...	"	" ...	" ...	" ...
<i>Cuthbert</i> ...	Deith, G. T. ...	E. F. Hopkins ...	No. A.	Federal ...	Form 911 18.2.26 to 19.6.26 ...	22.6.26.
<i>Cyclops</i> ...	Lee, O. J. P. ...	C. C. Beal ...	" A.	Booth ...	" 20.10.26 to 3.11.26 ...	10.11.26.
<i>Dardanus</i> ...	Cosker, W. ...	H. L. Cole ...	" A.	A. Holt ...	" 1.8.26 to 1.10.26 ...	8.10.26.
<i>Darian</i> ...	Williams, D. T. ...	C. F. Morgan ...	" M.	" ...	" 19.5.26 to 22.8.26 ...	26.8.26.
<i>Darro</i> ...	Masters, W. ...	" ...	" A.	Leyland ...	" 19.9.26 to 1.10.26 ...	4.10.26.
<i>Demerara</i> ...	Matthews, G. P. ...	W. Halder Campe ...	" M.	R.M.S.P. Co. ...	" 24.9.26 to 15.10.26 ...	18.10.26.
<i>Deseado</i> ...	Willan, F. C. L. ...	J. J. C. Blake ...	" M.	" ...	" 8.8.26 to 30.9.26 ...	4.10.26.
<i>Demosthenes</i> ...	Orriss, F. A. ...	J. F. Cruickshank ...	" M.	Aberdeen ...	" 8.7.26 to 27.8.26 ...	1.9.26.
<i>Desna</i> ...	Hannam, F. S. ...	C. C. Dingle, L. D. Jennings	" M.	R.M.S.P. Co. ...	" 4.9.26 to 31.10.26 ...	5.11.26.
<i>Deucalion</i> ...	Green, J. ...	J. W. Smith ...	" M.	" ...	" 10.7.26 to 3.9.26 ...	9.9.26.
<i>Dieppe</i> ...	Findlay, J. ...	W. L. Michie, R. Wilson	" A.	A. Holt ...	" 18.9.26 to 7.10.26 ...	18.10.26.
<i>Dimboola</i> ...	Marmery, S. ...	Mr. Parsons ...	C.C.	Southern Railway	Telegraphic Report 12.11.26	12.11.26.
<i>Discoverer</i> ...	Roy, C. M. ...	S. J. Griffith ...	No. A.	Melbourne S.S. Co. ...	Form 911 7.8.26 to 29.9.26 ...	1.11.26.
<i>Discovery, R.R.S.</i> ...	Ling, J. T. ...	C. C. Heaton ...	" M.	Harrison ...	" 26.6.26 to 19.8.26 ...	21.9.26.
	Stenhouse, J. R., D.S.O., D.S.C., O.B.E., R.D., Commr., R.N.R.	T. W. Goodchild ...	M.L.	Discovery Expedition	Met. Log. 8.5.26 to 11.7.26 ...	30.9.26.
<i>Domala, M.V.</i> ...	Kitson, A. G. ...	R. W. Smith ...	No. M.	British India ...	Form 911 9.9.26 to 11.10.26 ...	30.10.26.
<i>Dominia, C.S.</i> ...	Campos, V., O.B.E., Lt.-Commr., R.N.R.	" ...	M.L.	Telegraph Construction and Maintenance.	" ...	" ...
<i>61 Doric</i> ...	Bolton, S., D.S.C., R.D., R.N.R.	W. F. Dennison, F. W. Laws, E. N. Lloyd.	W.T.	White Star ...	Form 911 1.10.26 to 24.10.26 ...	27.10.26.
<i>Doric Star</i> ...	Thomas, R. T. ...	L. McDermott ...	No. M.	Blue Star ...	W.T. Reg. 3.10.26 to 24.10.26 ...	27.10.26.
<i>Dorington Court</i> ...	Clarke, E. J. ...	E. W. Blomberg ...	" A.	Haldin & Co. ...	Form 911 25.9.26 to 22.10.26 ...	12.11.26.
<i>Dromore Castle</i> ...	Vincent, E. S., R.D., Commr., R.N.R.	D. H. McDougall ...	" A.	Union Castle ...	" 20.8.26 to 29.9.26 ...	4.10.26.
<i>Dryden</i> ...	Major, T. W. ...	G. W. Major ...	" M.	Lampart & Holt ...	" 18.6.26 to 6.11.26 ...	10.11.26.
<i>Duendes</i> ...	Cox, F. D. ...	R. W. Hanson ...	" M.	" ...	" 25.9.26 to 16.10.26 ...	1.11.26.
<i>Dundrum Castle</i> ...	Weller, H. E. ...	W. S. Byles ...	" A.	P.S.N. Co. ...	" 3.4.26 to 14.8.26 ...	17.8.26.
<i>Dunrobin</i> ...	Ramsay, J. D. ...	C. H. Kendall ...	" A.	Union Castle ...	" 4.8.26 to 30.8.26 ...	14.9.26.
<i>Duquesa</i> ...	Ellis, F., D.S.C. ...	E. W. Denman ...	" M.	Glen & Co. ...	" 7.9.26 to 20.9.26 ...	4.10.26.
<i>Durenda</i> ...	Wilson, W. ...	K. G. Pullman ...	" M.	Furness Withy ...	" 12.8.26 to 7.10.26 ...	12.10.26.
<i>Edinburgh Castle</i> ...	Wilford, T. H. ...	" ...	No.	British India ...	" 1.1.26 to 9.1.26 ...	1.2.26.
<i>Egyptian Prince</i> ...	Ord, T. ...	W. R. Holt ...	No. A.	Union Castle ...	Met. Log. 8.1.26 to 24.1.26 ...	29.5.26.
<i>Elmina</i> ...	Williams, T. E. ...	J. A. McGough, G. Shorter, E. Moger.	M.L.	Prince ...	Form 911 10.8.26 to 18.10.26 ...	22.10.26.
	Allen, E. E. ...	" ...	"	Elder Dempster ...	Met. Log. 2.6.26 to 5.10.26 ...	11.10.26.
<i>El Paraguay</i> ...	Smith, F. C. ...	J. Allerton ...	No. M.	Houlder Bros. ...	Form 911 29.7.26 to 21.9.26 ...	25.9.26.
<i>Elpenor</i> ...	Leslie, G., D.S.C., R.D., Lt.-Commr., R.N.R.	M. Robertson ...	M.L.	A. Holt ...	Met. Log. 28.3.26 to 28.8.26 ...	8.9.26.
<i>Elysia</i> ...	Duncan, A. R. ...	A. Laidlaw, C. Jenkins, J. A. C. A. Leitch	"	Anchor ...	" 10.7.26 to 16.9.26 ...	3.10.26.
<i>Empress of Asia</i> ...	Holland, A. T. ...	R. H. Foley, L. Johnston, L. C. Hogg, T. M. W. Golby, W. T. Miller	"	Canadian Pacific ...	" 27.5.26 to 6.9.26 ...	8.10.26.
<i>Empress of Canada</i> ...	Lovegrove, A. V. R., D.S.O., R.D., Capt. R.N.R.	H. C. Halliday ...	"	" ...	" 10.6.26 to 20.9.26 ...	20.10.26.
<i>Empress of France</i> ...	Robinson, S., C.B.E., R.D., Commr., R.N.R.	" ...	"	" ...	" ...	" ...
<i>Empress of Russia</i> ...	Griffiths, E. ...	E. Roberts, W. Ewens, O. F. Pennington, W. Pickersgill.	"	" ...	" 1.5.26 to 3.11.26 ...	8.11.26.
<i>Empress of Scotland</i> ...	Hosken, A. J. ...	J. H. Reid ...	"	" ...	" 7.3.26 to 14.6.26 ...	6.9.26.
<i>Endeavour</i> ...	Latta, R. G. ...	M. McLellan, W. Bacon, F. G. Hutchings.	"	" ...	" 15.5.26 to 13.10.26 ...	28.10.26.
	Stuart, R.N., V.C., D.S.O.	" ...	"	" ...	" ...	" ...
<i>Essequibo</i> ...	Commr., S. A. Geary-Hill, D.S.O., R.N.	R. M. Southern, G. S. Norrington, E. V. B. Baker, E. H. B. Baker, J. Torlesse.	"	His Majesty's Ship ...	" 3.3.26 to 30.6.26 ...	17.7.26.
<i>Eumaeus</i> ...	Kite, E. ...	J. L. Forster ...	No. M.	R.M.S.P. Co. ...	Form 911 9.9.26 to 25.10.26 ...	12.11.26.
<i>Euripides</i> ...	Elford, W. J. ...	J. L. Millar ...	" A.	A. Holt ...	" 8.9.26 to 25.9.26 ...	8.11.26.
	Roberts, T. V. ...	H. S. Cox, G. R. Fisher, G. Perry.	M.L.	Aberdeen ...	Met. Log. 17.7.26 to 16.4.26 ...	23.4.26.



Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 12.11.26.	Date Received.
<i>Eurybates</i> ...	Carnon, C. G. ...	C. Napier ...	No. A.	A. Holt ...	Form 911 6.8.26 to 25.8.26 ...	29.9.26.
<i>Explorer</i> ...	Lamont, A. J. Allan, J. ...	Scientific Staff ...	M.L.	Scottish Fishery Board ...	Met. Log. 1.3.26 to 27.9.26 ...	9.11.26.
<i>Ferndale</i> ...	Daniel, F. ...	D. Jones ...	No. M.	Commonwealth Govt. ...	Form 911 26.7.26 to 24.8.26 ...	4.10.26.
<i>Fitzroy</i> ...	Harvey J.R., O.B.E., Lt.-Commr. R.N. Lockhart C. S. Lt.-Commr. R.N.	K. Collins ...	M.L.	His Majesty's Ship ...	Met. Log. 16.4.26 to 31.7.26 ...	18.8.26.
<i>Flandria</i> ...	Bakker, F. J. ...	T. Doornbosch ...	No. M.	Holland Lloyd ...	Form 911 23.7.26 to 11.9.26 ...	14.9.26.
<i>Flinders</i> ...	Law, E. F. B., Lt.-Commr. R.N.	D. W. Deane ...	M.L.	His Majesty's Ship ...	Met. Log. 27.3.26 to 24.7.26 ...	6.8.26.
<i>Francisco</i> ...	Scales, H. ...	J. C. Nettleship ...	No. A.	Ellerman Wilson ...	Form 911 2.10.26 to 4.11.26 ...	9.11.26.
<i>Freya</i> ...	Angus, W. ...	T. R. Ness ...	No. A.	Scottish Fishery Board ...	Met. Log. 8.10.26 to 31.10.26 ...	4.11.26.
<i>Gaika</i> ...	Whitfield, — ...	C. H. Williams ...	No. M.	Union Castle ...	Form 911 2.10.26 to 4.11.26 ...	9.11.26.
<i>Gallymore</i> ...	Southerland, — ...	C. J. Vandenboom ...	No. M.	Furness Withy ...	Form 911 22.5.26 to 11.8.26 ...	9.9.26.
<i>Garret</i> ...	Visser, C. W. ...	Wyllie, W. ...	No. A.	Marine Navgn. Co. ...	Form 911 19.1.26 to 24.2.26 ...	30.3.26.
<i>Garthpool, Ship</i> ...	Rutt, W. N. ...	R. Simpson ...	No. A.	Dalgaty & Co. ...	Form 911 19.1.26 to 24.2.26 ...	30.3.26.
<i>Gascoyne</i> ...	Veldkamp, G. J. ...	T. van der Mast ...	No. M.	Holland Lloyd ...	Form 911 19.1.26 to 24.2.26 ...	30.3.26.
<i>Gelria</i> ...	Homan, C. E. ...	R. H. Bishop ...	No. A.	Glen Line ...	Form 911 22.9.26 to 2.11.26 ...	10.11.26.
<i>Glenamoy, M.V.</i> ...	Roberts, W. E. ...	S. W. Bell ...	No. A.	" ...	Form 911 14.11.25 to 27.12.25 ...	4.1.26.
<i>Glenapp, M.V.</i> ...	Beer, E. ...	R. A. Dale ...	No. A.	" ...	Form 911 22.8.26 to 25.9.26 ...	25.10.26.
<i>Glenishane</i> ...	Robin, E. ...	H. J. Janett ...	No. A.	Bibby ...	Form 911 28.8.26 to 5.11.26 ...	9.11.26.
<i>Gloucestershire</i> ...	Hughes, J. W. ...	A. E. Bowlt ...	No. A.	A. Holt & Co. ...	Form 911 15.8.26 to 24.9.26 ...	25.10.26.
<i>Gorgon</i> ...	Aspinall, A. E. ...	G. B. Bray, S. N. Stokes, J. D. Birch.	No.	Ellerman Wilson ...	Met. Log. 16.5.25 to 1.11.25 ...	10.12.25.
<i>Haliartus</i> ...	Marsh, L. V. ...	W. H. Upton ...	No. A.	R. P. Houston ...	Form 911 11.4.26 to 8.5.26 ...	7.6.26.
<i>Harmonides</i> ...	Hughes, W. F. ...	S. S. Davidson ...	No. A.	" ...	Form 911 5.9.26 to 27.9.26 ...	18.10.26.
<i>Harmony, Auxy.</i> ...	Jackson, J. C. ...	A. W. Bush ...	No. A.	Moravian Mission ...	Form 911 4.8.26 to 27.9.26 ...	14.10.26.
<i>Hatarana</i> ...	Denne, G. H. A. ...	F. Wells, C. Parkes, W. T. Beedle, T. S. Barnes.	M.L.	British India ...	Form 911 12.6.25 to 27.2.26 ...	29.3.26.
<i>Hauraki, M.V.</i> ...	Frew, J. D. ...	M. A. Green ...	M. L.	Union S.S. Co. N.Z. ...	Form 911 22.6.26 to 11.7.26 ...	20.9.26.
<i>Henry Holmes, C.S.</i> ...	Bicker Caarten, A. ...	M. A. Green ...	No. M.	W. I. & Panama Telegraph Co. ...	Form 911 5.9.26 to 14.10.26 ...	12.11.26.
<i>Herald</i> ...	Silk, H. V., Lieut.-Commr. R.N.	W. C. Jenks ...	M.L.	His Majesty's Ship ...	Met. Log. 22.3.26 to 5.9.26 ...	20.10.26.
<i>Herefordshire</i> ...	Mann, R. P. ...	H. R. Mackay ...	No. A.	Bibby ...	Form 911 25.4.26 to 3.7.26 ...	12.7.26.
<i>Herminus</i> ...	Roberts, T. V. ...	G. P. McCraith ...	No. A.	Shaw, Savill & Albion ...	Form 911 5.9.26 to 24.9.26 ...	12.10.26.
<i>Herschell</i> ...	Davies, G. W. ...	J. M. Edgar ...	No. A.	Lampert & Holt ...	Form 911 14.10.25 to 15.12.25 ...	29.12.25.
<i>Hertford</i> ...	Urquhart, D. ...	A. Robertson ...	No. A.	Federal ...	Form 911 18.8.26 to 7.9.26 ...	4.10.26.
<i>Hibernia</i> ...	Tanner, E. B. ...	R. Woodall ...	C.C.	L.M. & S. Rly. ...	Form 911 12.12.25 to 11.2.26 ...	13.10.26.
<i>Highland Enterprise</i> ...	Pond, R. H. ...	J. H. Tilton ...	No. A.	Nelson ...	Form 911 29.3.26 to 26.5.26 ...	31.5.26.
<i>" Glen</i> ...	Jones, T. J. ...	W. Jealous ...	No. A.	" ...	Form 911 13.12.25 to 24.6.26 ...	14.7.26.
<i>" Heather</i> ...	Powell, G. A. ...	J. H. Fittou, J. Hardy ...	No. A.	" ...	Form 911 31.8.26 to 24.10.26 ...	5.10.26.
<i>" Laddie</i> ...	Alford, C. ...	E. F. Smart ...	No. A.	" ...	Form 911 25.4.26 to 16.9.26 ...	23.9.26.
<i>" Piper</i> ...	Collings, D. ...	J. S. Collins, S. E. Jackson W. T. Breen.	M.L.	" ...	Form 911 30.7.26 to 2.10.26 ...	7.10.26.
<i>" Pride</i> ...	Robinson, R. H. ...	W. Williams ...	No. A.	Prince ...	Form 911 25.8.26 to 5.9.26 ...	22.9.26.
<i>" Prince</i> ...	Brown, J. B. ...	S. A. Wheaton ...	No. A.	Nelson ...	Form 911 17.8.26 to 11.10.26 ...	21.10.26.
<i>" Rover</i> ...	Ashby Graves, F. ...	C. O. Legg ...	No. A.	" ...	Form 911 25.3.26 to 19.5.26 ...	26.5.26.
<i>" Warrior</i> ...	Robinson, R. H. ...	J. O. Simons ...	No. A.	Booth ...	Form 911 22.9.26 to 8.11.26 ...	11.11.26.

## LIST OF VOLUNTARY OBSERVING SHIPS

V

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 12.11.26.	Date Received
<i>Lalande</i> ...	Hamill, H. ...	A. E. Warburton ...	No. A.	Lampport & Holt ...	Form 911 26.7.26 to 12.8.26 ...	21.10.26.
<i>Lancashire</i> ...	de Legh, P. ...	R. Cuming ...	" A.	Bibby ...	29.7.26 to 29.8.26 ...	2.9.26.
36 <i>Lancustris</i> ...	Malin, R. G., Lt-Commr., R.N.R.	R. P. Campbell, L. R. Sharp, F. G. Russell	" W.T.	Cunard ...	W.T. Reg. 10.10.26 to 30.10.26 ...	2.11.26.
<i>Laomedon</i> ...	Beswick, W., D.S.C., Lt-Commr., R.N.R.	A. Yarwood ...	No. A.	A. Holt ...	Form 911 9.10.26 to 30.10.26 ...	3.11.26.
<i>La Paz, M.V.</i> ...	Dunn, R. E.	W. L. Jones ...	" M.	Pacific S.N. Co.	" 26.8.26 to 13.9.26 ...	22.9.26.
<i>Laplace</i> ...	Shaw, W.	A. L. Murray, R. D. Cottam	" A.	Lampport & Holt ...	" 23.7.26 to 8.8.26 ...	30.8.26.
55 <i>Lapland</i> ...	Thomas, A. J.	E. Cornellie, F. Good, J. C. Flett.	W.T.	Red Star ...	Met. Log. 7.8.26 to 13.10.26 ...	18.10.26.
<i>Lassell, M.V.</i> ...	Hickman, V. T.	F. J. Durrant ...	No. A.	Lampport & Holt ...	W.T. Reg. 1.1.26 to 8.5.26 ...	17.5.26.
<i>Leicestershire</i> ...	English, G. L.	J. Cullen, W. A. Kent, D. Y. Sharrock, J. Logan.	M.L.	Bibby ...	W.T. Reg. 23.8.26 to 11.9.26 ...	20.9.26.
<i>Leighton, M.V.</i> ...	Lindesay, J. M.	H. A. Bolding ...	No. A.	Lampport & Holt ...	Form 911 21.9.26 to 9.10.26 ...	11.10.26.
<i>Leitrim</i> ...	Robertson, A.	H. G. Letts ...	" A.	Dowie, J., & Co.	Form 911 22.8.26 to 9.10.26 ...	11.10.26.
<i>Loch Katrine</i> ...	Shillitoe, B.	K. Whitaker ...	" M.	R.M.S.P. Co.	Met. Log. 20.2.26 to 9.3.26 ...	29.3.26.
<i>London Commerce</i> ...	Young, H. J., D.S.C.	H. P. Longland ...	" A.	Furness Withy ...	" 31.7.26 to 9.10.26 ...	21.10.26.
<i>London Importer</i> ...	Williams, J. M.	J. S. Williams, W. Stanley ...	M.L.	"	Form 911 16.10.25 to 2.4.26 ...	13.8.26.
<i>Loriga, M.V.</i> ...	Makin, F. W.	W. N. Anders ...	No. A.	Pacific S.N. Co.	" 21.9.26 to 8.10.26 ...	26.10.26.
<i>Losada, M.V.</i> ...	Ross, J.	E. Baxter ...	" M.	"	"	"
<i>Macedonia</i> ...	Dayas, T. C. E.	E. R. Bodley ...	" M.	P. & O. ...	" 1.7.26 to 7.10.26 ...	12.10.26.
<i>Macharda</i> ...	Potter, H. W., R.D., Commr., R.N.R.	D. M. Fulton ...	" M.	Brocklebank ...	Met. Log. 26.9.26 to 10.10.26 ...	2.11.26.
<i>Mahana</i> ...	Tyers, W. O.	F. M. Smith, H. C. Smith, J. C. K. Rogers.	" A.	Shaw, Savill & Albion	Met. Log. 15.4.26 to 10.8.26 ...	30.8.26.
<i>Maharaja</i> ...	Hinton, J. C.	H. A. Hartley ...	" M.	Asiatic S.N. Co.	Form 911 30.7.26 to 26.9.26 ...	19.10.26.
<i>Mahia</i> ...	Williams, G.	R. Naef ...	No.	Shaw, Savill & Albion	"	"
<i>Maitbar</i> ...	Rowe, J. P.	C. Shaw, H. T. Scoins, G. Henshaw.	M.L.	Brocklebank ...	Met. Log. 20.3.26 to 23.6.26 ...	15.7.26.
<i>Maimyo</i> ...	Scurr, T. W.	H. M. Drummond ...	No. A.	Burns Philp ...	Form 911 25.4.26 to 4.6.26 ...	6.7.26.
<i>Maiwara</i> ...	Brown, T. M.	W. Pearson, J. Paine, A. Young, W. T. Fitzgerald.	M.L.	White Star ...	W.T. Reg. 1.10.26 to 4.11.26 ...	8.11.26.
58 <i>Majestic</i> ...	Metcalfe, G. R.	F. C. Vogelmann, T. K. Lang, W. O. L. Wilding.	M.L.	Burns Philp ...	Met. Log. 3.3.26 to 15.6.26 ...	10.8.26.
<i>Makambo</i> ...	McLean, J.	O. C. Bray, J. M. Hood, A. Foster.	"	Canadian-Australasian	" 11.3.25 to 19.2.26 ...	4.5.26.
<i>Makura</i> ...	Worrall, L. C. H.	"	"	Burns, Philp & Co. ...	Form 911 8.9.26 to 22.9.26 ...	25.9.26.
<i>Malabar</i> ...	Adamson, F. L.	J. H. Round ...	No. M.	Brocklebank ...	" 29.7.26 to 12.8.26 ...	28.9.26.
<i>Malakuta</i> ...	Sharpe, G.	R. Humble ...	" M.	"	" 21.9.26 to 27.10.26 ...	3.11.26.
<i>Malancha</i> ...	Gray, T. N.	W. S. Donald ...	" M.	British India ...	" 6.8.26 to 11.9.26 ...	1.11.26.
<i>Malda</i> ...	Gray, T. N.	P. Campbell ...	" A.	Shaw, Savill & Albion	" 30.8.26 to 4.10.26 ...	8.10.26.
<i>Mamari</i> ...	Falconer, H.	E. Hale ...	" A.	Manchester Liners ...	" 8.10.26 to 22.10.26 ...	27.10.26.
<i>Manchester Brigade</i> ...	Stott, C. H.	W. L. Lavers ...	" A.	"	"	"
<i>Manchester Corporation</i> ...	Everest, J. E.	"	"	"	"	"
<i>Manchester Hero</i> ...	Riley, J. E.	J. H. Emmitt, H. Anderton, B. M. Brown.	M.L.	"	Met. Log. 3.10.25 to 20.7.26 ...	27.7.26.
<i>Manchester Merchant</i> ...	Struss, F. D.	E. W. Jeffries ...	No. A.	"	Form 911 26.6.26 to 11.8.26 ...	20.8.26.
<i>Manchester Regiment</i> ...	Foale, J. R.	H. Dobson ...	" A.	"	"	"
<i>Manchester Shipper</i> ...	Dormer, A. E.	"	M.L.	"	Met. Log. 19.9.25 to 8.5.26 ...	31.5.26.
<i>Manipur</i> ...	Cochran, G. N.	R. Penston, K. Leadbetter ...	No. M.	Brocklebank ...	Form 911 5.9.26 to 2.10.26 ...	14.10.26.
<i>Mantua</i> ...	Randell, G. G.	D. B. Leader ...	" M.	P. & O. ...	" 11.9.26 to 30.9.26 ...	25.10.26.
<i>Manzanares</i> ...	Maxwell Brown, W. E.	G. S. Gracie ...	" A.	Elders & Pyfies ...	" 10.11.25 to 25.11.25 ...	4.1.26.
<i>Marburn</i> ...	Stewart, A.	R. H. W. Jackson ...	" M.	Canadian Pacific ...	" 24.4.26 to 17.5.26 ...	20.5.26.
<i>Marella</i> ...	Mortimer S.	J. A. Street ...	M.L.	Burns Philp ...	Met. Log. 2.4.25 to 25.8.25 ...	1.12.25.
<i>Marengo</i> ...	Brown, A. M.	"	"	Elherman Wilson ...	" 20.3.26 to 30.8.26 ...	2.9.26.
<i>Margha</i> ...	Williams, J. C. R.D., Commr., R.N.R.	F. Eglin, H. Brown, J. Ford	"	British India ...	" 20.6.26 to 14.9.26 ...	20.9.26.
<i>Marsina</i> ...	Milne, R. A., R.D., Commr., R.N.R.	J. Strachan, P. Wright, H. E. Evans.	"	Burns, Philp & Co. ...	Form 911 6.7.26 to 9.8.26 ...	20.9.26.
<i>Mastrah</i> ...	Williams, G. E.	W. Mann ...	No. A.	Brocklebank ...	" 6.8.26 to 21.8.26 ...	19.10.26.
<i>Matakana</i> ...	Mallett, R.	A. E. Evans ...	" M.	Shaw, Savill & Albion	Met. Log. 28.2.26 to 14.7.26 ...	22.7.26.
<i>Mataran</i> ...	Thurston, H. P.	H. W. Thompson, J. Hart, S. P. Stockholm, Turnbull.	M.L.	Burns Philp & Co. ...	Form 911 5.6.26 to 8.7.26 ...	6.9.26.
<i>Mataroa</i> ...	Williams, J. D.	K. L. Thompson ...	No. A.	Shaw, Savill & Albion	Met. Log. 28.3.26 to 1.8.26 ...	13.9.26.
<i>Matheran</i> ...	Kershaw, W. A. R.	H. H. Armstrong, H. Willington, J. Richardson.	"	Brocklebank ...	"	"
<i>Mathura</i> ...	Hanna, R. G.	H. H. Armstrong ...	No. M.	"	Form 911 1.2.26 to 3.3.26 ...	8.3.26.
<i>Matiana</i> ...	Bacon, A. E.	G. Earl ...	" M.	British India ...	" 29.4.26 to 27.5.26 ...	31.5.26.
<i>Maungamui</i> ...	Langlands, D. H.	C. G. Eustace ...	" M.	Union S.S. Co. of N.Z.	" 4.6.26 to 9.7.26 ...	23.8.26.
32 <i>Mauretania</i> ...	Davey, A. H.	E. K. Taylor, A. Mackellar, J. A. Quarrie.	W.T.	Cunard ...	W.T. Reg. 19.9.26 to 3.10.26 ...	6.10.26.
<i>Media</i> ...	Diggle, E. G., R.D., Capt., R.N.R.	S. C. Cramb ...	No. A.	T. & J. Brocklebank ...	Form 911 2.5.26 to 28.6.26 ...	7.7.26.
56 <i>Megantic</i> ...	Mallett, R.	H. A. Billiald, R. Conway, J. C. Boyce.	W.T.	White Star ...	W.T. Reg. 26.9.26 to 16.10.26 ...	20.10.26.
22 <i>Melita</i> ...	Trant, E. L., R.D., Commr., R.N.R.	J. Shearer, N. J. P. Roberts	"	Canadian Pacific ...	" 25.9.26 to 12.10.26 ...	14.10.26.
<i>Memnon</i> ...	Notley, A. H.	L. S. Evans ...	No. A.	A. Holt ...	Form 911 16.11.25 to 3.3.26 ...	13.3.26.
21 <i>Metagama</i> ...	Evans, D. L.	R. Walker, A. Mansey ...	W.T.	Canadian Pacific ...	W.T. Reg. 25.9.26 to 15.10.26 ...	19.10.26.
<i>Minderoo</i> ...	Freer, A., Commr., R.N.R.	"	"	West Australia Nav. Co.	Met. Log. 10.11.25 to 1.5.26 ...	6.7.26.
<i>Mina</i> ...	Richardson, E.	B. J. Bennie, W. J. McPhedran, J. H. Oxtan.	M.L.	Scottish Fishery Board	Form 911 1.9.26 to 10.10.26 ...	14.10.26.
23 <i>Minnedosa</i> ...	Mackenzie, G. G.	J. H. Hennessey ...	No. A.	Canadian Pacific ...	W.T. Reg. 10.10.26 to 28.10.26 ...	1.11.26.
<i>Minnetonka</i> ...	Griffiths, J. N.	L. Hammersley, F. W. Roberts	W.T.	Atlantic Transport ...	Form 911 11.10.26 to 30.10.26 ...	2.11.26.
<i>Minneapolis</i> ...	Gates, T. F., C.B.E.	H. E. McCartney ...	No. M.	"	" 26.9.26 to 16.10.26 ...	25.10.26.
<i>Mirror, C.S.</i> ...	Claret, F. H., C.B.E., Commr., R.N.R.	J. W. Grier ...	" M.	"	"	"
<i>Mississippi</i> ...	Gibson, L.	A. G. Watts ...	" M.	Eastern Tel. Co.	" 8.10.26 to 14.10.26 ...	4.11.26.
<i>Moldavia</i> ...	Wylie, J. T. J.	A. T. Perrin ...	" A.	Atlantic Transport ...	" 14.9.26 to 14.10.26 ...	19.10.26.
<i>Mongolian Prince</i> ...	Burleigh, C. W., D.S.O., R.D., Capt., R.N.R.	G. E. Owen ...	" M.	P. & O. ...	" 7.4.26 to 23.5.26 ...	10.6.26.
24 <i>Montcalm</i> ...	Edwards, W.	F. Mugford ...	" A.	Prince ...	" 16.10.26 to 29.10.26 ...	11.11.26.
25 <i>Montclare</i> ...	Hamilton, G.	H. McFadyen ...	W.T.	Canadian Pacific ...	W.T. Reg. 10.10.26 to 29.10.26 ...	2.11.26.
	Webster, G. S., R.D., Lt-Commr., R.N.R.	R. Fegan, H. S. Knight, A. Harrison, E. Shergold.	"	"	Form 911 16.10.26 to 4.11.26 ...	9.11.26.



Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 12.11.26.	Date Received.
Montferland ...	Van Noppen, C. D.	W. Slooten	No. M.	Holland Lloyd	Form 911 1.4.26 to 26.6.26 ...	3.7.26.
27 Montclair ...	Turnbull, J., C.B.E., R.D., Capt., R.N.R.	F. E. Williams, F. Chodzko, F. Hindle.	W.T.	Canadian Pacific	W.T. Reg. 9.10.26 to 27.10.26...	1.11.26.
26 Montrose ...	Landy, E.	A. Watt, R. Woods, A. W. Patrick.	"	"	" 2.10.26 to 21.10.26	27.10.26.
20 Montroyal ...	McQueen, D. S.	R. Antrobus	"	"	" 26.9.26 to 14.10.26	18.10.26.
Moresby ...	Edgell, J. A., O.B.E., Capt., R.N.	W. H. Martin	M.L.	His Majesty's Australian Ship.	Form 911 2.9.25 to 19.10.25 ...	26.7.26.
Morvada ...	Mills, T. L., O.B.E., R.D., Commr., R.N.R.	A. J. Norris	No. M.	British India	Met. Log. 15.4.26 to 12.8.26	30.9.26.
Mulbera ...	Steadman, W. R.	F. Broomhead	" M.	"	Form 911 11.7.26 to 1.10.26 ...	5.10.26.
Nagara ...	Buret, T. J. C.	F. A. C. Thacker	" M.	R.M.S.P. Co.	" 17.9.26 to 29.9.26 ...	25.10.26.
Nagoya ...	Davis, H. C., D.S.C., R.D., Commr., R.N.R.	L. Porter	" M.	P. & O.	" 16.1.26 to 19.3.26 ...	26.3.26.
Nellore... ..	Hignett, A. H., R.D., Lt. Commr., R.N.R.	S. H. Baldwin	" M.	"	" 30.5.26 to 27.8.26 ...	2.9.26.
Nestor ...	Owen, R. D., O.B.E.	D. Rees, F. J. Silva, D. W. Stroud.	M.L.	A. Holt	" 20.3.26 to 12.6.26 ...	14.7.26.
Newby Hall ...	Butler, J.	D. F. Galloway, A. W. Wise, D. T. Smith.	"	Ellerman	Met. Log. 24.1.26 to 30.5.26 ...	4.6.26.
Newfoundland ...	Westgarth, W. A., D.S.C.	"	"	Furness Withy	" 22.6.26 to 15.10.26...	27.10.26.
Niagara ...	Showman, A. C.	A. P. Cousin, D. McKenzie, T. Haulton.	"	Canadian-Australian...	"	"
Ningchow ...	Mawson, J.	G. H. Oldridge	No. A.	A. Holt	Met. Log. 2.6.26 to 16.9.26 ...	8.10.26.
Norfolk ...	Wilda, H. J.	"	" A.	Federal	Form 911 21.9.26 to 10.10.26...	8.11.26.
Norna ...	Wright, J. W.	T. Mather	" A.	Scottish Fishery Board	"	"
Norseman, C.S. ...	Barker, H. O., R.N., Commr., R.N.R.	E. Pearce	" M.	Western Tel. Co.	Form 911 1.10.26 to 31.10.26...	3.11.26.
Northwestern Miller	Nuttall, E. L.	N. Macdonald	" A.	Furness Withy	" 22.9.26 to 3.10.26 ...	20.10.26.
Nova Scotia ...	Furneaux, S.	W. P. Paterson	" A.	"	" 18.7.26 to 18.8.26 ...	23.8.26.
Nubian ...	Watmough, T. M.	H. E. Gaskill	" A.	Leyland	" 8.9.26 to 4.10.26 ...	18.10.26.
Oaklands Grange...	Routledge, R.	E. J. Longheed	" A.	Houlder Bros.	" 23.12.25 to 24.1.26	28.1.26.
42 Ohio ...	Clarke, E., R.D., Commr., R.N.R.	E. A. B. Littlewood, D. P. Larnham, G. N. Elliott.	W.T.	R.M.S.P. Co.	" 15.4.26 to 15.5.26 ...	25.5.26.
57 Olympic ...	Marshall, W., C.B., D.S.O., A.-d.-C., R.D., Capt., R.N.R.	A. Fisher, J. Law, A. W. Robison.	"	White Star	W.T. Reg. 17.10.26 to 7.11.26	12.11.26.
Orama... ..	Shelford, W. S., Lieut. Commr., R.N.R.	T. Fox Russell, C. K. Blake, H. Tanner.	M.L.	Orient	Form 911 18.9.26 to 7.11.26 ...	12.11.26.
Oranian ...	Hoskins, W.	W. Lawton	No. A.	Leyland	W.T. Reg. 14.10.26 to 28.10.26	1.11.26.
Orari ...	Robinson, F. W.	F. Longheed, C. Wilkinson, W. Tarr.	M.L.	New Zealand S.S. Co.	Met. Log. 25.7.26 to 26.10.26...	2.11.26.
Orbita ...	Warner, G. E., R.D., Capt., R.N.R.	C. V. Fletcher, H. H. Tre-weeks, A. Chamberlin.	No.	R.M.S.P. Co.	Form 911 1.6.26 to 15.8.26 ...	23.8.26.
43 Orca... ..	Le Brecht, H. A.	"	"	"	Met. Log. 15.9.25 to 9.6.26 ...	17.6.26.
Orcoma ...	Dominy, R. H., C.B.E., Commr., R.N.R.	R. Griffiths, R. Gill, T. Naylor.	W.T.	Pacific S.N. Co.	W.T. Reg. 12.9.26 to 3.10.26 ...	7.10.26.
Orduna... ..	Smith, W. E., D.S.O., R.D., Capt., R.N.R.	H. G. Whittle, S. Robbins, J. E. P. Matthews, D. P. Larham.	No.	R.M.S.P. Co.	Form 911 11.9.26 to 3.10.26 ...	7.10.26.
Orestes ...	Hanney, T. W.	T. Berry	No. A.	A. Holt	W.T. Reg. 19.8.26 to 5.11.26 ...	1.11.26.
Orita ...	Splatt, W. A.	T. R. Scott, D. W. Hutchinson, R. W. Hanson, G. R. Bubb, A. M. Hughes	M.L.	Pacific S.N. Co.	W.T. Reg. 5.9.26 to 26.9.26 ...	4.10.26.
Ormonde ...	Knowles, C. H., D.S.O., Commr., R.N.	"	"	His Majesty's Ship	Form 911 4.9.26 to 27.9.26 ...	4.10.26.
Ormuz ...	Wyatt, A. G. N., Lieut. Commr., R.N.	"	"	"	" 8.10.26 to 31.10.26...	11.11.26.
Oronsay ...	O'Sullivan, F. R.	F. J. L. Butler, W. Wickham, — Addison.	"	Orient	Met. Log. 17.2.26 to 29.5.26 ...	9.6.26.
Orsay ...	Owens, A. L., R.D., Lt.-Commr., R.N.R.	— Hatch, — Rice, W. Elliot	"	"	" 10.5.26 to 6.9.26 ...	7.10.26.
Oraya ...	Pearce, A.	G. Lewis	No. M.	Pacific S.N. Co.	" 21.3.26 to 25.6.26 ...	30.6.26.
Orsova ...	Cameron, E. P., R.D., Commr., R.N.R.	L. J. Vesty, R. J. Galpin, J. F. Castle-Bartley.	M.L.	Orient	" 21.2.26 to 25.5.26 ...	31.5.26.
Ortega ...	Barkley, E.	G. M. Rice	No. M.	Pacific S.N. Co.	Form 911 27.4.26 to 5.7.26 ...	12.7.26.
Orvieto... ..	Matheson, C. G., D.S.O., R.D., Capt., R.N.R.	J. Goldsworthy, A. Hawker, G. L. Carter, J. L. Skilling.	M.L.	Orient	Met. Log. 4.4.26 to 8.7.26 ...	17.7.26.
Osterley ...	Sarson, M. J.	H. Tanner, N. A. Whinfield, S. Burnand.	No.	"	Form 911 8.9.26 to 28.9.26 ...	18.10.26.
Otaki ...	McNish, R.	"	No. A.	New Zealand S.S. Co.	Met. Log. 2.5.26 to 5.8.26 ...	14.9.26.
Otira ...	Wood, C.	D. N. MacGregor	" M.	Shaw, Savill & Albion	" 24.1.26 to 27.4.26 ...	20.5.26.
Otranto ...	Simner, G. L., R.D., Commr., R.N.R.	R. H. Rogerson	" M.	Orient	Form 911 23.9.26 to 16.10.26...	9.11.26.
Ovid ...	Groom, A. C. B.	"	" A.	Shakespear Shipping Co.	" 29.1.26 to 10.4.26 ...	15.4.26.
Oxfordshire ...	Crumplin, W. E.	F. C. Brooks	" A.	Bibby Bros.	" 10.5.26 to 19.5.26 ...	26.5.26.
Pacific Shipper, M.V.	Newman, G. W. A.	G. Davis	" A.	Furness Withy	" 27.5.26 to 2.8.26 ...	9.8.26.
Pacurea ...	Harvey, A. E.	M. C. Cruickshank	" A.	Elders & Fyffes	" 29.8.26 to 25.9.26 ...	25.10.26.
Pakeha ...	W. P. Clifton Mogg	E. T. Baker, R. E. Nicholson, A. J. Tillot.	M.L.	Shaw, Savill & Albion	Met. Log. 3.8.26 to 16.8.26 ...	8.9.26.
Pareora ...	Evans, J. O.	N. Turner	No. A.	Hain S.S. Co.	Form 911 27.5.26 to 12.10.26...	18.10.26.
Paris ...	Cook, C. L.	Mr. Biles...	C.C.	Southern Rly.	Form 911 25.10.26 to 7.11.26	9.11.26.
Patia ...	Maxwell Brown, W. E.	J. Kinsley	No. A.	Elders & Fyffes	Telegraphic Report. 15.10.26 ...	15.10.26.
Patrician Patrol, C.S.	Pugh, —	"	" M.	Harrison	Form 911 19.9.26 to 24.10.26...	4.11.26.
Patrol, C.S.	Welsh, T. K.	H. F. P. Albrecht	M.L.	Eastern Extension (A. & C.) Telegraph Co.	"	"
Persic ...	Bulman, J. B.	R. Conway	No. A.	White Star	Met. Log. 8.7.25 to 3.2.26 ...	1.4.26.
Peshawar ...	Hester, C. W., R.D., Commr., R.N.R.	D. G. Baillie, J. K. Crone, R. D. Whyte-Mackay.	M.L.	P. & O.	Form 911 27.9.25 to 4.11.25 ...	17.3.26.
Polycarp ...	Evans, T. G.	C. W. Smethurst	No. A.	Booth	Met. Log. 16.1.26 to 2.7.26 ...	9.7.26.

## LIST OF VOLUNTARY OBSERVING SHIPS

vii

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 12.11.26.	Date Received.
<i>Port Adelaide</i> ...	Hayter, S. W. ...	R. W. Linklater, G. Lovegrove, J. L. Porter.	M.L.	Commonwealth & Dominion.	Met. Log. 6.2.26 to 11.6.26 ...	21.6.26.
" <i>Albany</i> ...	Robinson, C. A. ...	E. A. Leavett, A. G. Newbury, W. Eastoe, N. A. Crowe.	"	" " "	" 14.11.25 to 13.4.26...	21.4.26.
" <i>Auckland</i> ...	Durham, R. S. ...	R. B. Stannard ...	"	" " "	Form 911 4.3.26 to 20.7.26 ...	26.7.26.
" <i>Bowen</i> ...	Gilling, W. ...	W. R. Johnston ...	No. A.	" " "	" 21.7.26 to 27.8.26 ...	20.9.26.
" <i>Caroline</i> ...	Renaut, F. A. ...	H. H. Smith, E. Fenton, C. Chamberlin, A. T. C. Cooper.	M.L.	" " "	Met. Log. 3.10.25 to 11.4.26 ...	19.4.26.
" <i>Darwin</i> ...	Sawbridge, I. R. ...	E. T. N. Lawrey ...	No. A.	" " "	Form 911 22.7.26 to 5.9.26 ...	18.10.26.
" <i>Dunedin</i> ...	Lea, W. H. ...	E. G. Jones, R. Needham, H. M. Post, E. Wheeler.	M.L.	" " "	Met. Log. 17.7.26 to 29.10.26 ...	4.11.26.
" <i>Hacking</i> ...	Hoad, A. C. ...	F. W. Elgar ...	"	" " "	Form 911 1.8.26 to 14.8.26 ...	30.8.26.
" <i>Hobart</i> ...	Craven, R. ...	G. Langford ...	"	" " "	" 6.3.26 to 25.6.26 ...	8.7.26.
" <i>Hunter</i> ...	Cottell, S. C. ...	A. Cooper, C. F. Post, J. T. Weldin.	"	" " "	Met. Log. 30.10.25 to 2.4.26 ...	14.4.26.
" <i>Melbourne</i> ...	Kearney, F. J. ...	D. G. H. Bradley, J. A. Fairbairn, A. G. Starkey.	M.L.	" " "	" 4.5.26 to 5.9.26 ...	8.9.26.
" <i>Napier</i> ...	Jones, C. N. ...	A. R. Martin ...	No. A.	" " "	Form 911 8.7.26 to 20.8.26 ...	26.8.26.
" <i>Nicholson</i> ...	Jack, J. ...	J. L. Lewis, A. McDonald, P. A. Munday, C. Jolly.	M.L.	" " "	Met. Log. 20.2.26 to 18.7.26 ...	24.7.26.
" <i>Pirie</i> ...	Kippons, T. ...	H. C. Jeffery, W. G. Jones, N. M. Muzzill, S. Hearn.	"	" " "	" 6.4.26 to 6.9.26 ...	13.9.26.
" <i>Sydney</i> ...	Higgs, W. G. ...	G. L. H. Dean, K. D. Morgan, H. G. Boys Smith.	"	" " "	" 26.6.26 to 29.7.26 ...	5.8.26.
" <i>Victor</i> ...	Swan, L. H. ...	W. Howe, W. Renouf, W. J. Watson.	"	" " "	" 6.9.25 to 2.6.26 ...	7.6.26.
" <i>Wellington</i> ...	Farmer, F. ...	P. H. Pedrick ...	No. A.	" " "	Form 911 22.3.26 to 24.7.26 ...	6.8.26.
<i>President Jackson</i> ...	Griffith, J. ...	B. Christensen, A. L. Herre...	" A.	Pacific Mail S.S. Co....	" 19.4.26 to 21.5.26 ...	22.7.26.
<i>President Jefferson</i> ...	Nichols, F. R. ...	B. Christensen ...	" A.	Admiral Oriental Line	" 1.9.26 to 19.9.26 ...	18.10.26.
<i>President Wilson</i> ...	Nelson, H. ...	A. M. Quinlan ...	No.	Dollar ...	" 24.3.26 to 14.5.26 ...	3.7.26.
<i>Protea</i> , H.M.S.A.S. ...	Woodhouse, A. F. B., Lt.-Commr., R.N.	R. J. Whitley ...	No. M.	South African Naval Service.	" 1.8.26 to 14.9.26 ...	12.10.26.
<i>Pyrhus</i> ...	Read, J. W. ...	W. J. Ryan ...	" A.	A. Holt ...	" 15.9.26 to 29.9.26...	25.10.26.
<i>Ranpura</i> ...	King, A. M., D.S.C.	H. T. Rigden ...	" M.	P. & O. ...	" 19.9.26 to 7.10.26 ...	25.10.26.
<i>60 Regina</i> ...	Smith, R. G. ...	R. H. Shaw, C. Cochrane, H. J. Yates.	" W.T.	White Star-Dominion	W. T. Reg. 17.10.26 to 6.11.26 ...	10.11.26.
<i>Reindeer</i> ...	Langdon, C. ...	" ...	C.C.	G.W. Railway	Form 911 17.10.26 to 6.11.26 ...	11.11.26.
<i>Remuera</i> ...	Cameron, J. J. ...	P. McCullum, P. Shakespeare	No. A.	New Zealand S.S. Co.	Telegraphic Report 11.11.26 ...	11.11.26.
<i>Rhodesian Transport</i> ...	Fowler, W. H. ...	F. F. Feint ...	" A.	Houlder Bros. ...	Form 911 13.3.26 to 19.4.26 ...	27.7.26.
<i>Rimutaka</i> ...	Hemming, F. A. ...	F. Bishop ...	M.L.	New Zealand S.S. Co.	" 22.4.26 to 19.8.26 ...	25.8.26.
<i>Risaldar</i> ...	Park, G. ...	T. E. Hart, C. B. Miller, W. H. J. Llewellyn.	"	Asiatic S.N. Co. ...	Met. Log. 31.5.25 to 29.3.26 ...	1.4.26.
<i>Romney</i> ...	Syms, G. ...	J. W. McMullan ...	No. A.	Lampport & Holt ...	" 10.4.26 to 16.9.26 ...	19.10.26.
<i>Roturua</i> ...	Hunter, J. B. ...	E. Lawrence, R. G. Rees, H. Cockerill.	M.L.	N.Z.S. Co. ...	Form 911 27.4.26 to 7.7.26 ...	13.8.26.
<i>Royal Fusilier</i> ...	Dawson, J. ...	J. Fraser ...	No. A.	London & Edinburgh S.S. Co.	Met. Log. 3.7.26 to 15.10.26...	26.10.26.
<i>Royal Transport...</i>	Dove, J. ...	R. W. Wass ...	" A.	Houlder Bros. ...	Form 911 10.10.26 to 1.11.26 ...	9.11.26.
<i>Ruapehu</i> ...	McKellar, A. W., R.D., Capt., R.N.R.	- R. Russel, O. M. Watts, W. J. Glassborow.	M.L.	New Zealand S.S. Co.	" 24.1.26 to 24.7.26 ...	6.8.26.
<i>Sachem</i> ...	" ...	" ...	No.	Furness Withy ...	Met. Log. 16.4.26 to 10.8.26 ...	16.8.26.
<i>St. Albans</i> ...	Smith, G. L. ...	J. W. Kavanagh, W. McIntyre	M.L.	Eastern and Australian	" ...	" ...
<i>St. Helier</i> ...	Diamond, S. L. ...	C. Shalford ...	"	" ...	" ...	" ...
<i>St. Julien</i> ...	Mulhall, W. ...	C. Bell ...	C.C.	G.W. Railway ...	Met. Log. 9.4.26 to 5.9.26 ...	26.10.26.
<i>St. Patrick</i> ...	Langdon, C. H. ...	C. Joy ...	"	" ...	Telegraphic Report 4.11.26 ...	4.11.26.
<i>Salana</i> ...	Bearpark, E. W. ...	C. Smith ...	No. A.	Rankin Gilmore ...	Form 911 27.4.26 to 5.8.26 ...	29.9.26.
<i>38 Samara</i> ...	Sola, P., D.S.O. ...	F. C. Evans ...	" A.	Elder Dempster ...	" 12.6.26 to 29.8.26 ...	9.9.26.
<i>Sandown Castle</i> ...	Britten, E. T. ...	H. L. Pryse, A. B. Fasting, C. S. Williams, M. Boston	W.T.	Cunard ...	" 19.9.26 to 7.11.26 ...	11.11.26.
<i>Saxoleine</i> ...	Jackson, C. R. ...	P. G. MacIver ...	No. A.	Union Castle ...	W.T. Reg. 18.10.26 to 7.11.26 ...	10.11.26.
<i>Saxon</i> ...	Rodgers, C. S. ...	B. Johnson ...	" A.	Hunting & Son ...	Form 911 16.12.25 to 23.2.26 ...	26.2.26.
<i>Scindia</i> ...	Owen, S. H. ...	E. G. Broodbank ...	" A.	Union Castle ...	" 18.2.26 to 9.3.26 ...	29.3.26.
<i>Scholar</i> ...	Matthews, W. ...	R. S. Paton ...	" A.	Anchor ...	" 27.8.26 to 18.10.26...	29.10.26.
<i>Scotia</i> ...	Egerton, J. J. ...	O. W. L. Jones ...	" M.	Harrison ...	" 8.5.26 to 16.7.26 ...	12.8.26.
<i>Scottish Bard</i> ...	Pritchard, S.D., M.B.E.	J. W. Lilley ...	C.C.	L.M. & S. Ry. ...	Telegraphic Report 11.11.26 ...	11.11.26.
<i>33 Seythia</i> ...	McDonnell, S. ...	G. Overton, J. C. Munro, P. G. Britten.	No. A.	Tankers Ltd. ...	Form 911 31.1.26 to 15.2.26 ...	9.3.26.
<i>Sheaf Lance</i> ...	Earl, C. ...	G. A. Goold ...	No. A.	W. A. Souter ...	W.T. Reg. 23.9.26 to 17.10.26...	20.10.26.
<i>Sheaf Mount</i> ...	Groves, C. V. ...	" ...	M.L.	" ...	Form 911 22.9.26 to 17.10.26...	21.10.26.
<i>Sheaf Spear</i> ...	Whitfield, G. A., O.B.E.	" ...	"	" ...	" 10.6.26 to 8.7.26 ...	22.7.26.
<i>Shropshire</i> ...	Grisewood, W. H., Dring, S. J.	" ...	"	" ...	Met. Log. 25.6.26 to 3.10.26 ...	18.10.26.
<i>Socrates</i> ...	Adamson, B. W. ...	W. E. Jordan ...	No. A.	Bibby ...	" ...	" ...
<i>Soekaboemi</i> ...	Taylor, F. C. ...	C. van Reenen ...	" M.	Lampport & Holt ...	Form 911 30.8.26 to 18.9.26 ...	11.10.26.
<i>Somerset</i> ...	Z. W. Flach ...	J. J. Youngs ...	" M.	Rotterdam Lloyd ...	" 2.5.26 to 30.7.26 ...	12.8.26.
<i>Somersetshire</i> ...	Barnett, H. ...	R. C. Leitch, H. G. Walton, P. H. Potter.	M.L.	N.Z.S. Co. ...	" 15.12.25 to 21.1.26...	26.1.26.
<i>Somme</i> ...	Miles, F. R., Commr., R.D., R.N.R.	J. Watson ...	No. A.	Bibby ...	Met. Log. 2.5.26 to 25.8.26 ...	3.9.26.
<i>Spectator</i> ...	Harding, C. H. J. ...	D. Fraser, J. G. F. Betson ...	" A.	R.M.S.P. Co. ...	Form 911 1.5.26 to 23.7.26 ...	13.8.26.
<i>Spero</i> ...	Norton, W. J. ...	T. E. Fea ...	M.L.	Harrison ...	" 20.11.25 to 20.2.26...	26.2.26.
<i>Stockwell</i> ...	Montgomery, H. ...	W. Gibson ...	No. A.	Ellerman Wilson ...	Met. Log. 12.12.25 to 14.6.26...	1.7.26.
<i>Stuart Prince</i> ...	Thowless, E. ...	W. Venn ...	" A.	Brocklebank ...	Form 911 11.8.26 to 23.8.26 ...	27.8.26.
<i>Suva Maru</i> ...	Kemp, E. J. ...	" ...	" A.	Prince ...	" 18.2.26 to 6.3.26 ...	26.4.26.
<i>Sylvafield</i> ...	Okuno, Y. ...	" ...	" A.	Nippon Yusen Kaisha	" 23.8.26 to 20.9.26 ...	11.10.26.
<i>Taimui</i> ...	Biddick, E. ...	" ...	" A.	Hunting & Son ...	" 25.9.26 to 15.10.26 ...	21.10.26.
<i>Tairoa</i> ...	Elford, H. C. ...	P. S. Horwood ...	" A.	Shaw, Savill & Albion	" 16.8.26 to 21.9.26 ...	25.9.26.
<i>Tahiti</i> ...	Summers, W. G. ...	S. A. Bannister ...	" A.	" ...	" 30.3.26 to 12.5.26 ...	17.5.26.
<i>Taiiping</i> ...	Hill, T. V. ...	D. Amenlove ...	" A.	Union S.S. Co. of N.Z.	" 12.8.26 to 2.9.26 ...	28.9.26.
<i>Tanda</i> ...	Hamilton, H. E. ...	A. M. Frame, T. G. Stratford, W. Bailey, L. A. Baillie	M.L.	Yuill & Co. ...	Met. Log. 22.1.26 to 17.5.26 ...	19.7.26.
	Frame, A. M. ...	" ...	"	" ...	" ...	" ...
	Pilcher, E. ...	R. Lloyd Harry, B. Dun, F. Colvin, T. Cavanagh, C. Stratford.	"	E. & A. S.S. Co. ...	" 1.6.26 to 25.8.26 ...	26.10.26.



Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contriluted. Received up to 12.11.26.	Date Received.
<i>Tambora</i> ...	Huisman, N. ...	H. Van Manen ...	No. M.	Rotterdam Lloyd ...	Form 911 29.8.26 to 14.10.26...	30.10.26.
<i>Tetrestias</i> ...	Wilkinson, W. H. ...	W. Stanger ...	" A.	A. Holt & Co. ...	" 25.6.26 to 7.10.26 ...	12.10.26.
<i>Tekoa</i> ...	Barnett, H. ...	D. M. Lambert ...	" M.	New Zealand S.S. Co. ...	" 17.6.26 to 22.7.26 ...	26.7.26.
<i>Telamon</i> ...	Duggan, C. ...	G. Bevan ...	" A.	A. Holt ...	" 20.4.26 to 21.6.26 ...	3.7.26.
<i>Teucer</i> ...	Hodgson, R. N. ...	R. T. Harries ...	" A.	Aberdeen ...	" 1.9.26 to 18.9.26 ...	1.11.26.
<i>Themistocles</i> ...	Jermyn, W. M. ...	R. J. Buckland ...	" M.	Aberdeen ...	" 3.6.26 to 22.7.26 ...	3.8.26.
<i>Theseus</i> ...	Jones, E. ...	W. A. Fyffe ...	" A.	A. Holt ...	" 4.8.26 to 14.8.26 ...	17.8.26.
<i>Titan</i> ...	Wilkinson, T. G. ...	D. MacLavith, D. T. Williams, G. W. Best, C. G. Bailey.	M.L.	" ...	Met. Log. 20.10.25 to 11.3.26...	18.3.26.
<i>Tongariro</i> ...	White Parsons, V.C. ...	J. J. Youngs, E. Quick ...	No. M.	New Zealand S.S. Co. ...	Form 911 2.9.26 to 6.10.26 ...	20.10.26.
<i>Transylvania</i> ...	Bone, D. W. ...	P. Middleton ...	" A.	Anchor ...	" 4.10.26 to 24.10.26 ...	27.10.26.
<i>Traveller</i> ...	Worthington, B. ...	R. H. Rowe ...	" M.	T. & J. Harrison ...	" 24.9.26 to 13.10.26...	19.10.26.
<i>Trematon</i> ...	Evans, B. ...	R. Gregory, J. Toms, J. Bell.	M.L.	Hain S.S. Co. ...	Met. Log. 2.9.25 to 8.2.26 ...	2.3.26.
<i>Turakina</i> ...	Hamilton, E. S. ...	A. N. Marshall, G. S. Shepherd.	No. M.	New Zealand S.S. Co. ...	Form 911 9.2.26 to 4.5.26 ...	26.5.26.
<i>Tuscanus</i> ...	Gemmell, W. J. ...	J. Hamilton ...	" A.	Anchor ...	" 25.9.26 to 17.10.26...	21.10.26.
<i>Tyndareus</i> ...	Scott, J. R. ...	A. G. Phillips, C. E. Mock, A. R. McDavid.	M.L.	A. Holt ...	Met. Log. 7.1.26 to 9.6.26 ...	6.8.26.
<i>Ulimaroa</i> ...	Wylie, W. J. ...	J. S. Airey ...	No. M.	Huddart Parker, Ltd. ...	Form 911 31.7.26 to 24.8.26 ...	4.10.26.
<i>Ulysses</i> ...	McHutchon, — ...	E. C. Radford ...	" A.	A. Holt ...	" 26.9.26 to 15.10.26 ...	9.11.26.
<i>Umvolosi</i> ...	Barnes, E. W. ...	R. L. B. Ryde ...	" A.	Bullard King ...	" 14.9.26 to 5.10.26 ...	2.11.26.
<i>Valacia</i> ...	Doyle, M. ...	N. Grayson ...	" M.	Cunard ...	" 8.1.26 to 19.5.26 ...	31.5.26.
<i>Vardulia</i> ...	Fear, E. T. C. ...	L. D. W. Rand ...	" A.	" ...	" 9.9.26 to 21.9.26 ...	4.10.26.
<i>Verbana</i> ...	Pooley, T. S. M. ...	W. Bradley ...	" A.	" ...	" 4.4.26 to 7.5.26 ...	11.5.26.
<i>Vigilant</i> ...	Simpson, E. S. S. ...	J. Hunter ...	" A.	Scottish Fishery Board ...	" 8.10.26 to 31.10.26...	8.11.26.
<i>Waioapu</i> ...	Norton, A. ...	W. Johnson ...	" A.	Canadian-Australasian Union S.S. Co. of N.Z. ...	" 14.7.26 to 18.8.26 ...	20.9.26.
<i>Wairuna</i> ...	Chave, Sir B., K.B.E. ...	H. A. Deller ...	M.L.	Union Castle ...	Form 911 7.5.26 to 23.5.26 ...	7.6.26.
<i>Walmer Castle</i> ...	Scutt, W. ...	T. W. Wordingham, G. R. Millard, K. M. Morrison, N. A. Pope.	No. A.	British India ...	Met. Log. 6.3.26 to 30.7.26 ...	3.8.26.
<i>Warfield</i> ...	Steel, R. ...	C. M. Quick ...	No. A.	" ...	Form 911 16.8.26 to 18.9.26 ...	11.10.26.
<i>War Nizam</i> ...	Moncrieff, T. ...	J. Row ...	" A.	British Tankers ...	" 17.8.26 to 28.9.26 ...	6.10.26.
<i>Welshman</i> ...	Rollerson, W. ...	W. A. Fletcher ...	" M.	White Star-Dominion ...	" 18.9.26 to 11.10.26...	21.10.26.
<i>Westmoreland</i> ...	Upton, H. C. ...	R. G. Kers ...	M.L.	Federal ...	" 18.9.25 to 3.4.26 ...	3.5.26.
<i>William Scoresby</i> ...	Mercer, G. M., D.S.C., Lt.-Commr., R.N.R.	" ...	"	Falkland Islands Government.	" ...	"
<i>Windsor Castle</i> ...	Strong, H., R.D., Commr., R.N.R.	F. Wilbraham, C. L. Lovegrove, J. Montgomery, F. Norfolk.	No.	Union Castle ...	Met. Log. 1.6.26 to 20.9.26 ...	2.10.26.
<i>Winifredian</i> ...	Harrocks, W. ...	A. Crone ...	No. M.	Leyland ...	Form 911 22.5.26 to 21.6.26 ...	29.6.26.
<i>Woodarra</i> ...	Hudson, H. T. ...	L. D. Graham, G. Hyland, H. Goater, J. Wallace.	M.L.	British India ...	Met. Log. 20.3.26 to 8.9.26 ...	15.9.26.
<i>Yorkshire</i> ...	Adamson, B. W. ...	R. S. Evans, W. T. Wamsley, S. Hay, J. C. Goldsworthy.	No.	Bibby ...	Form 911 3.7.26 to 14.9.26 ...	17.9.26.
<i>Zeeland</i> ...	Harvey, H. ...	W. N. Jenkins ...	No. M.	Red Star ...	" 10.10.26 to 30.10.26	12.11.26.
<i>Conway H.M.S.</i> ...	Broadbent, H. W., R.D. Capt., R.N.R.	The Senior Cadets...	Cadets' M.L.	" ...	Cadets' Met. Log. 10.5.26 to 24.7.26	29.7.26.
<i>Pangbourne Nautical College.</i> ...	Tracy, A. F. G., Commr., R.N.	" " ...	"	" ...	Cadets' Met. Log. 2.5.26 to 24.7.26...	6.8.26.
<i>Worcester, H.M.S.</i> ...	Sayer, M. B., O.P.E., R.D., Capt., R.N.R.	" " ...	"	" ...	Cadets' Met. Log. 7.5.26 to 28.7.26...	31.7.26.
<i>Abaco</i> ...	" ...	The Keepers ...	Lighthouse Register.	" ...	Lighthouse Register 1.1.26 to 30.6.26	26.10.26.
<i>Cay Lobos</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.26 to 30.6.26	26.10.26.
<i>Double Headed Shot</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.26 to 30.6.26	26.10.26.
<i>Inagua</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.26 to 30.6.26	26.10.26.
<i>Sombrero</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.26 to 30.6.26	5.8.26.
<i>Watling Island</i> ...	" ...	" ...	"	" ...	Lighthouse Register 17.1.26 to 20.7.26	10.11.26.
<i>Cape Pembroke (Falkland Is.)</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.26 to 30.6.26	18.8.26.

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 31.10.26.	Date Received.
<i>Cristales</i> ...	Isaacson, J. M. ...	J. A. Hampshire ...	Elders & Fyffes ...	Water Samples ...	...
<i>Darro</i> ...	Matthews, G. P. ...	W. Halder-Campe ...	R.M.S.P. Co. ...	" " ...	23.10.26.
<i>Deseado</i> ...	Hannam, F. S. ...	C. C. Dingle ...	" " ...	" " ...	...
<i>Hildebrand</i> ...	Maddrell, J. ...	A. Allan ...	Booth ...	" " ...	10.9.26.
<i>Pacuare</i> ...	Harvey A. E. ...	H. G. Cruickshank ...	Elders & Fyffes ...	" " ...	15.9.26.

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