

VOL. I. No. 12.

THE MARINE OBSERVER.

DECEMBER 1924.

VOLUME ONE, THE MARINE OBSERVER.

LOOKING back through the first year's numbers, the questions naturally arise—have we aimed truly, with correct deflection, for our object? Have we, as seamen, upheld the confidence placed in us in the "Foreword"?

It is too soon to answer definitely, but results obtained already afford some criterion upon which provisional judgment may be based.

Increased interest in the work, both afloat and in the Marine Division, has freshened the nip or we could not have provided the material which has been published in 1924; nor could we promise, as we now do, that the 1925 MARINE OBSERVER will continue to fulfil the functions set out in "Aims and Objects."

As indicating what is thought of the MARINE OBSERVER by those for whom it is published, the following are quotations from letters received from Commanders of observing ships and Senior Officers:—

"All concerned in this new venture must feel that success is assured, as the magazine is beyond expectations and will undoubtedly stimulate further interest in Marine Meteorology."

"It will fill a much needed want amongst navigators of the Merchant Service."

"Your magazine contains a great deal of interesting information, which is of immense practical importance to seamen and which cannot be got elsewhere."

"I am sure the MARINE OBSERVER ought to encourage all hands to exert more attention in the line of observing."

These encouraging remarks, which were selected at hazard from many similar expressions, have encouraged us ashore, and so we pass them on to the whole Corps afloat, hoping that they may help to overcome the natural diffidence we seamen have for writing at sea. This diffidence is not surprising, for on occasions the seaman has been misunderstood, or doubt has been shown regarding reports of natural sea phenomena by those who do not habitually go down to the sea in ships.

Marine Observers may rest assured that it is the endeavour of the Meteorological Office to give them every possible assistance and to maintain a balance between the practice of the sea and the needs of science.

We hope that Marine Observers will make full use of the space provided at the end of the Meteorological Log headed "Additional Remarks," for the purpose of describing unusual phenomena observed or interesting experiences. If unfamiliar with the scientific method of procedure, describe exactly what you see in the natural terse language of the sea, noting the readings of your instruments at the time of the occurrence. Date, time and position are always important. If you sketch, or have a camera, you can do much to provide illustrations. It should be remembered that contributors to the "Marine Observer's Log" are responsible for their own statements; it would, therefore, be well for observing officers to show these to the Captain, and to ask him to initial them. The name of the contributor will, of course, be published.

The Air Ministry Publications Department has taken great pains in carrying out the postal arrangements, of which notice is frequently given on the back of the Ice Chart. The majority of Captains apparently prefer the second of the alternative arrangements. A number of ships have complained of the non-delivery of some Numbers; and as far as possible this has been remedied.

Marine Superintendents are invited to assist in this matter by giving directions for the prompt forwarding of postal matter from the Air Ministry addressed to Captains of ships, care of owners.

With the closing number of our first Volume, in which an index is given, Marine Observers will wish to consider the question of preservation.

The MARINE OBSERVER is sent monthly to every ship appearing on the List of Voluntary Observing Ships in return for their work, each ship being treated as a contributing unit; that is to say, these copies are looked upon as being the common property of the ship and are, therefore, addressed to the Captain.

A personal copy of a Number is sent to the Captain and another to the Observing Officer responsible for any special contribution which is published in it.

In future, at the end of the financial year, as far as possible, Captains and Principal Observing Officers to whom the Meteorological Committee grant "Excellent" Awards for Meteorological Logs, and Wireless Weather Report Registers containing a certain number of days' observations classed "excellent," will receive, specially bound and inscribed with their name upon the cover, the last complete

Volume of the MARINE OBSERVER. A few other publications may be substituted for "excellent" awards.

The MARINE OBSERVER is arranged with a view to this annual binding, and as the method may appeal to readers and be useful for preserving ships' copies, the arrangement may be briefly described.

The cover, advertisement pages, list of voluntary observing ships, and Ice Chart contain information which is either not permanent or

will be repeated in future volumes; these may be dispensed with for binding. When these have been removed there will remain pages numbered in sequence throughout each Number, also pages unnumbered containing lithographic Charts and Figures which should follow the numbered pages as they were published in the monthly Numbers.

MARINE SUPERINTENDENT.

September, 1924.

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.

HEAVY MISTRAL IN THE GULF OF LYONS.

THE following is from the "Additional Remarks" of the Meteorological Log of R.M.S. *Orsova*, Commander C. G. MATHESON, D.S.O., R.D., R.N.R., Observer Mr. N. A. WHINFIELD:—

"On the 28th December 1923, at 2.44 p.m., the R.M.S. *Orsova* made her departure from Toulon for Gibraltar, and shaped a course for Cape Palos. A strong westerly wind was encountered after rounding Capt Sepet, which developed into a moderate gale from W.S.W. towards 4 p.m. A rough sea was running, and the barometer had been falling since noon. Storm warnings were flown at Cape Sepet. Detached Stratus and Strato-Nimbus clouds were moving rapidly from a W.N.W. direction, and a long swell from the Westward proved to be a forerunner of the 'Gulf Lyons.'

"The wind continued to freshen and was fairly steady, while the clouds began to thin out and disperse. Shortly after 8 p.m. the wind veered to N.W. by N. in a terrific squall of storm force, and a superimposed sea soon lessened the vessel's speed. She then commenced making bad weather.

"At 11.40 p.m. the vessel was hove to, heading between N. and N.N.E. The barometer steadied somewhat and then commenced to rise. Typical of the mercurial maxims, the gale increased and the frequent squalls were of hurricane force. Visibility became very low owing to the height of the spindrift, and the sharp spume flying over all made the lookout a succession of dodges behind the bridge apron.

"The sky at 4 a.m. was cloudless and a 22-day-old moon caused a luminous effect all round. The barometer still continued to rise but the temperature was falling slowly. A few small Cumulus clouds scudding from W.N.W. and the steepening of the sea marked the only changes of the elements during the following sixteen hours.

"At 8 p.m. the lulls between squalls became more pronounced, and an attempt was made to run with the wind on the quarter, but owing to the high super-structure of the *Orsova's* poop it was found impossible, without increasing speed and courting danger to deck fittings. She was accordingly hove to again.

"Wireless D.F. bearings from Cape Agde, France, at 2.20 p.m. placed the ship in approximately Latitude 42° 07' N., Longitude 3° 54' E.

"At 6 p.m. and 9 p.m. a second and third attempt was made to get the ship round without the desired results, the ship being hove to once again.

"Towards midnight, although there were fierce squalls occasionally, the weather showed signs of moderating and the sea lessened considerably, with a rising barometer and temperature.

"At 2 a.m. on the 30th December the vessel was put about successfully and headed for Cape Palos; by noon she had run into fine and settled weather.

"It was estimated that, in the fiercest squall, the wind attained a velocity of 90 to 100 miles an hour.

"Certainly the accident boat was up-ended and life-boats on the weather side blown on their bilges, while the poles of the masts, 144 feet above sea-level, were coated with salt from the heavy spray."

EXTRACT from the Meteorological Log of S.S. *Clan Malcolm*, Captain C. J. HIGGINS:—

"DECEMBER 28TH, 1923.

Noon. Latitude 38° 46' N. Longitude 0° 56' E. Wind S.W. 3. Barometer 1017.5 mb. (30.05 in.). Dry Bulb 60°·6. Wet Bulb 57°·3. Sea 59°·3.

4 p.m. Wind S.W. by W. 4. Barometer 1014.3 mb. (29.95 in.). Dry Bulb 58°·8. Wet Bulb 56°·2. Ci-St. 3.

7.10 p.m. Wind shifted suddenly to N.W., blowing in strong gusts, cloudless sky.
First watch, upper clouds moving rapidly from N.W.
Midnight, strong gale from N.W. by W., rising sea.

"DECEMBER 29TH, 1923.

5.20 a.m. Wind blowing hurricane force, tremendous seas, hove to.

10 a.m. Bank of Cu-St formed to S.E. and dispersed.

Noon. Latitude 40° 51' N. Longitude 3° 37' E. Wind N. 11. Barometer 1015.3 mb. (29.98 in.). Dry Bulb 50°·5. Wet Bulb 45°·8. Sea 56°. Dense haze caused by flying spray. Vessel shipping heavy seas.

4 p.m. Abnormally high seas, very steep, 45 feet high. Wind backed to N.N.W.

Midnight. Wind N.N.W. 11. Barometer 1023.3 mb. (30.22 in.). Dry Bulb 47°. Wet Bulb 45°. Sea 56°. Cu-St 3. Gale blowing with great violence. Dangerous steep seas, occasional tremendous rollers and breaking seas.

"DECEMBER 30TH, 1923.

Noon. Latitude 41° 13' N. Longitude 4° 10' E. Wind N.N.W. 7. Barometer 1024.4 mb. (30.25 in.). Dry Bulb 50°·2. Wet Bulb 46°·3. Ci-St, Cu and detached St. 8/10ths. Wind and sea moderating considerably.

0.40 p.m. Resumed course at full speed.

4 p.m. Wind backing and moderating in appearance."

PARALLEL NIMBUS CLOUDS.

THE following extract is from the Meteorological Log of S.S. *Arracan*:—

Captain M. WILLIS, Port Said to Leith; Observer, Mr. H. POOLE, 2nd Officer.

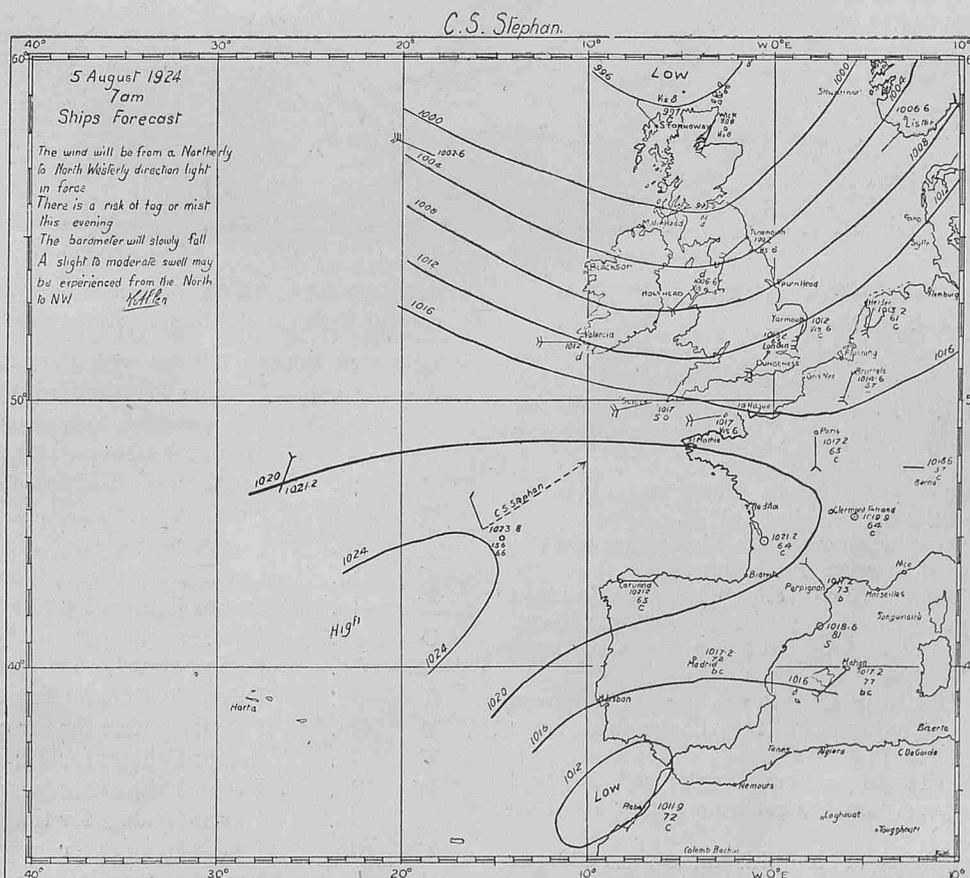
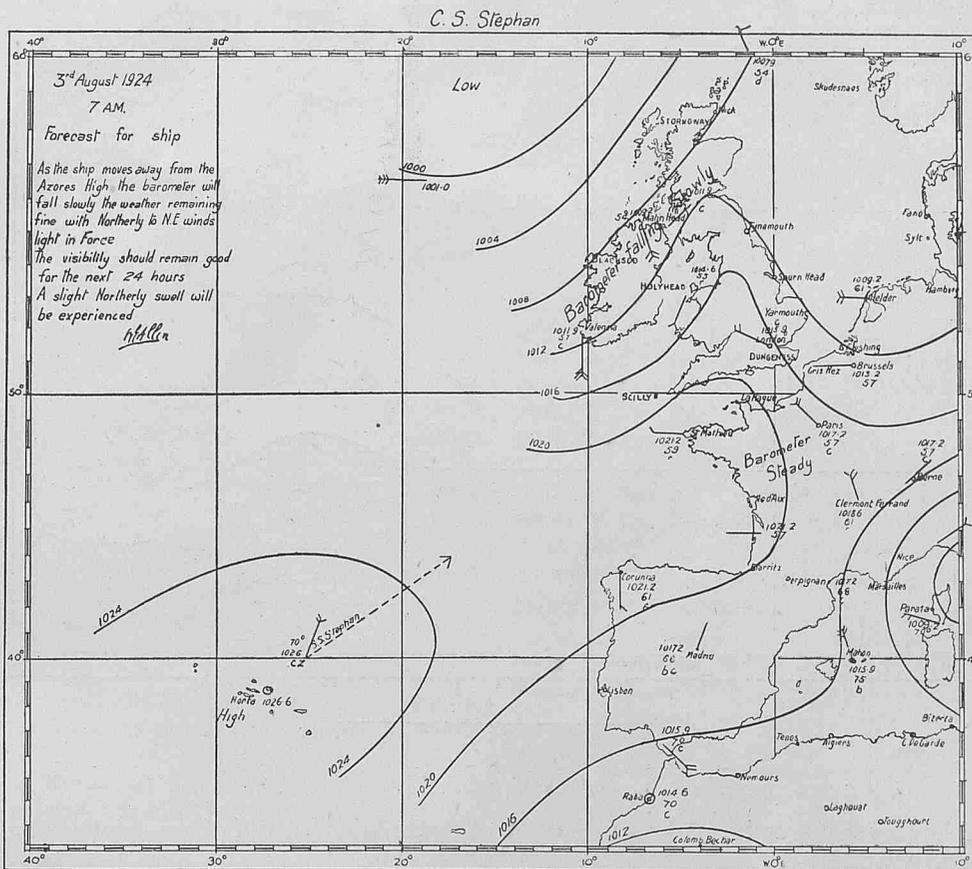
"December 13th, 1923. Midnight to 4 a.m. S.A.T. Mean Position, Latitude 35° 15' N., Longitude 18° 00' E. Wind S.W./S, force 3-5.

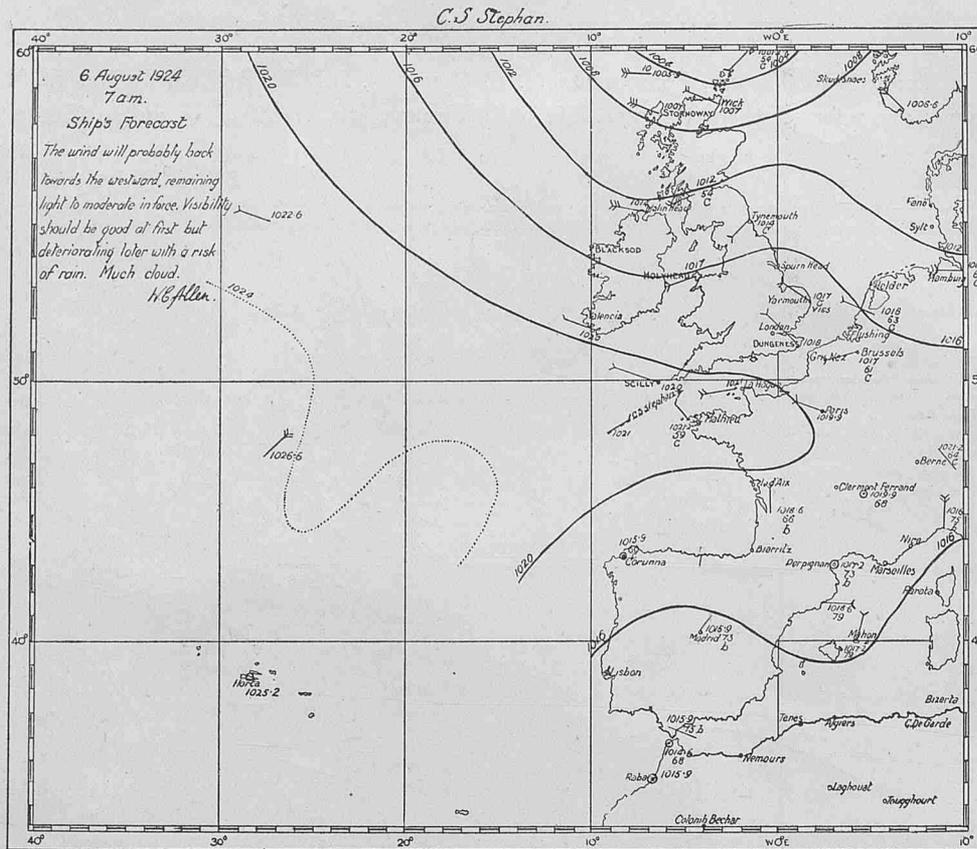
"Throughout the watch heavy nimbus clouds rose from Southward in broad strips extending to East and West. A feature of these clouds was their regular sequence and symmetry of outline, particularly their bases which presented an appearance of uninterrupted parallelism with the sea horizon, rising as a heavy curtain and revealing bright blue sky between each strip. The breadth of each cloud subtended a vertical angle of about 10°."

During the night of December 13-14 a small depression was situated with its centre over Sicily.

WEATHER CHARTS AND FORECASTS.

Made on board the Cable Steam Ship *Stephan*, Commander G. F. CARLTON, O.B.E., R.N.R., by Mr. W. E. ALLEN, 2nd Officer.
 These charts are referred to in Chapter XII of "Wireless and Weather, an aid to Navigation."

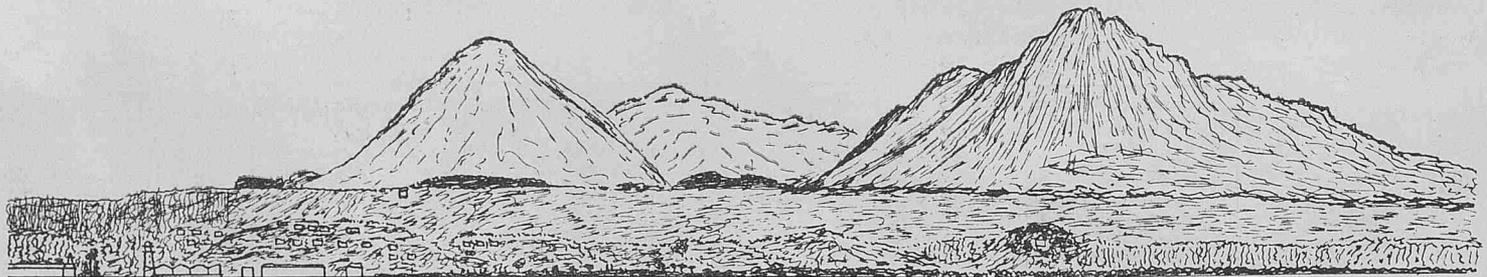




JAVA PORTS.

THE following sketch and remarks are contributed by Captain G. PARK of the Asiatic S.N. Co.

Samarang, Java.



Lighthouse 55°E 2-3

Mt Merbabu 10,223. 53°E.

Mt Ungoran 6,725 51°W

“Charts.—Island of Java, Western Portion No. 1653, Harbours and Anchorages on the Coast of Java No. 932.

“Your guides to an anchorage by night are Samarang Light and the gas buoy, red. Hesitate before choosing an anchorage by night because of other vessels in the Roads. The custom of the Port is for steamers, in the East Monsoon, to anchor with the Lighthouse bearing S 5° E to S 15° W.

“During the West Monsoon it is advisable to anchor more West so as to bring the Lighthouse to bear S 10° E to S 50° E.

“It frequently happens you can neither see the Lighthouse nor the gas buoy owing to the amount of shipping in the port.

“My advice is for you to close slowly with the shipping, taking into consideration the size and draft of the steamers loading or unloading, and keep your lead going. Do not be tempted to go where the local Packet Steamers lay.

“The holding ground is excellent, and even in the burst of the West Monsoon the second anchor is not required but may be dropped under foot to warn you.

“Coolies will remain on board until your cargo is finished, and will require water only. You may rely on the coolies working 150 tons of sugar per day, per gang.

“The Lighter Company rarely send alongside more than 600 per day.

“The Port Health Doctor will visit you early if ‘2 flag’ is flying. Be careful with this ‘2 flag.’ Study your Health Book.

“Single Flag Signals for use with the Lighter Company, Samarang.

- A over ball.—Leaking Lighter alongside.
- E do. I do not wish to load or discharge on Sunday.
- F do. There are lighters alongside to be towed away.
- G do. I require medical assistance.
- H do. I want to work all night.
- I do. I want to work half-night.
- K do. I want Stevedore KLEIN.
- M do. I want lighters for piece-goods.
- O do. I have passengers to disembark.
- R do. I want Stevedore ROWLEY.
- S do. I want lighters for bag cargo.
- T do. I want lighters for tar or oil.
- V do. I want lighters for fish.
- W do. I want lighters for heavy cargo.
- X do. I want lighters for timber.
- Y do. I want lighters for long iron.
- Z do. I want launch for sick man.

Samarang, Java (*continued*).

The Company's flag over ball—Require to communicate with Agents.

National flag over ball—Require to communicate with Lighter Company.

“It is urgently requested that these signals will not be used unnecessarily, and to be hauled down when attention is given.

‘Note.—These signals are local, for Samarang only.’”

DRIFT OF A DINGHY.

THE following was received from Mr. R. O. COLLISTER, 3rd Officer, M.V. *La Paz*, Captain J. Ross:—

“This ship's dinghy was washed overboard during a moderate South-Westerly gale at 11.15 a.m. (A.T.S.) on the 30th December, 1923, in Latitude 36° 48' N., Longitude 39° 28' W., and was picked up by the Italian steamer *Montenero* at 9.00 a.m. on the 20th February, 1924, in Latitude 32° 55' N., Longitude 34° 25' W. (in good condition), being a set and drift of S. 46° $\frac{3}{4}$ E. (True), 341 miles in 52 days.”

WIRELESS AND WEATHER, AN AID TO NAVIGATION.

CHAPTER XII.

CONCLUSION.

IN preparing charts of the percentage frequency of observations of gales in all oceans for the Board of Trade Committee upon Weather Zones and Seasons for the Load Line, we were struck with the high percentage of gales occurring in the western parts of the North Atlantic and North Pacific Oceans as compared with the gale frequency in the eastern parts of these Oceans. In both these Oceans to the west there are cold currents coming from the Arctic regions and warm currents coming from the Tropics.

Thus, taking a great average of observations, the association of bad weather with steep sea isothermal gradients is shown. The Gulf Stream has long been known by seamen as a “weather breeder.” MAURY wrote of it: “The most furious gales of wind sweep along with it; and the fogs of Newfoundland, which so much endanger navigation in spring and summer, doubtless owe their existence to the presence, in that cold sea, of immense volumes of warm water brought by the Gulf Stream.”

In a report upon an “Investigation of the Meteorology of the North Atlantic,” published in 1869, Captain TOYNBEE wrote: “The effect of the temperature of the surface water on the wind and weather seems to be a phenomenon of universal occurrence.”

It was under Captain TOYNBEE that daily synoptic charts of the North Atlantic were first drawn, and daily synoptic charts drawn for areas over the sea have since proved that in middle and high latitude, where the changes of the surface temperature from place to place are more sudden, depressions more often occur or develop.

Different degrees of heat imparted by the surface to the air above it and the rotation of the earth contribute to pressure gradient, and in preceding Chapters we have seen that pressure gradient is proportional to wind.

There are, however, exceptions to this rule, for, if air cooled by mountain tops is moved by change of pressure distribution in the vicinity, it moves down the mountain slope by gravitation and attains a velocity, as wind, out of all proportion to the pressure gradient.

In his “Physical Geography of the Sea and its Meteorology,” MAURY wrote:—

“When we travel out upon the ocean, and get beyond the influence of the land upon the winds, we find ourselves in a field particularly favourable for studying the general laws of atmospheric circulation. Here, beyond the reach of the great equatorial and polar currents of the sea, there are no unduly heated surfaces, no mountain ranges, or other obstructions to the circulation of the atmosphere—nothing to disturb it in its normal courses.

“The sea, therefore, is the field for observing the operations of the general laws which govern the movements of the great aerial ocean.

“Observations on the land will enable us to discover the exceptions, but from the sea we shall get the rule.

“Each valley, every mountain range and local district, may be said to have its own peculiar system of calms, winds, rains and droughts. But not so the surface of the broad ocean; over it the agents which are at work are of a more uniform character.”

The Mediterranean Sea is land-locked, having lofty mountains along its northern coast, while to the southward lie the deserts of Africa. In this sea there often occur exceptions to the rule of the

barometer and peculiarities of weather. There are the “Mistral” of the Gulf of Lyons, the “Bora” of the Adriatic, and the “White squall” of the Ægean Sea; “Tramontana” or winds off the mountains.

In the Mediterranean we also get, particularly in the Malta Channel, the “Scirocco,” a hot southerly wind sometimes charged with the sands of the African desert occurring with suddenness, chiefly in the Autumn.

The “Gregale” or N.E. wind frequently blows with great violence in the winter at Malta.

In the Western Mediterranean, “Vendavales” or S.W. winds occur frequently in winter, accompanied by much rain. Land and sea breezes are common on the coast of Spain in summer.

“Contrastes,” or opposing winds, are frequent off the southern coast of Spain. It is by no means a very uncommon sight to see sailing vessels in with the land and in the offing, steering nearly opposite courses, both with the wind aft or quartering. The name *Capo Spartivento* given to the southern point of Italy, “Cape split the wind,” is significant (*spartire*, to divide; *vento*, wind). The “Mistral” and “Bora” are usually preceded by cloud-caps over the mountains which often continue while the wind lasts, and there are other signs known locally, all of which, when observed, should be noted in the Meteorological Log, in order that by publication in this Journal they may become more generally known. Indeed, Marine Observers can do much in every part of the World by remarking in their logs upon peculiarities of weather phenomena, but such remarks recorded during the next few years in the Mediterranean may be of special value, for the Meteorological Office has recently established a branch at Malta, where, for successful forecasting, this information may be valuable.

Though the barometer in the open ocean may be an unfailing guide to wind, there are exceptions in the vicinity of high land, of which the following is an example:—

Excessive Wind for Barometric Gradient.

CHART LXVIII. FOR THE MORNING OF 31ST DECEMBER, 1921.

It will be noted that pressure is Low over the Gulf of Genoa and High over the Atlantic west of Portugal, the wind being W.N.W. at Pic du Midi, where the air temperature is 21° F., altitude 9,380 ft., and at Perpignan the wind is also W.N.W. with air temperature 57°, altitude 104 ft. At sea off Marseilles, the air temperature is also 57°, and off Barcelona it is 56°, as observed by *Tottori Maru* and *Antilochus*.

The P. & O. S.S. *Nyanza*, Captain C. D. FORBES, left Marseilles at 8.39 a.m. on 31st December, wind W.N.W., a fresh breeze, though it should be noted that at 8 a.m. *Tottori Maru*, not far off Marseilles, logged the wind as force 7.

Noon, wind W.N.W. 6 increasing, barometer 1016.8 (30.02), air temperature 58°, wet bulb 54°, which gives humidity 76 per cent., weather *b*. Cirrus and Cumulus are logged as covering $\frac{1}{10}$ th of sky. (We should like to know if these clouds were over the mountains or nearer the zenith?)

4 p.m., wind N.W. 9, barometer 1017.3 (30.04), air temperature 55°, wet bulb 50°, humidity 70 per cent., weather *b*.

At 6.30 p.m. the wind from N.W. increased to storm force 11, with very high steep sea. Ship labouring heavily. Hove to with ship's head N.N.E.

8 p.m., wind N.W. force 11, barometer 1020.8 (30.14), air temperature 49° (the wet bulb reading was by this time probably affected by salt-water spray, so that humidity cannot be found), weather *b*.

CHART LXIX. is made from ships' observations only, taken at 8 p.m. on 31st December. Comparing it with CHART LXVIII. it will be seen that during the day the "Low" which was over the Gulf of Genoa has moved south and is now over the Straits of Bonifacio, also that the barometric gradient over the Gulf of Lyons is much less steep than would be expected for so much wind.

Herefordshire bears N. 72° E. 116 miles from *Nyanza*, the line of bearing is nearly at right angles to the isobars, and there is only a difference of 4 mb. (.12 in.) in their corrected barometer readings; while *Antilochus* bears S. 34° W. 236 miles from *Nyanza*, this line of bearing is at an angle of about 4 points to the isobars, so that the distance for gradient would be about 167 miles, with barometers only differing 2 mb. (.06 in.).

It should also be noted that between noon and 8 p.m., *Nyanza's* barometer had risen 4 mb. (.12 in.), the ship having made S. 48° W. 60 miles during this time, the depression also moving south.

With a wind of storm force out in the open ocean the difference in barometers, 60 miles apart, and on a line of bearing at right angles to the isobars, would be about 6.8 mb. (.20 in.). See Table, CHAPTER XI.

The Mistral.

At noon, with wind W.N.W. 6, the temperature of the air was 58° and humidity 76 per cent. By 4 p.m. the wind had veered to N.W. and increased to a strong gale, while the temperature fell 3° and the humidity 6 per cent. By 8 p.m. the air temperature had fallen 9° altogether since noon, and the wind was then N.W., force 11.

Now in the morning the "Low" was over the Gulf of Genoa and the general direction of the wind from W.N.W. over the Franco-Spanish boundary, where the Pyrenees Mountains, rising to a height of 11,000 feet, lie in an E.S.E. and W.N.W. direction. North of the Pyrenees, the Cevennes Mountains, rising to 5,000 feet, extend in a N.N.E. direction.

The "Low" travelled south during the day, which would tend to a veer of the wind from a more northerly point of the compass with slight increase in force in the Gulf of Lyons, due to slight steepening of the barometer gradient. The cold, dry, heavy air over the tops of the mountains accelerates the N.W. wind by gravitation and rushes down to the sea as the "Mistral."

The cold, dry, heavy air striking downward on the surface of the sea no doubt accounts for the well-known fact that the sea rises with extraordinary rapidity in the Mediterranean with Northerly winds, of which we had many unpleasant experiences in the light, fast, little ships of the Fleet messenger service during the late War.

CHART LXX. shows the conditions on the morning of 1st January, 1922. It will be noted that the "Low" is now over the Tyrrhenian Sea, and that the gradient has steepened over the Gulf of Lyons, conforming more to the force of the wind. During the day, the wind moderated until at 4.20 p.m. *Nyanza* was able to proceed on her course with a fresh N.N.W. gale on the starboard quarter, the air temperature having risen again to 53° F. and barometer to 1026.3 mb. (30.31).

During several winters in the Mediterranean, and on many passages through it, I have noticed when bound in or out of Marseilles and Toulon, that with the wind from northward of west, if it increases round about noon it almost invariably blows with gale force before midnight, and doubtless others will have noticed the same.

With a clear sky the air at the mountain tops, already cool due to altitude, is further cooled by terrestrial radiation at night, hence the "Mistral" usually blows hardest with a clear sky.

The "Mistral" may be concurrent with the southerly passage of the right semi-circle of a deep depression; when this happens the pressure gradient will be more nearly proportional to the wind, and so, as Mr. N. A. WHINFIELD terms it, in his report given in the "Marine Observer's Log," the behaviour of the barometer will appear "Typical of the Mercurial Maxims."

The following example will not only serve to illustrate this, but it will also demonstrate the utility of wireless reports in these waters:—

"Mistral" with steep Barometer Gradient in rear of a Depression.

The Bibby Line S.S. *Oxfordshire*, Captain B. W. ADAMSON, of whom there has been no more regular and consistent broadcaster of standardised weather reports in the Corps of Voluntary Marine Observers, was approaching Marseilles outward bound on December 28th, 1923.

They sent out a weather report addressed to "All Ships" as usual, but received none.

The Bibby Line steamers call at Marseilles, and it is important to these ships and to all mail and passenger steamers with a schedule to maintain, to know in winter time if a "Mistral" may be expected during the time of their call, for often it may be desirable, if the "Mistral" is likely to be violent, to anchor in l'Estaque Roads, not going inside the breakwater for fear of delay.

It has often been found advantageous to embark passengers in this roadstead by tender in a strong "Mistral," for with that wind it is often not safe to attempt to go to sea from the harbour within the breakwater.

Had *Oxfordshire* received reports from other ships and intercepted the Eiffel Tower message, by making a weather chart, she could probably have seen that a heavy "Mistral" was to be expected, and that it would probably last until some time after noon on December 29th, when she was due to sail.

In the Western Mediterranean the station reports and ships' reports contained in the Eiffel Tower message are particularly useful, for the latter cannot be received direct from the Eastern North Atlantic because of the interference of the land. A selection of these reports will give the general pressure distribution over the Eastern North Atlantic and Western Europe, and, with ships' reports received direct, a sufficiently complete chart for the purpose may be made.

IN CHART LXXI. WE HAVE SUCH A CHART FOR THE MORNING OF DECEMBER 28TH, 1923.

By it, *Oxfordshire*, and ships in the Gulf of Lyons, could have seen that there was a large and fairly deep depression centred north of Paris, and that with the barometer rising quickly at Holyhead in its rear, falling at Paris and Lyons, and falling rapidly at Zurich, that this depression would probably travel in a direction to the south-eastward. Such a movement of the depression would cause the wind over the mountains to the westward and north-west, which by the trend of isobars and observation at Perpignan was from the westward, to veer to the N.W. and so cause the air to flow down the mountain slopes with increasing velocity. Further, with this depression moving to the S.E., the wind would be from a north-westerly direction at Marseilles due to pressure, until the depression had passed away a considerable distance to the S.E. With this combination of the effects of gravitation and barometer gradient a heavy and fairly long spell of "Mistral" would be expected.

Oxfordshire arrived at Marseilles in the forenoon, and was in harbour throughout the strength of this "Mistral"; her meteorological log was not continued until she proceeded to sea.

The meteorological logs of ss. *Clan Malcolm*, Captain C. J. HIGGINS, and ss. *Orsova*, Captain C. G. MATHESON, indicate that the "Mistral" blew with very great severity over the Gulf of Lyons from the evening of December 28th until the morning of December 30th, 1923; extracts are given in the "Marine Observer's Log."

CHART LXXII. shows the conditions on the morning of December 29th, 1923, when the depression was centred west of Rome. There is a steep gradient over the Gulf of Lyons, where the wind from off the mountains is reported by *Orsova* and *Clan Malcolm* to be storm force, and it will be noted that in this vicinity the air temperature has dropped 8 degrees since yesterday morning.

CHART LXXIII. MORNING OF DECEMBER 30TH, 1923.

Oxfordshire is at sea again, and has a light N.N.W. breeze in rear of the depression. *Clan Malcolm*, though no longer under the influence of the depression, is still experiencing the "Mistral," or mountain wind, from the northward, the gradient in her vicinity being shallower than would cause a wind of force 10, due to pressure.

High Seas.

This "Mistral" set up a very high, steep sea in the Gulf of Lyons on December 29th, 1923, *Clan Malcolm* and *Orsova* both being obliged to heave to. Captain HIGGINS, who is one of our most experienced "excellent" observers, estimated the sea to have been 45 feet high at 4 p.m. when *Clan Malcolm* was distant only some 180 miles from the "weather" shore. The fact that the sea compelled *Orsova* to heave to is sufficient to indicate the severity of the weather. The question has been asked lately, "Why is it that heavier seas occur with northerly winds in northern latitudes, and southerly winds in southern latitudes?" The following is possibly an explanation.

The barometric gradient is usually steeper and wind stronger in the rear of depressions than in front of them, and, therefore, in middle and high latitudes where depressions are usually moving eastward stronger winds occur from polar directions.

Further polar winds being composed of comparatively cold, heavy air appear to set up more sea disturbance than equatorial winds composed of warmer, moist, light air. The matter requires investigation and observations and remarks upon sea and wind will be very welcome.

The length of waves is influenced by the "fetch." The highest sea reported of recent years was that encountered by *Majestic* on the night of December 29th, 1922, in the North Atlantic, in approximate Latitude 49° N., Longitude 20° W., when Sir BERTRAM HAYES and his officers estimated that the sea reached a height of 80 feet. Upon investigation of the weather conditions, Captain HENNESSY found that this month in the North Atlantic had been remarkable for the frequency and strength of its gales. The phenomenal seas were caused not only by storm winds in the vicinity, but also by reinforced waves due to westerly winds which had been blowing continuously for at least 36 hours over an area extending 800 miles west, aided further by heavy westerly swell entering this area from the westward.

The inclusion of sea in weather reports has not been suggested in (I.) Ships' Wireless Signals, page 12, because winds reported usually give a very good idea of what sea may exist or be expected. Swell is an essential element to report. There are, of course, localities where the sea is far more dangerous than in others with the same amount of wind, as, for example, off the South African coast on the edge of the Agulhas Bank. Captain TOYNBEE remarks in his "Report on the Gales of the Ocean District adjacent to the Cape of Good Hope": "In some cases the sea was tremendous, the eastern edge of the Agulhas Bank (where there is a strong current setting to the south-westward) is remarkable for its extremely high and confused seas, more especially in south-westerly gales, which blow counter to the current."

Naval architects have recently drawn attention in several papers, to the importance of statistical information of sea and swell, for the purpose of research work in connection with the form of hull for obtaining sea-kindliness and small resistance.

The correlation of wind force and sea disturbance would possibly be useful for many purposes, so that observations of sea may well be given careful attention. Possibly the new system of data extraction, when sufficient has been done, may provide a means of investigation; it bore fruitful results in the survey we made of the conditions in the region near Cape Guardafui and Sokotra in the height of the S.W. monsoon season.

System applicable to all Parts of the Oceans.

Throughout these Chapters we have kept before us the aim set in the "Foreword"—"to give suitable guidance to Mariners for the making of charts and forecasts by a simple and quick process by using the observations of marine observers, and giving experiences and suggestions for the application of the method in all seas from which sufficient synchronised observations are available."

Examples and suggestions have been given for all the permanent atmospheric pressure zones shown upon the CHARTS OF THE WORLD XXVI. AND XXVII., except those of the Polar regions. That is, we have dealt with weather at sea in all Latitudes covered by the trade routes; broadly the same procedure is applicable in the same Latitude in other Longitudes over the Oceans.

Examples of all seven fundamental shapes of isobars which were generalised in Chapter I. have been given. Marine Observers having read these Chapters as they were received month by month are now asked to peruse them as a whole. Weather at any place is connected with the general circulation of the atmosphere and therefore a world-

wide conception of the conditions of the atmosphere must be kept in view. The forecaster on shore is dealing with weather systems passing or developing over his area; he has been given a very large range of reports of recent years by means of wireless telegraphy. The Mariner is continually passing over the oceans not only through weather systems which are passing or developing, but through the great zones of different atmospheric pressure in which are attendant all types of weather. His should indeed be a wide outlook and wireless telegraphy has enabled him to "see," with the assistance of other observers ashore and afloat, up to several thousand miles distant; whereas, not more than 30 years ago, his range of communication was that of vision bounded by the horizon, and his predictions were more conjectural.

General Rules for Predicting the Movement or Change of Cyclonic Systems.

Sir NAPIER SHAW in his "Forecasting Weather," a book recommended to those who wish to advance their study of the subject, says with reference to the British Isles and the approach of depressions from the Atlantic:—

"We watch for the first indications of a falling barometer at the stations on the western fringe of our area. It may be either a fall since the normal time of reading, or a slight downward motion indicated at the time of observation by the barographic record, and it may be merely the backing of the wind at one or more of the western stations in anticipation of the falling barometer.

"As soon as the approach of a depression declares itself we depend upon the rapidity of the fall of the barometer for an indication of its intensity, and upon the behaviour of the barometer in its front as to the path which it intends to follow. We assume that it will follow the direction in which the fall of the barometer is most pronounced, and that the disturbance will be intense if the fall is rapid. Generally speaking, these assumptions are justified, but not always. Other considerations have some weight, but it is not easy to say how much. The distribution of pressure to the eastward, and the way in which it is varying at the time, may suggest that certain lines of movement are the most likely.

"In winter when they are most numerous and best defined, the centres of low pressure have a way of keeping to the sea, and to a certain extent they show a partiality for recognised tracks, but they are not by any means amenable to the discipline of fixed rules."

In using barometer tendency at sea the influence of course and speed should ever be borne in mind. When that has been considered it will often be possible to tell in which direction pressure is reducing, in which it is increasing, and in which there is little change. Sir NAPIER SHAW summarises the rules formulated by M. GABRIEL GUILBERT, a French Meteorologist, as follows:—

(1) A depression with winds *above* normal (for the barometric gradient) on all sides will sooner or later fill up; one with winds *below* normal will become deeper, and often depressions which are apparently weak will change into cyclonic storms.

(2) Those parts of a depression in which the winds are below normal (for the barometric gradient) indicate directions in which the depression may advance; thus, when a depression consists of winds that are above normal and partly of winds that are below normal it will move in the direction of "least resistance," that is in the direction where the winds are below normal.

(3) Pressure increases from right to left across the line of winds too strong for the gradient. Such winds cause an increase of pressure on their left as they move.

In Rule 3, according to Seamen's terms, right is left and left right, *i.e.*, we face the wind, the Meteorologist turns his back to it.

These rules were based upon observations made ashore and have not been generally accepted by Meteorologists. At sea error of position and time of observation, together with refinement in the observation of absolute pressure necessary for exactly establishing gradient, make it difficult to establish definitely such relationships. Rule 1 appears, from charts which have been made in the Marine Division during the last few years, to apply to depressions over the sea.

In the Norwegian method, *see* Chapter X, FIGURE 37, the line of advance is said to be at a tangent to the warm front at the centre

of the depression or parallel to the isobars in the warm sector. Concerning the prediction of advance of tropical revolving storms so much may depend upon the direction that one of these storms will move in, to the navigator, that it would be worse than misleading to advocate any but the most definitely established rule. It will usually be best to ascertain from time to time how a storm has moved and considering the possibilities of movement and the latitude of recurvature as shown by tracks of storms which have occurred in the same month, upon the Charts included in each Number to anticipate the probability of such advance.

The tendency of the barometer in ships or at coast stations coming under the influence of a tropical revolving storm will often give more definite indications of movement than in the case of depressions of higher latitudes because the isobars are more uniform in shape and are closely packed near the centre. Wind direction and its changes are a further guide. With upper air observations and an intricate and extensive organisation of reports over areas traversed by Tropical Storms, Weather Offices are making progress in the prediction of movement, and issue warnings containing forecasts of probable direction of advance, particulars of which with much other information broadcast by wireless or made by visual are given in "Weather Signals."

Weather Signals.

We have confined our suggestions and experiences entirely to the application of Weather reports received and charted on board ship by the navigator himself and there is little doubt that if this method becomes popular at sea it will have far reaching results, its success must mainly depend upon Marine Observers.

In areas adjacent to coasts of countries with Weather Services and in Ocean areas from which numerous reports can be constantly and regularly received at routine times without fear of interruption, very effective forecasts may be made ashore and broadcasted for the information of shipping and no doubt in time this practice will be considerably extended.

The "Weather Shipping Bulletin" was adopted by the British Meteorological Office with a view to assisting the mariner by both methods; it provides Weather Reports from Coast stations, with which and ships' reports he may construct his chart and form his own conclusions; as well as forecasts for defined areas and districts for a definite period also giving the "further outlook" when possible. Reports for two far northern stations in this message will be of particular value for ascertaining the movement of depressions passing between Scotland and Iceland.

Having regard to the movement of weather systems when forecasts are broadcast—the receiver cannot see the Weather Map—it should be remembered that the message refers to a definite place or area and is for a definite period. In fairness to this system, all who receive and use the signals—wireless or visual—should give due consideration to the explanations published for their information. There is a mutual moral responsibility.

Coast station reports provide a basis for the mariner to work on; the broadcasting of these reports has already had a profound influence upon barometer observation at sea.

Ships' Weather Signals.

Marine Observers complain that messages they receive from some ships contain uncorrected barometer readings or that they have not sufficient wireless range.

All cannot be converted in a day. There are some 120 steamers equipped by the Meteorological Office with Tested Mercurial Barometers plying all the Main Ocean Routes of the Globe. These ships have been so equipped for the purpose of keeping a Meteorological Log and were selected owing in part to the keenness of their officers and in part to their trade. In the normal course of their voyaging they are so distributed that they provide, generally, observation points on any day which cover well all the Oceans.

A large proportion of these ships are fitted for long-range transmission while a considerable portion of the 500 Meteorological Office Regular Voluntary Observers are fitted for long-range reception, and a great many ships which are not upon our list are also fitted for long-range reception; the number is steadily increasing.

Now, if once or twice a day only, at the standard routine time of the neighbourhood (*see* page 11), each of these 120 ships which have

long-range installations would broadcast a report framed upon the example given upon page 12 there would be reliable synchronised observations available to all within hearing and in a fair number over the Oceans, so that a daily chart could be made in many regions.

During all other times of day reports which do not contain synchronous observations made as usual on spark wave length would be more useful than before.

In the Trans-North Atlantic Trade there are some 28 steamers which report regularly observations made at standard routine hours in code to England and America. The decode and other particulars were published in the September Number. If intercepted, these reports with those before suggested will seldom allow any day to go by without there being sufficient data available to ships fitted with valve receivers for making an ample adequate chart.

Reports are also being made by ships to other countries in the International Figure code.

The whole system is in its infancy, new wireless inventions are constantly being made, and new requirements are constantly presenting themselves to the Meteorological Service, so that perfection of organisation for the sea services may probably be better effected by degrees. The bearing of Ships' Wireless Weather reports upon Meteorology and all that it serves will be manifold.

Reciprocation of these reports at sea provides an aid to navigation both on the sea and in the air; reception of ships' reports at Weather Offices not only is the means of aiding navigation by the issue of forecasts and warnings to shipping from the shore, but they have a profound effect upon weather intelligence generally.

In the great stock and grain districts of the Dominions overseas, fore-knowledge of rain or drought may contribute considerably to production. For example, it is thought that the strength of the North-East Trade in the Atlantic may be associated with rainfall in the cornfields of Canada.

Supposing it is, ships reporting weather in the North-East Trade would possibly contribute indirectly to the production of grain cargoes to be shipped to England.

It is certain that the navigator with a Weather chart before him is far better able to form an idea of what wind, sea, visibility and current he will experience, than the navigator who has nothing but his own isolated observations to go upon, or, indeed, a forecast made for him by people on shore, much though this latter will help him.

The making of a weather chart becomes a simple matter with practice; the difficulty at present at sea is to get sufficient of the right kind of reports from other ships, and here is where the Wireless Operator can give valuable assistance. It is well worth the trouble to Marine Observers to interest him and to share with him in reading this Journal.

In the middle of last century MAURY wrote in capital letters in that book beloved by sailormen, "The Physical Geography of the Sea":—

"The greatest move that can now be made for the advance of Meteorology is to extend this system of co-operation and research from the sea to the land, and to bring the Magnetic Telegraph regularly into the service of Meteorology."

Very shortly afterwards Admiral FITZROY set an example to the world in the use of the Electric Telegraph for weather reporting ashore. **120 fully equipped Marine Observers are now invited to set an example in the use of Wireless Telegraphy for weather reporting to "all ships."** A space has been provided in the Meteorological Log in which they may record exactly what they have broadcast.

The ways of commerce over the Oceans and the hereditary chivalry of the sea are beyond doubt more adaptable to voluntary Meteorological Service than to obligatory Service.

Economical Passage Making.

We will end by repeating what we said on the North Atlantic Chart for November, 1922:—

Concerning passages, there are many ways in which prediction of weather may have an economic bearing as well as contributing very largely to safety.

Take the passage from the Straits of Gibraltar to Channel ports as concerning mail and passenger steamers with ample speed and a time-table to keep, the weather which may be expected in the Bay, off Ushant and in the Channel is frequently a source of anxiety to the commander, who wishes to arrive at his disem-

barkation port on time. Without information of the conditions ahead and what those conditions are likely to be in the near future, it is often considered wise to assume that they may be unfavourable—i.e., fog, dirty weather or strong head winds. With W/T some idea may be obtained by intercepting reports from ships ahead and to the westward, from whence most weather comes, together with reports from land stations, and on occasions it may be possible to forecast with some accuracy that fine clear weather is most probable.

In the first case it is usual to steam at a speed in excess of the average required to arrive on time, and when sufficient is considered to be in hand to ease down; thus, if the weather remains favourable, more coal than necessary is consumed.

In the second case, if reports indicate that clear favourable weather is reasonably probable, provided confidence is sufficient, a speed very little in excess of the required average will be steamed from the commencement of the passage.

The term "forecast" was introduced by Admiral FITZROY as meaning a statement of weather which may be expected in the near future, but of recent years the term appears to have conveyed to many the meaning that a prophecy of weather was intended. This is not so, for all the forecaster can do, be he meteorologist, with a highly organised system of quickly reported observations from a great many stations over a large area, or a seaman, with a number of ships co-operating with him by means of W/T, is to chart his observations, and then from

experience of what has happened before with similar pressure distribution, winds and weather over the area under consideration, state what the probabilities are. If reports received contain false observations, the forecast may miscarry, pending changes may be overlooked, and, as we know only too well at sea, Divine Providence often ordereth the elements at sea to act in ways beyond the comprehension of man. Still, experience shows that it is worth trying at sea.

May be in a year or two we shall be able to publish revised serial chapters upon "Wireless and Weather, an Aid to Navigation"; in next year's "Marine Observer" the subject will not be dealt with serially, but we hope to supplement the subject with information which will be of assistance in weather prediction and "Weather Signals" will be continued. We shall discuss Weather Charts each month as far as space permits.

Until revised it is hoped that Marine Observers will continue to consult these Chapters and that they will freely communicate their experience, with copies of weather charts and forecasts made, advantages gained, and suggestions for improvement.

In the "Marine Observer's Log" we are able to reproduce by photography three weather charts made on board the Cable Ship *Stephan* in August of this year, which give us much encouragement as indicating progress at sea towards the mastery of our subject.

THE END.

WEATHER SIGNALS.

II. WIRELESS WEATHER BULLETINS.

BRITISH COLUMBIA.

THE following W/T stations in British Columbia transmit weather forecasts, issued by the Canadian Meteorological Service, to any ship upon request.

The hours of service are from 0000-1200 G.M.T. (civil) and the wave length used is 600 metres spark in all cases.

W/T Station.	Position (approx.)		Call Sign.
	Latitude.	Longitude.	
Digby Island - - -	54° 17' N.	130° 23' W.	VAJ
Dead Tree Point - - -	53° 21' N.	131° 56' W.	VAH
Bull Harbour - - -	50° 55' N.	127° 56' W.	VAG
Alert Bay - - -	50° 35' N.	126° 56' W.	VAF
Cape Lazo - - -	49° 42' N.	124° 53' W.	VAC
Estevan - - -	49° 22' N.	126° 32' W.	VAE
Point Grey - - -	49° 16' N.	123° 15' W.	VAB
Gonzales Hill (Victoria) - - -	48° 25' N.	123° 19' W.	VAK

UNITED STATES OF AMERICA (PACIFIC COAST).

North Head, Wash., W/T Station, approximate Latitude 46° 18' N., Longitude 124° 05' W., call sign NPE, wave length 2,726 metres (spark), transmits weather messages as follows:—

At 0130, 1330 and 2130 G.M.T.:—Current barometric pressure, wind direction and force, and state of weather at North Head.

At 0430 and 1730 G.M.T.:—Forecasts for the coasts of Washington and Oregon, and Columbia River entrance. The 1730 message also contains barometric pressure, wind direction and force, and state of weather at North Head.

The information is also transmitted on request.

Eureka, Calif., W/T Station, approximate Latitude 40° 42' N., Longitude 124° 16' W., call sign NPW, wave length 2,250 metres, transmits weather messages as follows:—

At 0130 G.M.T.:—Barometric pressure, wind direction and force, and state of weather at Eureka, at 0100 G.M.T.

At 1700 G.M.T.:—Forecasts for coast of California, north of San Francisco; barometric pressure, wind direction and force, and state of weather at Eureka, at 1300 G.M.T.

The information is also transmitted on request.

Weather Bulletins from Light Vessels, U.S.A. Pacific Coast.

The W/T stations on board the following light vessels broadcast reports pertaining to existing weather conditions in the immediate vicinity at the times stated.

The wave length used is 600 metres (spark) in each case.

W/T Station.	Position (approx.)		Call Sign.	Times of Transmission G.M.T.
	Latitude.	Longitude.		
Umatilla Reef Lt.V. - - -	48° 10' N.	124° 51' W.	NACV	0000, 0400, 1600, 2000
Blunts Reef Lt.V., Calif. - - -	40° 26' N.	124° 30' W.	NACT	0400, 1600, 2000
San Francisco Lt. V. - - -	37° 45' N.	122° 42' W.	NAKS	0400, 1600, 2000

The information is also transmitted on request.

San Francisco, Calif., W/T Station, approximate Latitude 37° 39' N., Longitude 122° 23' W., call sign NPG, broadcasts daily weather bulletins at 0330, 0600 and 1700 G.M.T. Each bulletin commences with the letters U.S.W.B. (U.S. Weather Bureau) and is divided into two parts.

Wave lengths used:—At 0330 and 0600 G.M.T., 1,330 metres (spark). At 1700 G.M.T., 4,613 metres (arc).

Part I contains observations from the stations given below; at 0330 and 0600 G.M.T. observations of 0100 G.M.T. and at 1700 G.M.T. observations of 1300 G.M.T.

Indicator Letters.	Station.	Position (approx.)	
		Latitude.	Longitude.
<i>Alaska.*</i>			
DH - -	Dutch Harbour - - -	53° 53' N.	166° 32' W.
EA - -	Eagle - - -	64° 50' N.	140° 50' W.
JU - -	Juneau - - -	58° 18' N.	134° 25' W.
NM - -	Nome - - -	64° 50' N.	167° 20' W.
SK - -	Sitka - - -	57° 03' N.	135° 20' W.
TN - -	Tanana - - -	65° 00' N.	151° 40' W.
VZ - -	Valdez - - -	61° 05' N.	146° 39' W.
<i>United States.</i>			
TAT - -	Tatoosh I, Wash. - - -	48° 23' N.	124° 44' W.
SE - -	Seattle, Wash.† - - -	47° 38' N.	122° 25' W.
NH - -	North Head, Wash. - - -	46° 18' N.	124° 05' W.
PD - -	Portland, Oreg. - - -	45° 31' N.	122° 31' W.
RO - -	Roseburg, Oreg. - - -	43° 11' N.	123° 10' W.
EUR - -	Eureka, Calif. - - -	40° 42' N.	124° 16' W.
RB - -	Red Bluff, Calif. - - -	40° 10' N.	122° 10' W.
SM - -	Sacramento, Calif.† - - -	38° 32' N.	121° 30' W.
SF - -	San Francisco, Calif.† - - -	37° 50' N.	122° 30' W.

Indicator Letters.	Station.	Position (approx.).	
		Latitude.	Longitude.
FN	Fresno, Calif.	36° 10' N.	119° 50' W.
SLO	San Luis Obispo, Calif.	35° 08' N.	120° 43' W.
LA	Los Angeles, Calif. †	33° 42' N.	118° 15' W.
DI	San Diego, Calif. †	32° 42' N.	117° 15' W.
HL	Helena, Mont.	46° 10' N.	111° 50' W.
BS	Boise, Idaho	43° 40' N.	116° 00' W.
LD	Lander, Wyo.	41° 40' N.	108° 40' W.
WM	Winnemucca, Nev.	40° 50' N.	118° 10' W.
R	Reno, Nev.	39° 20' N.	119° 50' W.
SLC	Salt Lake City, Utah	40° 45' N.	111° 40' W.
MD	Modena, Utah	37° 30' N.	113° 50' W.
DV	Denver, Colo.	39° 48' N.	105° 05' W.
GJ	Grand Junction, Colo.	39° 10' N.	108° 20' W.
SA	Santa Fe, N. Mex.	35° 39' N.	106° 02' W.
PH	Phoenix, Ariz.	33° 00' N.	112° 00' W.
YU	Yuma, Ariz.	32° 46' N.	114° 38' W.
HO	Honolulu, Hawaii	21° 18' N.	157° 52' W.

Canada.

ED	Edmonton, Alberta	53° 32' N.	113° 05' W.
KA	Kamloops, B.C.	50° 48' N.	120° 03' W.
CY	Calgary, Alberta	51° 00' N.	114° 00' W.
SC	Swift Current, Sask.	50° 30' N.	107° 45' W.
PR	Prince Rupert, B.C.	54° 15' N.	130° 21' W.

* Alaskan reports included in the 0600 G.M.T. bulletin are observations taken previous p.m.; those in 0330 and 1700 G.M.T. bulletins are observations taken a.m. current date.

† Stations with which upper air observations are included in the 0330 G.M.T. bulletin regularly; and in the 1700 G.M.T. bulletin when obtained in time.

The stations are indicated by the key letters given above, and are followed by two or more groups of five figures. The first two of these always contain surface observations. Additional groups giving upper air data are only given for the stations marked with a dagger (†).

If upper air observations are not possible, these groups will be substituted by the words "foggy," "rain," or "snow," as the case may be.

An "X" will be substituted for any missing data.

Explanation of Groups.

First Group.—1st three figures give the barometer reading corrected in inches and hundredths, the first 2 or 3 being omitted. (To convert to millibars, see Table XXX, p. 57, April number.)

4th figure gives the wind direction (Table XXV, p. 57, April number).

5th figure gives the wind force by Beaufort scale; 9 is sent for force 9 and above.

Second Group.—1st figure gives the present weather (State of weather at surface) (Table XXVI, p. 57, April number).

2nd figure gives the pressure change in hundredths of an inch during the two hours preceding observation (Table XXVII, p. 57, April number).

3rd figure gives the cloud amount (number of tenths of the sky obscured, 10 tenths being total cloudiness) (Table XXVIII, p. 57, April number).

4th figure gives the cloud form and speed (Table XXIX, p. 57, April number).

5th figure gives the direction, from, of cloud movement (Table XXX, where 0 in this case means no movement observable).

Note.—When both upper and lower clouds are observed, only the amount, kind, and direction of the lower clouds will be sent. In such cases the amount of the upper clouds, if any, can be determined, approximately, by taking the difference between the tenths of cloudiness interpreted from the figures showing "present weather" and "amount of clouds."

Remaining groups, if sent, refer to upper air observations.

Part II is in plain language, and consists of a synopsis of general pressure distribution, wind and weather forecasts for ocean zones (viz., North Pacific and South Pacific zones, see Chartlet opposite) for a period of 24 hours, beginning at 1700; storm warnings (see under W/T Storm Warnings); and flying weather forecasts by zones for a period of 12 hours (see Chartlet opposite).

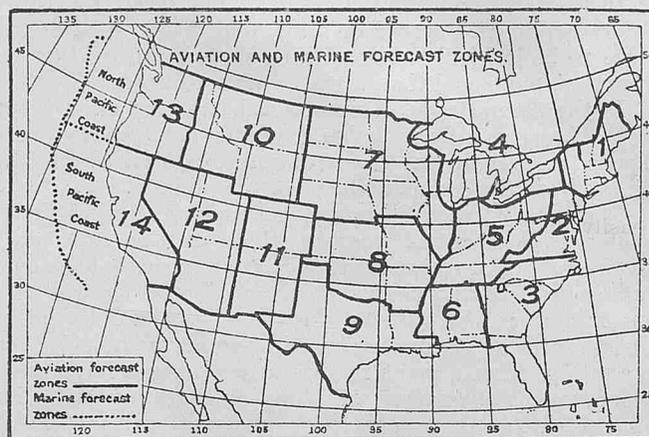
San Francisco W/T Station also transmits a report of the weather conditions in the Bonita Channel, every four hours, commencing with 0000 G.M.T. The report is sent *en clair*.

San Diego, Calif. W/T Station, approximate Latitude 32° 42' N., Longitude 117° 15' W., call sign NPL, transmits weather messages at 0430 and 1630 G.M.T. on a wave length of 1,988 metres (spark).

The messages at both these transmission times consist of:—
Forecasts for the coast of California south of San Francisco; barometric pressure, direction and force of wind, and state of weather at San Pedro, San Francisco and San Diego, at 0100 and 1300 G.M.T. respectively. (State of the weather at San Pedro is omitted from the 0430 G.M.T. message.)

A further weather message is also transmitted at 2200 G.M.T. on the same wave length.

The information is also transmitted on request.



SOUTH AMERICA.

CHILE.

Valparaiso W/T Station, approximate Latitude 33° 01' S., Longitude 71° 39' W., call sign CCE, sends out a weather bulletin in code commencing with the letters OMC (Oficina Meteorologica de Chile) at 0100 and 1700 G.M.T. on a wave length of 1,000 metres (spark).

The message gives observations from the following stations:—

Indicator Letter.	Station.	Position (approx.).	
		Latitude.	Longitude.
V	Valparaiso	33° 06' S.	71° 40' W.
T	Talcahuano	36° 43' S.	73° 08' W.
C	Corral	39° 53' S.	73° 35' W.
J	Juan Fernandez	33° 42' S.	78° 45' W.
M	Mocha	38° 25' S.	74° 00' W.
G	Guafu (or Huafo)	43° 35' S.	74° 45' W.
R	Raper	46° 50' S.	75° 38' W.
P	Punta Arenas	53° 08' S.	70° 56' W.
O	Puerto Montt	41° 30' S.	72° 58' W.
Q	Coquimbo	29° 57' S.	71° 20' W.

The observations are contained in one group consisting of a key letter and four figures for each station.

The first two figures give barometer corrected in whole millimetres, the initial seven being omitted (see Table V, p. 28, February number, to convert to mbs. and ins.).

The third figure gives wind direction true.

1 = N. 3 = E. 5 = S. 7 = W.
2 = N.E. 4 = S.E. 6 = S.W. 8 = N.W.

The fourth figure gives wind force by Beaufort scale. When this is greater than 9 it will be given in words, thus:—
diez = 10, once = 11, and doce = 12.

When necessary the following words will be added:—

Temporal = gale. Neblina = fog.
Lluvia = rain. Sol = sunny.

An "X" will replace the figure for any missing observation, but if all the values for any station are missing, the word "No" will precede the key letter, thus "No T."

The bulletin at 0100 G.M.T. will also contain a summary of the weather changes that have taken place during the day.

Each bulletin will conclude with a meteorological forecast, and a statement regarding the probable approach of bad weather.

Talcahuano—Rocuant, W/T Station, Latitude 36° 44' S., Longitude 73° 06' W., call sign CCK, sends out at 0130 and 1730 G.M.T. on a wave length of 1,900 metres (spark), a repetition of the messages broadcast from Valparaiso at 0100 and 1700 G.M.T. respectively.

ARGENTINA.

Buenos Ayres—Dársena Norte, W/T Station, approximate Latitude 34° 35' S., Longitude 58° 22' W., call sign LIH, broadcasts a weather bulletin, *en clair*, in Spanish, at 0205 G.M.T., on a wave length of 1,000 metres. The bulletin will also contain a weather forecast for the ensuing 24 hours for the Rio de la Plata.

BRAZIL.

(a) Wireless Weather Reports on the Brazilian Coast.

With a view to assisting navigation, etc., the Brazilian W/T coast stations given in the list below transmit, every four hours, the state of weather and sea, as well as the force and direction of the wind. The elements so transmitted are direct observations made at the W/T stations. They are sent in Portuguese, *en clair*, and owing to uniformity can be easily understood by ships of other nationalities.

W/T Station.	Position (approx.) Latitude. Longitude.	Call Sign.	Times of Sending. G.M.T.
Belém (Para) - - -	1° 27' S. 48° 30' W.	SPB	0245, 0645, etc., etc.
S. Luiz (Maranhã) - -	2° 32' S. 44° 17' W.	SOM	0300, 0700, etc., etc.
Natal - - - - -	5° 47' S. 35° 18' W.	SNR	0330, 0730, etc., etc.
Olinda (Pernambuco) -	8° 01' S. 34° 51' W.	SPO	0345, 0745, etc., etc.
Amaralina (Bahia) - -	13° 01' S. 38° 28' W.	SPA	0315, 0715, etc., etc.
Fernando Noronha - -	3° 51' S. 32° 25' W.	SPN	0315, 0715, etc., etc.
Abrolhos - - - - -	17° 58' S. 38° 45' W.	SNN	0320, 0720, etc., etc.
C. St. Thome - - - -	22° 02' S. 40° 59' W.	SPT	0330, 0730, etc., etc.
Santos - - - - -	23° 56' S. 46° 20' W.	SPS	0245, 0645, etc., etc.
Florianopolis - - - -	27° 36' S. 48° 30' W.	SOV	0315, 0715, etc., etc.
Juneção (Rio Grande do Sul) - - - - -	32° 04' S. 52° 07' W.	SPJ	0345, 0745, etc., etc.
Rio - - - - -	22° 54' S. 43° 10' W.	SOH	1200, 1500, 2100, 0000

The wave length used by the above stations for the transmission of the messages is 600 metres (spark) in each case.

(b) Special Messages, including forecasts for the South Coast of the State of Rio de Janeiro, the remainder of the Southern Brazilian Coast, and to Buenos Ayres.

Iiha do Governado—Rio de Janeiro—W/T Station, approximate Latitude 22° 54' S., Longitude 43° 10' W., call sign SOH, broadcasts daily two special weather bulletins at 1800 and 0100 G.M.T., both on 1800 metres (spark).

These bulletins are divided into three parts; the first part contains respectively the 1200 and 2100 G.M.T. observations in code of various Brazilian, Uruguayan and Argentine meteorological stations given below; the second part contains upper air observations in code; the third part contains detailed weather forecasts in Portuguese, *en clair*, expressed in a small collection of terms which can be easily understood by ships of other nationalities.

Index Number.	Station.	State.	Position (approx.) Latitude. Longitude.
01	Ondina - - - - -	Bahia - - -	13° 00' S. 38° 30' W.
02	Caetitê - - - - -	" - - -	14° 02' S. 42° 37' W.
03	Victoria - - - - -	Esp. Santo -	20° 10' S. 40° 17' W.
04	Bello Horizonte - -	Minas Geraes -	19° 55' S. 43° 56' W.
05	Uberaba - - - - -	" - - -	19° 45' S. 47° 57' W.
06	Pirapora - - - - -	" - - -	17° 18' S. 44° 57' W.
07	Juiz de Fôra - - - -	" - - -	21° 45' S. 43° 20' W.
08	Rio de Janeiro - - -	Rio de Janeiro	22° 54' S. 43° 10' W.
09	Cabo Frio - - - - -	" - - -	22° 52' S. 42° 01' W.
10	S. Paulo - - - - -	São Paulo - -	23° 33' S. 46° 38' W.
11	Santos - - - - -	" - - -	23° 56' S. 46° 19' W.
12	S. Paulo dos Agudos -	" - - -	22° 28' S. 49° 00' W.
13	Cuyabá - - - - -	Matto Grosso -	15° 35' S. 56° 05' W.
14	Coxim - - - - -	" - - -	18° 28' S. 54° 45' W.
15	Tres Lagoas - - - -	" - - -	20° 47' S. 41° 42' W.
16	Curityba - - - - -	Paraná - - -	25° 25' S. 49° 16' W.
17	Florianopolis - - - -	S. Catharina -	27° 36' S. 48° 30' W.
18	Palmas - - - - -	Paraná - - -	26° 28' S. 51° 58' W.
19	Porto Alegre - - - -	Rio G. Sul - -	30° 01' S. 51° 13' W.
20	Uruguayana - - - - -	" - - -	29° 45' S. 57° 05' W.
21	S. Luiz das Missões -	" - - -	28° 23' S. 54° 58' W.
22	Rio Grande - - - - -	" - - -	32° 01' S. 52° 05' W.
23	Bagé - - - - -	" - - -	31° 20' S. 54° 06' W.
24	S. Victoria do Palmar	" - - -	33° 31' S. 53° 21' W.
25	Sta. Izabel - - - - -	Uruguay - - -	32° 45' S. 56° 32' W.
26	Montevideo - - - - -	" - - -	34° 54' S. 58° 12' W.
27	Buenos Ayres - - - -	Buenos Ayres -	34° 36' S. 58° 22' W.
28	Oran - - - - -	Salta - - -	23° 06' S. 64° 20' W.
29	Adalgala - - - - -	Catamarca - -	27° 30' S. 66° 26' W.
30	Corrientes - - - - -	Corrientes - -	27° 27' S. 58° 49' W.

Index Number.	Station.	State.	Position (approx.) Latitude. Longitude.
31	Santa Fé - - - - -	Santa Fé - - -	31° 40' S. 60° 42' W.
32	Mendoza - - - - -	Mendoza - - -	32° 53' S. 68° 49' W.
33	Victoria - - - - -	Pampa Central	36° 10' S. 65° 21' W.
34	Cipolletti - - - - -	Rio Negro - -	38° 56' S. 68° 08' W.
35	Bahia Blanca - - - -	Buenos Ayres -	38° 45' S. 63° 15' W.
36	P. Madryn - - - - -	Chubut - - -	42° 49' S. 64° 58' W.
37	Sarmiento - - - - -	" - - -	45° 30' S. 69° 00' W.
38	l de Outubro - - - -	" - - -	42° 12' S. 71° 08' W.

1800 G.M.T. Bulletin (1500 45th Meridian Time).

First part of Bulletin (observations of 1200 G.M.T.) Code used :-

Brazilian Stations (1-24) I_n I_n BBBDD. FwwTT.
Uruguayan ,, (25-26) I_n I_n BBBDD.
Argentine ,, (27-38) I_n I_n BBBDD.

in which

- I_n I_n = Index number of station.
- BBB = Barometric pressure corrected, in millimetres and tenths (initial 7 omitted). (See Table V, p. 28, February number, to convert to mbs. and ins.)
- DD = Wind direction true (Table IV, p. 15, January number).
- F = Wind force by Beaufort scale.
- ww = Weather at time of observation (Table II, p. 14, January number).
- TT = Air temperature in whole degrees C. (See Table VII, p. 29, February number, to convert to Faht.).

Second Part of Bulletin sent in code preceded by the word "Pilot" contains upper air observations.

Third Part of Bulletin contains night weather forecasts and is preceded by the word "Previsão."

0100 G.M.T. Bulletin (2200 45th Meridian Time).

The First Part of the Bulletin contains the 2100 G.M.T. observations (in code) of stations 08, 09, 11, 17, 22 and 24, in exactly similar form as for stations 1-24 in the 1800 G.M.T. Bulletin.

Second Part of Bulletin contains upper air observations in code and is preceded by the word "Temp Alegrete."

Third Part of Bulletin contains weather forecasts for the following day for the south coast of the State of Rio de Janeiro, remainder of the Brazilian coast and to Buenos Aires, in Portuguese (*en clair*), preceded by the word "Previsão."

WIRELESS STORM SIGNALS.

United States of America, Pacific Coast.

North Head, Wash, W/T Station, call sign NPE, broadcasts storm warnings when necessary after the weather bulletins at 0130, 0430, 1730 and 2130 G.M.T. When issued, the warnings refer to the coasts of Washington and Oregon, and Columbia River entrance, followed by advices concerning storm warnings issued for the North Pacific coast. The warnings are also transmitted on request. Wave length used is 2,726 metres (spark).

Eureka, Calif, W/T Station, call sign NPW, broadcasts storm warnings, when necessary, after the weather bulletins at 0130 and 1730 G.M.T. and also at 2200 G.M.T. When issued the warnings refer to the coast of California north of San Francisco, followed by advices concerning storm warnings for the North Pacific coast.

The warnings are also transmitted on request. Wave length used is 2,250 metres (spark).

San Francisco, Calif, W/T Station, call sign NPG, broadcasts storm warnings, when necessary, at 0330 and 1700 G.M.T. The warnings are included in Part II of the Weather Bulletins (q.v.) which are broadcast at those times. They refer to the Pacific off-shore areas as indicated on the Chartlet, p. 164. Wave lengths used, for the a.m. issue, 1330 metres (spark) and for the p.m. issue, 4,613 metres (arc).

San Diego, Calif, W/T Station, call sign NPL, broadcasts storm warnings, when necessary, at 0430 and 1630 G.M.T. after the weather bulletins, and also at 2200 G.M.T. When issued the warnings refer to the coast of California south of San Francisco, followed by advices concerning storm warnings for the coast of California.

The warnings are also transmitted on request. Wave length used is 1,988 metres (spark).

SOUTH AMERICA.

CHILE.

Valparaiso W/T Station, call sign CCE, broadcasts storm warnings, when necessary, after the weather bulletins at 0100 and 1700 G.M.T. on a wave length of 1,000 metres (spark).

III. VISUAL STORM WARNINGS.

British Columbia.

THE Canadian system of Visual Storm Signals, by day and by night, as explained on p. 86 of the June number of this Journal is in operation at a number of places on the coasts of British Columbia and Vancouver Island.

The storm signals are displayed from a gallows, usually erected on the Post Office, or Customs House.

At night a *red* light is substituted for the two white lights (Nos. 1 or 3) described in the above mentioned number. Its signification when hoisted is the same, viz. :—"To indicate the probability of a moderate or heavy gale from an easterly direction."

United States of America, Pacific Coast.

The United States system of Visual, Small-craft, Storm, and Hurricane Warnings as explained on p. 58 of the April number of this Journal is in operation at a number of stations on the Pacific Coast of the United States.

South America.

Chile.

Storm Signals, Valparaiso.—The storm signals formerly exhibited from the signal mast on the turret of the "Gobernacion Maritima" Building have been discontinued.

The following signals are now exhibited from the above mast, from April 15th to October 15th.

By day.—The degrees of good, variable and stormy or bad weather are indicated by the position of the symbols on the mast, viz. :—

First degree, mast-head; Second degree, half-mast; Third degree, below.

Good weather is indicated by flag D (International Code).

Variable weather is indicated by one ball.

Storm or bad weather is indicated by two balls.

By night.—The degrees of variable, and stormy weather are indicated by one, two or three lights, viz. :—

Variable weather by *blue* light or lights.

Stormy weather by *red* light or lights.

Special Night Signal.—One *red* and one *blue* light placed vertically means "Barometer falling rapidly."

Argentina.

Buenos Aires.—On a flagstaff on the roof of the Ministry of Agriculture, situated near Dock No. 1, the undermentioned storm signals for the Rio de la Plata are made.

Signals for Local Gales—probable up to the next day.

By day.	Meaning.	By Night.
A black cone, point up.	Gale from N.W. quadrant.	Three <i>white</i> lights in triangle, point up.
A black cone, point down.	Gale from S.W. quadrant.	Three <i>white</i> lights in triangle, point down.
Two cones, points up.	Gale from N.E. quadrant.	Four <i>white</i> lights in a square, with one light above.
Two cones, points down.	Gale from S.E. quadrant.	Four <i>white</i> lights in a square, with one light below.
Two cones, bases together.	Hurricane.	Six <i>white</i> lights forming two triangles, bases together.
Red square flag above the cones.	Caution that the gales predicted are imminent, or may occur on same day.	<i>Red</i> light over the <i>white</i> lights.

Uruguay.

Montevideo.—On the approach of storms or bad weather, by day, a red and white flag will be hoisted under the national flag from a flagstaff at the north-west angle of the Custom-house; at night a *red* light will be shown in place of the flag.

Brazil.

The following system of Visual Storm Signals is in operation at Brazilian seaports, the symbols being hoisted when necessary.

By Day.	Meaning.	By Night.
One black cone.	Wind from any quarter, dangerous for small craft.	—
Two black cones, bases touching.	Strong winds from S.E.	One <i>red</i> light.
Two black cones, points upward.	Strong winds from N.E.	Two <i>red</i> lights.
Two black cones, points touching.	Strong winds from N.W.	<i>White</i> over red light.
Two black cones, points downward.	Strong winds from S.W.	<i>Red</i> over white light.

At Rio de Janeiro, the signals are exhibited from the Time Signal Tower at the Observatory, at Santos from the Signal Station on Monte Serrat, and at Cape Frio, from the Signal Station.

Special Notices regarding Personnel.

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

Vice-Admiral F. C. Learmonth, C.B., C.B.E., Royal Navy (Retired).

ADMIRAL LEARMONTH, the Hydrographer of the Navy since September 1st, 1919, retired from that post on September 30th, 1924. During his service afloat Admiral LEARMONTH was a member of the Corps of Marine Observers, contributing 18 meteorological logs in H.M. Surveying Vessels.

As Hydrographer of the Navy, Admiral LEARMONTH represented the Admiralty on the Meteorological Committee, also serving on the Sub-Committee for Marine Meteorology in which he took much interest, particularly in the new system of data extraction and the re-organisation of the Atlantic Wireless Weather reporting service. He was Chairman of the Committee appointed by the President of the Board of Trade to advise on the application of the Seasonal Load Line Marks.

Captain H. P. Douglas, C.M.G., Royal Navy.

CAPTAIN DOUGLAS, who succeeds Admiral LEARMONTH as Hydrographer of the Navy, was also a member of the Corps of Marine Observers and has contributed 12 meteorological logs, of which 7 were classed "Excellent," also a number of interesting reports upon meteorological phenomena, of which may be mentioned valuable reports upon the Bermuda hurricanes of September, 1921 and 1922 when he commanded H.M.S. *Mutine*. He devised a sea and swell scale which was considered the most practical of a number of suggestions received from our Corps, which has been referred for International consideration. As Assistant Hydrographer, Captain DOUGLAS directed the Admiralty Weather Forecast and Meteorological Service which was later merged into the Meteorological Office of the Air Ministry.

Lieut. Commander Mortimer Cresswell, R.N.R.

Lieut. Commander CRESSWELL, an Officer of the Canadian Pacific Service, was appointed a Senior Professional Assistant on the staff of the Meteorological Office of the Air Ministry on October 8th, 1924.

Trained in the ship *Port Crawford* and Four-Masted Barque *Port Caledonia* he completed his time for Master, in steam.

Mobilised in 1914 he served as Navigating Officer of H.M. Ships *Hazel* and *Halcyon* during the late war, holds an Extra Master's Certificate, square rigged, and has been a member of the Corps of Voluntary Marine Observers since 1912.

Mr. CRESSWELL is now performing a course in the Marine Division, on completion of which he will take up the post of Port Meteorological Officer at Liverpool.

"WIRELESS AND WEATHER."

Chart LXVIII—Morning of December 31st, 1921.

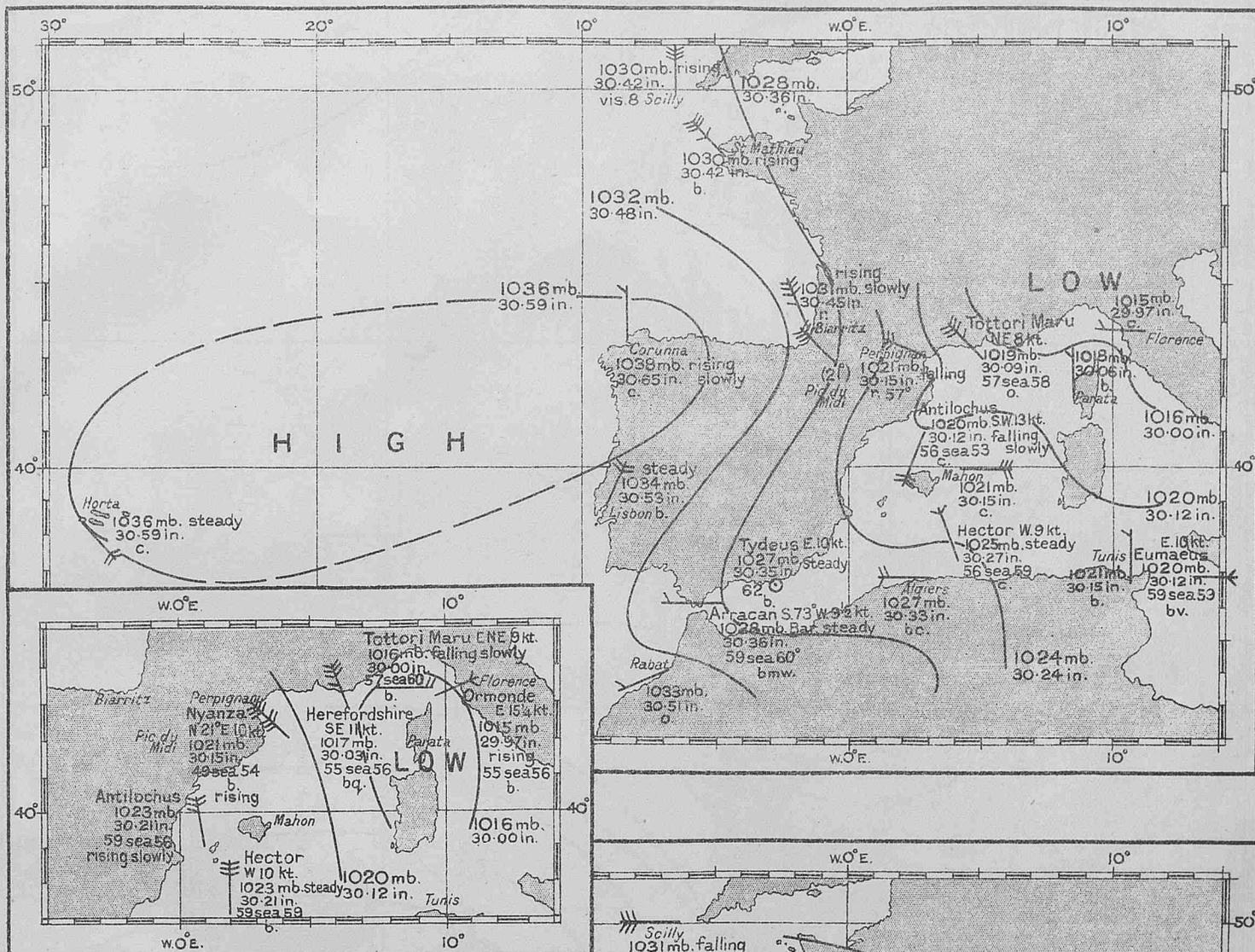


Chart LXIX—Evening of December 31st, 1921.

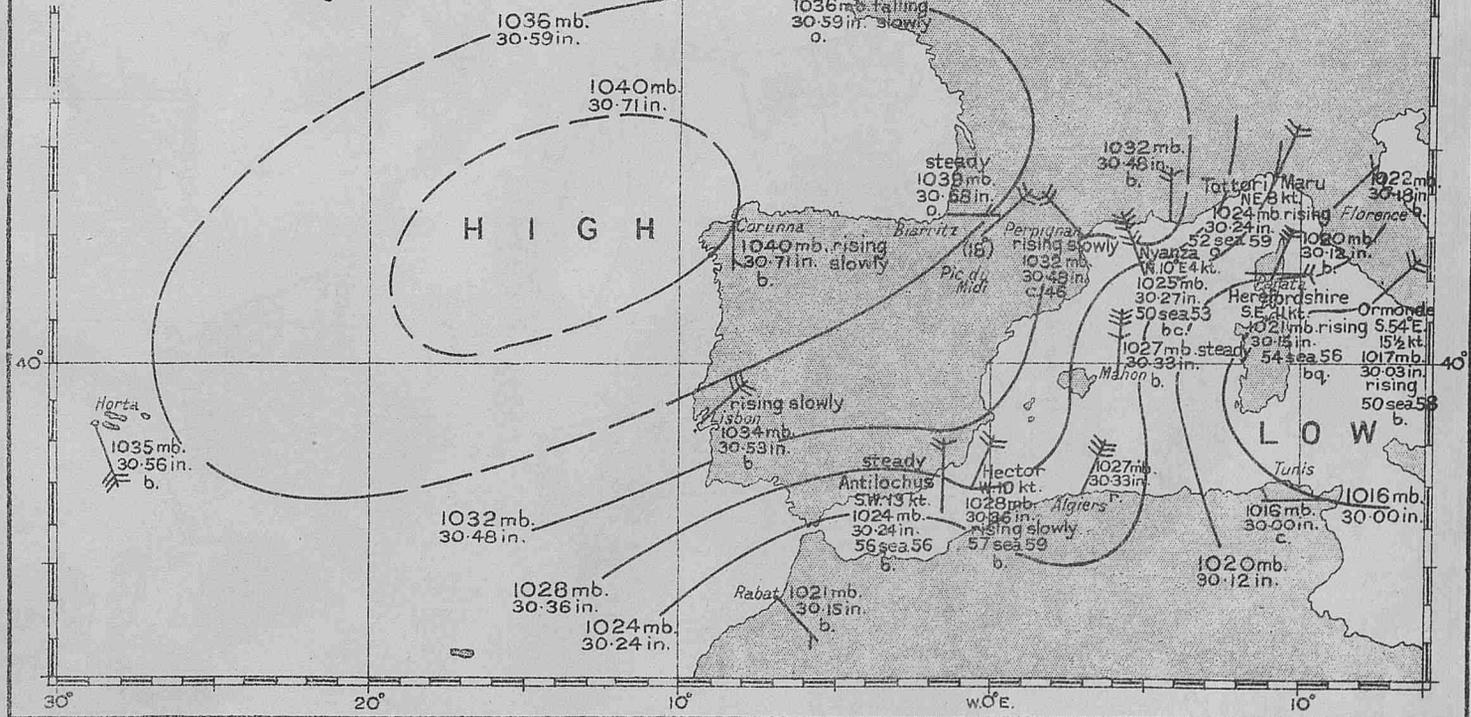


Chart LXX—Morning of January 1st, 1922.

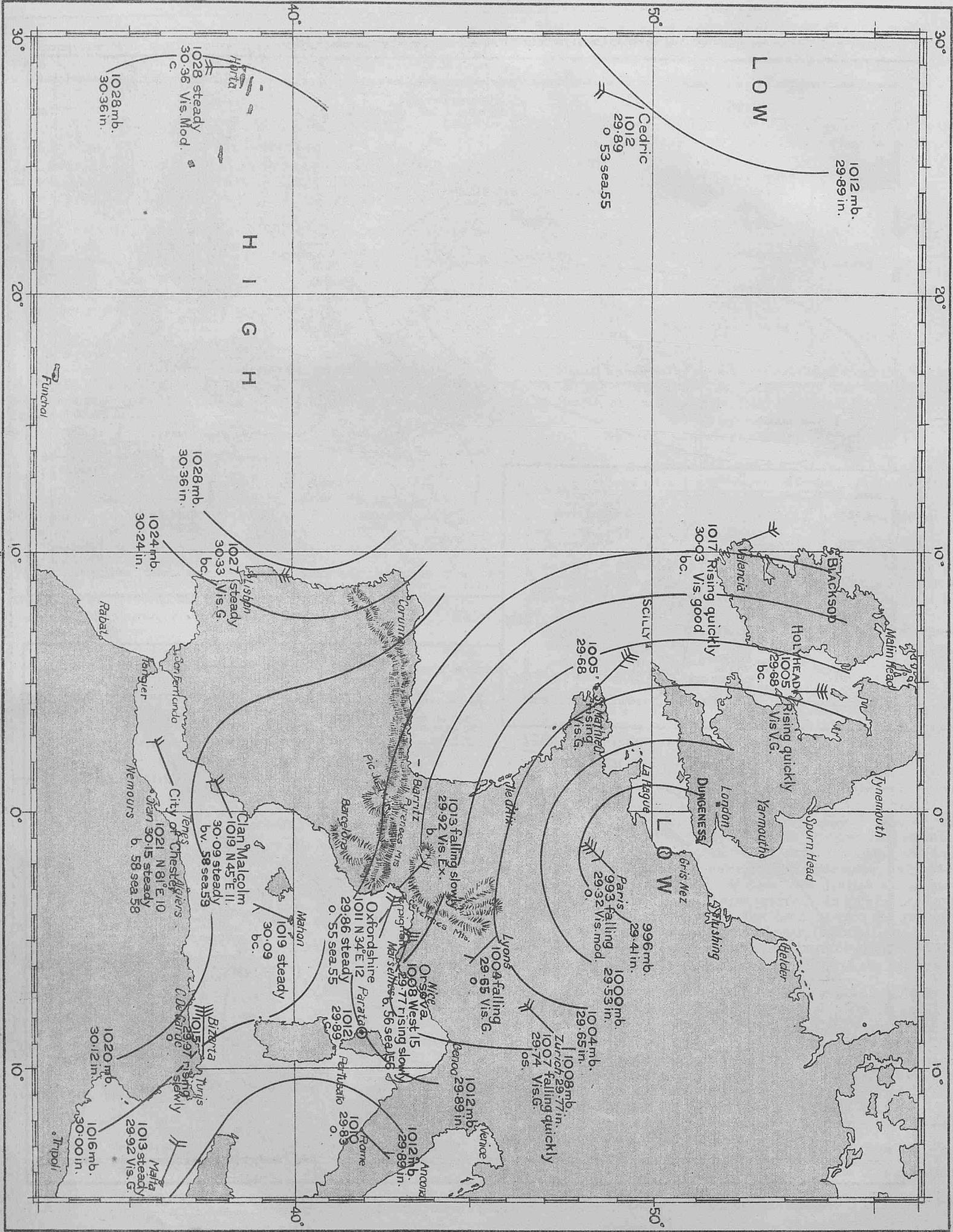


Chart LXXI - "WIRELESS AND WEATHER."

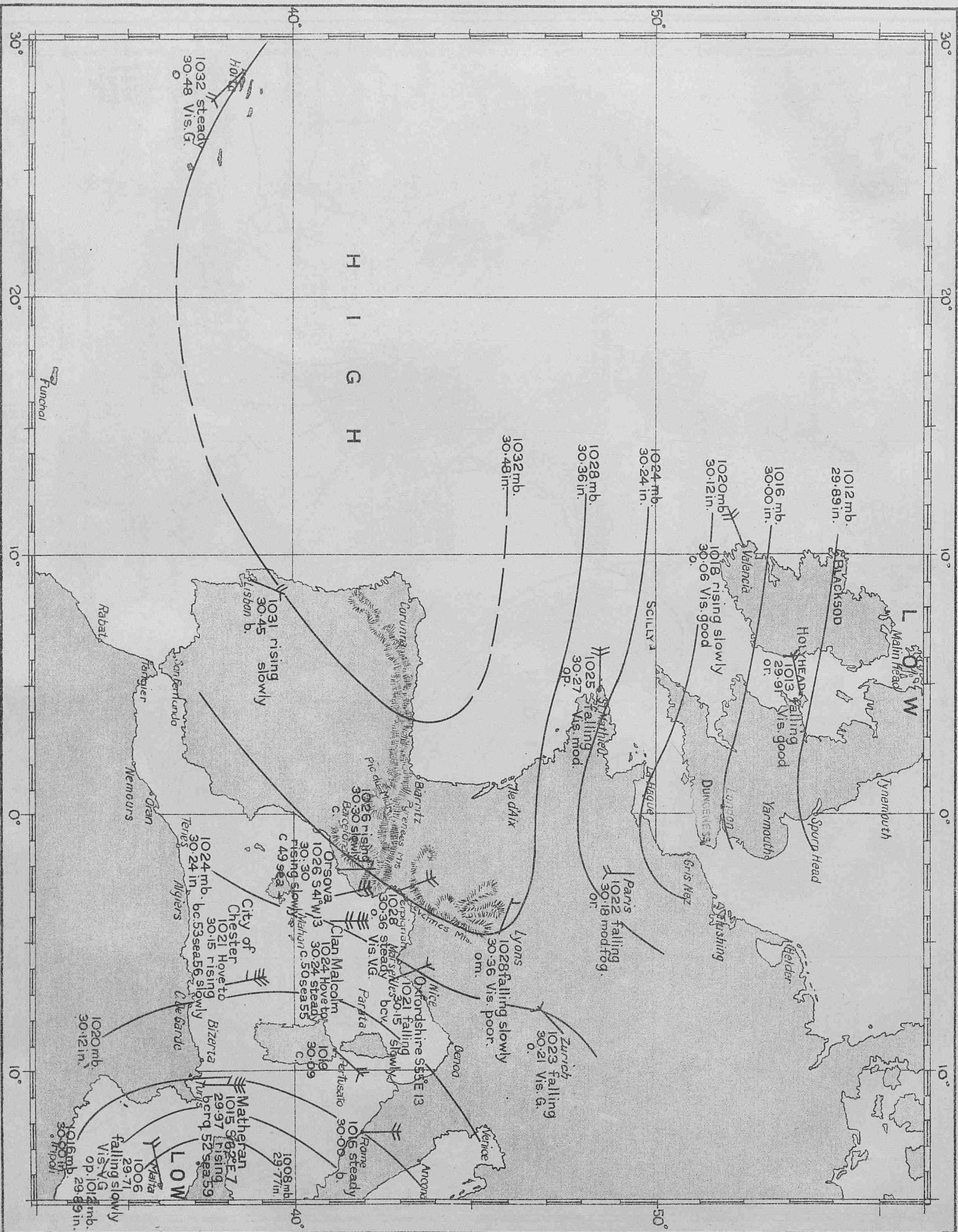
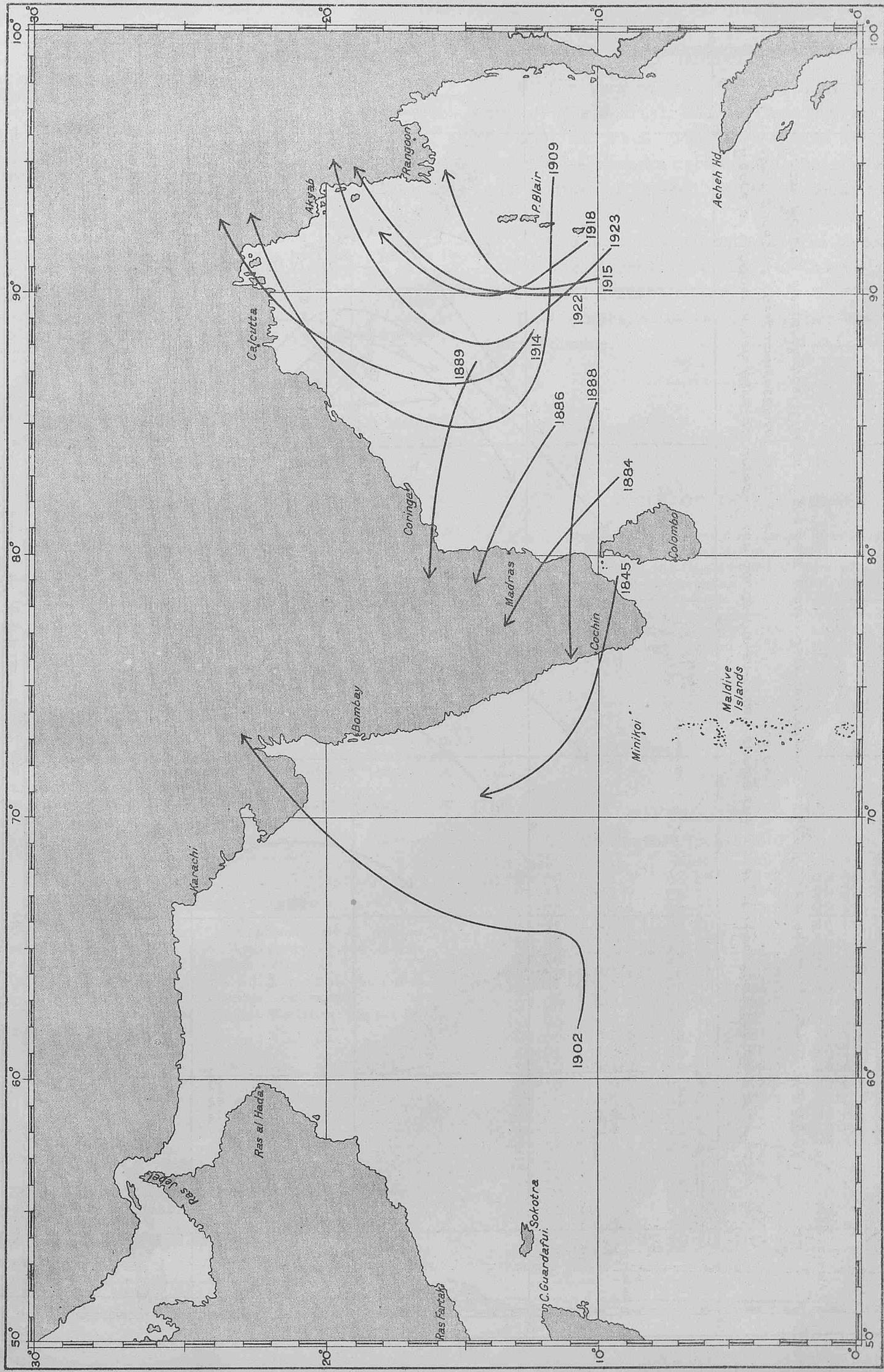


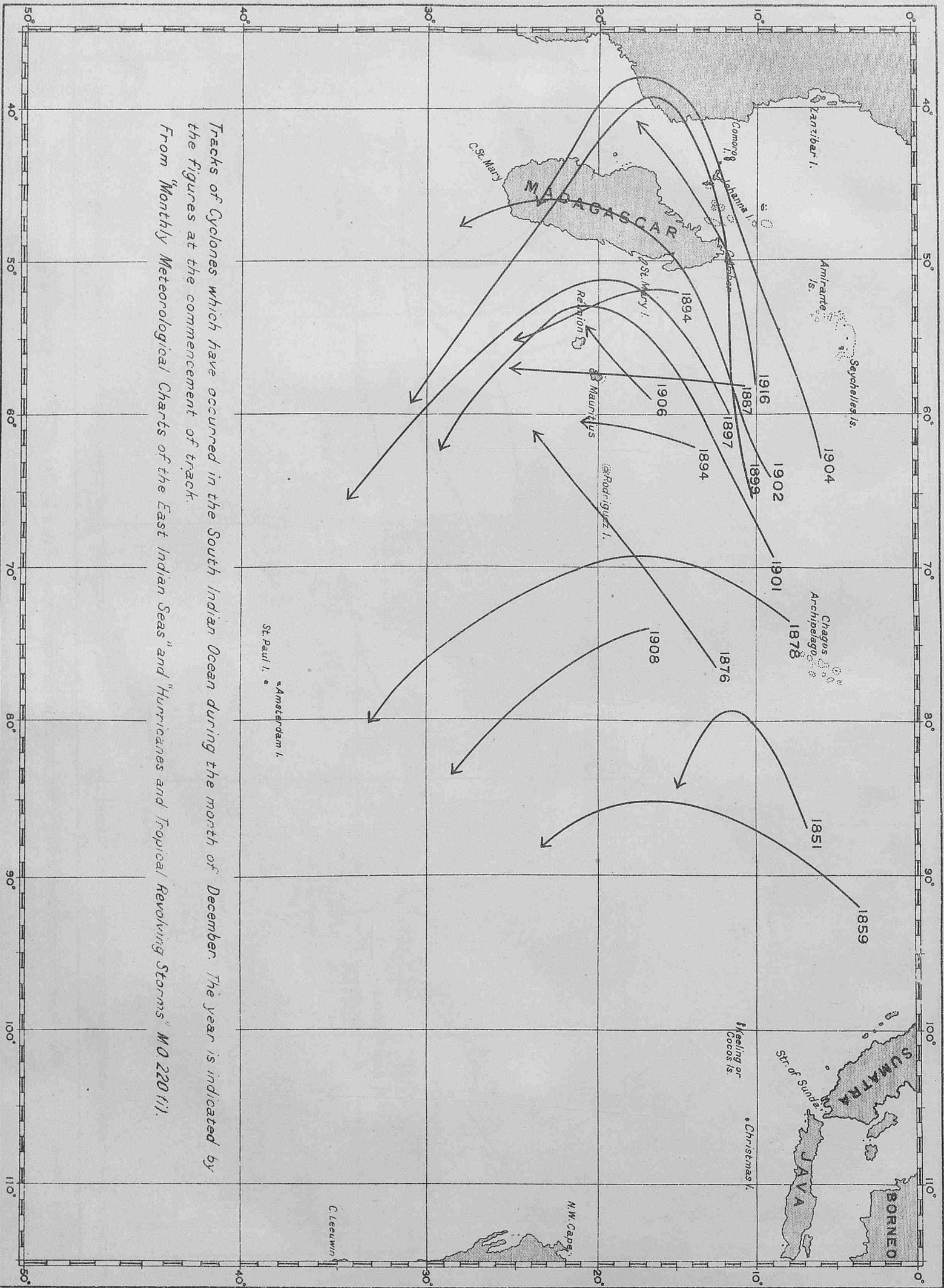
Chart LXXIII "WIRELESS AND WEATHER."

CYCLONE TRACKS OF THE ARABIAN SEA AND BAY OF BENGAL.



Tracks of cyclones which have occurred in the Arabian Sea and Bay of Bengal during the month of December. The year is indicated by the figures at commencement of track.
 From "Monthly Meteorological Chart of the East Indian Seas" and "U.S.A. Pilot Chart of the Indian Ocean" for December, 1923.

CYCLONE TRACKS OF THE SOUTH INDIAN OCEAN



Tracks of Cyclones which have occurred in the South Indian Ocean during the month of December. The year is indicated by the figures at the commencement of track.
 From "Monthly Meteorological Charts of the East Indian Seas" and "Hurricanes and Tropical Revolving Storms" MO 220 (1).

NOTICES.

INVITATION TO MARINE OBSERVERS.

The Marine Superintendent will be pleased to see the Captains of Observing Ships or their Observing Officers when they are in London, between 10 a.m. and 4 p.m. at Room 319, Adastral House, Kingsway, W.C.2. Telephone No., Regent 8000, Extension 421. Telegrams, Marine Superintendent, Weather, London. (Nearest Station, Temple, District Railway).

Personal touch is not only conducive to efficient work, but by this means we may be better able to advance upon lines which will further the practice of Meteorology in Navigation and at the same time provide the most suitable data for the general needs of Meteorological Science.

Those Marine Observers who do not come to London wishing to discuss matters connected with Marine Meteorology, are asked to consult the Agents at the Ports.

The Marine Agencies in Great Britain and Ireland are visited at least once a year by the Marine Superintendent, and it is hoped by these means to further promote voluntary co-operation between ships at sea, and with the Meteorological Office.

IMPORTANT.

With a view to promoting the interest and usefulness of this Journal, Marine Observers are requested to send in when possible accounts of interesting experiences, remarks upon special phenomena observed, and matters of interest, especially those which affect navigation.

A page for additional remarks will be found at the end of the Meteorological Log, or these can be made separately in manuscript.

Photographs, sketches and weather charts will be most welcome.

CHARTS OF NORMALS AND FREQUENCIES READY FOR DISTRIBUTION TO REGULAR OBSERVING SHIPS ON REQUEST.

The Reprints of Meteorological Charts notified in "Aims and Objects" of the January Number of this Journal are available.

Upon written application being made by the Commanders of Ships on the List of Regular Observers, one set of these Charts for the North Atlantic and/or the East Indian Seas will be sent with the understanding that they will be preserved in the Ship. They are only issued without payment to Regular Observing Ships appearing on the List.

These Charts may also be purchased from the Admiralty Chart Agents.

CARE OF INSTRUMENTS.

Marine Observers are earnestly requested to exercise every precaution in the care of instruments lent by the Meteorological Office.

It is requested that the Captains and Officers will give the Port Meteorological Officers assistance when they visit the ship, by having all instruments accessible for their inspection.

In the event of breakages or losses, the broken parts should be handed to the Port Meteorological Officer or Agent at the ports, with a brief and clear account of how the breakage or loss occurred.

ICE REPORTS.

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

These forms are supplied with the "Marine Observer" each month to regular observing ships in these Trades.

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		

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.

ICE CHART.

WESTERN NORTH ATLANTIC.

LETTERS OF TRANSATLANTIC TRACKS INDICATE

- (C) From 1st September to 31st January, inclusive.
- (E) From 15th November to 14th February.

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

ROUTE NOTICES.

For latest information *re* Tracks see front page of Ice Chart published with April Marine Observer.

SYMBOLS USED ON THE CHART.

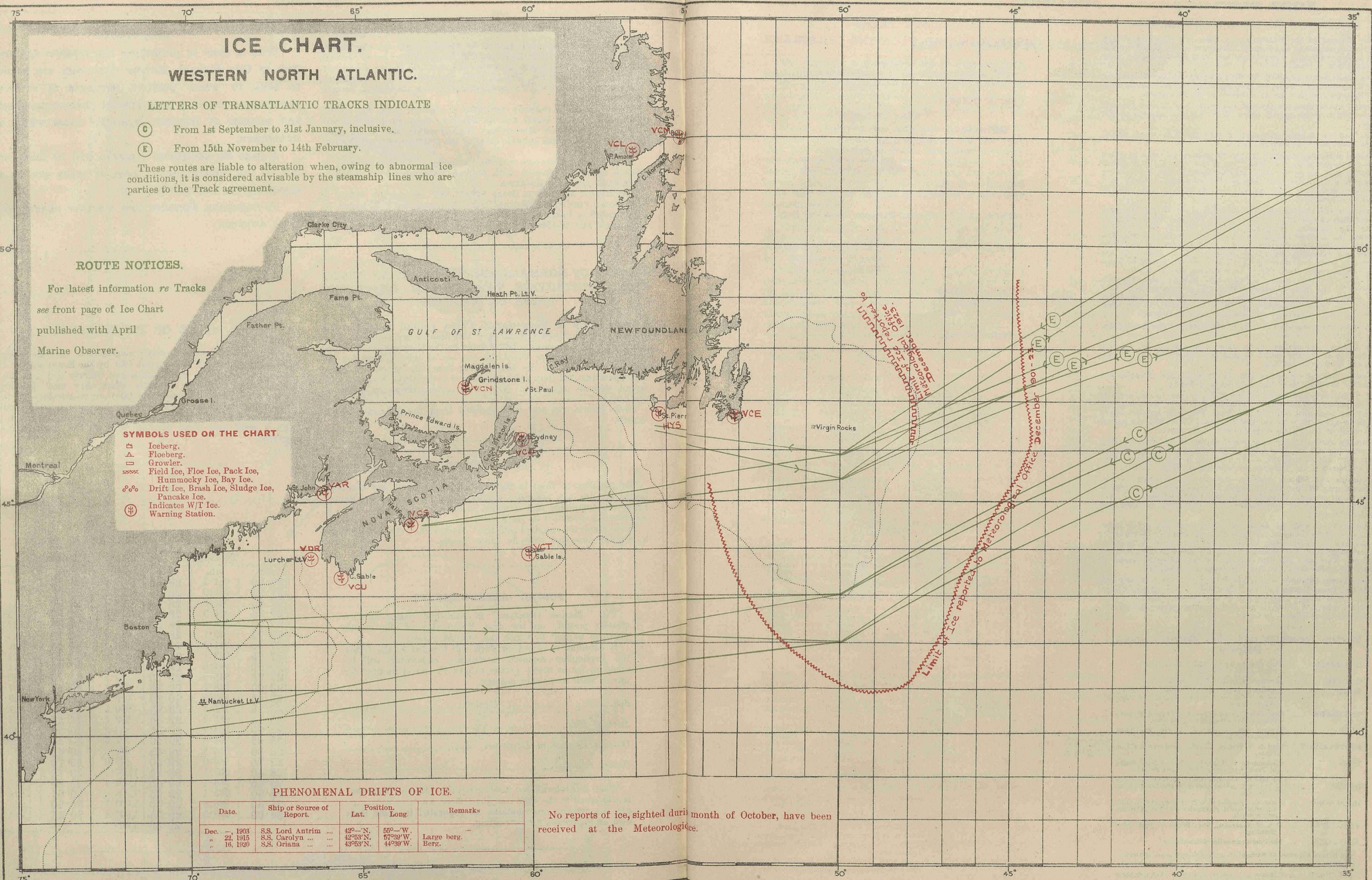
- ⊠ Iceberg.
- △ Floeberg.
- Growler.
- xxxx Field Ice, Floe Ice, Pack Ice, Hummocky Ice, Bay Ice.
- o/o Drift Ice, Brash Ice, Sludge Ice, Pancake Ice.
- ⊕ Indicates W/T Ice.
- ⊕ Warning Station.

PHENOMENAL DRIFTS OF ICE.

Date.	Ship or Source of Report.	Position.	Remarks
		Lat. Long.	
Dec. — 1903	S.S. Lord Antrim ...	42°—N. 55°—W.	Large berg.
" 22, 1915	S.S. Carolyn ...	42°53'N. 57°39'W.	Berg.
" 16, 1920	S.S. Oriana ...	43°53'N. 44°39'W.	Berg.

No reports of ice, sighted during month of October, have been received at the Meteorological Office.

Limit of Ice reported to Meteorological Office December 1901-23
 Meteorological Office
 December 1901-23



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, Ships 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.

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.

Masters who wish to assist in developing the rapid interchange of Meteorological information and Weather Forecasting at sea can do so by using the standard form of W/T Weather Report suggested in "Weather Signals," given in this Journal, January Number. For this purpose a mercurial barometer of which the index error has been ascertained is essential.

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.

Marine Agencies and Port Meteorological Officers.

LIVERPOOL	..	(Port Meteorological Office), Dock Office. Telephone No.: Bank 8959.
CARDIFF	..	Captain T. Johnston, Technical College.
LEITH	..	Captains G. Black and C. G. Bonner, V.C., D.S.C., Leith Salvage and Towage Co., Ltd., 2, Commercial Street.
THE CLYDE	..	Captain M. Corrance, Board of Trade Surveyor's Office, 73, Robertson Street, Glasgow.
HULL	..	Captain Geo. B. Sturdy, c/o Mr. W. Hakes, Commercial Road.
SOUTHAMPTON	..	Captain D. Forbes, Nautical Academy, 1, Albion Place.
TYNE	..	Commander E. S. Macleod, R.D., R.N.R., Board of Trade Surveyor's Office, North Shields.
DUBLIN	..	{ Captain M. H. Clarke, Chief Surveyor, Ministry of Industry and Commerce, Marine Department, 27, Eden Quay.
HONG KONG	..	Lieut.-Commander C. R. H. Harvey, O.B.E., R.N., Superintendent, Admiralty Chart and Chrono- meter Depot.
VANCOUVER	..	T. S. H. Shearman, Esq., Room 40, Post Office Building.
AUSTRALIA	..	The Commonwealth Meteorologist.
The Deputy Directors of Navigation act as sub-agents as follows:—		
SYDNEY	..	Captain G. D. Williams, D.S.O., Customs House.
MELBOURNE	..	Captain L. J. Bolger, Electricity Commissioners Building, 22, William Street.
FREMANTLE	..	Captain J. J. Airey, Dalgety's Buildings.

LATE PRESS.

DERELICTS AND FLOATING WRECKAGE.

Date.	Position.		Description.
	Latitude.	Longitude.	
ARCTIC OCEAN.			
10.10.24	66°49'N.	41°19'E.	Submerged obstruction, probably a wreck.
NORTH SEA.			
3.10.24	52°47'N.	1°50'E.	Capsized vessel.
9.10.24	56°58'N.	2°06'W.	SS. <i>Matador</i> derelict.
15.10.24	57°10'N.	7°24'E.	White painted clinker built lifeboat, bottom up
21.10.24	53°30'N.	3°27'E.	Part of mast with yards 6 ft. high.
ENGLISH CHANNEL.			
5.10.24	50°46'N.	0°35'E.	Drifting gas buoy.
14.10.24	50°42'N.	0°26'E.	Submerged object.
17.10.24	50°01'N.	1°38'W.	Wooden mooring buoy, about 10 ft. long, with chains attached.
18.10.24	48°46'N.	5°59'W.	Trunk conical buoy, about 6 ft. above water; dan- gerous to navigation.
21.10.24	51°09'N.	1°31'E.	Spar projecting about 6 ft. above water.
23.10.24	8½ miles N.W. by W. from Portland Bill Light House.		Black and white vertical striped buoy, No. 6 painted on side; dangerous to navigation.
BRISTOL CHANNEL.			
4.10.24	S. 78° W. (true) 8 miles from Nash Point.		Spar, painted red, projecting about 5 ft. out of water.
IRISH CHANNEL.			
2.10.24	52°50'N.	4°57'W.	Wreckage like iron mast, 4 ft. out of water.
NORTH ATLANTIC.			
1.10.24	35°33'N.	74°33'W.	Red and white spar, projecting about 6 ft. out of water.
1.10.24	33°48'N.	78°21'W.	Nun buoy.
3.10.24	37°43'N.	75°08'W.	Waterlogged scow, about 50 ft. long, decks showing about 8 inches out of water.
3.10.24	40°26'N.	74°49'W.	Wreckage.
4.10.24	50°53'N.	5°47'W.	Heavy piece of floating timber, about 20 ft. square, covered with marine growth; dangerous to navi- gation.
4.10.24	33°11'N.	77°58'W.	Wooden capsized lifeboat.
5.10.24	50°06'N.	6°19'W.	Red buoy, No. Three F, staff and a ball, with blue flag with a white ball.
6.10.24	38°40'N.	67°56'W.	Capsized ship's lifeboat painted white, first letter of name H, boat apparently in good condition.
6.10.24	33°08'N.	78°19'W.	Three pieces of timber, 12 inches square and 25 feet long.
6.10.24	37°30'N.	31°38'W.	Gas buoy.
7.10.24	53°50'N.	25°39'W.	Large red conical buoy, with staff and blue flag attached.
7.10.24	40°50'N.	68°41'W.	Derelict, with broken mast projecting 10 ft. out of water, also smaller spars floating close by.
8.10.24	35°18'N.	14°49'W.	Large red can buoy, covered with marine growth. Buoy was floating with top well out of water, and apparently a chain was attached.
8.10.24	100 miles S.W. of Ushant.		Large derelict steel barge.
9.10.24	38°10'N.	66°39'W.	Capsized lifeboat painted white.
11.10.24	48°55'N.	15°25'W.	Large spar buoy, painted black, projecting 20 ft. above water.
12.10.24	1°—'N.	30°—'W.	Submerged object, probably wooden wreck.
13.10.24	46°31'N.	6°51'W.	Sunken log; dangerous to navigation.
13.10.24	48°18'N.	30°54'W.	Portion of a schooner, bottom up, about 60 ft. long; dangerous to navigation.
14.10.24	37°00'N.	70°00'W.	American schooner <i>Alcaeus Hooper</i> .
14.10.24	28°05'N.	13°07'W.	Dangerous derelict (? <i>Governor Parr</i>).
16.10.24	40°50'N.	10°14'W.	Large rusty iron can buoy marked BA 75 W.
17.10.24	3 miles South of Bull Rock.		Submerged wreck, with stump of mast showing.
22.10.24	48°03'N.	16°10'W.	Large steel frame light buoy adrift, painted red, marine growth on cylinder, marked PF2A, light extinguished; dangerous to navigation.
23.10.24	49°45'N.	8°10'W.	Large spherical buoy adrift; dangerous to naviga- tion.
23.10.24	49°48'N.	8°19'W.	Large buoy painted red with letters TEL and a white cross visible.
24.10.24	49°42'N.	7°57'W.	Large conical buoy, painted red with white cross and two eye-plates for shackles.
GULF OF MEXICO.			
19.10.24	16°—'N.	86°—'W.	American motor vessel <i>James Timpson</i> , abandoned.
NORTH PACIFIC.			
2.10.24	8°40'N.	79°32'W.	Large tree trunk, about 25 ft. long partly submerged, with roots projecting about 3 ft. out of water.
2.10.24	51°30'N.	150°33'W.	Log, about 40 ft. long and two ft. in diameter, partly submerged.
4.10.24	26°56'N.	148°11'W.	Broken mast, projecting 10 ft. out of water and apparently attached to submerged wreckage.
5.10.24	42°37'N.	124°45'W.	Large log.

LIST OF VOLUNTARY OBSERVING SHIPS.

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.

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 17.10.24.	Date Received.
<i>Aba</i> ...	Hughes, J. ...	G. P. Williams ...	No.	Elder Dempster ...	Form 911 21.8.24 to 27.9.24 ...	2.10.24.
<i>Abinsi</i> ...	Wright, J. B. ...	R. Redmore ...	"	Elder Dempster ...	" 1.10.24 to 12.10.24 ...	16.10.24.
<i>Acton</i> ...	Haylett, E. ...	W. Rennie ...	"	Harrison ...	" 22.8.24 to 6.9.24 ...	7.10.24.
<i>Adda</i> ...	Toft, J. T. ...	J. E. Wood, E. H. Gatward ...	"	Elder Dempster ...	" 12.6.24 to 18.7.24 ...	21.7.24.
50 <i>Adriatic</i> ...	Beadnell, F. E., Commr., R.N.R.	J. Collins, R. Hawkins, J. Farrell, A. C. Jansen.	W.T.	White Star ...	W.T.Reg. 15.9.24 to 4.10.24 ...	11.10.24.
<i>Agapenor</i> ...	Ramsay, J. ...	J. P. Makepeace ...	No.	A. Holt ...	" 14.9.24 to 5.10.24 ...	7.10.24.
<i>Alban</i> ...	Torrible, R. H. ...	R. Griffiths ...	"	Booth ...	" 31.8.24 to 10.9.24 ...	23.9.24.
<i>Albania</i> ...	Irving, R. B. ...	C. B. Osborne ...	"	Cunard ...	" 12.7.24 to 2.10.24 ...	16.10.24.
<i>Algerian Prince</i> ...	Rowlands, D. ...	G. Potts ...	"	Prince ...	" 3.8.24 to 1.9.24 ...	4.9.24.
<i>Alipore</i> ...	Gordon, L. M., R.D., Commr., R.N.R.	H. D. Case ...	"	P. and O. ...	" 30.9.24 to 12.10.24 ...	16.10.24.
<i>Almanzora</i> ...	Mackenzie G. A. ...	A. P. Portsmouth, E. B. Ingram.	"	R.M.S.P. ...	" 8.8.24 to 22.9.24 ...	24.9.24.
<i>Alondra</i> ...	J. Prendergast ...	H. Peters ...	"	Yeoward ...	" 7.9.24 to 28.9.24 ...	2.10.24.
<i>Ampetco</i> ...	Verschelen, A. ...	E. Suret ...	"	American Petroleum ...	" 26.5.24 to 27.7.24 ...	6.8.24.
<i>Anglia</i> ...	Sorge, P. ...	W. H. Hughes ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report 11.4.24 ...	11.4.24.
<i>Antiochus</i> ...	Ireland, T. ...	A. C. D. Howes ...	No.	A. Holt ...	Form 911 14.7.24 to 5.8.24 ...	16.9.24.
<i>Appam</i> ...	Yardley, H. A. ...	... ..	M.L.	Elder Dempster ...	Met. Log. 23.1.24 to 22.6.24 ...	8.7.24.
30 <i>Aquitania</i> ...	Charles, Sir J. T., W. K.B.E., C.B., R.D., Commodore, R.N.R.	J. L. Croasdaile, P. O. Davis, J. Locke.	W.T.	Cunard ...	W.T. Reg. 7.9.24 to 22.9.24 ...	25.9.24.
<i>Arafura</i> ...	Gordon, A. S. ...	H. Jeans ...	No.	Eastern and Australian R.M.S.P. ...	Form 911 9.2.24 to 1.5.24 ...	30.6.24.
<i>Arana</i> ...	Moir, A. G. ...	R. Jones ...	"	Union Castle ...	" 5.9.24 to 21.9.24 ...	23.9.24.
<i>Armada Castle</i> ...	George, J., O.B.E.	L. G. May ...	"	P. Henderson ...	Met. Log. 17.5.24 to 7.9.24 ...	1.10.24.
<i>Aracan</i> ...	Willis, M. ...	H. Poole, D. Frame, J. Aitken	M.L.	Southern Rly. ...	Telegraphic Report 6.10.24 ...	6.10.24.
<i>Arundel</i> ...	Short, H. ...	Mr. Hill ...	C.C.	Union Castle ...	Met. Log. 2.5.24 to 31.8.24 ...	6.9.24.
<i>Arundel Castle</i> ...	Hague, J. W., Commr., R.N.R.	Williams, F. Granger.	M.L.	Anchor ...	Form 911 16.8.24 to 7.10.24 ...	16.10.24.
<i>Assyria</i> ...	Erskine, K. ...	J. Hamilton ...	No.	Harrison ...	Met. Log. 20.3.24 to 10.6.24 ...	19.6.24.
<i>Astronomer</i> ...	Booth, W. M. ...	E. S. Machon, W. Weatherall, J. Jackson.	M.L.	White Star ...	Form 911 5.7.24 to 15.8.24 ...	16.8.24.
<i>Athenic</i> ...	Jones, J. L. ...	W. Hill ...	No.	Nippon Yusen Kaisha	" 3.8.24 to 1.9.24 ...	7.10.24.
<i>Atsuta Maru</i> ...	Saito, B. ...	S. Mizoguchi ...	"	Harrison ...	" 25.7.24 to 27.8.24 ...	16.10.24.
<i>Auditor</i> ...	Owen, W. F. ...	J. Harnden ...	"	Glen & Co. ...	Form 911 9.7.24 to 26.7.24 ...	1.8.24.
<i>Auldmuir</i> ...	Ramsay, J. D. ...	P. D. Thompson ...	"	Cunard ...	" 23.8.24 to 14.9.24 ...	26.9.24.
<i>Ausonia</i> ...	Gibbons, G., R.D., Commr., R.N.R.	A. T. Hamer ...	"			
51 <i>Baltic</i> ...	Roberts, J., C.B.E., D.S.O., R.D., Capt., R.N.R.	E. S. Bell, E. A. A. Crowley, J. Law.	W.T.	White Star ...	W.T. Reg. 4.9.24 to 20.9.24 ...	23.9.24.
<i>Bambra</i> ...	Wyles, W. S. ...	H. W. Norris, J. E. Turner, J. Eggleston, W. Walters.	M.L.	State Service, Australia	Form 911 31.8.24 to 20.9.24 ...	23.9.24.
<i>Bampton Castle</i> ...	Buckeridge, G. ...	F. Norfolk, L. C. Chapman, H. A. Deller, E. Crocker, C. B. Hoggan.	"	Union Castle ...	" 21.2.23 to 3.5.23 ...	28.1.24.
<i>Banbury Castle</i> ...	... ..	C. C. Page ...	No.	Turnbull Martin ...	" 2.9.23 to 9.12.23 ...	
<i>Banffshire</i> ...	Wynne, R. H. ...	L. W. Evans ...	"	Commonwealth Govt.	Form 911 23.7.24 to 13.8.24 ...	18.8.24.
<i>Barambah</i> ...	Daniel, F. ...	T. Swann ...	"	Hogarth & Sons ...	" 19.8.24 to 2.10.24 ...	16.10.24.
<i>Baron Clavador</i> ...	Baillie, T. ...	A. Campbell ...	"	His Majesty's Ship ...	Met. Log. 15.8.24 to 28.8.24 ...	16.10.24.
<i>Beaufort</i> ...	Rice, W. V., D.S.O., D.S.C., Commr., R.N.	H. M. S. Forbes ...	M.L.		" 18.3.24 to 1.7.24 ...	16.8.24.
59 <i>Belgenland</i> ...	Bradshaw, J. ...	C. J. Murray, J. M. Appleby, W. E. Hesketh.	W.T.	Red Star ...	" 21.9.23 to 21.4.24 ...	27.5.24.
<i>Benalder</i> ...	Cole, J. H., D.S.C.	W. M. Webster ...	No.	Ben Line ...	Form 911 17.9.24 to 27.9.24 ...	7.10.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 17.10.24.	Date Received.
<i>Bengloe</i> ...	McCorquodale, A. ...	G. M. Duff ...	No.	Ben Line ...	Form 911 16.8.24 to 5.9.24 ...	7.10.24.
<i>31 Berengaria</i> ...	Irvine, W. R. D., R.D. Capt., R.N.R.	G. H. Jones, R. F. Bovey, W. C. A. Robson.	W.T.	Cunard ...	W.T. Reg. 14.9.24 to 30.9.24 ...	2.10.24.
<i>Bernini</i> ...	Evans, W. ...	H. L. Rudd ...	No.	Lamport & Holt ...	Form 911 23.5.24 to 5.8.24 ...	4.9.24.
<i>Berrima</i> ...	Hussey Cooper, E. M., R.D., Commr., R.N.R.	C. C. Smith ...	"	P. & O. Branch ...	" 12.7.24 to 1.8.24 ...	25.8.24.
<i>Bolingbroke</i> ...	Stewart, A. ...	C. E. Duggan ...	M.L.	Canadian Pacific ...	Met. Log. 25.8.24 to 23.9.24 ...	2.10.24.
<i>Borda</i> ...	Holland, R. ...	" ...	No.	P. & O. Branch ...	Form 911 27.3.24 to 4.5.24 ...	11.8.24.
<i>Bothwell</i> ...	Dott, J. F. ...	S. W. Keay ...	"	Canadian Pacific ...	" 9.7.24 to 9.10.24 ...	16.10.24.
<i>Brandon</i> ...	Freer, A., R.D., Commr., R.N.R.	J. Mackenzie ...	"	" ...	" 21.10.23 to 20.11.23 ...	27.11.23.
<i>Brecon</i> ...	McDonald, J. ...	N. B. Glennie, W. W. J. Evans, W. J. P. Roberts.	M.L.	" ...	Met. Log. 20.9.23 to 6.5.24 ...	8.5.24.
<i>Brenda</i> ...	Murdoch, R. G. ...	A. M. Adams ...	No.	Scottish Fishery Board ...	Form 911 2.9.24 to 12.9.24 ...	2.10.24.
<i>Brighton</i> ...	Hill, A. ...	Mr. Munton ...	C.C.	Southern Railway ...	Telegraphic Report 17.10.24 ...	17.10.24.
<i>British Engineer</i> ...	Piper, H. C. ...	E. L. Miller ...	No.	British Tankers ...	Form 911 26.6.24 to 3.9.24 ...	5.9.24.
<i>British Lantern</i> ...	Taylor, R. J. ...	R. B. Page ...	"	" ...	" 9.7.24 to 13.8.24 ...	18.8.24.
<i>Browning</i> ...	Connorton, C. A. ...	G. F. V. Peck ...	"	Lamport & Holt ...	" 26.4.24 to 23.5.24 ...	27.5.24.
<i>Bruyere</i> ...	Heasley, W. S. ...	C. E. Legg ...	"	" ...	" 11.7.24 to 24.9.24 ...	14.10.24.
<i>Cabotia</i> ...	Lawson, P. ...	T. G. Menzies ...	No.	Anchor Donaldson ...	Form 911 3.8.24 to 3.9.24 ...	10.9.24.
<i>Cambria C.S.</i> ...	Wightman, H. G. E., D.S.C.	E. N. L. Staples ...	M.L.	Eastern Tel. Co. ...	Met. Log. 1.12.23 to 28.3.24 ...	23.4.24.
<i>Cambria</i> ...	" ...	V. S. Phillips ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report 16.10.24 ...	16.10.24.
<i>Cambria</i> ...	Scudamore, J. H. H., D. S. C., R. D., Commr., R.N.R.	D. A. Jack, R. M. Cossantine, S. Borrie.	M.L.	Elders & Fyffes ...	Met. Log. 2.3.24 to 28.6.24 ...	2.7.24.
<i>Canada</i> ...	Jones, T. ...	F. W. Laws ...	No.	White Star-Dominion ...	Form 911 6.9.24 to 27.9.24 ...	30.9.24.
<i>Canadian Inventor</i> ...	Roberts, R. P. ...	S. M. Holinden ...	"	Canadian Govt. Merchant Marine.	" 16.12.23 to 6.2.24 ...	24.3.24.
<i>Canadian Scottish</i> ...	Forson, A. ...	S. Fieldhouse ...	"	" ...	" 15.5.24 to 16.8.24 ...	16.9.24.
<i>Canadian Seigneur</i> ...	Dixon, C. C. ...	" ...	"	" ...	" ...	" ...
<i>Canadian Scirmisher</i> ...	Millar, W. H. ...	J. Moller ...	"	" ...	Form 911 17.5.24 to 19.6.24 ...	24.6.24.
<i>Canadian Winner</i> ...	Hocking, N. P. ...	R. D. Ranns ...	"	" ...	" 24.7.24 to 30.8.24 ...	18.9.24.
<i>Carlow Castle</i> ...	Harvey, H. B. ...	L. H. Stevens ...	"	Union Castle ...	" 18.6.24 to 10.7.24 ...	28.7.24.
<i>35 Carmania</i> ...	McNeil, S. G. S., R.D., Capt., R.N.R.	D. S. Kite, R. Allen, T. A. O. Ellis.	W.T.	Cunard ...	W.T. Reg. 5.9.24 to 24.9.24 ...	25.9.24.
<i>34 Caronia</i> ...	Diggle, E. G., R.D., Capt., R.N.R.	D. W. Sorrell, J. A. Quarrie, E. R. Taylor.	W.T.	Cunard ...	Form 911 4.9.24 to 24.9.24 ...	26.9.24.
<i>Cassandra</i> ...	Mitchell, W. E. ...	G. M. Sime ...	No.	Anchor Donaldson ...	Form 911 24.8.24 to 10.9.24 ...	12.9.24.
<i>52 Cedric</i> ...	Marshall, W., D.S.O., R.D., Capt., R.N.R.	A. E. Weller, J. A. Heenan, A. E. Harvey.	W.T.	White Star ...	W.T. Reg. 30.5.24 to 12.10.24 ...	16.10.24.
<i>53 Celtic</i> ...	Holme, A. ...	R. S. Walker, G. T. Kavanagh, D. W. Chamberlain.	W.T.	" ...	Form 911 22.9.24 to 11.10.24 ...	14.10.24.
<i>Ceramic</i> ...	Symons, J. ...	E. E. Bint ...	No.	" ...	W.T. Reg. 8.9.24 to 27.9.24 ...	1.10.24.
<i>Changsha</i> ...	Gambrill, F. C. ...	A. M. Frame, F. G. Stratford, H. Lishman, L. H. Baillie.	M.L.	Yull & Co. ...	Form 911 7.9.24 to 25.9.24 ...	1.10.24.
<i>Charon</i> ...	Sturrock, — ...	" ...	No.	Dalgety & Co. ...	Met. Log. 1.9.24 to 18.9.24 ...	7.10.24.
<i>Chimecto</i> ...	Green, J. ...	A. F. Walker ...	"	R.M.S.P. Co. ...	Form 911 19.1.24 to 26.2.24 ...	2.8.24.
<i>China</i> ...	King, A., D.S.C. ...	E. Cox Walker ...	"	P. & O. ...	" 9.4.24 to 20.5.24 ...	26.5.24.
<i>Chindwara</i> ...	Brisley, P. L. ...	A. G. Earl ...	"	British India ...	" 2.8.24 to 28.8.24 ...	22.9.24.
<i>Chindwin</i> ...	Esslemont, C. ...	J. Summers, W. Wilson, C. Owen.	M.L.	P. Henderson ...	Met. Log. 16.5.24 to 3.8.24 ...	12.8.24.
<i>Chinhua</i> ...	Byers, G. ...	Messrs. Shinn, Graybrook, Stringer, Taylor.	"	China Nav. Co. ...	" 22.2.24 to 3.7.24 ...	4.9.24.
<i>City of Alexandria</i> ...	Bedford, G. B. ...	T. C. Higgins ...	No.	Ellerman ...	" ...	" ...
<i>City of Baroda</i> ...	" ...	A. V. Radcliffe, R. J. Witton, A. B. Carson.	M.L.	" ...	Met. Log. 20.6.23 to 15.9.23 ...	4.10.23.
<i>City of Batavia</i> ...	Nancollas, H. E. ...	S. J. Nash ...	No.	" ...	Form 911 4.7.24 to 31.7.24 ...	18.8.24.
<i>City of Benares</i> ...	McArthur, J. ...	A. A. Fullerton ...	"	" ...	" 12.6.24 to 4.7.24 ...	18.8.24.
<i>City of Brisbane</i> ...	Pine, R. ...	W. Robinson ...	"	" ...	" 23.11.23 to 14.12.23 ...	12.2.24.
<i>City of Canterbury</i> ...	Bremner, D. M. ...	A. M. Hamilton ...	"	" ...	" 7.5.24 to 15.7.24 ...	6.8.24.
<i>City of Chester</i> ...	Teague, R. E. ...	F. C. Wilson ...	M.L.	" ...	Met. Log. 22.12.23 to 4.4.24 ...	8.4.24.
<i>City of Edinburgh</i> ...	Spencer, H. ...	E. V. Henday ...	No.	" ...	Form 911 31.8.24 to 30.9.24 ...	16.10.24.
<i>City of London</i> ...	Martin, D. ...	C. Inglis ...	"	" ...	" 17.9.24 to 28.9.24 ...	7.10.24.
<i>City of Marseilles</i> ...	Brown, G. ...	G. M. Womersley ...	"	" ...	" 23.2.24 to 12.3.24 ...	17.3.24.
<i>City of Newcastle</i> ...	Oliver, R. E., D.S.C.	C. Paton ...	"	" ...	" 26.9.23 to 22.10.23 ...	31.10.23.
<i>City of Rangoon</i> ...	Williams, T. L. ...	W. Ibbotson, S. L. Hoare, T. A. Dexter.	M.L.	" ...	Met. Log. 25.4.23 to 9.8.23 ...	16.8.23.
<i>City of Valencia</i> ...	Williamson, W. A., R.D., Lieut.- Commr. R.N.R.	C. C. Duncan ...	No.	" ...	Form 911 12.7.24 to 26.9.24 ...	16.10.24.
<i>City of Yokohama</i> ...	Jinks, J. W. ...	R. Moloney ...	"	" ...	" 21.7.24 to 7.8.24 ...	12.9.24.
<i>Clan Buchanan</i> ...	George, L. S. ...	P. G. de Gruchy ...	"	Clan ...	" 11.10.23 to 10.1.24 ...	14.1.24.
<i>Clan Lindsay</i> ...	Baker, C. W. ...	S. J. Shennan ...	"	" ...	" 17.5.24 to 27.5.24 ...	30.5.24.
<i>Clan Macbeth</i> ...	Young, A. H., R.D., Lieut.-Commr., R.N.R.	T. Lund ...	"	" ...	" 14.8.24 to 8.10.24 ...	17.10.24.
<i>Clan Macgillivray</i> ...	West, W. F. ...	P. G. de Gruchy ...	"	" ...	" 4.9.24 to 9.10.24 ...	16.10.24.
<i>Clan Macindoe</i> ...	Miller, W. ...	F. G. Darnborough ...	"	" ...	" 23.6.24 to 13.7.24 ...	11.8.24.
<i>Clan Mackellar</i> ...	T. Forreth ...	C. W. Banbury, E. N. Stewart ...	"	" ...	" 9.7.24 to 27.7.24 ...	8.9.24.
<i>Clan Mackenzie</i> ...	Young, G. ...	W. G. Arthur, J. M. Lorimer ...	"	" ...	" 10.5.24 to 10.6.24 ...	12.6.24.
<i>Clan Mackinnon</i> ...	Mackie, R. W. ...	W. S. Holden ...	M.L.	" ...	Met. Log. 9.4.24 to 8.8.24 ...	2.9.24.
<i>Clan Macnaughton</i> ...	Gray, J. N. ...	A. G. Storkey, F. Burnes ...	No.	" ...	Form 911 19.1.24 to 24.2.24 ...	26.2.24.
<i>Clan Macpheer</i> ...	Gourlay, J. B. ...	P. H. Aydon, W. D. E. Campbell, F. Buckley, — Carter.	M.L.	" ...	Met. Log. 26.1.24 to 12.6.24 ...	8.8.24.
<i>Clan Mactaggart</i> ...	Gray, J. N. ...	J. H. Malpas, W. S. Henderson ...	No.	" ...	Form 911 23.5.24 to 21.6.24 ...	28.7.24.
<i>Clan Macvicar</i> ...	Phillips, G. P. ...	L. S. Murrin ...	"	" ...	" 17.8.24 to 17.9.24 ...	16.10.24.
<i>Clan Malcolm</i> ...	Higgins, C. J. ...	T. G. Young, R. F. Buckley ...	M.L.	" ...	Met. Log. 4.5.24 to 7.9.24 ...	22.9.24.
<i>Clan Morrison</i> ...	Porterfield, W. M. ...	D. A. Evans ...	No.	" ...	Form 911 6.7.24 to 26.7.24 ...	1.9.24.
<i>Clan Murdoch</i> ...	Pagan, J. C. ...	C. E. Abbey, C. W. Thomas ...	"	" ...	" 27.8.24 to 14.9.24 ...	16.10.24.
<i>Clan Ronald</i> ...	Openshaw, L. G. ...	W. H. D. Stephen ...	"	" ...	" 17.8.24 to 13.9.24 ...	7.10.24.
<i>Clan Ross</i> ...	Christian, W. G. M. ...	S. M. Werrey Easterbrook ...	"	" ...	" 3.8.23 to 8.10.23 ...	19.10.23.
<i>Clan Stclair</i> ...	Neill, G. A. ...	F. B. Parker ...	"	" ...	" 20.8.24 to 17.9.24 ...	22.9.24.
<i>Clan Stuart</i> ...	Stenson, F. J. R. D., Commr. R.N.R.	R. P. Jackson ...	"	" ...	" 10.7.24 to 6.8.24 ...	11.8.24.
<i>Clan Urquhart</i> ...	Gibb, A. F. W. ...	R. H. Law ...	"	" ...	" 28.6.24 to 2.10.24 ...	3.10.24.
<i>Colonia, C.S.</i> ...	Campos, V., O.B.E., Lt.-Commr. R.N.R.	S. A. Garnham, A. S. Muir, J. M. Matthews, F. Bolinbroke.	M.L.	Telegraph Construction & Maintenance.	Met. Log. 12.2.24 to 27.9.24 ...	30.9.24.

LIST OF VOLUNTARY OBSERVING SHIPS

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 17.10.24.	Date Received.
<i>Colonial</i> ...	Barrow, R. K. ...	A. V. Jones ...	No.	Harrison ...	Form 911 7.5.24 to 23.7.24 ...	29.7.24.
<i>Colombian</i> ...	Gittins, R. P. ...	J. Crangle ...	"	Leyland ...	" 22.8.24 to 16.9.24 ...	24.9.24.
<i>Columbia</i> ...	Gemmell, W. ...	S. G. Taylor ...	"	Anchor ...	" 22.8.24 to 20.9.24 ...	30.9.24.
<i>Comino</i> ...	Nuttall, E. L. ...	A. McVicar ...	"	Furness Withy ...	" 7.3.24 to 13.4.24 ...	5.5.24.
<i>Coocoe</i> ...	Festa, M. ...	C. Keen ...	"	Commonwealth Govt. ...	" 9.8.24 to 29.8.24 ...	7.10.24.
<i>Corinthian</i> ...	Hart, F. ...	... ..	M.L.	White Star ...	Met. Log. 13.6.24 to 3.10.24 ...	7.10.24.
<i>Cornish City</i> ...	Bowen, T. S. ...	G. S. Dawes ...	No.	Reardon Smith ...	Form 911 8.1.24 to 16.2.24 ...	7.4.24.
<i>Cornwall</i> ...	Robertson, H. W. ...	W. W. Glover ...	"	Dowie, J. & Co. ...	" 25.5.24 to 30.6.24 ...	7.8.24.
<i>Crawford Castle</i> ...	Sinclair, G. ...	J. C. Brown ...	"	Union Castle ...	" 9.5.24 to 11.8.24 ...	15.8.24.
<i>Culebra</i> ...	Mackay, A. S. ...	... ..	M.L.	R.M.S.P. Co. ...	... ..	... ..
<i>Cuthbert</i> ...	Reynolds, W. H. B. ...	A. B. Fasting, K. S. Munro ...	No.	Booth ...	Form 911 22.5.24 to 5.8.24 ...	23.8.24.
<i>Cyclops</i> ...	Cosker, W. ...	R. W. Ellis ...	"	A. Holt ...	" 25.8.24 to 14.9.24 ...	2.10.24.
<i>Dardanus</i> ...	Shaw, A. T. ...	... ..	No.	A. Holt ...	" 21.8.24 to 5.9.24 ...	7.10.24.
<i>Darian</i> ...	Masters, W. ...	A. S. Holland ...	"	Leyland ...	" 10.8.24 to 21.8.24 ...	1.9.24.
<i>Darro</i> ...	Smith, W. E., D.S.O., R.D., Capt., R.N.R. ...	H. D. Jackman ...	"	R.M.S.P. Co. ...	" 12.7.24 to 6.9.24 ...	10.9.24.
<i>Daytonian</i> ...	Walker, C. J., D.S.C. ...	W. T. Godwin ...	"	Leyland ...	" 15.8.24 to 25.8.24 ...	10.9.24.
<i>Delta</i> ...	Brooks, C., D.S.O., R.D., Commr., R.N.R. ...	J. O. V. Young ...	"	P. & O. ...	" 28.6.24 to 8.8.24 ...	13.8.24.
<i>Demerara</i> ...	Hill, T. A. ...	A. Hamby ...	"	R.M.S.P. Co. ...	" 20.5.24 to 12.7.24 ...	14.7.24.
<i>Demosthenes</i> ...	Williams, W. J. ...	R. A. Alcock ...	"	Aberdeen ...	" 2.7.24 to 21.8.24 ...	2.9.24.
<i>Deseado</i> ...	Wakeman, E. C. ...	W. Scott, D. L. Neilson ...	"	R.M.S.P. Co. ...	" 29.6.24 to 24.8.24 ...	28.8.24.
<i>Desna</i> ...	Adam, C., R.D., Commr., R.N.R. ...	A. A. Martin ...	"	" ...	" 12.8.24 to 3.10.24 ...	7.10.24.
<i>Deucalion</i> ...	Findlay, J. ...	P. W. Savery, O. Thomas ...	"	A. Holt ...	" 17.9.24 to 5.10.24 ...	16.10.24.
<i>Dexon</i> ...	Gardner, H. W. ...	A. Bell ...	"	New Zealand S.S. Co. ...	" 20.12.23 to 11.5.24 ...	4.6.24.
<i>Dieppe</i> ...	Marmery, S. ...	Mr. Parsons ...	C.C.	Southern Railway ...	Telegraphic Report. 16.10.24 ...	16.10.24.
<i>Digby</i> ...	Chambers, F. W., D.S.C. ...	J. Pascoe, J. W. Murphy, W. P. Paterson. ...	M.L.	Furness Withy ...	Met. Log. 2.10.23 to 8.4.24 ...	22.4.24.
<i>Dimboola</i> ...	Roy, C. M. ...	G. N. Baker ...	No.	Melbourne S.S. Co. ...	Form 911 2.8.24 to 9.8.24 ...	22.9.24.
<i>Discoverer</i> ...	King, J. T. ...	J. Stanhope ...	"	Harrison ...	" 8.1.24 to 8.4.24 ...	14.4.24.
<i>Dogra</i> ...	Hartcock, L. ...	E. C. Akers ...	"	Asiatic S.N. Co. ...	" 26.6.24 to 10.7.24 ...	5.8.24.
<i>Domala, M.V.</i> ...	Whittingham, W. E., O.B.E., R.D., Commr. R.N.R. ...	C. E. Merchant ...	"	British India ...	" 12.1.24 to 6.2.24 ...	18.3.24.
<i>Doric</i> ...	Davies, J. ...	A. Thompson ...	"	White Star ...	" 13.9.24 to 3.10.24 ...	7.10.24.
<i>Doric Star</i> ...	Thomas, R. T. ...	A. S. Menzies ...	"	Blue Star ...	" 17.9.24 to 28.9.24 ...	7.10.24.
<i>Dorington Court</i> ...	Isaacs, W. A. ...	E. V. Quickenden ...	"	Haldin & Co. ...	" 17.8.24 to 8.9.24 ...	18.9.24.
<i>Dorsel</i> ...	Kettlewell, C. R. ...	H. S. White, H. Neagle, J. S. Bloomfield, L. Cann. ...	M.L.	New Zealand S.S. Co. ...	Met. Log. 3.4.24 to 6.10.24 ...	10.10.24.
<i>Dromore Castle</i> ...	Linklater, H. ...	S. S. Smith ...	No.	Union Castle ...	Form 911 20.3.24 to 9.4.24 ...	6.5.24.
<i>Dryden</i> ...	Knight, R. A. ...	G. D. Oldfield ...	"	Lamport & Holt ...	" 14.8.24 to 3.9.24 ...	12.9.24.
<i>Dundrum Castle</i> ...	Mumford, C. E. ...	H. Bunn ...	"	Union Castle ...	... ..	... ..
<i>Duendes</i> ...	Pape, E. R. ...	... ..	"	Pacific S.N. Co. ...	Form 911 20.7.24 to 13.8.24 ...	22.8.24.
<i>Duffield</i> ...	... ..	T. S. Robertson ...	"	Hunting & Sons ...	... ..	... ..
<i>Duquesa</i> ...	Fyffe, F. M. ...	C. P. Lane ...	"	Furness Withy ...	Form 911 10.8.24 to 7.10.24 ...	16.10.24.
<i>Durenda</i> ...	Wilson, W. ...	W. H. Creese ...	"	British India ...	" 27.4.24 to 21.5.24 ...	7.8.24.
<i>Eastern</i> ...	Smith, G. L. ...	H. Murray, G. Munro, E. S. Birrell. ...	M.L.	Eastern and Australian ...	Met. Log. 27.8.23 to 3.5.24 ...	2.8.24.
<i>Ebani</i> ...	Faill, — ...	W. McKeown ...	No.	Elder Dempster ...	... ..	... ..
<i>Edinburgh Castle</i> ...	Strong, H., R.D., Commr., R.N.R. ...	... ..	M.L.	Union Castle ...	Met. Log. 30.11.23 to 24.3.24 ...	14.4.24.
<i>Eemland</i> ...	Van Noppen, C. D. ...	T. Doornbosch ...	No.	Holland Lloyd ...	Form 911 1.7.24 to 1.8.24 ...	18.8.24.
<i>Egori</i> ...	McDowall, J. ...	K. Redmore ...	"	Elder Dempster ...	" 25.11.23 to 10.12.23 ...	12.12.23.
<i>El Cordobes</i> ...	Noton, F. G. ...	N. H. Oldham ...	"	British & Argentine S.N. Co. ...	" 6.6.24 to 4.7.24 ...	8.7.24.
<i>Elmina</i> ...	Millson, H. E. ...	W. McKeown, J. H. Hall, C. H. Turner. ...	M.L.	Elder Dempster ...	Met. Log. 1.3.24 to 30.8.24 ...	8.9.24.
<i>El Paraguay</i> ...	Ellis, F., D.S.C. ...	W. E. Williams ...	No.	Houlder Bros. ...	Form 911 8.6.24 to 31.7.24 ...	6.8.24.
<i>Elpenor</i> ...	Holden, W. R. F. ...	P. E. Wright, C. Mock ...	M.L.	A. Holt ...	Met. Log. 26.5.24 to 12.9.24 ...	17.9.24.
<i>Elysia</i> ...	Kinnaird, J. ...	A. Grant ...	No.	Anchor ...	Form 911 16.2.24 to 8.3.24 ...	1.4.24.
<i>Empress of Asia</i> ...	Douglas, L. D., R.D., Lt. - Commr., R.N.R. ...	... ..	M.L.	Canadian Pacific ...	Met. Log. 5.6.24 to 14.9.24 ...	14.10.24.
<i>Empress of Australia</i> ...	Robinson, S., C.B.E., R.D., Commr., R.N.R. ...	... ..	M.L.	" ...	" 1.6.23 to 9.3.24 ...	7.4.24.
<i>Empress of Canada</i> ...	Hopcraft, D. ...	... ..	"	" ...	... ..	... ..
<i>Empress of France</i> ...	Robinson, S., C.B.E., R.D., Commr., R.N.R. ...	W. S. Halliday ...	M.L.	" ...	Met. Log. 4.1.24 to 22.5.24 ...	7.7.24.
<i>Empress of Russia</i> ...	Griffiths, E. ...	R. V. Everett, A. S. Phillips, B. Grant. ...	M.L.	" ...	" 13.6.23 to 17.11.23 ...	21.11.23.
<i>Empress of Scotland</i> ...	Hosken, A. J. ...	A. M. Barff, J. P. Napier, C. S. Morris. R. H. Graham. ...	M.L.	" ...	" 1.5.24 to 18.8.24 ...	18.9.24.
<i>Endeavour</i> ...	Gillies, J., C.B.E. ...	... ..	M.L.	His Majesty's Ship ...	Met. Log. 23.10.23 to 19.2.24 ...	14.6.24.
<i>Essequibo</i> ...	Nares, J. D., D.S.O., Capt., R.N. ...	H. Exton Turner ...	M.L.	... ..	... ..	... ..
<i>Eumaeus</i> ...	Duncan, E. E. ...	G. Pattison ...	No.	R.M.S.P. Co. ...	Form 911 20.8.24 to 1.9.24 ...	16.9.24.
<i>Euripides</i> ...	Power, J. ...	E. R. Pritchard ...	"	A. Holt ...	" 5.8.24 to 21.8.24 ...	22.9.24.
<i>Eurybates</i> ...	Collins, P. J., O.B.E. ...	H. S. Cox, A. R. Payne, A. K. Cameron. ...	M.L.	Aberdeen ...	Met. Log. 23.5.24 to 11.9.24 ...	18.9.24.
<i>Explorer</i> ...	Lloyd, R. ...	J. A. Havard ...	No.	A. Holt ...	Form 911 16.8.24 to 13.10.24 ...	16.10.24.
<i>Fitzroy</i> ...	Lamont, A. ...	Scientific Staff ...	M.L.	Scottish Fishery Board ...	Met. Log. 23.2.24 to 5.6.24 ...	23.6.24.
<i>Flandria</i> ...	Woodhouse, A. F. B., Lt.-Commr., R.N. ...	C. W. Sabine, H. P. L. Tennent ...	M.L.	His Majesty's Ship ...	" 26.3.24 to 23.7.24 ...	6.8.24.
<i>Flinders</i> ...	Silk, H. V., Lt.-Commr., R.N. ...	... ..	"	... ..	... ..	... ..
<i>Francisco</i> ...	Veldkamp, G. J. ...	W. G. Ton ...	No.	Holland Lloyd ...	Form 911 16.5.24 to 29.6.24 ...	7.7.24.
<i>Francol</i> ...	Henderson, D. A., Lt.-Commr., R.N. ...	A. B. Foulston, K. F. Boxall ...	M.L.	His Majesty's Ship ...	Met. Log. 28.3.24 to 25.7.24 ...	7.8.24.
<i>Frankensfels</i> ...	Wilkins, J., O.B.E. ...	F. D. Shaw ...	No.	Ellerman Wilson ...	Form 911 30.7.24 to 16.9.24 ...	11.9.24.
<i>Freienfels</i> ...	Gathey, E. ...	H. J. Prout ...	"	Royal Fleet Auxiliary ...	" 20.6.23 to 15.9.23 ...	27.11.23.
<i>Freya</i> ...	Cartmer, G. E., O.B.E. ...	L. M. Burfitt, J. H. A. Mackie, J. Garmory. ...	M.L.	India Office Shipping ...	Met. Log. 12.6.24 to 17.9.24 ...	14.10.24.
<i>Freya</i> ...	Cleugh, J. W. ...	C. F. Bennett, H. Wilson, R. Soper. ...	"	" ...	" 8.4.24 to 8.7.24 ...	13.8.24.
<i>Freya</i> ...	Angus, W. ...	J. Murray ...	No.	Scottish Fishery Board ...	Form 911 4.9.24 to 26.9.24 ...	2.10.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log Register, or Report Contributed. Received up to 17.10.24.	Date Received.
<i>Gallie</i> ...	Summers, F. F., R.D., Commr. R.N.R.	W. G. O. Jones ...	No.	White Star ...	Met. Log. 11.4.24 to 24.5.24 ...	27.5.24.
<i>Galthmore</i> ...	Ledsome, J. S. ...	N. Goubrough ...	"	Furness Withy ...	Form 911 28.9.24 to 9.10.24 ...	16.10.24.
<i>Garret</i> ...	Visser, C. W. ...	S. de Boo ...	"	Rotterdam Lloyd ...	" 18.7.24 to 29.8.24 ...	8.9.24.
<i>Gascoyne</i> ...	Mills, A. ...	P. G. Collins ...	"	Dalgaty & Co. ...	" 9.6.24 to 9.8.24 ...	22.9.24.
<i>Gelria</i> ...	Kolkman, J. M. ...	" ...	"	Holland Lloyd ...	" 10.7.24 to 5.9.24 ...	8.9.24.
<i>Gladiator</i> ...	Ruffell, ...	D. H. Bryant, W. E. Shotton ...	"	Harrison ...	" 7.1.24 to 8.3.24 ...	12.3.24.
<i>Glenamoy, M.V.</i> ...	Angier, J. ...	L. C. Riggs ...	"	Glen Line ...	" 15.4.24 to 11.5.24 ...	18.8.24.
<i>Glenapp, M.V.</i> ...	Ingram, T. T. ...	F. Poate ...	"	" ...	" 4.7.24 to 21.7.24 ...	31.7.24.
<i>Glenluce, M.V.</i> ...	Barkley, E. ...	J. D. Richards ...	"	" ...	" 28.7.24 to 4.8.24 ...	9.9.24.
<i>Glenshane</i> ...	Roberts, W. E. ...	" ...	"	" ...	" 10.2.24 to 21.6.24 ...	16.9.24.
<i>Gloucestershire</i> ...	Robin, E. ...	T. E. Field ...	"	Bibby ...	" 21.6.24 to 31.8.24 ...	2.9.24.
<i>Gorgon</i> ...	Hughes, J. W. ...	W. E. Crompton ...	"	Dalgaty & Co. ...	" 13.7.24 to 27.7.24 ...	8.9.24.
<i>Gourko</i> ...	Montgomery, H. ...	" ...	M.L.	Ellerman Wilson ...	" ...	"
<i>Haliartus</i> ...	Marsh, L. V. ...	W. H. Upton ...	No.	R. P. Houston ...	Form 911 16.8.23 to 3.10.23 ...	20.11.23.
<i>Harmonides</i> ...	Hughes, W. J. ...	R. P. Davies ...	"	" ...	" 18.6.24 to 17.7.24 ...	21.7.24.
<i>Harmony, Auxy.</i> ...	Jackson, J. C. ...	A. W. Bush ...	"	Moravian Mission ...	" 9.7.24 to 8.9.24 ...	26.9.24.
<i>Hatarana</i> ...	Mardon, T. T. ...	J. L. Durkee, F. Wells, E. B. Heath, E. C. McGuinness.	M.L.	British India ...	" 12.9.23 to 26.3.24 ...	22.4.24.
<i>Hawaki, M.V.</i> ...	Woodget, H. T. ...	" ...	"	" ...	" ...	"
<i>Henry Holmes, C.S.</i> ...	Showman, A. C. ...	D. McLeish ...	No.	Union S.S. Co., N.Z. ...	" 27.10.23 to 4.1.24 ...	11.2.24.
	Geeve, G. E. ...	E. Hislop Tucker ...	"	W. I. & Panama Telegraph Co. ...	" 1.8.24 to 21.8.24 ...	22.9.24.
<i>Herald</i> ...	Harvey, J. R., Commr. R.N.	W. C. Jenks ...	M.L.	His Majesty's Ship ...	Met. Log. 7.2.24 to 5.6.24 ...	11.8.24.
<i>Herefordshire</i> ...	Stanley, W. ...	P. Flood, G. Whitworth, P. S. Cooper, S. M. Burton, G. Holdsworth.	"	Bibby ...	" 1.3.24 to 19.8.24 ...	8.9.24.
<i>Herschel</i> ...	Carey, W. J. ...	S. C. Smith ...	No.	Lampert & Holt ...	Form 911 24.5.24 to 29.7.24 ...	4.8.24.
<i>Hibernia</i> ...	Tanner ...	R. Woodall ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report. 13.10.24 ...	13.10.24.
<i>Highland Enterprise</i> ...	Pond, R. H. ...	D. R. S. Webster ...	No.	Nelson ...	Form 911 29.3.24 to 12.6.24 ...	8.7.24.
<i>Glen</i> ...	Jones, T. J. ...	H. H. Thomas ...	"	" ...	" 6.4.24 to 26.4.24 ...	20.5.24.
<i>Heather</i> ...	Powell, G. A. ...	G. Watson, R. Sinclair Davies, J. C. Morton.	M.L.	" ...	Met. Log. 23.12.22 to 22.3.23 ...	28.3.23.
<i>Laddie</i> ...	Alford, C. ...	G. L. Goodman ...	No.	" ...	Form 911 17.3.24 to 6.4.24 ...	6.6.24.
<i>Piper</i> ...	Collings, D. ...	A. S. Jones, J. S. Collins, J. H. Cables.	M.L.	" ...	Met. Log. 4.2.24 to 23.6.24 ...	2.7.24.
<i>Pride</i> ...	Robinson, R. H. ...	H. McKinnon, F. Falconer, R. R. Soanes.	"	" ...	" 15.4.24 to 31.8.24 ...	17.9.24.
<i>Rover</i> ...	Ashby Graves, F. ...	F. W. Harvey, H. Thomas, F. Abbott.	"	" ...	" 31.7.24 to 29.9.24 ...	6.10.24.
<i>Warrior</i> ...	Brooke, W. ...	W. T. Breen ...	No.	" ...	Form 911 20.5.24 to 23.7.24 ...	12.9.24.
<i>Hildebrand</i> ...	Maddrell, J. ...	R. S. H. Goodier ...	"	Booth ...	" 15.7.24 to 28.8.24 ...	2.9.24.
<i>Hobsons Bay</i> ...	Kydd, O. J. ...	J. E. Williams, E. Bailie, O. J. Edwards.	M.L.	Commonwealth Govt. ...	Met. Log. 25.3.24 to 5.7.24 ...	14.7.24.
<i>Holbein</i> ...	Gough, W. A. ...	G. P. Kitto ...	No.	Lampert & Holt ...	Form 911 20.5.24 to 29.8.24 ...	8.9.24.
<i>54 Homeric</i> ...	Metcalfe, G. R., Lt.- Commr. R.N.R.	H. Clark, H. Yates, A. Griffiths.	W.T.	White Star ...	W.T. Reg. 11.9.24 to 25.9.24 ...	30.9.24.
<i>Honorius</i> ...	Samuels, C. ...	J. E. Martin, W. G. Iddes ...	No.	R. P. Houston ...	Form 911 1.8.24 to 31.8.24 ...	16.9.24.
<i>Huanachaco</i> ...	Redyard, A. ...	A. G. Litherland ...	"	Pacific S.N. Co. ...	" 15.7.24 to 5.8.24 ...	15.8.24.
<i>Hubert</i> ...	Evans, T. G. ...	C. C. Beal ...	"	Booth ...	" 23.6.24 to 11.7.24 ...	22.7.24.
<i>Hurunui</i> ...	Burton Davies, J. ...	Mr. Oxnard, J. Carpenter, Mr. Newington.	M.L.	New Zealand S.S. Co. ...	Met. Log. 31.8.23 to 8.3.24 ...	15.3.24.
<i>Ibez</i> ...	Langdon, C. ...	" ...	C.C.	G.W. Railway ...	Telegraphic Report. 29.9.24 ...	29.9.24.
<i>Icala</i> ...	Meetham, J. T. ...	E. Lightfoot ...	No.	J. H. Welsford & Co. ...	Form 911 18.8.24 to 24.8.24 ...	22.9.24.
<i>Intaba</i> ...	Gibbings, W. A. ...	T. B. Littlechild ...	"	Harrison ...	" 3.6.24 to 17.6.24 ...	23.6.24.
<i>Intombi</i> ...	Worthington, B. ...	J. Richardson ...	"	" ...	" 22.2.24 to 23.3.24 ...	26.3.24.
<i>Ionic Star</i> ...	Wilson, G. ...	J. Sinclair ...	"	Blue Star ...	" 29.1.24 to 26.3.24 ...	29.3.24.
<i>Iroquois</i> ...	Tinson, C. W., O.B.E., Commr. R.N.	G. A. Gould ...	M.L.	His Majesty's Ship ...	Met. Log. 17.3.24 to 14.7.24 ...	26.8.24.
<i>Izion</i> ...	Baetens, F. ...	A. K. Sanderson ...	No.	A. Holt ...	Form 911 22.8.24 to 13.10.24 ...	17.10.24.
<i>John Pender, C.S.</i> ...	Gibson, L., M.B.E.	B. C. Farrow ...	No.	Eastern Tel. Co. ...	" 25.5.24 to 6.7.24 ...	15.7.24.
<i>Junin</i> ...	Benson, C. W. ...	R. D. Eckford ...	"	Pacific S.N. Co. ...	" 19.6.24 to 7.10.24 ...	14.10.24.
<i>Kaikoura</i> ...	Downton, M. ...	L. H. Whitfield, N. Anderson, J. Hopkins.	M.L.	New Zealand S.S. Co. ...	Met. Log. 17.9.23 to 31.3.24 ...	19.5.24.
<i>Kaisar-i-Hind</i> ...	Manley, G. ...	F. D. Forbes ...	No.	P. & O. ...	Form 911 19.7.24 to 12.8.24 ...	8.9.24.
<i>Kamo Maru</i> ...	Okano, Y. ...	F. Takaku ...	"	Nippon Yusen Kaisha ...	" 6.7.24 to 4.8.24 ...	17.9.24.
<i>Kangaroo</i> ...	Norris, H. C. ...	C. M. C. Clayton, R. J. Sinclair F. Humble.	M.L.	State Service Australia ...	Met. Log. 26.2.24 to 14.8.24 ...	17.10.24.
<i>Karoo</i> ...	Robinson, T. ...	H. J. Perrett ...	No.	Ellerman Bucknall ...	Form 911 2.6.24 to 16.6.24 ...	25.6.24.
<i>Kashima Maru</i> ...	Shinomiyama, T. ...	M. Takada ...	"	Nippon Yusen Kaisha ...	" 2.1.24 to 9.2.24 ...	14.3.24.
<i>Kashmir</i> ...	Stringer, R. H., O.B.E., R.D., Commr. R.N.R.	F. Hopkins ...	"	P. & O. ...	" 2.8.24 to 22.8.24 ...	16.9.24.
<i>Kellett</i> ...	Haselfoot, F. E. B., D.S.O., Commr., R.N.	E. H. B. Baker ...	M.L.	His Majesty's Ship ...	Met. Log. 1.4.24 to 29.7.24 ...	22.8.24.
<i>Kenilworth Castle</i> ...	Millard, L. A. ...	A. E. Denn, W. M. Tomkins ...	M.L.	Union Castle ...	" 28.12.23 to 28.4.24 ...	8.5.24.
<i>Khiva</i> ...	Redhead, C. M., D.S.O., R.D., Capt., R.N.R.	L. Fraser, A. L. Hill, R. G. Freeman.	M.L.	P. & O. ...	" 28.3.24 to 6.7.24 ...	10.7.24.
<i>Klyber</i> ...	Pinckney, L. D., O.B.E.	N. B. S. Hewett ...	No.	" ...	Form 911 6.4.24 to 11.5.24 ...	14.5.24.
<i>Kia Ora</i> ...	Thurston, H. P. ...	A. E. Lockhart ...	"	Shaw Savill & Albion ...	" 18.3.24 to 2.5.24 ...	9.5.24.
<i>Kinderdijk</i> ...	Jochems, A. B. ...	A. Stenger ...	"	Holland America ...	" 27.3.24 to 3.5.24 ...	8.5.24.
<i>Kitano Maru</i> ...	Gotoh, M. ...	R. Nakane ...	"	Nippon Yusen Kaisha ...	" 8.6.24 to 5.10.24 ...	14.10.24.
<i>Knight Companion</i> ...	Beale, H. E. ...	J. H. Brown ...	"	A. Holt ...	" 21.7.24 to 29.7.24 ...	7.10.24.
<i>Koono</i> ...	Casson, D. H., R.D., Commr. R.N.R.	E. R. Massam, L. Griffiths, J. Sanders, T. Fea.	M.L.	Ellerman Wilson ...	Met. Log. 16.12.23 to 22.7.24 ...	2.9.24.
<i>Kyogle</i> ...	Coalstad, C. ...	C. B. Odman, E. W. Hughes	No.	Commonwealth Light- house Service.	" ...	"
<i>Lady Denison Pender, C.S.</i> ...	West, G. W. ...	A. G. Watts ...	"	Eastern Tel. Co. ...	Form 911 16.6.24 to 8.9.24 ...	17.10.24.
<i>Laguna</i> ...	Mander, F. ...	F. W. Parker ...	"	Pacific S.N. Co. ...	" 22.3.24 to 14.4.24 ...	28.4.24.
<i>Lalande</i> ...	Bambra, W. A. ...	N. Webster ...	"	Lampert & Holt ...	" 17.7.24 to 3.8.24 ...	27.8.24.
<i>Lancashire</i> ...	Beckett, F. W. ...	T. L. Owen ...	"	Bibby ...	" 19.7.24 to 27.9.24 ...	14.10.24.
<i>Lamedon</i> ...	Smith, A. H. ...	A. J. Barclay ...	"	A. Holt ...	" 5.4.24 to 18.7.24 ...	25.7.24.
<i>La Paz, M.V.</i> ...	Ross, J. ...	R. D. Collister ...	"	Pacific S.N. Co. ...	" 29.8.24 to 19.9.24 ...	30.9.24.

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 17.10.24.	Date Received.
Laplace ...	Davies, G. W. ...	A. Hughes, I. O. Jones ...	No.	Lampport & Holt	Form 911 20.1.24 to 27.3.24 ...	7.4.24.
55 Lapland ...	Howell, T. ...	B. T. Harries, G. H. Bowyer, A. Mather.	W.T.	Red Star ...	W.T. Reg. 30.8.24 to 18.9.24 ...	22.9.24.
Lassell, M.V. ...	Turner, J. E. ...	A. T. Crilly ...	No.	Lampport & Holt	Form 911 30.8.24 to 18.9.24 ...	22.9.24.
Leicestershire ...	De Legh, P. ...	W. Whiteside, P. H. Potter, R. Arkieson, D. Sharrock.	M.L.	Bibby ...	Met. Log. 5.8.23 to 24.10.23 ...	27.11.23.
Leitrim ...	Robertson, A. ...	H. C. Roberts ...	No.	Dowie, J., & Co. ...	" 16.8.24 to 25.9.24 ...	30.9.24.
Levant, C.S. ...	West, G. W. ...	" ...	"	Eastern Tel. Co. ...	" 26.11.23 to 16.12.23 ...	30.12.23.
Ling Nam ...	Waterson, W. H. V. ...	" ...	No.	Chunghwa Nav. Co. ...	Form 911 27.10.23 to 12.1.24 ...	22.4.24.
Llanstephan Castle ...	Wilford, T. H. ...	W. F. Malden ...	"	Union Castle ...	" 19.3.24 to 10.4.24 ...	22.4.24.
Loch Katrine ...	Matthews, G. P. ...	C. Noakes ...	"	R.M.S.P. Co. ...	" 25.4.24 to 1.8.24 ...	13.8.24.
London Commerce ...	Young, H. J., D.S.O. ...	P. G. Leverett ...	"	Furness Withy ...	" 14.6.24 to 15.7.24 ...	22.7.24.
Loreto, M.V. ...	Barkley, E. ...	F. Binnion ...	"	Pacific S.N. Co. ...	" 18.5.24 to 7.6.24 ...	12.6.24.
Losada M.V. ...	Meldrum, G. W. ...	A. H. Turner ...	"	" ...	" 5.7.24 to 24.7.24 ...	25.8.24.
Macedonia ...	Potter, H. W., R.D., Commr., R.N.R. ...	J. B. Buggi ...	No.	P. & O. ...	" 6.7.24 to 14.7.24 ...	28.7.24.
Macharda ...	Cochran, G. ...	W. Moore ...	"	Brocklebank ...	" 1.5.24 to 25.7.24 ...	18.8.24.
Mahana ...	Kershaw, W. A. R. ...	F. M. Smith, F. Gilroy ...	"	Shaw Savill & Albion	" 7.9.24 to 21.9.24 ...	16.10.24.
Maharaja ...	Peet, T. M. ...	E. Childs ...	"	Asiatic S.N. Co. ...	" 27.7.24 to 8.9.24 ...	16.10.24.
Maihar ...	Rowe J. P. ...	C. Shaw L. Robertson, R. G. Widdon.	M.L.	Brocklebank ...	Met. Log. 26.1.24 to 26.5.24 ...	23.6.24.
Maimyo ...	Richardson, T. ...	R. A. L. Williams ...	No.	" ...	Form 911 4.7.24 to 17.7.24 ...	11.8.24.
Maine ...	Seymour, H. ...	S. C. Skinner ...	"	Atlantic Transport ...	" 18.8.24 to 14.9.24 ...	22.9.24.
58 Majestic ...	Hayes, Sir B. F., K.C.M.G. D.S.O., R.D., Commadore, R.N.R. ...	A. F. Butcher, W. W. Pearson	W.T.	White Star ...	W.T. Reg. 28.8.24 to 11.9.24 ...	15.9.24.
					Form 911 18.9.24 to 2.10.24 ...	7.10.24.
					Form 911 28.8.24 to 11.9.24 ...	15.9.24.
					Form 911 18.9.24 to 3.10.24 ...	7.10.24.
Makambo ...	Butler, E. ...	F. C. Ree ...	M.L.	Burns Philp ...	Met. Log. 26.9.23 to 29.1.24 ...	7.7.24.
	Griffiths, G. I. ...	" ...	"	" ...	" ...	" ...
Makua ...	Crawford, R. ...	G. O. Knaggs ...	M.L.	Canadian-Australasian	" 8.3.24 to 26.6.24 ...	22.7.24.
	Barlow, A. E. ...	" ...	"	" ...	" ...	" ...
Malancha ...	Whitham, F. ...	F. Boulding ...	No.	Brocklebank ...	Form 911 20.7.24 to 1.10.24 ...	3.10.24.
Malda ...	Gray, T. N. ...	W. Hunt ...	"	British India ...	" 5.9.24 to 29.9.24 ...	2.10.24.
Manchester Corporation.	Everest J. E. ...	L. H. Moorhouse ...	"	Manchester Liners ...	" 23.8.24 to 22.9.24 ...	25.9.24.
Manchester Mariner	Riley, J. E. ...	C. E. Stocker, J. F. Fisher, F. Stockton.	M.L.	" "	Met. Log. 28.7.23 to 29.2.24 ...	19.3.24.
Manchester Merchant.	Barclay J. ...	A. H. Boyd, A. E. Ricketts...	No.	" "	Form 911 30.8.24 to 10.9.24 ...	30.9.24.
Mandasor ...	Kershaw, R. W. ...	W. Baxter ...	"	Brocklebank ...	" 1.12.23 to 7.1.24 ...	28.1.24.
Manhattan ...	Hutchison J. G. ...	S. K. Hawkins ...	"	Atlantic Transport ...	" 25.5.24 to 1.8.24 ...	11.8.24.
Manipur ...	Scurr, T. W. ...	G. W. Barker ...	"	Brocklebank ...	" 4.6.24 to 4.9.24 ...	5.9.24.
Manistee ...	Isaacson, J. M. ...	F. McCole, H. E. Lees, L. C. Bach, H. C. Slater.	M.L.	Elders & Fyfes ...	Met. Log. 22.3.24 to 20.7.24 ...	24.7.24.
Marella ...	Mortimer S. ...	Burdis, Pemberton, Thompson	M.L.	Burns Philp ...	" 12.7.23 to 22.11.23...	3.3.24.
Marengo ...	Bean, A. ...	W. G. Pearce, G. B. Bray, E. Wood.	M.L.	Ellerman Wilson ...	" 22.5.24 to 28.8.24 ...	3.9.24.
Margha ...	Whittingham, W. E., O.B.E., R.D., Commr., R.N.R. ...	J. Strachan, P. Wright, N. A. Thatcher, H. E. Evans.	M.L.	British India ...	Met. Log. 5.7.24 to 17.9.24 ...	29.9.24.
Marglen ...	Griffiths, J. N. ...	A. Pennington ...	No.	Canadian Pacific ...	Form 911 16.2.24 to 7.3.24 ...	11.3.24.
27 Marloch ...	Hamilton, G. ...	" ...	W.T.	" ...	" ...	" ...
Maryland ...	Pollard, F. W., D.S.O., R.D., Commr., R.N.R. ...	F. T. Good ...	No.	Atlantic Transport ...	Form 911 19.3.24 to 23.4.24 ...	8.5.24.
Masirah ...	Thowless, E. ...	R. C. Baker ...	"	Brocklebank ...	Form 911 4.4.24 to 25.4.24 ...	26.5.24.
Massilia ...	Henderson, J. L. ...	E. Richardson ...	"	Anchor ...	" 12.9.24 to 20.9.24 ...	22.9.24.
Matakana ...	Bosdet, V. J. ...	J. J. Finn, J. W. Hart ...	"	Shaw, Savill & Albion	" 31.12.23 to 24.4.24...	29.4.24.
Mataram ...	McInnes, G. ...	K. Morris ...	"	Burns Philp & Co. ...	" 29.5.24 to 9.8.24 ...	7.10.24.
Matharan ...	Cornish, N. P. ...	G. B. Smith, F. Boulding, D. Hunter, G. E. Thomas.	M.L.	Brocklebank ...	Met. Log. 20.2.24 to 19.5.24 ...	12.6.24.
Mathura ...	Hanna, R. G. ...	H. H. Armstrong ...	No.	" ...	Form 911 15.8.24 to 29.8.24 ...	30.9.24.
Matiana ...	Langlands, D. H. ...	L. W. Leask ...	"	British India ...	" 5.7.24 to 3.10.24 ...	14.10.24.
Matina ...	Henderson, J. ...	" ...	M.L.	Elders & Fyfes ...	Met. Log. 3.9.23 to 28.5.24 ...	31.5.24.
32 Mauretania ...	Roston, A. H., C.B.E., R.D., A.-d.-C., Capt., R.N.R. ...	J. A. Myles, P. A. Morgan, D. Forbes.	W.T.	Cunard ...	W.T. Reg. 31.8.24 to 15.9.24 ...	17.9.24.
					" 21.9.24 to 6.10.24 ...	7.10.24.
56 Megantic ...	Berry, G. ...	H. J. C. Day, R. Conway ...	W.T.	White Star ...	W.T. Reg. 24.8.24 to 12.9.24 ...	16.9.24.
					" 21.9.24 to 10.10.24...	14.10.24.
22 Melita ...	Clews, A. H. ...	C. Draper, W. Bacon ...	W.T.	Canadian Pacific ...	" 23.8.24 to 10.9.24 ...	15.9.24.
					" 21.9.24 to 8.10.24 ...	10.10.24.
Mennon ...	Salter, G. H. ...	E. D. Potts ...	"	A. Holt ...	Form 911 31.7.24 to 1.10.24 ...	16.10.24.
Menominee ...	Finch, E. ...	N. Seymour ...	No.	Atlantic Transport ...	" 1.9.24 to 9.10.24 ...	16.10.24.
Mercian ...	Carnon, J. R. ...	W. R. C. Baker ...	"	Leyland ...	" 21.7.24 to 26.8.24 ...	9.9.24.
21 Metagama ...	Henderson, W. ...	B. Leslie, A. M. Watt, E. V. Glennie.	W.T.	Canadian Pacific ...	W.T. Reg. 7.9.24 to 24.9.24 ...	29.9.24.
Miami ...	Maxwell Brown, W. E. ...	E. Lowndes ...	No.	Elders & Fyfes ...	Form 911 19.5.24 to 21.6.24 ...	24.6.24.
Michigan ...	Tribe, A. E. ...	L. A. Williams ...	"	Atlantic Transport ...	" 11.6.24 to 20.6.24 ...	25.6.24.
Minderoo ...	Richardson, E. ...	B. J. Bennie, W. J. McPhedron, J. H. Oxtton.	M.L.	West Australia Nav. Co.	Met. Log. 30.12.23 to 12.6.24...	27.8.24.
Minna ...	Mackenzie, G. G. ...	D. Rattray ...	No.	Scottish Fishery Board	Form 911 19.8.24 to 21.9.24 ...	24.9.24.
23 Minnedosa ...	Sibbons, H. ...	Mackenzie, — Carter, H. Scallan.	W.T.	Canadian Pacific ...	W.T. Reg. 6.9.24 to 25.9.24 ...	29.9.24.
					Form 911 6.9.24 to 24.9.24 ...	26.9.24.
Minnetonka ...	Gates, T. F. ...	H. E. McCartney ...	No.	Atlantic Transport ...	" 25.8.24 to 11.10.24...	16.10.24.
Minnewaska ...	Claret, F. ...	W. S. Mackie ...	"	" ...	" 8.9.24 to 27.9.24 ...	1.10.24.
Mirror, C.S. ...	Sherwood, C. A. ...	C. E. F. St. John ...	"	Eastern Tel. Co. ...	" 12.4.24 to 25.5.24 ...	12.8.24.
Mississippi, M.V. ...	Wylie, J. T. J. ...	G. Batchelor ...	"	Atlantic Transport ...	" 20.9.24 to 30.9.24 ...	3.10.24.
Moena ...	Morzer Bruyns, M. F. ...	P. de Viels ...	"	Nederland ...	" 12.7.24 to 17.9.24 ...	25.9.24.
Moldavia ...	Burleigh, C. W., D.S.O., R.D., Capt., R.N.R. ...	E. T. Ferraby ...	"	P. & O. ...	" 5.5.24 to 29.6.24 ...	14.7.24.
Mongolian Prince	Durrant, G. D. ...	R. S. Bibby ...	No.	Prince ...	Form 911 7.7.24 to 3.10.24 ...	14.10.24.
Monkbarns, Ship	Davies, W. ...	M. B. Glasier ...	"	J. Stewart & Co. ...	" 13.10.23 to 20.11.23 ...	21.1.24.
24 Montcalm ...	Rennie, A., O.B.E. ...	H. McFadyen ...	W.T.	Canadian Pacific ...	W.T. Reg. 13.9.24 to 1.10.24 ...	7.10.24.
25 Montclare ...	Webster, G. S., R.D., Commr., R.N.R. ...	R. Fegan, C. E. Duggan, A. Phillips.	W.T.	" "	Form 911 30.8.24 to 18.9.24 ...	23.9.24.
					Form 911 27.9.24 to 1.10.24 ...	14.10.24.
Montlaurier ...	Turnbull, J., C.B.E., R.D., Capt., R.N.R. ...	H. H. Davies ...	No.	" "	" 23.8.24 to 8.10.24 ...	14.10.24.
26 Montrose ...	Landy, E. ...	T. Beck, A. Mansey, R. Robinson.	W.T.	" "	W.T. Reg. 23.8.24 to 11.9.24 ...	16.9.24.
					" 20.9.24 to 9.10.24 ...	14.10.24.
					Form 911 23.8.24 to 10.10.24...	16.10.24.
20 Montroyal ...	Latta, R. G. ...	R. W. Jones, F. E. Williams	"	" "	" 11.7.24 to 31.7.24 ...	5.8.24.
					W.T. Reg. 6.9.24 to 24.9.24 ...	29.9.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 17.10.24.	Date Received.
<i>Morvada</i> ...	Mills, T. L., O.B.E., R.D., Commr., R.N.R.	J. Norris, C. L. Hazeldine ...	M.L.	British India ...	Met. Log. 5.1.24 to 24.7.24 ...	11.9.24.
<i>Mulbera</i> ...	Steadman, W. R. ...	E. Holland ...	No.	British India ...	Form 911 22.8.24 to 31.8.24 ...	22.9.24.
<i>Nagara</i> ...	Shillitoe, B., R.D., Commr., R.N.R.	C. K. Brown ...	"	R.M.S.P. Co. ...	" 18.7.24 to 16.9.24 ...	22.9.24.
<i>Napierian</i> ...	Kerruish, W. ...	T. Griffiths ...	"	Leyland ...	" 14.2.24 to 26.2.24 ...	14.3.24.
<i>Nardana</i> ...	Brown, H. ...	S. C. T. Smith, W. E. Jackson ...	"	British India ...	" 25.7.24 to 29.8.24 ...	16.9.24.
<i>Nariva</i> ...	Buret, T. J. C. ...	H. M. S. Laidlaw, C. Waterhouse, E. N. Giller.	M.L.	R.M.S.P. Co. ...	Met. Log. 21.6.24 to 17.8.24 ...	21.8.24.
<i>Nascopie</i> ...	Smellie, T. F. ...	P. Lloyd, R. J. Summers, R. S. Mott.	M.L.	Hudson's Bay Co. ...	" 15.6.23 to 24.10.23 ...	31.10.23.
<i>Navarino</i> ...	Crichton, J. S. ...	J. Annam ...	No.	Glen & Co. ...	Form 911 13.12.23 to 12.1.24 ...	22.1.24.
<i>Navasota</i> ...	Willan, F. G. L., R.D., Commr., R.N.R.	W. A. Delap ...	"	R.M.S.P. Co. ...	" 23.6.24 to 20.8.24 ...	28.8.24.
<i>Nawab</i> ...	Smith J. F. ...	... ..	"	Asiatic S.N. Co. ...	" 22.6.24 to 12.7.24 ...	5.8.24.
<i>Nebraska</i> ...	Collins, A. R. D., O.B.E., R.D., Lt.-Commr., R.N.R.	A. F. Walker ...	"	R.M.S.P. Co. ...	" 15.3.24 to 21.4.24 ...	5.5.24.
<i>Nellore</i> ...	Murray, F. S., R.D., Lt. - Commr., R.N.R.	G. E. Owen ...	"	P. & O. ...	" 17.8.24 to 26.9.24 ...	17.10.24.
<i>Nestor</i> ...	Owen, R. D., O.B.E.	O. V. Jones ...	M.L.	A. Holt ...	" 10.7.24 to 22.8.24 ...	1.9.24.
<i>Nevasa</i> ...	Swanson, C. J. ...	D. Lorrie ...	No.	British India ...	" 14.6.24 to 31.8.24 ...	12.9.24.
<i>Newby Hall</i> ...	Kendall, J. W. ...	E. J. Myles, C. H. Webb, T. A. Dexter.	M.L.	Ellerman ...	Met. Log. 4.7.23 to 24.1.24 ...	4.3.24.
<i>Niagara</i> ...	Rolls J. T. ...	N. G. Buxton, O. C. Bray, R. B. Denniston, T. A. Macpherson, V. V. Bray.	M.L.	Canadian-Australian... ..	" 29.2.24 to 18.7.24 ...	16.8.24.
<i>Ningchow</i> ...	Wilson, C. A. ...	R. A. Hannay ...	No.	A. Holt ...	Form 911 21.6.24 to 18.8.24 ...	22.8.24.
<i>Nore</i> ...	Randall H. W. R.D., Capt., R.N.R.	J. C. Ablewhite R. W. Mackie, C. B. Roche, R. H. Turner.	M.L.	P. & O. ...	Met. Log. 12.7.24 to 2.10.24 ...	7.10.24.
<i>Norman</i> ...	Morton Betts W. ...	D. A. Hodgson ...	No.	Union Castle ...	Form 911 11.8.24 to 31.8.24 ...	16.10.24.
<i>Norna</i> ...	Wright, J. ...	T. Mather ...	"	Scottish Fishery Board ...	" 1.9.24 to 30.9.24 ...	3.10.24.
<i>Norseman, C.S.</i> ...	Barter, H. O., R.D., Commr., R.N.R.	... ..	M.L.	Western Tel. Co. ...	Met. Log. 11.9.23 to 28.3.24 ...	7.7.24.
<i>Nortonian</i> ...	McCormick, J. ...	T. Griffiths ...	No.	Leyland ...	Form 911 2.8.24 to 30.9.24 ...	4.10.24.
<i>Nubian</i> ...	Watmough, T. M. ...	H. R. Gaskill ...	"	Leyland ...	" 22.9.24 to 2.10.24 ...	16.10.24.
<i>Nyanza</i> ...	Carpendale, F. W. J.	H. C. G. C. Cumming, C. H. Hand, R. A. C. Beeching.	M.L.	P. & O. ...	Met. Log. 15.6.24 to 8.9.24 ...	13.9.24.
<i>Oaklands Grange</i> ...	Routledge, R. ...	E. A. Insley ...	No.	Houlder Bros. ...	Form 911 27.5.24 to 19.9.24 ...	26.9.24.
<i>Odland I.</i> ...	Villiamsen ...	H. Svendgaard ...	"	Hannevig Bros. ...	" 19.12.23 to 2.1.24 ...	4.1.24.
<i>42 Ohio</i> ...	Lainson, W. H. ...	... ..	W.T.	R.M.S.P. Co. ...	Met. Log. 22.6.24 to 13.9.24 ...	30.9.24.
<i>Olympia</i> ...	Duncan, A. R. ...	D. R. Urquhart, G. Lynas, F. McIntyre.	M.L.	Anchor ...	" 30.4.24 to 11.7.24 ...	28.7.24.
<i>57 Olympic</i> ...	Howarth, F. B., Commr., R.N.R.	J. C. M. Boyce, G. W. Couch, C. J. Warltire.	W.T.	White Star ...	W.T. Reg. 4.9.24 to 18.9.24 ...	23.9.24.
<i>Onitsha</i> ...	Williams, T. E. ...	D. Rollo ...	No.	Elder Dempster ...	Form 911 25.9.24 to 9.10.24 ...	14.10.24.
<i>Oranien</i> ...	Hoskins, W. ...	T. Miller ...	"	Leyland ...	" 4.9.24 to 9.10.24 ...	16.10.24.
<i>Orari</i> ...	Robinson, F. W. ...	R. Newman, T. Breen, F. Longheed, G. Lant, H. Farrant.	M.L.	New Zealand S.S. Co. ...	Met. Log. 2.2.24 to 29.3.24 ...	2.4.24.
<i>40 Orbita</i> ...	Parker, W. H., C.B.E., R.D., Capt., R.N.R.	R. V. Rutley, O. S. Thomas, C. H. Milward.	W.T.	R.M.S.P. Co. ...	W.T. Reg. 17.8.24 to 13.9.24 ...	1.10.24.
<i>Orcoma</i> ...	Pleignier, H. T. S. ...	G. B. Wardale, L. Jones, C. H. Denton.	M.L.	Pacific S.N. Co. ...	Form 911 6.9.24 to 29.9.24 ...	2.10.24.
<i>41 Orduna</i> ...	Warner, G. E., R.D., Commr., R.N.R.	S. Robbins, J. Vivian, R. W. Sumpton, J. Smith, J. A. Watson.	W.T.	R.M.S.P. Co. ...	Met. Log. 22.5.24 to 8.8.24 ...	21.8.24.
<i>Oriana</i> ...	Christian, G. H. ...	G. Pattison, Mason, G. F. Nicholson, Cruikshank.	M.L.	Pacific S.N. Co. ...	W.T. Reg. 23.8.24 to 21.9.24 ...	24.9.24.
<i>Orila</i> ...	Dominy, R. H., C.B.E., Commr., R.N.R.	J. S. Wardman ...	M.L.	" " ...	Form 911 23.8.24 to 22.9.24 ...	23.9.24.
<i>Ormonde</i> ...	Douglas, H. P., C.M.G., Capt., R.N.	A. M. Hughes ...	M.L.	His Majesty's Ship ...	Met. Log. 26.1.23 to 14.8.23 ...	18.8.23.
<i>Ormonde</i> ...	Staunton, H. G., C.B.E., R.D., Commr., R.N.R.	T. G. McGregor, N. Savage, F. J. L. Butler, F. Firmstone	M.L.	Orient ...	Met. Log. 19.6.24 to 6.9.24 ...	15.9.24.
<i>Ormuz</i> ...	James L. V., D.S.C.	G. A. Moir, J. C. K. Dowding, I. E. G. Goldsworthy N. A. Whinfield.	M.L.	" ...	Met. Log. 4.3.24 to 23.6.24 ...	10.7.24.
<i>Oroya</i> ...	Pearce, A. ...	S. Lewis ...	No.	Pacific S.N. Co. ...	Met. Log. 2.3.24 to 15.6.24 ...	28.6.24.
<i>Orsova</i> ...	Matheson, C. G., D.S.O., R.D., Commr., R.N.R.	C. Fox, A. J. Croft Cohen, C. V. Dodgson, P. P. Murphy.	M.L.	Orient ...	Met. Log. 25.5.24 to 28.8.24 ...	2.9.24.
<i>Ortega</i> ...	Christian, C. H. ...	D. W. Hutchison ...	No.	Pacific S.N. Co. ...	Form 911 30.7.24 to 7.10.24 ...	16.10.24.
<i>Orvieto</i> ...	Shelford, W. S., Lt.-Commr., R.N.R.	C. G. Thorne, A. J. Baxter, G. E. Martin, A. O. H. O'Brien, M. C. Lester.	M.L.	Orient ...	Met. Log. 22.6.24 to 23.9.24 ...	25.9.24.
<i>Osterley</i> ...	Cameron, E. P. ...	F. G. Goodman, E. Hatch, L. A. Keeble.	M.L.	" ...	Form 911 12.6.24 to 5.7.24 ...	26.8.24.
<i>Othello</i> ...	Pearson, Z. C. ...	E. G. H. Huddleston ...	No.	Ellerman Wilson ...	Met. Log. 30.3.24 to 2.7.24 ...	7.7.24.
<i>Oliva</i> ...	Elford, H. E. ...	V. R. Bowling ...	"	Shaw, Savill & Albion ...	" 27.4.24 to 30.7.24 ...	6.8.24.
<i>Ovid</i> ...	Groom, A. C. B. ...	... ..	"	Shakespeare Shipping Co. ...	Form 911 23.5.24 to 12.7.24 ...	18.7.24.
<i>Pacific Shipper, M.V.</i> ...	Newman, G. ...	F. H. Perry ...	"	Furness Withy ...	" 20.6.24 to 18.7.24 ...	25.8.24.
<i>Pakeha</i> ...	W. P. Clifton Mogg	M. F. Armitage ...	M.L.	Shaw, Savill & Albion ...	" 6.8.24 to 5.9.24 ...	17.9.24.
<i>Paparua</i> ...	Ashworth, F. ...	E. H. Hopkins ...	No.	New Zealand S.S. Co. ...	Form 911 1.7.24 to 10.8.24 ...	15.8.24.
<i>Paris</i> ...	Cook, C. L. ...	Mr. Biles ...	C.C.	Southern Ry. ...	" 25.3.24 to 10.5.24 ...	14.5.24.
<i>Patia</i> ...	Bostock, R. J. ...	W. McIlwaine ...	No.	Elders & Fyffes ...	Telegraphic Report. 19.2.24 ...	19.2.24.
<i>Patrol, C.S.</i> ...	Welsh, T. K. ...	H. A. Davison, B. L. Vinden, A. T. Morrell.	M.L.	Eastern Extension (A. & C.) Telegraph Co. ...	Form 911 24.8.24 to 28.9.24 ...	14.10.24.
<i>Persic</i> ...	Davies, E. ...	H. Williams ...	No.	White Star ...	Met. Log. 11.2.24 to 13.7.24 ...	25.8.24.
<i>Peshawur</i> ...	Hester, C. W. R.D., Commr., R.N.R.	C. E. Arundel ...	M.L.	P. & O. ...	Form 911 12.8.24 to 23.8.24 ...	7.10.24.
<i>Philadelphuan</i> ...	Baker, J. A. ...	G. W. B. Lloyd ...	No.	Leyland ...	Met. Log. 13.3.24 to 13.5.24 ...	19.5.24.
<i>Polyphemus</i> ...	Hatfield, J. ...	F. Silva ...	"	A. Holt ...	Form 911 7.2.24 to 22.4.24 ...	24.4.24.
<i>Poona</i> ...	Cherry, W. G. W. ...	F. R. W. Page ...	"	P. & O. ...	" 25.7.24 to 30.9.24 ...	3.10.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 17.10.24.	Date Received.
<i>Teiresias</i> ...	Reynard, J. G. ...	T. P. Griffith ...	No.	A. Holt ...	Form 911 23.6.24 to 22.9.24 ...	25.9.24.
<i>Teucer</i> ...	Hodgson, R. N. ...	G. Lancaster ...	"	" ...	" 9.8.24 to 6.9.24 ...	16.10.24.
<i>Themistocles</i> ...	Jermyn, W. M. ...	W. F. Sargent ...	"	Aberdeen ...	" 16.8.24 to 4.9.24 ...	22.9.24.
<i>Theseus</i> ...	Batt, A. E. ...	J. R. Clement Evans ...	"	A. Holt ...	" 18.8.24 to 6.9.24 ...	16.10.24.
<i>Titan</i> ...	Ireland, T. R. ...	J. P. Williams, A. C. H. Jones D. J. Davies, C. Taylor.	M.L.	" ...	Met. Log. 2.11.23 to 8.3.24 ...	12.3.24.
<i>Tolmie</i> , S.F.Bqtne.	Stewart, J. C. ...	E. F. Collins R. E. Smith ...	No.	B. C. Mills, Tug and Barge Co.	Form 911 10.2.24 to 17.4.24 ...	3.6.24.
<i>Tottori Maru</i> ...	Matakura, B. ...	K. H. Kubota ...	"	Nippon Yusen Kaisha	" 2.5.24 to 22.5.24 ...	23.6.24.
<i>Transmitter</i> , C.S.	Jones, Ll. T., M.B.E.	S. P. Sheldon ...	"	Eastern Tel. Co. ...	" 7.12.23 to 2.2.24 ...	18.2.24.
<i>Traveller</i> ...	Worthington, B. ...	A. Robertson ...	"	Harrison ...	" 19.6.24 to 18.7.24 ...	22.7.24.
<i>Tredenham</i> ...	Evans, J. O. ...	R. F. Hellings ...	"	Hain S.S. Co. ...	" 19.8.24 to 31.8.24 ...	17.9.24.
<i>Trematon</i> ...	Hicks, F. H. ... Evans, B. ...	J. Christopher, D. Thomas, F. J. Webb, S. Smith, C. Mayberry.	M.L.	" ...	Met. Log. 31.3.23 to 24.9.24 ...	14.10.24.
<i>Tuscania</i> ...	Bone, D. W. ...	T. S. Nixon ...	No.	Anchor ...	Form 911 24.8.24 to 20.9.24 ...	24.9.24.
<i>Tyndareus</i> ...	Adcock, F. ...	D. L. Hoare ...	"	A. Holt ...	" 17.5.24 to 22.8.24 ...	10.9.24.
<i>Ulimaroa</i> ...	Wyllie, W. J. ...	R. A. Dance ...	"	Huddart Parker, Ltd.	" 9.6.24 to 10.8.24 ...	7.10.24.
<i>Ulysses</i> ...	McHutcheon, W. ...	T. R. Phillips ...	"	A. Holt ...	" 28.6.24 to 16.7.24 ...	25.8.24.
<i>Untali</i> ...	Barnes, E. W. ...	W. H. Foster ...	"	Bullard King ...	" 9.5.24 to 16.8.24 ...	18.8.24.
<i>Valacia</i> ...	Doyle, M. ...	J. W. Counce ...	"	Cunard ...	" 5.6.24 to 12.6.24 ...	17.6.24.
<i>Valdura</i> ...	Mitchell, A. ...	H. J. Maughan, J. Anderson, A. M. S. Well.	M.L.	Gow Harrison ...	Met. Log. 10.1.24 to 18.6.24 ...	22.8.24.
<i>Valemore</i> ...	Griffiths, J. ...	H. Miller ...	No.	Furness Withy ...	Form 911 22.11.23 to 29.12.23	30.12.23.
<i>Vardulia</i> ...	Townley, J. C. ...	J. E. Deans ...	"	Cunard ...	" 11.8.24 to 20.8.24 ...	2.9.24.
<i>Vasconia</i> ...	Inch F. ...	E. Gleave ...	"	" ...	" 30.6.24 to 30.7.24 ...	5.8.24.
<i>Vellavia</i> ...	Fear, E. T. C. ...	H. H. Kidwell ...	"	" ...	" 30.3.24 to 11.4.24 ...	22.4.24.
<i>Ventura de Lar-rinaga.</i>	Keay, W. S. ...	H. J. Kay ...	"	Larrinaga ...	" 31.7.24 to 30.8.24 ...	7.10.24.
<i>Verbania</i> ...	Hatcher, W. H. ...	J. G. Wiseman ...	"	Cunard ...	" 24.8.24 to 3.10.24 ...	6.10.24.
<i>Verentia</i> ...	Stafford, W., D.S.C., R.D., Lt.-Commr., R.N.R.	A. F. Watts ...	"	" ...	" 7.7.24 to 5.8.24 ...	14.8.24.
<i>Victoria</i> ...	Fisher, F. T. ...	J. Males, E. Peacock, J. Archer	M.L.	China-Australia ...	Met. Log. 3.9.23 to 16.2.24 ...	2.8.24.
<i>Vigilant</i> ...	Simpson, E. S. S. ...	J. Hunter ...	No.	Scottish Fishery Board	Form 911 16.8.24 to 5.10.24 ...	14.10.24.
<i>Waiotapu</i> ...	Brown, T. F. S. ... Davey, A. ...	B. S. Cave ...	No.	Canadian-Australasian	Form 911 2.7.24 to 16.9.24 ...	4.10.24.
<i>Walmer Castle</i> ...	Chave, Sir B., K.B.E.	C. Aylen ...	"	Union Castle ...	" 27.6.24 to 18.8.24 ...	19.8.24.
<i>Wangaratta</i> ...	Scutt, W. ...	T. W. Wordingham, M. Chant, K. M. Morrison.	M.L.	British India ...	Met. Log. 14.1.24 to 20.5.24 ...	27.5.24.
<i>Warfield</i> ...	Steel, R. ...	E. V. Wilkinson ...	No.	" " ...	Form 911 3.6.24 to 13.7.24 ...	26.8.24.
<i>War Nizam</i> ...	Putt, R. O. ...	E. R. Clark ...	"	British Tankers ...	" 18.8.24 to 6.9.24 ...	7.10.24.
<i>Welshman</i> ...	Rollerson, W. ...	W. A. Fletcher ...	"	White Star-Dominion	" 29.8.24 to 22.9.24 ...	30.9.24.
<i>Winifredian</i> ...	Harrocks, W. ...	A. R. Rose ...	"	Leyland ...	" 7.9.24 to 14.10.24 ...	17.10.24.
<i>Woodarra</i> ...	Reilly, J. V. ...	L. D. Graham, A. V. Fisher, L. C. Comber, J. Wallace.	M.L.	British India ...	Met. Log. 3.4.24 to 22.6.24 ...	2.8.24.
<i>Yorkshire</i> ...	Millson, G. C. ...	E. Jones ...	No.	Bibby ...	Form 911 2.8.24 to 10.10.24 ...	16.10.24.
<i>Zeeland</i> ...	Thomas, A. J. ...	W. F. Jackman ...	No.	Red Star ...	Form 911 12.9.24 to 3.10.24 ...	4.10.24.
<i>Conway</i> , H.M.S.	Broadbent, H. W., R.D. Capt., R.N.R.	The Senior Cadets ...	Cadets' M.L.	" ...	Cadets' Met. Log. 4.5.24 to 19.7.24	31.7.24.
<i>Pangbourne Nautical College.</i>	Tracy, A. F. G., Commr., R.N.	" ...	"	" ...	Cadets' Met. Log. 12.5.24 to 26.7.24	29.7.24.
<i>Worcester</i> , H.M.S.	Sayer M. B., O.B.E., R.D., Capt., R.N.R.	" ...	"	" ...	Cadets' Met. Log. 9.5.24 to 30.7.24	13.8.24.
<i>Abaco</i> ...	" ...	The Keepers ...	Lighthouse Register.	" ...	Lighthouse Register 2.1.24 to 6.7.24	13.8.24.
<i>Cay Lobos</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.24 to 30.6.24	13.8.24.
<i>Double Headed Shot</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.6.24 to 30.6.24	5.9.24.
<i>Inagua</i> ...	" ...	" ...	"	" ...	Lighthouse Register 8.1.24 to 9.7.24	13.8.24.
<i>Sombrero</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.24 to 30.6.24	6.8.24.
<i>Watling Island</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.24 to 30.6.24	13.8.24.
<i>Cape Pembroke</i> (Falkland Is.).	" ...	" ...	"	" ...	Lighthouse Register 1.1.24 to 30.6.24	23.9.24.

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

Name of Vessel.	Captain.	Observing Officer.	Line.	Last Case of Water Samples, Reports, etc., Received up to 30.9.24.	Date Received.
<i>Alban</i> ...	Whayman, W. R. ...	R. Griffiths ...	Booth ...	Water Samples ...	23.4.24.
<i>Hildebrand</i> ...	Maddrell, J. ...	R. S. Hulme Goodier ...	" ...	" " ...	4.9.24.
<i>Patia</i> ...	Bostock, R. J. ...	W. McIlwaine ...	Elder & Fyffes ...	" " ...	28.8.24.
<i>Tortuguero</i> ...	Martin ...	H. H. Dunning ...	" " ...	" " ...	5.9.24.

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Mediterranean Sea (Western) - - - - -	- 98	Foreword - - - - -	10
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ERRATA.

Page 65, May number.

Column 1, eighteenth line from bottom, for thirds read tenths.

Page 133, October number.

Column 2, twenty-first line from bottom, for Atlantic read Arctic.

Page 139, October number.

Wireless Storm Warnings—Hong Kong, for Cape d'Aquilar read Cape d'Agular.