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THE MARINE OBSERVER.

OCTOBER 1924.

"HOTSPUR."

Captain Henry Toynbee's last command.

BY BASIL LUBBOCK.

SMITH'S 1,142 ton Blackwall frigate, *Hotspur*, which was the famous Captain TOYNBEE'S last command, was launched in 1851, and came to her end in the Madras Cyclone of 1872. As the late Captain BOULTBEE WHALL, who served five voyages in her, used to say, she was shaped like a serving mallet. She was certainly as bluff above water as one of NELSON'S ships, but under water she had a sharp rise of floor, with a midship section which resembled that of the SYMOND'S Naval brigs.

Though the *Hotspur* was only an eleven-knot ship at her best, with a ship's company that numbered 65 men, including idlers, Captain TOYNBEE always drove her to the limit, and actually got 328 miles out of her on one occasion.

This was in 1864; TOYNBEE was running his Easting down in 42° S. 56° E. in September. It must, however, have been a very exceptional occasion, as in five voyages from 1861 to 1866, of which I have the abstracts, this record was never even approached either before or after, her next best being 280 miles.

TOYNBEE, however, was so skilful a navigator, and possessed so shrewd a knowledge of where to find the best winds that the *Hotspur* rarely made a poor passage.

The following data regarding her voyages under TOYNBEE show the skill of her commander very clearly:—

1861.	July 5.	Eddystone N. by E. 6 miles.
	Sept. 27.	Anchored Madras Roads, 84 days from Eddystone. Best run 238 miles.
1862.	Jan. 4.	5 a.m. left Madras.
	Feb. 15.	Anchored Table Bay, 42 days from Madras.
	" 20.	Left Table Bay.
	Apr. 10.	Saw Lizard Lights, 49 days from the Cape.
	" 15.	Hauled into E.I. Dock. Best run 267 miles.
1862.	July 5.	Passed Isle of Wight.
	Oct. 8.	Anchored Madras Roads, 92 days from the Lizard. Best run 280 miles.

1862/3.	Dec. 25.	Made sail from Sandheads, 1 p.m.
	Feb. 11.	Anchored Table Bay, 47 days from Sandheads.
	" 12.	6 p.m. left Table Bay in strong South-Easter.
	Mar. 30.	3 a.m. Lizard Light N.N.W.
	Apr. 2.	Anchored Spithead, landed troops and passengers : 98 days from Sandheads. Best run 261 miles.
1863.	July 5.	Dropped pilot off St. Catherines.
	Sept. 23.	Anchored Madras Roads, 79 days from the Lizard. Best run 267 miles.
1863/4.	Dec. 21.	Made sail from Sandheads.
	Jan. 30.	Anchored Table Bay, 39½ days from Sandheads.
	Feb. 2.	3 p.m. left Table Bay.
	Mar. 29.	Made the Start, 99 days from Sandheads. Best run 262 miles in S.E. Trades.
1864.	July 6.	Dropped pilot.
	Oct. 9.	Anchored Madras Roads, 95 days from Channel. Best run 328 miles.
1865.	Jan. 9.	6.30 p.m. weighed for Cape Town from Madras.
	Feb. 14.	Anchored Table Bay, 36 days from Madras.
	Apr. 8.	Lizard Light E. by S., 89 days out. Best run 250.
1865.	Aug. 15.	Anchored Portland Roads.
	" 20.	Passed Wolf Rock and Longships.
	Nov. 24.	Took pilot off Gaspar Channel, 96 days from Longships. Best run 248.
1866.	Feb. 2.	Made sail from Sandheads.
	Mar. 20.	11 a.m. anchored Table Bay, 46 days out.
	" 22.	4 p.m. weighed from Table Bay.
	May 11.	Anchored Spithead 10.30 p.m., 98 days out. Best run 265.

Men who have served in sail will be the first to admit that the above is an astonishing record for a bluff bowed, frigate-built ship. During all this time, Captain TOYNBEE never carried away a ropeyarn, beyond breaking stunsail booms, with the one exception,

and this was when he rode out a cyclone off the Sandheads on Oct. 22nd, 1864. On this occasion, though topgallant and royalyards had been sent down, the force of the wind blew the topgallant masts clean out of her, without anyone on deck seeing them go. Yet in spite of a sea which stove in the stern deadlights and pitched the flying jibboom out of her, the *Hotspur* with her cable veered out to the end, came through without any further damage.

A number of well-known men were trained or served under TOYNBEE in the *Hotspur*, notably ROBERT STUDDERT (afterwards Commodore P.S.N. Co. and Orient Lines), C. B. JOHNS (late Dockmaster at Cardiff), W. BOULTBEE WHALL (late B.O.T. Cardiff), W. S. POWELL (K.C., Admiralty barrister) and W. F. CABORNE (C.B., R.N.R., Nautical assessor).

When TOYNBEE gave up the sea in 1866 in order to go to the Meteorological Office, T. L. PORTEOUS, his first officer succeeded him in command of the *Hotspur*.

The old ship continued to be a favourite in the Indian passenger and trooping trade until 1872, when, as I have already stated, she went ashore in the Madras cyclone of May 2nd and became a total loss.

PORTEOUS had anchored rather close in, and when it was evident that a cyclone was approaching, it was too late to slip, as he would have had to beat off a lee shore with the wind growing stronger and stronger as the centre neared.

Messrs. T. and W. SMITH, the owners of the *Hotspur* built their own ships. The *Hotspur* succeeded the magnificent *Blenheim* on the stocks. SMITHS' *Marlborough* and *Blenheim* were considered two of the finest Blackwall frigates ever built. They were some 300 tons larger than the *Hotspur*, but there is no doubt that there was no more perfect little ship than TOYNBEE'S *Hotspur*, for the service for which she was designed.

An Account of an 1864 Cyclone.

The following is Captain TOYNBEE'S own account of the cyclone, mentioned above by Mr. BASIL LUBBOCK, as recorded in *Hotspur*'s meteorological log for that voyage.

"October 21st, 1864.—Between 1 a.m. and 3 a.m. tremendous rain, and very heavy rain for the rest of the day with little wind and that variable.

"5 p.m. Sounded in 18 fathoms blue mud, ship standing to the Northward; by allowing 60 miles of westerly current for the last two days supposed ourselves 30 miles east of the Lower Floating Light, but not having had observations during that time thought it right to come to an anchor until we could find our position, knowing that there was a strong set to the westward.

"6 p.m. Brought up in 13 fathoms stiff blue mud, and veered away 50 fathoms of cable.

"8 p.m. The barometer was 29.744 in (corrected) having risen four hundredths since 4 p.m.; as the wind was moderate, considered this a sufficient evidence that the weather would not be very bad.

"11 p.m. About 11 p.m. noticed that the barometer was falling, with extremely heavy rain, and moderate squalls of wind from E.S.E.—as this led one to suppose that worse weather was coming, turned the

hands out to send down royal and topgallant yards, and veered away 118 fathoms of cable.

"Midnight. Barometer 29.645 in (corrected), Ther. 80°, wind gradually increasing with heavy squalls, increasing in sharpness and tremendous rain.

"October 22nd.—1 a.m. Barometer 29.605 in. (corrected) Ther. 80.5°. Wind E.S.E. Between one and two, it became manifest that a cyclone was passing over us; the lightning was beyond description a ball of light sat on the main royal mast-head, the rain fell in a sheet rather than drops, and one may truly say that the darkness could be felt except when the red glare of lightning made all visible.

"2 a.m. About 2 a.m. the wind shifted to the Southward blowing in furious gusts at intervals. In the course of an hour or two it shifted from E. by S. to S.W. and from that to N.W. The hardest gust was from S.W., laying the ship over as if we had been carrying a heavy press of canvas, and it must have been then that our topgallant masts blew over the side—the sound of their fall was not heard on deck; in fact I had sent the crew below to get some coffee, and had told the boatswain that as soon as they had drunk it we must strike our topgallant masts; during a flash of lightning I looked aloft and saw the three hanging in the topmast rigging. The short time which the wind took to shift from E. by S. to N.W. leads me to suppose that the east side of the cyclone (very near the centre) passed over us. Expecting every minute that our cable would part, I carefully watched the compass knowing that very shoal water was to north of us and had decided that in case it should part before the wind shifted from the southward to the westward, we would cut away our masts and let go the starboard anchor.

"4.30 a.m. About 4.30 a.m. after a furious clap of thunder the wind shifted to N.W. and blew only a hard gale with very cold rain; all the rain before having been warm. The N.W. wind now exposed the ships stern to the S.E. sea which was coming up in great rollers, and topping tremendously like awful breakers; this filled our stern cabins with water, but it decreased very quickly, and in a few hours we had a very confused but moderate sea.

"6 a.m. As the day broke we saw the *Alnwick Castle* totally dismasted to the N.E. of us, another partially dismasted to the eastward, and a third to the south-westward.

"We got a double altitude in the afternoon and found we were in Lat. 21° 03' N., Long. 88° 51' E. Very cloudy all day with a strong N.W. wind. As I was not able to leave the deck during the height of the gale, there is unfortunately no record of the barometer during that time; the aneroid was only registered during the following hours.

21st 8 p.m.	...	...	...	29.84	Ther. 81°
22nd 5.15 a.m.	...	...	...	29.52	" 82°
" 6.00 a.m.	...	...	...	29.60	" 82°
" 7.30 a.m.	...	...	...	29.70	" 82°
" 8.30 a.m.	...	...	...	29.74	" 81°

"October 23rd.—At daylight saw a pilot-brig standing towards us, she had stood to sea to avoid the gale and was on her way back to her station; she supplied us with a Pilot; weighed and beat to the westward against a light westerly wind. Passed something floating, about a quarter of a mile off which looked like a ship bottom upwards."

THE INTERNATIONAL HYDROGRAPHIC BUREAU, MONACO.

HYDROGRAPHIC REVIEW, VOL. I., No. 2.

THE International Hydrographic Bureau of which Vice-Admiral SIR JOHN F. PARRY, K.C.B., late Hydrographer of His Britannic Majesty's Navy, is President of the Directing Committee, published in May of this year the second number of its Review.

The Hydrographic Review contains much information which will be of great interest to Marine Observers and shows clearly the work of the Bureau, the work which it is preparing and the work it proposes to undertake.

The President writes under the heading "Meteorology as allied to Hydrography."

"The question of the extent to which the subject of Meteorology is connected to the work of the Bureau was referred to in Circular Letter 44 of 27th October, 1922; winds, currents, precipitation and rainfall were specially referred to, and the States Members were requested to communicate to the special organisation dealing with these matters in their respective countries, the desire of the Bureau to be supplied with any charts and other publications referring to the subjects mentioned above.

"This request has been responded to very satisfactorily, and the Bureau is now in possession of a considerable quantity of material on these subjects.

"The line of demarcation between meteorology and hydrography is obviously one which it is exceedingly difficult to define exactly, but it is evident that there is connection in a variety of directions, one of which is the necessity of close examination of meteorologic data in connection with the important question of visibility of light."

In a Report on observations made of "Light in the United Kingdom," by Rear-Admiral PHAFF, a Director of the Bureau, tables of "Mutual Visibility of Lighthouses," "Percentage Visibility of Lights observed," and "Percentage of Visibility of Lightships," are given and discussed.

To Navigators, "On a Wireless Direction Finding Chart" (Skagerrak-Kattegat) by Captain G. REINIUS and Mr. P. COLLINDER, will be of special interest, they say:—

"At present two direction-finding stations, Vinga and Hallo are available for passing Skagen (the Skaw) and making the inlets to Gothenburg. A third station is under construction at Morup and will be opened to traffic this year. The value of this third station will be evident from a glance at the annexed chart. Its radius of action extends far to the West of Skagen, and it will give valuable aid in the rounding of this point which is well known to be somewhat difficult. It will be useful to navigation in the Kattegat and to the southward of Anholt Island also.

"In order to facilitate the use of the bearings received from the three stations mentioned, the Hydrographic Office of Sweden has essayed a new form of chart for this purpose. This chart is a Mercator's chart and is, mainly, a photographic combination of existing Swedish charts; the combination of an ordinary chart with a direction-finding chart is calculated to facilitate its use by Mariners. Some of the other advantages gained by this method appear to be:—

"Navigators generally find it difficult to lay off a very long bearing through a certain point, no such difficulty will arise when using this

chart, for the true bearings from the stations in question are drawn at every five degrees and every degree is marked at certain radii. The radial distances between the circles graduated in single degrees are such that the arc of a great circle between two corresponding points on adjacent graduations may be taken practically to be a straight line. This method of plotting will without doubt be found to be both simple and reliable. Moreover the azimuth correction applied when plotting wireless bearings on ordinary Mercator's charts will not be necessary, for the lines of bearing shown are calculated and laid off as arcs of great circles and will give the ship's true bearing independently of the distance from the station. Thus the use of this chart combines greater accuracy with greater rapidity in plotting the bearings.

"It may be pointed out that, when using this chart for plotting bearings taken with the ship's own direction-finder, it will be necessary first to apply *twice* the ordinary correction to Mercator bearings—i.e., the total amount of meridian convergence. This, as is well known, is the case with the gnomonic chart also.

"The rapid expansion of wireless direction-finding methods is, without doubt, still causing charts of varying type to be produced. It is hoped that the type advocated here may be regarded as a step in the right direction."

There are interesting remarks on "Conventional Symbols and Abbreviations for use on Charts" and a memoir upon MAURY by the President, also a number of articles on the modern aspects of this great subject which is the foundation of navigation.—L. A. B. S.

"Hydrographic Review," Vol. I, No. 2, published by the International Hydrographic Bureau, 3, Avenue du Port, Monaco. Price 5 francs (Swiss).

Applications for publications should be addressed to the Secretary-General, at the above address.

HINTS FOR KEEPING THE SHIP'S METEOROLOGICAL REPORT FORM 911.

THE latest reprint of Form 911 provides a column in which to insert absolute pressure and to facilitate easy reference the columns have been numbered in similar manner to the Meteorological log though it should be noted that the latter has 30 vertical columns as against 22 in Form 911. For full instructions as to observation the "Marine Observers' Handbook," 3rd Edition, with Corrections to September, 1922, should be referred to, the following hints for writing up Form 911, will, however, be of assistance.

These forms are for use with the ship's instruments in ships appearing upon the list of Voluntary Observing Ships published in the "Marine Observer." They are also used with Meteorological Office instruments in ships specially detailed for reporting to the Office in Code by Wireless Telegraphy.

By this means some 1,800 completed forms 911 are returned to the Marine Division with observations from all Ocean routes a year, which is sufficient for present requirements.

Columns 1 and 2.—Month and Day require no explanation.

Column 3.—Gives the time of observation, ship's time 8 a.m. and 8 p.m. against which should be noted A.T.S. or local standard, whichever is being kept, also the difference from G.M.T. in the "Remarks" Column.

Columns 4 and 5.—Latitude and longitude of position at which the observations were made. These should be entered with the usual care and accuracy used in the ship's own log book.

Columns 6 and 7.—The *True* direction and force of the wind. In this case the word *True* is not only used to indicate the *True* compass, but also the *True* wind. In short, don't look up at the funnel and think that the smoke will give you the direction and force of the wind when under way. The sea surface will give you the best indication as to both force and direction, see pages 38 to 42, "Marine Observer's Handbook," (Third Edition.)

Column 8.—Always enter the uncorrected reading of the barometer in this column whether you intend to give the correct pressure or not. If a mercurial instrument and pumping, take the mean level of the top of the mercury as judged by eye in much the same way as you would take the draught of your ship when there is a lop.

Column 9.—Enter the reading of the thermometer attached to the Barometer which is to give the temperature of that instrument and not of the air; this is not required when an aneroid is used.

Column 10.—Having ascertained the Index error of your barometer before going to sea, either by means of the *blue postcard* which you have previously sent in to the Meteorological Office, or in the manner explained in Chapter II. of "Wireless and Weather," pages 22 and 24, reduce the observed reading to correct pressure for sea level in the manner described in Chapter II., referred to, or see pages 16 to 20 of the "Marine Observer's Handbook." If your instrument is an aneroid only apply correction for index error and height. Do not fail to enter the particulars of your barometer required at the bottom of the form before completing it. By making this little calculation twice daily and entering the result in Column 10, you will be assisting in the furtherance of the use of your observations and in some measure reducing the cost of the work to the State.

Column 11.—Enter the temperature of the air as measured by a thermometer unaffected by the sun's direct rays, spray, rain, or artificial heat, that is to say the temperature of the free air over the sea as near as you can get it.

Column 12.—Sea surface temperature, a small canvas bucket, ballasted at the bottom with sand or small shot, will enable you to obtain a sample of sea water from overside even if steaming at high speed. Care is necessary to draw water forward of all outlets. An ordinary air thermometer placed in a copper case with a receptacle at the bottom sufficient to keep the bulb covered with water while being read is recommended.

Columns 13, 14 and 15.—Clouds : Types and Amount.—Great care should be taken in entering the types of clouds observed in their columns, Upper or Lower. The total amount of clouds of all types visible both upper and lower is required. Thus if there was 1/10th of the sky covered by Cirrus high in the sky and 3/10th covered by Cumulus lower in the sky, the amount would be 4/10th. The movement of the Upper clouds should be given whenever possible in the remarks column. The velocity being indicated as follows :—

- 0 Stationary.
- 1 Slow movement.
- 2 Moderate Speed.
- 3 Fast.

The direction *from* should be given true, remembering that the speed of your ship may alter the apparent movement. As regards types, the following abbreviations should be used :—

In the column for upper clouds.

Ci., Ci-St., Ci-Cu., A-St., A-Cu.

In the column for lower clouds.

Cu., St., Nb., St-Cu., Cu-Nb., Fr-Nb., Fr-Cu., Fr-St.

A compound name such as Strato-Cumulus should always be written as St.-Cu., with a hyphen between the two parts to distinguish it from St/Cu., Stratus and Cumulus.

If Stratus and Cumulus are both present they should be denoted thus St/Cu. with a vertical stroke between them.

Such terms as St. Cu. without a hyphen or stroke should never be used, as it is not evident whether Stratus and Cumulus are both present, or Strato-Cumulus only.

Particular attention should be paid to the observation and record of Cirrus, *particularly in Tropical Cyclone regions.*

Column 16.—The Beaufort notation is given upon the back of the form.

Columns 17, 18, 19, 20 and 21.—Also the Visibility, Sea and Swell scales.

Column 22.—Remarks on any feature of the weather which is not adequately described in the preceding columns, especially the time of commencement and ending of fog, rain, etc., also visibility when making landfall. Avoid repetition but make your record as complete as possible by using this column. The time and distance off salient points of land should be entered. Additional remarks in manuscripts which may be pasted to the form describing unusual phenomenon and specially interesting experiences will be much appreciated. Sketches and photographs will contribute to the success of this journal.

Ocean current observations : Overleaf are provided columns which explain themselves to any navigator. The notes which frequently appear on the back of the ice chart will provide sufficient hints for this branch of observation and Chapter IX. of "Wireless and Weather" deals with the subject

Remember Captain TOYNBEE's advice : "A blank space is preferable to a doubtful observation."

These forms are now classed upon receipt in the Marine Division and it is hoped that a high percentage of "Excellents" may be obtained each year. "Work of the Year," usually published in the June Number, will in future give information of the number and classing of ship's meteorological reports contributed by Marine Observers. Individual acknowledgment is made monthly in the List of Voluntary Observing Ships.

MARINE SUPERINTENDENT.

Marine Division,
Meteorological Office,
London.
July, 1924.

THE MARINE OBSERVERS' 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.

LONG DISTANCE DRIFTS.

THE following notes and photograph have been received from Captain J. J. AIREY, Deputy Director of Navigation, Marine Agent of the Meteorological Office, at Fremantle, Western Australia.

Derelict Light Buoy from South America stranded on Western Australia Coast.

"A spherical floating gas buoy constructed of steel with a superimposed steel framework structure supporting a dioptric lantern illuminated by acetylene gas was reported to have broken adrift on July 3rd, 1918, from its moorings off Cape Indio, River Plate (South America). This buoy is identical with a gas buoy, having ironwork superstructure that was found stranded on the coast of Western Australia near Cervantes Island about 100 miles north of Fremantle.

"The Master of the steamship *Poona* recently reported to the Commonwealth Navigation Service having passed, on March 9th, 1923, in the Indian Ocean, when in latitude 36° 38' S., longitude 106° 06' E., a derelict light buoy whose description agrees with the buoy eventually found cast ashore north of Fremantle. The position of the buoy when sighted by the *Poona* was 570 miles S.E. of the position where found, showing that its average daily drift was 4½ miles per day for a period of 122 days since it was sighted by the *Poona*.

"The Trinity House Authorities in England were advised of the discovery of a buoy on the beach at Cervantes, W.A., and provided with a description of the buoy. This was circulated to foreign Governments and the identity of the buoy was determined.



"The voyage of this derelict light buoy is a remarkable ocean drift of 8,500 miles. Assuming that it followed the shortest and most direct route, it has drifted at the rate of 4.6 miles per day for the five years (exactly) it was adrift.

"Another remarkable feature is that the buoy after its severe buffeting is intact and in very good condition. The lantern and lighting mechanism were removed intact and placed in the Customs House at Fremantle for safe keeping. The buoy was left on the beach where it was stranded and the opinion has been expressed that the cost of recovery and transit of the buoy back to the Argentine Republic would be greater than it is worth. The cost in Australia of a light buoy of this description would be approximately £600. The type is almost similar to those in use in Port Phillip Bay for indicating to Pilots and shipmasters the various deep-water channels.

Drifting Bottle found near Cape Leeuwin.

"This bottle containing the following message, was found on the beach near Cape Leeuwin, on the 4th December, 1923.

'SS. *Pallas*. April 16th, 19—(?).

'Bound from San Francisco for Buenos Aires off Santa Cruz, Argentine. Arrive Straits of Magellan 7 p.m. to-night.

'To Finder.

'Please write and let us know when and where you pick up this note. Thanking you, we remain.

'C. J. PHILLIPS,

1016 San Antonio Ave.,
Alameda, California, U.S.A.

'P. J. BALLAST,

930 Union Ave.,
Grand Rapids, Michigan, U.S.A.'

"The persons mentioned have been communicated with and in their replies have stated that this bottle was dropped overboard off Santa Cruz, Argentine, on April 16th, 1921.

"These two instances of long distance drifting are interesting as the objects landed on this coast at points about 280 miles apart. The bottle containing the message has been two years and 8 months drifting from the South American coast, whereas the derelict buoy was drifting for five years from the time it left its moorings at the River Plate, South America."

A note with regard to the drift of this buoy was published in the June Number, Marine Observer's Log.

CURRENT OBSERVATIONS.

THE following observations of current have been received from SS. *Port Stephens*, Captain I. R. SAWBRIDGE, observer Mr. H. G. B. PINKNEY bound Panama to Auckland, New Zealand. Mr. PINKNEY calls attention to difference of current experienced by SS. *Port Stephens* and another ship on the same route with which *Port Stephens* was in wireless communication and his remarks are given:—

"Daily comparisons with another vessel bound the same way and passing us forty miles to the Southward were very disappointing however. Day after day and week after week she reported South Westerly sets of over 20 miles while ours were North Westerly sets of 12 miles or so, and from the 14th October to various points whereas she carried this south-westerly set right up to the day before her arrival in Auckland.

"The only way I can account for this is a possible index error in her log to add. This would put her D.R. astern (if unknown) and lead her to assume a South-Westerly set. Her W/T. set had a receiving range of about 300 miles. On the 12th day out we gave her a time signal which was the only one she received until she was approaching Auckland. The only other reason for such constant and considerable disagreement is that the estimation of her leeway may have been considerably in excess of that supposed by the Master and myself for this vessel."

Currents Experienced from Panama to Auckland.

SS. *Port Stephens*.

SS. _____.

Date.	Lat.	Long.	Set.	Drift.	Wind.	Date.	Lat.	Long.	Set.	Drift.	Wind.
" 1923.						1923.					
Oct.	N.	W.				Oct.	S.	W.			
2nd	5° 55'	81° 27'	S. 42° W.	13	W.S.W.	—	—	—	—	—	—
3rd	2° 51'	84° 28'	N. 27° E.	8	S.S.W.	—	—	—	—	—	—
	S.										
4th	0° 08'	87° 38'	N. 45° W.	3	S.S.E.	5th	1° 13'	88° 21'	S.W.	27	S'ly.
6th	5° 24'	95° 15'	N. 35° W.	12	S.E. by S.	6th	4° 24'	92° 18'	S.W.	34	S'ly.
7th	8° 05'	99° 11'	S. 83° W.	13	S.E.	7th	7° 05'	96° 32'	S. 58° W.	12	—
8th	10° 49'	103° 14'	N. 31° W.	12	S.E. by E.	8th	9° 55'	100° 52'	S. 49° W.	18	Mod. trade conditions.
9th	13° 20'	107° 11'	N. 57° W.	12	East.	9th	12° 46'	105° 13'	S. 47° W.	16	—
10th	15° 53'	111° 03'	N. 38° W.	10	East.	10th	15° 38'	109° 43'	S. 37° W.	29	—
14th	24° 48'	128° 00'	N. 84° W.	13	N.E.	14th	25° 28'	128° 27'	S. 30° W.	16	S.E.
15th	26° 34'	132° 39'	South	4	N.N.W.	15th	28° 00'	133° 19'	S. 34° W.	17	W'ly.
16th	28° 06'	137° 13'	S. 18° E.	12	S.W.	16th	29° 58'	138° 07'	S. 8° E.	10	S.W.
17th	29° 26'	141° 58'	N. 30° E.	8	S.E.	17th	31° 39'	143° 34'	S. 76° W.	15	S.W.
18th	30° 48'	147° 04'	N. 20° W.	4	E.N.E.	—	—	—	—	—	—
19th	32° 03'	152° 31'	S. 34° W.	14	West.	19th	33° 15'	149° 13'	S. 41° W.	15	N'ly.
20th	32° 57'	157° 13'	N. 63° E.	10	S.W. by W.	20th	34° 38'	154° 57'	S. 19° W.	9	N.W.
22nd	35° 05'	168° 03'	N. 23° E.	5	N.E. by E.	21st	35° 23'	160° 11'	S. 12° E.	6	S.W. Rgh.sea.
23rd	35° 47'	173° 40'	S. 45° W.	10	N.W.	22nd	36° 01'	166° 02'	S. 35° W.	11	East.
24th	36° 14'	178° 44'	S. 30° E.	11	W. by S.	23rd	36° 24'	172° 18'	S. 79° W.	11	W'ly.
3.10 a.m.											
26th	36° 19'	178° 10'	N. 82° W.	7	W.S.W.	24th	36° 30'	178° 15'	S. 58° W.	12	W.N.W. 6. Rgh."
		to Cuvier Is.									

PHOSPHORESCENT PATCHES.

THE following is an extract from the Meteorological Log of SS. *Omar*, Commander G. L. SIMNER, R.D., R.N.R., Suez to Colombo :—

"14th October, 1923, at about 3.30 a.m., 1000 G.M.T. in latitude $7^{\circ} 50' N.$, longitude $76^{\circ} 18' E.$

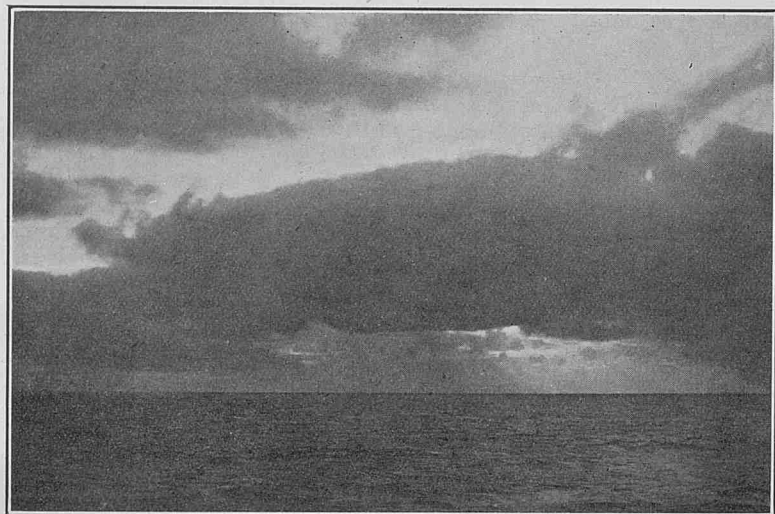
"Barometer 1011.1 mb. (29.86 in.). Temperature, Air 81° , Sea 82° . Large expanding patches of light were observed in the sea around the ship; these patches whilst expanding became very brilliant and after about two minutes died away. They commenced with a diameter of about one foot and expanded to at least 30 yards.

"The sea was smooth with a slight swell. Wind northerly airs."

CLOUD PHOTOGRAPH.

THE accompanying photograph of cloud was taken on October 10th, 1920, in Latitude $55^{\circ} 26' N.$, Longitude $38^{\circ} 45' W.$ by Mr. H. S. KNIGHT SS. *Empress of France*, the late Captain E. Cook.

"The observations made at 8 a.m. were :—Wind S.W. by W. 4. Bar. 1009.2 mb. (29.80 ins.). Dry bulb 40° , wet bulb 38° . Cloud Nb./Cu. 2. Sea S.W. by W. 4. Swell N.W. 5. Sea temperature 45° ."



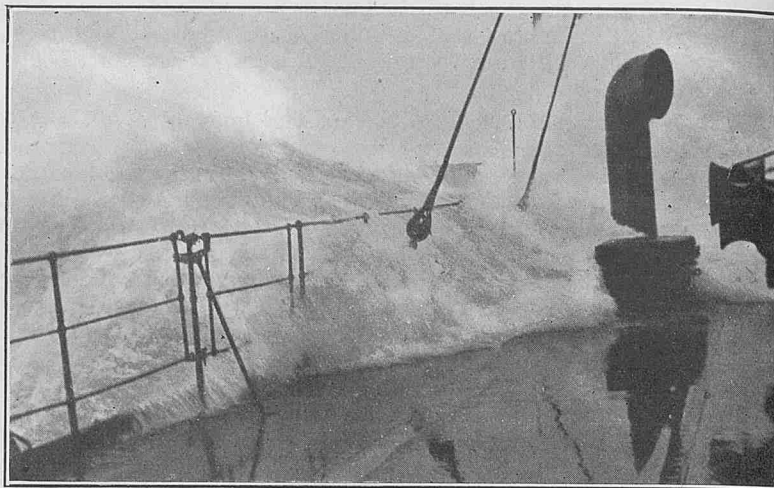
SQUALL.

THE following note has been received from S.S. *Clan Ross*, Captain W. G. M. CHRISTIAN, Observer Mr. S. M. WERREY EASTERBROOK, East Indies to Barcelona, Spain, via Suez :—"October 5th, 1923, 10.30 a.m. to 11 a.m. from Latitude $36^{\circ} 09' N.$ to Latitude $36^{\circ} 11' N.$, Longitude $14^{\circ} 13' E.$, to Longitude $14^{\circ} 08' E.$, steamship passed under a broad belt of St.-Cu. cloud lying in a S.W. and N.E. line, just west of Gozo Island, and stretching from horizon to horizon in two layers, one (the upper) of which moved slowly from S.S.W., the other (the lower) at normal speed from N.N.W. Wind direction N.N.W. 3. There was also a confused sea and swell. The sea being slight and from N.N.W. and South, whilst a slight N.N.W. swell was confused with a rather high Southerly long swell. There was no change in either barometer or thermometer during passage. As steamship proceeded to Westward and cleared the cloud, the wind increased to force 5, and sea and swell from N.N.W. became moderate."

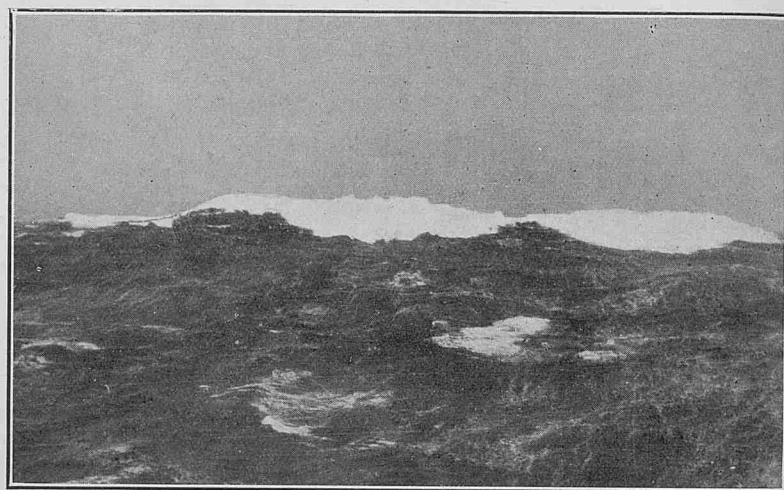
STORM IN THE SOUTHERN OCEAN.

COMMANDER C. HESTER, R.D., R.N.R., S.S. *Peshawur* has forwarded an account of very heavy weather experienced when running the Easting down from Cape Town to Adelaide, an extract from which is given below :—

"The accompanying photographs taken by Mr. SNOW, 3rd Officer, S.S. *Peshawur*, give a graphic idea of the heavy seas experienced.



"29th September, 1923. Latitude $37^{\circ} 23' S.$ Longitude $63^{\circ} 31' E.$ Starboard side between funnel and bridge deck just abaft No. 3 hatch. The ventilator is to the forward bunks, and eventually had to be unshipped and plugged."



"Taken from upper bridge S.S. *Peshawur*, October 10th, 1923. Latitude $36^{\circ} 22' S.$ Longitude $129^{\circ} 56' E.$ "

"Sunday, 7th October, 1923. During the afternoon wind was variable, force 2, and at midnight had backed to West 4, Bar. 1006.4 mb. (29.72 ins.), inclined to rise.

"Tuesday, October 9th, 1923. Noon Position, $37^{\circ} 30' S.$, $124^{\circ} 5' E.$, steering $N.80^{\circ} E.$, true. Bar. 1009.7 mb. (29.82 ins.) falling slowly wind West 7, increasing. Passing rain squalls, high following sea and swell increasing, at 6 p.m. wind backed to S.W. 8, Bar. 1007.2 mb. (29.74 ins.). Inclined to rise.

"Wednesday, 10th October, 8 a.m. Position $36^{\circ} 30' S.$, $128^{\circ} 56' E.$, Bar. 1010.4 mb. (29.84 ins.) rising, wind S.W. 9 to 10. Strong gale, precipitous south-westerly sea and swell, taking heavy water fore and aft to windward, 11 a.m., commenced using oil from starboard latrines. Height of waves estimated about 45 feet. Noon position, $36^{\circ} 22' S.$, $129^{\circ} 56' E.$, steering $N. 78^{\circ} E.$, true.

"Course and Dist. to $5' N.$ of C. Borda Light House. $N. 82^{\circ} 45' E.$ 325.

"Bar. 1012.6 mb. (29.90 ins.) rising slowly, wind S.W. by W. 10. Whole gale, cloudy, with squalls of hurricane force accompanied by rain, lurching heavily to mountainous S.W. sea and swell, taking heavy water all over to windward.

"2 p.m. Wind W.S.W. 10, Bar. 1013.1 mb. (29.92 ins.) rising steadily, approx. position $36^{\circ} 17' S.$, $130^{\circ} 25' E.$ Owing to mountainous sea and swell running, and frequent violent squalls of wind and hail, ship gripping to windward and shipping heavy water fore and aft, decided to heave to. Used oil, cleared decks and waited for favourable opportunity, and using engines brought ship round on Port helm; 2.5 p.m. S.B.E. ; 2.14, ship round ; 2.15 slow ; 2.26, half speed—40 revs.,

about 6 knots. Ship came round very well as she has good steam power and a half balance rudder. Engines at slow, she simply bowed to the sea and made sternway. At half speed she lay to comfortably, heading S. 31° W. true, and making about 1 knot.

"At 4 p.m. wind S.W. by W. 10. Bar. 1014.0 mb. (29.94 ins.), rising quickly, steering S. 31° W. true, logging 2 knots. Whole gale, violent squalls of hail and rain, ship labouring to mountainous south-westerly sea and swell, and taking heavy water over forward occasionally. 6.42 p.m., Position by Stars: Obs. Latitude $36^{\circ} 21\frac{1}{2}'$ S. Longitude Obs. $130^{\circ} 20'$ E. D.R. Latitude $36^{\circ} 24'$ S.; Longitude D.R. $130^{\circ} 20'$ E. 7 p.m., wind S.W. by W. 9, decreasing, discontinued use of oil, steering S. 28° W. true.

"Extract from the Register, Adelaide, Friday October 12th, 1923.

"One of the worst nights in the history of the state was experienced on Wednesday. Old hands say that they remember

nothing to eclipse it for the month of October. Considerable damage was done to property in some places.

"O Pilot, 'tis an awful night, there's danger on the deep" might have been quoted as the summary of human thoughts upon the violence of the storm, etc."

"Thursday, October 11th, 1923, 1.0 a.m. Bar. 1021.4 mb. (30.16 ins.), rising, S.S.W. 6. Weather moderating quickly. 1.18 a.m., full speed and turned ship to the Eastward using engines as required. 1.25 a.m., steering N. 81° E. true; revs. 73, speed 12 knots. Position $36^{\circ} 40'$ S., $130^{\circ} 07'$ E., by D.R., very high and confused south westerly swell running. When ship was hove to, compass oscillated from 15° to 20° . To C. Borda wind varied between S.S.W. to S. 5, with very very high S.S.W.ly swell running.

"Friday, 12th October, 1923. Anchored at 1.15 p.m. Semaphore anchorage off Adelaide."

WIRELESS AND WEATHER, AN AID TO NAVIGATION.

CHAPTER X.

THE THERMOMETER AS AN AUXILIARY TO THE BAROMETER.

THE examples in previous chapters give conclusive proof of a definite law of relation of wind to pressure away from the land and disturbing causes.

The persistent alternation of sea and land breezes in the Tropics caused by the inrush of cooler air over the sea to take the place of the warmed rising air over the land during the day, and the outrush of air cooled over the land at night to replace a warmer layer over the sea is sufficient to prove that there is a relationship of temperature to wind and indirectly to pressure, but no rule for temperature and wind or temperature and weather such as BUYS BALLOT'S law for wind and pressure has been found.

As heat is a fundamental source of energy in the atmosphere it follows that it must have great effect upon weather and therefore consideration of temperature is important for general prediction.

In the middle of the last century the German professor, H. W. DOVE, propounded a theory by which he accounted for the formation of cyclones as the result of the conflict of cold polar and warm equatorial winds meeting. DOVE dedicated the second edition of his book "The Law of Storms considered in connection with the ordinary movements of the atmosphere" to Admiral FITZROY.

Of recent years Professor J. BJERKNES of Norway, has developed a theory which seems to revert to DOVE's line of thought. Instead of dividing the cyclone with reference to the centre into four quadrants lying to left and right of the line of progression and in front and in rear of the trough according to ABERCROMBY as in FIGURE 1, Chapter I, BJERKNES divides it into two very unequal parts by two lines which meet at the centre. See FIGURE 37.

Typical Flow Lines of Air in a Cyclone of Northern Latitudes, after Bjerknes.

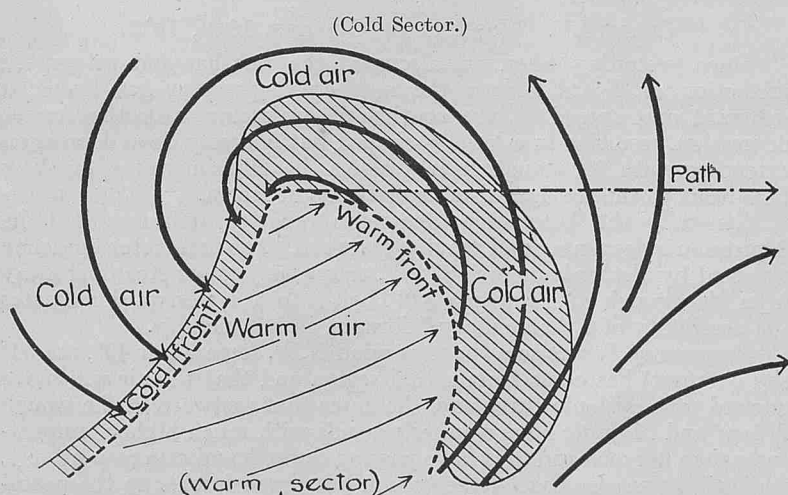


Fig. 37.

These two lines indicate the boundary between the warm and colder air of the cyclone and are dotted in the figure, thus dividing it into warm and cold sectors.

The dividing line from the centre, eastward and south-eastward or in advance, is called the warm "front," while that from the centre, south-westward or in rear, the cold "front."

The dark flow lines represent cold wind and the light flow lines warm winds.

Usually there is a marked rise of temperature at the warm front preceded by considerable rainfall, the area of which is shaded in the figure. At the cold front there is a sudden fall of temperature accompanied by a shower of rain; this corresponds with the "trough."

The rain in advance of the warm front is attributed to the ascent of warm moist air over cold air, and the rain in rear of the cold front to undercutting of the warm air by the cold winds from the rear.

Rainfall in regions outside the shaded areas in advance of the warm front and in rear of the cold front is attributed to local instability of air passing over warmer sea or land.

Working on this hypothesis the Norwegian Weather Service predicts local rainfall in all parts of its mountainous sea-girt country. What is of more interest to seamen is that it is contended that when the warm sector is of marked higher temperature than the cold sector, cyclones develop, while if the warm sector is cut off by cold air, surrounding it, the supply of warm air to the centre being cut off, the cyclones fill up.

The former case may frequently happen in the western North Atlantic when the wind from the southward circulating round the western side of the Atlantic anti-cyclone blows into a cyclone.

The latter case may occur when cyclones have crossed the Atlantic and the chilled air drawn from the Atlantic circulates round them.

A severe storm which was encountered by R.M.S. *Olympic*, Commodore SIR BERTRAM HAYES, K.C.M.G., D.S.O., R.N.R., and other ships in December, 1921, affords an excellent example of a cyclone intensifying with a marked warm sector.

CHART L, FOR MORNING OF DECEMBER 11TH, 1921, shows a depression centred just south of *Olympic's* position to the southward of Cape Sable and a wedge extending N.W. from the anti-cyclone to the S.E. The wind at Bermuda south of the depression is S.W. force 7, with air temperature 62° ; this is the only report to indicate the warm sector; the ships in the depression are west, north and E.N.E. of the centre and all report much lower temperatures.

The depression travelled E.N.E. at 23 knots and *Olympic* steamed E. by N. 21 knots, so that the ship and depression were on slightly converging courses, the storm travelling rather faster than the ship. *Olympic* experienced a steady E.N.E. wind increasing in strength. At about 7.30 p.m. the storm's path had curved north eastward and *Olympic* ran into the centre. CHART LI shows the pressure distribution, wind, weather and temperatures existing in the cyclone at 8 p.m., on December 11th, 1921. *Olympic* had a moderate gale from S.E. with rain and air temperature of 61° . *Missouri*, *Winifredian*,

Orduna and *Valacia* have northerly winds and air temperatures as much as 19° lower than *Olympic* in the warm sector.

The storm continued to travel N.E. by N. at about 15 knots, *Olympic* continuing on her course E. by N. at 17 knots, the wind remaining nearly steady in direction from E.S.E. but increasing in force with falling barometer.

At 4 a.m. (ship hove to) the wind was S. by E. force 10 and the trough passed.

In the morning watch with barometer rising the depression drawing away from the ship to the northward, the wind veered to N. by E. but increased in strength. At 6 a.m. the wind was S.S.W. force 11, very high sea, with frequent fierce rain squalls.

CHART LII, MORNING OF DECEMBER 12, 1921. *Olympic* and *Nile* have wind S.W. force 11, air temperature 52° and wind S.S.E. force 11, air temperature 53° respectively, indicating that the air in the warm sector has cooled some 8° since the previous evening. All other ships in the cyclone including *Vellavia* with wind south, temperature 40°, still report considerably lower temperatures. Thus a shallow depression on December 11th, 1921, with a warm sector developed into an intense cyclone in less than 24 hours.

CHART LII affords another example regarding the wind in moving cyclones of middle and high latitudes. It will be noted that ships nearly equidistant from the centre but on different bearings from it have widely different wind forces and that *Megantic*, nearest the centre and north of it, had only a fresh breeze from east.

Now the wind at any position or place over which a cyclone is passing is made up of two constituents, that due to the progressive movement of the system and that due to the spin within the whirl itself.

With an east moving cyclone at places south of the centre these two constituents are in the same direction and here the winds are strong, while north of the centre the constituents are in opposite directions resulting in less wind.

Practical consideration of some effects of Temperature.

The atmosphere derives its heat directly or indirectly entirely from the sun. The temperature of the air depends more upon heating by conduction and radiation from the earth's surface heated by the sun's rays, than by the direct rays of the sun. That is the sun's rays pass through the air without imparting much heat to it, but the surface of the earth is heated by the sunshine and the air is warmed by contact with the earth by radiation and convection. Land absorbs heat and radiates it more quickly than water.

When the sun's rays fall upon water the heat produced instead of being arrested at the surface penetrates and by vertical and horizontal currents is diffused to a considerable depth over a large expanse.

The capacity of air to carry heat is small compared with water. Water absorbs heat, stores it, and conveys it whither it flows.

Over the ocean there is small diurnal variation of the temperature of the air but over the land this is considerable.

CHART LIII shows the mean sea surface temperatures over the North Atlantic for the month of October, in which the influence of currents particularly the Gulf Stream and Labrador current may be seen by the trend of the isotherms. The mean track of cyclonic depressions in October is also shown.

Variable currents and sunshine produce frequent variations from these normals so that large or even small areas of sea surface may have widely differing temperatures, which impart different degrees of heat to the air above them. These variations tend to produce unstable conditions which may contribute to the development of atmospheric disturbances.

Rain or any form of precipitation is generally attributed to cooling of ascending air which is often produced by converging or crossing winds of different temperatures, the warm wind of moist light air riding over the cold wind of heavy air; where this happens there are also frequently squalls.

Instability of the atmosphere, that is when a layer of light air under a layer of heavier air breaks through the layer above it causing a violent upward air current until stability is restored, produces heavy showers, thunderstorms, hail and squalls.

The processes involved are extremely complex and beyond the scope of these Chapters, but the following examples will illustrate that prediction of weather at sea may be improved if reports of air and sea temperature are used as an auxiliary to barometer pressure.

Barometer reports enable us to obtain the pressure distribution and its probable changes with which, and wind reports, we may be able

to obtain the approximate flow lines of the air at the surface from day to day. Temperature reports will also assist us in tracing the air and ascertaining the changes it is undergoing.

Weather Charts of Pressure, Wind and Air and Sea Temperature and predicting Wind and Weather.

For exercise let us suppose that the reports have been broadcast, intercepted and charted by all the ships shown on CHARTS LIV to LIX each morning, and let us join the Commanders and Observing Officers of three of these ships in their Chart House in turn, i.e., *Miami*, Captain MAXWELL BROWN, Liverpool to Jamaica; *Empress of France*, Captain E. GRIFFITHS, Quebec to Cherbourg; and *Nascopie*, Captain T. F. SMELLIE, Newfoundland to Liverpool.

CHART LIV. MORNING OF OCTOBER 17TH, 1923.

There is a depression to the north westward of *Empress of France*, a small anti-cyclone centred east of *Miami* and a depression east of the Azores.

Barometer tendencies allowing for course and speed, reported by *Adriatic*, *Empress of France*, *Colonia* and *Zeeland* indicate that the northern depression is travelling eastward or S.E. or spreading south or may be it is deepening, while those reported by *Horta* and *El Paraguay* make it appear that the southern depression is nearly stationary and changing little.

Miami proceeding S. 59° W. 12 knots in the small anti-cyclone sees that *Empress of France* with a fresh breeze from S.W. has air 50°, sea 51°, overcast and drizzle, while *Adriatic* to the S.S.W. of *Empress of France* has a gentle breeze from West, air 59°, sea 65°, overcast, and that *Colonian*, E.N.E. from *Empress of France* with a strong S.W. by S. wind has sea and air 54°, overcast. The air at *Empress of France's* position is too cold to have come far from S.W., it has probably taken a curved cyclonic course from a region to the N.W. The sea surface is normal. The air at *Adriatic's* position has possibly taken a curved anti-cyclonic course from a region to the southward of west where there is the cold water of the Labrador current. The sea surface is 4° above normal, probably due to the Gulf Stream or an off-shoot from it being further north than usual in October.

The air at *Colonian's* position being 4° warmer than *Empress of France* has probably travelled on a curved cyclonic course from a position southward of that ship. The sea is only about 1° above normal.

These three reports give indications from which we may conjecture winds composed of air with different regions of departure of widely differing temperatures. With the northern depression travelling S.E. or spreading south and the southern depression stationary it is very difficult to predict what the pressure distribution is likely to become, though it will probably result in a large depression over the eastern North Atlantic in the next 24 hours and *Miami* may expect variable, then southerly winds as she proceeds on her course and that there will be unsettled weather with showers of rain.

According to her Meteorological Report (Form 911) *Miami* had the wind east force 4 at midnight with air 57°, sky overcast, misty, rain showers, later wind S.S.W. force 3 with passing showers.

CHART LV. MORNING OF OCTOBER 18TH, 1923.

Since yesterday when we discussed the weather and attempted prediction on board *Miami* the northern depression has travelled eastward and spread to the southward coalescing with the Azores depression, resulting in a large V-shaped but not very deep depression extending with its trough nearly along the 20th meridian of West Longitude to the southward of the latitude of *Horta*.

Generally the barometer tendencies reported indicates that the depression is deepening and moving eastward. The barometer tendency reported by *Verbania* on a S. 87° W. course at 7 knots steaming away from the trough and towards a "High" to the westward indicates the possibility of a "secondary" forming in her vicinity.

Empress of France sees that her wind N.W. force 5 (air 49°, sea 54° sky overcast) has come from a cold region and that the air will move onward with cyclonic curvature, she notes that eastward of the trough *Miami* and *Majestic* have southerly winds with much higher temperatures than her own and they have passing showers and rain respectively, while *Colonian* also east of the trough but much further to the northward has a moderate gale from S.S.E. with air 3° higher than her own and sea the same, sky overcast.

Near the trough the cold, comparatively dry, heavy air of the N.W. wind curving more from the westward, will be undercutting the warm comparatively moist light air of the southerly wind which will probably ride over the cold air coming from the N.W. causing rain and possibly squalls. *Empress of France* will expect that if the trough travels east at a greater speed than her own she may have north-westerly winds and clear cold weather, but if she overhauls the trough she may expect the wind to back considerably and that there will be rain. If a secondary is forming in *Verbania's* vicinity this prediction may be compromised. As *Empress of France's* barometer is rising slowly the depression is probably moving east at greater speed than her own.

According to her log the wind remained N.W. until midnight; after 8 a.m. on October 18th the barometer fell indicating that she had probably begun to overhaul the trough, or that the depression was deepening.

There were occasional rain squalls of short duration in the afternoon watch. From midnight the barometer rose slowly. At 2 a.m. on October 19th, 1923, the wind commenced to back and was logged as west, force 6 at 4 a.m. when there were passing showers. It is interesting to note that *Miami*, some 300 miles to the southward of *Empress of France's* track, experienced a heavy squall with rain at 11.40 a.m. when the wind shifted to N.N.W. this was on the line of the trough.

CHART LVI. MORNING OF OCTOBER 19TH, 1923.

This chart shows us that the trough of the depression travelled some 550 miles eastward in the 24 hours and that it drew further ahead of *Empress of France* and now stretches on a curved line from Cape Wrath to Brest.

Secondary depressions have developed to the N.W. of Corunna and near Latitude 48° N. Longitude 30° W. Barometer tendencies at stations in the British Isles indicate that the depression will probably continue to travel eastward. While the barometer tendencies of ships between the meridians of 25° and 35° W. indicate that there may be a not very unsimilar repetition of the pressure distribution which formed over the eastern north Atlantic between a.m. October 17th and a.m. October 18th, 1923.

Discussing the situation in *Nascopie's* chart house we see that it is not easy to forecast. However we bank on the expectation that the secondary to the southward will coalesce with the main depression. If this happens there will be a considerable strip of cold north-westerly winds in rear of the trough and ahead of *Nascopie*.

We therefore expect a fresh breeze to a gale from N.W. for the next 24 hours with cloudy weather and possibly passing showers. According to *Nascopie's* log the wind continued from W.N.W. with slowly falling barometer until 8 p.m., the sea and air temperature only falling 1° since 8 a.m.

At 8 p.m. the wind veered to N.N.W. and at midnight it was from N. by W. the barometer continuing to fall slowly up to that hour. The sky was cloudy or overcast throughout. During the first and middle watches the ship passed through a strip or tongue of cold water, the sea surface temperature being 50° at 8 p.m., 43° at midnight and 48° at 4 a.m., during this time the air temperature fell another degree and squalls and rain were experienced. The passage of the cold N. by W. wind over warmer water, then over colder water and finally over warmer water, cannot be attributed to causing these squalls and rain; they were more likely due to processes connected with the coalescing of pressure systems.

Nascopie has been in the Arctic and they have much of interest to tell, let us stay on board a few days, for we may hear much that is not in the log, or available for the "Marine Observer" to publish, and the sequence of weather discussed on 4 days in one ship, will be more helpful.

CHART LVII. MORNING OF OCTOBER 20TH, 1923.

There is now the extension of a depression with its trough along the meridian of 17° W. Longitude, which appears to be centred at some

distance north of the limit of our chart and judged by the wind and barometer reported at Wick the centre has moved to the northward or north-west instead of to the eastward as we expected, showing the difficulty of prediction of movement or change in weather systems when observations are not available to the northward of the centre as well as to east, south and west.

In view of the conditions reported by *Baltic* near the trough, this extension cannot be regarded as a true V for her observations indicate that there is not a sharp dividing line between the north-westerly and south-westerly winds.

Generally considered, the barometer tendencies indicate that the depression is moving eastward with deepening of the gradients in parts of the system.

Nascopie on her course for Inishtrahull will expect a continuance of north-westerly winds with cloudy weather and squalls with passing showers of rain or hail; the wind may be expected to increase to gale force at times.

According to the log the wind remained from N.N.W. a strong breeze until 8 p.m. and there were frequent heavy squalls with rain; at 8 p.m. it backed to N.W. and increased to force 8; at midnight it was W.N.W. force 8 after which it moderated.

CHART LVIII. MORNING OF OCTOBER 21ST, 1923.

This chart shows *Nascopie* that north-westerly winds and good visibility may be expected for another day, after which the possibility of the depression to the westward of *Vardulia* approaching will have to be considered in predicting the weather at the time of her landfall.

According to the log the wind was N.W. by W. force 7 and 6 throughout the 24 hours for which we predicted, there were squalls and sky clouded with Cumulus and Cumulo-Nimbus.

CHART LIX. MORNING OF OCTOBER 22ND, 1923.

Nascopie now sees that the trough of the depression ahead has moved very little, but that the centre has moved eastward so that the trough now lies over the west coast of Scotland and the Irish Sea. The barometer tendencies at coast stations indicate that this depression is nearly stationary.

The depression to the westward has travelled east, not less than 200 miles in the last 24 hours, probably more; the barometer tendencies of ships under its influence reported, indicate that it is probably deepening. *Nascopie's* own slowly falling barometer appears to be due to her approach to the trough of the depression on her port bow, but it may also be due to a general reduction of pressure spreading from the low astern.

To predict visibility and weather in this case for the time of landfall next morning is not easy.

We anticipate that the wind will back as the depression astern comes up and probably coalesces with the depression ahead. With a S.W. or southerly wind some rain and reduced visibility may be expected. The reports are not sufficient to enable us to trace convergence of winds; indeed under such conditions even with a number of reports this would be an extremely difficult matter.

According to the log the wind backed to west at 8 p.m. and S.W. at 11.15 p.m. moderating to force 4. At 4 a.m. October 23rd, 1923, the wind was still S.W. force 4; there was rain with visibility reduced to less than 5 miles.

At 8 a.m. the wind had backed to S.E. by S. and the visibility improved; course was altered at 8.55 a.m. and Inishtrahull was abeam, distant 1.4 miles, at 9.30 a.m.

These examples are sufficient to show that until fairly extensive observations have been made in the upper air by ships at sea, we have to conjecture much of what may be happening aloft.

As Commander L. GARBETT, R.N., Superintendent of Naval Meteorological Services, intimated in his "Investigation of the Upper Air," air soundings are usually impracticable in merchant ships; we hope he will obtain the co-operation of ships of the Royal Navy.

(To be continued.)

WEATHER SIGNALS.

II. WIRELESS WEATHER BULLETINS.

CHINA SEA—continued.

HONG KONG.

Cape d'Aguilar (Tailong head) W/T Station, approximate Latitude 22° 13' N., Longitude 114° 16' E., call sign VPS, broadcasts a summary of meteorological conditions at 2200 G.M.T. and weather forecasts based thereon, at 0500 and 0900 G.M.T., on a wavelength of 600 metres (spark). A second summary and forecast based upon observations at 0600 G.M.T. will be broadcast at 1100 G.M.T. and repeated at 1200 G.M.T.

CHINA.

Shanghai—Zikawei W/T Station, approximate Latitude 31° 12' N., Longitude 121° 26' E., call sign FFZ, broadcasts weather bulletins at 0300, 0900, 1400 and 1800 G.M.T. on a wavelength of 750 metres (spark). The bulletins are sent in four parts, viz. :—

The first part consists of a weather message, sent *en clair*, in French and English, for China and the China Seas, giving the observations of 0100 G.M.T., at 0300 G.M.T., of 0700 G.M.T. at 0900 G.M.T., and of 1200 G.M.T., at 1400 and 1800 G.M.T.

The second part consists of typhoons and gale warnings in the same form as Kien-an (see under W/T Storm Warnings, p. 125).

The third part gives information regarding air currents and clouds (0300 and 0900 G.M.T. transmissions only), in the following form :—

The message commences with the words "Air Currents"; altitudes are grouped and are indicated by the words "high" (15,000 to 6,000 metres), "mean" (5,500 to 2,500 metres) and "low" (2,000 to 500 metres). For each of these groups the direction of the wind is given *en clair*, i.e., N., N.E., etc.; several directions may figure for the same group and they refer to the wind at decreasing altitudes.

The observations are taken immediately before transmission.

The word "nil" is used when the observations for an altitude are missing.

The fourth part consists of observations taken at the stations mentioned in the list below, which are transmitted in code to Tsingtau.

Form of message :—

Two code letters, followed by two five-figure groups, for each observation station.

The 1st letter is the code letter of the station (see list below).

The 2nd letter gives the hour and date of observation, X = morning observations, Y = evening observations.

First Group of Figures :—1st 3 figures, give the corrected barometer reading in millimetres and tenths (the initial 7 being omitted). See Table V, p. 28, February number, for conversion to mbs. and ins. 4th and 5th figures give the wind direction true. (See Table IV., p. 15, January number.)

Second Group of Figures :—1st figure, gives the wind force by Beaufort scale, forces 9 and above being sent as 9.

2nd figure, gives the weather at time of observation. (See Table XIII, p. 29, February number.)

3rd, 4th and 5th figures, give the air temperature in degrees and tenths, Centigrade (500 is added for negative temperatures). See Table VII, p. 29, February number, for conversion to Faht.

List of Observation Stations.

			Position (approx.)	
			Latitude	Longitude
S	Shanghai ...	...	31 12 N.	121 26 E.
W	Wen chau ...	...	28 01 N.	120 40 E.
F	Fu chau (Sharp Peak) ...	...	25 59 N.	119 27 E.
T	Tomsk ...	...	56 10 N.	84 50 E.
R	Irkutsk ...	...	52 16 N.	104 30 E.
C	Chumkang ...	...	29 34 N.	106 31 E.
I	Itchang ...	...	30 42 N.	111 16 E.
K	Kiukiang ...	...	29 45 N.	116 08 E.

Note.—When the name of the observation station only is transmitted, it signifies that the observations were made a short time before the transmission.

Tsingtau W/T Station, approximate Latitude 36° 03' N., Longitude 120° 17' E., call sign XRT, sends out a weather message, on 600 metres wavelength, at 0000 and 1000 G.M.T. The message is in English and is preceded by the signal QST repeated 3 times, and gives date, time, location of pressure systems, direction and force of wind, state of the weather. The message is repeated twice.

JAPAN.

The W/T station attached to the Imperial Marine Observatory, Kobe, approximate Latitude 34° 41' N., Longitude 135° 11' E., call sign JTJ, broadcasts weather bulletins, giving a synopsis of the weather situation over Japan and the neighbouring seas, by means of data, in code, for twenty selected stations. The bulletins are broadcasted thrice daily, as follows :—

At 0030 G.M.T. giving the stations' observations and the weather situation at 2100 G.M.T. (previous day).

At 0530 G.M.T. giving the stations' observations and the weather situation at 0300 G.M.T.

At 1230 G.M.T. giving the stations' observations and the weather situation at 0900 G.M.T.

Wavelength used in a.m. transmissions 600 metres, and in p.m. transmission 750 metres, quenched spark (damped) respectively.

The bulletins are repeated 5 minutes later, in each case, on a wavelength of 2,650 metres, Poulsen arc (undamped).

Method of transmission of bulletins at all times is as follows :—

- (1) Commencing signal : — • — • — transmitted once.
- (2) QST " thrice.
- (3) " de " : — • • • " once.
- (4) Call sign, JTJ " once.
- (5) Message (weather bulletin) in code " twice.
- (6) End of message • • • — • — " once.

List of Selected Observation Stations (20 in Number).

Name of Station.	Province.	Latitude.	Longitude.
Ishigakijima ...	Loochoo Is. ...	24° 20' N.	124° 10' E.
Nafa ...	" ...	26° 13' N.	127° 41' E.
Nase ...	" ...	28° 23' N.	129° 31' E.
Miyazaki ...	Japan Proper	31° 55' N.	131° 26' E.
Shiwomisaki ...	"	33° 57' N.	130° 56' E.
Nagasaki ...	"	24° 23' N.	132° 27' E.
Shimonoseki ...	"	33° 57' N.	130° 56' E.
Choshi ...	"	35° 44' N.	140° 51' E.
Hachijo Is. ...	"	33° 06' N.	139° 50' E.
Chichijima ...	Bonin Is. ...	27° 05' N.	142° 11' E.
Fukui ...	Japan Proper	36° 03' N.	136° 16' E.
Akita ...	"	39° 41' N.	140° 06' E.
Sapporo ...	Hokkaido ...	43° 04' N.	141° 21' E.
Nemuro ...	"	43° 20' N.	145° 35' E.
Moppe ...	Korea ...	34° 47' N.	126° 20' E.
Joshin ...	"	40° 40' N.	129° 11' E.
Ryojun (Port Arthur)...	S. Manchuria	38° 47' N.	121° 16' E.
Changchun ...	"	43° 55' N.	125° 18' E.
Tsingtau ...	Shantung ...	36° 04' N.	120° 19' E.
Shanghai ...	China... ..	31° 15' N.	121° 30' E.

Code used : Explanatory Notes.

The bulletins are transmitted in a collection of letters and figures from the Tables forming the Japanese Meteorological Code, appended herewith, 100 symbols in all :—

(A) The first 20 groups, each of which consists of three letters and a figure, are sent in the order of the stations above, so that the first group refers to Ishigakijima, the second to Nafa and so on to the twentieth group.

(B) The remaining 20 letters are sent in 3 groups, one group containing 4 letters and two groups containing 8 letters in each.

Groups in (A) contain the corrected barometer readings, direction and force of the wind, state of the weather, at the stations, at the times mentioned on p. 136.

Groups in (B) give information concerning High and Low pressure areas.

Meanings of Code Letters and Figures in (A) and (B).

(A) 1st and 2nd letters in each group, give the corrected barometer reading in millimetres (mm.). See Table XLVII of this number, and Table V, February number to convert to mbs. and ins.

3rd letter in each group, gives the wind force by Beaufort scale and the state of the weather. (See Table XLVIII.)

The last symbol of each group, a figure, gives the wind direction (Table XLIX).

(B) The remaining groups of the message can be decoded as follows :

Twenty-first group of message. 1st and 2nd letters, give Latitude and Longitude respectively of the "high pressure" area. (Table L.)

3rd letter gives the approximate barometric pressure in the centre of the "high pressure" area in mm. (Table LI.)

4th letter gives information or remarks on the "high pressure" area. (Table LII.)

Twenty-second group of message. 1st, 2nd and 3rd letters, give, respectively, the Latitude, Longitude, and the position within a 2-degree square of Latitude and Longitude, of the "primary low pressure area." (Tables L and LIII.)

4th letter gives the barometric pressure in the centre of the "low" in mm. (Table LIV.)

5th letter gives the direction in which the "low" is moving. (Table LV.)

6th letter gives the velocity in kilometres per hour at which the "low" is moving. (Table LVI.)

7th letter gives a description of the "low." (Table LVII.)

8th letter gives supplementary remarks on the low. (Table LVIII.)

Twenty-third group of message gives information concerning the "secondary depression," exactly similar to that given in the preceding group. It can therefore be decoded, and the same tables used, in the manner described for that group.

Note :—Information lacking in (A) and (B) is replaced by ciphers to preserve the order.

Japanese Meteorological Code.

Table XLVII.—Barometric Pressure.

Tenths	-	0	1	2	3	4	5	6	7	8	9
Millimetres.											
710 & under	AA	—	—	—	—	—	—	—	—	—	—
711	AB	—	AC	—	AD	—	AE	—	AF	—	—
2	AG	—	AH	—	AI	—	AJ	—	AK	—	—
3	AL	—	AM	—	AN	—	AO	—	AP	—	—
4	AQ	—	AR	—	AS	—	AT	—	AU	—	—
5	AV	—	AW	—	AX	—	AY	—	AZ	—	—
6	BA	—	BB	—	BC	—	BD	—	BE	—	—
7	BF	—	BG	—	BH	—	BI	—	BJ	—	—
8	BK	—	BL	—	BM	—	BN	—	BO	—	—
9	BP	—	BQ	—	BR	—	BS	—	BT	—	—
720	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	—
1	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	—
2	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	—
3	CY	CZ	DA	DB	DC	DD	DE	DF	EG	DH	—
4	DI	DJ	DK	DL	DM	DN	DG	DP	DQ	DR	—
5	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	—
6	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	—
7	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	—
8	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	—
9	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	—
730	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	—
1	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	—
2	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	—
3	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	—

Tenths	-	0	1	2	3	4	5	6	7	8	9
Millimetres.					Code	Letters.					
734	...	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN
5	...	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX
6	...	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH
7	...	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR
8	...	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB
9	...	JC	JD	JE	JF	JG	JH	JI	JJ	JK	JL
740	...	JM	JN	JO	JP	JQ	JR	JS	JT	JU	JV
1	...	JW	JX	JY	JZ	KA	KB	KC	KD	KE	KF
2	...	KG	KH	KI	KJ	KK	KL	KM	KN	KO	KP
3	...	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ
4	...	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ
5	...	LK	LL	LM	LN	LO	LP	LQ	LR	LS	LT
6	...	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD
7	...	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN
8	...	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX
9	...	MY	MZ	OA	OB	OC	OD	OE	OF	OG	OH
750	...	OI	OJ	OK	OL	OM	ON	OP	OQ	OR	OS
1	...	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC
2	...	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM
3	...	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW
4	...	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG
5	...	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ
6	...	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA
7	...	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RK
8	...	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU
9	...	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE
760	...	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SO
1	...	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY
2	...	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI
3	...	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS
4	...	TT	TU	TV	TW	TX	TY	TZ	UA	UB	UC
5	...	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UM
6	...	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW
7	...	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG
8	...	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VQ
9	...	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA
770	...	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK
1	...	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU
2	...	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE
3	...	XF	XG	XH	XI	XJ	XK	XL	XM	XN	XO
4	...	XP	XQ	XR	XS	XT	XU	XV	XW	XX	XY
5	...	XZ	YA	YB	YC	YD	YE	YF	YG	YH	YI
6	...	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS
7	...	YT	YU	YV	YW	YX	YY	YZ	ZA	ZB	ZC
8	...	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZM
9	...	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW
780	...	ZX	ZY	—	—	—	—	—	—	—	—
781 and over.	...	ZZ	—	—	—	—	—	—	—	—	—

Table XLVIII.—Force of the Wind and State of the Weather.

Wind Force	-	0-1 (Calm).	2-3 (Light winds).	4-5 (Fresh winds).	6-7 (Strong winds).	8-9 (Hurri- cane).	10 (Ty- phoon).
Weather.							
Fine, clear	-	A	A	B	C	D	E
Cloudy	-	F	F	G	H	I	J
Rain	-	K	K	L	M	N	P
Snow	-	Q	Q	R	S	T	U
Fog	-	V	V	W	X	Y	Z

The Beaufort Scale should be consulted for the correct terms to be applied to the wind forces quoted above.

Note.—Although the same signals are given for "Calms" and "Light Winds," the former is always meant when the direction of the wind is omitted.

Table LVII.—Description of Depression.

Code Letter.	Meaning.	Code Letter.	Meaning.
A	Typhoon.	F	Almost a cyclone.
B	Depression developing; may become a typhoon.	G	Depression developing into almost a cyclone.
C	Violent typhoon.	H	Depression developing, may become a cyclone.
D	Cyclone.		
E	Violent cyclone.		

Table LVIII.—Supplementary Remarks on Depression.

Code Letter.	Meaning.
A	Force weak; gradually developing.
B	Force strong; gradually subsiding.
C	Developing gradually.
D	Subsiding gradually.
E	Developing rapidly.
F	Subsiding rapidly.
G	Heavy squalls in vicinity of centre.
H	Snow storms do.
I	Conditions at centre uncertain.
J	Force weak.
K	Storm area large.
L	Snowstorm area large.
M	Wind force exceeds 8 (Beaufort) - { 300 kilometres from centre. 400 do. do. 500 do. do. 600 do. do. 700 do. do.
N	
O	
P	
Q	
R	Following the cyclone a strong N.W. monsoon will set in over the Japan Sea and the vicinity of Hokkaido.
S	Following the cyclone heavy snowstorms from the N.W. will set in over the Japan Sea and the vicinity of Hokkaido.
T	Following the cyclone a strong N. monsoon will set in over the Eastern China Sea.
U	Following the cyclone a strong N.W. monsoon will set in over the Japan Sea and the vicinity of Hokkaido; and a strong N. monsoon over the Eastern China Sea.
V	Cyclone will develop rapidly, accompanied by snowstorms, over the Japan Sea.
W	Cyclone will develop rapidly, accompanied by snowstorms, over the Yellow Sea.
X	Cyclone will develop rapidly, accompanied by snowstorms, over the East Sea (Tō Kai).

WIRELESS STORM WARNINGS.

CHINA SEA—continued.

HONG KONG.

Cape d'Aquilar (Tailong Head), W/T station, call sign VPS, broadcasts storm warnings at 0400 G.M.T. and repeats them every two hours until 1600, on a wavelength of 600 metres. If a second warning is issued during the day, the later warning will be substituted.

FORMOSA.

Keelung (Kürun) W/T station, approximate Latitude 25° 08' N., Longitude 121° 45' E., call sign JFK, broadcasts a storm warning at 1230 G.M.T. on a wavelength of 600 metres (spark). The warning is sent *en clair* in English and commences QST QST QST followed by the text of the message which is sent three times.

CHINA.

Tsingtau W/T station, call sign XRT, broadcasts a storm warning at 1300 G.M.T. on a wavelength of 600 metres. The message, which is transmitted in *English*, is preceded by the signal QST repeated three times and contains the following information: warning, date, time, position of centre of cyclone (or typhoon), barometric pressure at storm centre, and direction in which centre is travelling.

JAPAN.

The W/T station of the Imperial Marine Observatory, Kobe, call sign JTJ, broadcasts storm warnings after the weather bulletins on a wavelength of 600 metres (spark) by day, and 750 metres (spark) by night. The warnings are broadcasted *en clair* in English and contain the following information: warning, date, time, position of cyclone (or typhoon), direction in which it is moving or expected movement, or information concerning severe gales, or duration of monsoon.

III. VISUAL STORM WARNINGS.

CHINA SEAS STORM SIGNAL SYSTEM.

Typhoon and Storm Signals.

The following stations exhibit Typhoon and Storm Warnings which are issued from Zikawei Observatory:—

The Maritime Customs Stations at Newchwang, Taku, Chefoo, Chinkiang, Wusung, Gutzlaff, Pagoda anchorage, and Amoy.

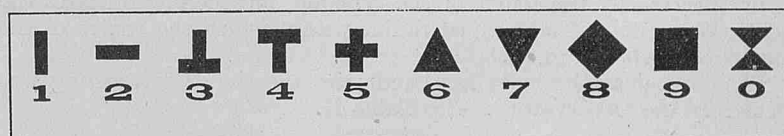
The French Municipal station at Shanghai.

The British station at Wei-hai-wei.

(Storm warnings are also issued to, but are not signalled, from Antung, Chin wang tao, Hankow, Ningpo, Chinhaï and Wen chau.)

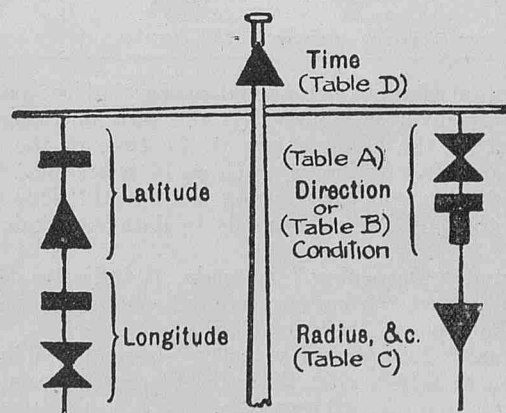
The Maritime Customs station Swatau (warnings issued by the Royal Observatory Hong Kong).

The signals are made by means of the following symbols, each corresponding, for certain purposes, to a number.



The symbols are hoisted at the yardarms and mast head of the storm-signal mast and have the general characteristics as shown below.

Typhoon Signal.



Meaning.—A severe typhoon within 30 miles of Lat. 26° N., Long. 120° E., travelling N.E. Warning issued this morning.

The two upper symbols on one yardarm indicate latitude, 26°, the lower two figures longitude, the 100 being omitted, i.e., 20 indicates longitude 120°.

The two upper symbols on the opposite yardarm indicate the direction in which a typhoon is travelling, see Table A.

TABLE A.

DIRECTION SIGNALS.															
N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW

(Note.—The numbers corresponding to the symbols indicate the number of points from North, or alternatively certain conditions of the typhoon see Table B.)

TABLE B.

CONDITION SIGNALS.					
Forming	Two centres	Direction unknown.	Stationary or very slow.	Recurring.	Filling up.

The lower symbol on this side indicates the radius of the circle whose centre is shown by the latitude and longitude. This symbol may also indicate degree of intensity. In the case of a continental depression it indicates that it is such, and the corresponding latitude and longitude is the centre of an indefinite area affected. See Table C.

TABLE C.

RADIUS AND INTENSITY SIGNALS.									
Radius of position Circle.	120	60	30						
Intensity:	Unknown	Severe	Unknown	Severe	Deepening	Unknown	Severe	Excep. velocity	Contln. depres. uncertain

Note.—It should be clearly understood that the position indicated is not necessarily the centre of the typhoon, but merely indicates the centre of a circle of a specified radius within which the centre of the typhoon is believed to lie.

The signal at the mast head indicates the time the warning was issued by the Observatory. See Table D.

TABLE D.

TIME SIGNALS.			
Yesterday morning.	Yesterday afternoon.	This morning.	This afternoon.

It is important that seamen should realise that the position of the centre of the typhoon as signalled is the position according to the data possessed by the Observatory at the time of the issue of the warning. That data may be as much as 12 hours old. Thus, if the time signal indicates that the warning was issued "This morning," it may be that the position corresponds to data concerning yesterday afternoon.

If the signal "Deepening" is made, it indicates that there is reason to believe that the barometric gradient and, consequently, the intensity of the typhoon are increasing.

If the signal "Exceptional velocity" is made, it indicates that there is reason to believe that the rate of progression is 25 per cent. or more, greater than the average rate.

If the signal "Position uncertain" is made, it indicates that the data possessed is unreliable and that the position signalled is a mere probability.

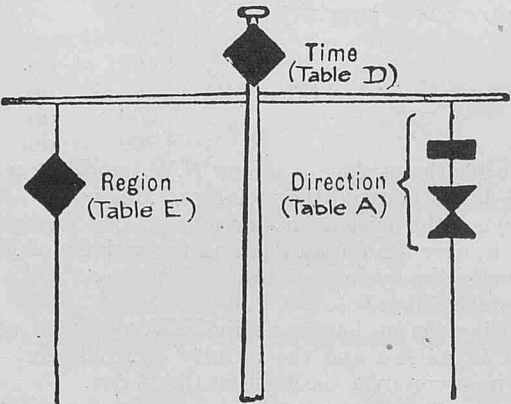
The several tracks which a typhoon may follow in the several months are very varied, and the velocity of progression is liable to be erratic. It is not safe to count on a typhoon maintaining a velocity indicated by previous position of its centre. The velocity is liable to increase very suddenly. Seamen are recommended to study from available sources the tracks and average velocities for the month and

locality concerned. In the absence of more exact information, the following table of velocities in knots for the several latitudes may be useful.

LATITUDE.	BEFORE RECURRING.				AFTER RECURRING.			
	Ordinary Limits.	Mean.	Exceptional Velocity as signalled.	Maximum recorded.	Ordinary Limits.	Mean.	Exceptional Velocity signalled.	Maximum recorded.
5° to 15°	5 to 12	9	11	22	—	—	—	—
15° „ 20°	5 „ 14	10	12½	24	5 to 17	10	13	22
20° „ 25°	7 „ 16	11	13	19	14 „ 23	17	21	30
25° „ 30°	7 „ 13	11	13	15	10 „ 23	18	23	47
30° „ 35°	—	—	—	10	11 „ 36	20	25	42
35° „ 40°	—	—	—	16	12 „ 36	21	26	50
40° „ 45°	—	—	—	—	17 „ 36	21	26	48
45° „ 50°	—	—	—	—	12 „ 36	21	26	52
50° „ 55°	—	—	—	—	12 „ 37	21	26	49

Seamen should realise that, whatever may be the probability of a certain velocity in a given case, there is always the possibility that it may be greatly exceeded. The safest guide is to make allowance for extreme velocity.

GALE SIGNALS.



Meaning.—The north coast of Hokushu threatened by a gale from S.W. Warning issued yesterday afternoon.

The one symbol at one end of the yardarm shows the region threatened. See Table E.

TABLE E.

DISTRICT SIGNAL.									
Coast of G. of Tongking	Formosa	Formosa Strait	Yangtze to G. of Yalu	Sea of Japan	North of Hokkaido	East Coast of Japan	South of Japan	Kiusiu	Kiusiu

The two symbols at the other yardarm show the direction from which the gale is expected to blow. See Table A.

The symbol at the mast head shows the time the warning was issued by the Observatory. See Table D.

Tsingtau Storm Signal Station.

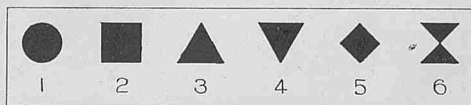
The storm signals in use at this station are as follows :—

By Day.	By Night.	Signification.
A red ball -	A red light - - -	Gale expected.
A red cylinder -	Two red lights, vertical -	Storm expected.
A red cone -	Three red lights, vertical -	Cyclonic storm expected.

Storm Signals.—The storm signals made at various places on the coasts of Japan consist of General storm signals and Local storm signals. The former, shown on special masts, are composed of five signals, giving the time of observation, the position, the direction, the rate of progressive movement, while the latter only furnish a general idea of the character of the storm expected.

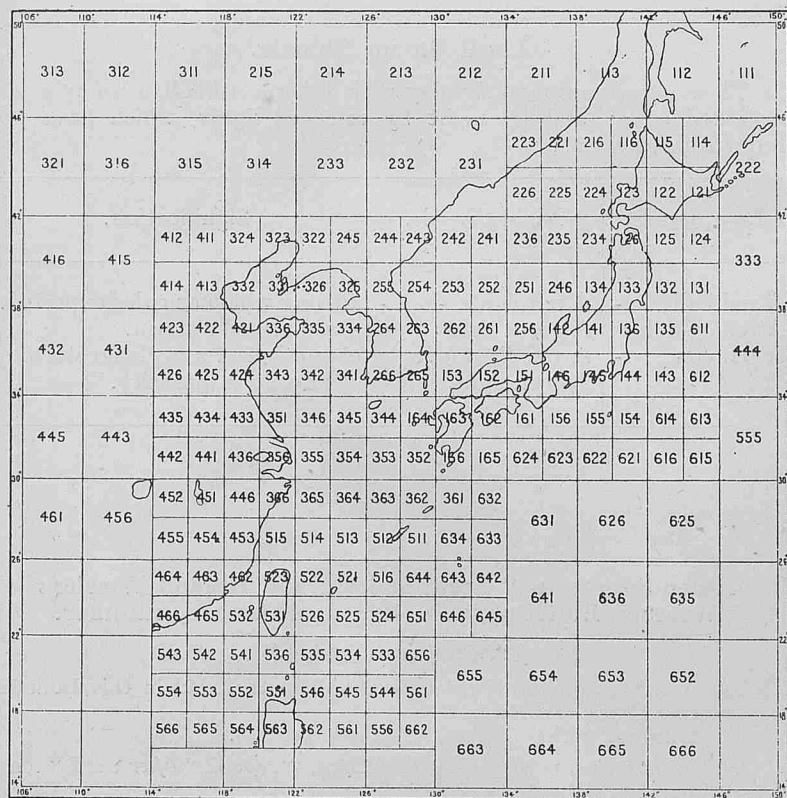
General Details.

- (a) By day the signals are made from a mast with a yard by means of certain symbols; these symbols and their equivalent numbers are as follows :—



The symbols are usually *red*, but in some places, to suit local conditions, they are *white*.

- (b) By night the signals are made by means of *red*, *white*, and *green* lights.



Day Signals for General Storm Signals.

Chartlet indicating position of Storm Centre. Japan.

1. Day Signals.

- (a) Three symbols, vertical, at one yardarm of the storm-signal mast, indicate the number of the district in which the centre of a typhoon or cyclone is situated, thus :—



indicates district 314. See Chartlet, Day Signals.

- (b) Two symbols at the other yardarm show the direction of the progressive motion. See Table F.

- (c) The rate of progression is shown by changing the relative positions of the direction symbols to the yardarm. *See* Table G.
- (d) One symbol at the masthead shows the time at which the centre was located, and the intensity of the rotatory storm. *See* Table H.

TABLE F.—Direction of Motion.

N.	NNE.	NE.	ENE.	E.	ESE.	SE.	SSE.	S.	SSW.	SW.	WSW.	W.
WNW.	NW.	NNW.	Forming	Filling up		Unknown.		Recurring		Steady or Slow.		

TABLE G.—Rate of Progression.

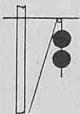
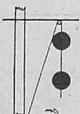
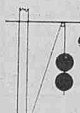
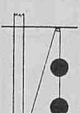
	Direction symbols separated by the normal distance.	Moving in an easterly direction, velocity not known.
	Direction symbols separated by twice normal distance.	Moving in an easterly direction, 10 to 20 miles per hour.
	Twice normal distance between yardarm and upper symbol.	Moving in an easterly direction, 20 to 30 miles per hour.
	Twice normal distance between yardarm and upper symbol. Also twice normal distance between the two symbols.	Moving in an easterly direction, about 30 miles per hour.

TABLE H.—Time and Force.

Time Force.	This Morning 6 am.	This Afternoon 2 pm.	Last Night 10 pm.
Not indicated.	●	✕	◆
Violent.	▼	▲	■

2. Night Signals.

- (a) Three lights, *vertical*, at one yardarm indicate the district in which the typhoon or cyclone is situated. See POSITION LIGHT CHARTLET.
- (b) One light at the masthead shows the subdivision of the district in which the centre is situated. See Table I. and POSITION LIGHT CHARTLET.

TABLE I.—Subdivision Light.

(W) 1 st Quadrant.	(R) 2 nd Quadrant.	(G) 3 rd Quadrant.	None 4 th Quadrant.
----------------------------------	----------------------------------	----------------------------------	-----------------------------------

LOW
1002 mb.
29.59 in.
51 c.

Locations and Weather Data:

- New York:** 1005 mb., 29.68 in., 46 c.
- Nantuxet:** 1003 mb., 29.62 in., 46 c.
- Winifredian:** 1003 mb., 29.62 in., 40 z.
- Megantic:** 1004 mb., 29.64 in., 40 o.
- Bermuda:** 1008 mb., 29.77 in.
- 1004 mb., 29.65 in.**
- 1010 mb., 29.83 in., 62°**
- 1012 mb., 29.89 in.**
- 1015 mb., 30.00 in.**
- 1020 mb., 30.12 in.**
- Rimutaka:** 1023 mb., 30.21 in., 56 b.
- Nile:** 1020 mb., 30.12 in., 37 b.
- Vernonie:** 34 c.
- Metagama:** 1018 mb., 30.56 in., 36 o.
- Missouri:** 1012 mb., 29.89 in., 41 c w.
- Valemore:** 35 o.
- Velavja:** 1013 mb., 29.92 in., 31 o.

WEATHER CHART, MORNING OF DECEMBER 12TH, 1921.

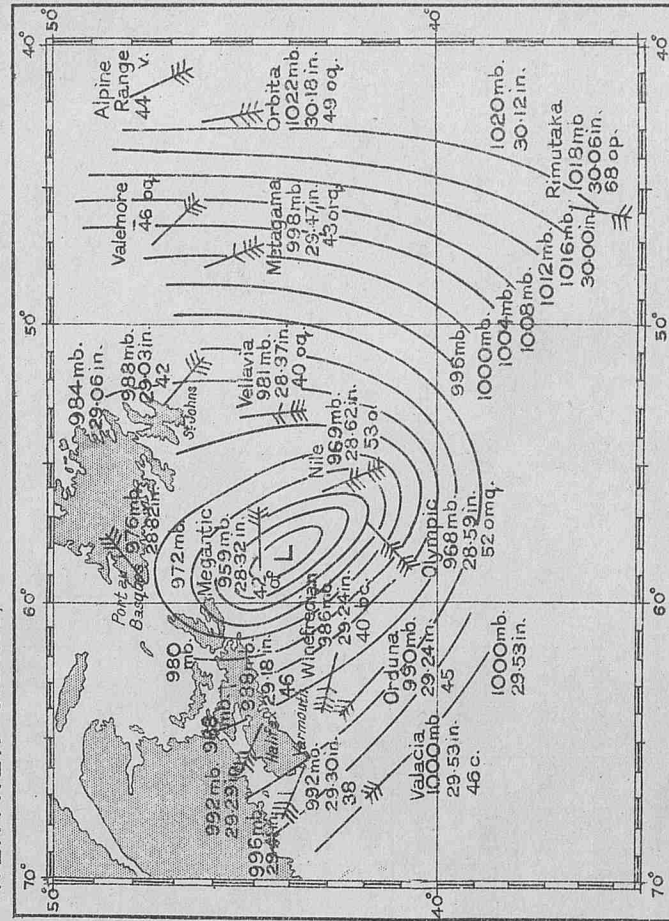


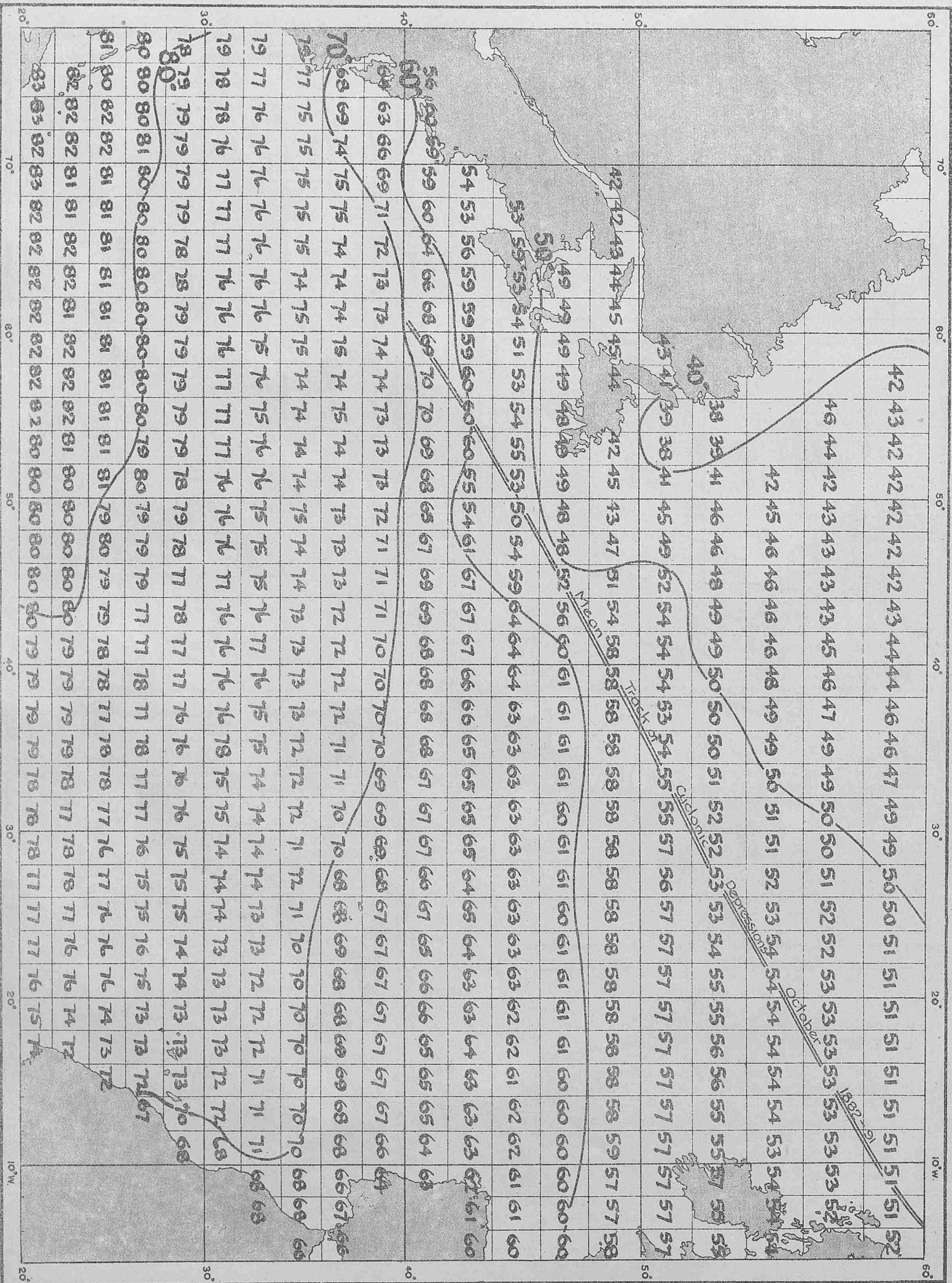
Chart LII — "WIRELESS AND WEATHER."

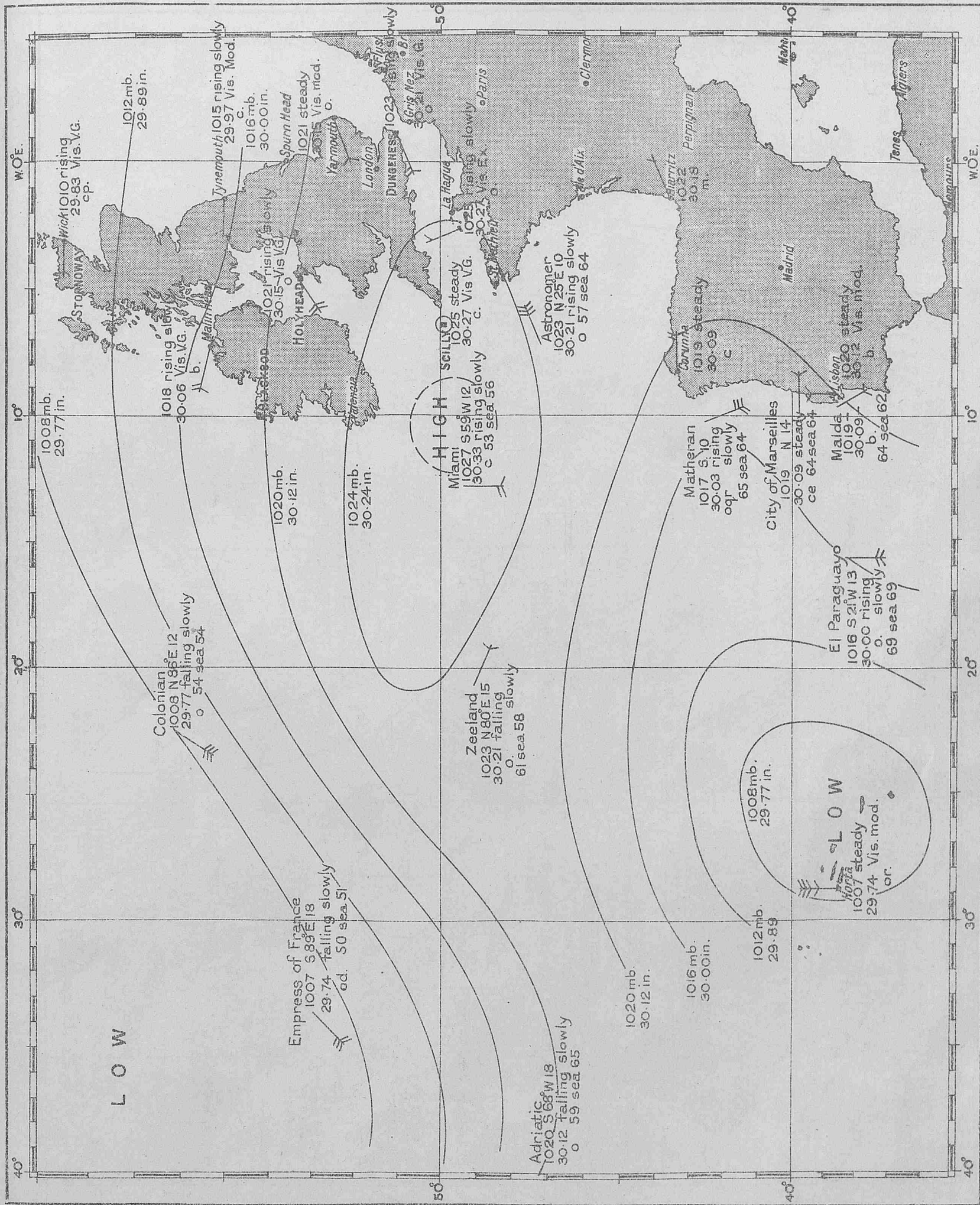
Map Data Summary:

Location	Pressure (mb)	Wind	Temp (°C)	Precip (in)	Other
Valencia	99.5	43 or m	-	29.38	
Orduña	99.2	43 or m	-	29.00	
Winifredien	98.6	44 or m	-	23.12	
Missouri	99.2	29.29	42 c	-	
1000 mb	-	-	-	-	1000 mb
1008 mb	-	-	-	-	1008 mb
Nile	1010	29.83	43 o	-	
Metadana	1013	29.92	38 o	-	
1016 mb	-	-	-	-	1016 mb
Valemore	1020	30.00	36 o	-	
1024 mb	-	-	-	-	1024 mb
Vernonia	1026	30.30	42 c	-	
Rimutaka	1026	30.30	61 bc	-	

Chart LI — "WIRELESS AND WEATHER."

NORTH ATLANTIC MEAN SEA TEMPERATURES - OCTOBER.





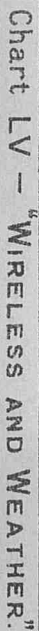


Chart LV - "WIRELESS AND WEATHER."

W.O.E. 40° 30° 20° 10° 0° 10° 20° 30° 40° W.O.E.

40° 30° 20° 10° 0° 10° 20° 30° 40° W.O.E.

LOW

HIGH

HIGH

Verbania 1008 N 74°W 10 29.77 falling crq. 55 sea 59

Baltic 1006 N 71°E 16 29.71 falling slowly C 52 sea 56

Orduna 1003 N 71°E 14 29.62 falling O 58 sea 62

1004 mb. 29.65 in.

1008 mb. 29.77 in.

1012 mb. 29.89 in.

Miami 1013 55°W 11 29.92 rising slowly Cq 57 sea 60

Theseus 1009 51°W 13 29.80 steady cm. 65 sea 64

1008 mb. 29.77 in.

1006 mb. 29.71 in.

1004 mb. 29.65 in.

1002 mb. 29.59 in.

1000 mb. 29.53 in.

998 mb. 29.48 in.

996 mb. 29.41 in.

992 mb. 29.29 in.

988 mb. 29.18 in.

984 mb. 29.06 in.

980 mb. 28.94 in.

976 mb. 28.82 in.

972 mb. 28.70 in.

968 mb. 28.58 in.

964 mb. 28.46 in.

960 mb. 28.34 in.

956 mb. 28.22 in.

952 mb. 28.10 in.

948 mb. 27.98 in.

944 mb. 27.86 in.

940 mb. 27.74 in.

936 mb. 27.62 in.

932 mb. 27.50 in.

928 mb. 27.38 in.

924 mb. 27.26 in.

920 mb. 27.14 in.

916 mb. 27.02 in.

912 mb. 26.90 in.

908 mb. 26.78 in.

904 mb. 26.66 in.

900 mb. 26.54 in.

896 mb. 26.42 in.

892 mb. 26.30 in.

888 mb. 26.18 in.

884 mb. 26.06 in.

880 mb. 25.94 in.

876 mb. 25.82 in.

872 mb. 25.70 in.

868 mb. 25.58 in.

864 mb. 25.46 in.

860 mb. 25.34 in.

856 mb. 25.22 in.

852 mb. 25.10 in.

848 mb. 24.98 in.

844 mb. 24.86 in.

840 mb. 24.74 in.

836 mb. 24.62 in.

832 mb. 24.50 in.

828 mb. 24.38 in.

824 mb. 24.26 in.

820 mb. 24.14 in.

816 mb. 24.02 in.

812 mb. 23.90 in.

808 mb. 23.78 in.

804 mb. 23.66 in.

800 mb. 23.54 in.

796 mb. 23.42 in.

792 mb. 23.30 in.

788 mb. 23.18 in.

784 mb. 23.06 in.

780 mb. 22.94 in.

776 mb. 22.82 in.

772 mb. 22.70 in.

768 mb. 22.58 in.

764 mb. 22.46 in.

760 mb. 22.34 in.

756 mb. 22.22 in.

752 mb. 22.10 in.

748 mb. 21.98 in.

744 mb. 21.86 in.

740 mb. 21.74 in.

736 mb. 21.62 in.

732 mb. 21.50 in.

728 mb. 21.38 in.

724 mb. 21.26 in.

720 mb. 21.14 in.

716 mb. 21.02 in.

712 mb. 20.90 in.

708 mb. 20.78 in.

704 mb. 20.66 in.

700 mb. 20.54 in.

696 mb. 20.42 in.

692 mb. 20.30 in.

688 mb. 20.18 in.

684 mb. 20.06 in.

680 mb. 19.94 in.

676 mb. 19.82 in.

672 mb. 19.70 in.

668 mb. 19.58 in.

664 mb. 19.46 in.

660 mb. 19.34 in.

656 mb. 19.22 in.

652 mb. 19.10 in.

648 mb. 18.98 in.

644 mb. 18.86 in.

640 mb. 18.74 in.

636 mb. 18.62 in.

632 mb. 18.50 in.

628 mb. 18.38 in.

624 mb. 18.26 in.

620 mb. 18.14 in.

616 mb. 18.02 in.

612 mb. 17.90 in.

608 mb. 17.78 in.

604 mb. 17.66 in.

600 mb. 17.54 in.

596 mb. 17.42 in.

592 mb. 17.30 in.

588 mb. 17.18 in.

584 mb. 17.06 in.

580 mb. 16.94 in.

576 mb. 16.82 in.

572 mb. 16.70 in.

568 mb. 16.58 in.

564 mb. 16.46 in.

560 mb. 16.34 in.

556 mb. 16.22 in.

552 mb. 16.10 in.

548 mb. 15.98 in.

544 mb. 15.86 in.

540 mb. 15.74 in.

536 mb. 15.62 in.

532 mb. 15.50 in.

528 mb. 15.38 in.

524 mb. 15.26 in.

520 mb. 15.14 in.

516 mb. 15.02 in.

512 mb. 14.90 in.

508 mb. 14.78 in.

504 mb. 14.66 in.

500 mb. 14.54 in.

496 mb. 14.42 in.

492 mb. 14.30 in.

488 mb. 14.18 in.

484 mb. 14.06 in.

480 mb. 13.94 in.

476 mb. 13.82 in.

472 mb. 13.70 in.

468 mb. 13.58 in.

464 mb. 13.46 in.

460 mb. 13.34 in.

456 mb. 13.22 in.

452 mb. 13.10 in.

448 mb. 12.98 in.

444 mb. 12.86 in.

440 mb. 12.74 in.

436 mb. 12.62 in.

432 mb. 12.50 in.

428 mb. 12.38 in.

424 mb. 12.26 in.

420 mb. 12.14 in.

416 mb. 12.02 in.

412 mb. 11.90 in.

408 mb. 11.78 in.

404 mb. 11.66 in.

400 mb. 11.54 in.

396 mb. 11.42 in.

392 mb. 11.30 in.

388 mb. 11.18 in.

384 mb. 11.06 in.

380 mb. 10.94 in.

376 mb. 10.82 in.

372 mb. 10.70 in.

368 mb. 10.58 in.

364 mb. 10.46 in.

360 mb. 10.34 in.

356 mb. 10.22 in.

352 mb. 10.10 in.

348 mb. 9.98 in.

344 mb. 9.86 in.

340 mb. 9.74 in.

336 mb. 9.62 in.

332 mb. 9.50 in.

328 mb. 9.38 in.

324 mb. 9.26 in.

320 mb. 9.14 in.

316 mb. 9.02 in.

312 mb. 8.90 in.

308 mb. 8.78 in.

304 mb. 8.66 in.

300 mb. 8.54 in.

296 mb. 8.42 in.

292 mb. 8.30 in.

288 mb. 8.18 in.

284 mb. 8.06 in.

280 mb. 7.94 in.

276 mb. 7.82 in.

272 mb. 7.70 in.

268 mb. 7.58 in.

264 mb. 7.46 in.

260 mb. 7.34 in.

256 mb. 7.22 in.

252 mb. 7.10 in.

248 mb. 6.98 in.

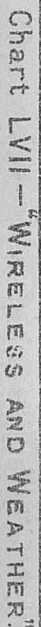
244 mb. 6.86 in.

240 mb. 6.74 in.

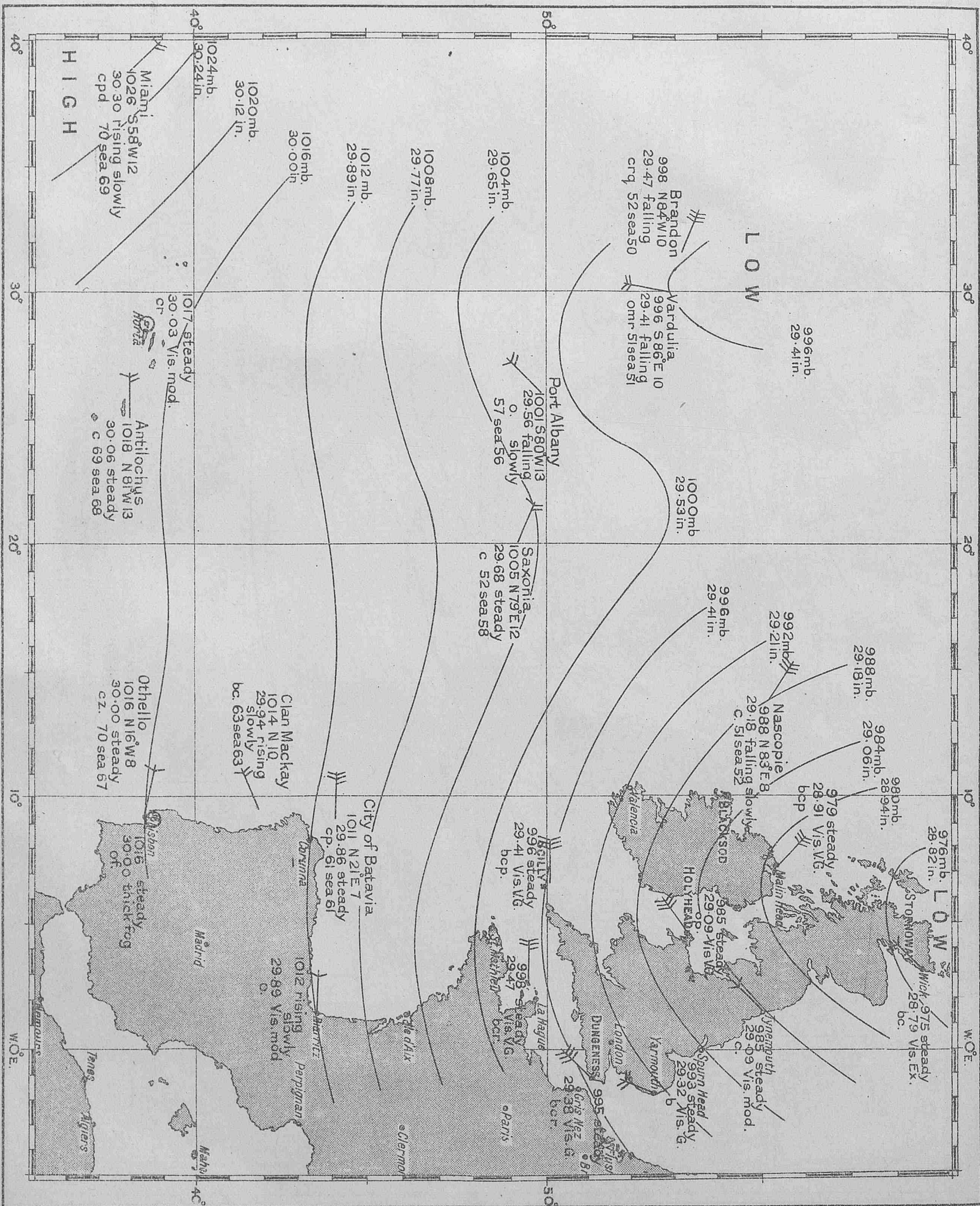
236 mb. 6.62 in.

232 mb

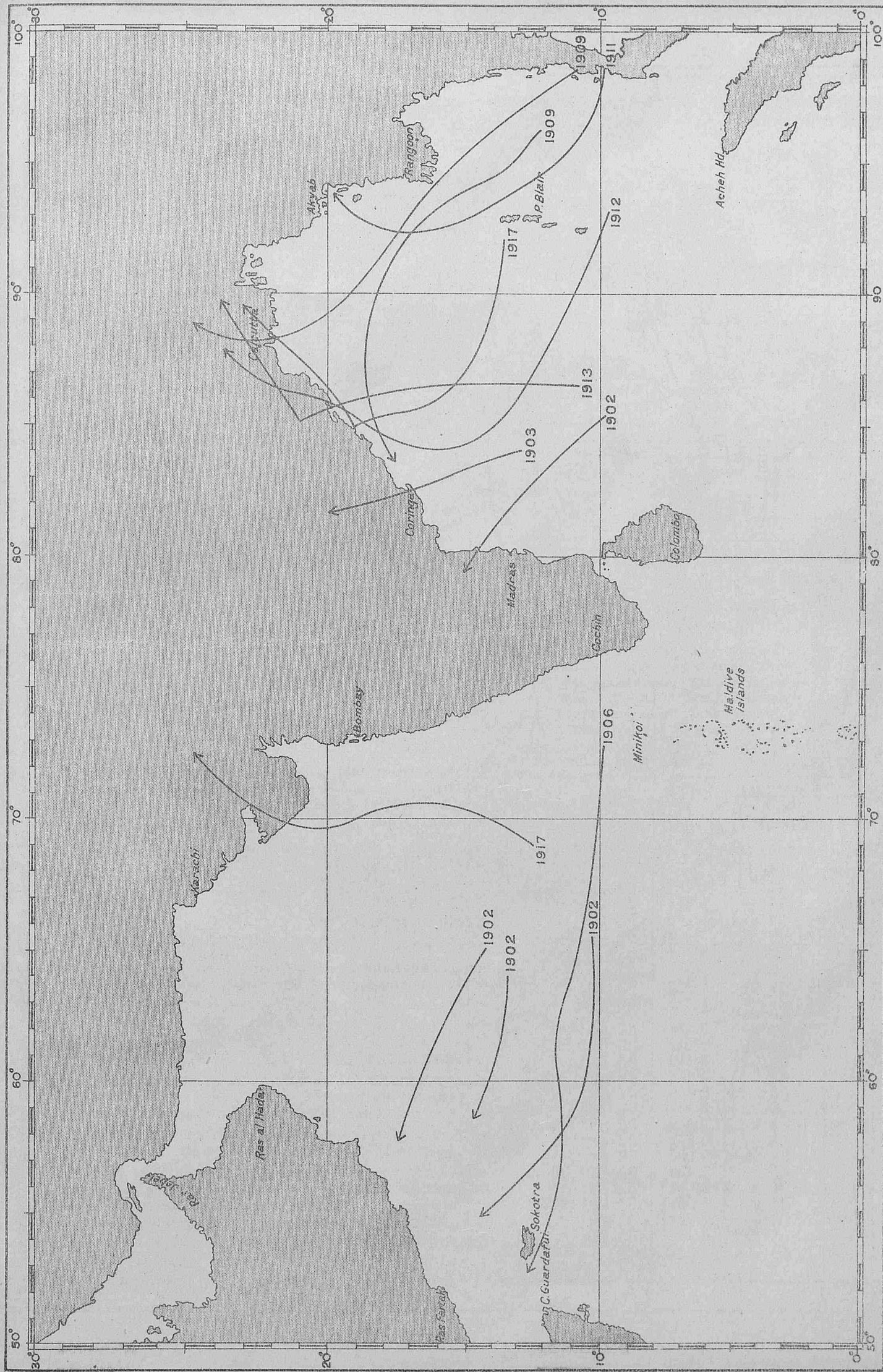
Chart LVI - "WIRELESS AND WEATHER."





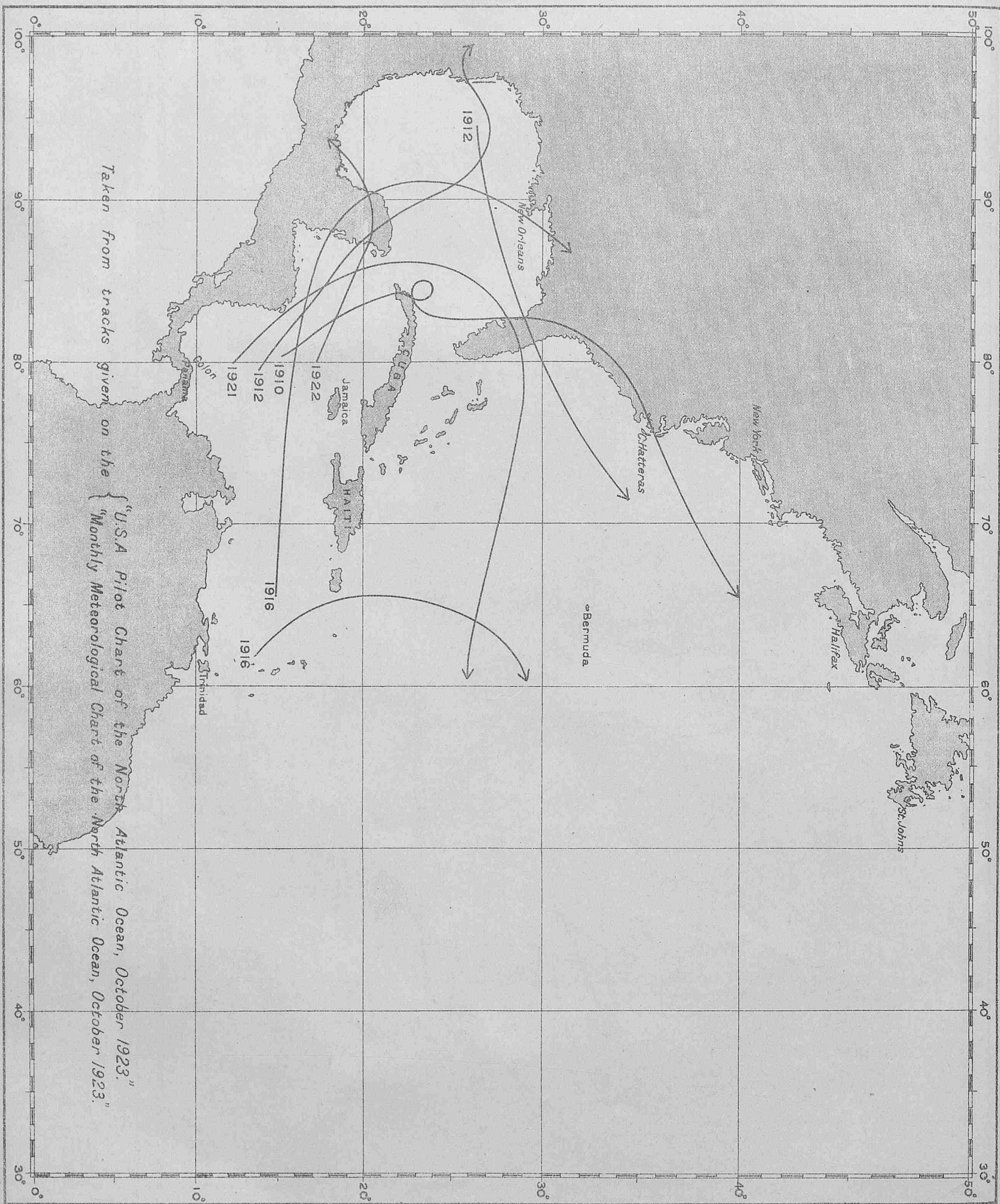


CYCLONE TRACKS OF THE ARABIAN SEA AND BAY OF BENGAL.



Tracks of cyclones which have occurred in the Arabian Sea and Bay of Bengal during the month of October. 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 October.

TRACKS OF WEST INDIAN HURRICANES.



Tracks of Hurricanes which have occurred in the West Indies during the month of October. The year is indicated by the figures at the commencement of track.

U.S. Navy, Office of the Chief of the Bureau of Navigation, 1923.

IMPORTANT.**The "Marine Observer." Distribution and Preservation.**

A number of requests have been received from Commanders of regular observing ships to which copies of the "Marine Observer" have been sent each month, for certain numbers.

In several cases Commanders have stated that these copies have been inadvertently mislaid or have not been received in the ship.

Upon investigation it was found that all numbers had been posted to the ship in accordance with the published "Postal Arrangements" to which special attention is invited. Each ship upon the list is supplied with a copy of the "Marine Observer" addressed to her Captain, which it is desired should be preserved in the ship.

Personal copies of individual numbers are sent to Captains and observing officers whose special contributions appear in them.

In future "Excellent" awards will mainly consist of bound volumes of the previous year's numbers of the "Marine Observer."

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.

CLOUD OBSERVATION.

Marine Observers are requested to enter in the Meteorological Log and Form 911 types as follows unless a specific reason is given:—

- (1) In the column for upper clouds.
Ci., Ci-St., Ci-Cu., A-St., A-Cu.
- (2) In the column for lower clouds.
Cu, St., Nb., St-Cu., Cu-Nb., Fr-Nb., Fr-Cu., Fr-St.
- (3) A compound name such as Strato-Cumulus should always be written as St-Cu, with a hyphen between the two parts to distinguish it from St/Cu, Stratus and Cumulus.
- (4) If Stratus and Cumulus are both present they should be denoted thus St/Cu with a vertical stroke between them.
- (5) Such terms as St. Cu without a hyphen or stroke should never be used as it is not evident whether Stratus and Cumulus are both present, or Strato-Cumulus only.

Particular attention should be paid to the observation and record of Cirrus, particularly in Tropical Cyclone regions.

BLUE POSTCARD FOR BAROMETER COMPARISON.

Marine Observers will greatly assist by obtaining comparisons with Standard instruments when at suitable ports; also regularly completing and returning the Blue Postcard whether their instruments are M.O. or Ships.

Form 913.

Barometer Error.

TEST CARD FOR BAROMETER ERROR.

To be forwarded with Logs or Reports to

Meteorological Office,
Air Ministry,
Kingsway, London.

Name of Ship				Ship
Captain				Capt.
In Port of				Port
Mercurial or Aneroid				Date
Maker's Name and No.				Bar. No.
Height above Mean Sea Level .....ft.				..... } Too high
				..... } Too low
Date 192	Time.	Barometer readings.	Attached Therm.	At
				Date
				This counterfoil will be returned to Ship.

In British Home Ports please take three readings at 7 a.m., or 6 p.m. G.M.T. If in a colonial or foreign port, read at 8 a.m. Local Standard Time.

IMPORTANT.

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.

CONVERSION TABLE.

To Convert Inches into Millibars.

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

ICE CHART.

WESTERN NORTH ATLANTIC.

LETTERS OF TRANSATLANTIC TRACKS INDICATE

- (C) From 1st September to 31st January, inclusive.
- (G) From opening of Straits of Belle Isle to 14th November.

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.
- Field Ice, Floe Ice, Pack Ice, Hummocky Ice, Bay Ice.
- Drift Ice, Brash Ice, Sludge Ice, Pancake Ice.
- Indicates W/T Ice.
- Warning Station.

PHENOMENAL DRIFTS OF ICE.

Date.	Ship or Source of Report.	Lat.	Long.	Remarks.
Oct. 15, 1883	S.S. Elenora ...	37°-N.	18°-W.	Piece.
" 8, 1912	S.S. Putney Bridge...	35°15'N.	44°50'W.	Small berg 35 ft. long, 6 ft. high.
" 2, 1918	U.S. Hydrographic Bulletin.	50°10'N.	40°50'W.	Large berg.
" 19, 1920	Do.	45°22'N.	40°09'W.	Berg.
" 17, 1921	S.S. Mt. Vernon ...	45°24'N.	40°07'W.	Berg.
" 6, 1922	S.S. Christian Krogh	48°23'N.	42°19'W.	Berg about 70 ft. high, 400 ft. long.
" 7, 1923	S.S. Eastern Dawn ...	50°43'N.	40°42'W.	Berg 60 ft. high.
		40°46'N.	66°54'W.	Large growler about 100 ft. square.

Reports of Ice sighted between August 1st and August 31st which have been received by the Meteorological Office, are shown by the Symbols plotted in this position reported, the figures indicating the day of the month.

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, 23, William Street.
 FREMANTLE .. Captain J. J. Airey, Dalgety's Buildings.

LATE PRESS.

DERELICTS AND FLOATING WRECKAGE.

Date.	Position.		Description.
	Latitude.	Longitude.	
NORTH SEA.			
5.8.24	53°31'N.	5°06'E.	Drifting mooring buoy, dangerous to navigation.
5.8.24	51°20'N.	2°11'E.	Submerged object.
12.8.24	Between E. & S. Goodwin Light Vessels.		Mast projecting about 3 feet.
12.8.24	19 miles N.N.W. Dudgeon Light Vessel.		Small boat, bottom up.
ENGLISH CHANNEL.			
6.8.24	50°42'N.	0°20'E.	Submerged wreckage.
7.8.24	50°39'N.	0°54'E.	Large varnished boat, floating bottom up, bows 4 ft. out of water.
19.8.24	50°14'N.	1°59'W.	Dangerous wreckage with mast projecting metre and half above water.
19.8.24	6 miles South of St. Catherine's.		Small open boat—no one on board—"Weymouth" on stern.
IRISH SEA.			
2.8.24	51°40'N.	5°55'W.	Object painted red : letter "Z" on side : network attached.
13.8.24	1 mile S.E. by E. (mag.) from Rockabill Light House.		Lifeboat full of water.
21.8.24	7 miles W.N.W. of South Stack Light House.		Derrick projecting about 2 feet out of water.
NORTH ATLANTIC.			
2.8.24	48°45'N.	14°01'W.	Red spherical buoy
2.8.24	38°01'N.	73°01'W.	Life raft, painted black.
4.8.24	49°13'N.	15°26'W.	Floating spar, approx. 30 ft. long, 3 ft. wide, covered with marine growth.
4.8.24	61°21'N.	6°55'W.	Partly submerged seaplane.
5.8.24	35°35'N.	74°53'W.	Drifting nun buoy.
6.8.24	34°25'N.	57°25'W.	Buoy
11.8.24	32°41'N.	77°19'W.	Log about 20 ft. long and 2 ft. diameter.
11.8.24	32°39'N.	78°57'W.	Log about 50 ft. long.
13.8.24	46°00'N.	32°30'W.	Derelict, apparently schooner awash.
13.8.24	38°06'N.	11°44'W.	Sailing vessel "Governor Parr," awash, not fire, no crew, dangerous to navigation.
16.8.24	E. by S. (mag.) 9 miles Lizard.		Open boats—no occupants—dangerous.
17.8.24	44°28'N.	24°06'W.	Large piece of wreckage 20 ft. square with 2 piles attached 6 ft. above water, apparently section of wharf.
19.8.24	9 miles N. & W. from Trevose Head.		Large red painted buoy with top mark.
19.8.24	8 miles N. of Trevose Head.		Large gas buoy adrift.
21.8.24	48°45'N.	4°41'W.	Large log about 80 ft. long, covered by marine growth.
BALTIC.			
3.8.24	59°02'N.	19°43'E.	Derelict.
20.8.24	54°55'N.	19°54'E.	Top of damaged mast 2 metres long projecting above water in depth of 15 metres.
NORTH PACIFIC.			
3.8.24	13°55'N.	95°07'W.	Large piece of wreckage about 25 ft. long and mostly submerged : appeared to be part of wooden vessel. About 7 miles to westward a large tree trunk about 20 ft. long.
4.8.24	35°02'N.	131°24'W.	Log about 15 feet long and 40 inches circumference.

LIST OF VOLUNTARY OBSERVING SHIPS.

i

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.	Date Received.
<i>Aba</i> ...	Hughes, J. ...	G. P. Williams ...	No.	Elder Dempster ...	Form 911 26.6.24 to 1.8.24 ...	6.8.24.
<i>Abinsi</i> ...	Wright, J. B. ...	V. Baddeley ...	"	Elder Dempster ...	" 12.12.23 to 18.1.24 ...	25.1.24.
<i>Actor</i> ...	Haylett, E. ...	G. Kent ...	"	Harrison ...	" 19.1.24 to 7.3.24 ...	1.4.24.
<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, A. W. C. Robinson, J. Farrell.	W.T.	White Star ...	{ W.T. Reg. 21.7.24 to 9.8.24 ... Form 911 19.7.24 to 10.8.24 ...	12.8.24. 12.8.24.
<i>Agapenor</i> ...	Ramsay, J. ...	J. P. Makepeace ...	No.	A. Holt ...	" 25.5.24 to 13.6.24 ...	28.7.24.
<i>Alban</i> ...	Whayman, W. R. ...	R. Griffiths ...	"	Booth ...	" 21.2.24 to 15.4.24 ...	22.4.24.
<i>Albania</i> ...	Gibbons, G., R.D., Commr., R.N.R.	C. B. Osborne ...	"	Cunard ...	" 22.6.24 to 19.7.24 ...	23.7.24.
<i>Algerian Prince</i> ...	Rowlands, D. ...	G. Potts ...	"	Prince ...	" 24.7.24 to 6.8.24 ...	11.8.24.
<i>Alipore</i> ...	Gordon, L. M., R.D., Commr., R.N.R.	H. D. Case ...	"	P. and O. ...	" 24.4.24 to 15.6.24 ...	14.7.24.
<i>Almanzora</i> ...	Mackenzie, G. A. ...	A. P. Portsmouth ...	"	R.M.S.P. ...	" 13.6.24 to 28.7.24 ...	30.7.24.
<i>Alondra</i> ...	J. Pendergast ...	H. Peters ...	"	Yeoward ...	" 12.7.24 to 5.8.24 ...	6.8.24.
<i>Ampelco</i> ...	Verstichelen, 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 1.4.24 ...	11.4.24.
<i>Antiochus</i> ...	Sprott, E. J. ...	J. J. Daniel ...	No.	A. Holt ...	Form 911 22.1.24 to 16.4.24 ...	23.4.24.
<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., Commadore, R.N.R.	J. L. Croasdaile, P. O. Davis, J. Locke.	W.T.	Cunard ...	W.T. Reg. 29.6.24 to 14.7.24 ...	25.7.24.
<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 ...	Form 911 4.7.24 to 20.7.24 ...	22.7.24.
<i>Armada Castle</i> ...	George, J., O.B.E.	L. G. May ...	"	P. Henderson ...	Met. Log. 26.1.24 to 24.4.24 ...	5.5.24.
<i>Arracan</i> ...	Willis, M. ...	R. MacInnes, H. Poole, D. Frame, A. Olding.	M.L.	Southern Rly. ...	Telegraphic Report 27.7.24 ...	27.7.24.
<i>Arundel</i> ...	Short, H. ...	Mr. Hill ...	C.C.	Union Castle ...	Met. Log. 21.12.23 to 20.4.24 ...	8.5.24.
<i>Arundel Castle</i> ...	Hague, J. W., Capt., R.N.R.	G. Blaiklock, C. Williams, C. Keen.	M.L.	Anchor ...	Form 911 5.7.24 to 28.7.24 ...	15.8.24.
<i>Assyria</i> ...	Erskine, R. ...	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 ...	" 27.5.24 to 29.6.24 ...	1.7.24.
<i>Atsuta Maru</i> ...	Saito, B. ...	S. Mizoguchi ...	"	Harrison ...	" 3.7.24 to 22.7.24 ...	5.8.24.
<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 ...	" 19.6.24 to 7.7.24 ...	14.7.24.
<i>Ausonia</i> ...	Brown, F. G., R.D., Capt., R.N.R.	R. O. Young ...	"	Harrison ...	" 29.8.23 to 7.10.23 ...	12.10.23.
<i>Author</i> ...	Kinlock, R. ...	A. Goddard ...	"	P.S.N. Co. ...	" 19.9.23 to 11.10.23 ...	15.10.23.
<i>Ballena</i> ...	Pape, E. R. ...	W. Webster ...	"	White Star ...	{ W.T. Reg. 6.7.24 to 26.7.24 ... Form 911 6.7.24 to 26.7.24 ...	30.7.24. 30.7.24.
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.	State Service, Australia	Met. Log. 27.2.24 to 25.6.24 ...	12.8.24.
<i>Bambra</i> ...	Wyles, W. S. ...	H. W. Norris, J. E. Turner, J. Eggleston, W. Walters.	M.L.	Union Castle ...	{ " 21.2.23 to 3.5.23 ... " 2.9.23 to 9.12.23 ...	28.1.24.
<i>Bampton Castle</i> ...	Buckeridge, G. ...	F. Norfolk, L. C. Chapman, H. A. Deller, E. Crocker, C. B. Hoggan.	"	Turnbull Martin ...	Form 911 1.7.24 to 23.7.24 ...	11.8.24.
<i>Banbury Castle</i> ...	... ..	C. C. Page ...	No.	Commonwealth Govt. ...	" 4.8.23 to 5.9.23 ...	16.10.23.
<i>Banffshire</i> ...	Wynne, R. H. ...	L. W. Evans ...	"	Hogarth & Sons ...	" 16.1.24 to 28.1.24 ...	11.3.24.
<i>Barambah</i> ...	Mayne, W. ...	T. Swann ...	"	His Majesty's Ship ...	Met. Log. 31.7.22 to 3.10.22 ...	10.10.22.
<i>Baron Cawdor</i> ...	Baillie, T. ...	A. Campbell ...	"	Red Star ...	" 21.9.23 to 21.4.24 ...	27.5.24.
<i>Beaufort</i> ...	Knowles, C. H., D.S.O., Commr., R.N.	H. L. Wheeler ...	M.L.	Algarsson Expedition, 1924.	... ..	...
<i>Belgenland</i> ...	Bradshaw, J. ...	C. J. Murray, J. M. Appleby, W. E. Hesketh.	"	Ben Lue ...	Form 911 14.6.24 to 13.7.24 ...	22.7.24.
<i>Beltai, Ketch</i> ...	Algarsson, G. ...	J. B. Hewson ...	No.	...	...	...
<i>Benalder</i> ...	Cole, J. H., D.S.C....	A. K. Watson ...	"	...	...	...

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed.	Date Received.
<i>Bengloe</i> ...	McCorquodale, A. ...	G. M. Duff ...	No.	Ben Line ...	Form 911 4.5.24 to 29.5.24 ...	12.6.24.
<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. 5.7.24 to 18.7.24 ...	21.7.24.
<i>Bernini</i> ...	Evans, W.	H. L. Rudd ...	No.	Lampart & Holt ...	Form 911 16.1.24 to 1.5.24 ...	28.5.24.
<i>Berrima</i> ...	Hussey Cooper, E. M., R.D., Commr., R.N.R.	C. C. Smith, F. W. Walsh ...	"	P. & O. Branch ...	" 16.5.24 to 8.6.24 ...	15.7.24.
<i>Bolingbroke</i> ...	Stewart, A. ...	E. Laurence, R. Woods, J. S. Liddell.	M.L.	Canadian Pacific ...	Met. Log. 13.7.24 to 12.8.24 ...	16.8.24.
<i>Borda</i> ...	Holland, R. ...	S. W. Keay ...	No.	P. & O. Branch ...	Form 911 27.3.24 to 4.5.24 ...	11.8.24.
<i>Bothwell</i> ...	Dott, J. F. ...	J. Mackenzie ...	"	Canadian Pacific ...	" 16.6.24 to 15.7.24 ...	21.7.24.
<i>Brandon</i> ...	Freer, A., R.D., Commr., R.N.R.	"	"	"	" 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. ...	"	"	Scottish Fishery Board ...	"	"
<i>Brighton</i> ...	Hill, A. ...	Mr. Munton ...	C.C.	Southern Railway ...	Telegraphic Report 14.8.24 ...	14.8.24.
<i>British Engineer</i> ...	Piper, H. C. ...	A. Campbell ...	No.	British Tankers ...	Form 911 20.5.24 to 18.6.24 ...	20.6.24.
<i>British Lantern</i> ...	Taylor, R. J. ...	R. B. Page ...	"	"	" 23.6.24 to 5.7.24 ...	21.7.24.
<i>Browning</i> ...	Connorton, C. A. ...	G. F. V. Peck ...	"	Lampart & Holt ...	" 26.4.24 to 23.5.24 ...	27.5.24.
<i>Bruyere</i> ...	Heasley, W. S. ...	A. C. Kennedy ...	"	"	" 25.4.24 to 30.6.24 ...	17.7.24.
<i>Cabotia</i> ...	Lawson, P. ...	T. G. Menzies ...	No.	Anchor Donaldson ...	Form 911 8.7.24 to 18.7.24 ...	22.7.24.
<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 25.7.24 ...	25.7.24.
<i>Camito</i> ...	Soudamore, J. H. H., D. S. C., R.D., Commr., R.N.R.	D. A. Jack, R. M. Cossantine, S. Borrie.	M.L.	Elders & Fyfes ...	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 12.7.24 to 2.8.24 ...	5.8.24.
<i>Canadian Inventor</i> ...	Roberts, R. P. ...	S. M. Holinden ...	"	Canadian Govt. Mer- chant Marine.	" 16.12.23 to 6.2.24 ...	24.3.24.
<i>Canadian Scottish</i> ...	Harris, G. W. ...	S. Fieldhouse ...	"	"	" 22.12.23 to 26.2.24 ...	21.5.24.
<i>Canadian Skirmisher</i> ...	Millar, W. H. ...	J. Moller ...	"	"	" 17.5.24 to 19.6.24 ...	24.6.24.
<i>Canadian Winner</i> ...	Hocking, N. P. ...	R. D. Ranns ...	"	"	" 31.3.24 to 19.5.24 ...	18.6.24.
<i>Carlow Castle</i> ...	Harvey, H. B. ...	L. H. Stevens ...	"	Union Castle ...	" 13.6.24 to 10.7.24 ...	28.7.24.
<i>35 Carmania</i> ...	McNeil, S. G. S., R.D., Capt., R.N.R.	A. T. Hamer, L. R. Allen, P. J. Robinson.	W.T.	Cunard ...	W.T. Reg. 16.5.24 to 3.6.24 ...	10.6.24.
<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 16.5.24 to 4.6.24 ...	10.6.24.
<i>Cassandra</i> ...	Mitchell, W. E. ...	G. M. Sime ...	No.	Anchor Donaldson ...	W.T. Reg. 30.5.24 to 18.6.24 ...	20.6.24.
<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 ...	" 25.6.24 to 11.7.24 ...	14.7.24.
<i>53 Celtic</i> ...	Holme, A. ...	R. S. Walker, G. T. Kavanagh, D. W. Chamberlain.	W.T.	"	Form 911 1.5.24 to 25.5.24 ...	27.5.24.
<i>Ceramic</i> ...	Symons, J. ...	H. Williams ...	No.	"	W.T. Reg. 30.6.24 to 19.7.24 ...	22.7.24.
<i>Changsha</i> ...	Gambrell, F. C. ...	A. M. Frame, F. G. Strat- ford, H. Lishman, L. H. Baillie.	M.L.	Yull & Co. ...	Form 911 29.6.24 to 19.7.24 ...	23.7.24.
<i>Charon</i> ...	Sturrock, — ...	"	No.	Dalgety & Co. ...	W.T. Reg. 14.7.24 to 11.7.24 ...	14.7.24.
<i>Chignecto</i> ...	Green, J. ...	A. F. Walker ...	"	R.M.S.P. Co. ...	Form 911 3.7.24 to 2.8.24 ...	5.8.24.
<i>China</i> ...	King, A., D.S.C. ...	E. Cox Walker ...	"	P. & O. ...	Met. Log. 27.1.24 to 21.5.24 ...	26.5.24.
<i>Chindwara</i> ...	Le Bas, — ...	T. Mather ...	"	British India ...	" 24.4.24 to 23.5.24 ...	1.7.24.
<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. ...	Mr. Cook, Mr. Wherny ...	"	China Nav. Co. ...	" 26.7.23 to 8.12.23 ...	24.4.24.
<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> ...	Spencer, H. ...	B. Moloney ...	No.	"	Form 911 23.1.24 to 22.2.24 ...	26.2.24.
<i>City of Benares</i> ...	Macdonald, K., O.B.E.	A. A. Fullerton ...	"	"	" 6.2.24 to 7.3.24 ...	14.3.24.
<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 Dunkirk</i> ...	Seaborne, F. O. ...	W. Leadbeater ...	No.	"	Form 911 21.9.23 to 4.10.23 ...	17.10.23.
<i>City of London</i> ...	Martin, D. ...	C. Inglis ...	"	"	" 3.4.24 to 29.4.24 ...	8.5.24.
<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.	J. J. McTigue ...	No.	"	Form 911 27.1.24 to 3.4.24 ...	7.4.24.
<i>City of Yokohama</i> ...	Jinks, J. W. ...	"	"	"	" 2.7.24 to 19.7.24 ...	5.8.24.
<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 ...	"	"	" 15.7.24 to 25.7.24 ...	5.8.24.
<i>Clan Macgillivray</i> ...	West, W. F. ...	P. G. de Gruchy ...	"	"	" 5.7.24 to 18.7.24 ...	28.7.24.
<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 ...	"	"	" 16.6.24 to 7.7.24 ...	29.7.24.
<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> ...	Thomson, W. ...	V. Wilson, W. S. Holden, T. Kay.	M.L.	"	Met. Log. 6.9.23 to 24.2.24 ...	27.2.24.
<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 Macphee</i> ...	Gourlay, J. B. ...	P. H. Avdon, W. D. E. Camp- bell, F. Buckley, — Carter.	M.L.	"	Met. Log. 26.1.24 to 12.6.24 ...	8.8.24.
<i>Clan Macraicar</i> ...	Phillips, G. P. ...	L. S. Murrin ...	No.	"	Form 911 14.5.24 to 11.6.24 ...	13.6.24.
<i>Clan Malcolm</i> ...	Higgins, C. J. ...	T. G. Young, A. Cameron ...	M.L.	"	Met. Log. 22.12.24 to 31.3.24 ...	3.4.24.
<i>Clan Morrison</i> ...	Porterfield, W. M. ...	D. A. Evans ...	No.	"	Form 911 14.5.24 to 8.6.24 ...	1.7.24.
<i>Clan Murdoch</i> ...	Pagan, J. C. ...	R. E. Owen ...	"	"	" 10.6.24 to 10.7.24 ...	14.7.24.
<i>Clan Ranald</i> ...	Henderson, C. W. ...	P. J. Green ...	"	"	" 8.12.23 to 22.1.24 ...	28.1.24.
<i>Clan Ross</i> ...	Christian, W. G. M. ...	S. M. Werrey Easterbrook ...	"	"	" 3.8.23 to 8.10.23 ...	19.10.23.
<i>Clan Sinclair</i> ...	Neill, G. A. ...	F. B. Parker ...	"	"	" 21.6.24 to 1.7.24 ...	28.7.24.
<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 ...	"	"	" 5.6.24 to 27.6.24 ...	28.7.24.
<i>Colonial C.S.</i> ...	Campos, V., O.B.E., Lt.-Commr., R.N.R.	S. A. Garnham, A. S. Muir, W. E. Allen, S. Hall.	M.L.	Telegraph Construction & Maintenance.	Met. Log. 27.10.23 to 22.11.23 ...	26.11.23.
<i>Colonial</i> ...	Barrow, R. K. ...	A. V. Jones ...	No.	Harrison ...	Form 911 7.5.24 to 23.7.24 ...	29.7.24.
<i>Colonian</i> ...	Gittins, R. P. ...	J. Crangle ...	"	Leyland ...	" 9.7.24 to 5.8.24 ...	13.8.24.

LIST OF VOLUNTARY OBSERVING SHIPS

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Name of Vessel.	Captain.	Observing Officers.	Official Meteoro- logical Equipment.	Line.	Last Log, Register, or Report Contributed.	Date Received.
<i>Columbia</i> ...	Gemmell, W. ...	S. G. Taylor ...	No.	Anchor ...	Form 911 29.6.24 to 20.7.24 ...	22.7.24.
<i>Comino</i> ...	Nuttall, E. L. ...	A. McVicar ...	"	Furness Withy ...	" 7.3.24 to 13.4.24 ...	5.5.24.
<i>Cooee</i> ...	Festa, M. ...	C. Keen, D. C. Rees ...	"	Commonwealth Govt. ...	" 29.6.23 to 16.8.23 ...	8.10.23.
<i>Corinthic</i> ...	Hart, F. ...	W. T. Fitzgerald, M. Bennett, F. G. Rogers.	M.L.	White Star ...	Met. Log. 29.12.23 to 8.4.24 ...	12.5.24.
<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>Cyclops</i> ...	Cosker, W. ...	R. W. Ellis ...	No.	A. Holt ...	Form 911 27.5.24 to 19.6.24 ...	25.7.24.
<i>Dardanus</i> ...	Shaw, A. T. ...	" ...	No.	A. Holt ...	" 11.5.23 to 11.7.24 ...	17.7.24.
<i>Darian</i> ...	Masters, W. ...	G. F. Parkinson ...	"	Leyland ...	" 13.7.24 to 24.7.24 ...	28.7.24.
<i>Darro</i> ...	Smith, W. E., D.S.O., R.D., Capt., R.N.R.	E. H. Giller ...	"	R.M.S.P. Co. ...	" 6.4.24 to 30.5.24 ...	12.6.24.
<i>Daytonian</i> ...	Walker, C. J., D.S.O.	W. T. Godwin ...	"	Leyland ...	" 22.6.24 to 29.7.24 ...	6.8.24.
<i>Della</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 ...	" 18.5.24 to 3.6.24 ...	28.7.24.
<i>Desado</i> ...	Wakeman, E. C. ...	F. Collinson, W. Scott ...	"	R.M.S.P. Co. ...	" 20.4.24 to 15.6.24 ...	17.6.24.
<i>Desna</i> ...	Adam, C., R.D., Commr., R.N.R.	H. D. Jackman ...	"	" ...	" 3.5.24 to 28.6.24 ...	1.7.24.
<i>Deucalion</i> ...	Findlay, J. ...	P. W. Savery, O. Thomas ...	"	A. Holt ...	" 23.6.24 to 22.7.24 ...	28.7.24.
<i>Devon</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. 15.8.24 ...	15.8.24.
<i>Digby</i> ...	Chambers, F. W., D.S.O.	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 7.6.24 to 2.7.24 ...	7.8.24.
<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 ...	" 25.5.24 to 12.7.24 ...	15.7.24.
<i>Dorington Court</i> ...	Isaacs, W. A. ...	E. V. Quickenden ...	"	Haldin & Co. ...	" 26.6.24 to 16.7.24 ...	21.7.24.
<i>Dorset</i> ...	Kettlewell, C. R. ...	" ...	M.L.	New Zealand S.S. Co. ...	" ...	"
<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 ...	"	Lampert & Holt ...	" 28.10.23 to 2.1.24 ...	18.2.24.
<i>Dundrum Castle</i> ...	Mumford, C. E. ...	H. Bunn ...	"	Union Castle ...	" ...	"
<i>Duendes</i> ...	Pape, E. R. ...	" ...	"	Pacific S.N. Co. ...	Form 911 18.4.24 to 8.5.24 ...	26.5.24.
<i>Duquesa</i> ...	G. Jarvis ...	D. Thornton, C. Shane, A. Bradbury.	"	Furness Withy ...	" 25.5.24 to 24.7.24 ...	29.7.24.
<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. Doorneesch ...	No.	Holland Lloyd ...	Form 911 15.4.24 to 11.6.24 ...	15.7.24.
<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. ...	" ...	M.L.	Elder Dempster ...	Met. Log. 20.9.23 to 13.12.23 ...	4.3.24.
<i>El Paraguay</i> ...	Ellis, F., D.S.O. ...	W. E. Williams ...	No.	Houlder Bros. ...	Form 911 8.6.24 to 31.7.24 ...	6.8.24.
<i>Elpenor</i> ...	Evans, D. L. ...	P. E. Wright, C. Mock ...	M.L.	A. Holt ...	Met. Log. 31.12.23 to 19.4.24 ...	24.4.24.
<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.	F. C. Stratford, R. J. Hickey, M. Blyth.	M.L.	Canadian Pacific ...	Met. Log. 8.2.24 to 24.5.24 ...	20.6.24.
<i>Empress of Aus- tralia.</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. ...	W. S. Halliday ...	M.L.	" ...	Met. Log. 4.1.24 to 22.5.24 ...	7.7.24.
<i>Empress of France</i> ...	Hailey, A. J. ...	" ...	"	" ...	" ...	"
<i>Empress of Russia</i> ...	Robinson, S., C.B.E., R.D., Commr., R.N.R.	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. B. Smith, A. M. Barff, S. H. Blyth, J. P. Napier, C. S. Morris. R. H. Gra- ham.	M.L.	" ...	" 27.12.23 to 20.4.24 ...	26.5.24.
<i>Empress of Scotland</i> ...	Gillies, J., C.B.E. ...	" ...	M.L.	" ...	" ...	"
<i>Endeavour</i> ...	Nares, J. D., D.S.O., Capt., R.N.	H. Exton Turner ...	M.L.	His Majesty's Ship ...	Met. Log. 23.10.23 to 19.2.24 ...	14.6.24.
<i>Essequibo</i> ...	Pearce, A. W. ...	G. Pattison ...	No.	R.M.S.P. Co. ...	Form 911 31.5.24 to 30.6.24 ...	5.8.24.
<i>Eumaeus</i> ...	Read, J. W. ...	E. R. Pritchard ...	"	A. Holt ...	" 30.4.24 to 15.6.24 ...	19.6.24.
<i>Euripides</i> ...	Collins, P. J., O.B.E.	H. S. Cox, A. R. Payne, F. Fuller.	M.L.	Aberdeen ...	Met. Log. 4.1.24 to 27.4.24 ...	12.5.24.
<i>Eurybates</i> ...	Lloyd, R. ...	J. A. Havard ...	No.	A. Holt ...	Form 911 31.5.24 to 30.6.24 ...	5.8.24.
<i>Explorer</i> ...	Lamont, A. ...	Scientific Staff ...	M.L.	Scottish Fishery Board ...	Met. Log. 23.2.24 to 5.6.24 ...	23.6.24.
<i>Fitzroy</i> ...	Woodhouse, A. F. B., Lt.-Commr., R.N. Silk, H. V., 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>Flandria</i> ...	Veldkamp, G. J. ...	W. G. Ton ...	No.	Holland Lloyd ...	Form 911 16.5.24 to 29.6.24 ...	7.7.24.
<i>Flinders</i> ...	Henderson, D. A., Lt.-Commr., R.N.	A. B. Foulleston, K. F. Boxall ...	M.L.	His Majesty's Ship ...	Met. Log. 28.3.24 to 25.7.24 ...	7.8.24.
<i>Francisco</i> ...	Wilkins, J., O.B.E.	A. Turpin ...	No.	Ellerman Wilson ...	Form 911 9.4.24 to 18.5.24 ...	21.5.24.
<i>Francol</i> ...	Gatley, E. ...	H. J. Prout ...	"	Royal Fleet Auxiliary ...	" 20.6.23 to 15.9.23 ...	27.11.23.
<i>Frankenfels</i> ...	Cartmer, G. E., O.B.E.	J. W. Allingham, J. H. A. Mackie, J. Garmory.	M.L.	India Office Shipping ...	Met. Log. 23.1.24 to 2.5.24 ...	8.5.24.
<i>Freienfels</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. ...	" ...	"	Scottish Fishery Board ...	" ...	"
<i>Gallic</i> ...	Summers, F. F., R.D., Commr. R.N.R.	W. G. O. Jones ...	No.	White Star ...	" 11.4.24 to 24.5.24 ...	27.5.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log Register, or Report Contributed.	Date Received.
<i>Galtymore</i> ...	Ledsome, J. S. ...	N. Goubrough ...	No.	Furness Withy	Form 911 24.6.24 to 5.7.24 ...	11.7.24.
<i>Garret</i> ...	Visser, C. W. ...	S. de Boo ...	"	Rotterdam Lloyd ...	" 21.5.24 to 3.6.24 ...	15.7.24.
<i>Gascoyne</i> ...	Mills, A. ...	P. G. Collins ...	"	Dalgaty & Co. ...	" 16.3.24 to 28.5.24 ...	15.7.24.
<i>Gelria</i> ...	Kalkman, J. M. ...	J. Aarents ...	"	Holland Lloyd ...	" 4.4.24 to 22.5.24 ...	20.5.24.
<i>Gladador</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 ...	" 24.3.24 to 14.4.24 ...	27.5.24.
<i>Glenapp, M.V.</i> ...	Ingram, T. T. ...	E. Poate ...	"	" ...	" 4.7.24 to 21.7.24 ...	31.7.24.
<i>Glenluce, M.V.</i> ...	Kennett, W. H. ...	A. Hodd ...	"	" ...	" 16.4.24 to 15.6.24 ...	20.6.24.
<i>Gloucestershire</i> ...	Robin, E. ...	T. E. Field ...	"	Bibby ...	" 15.3.24 to 23.5.24 ...	26.5.24.
<i>Gorgon</i> ...	Hughes, J. W. ...	W. E. Crompton ...	"	Dalgaty & Co. ...	" 25.5.24 to 4.7.24 ...	11.8.24.
<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 ...	" 15.11.23 to 3.12.23 ...	19.12.23.
<i>Hatarana</i> ...	Mardon, T. T. ...	J. L. Durkee, F. Wells, E. B. Heath, E. C. McGuiness. ...	M.L.	British India ...	" 12.9.23 to 26.3.24 ...	22.4.24.
<i>Hauraki, M.V.</i> ...	Woodget, H. T. ...	D. McLeish ...	No.	Union S.S. Co., N.Z. ...	" 27.10.23 to 4.1.24 ...	11.2.24.
<i>Henry Holmes, C.S.</i> ...	Geeve, G. E. ...	E. Hislop Tucker ...	"	W. I. & Panama Telegraph Co. ...	" 8.6.24 to 28.6.24 ...	25.7.24.
<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, H. Moore. ...	"	Bibby ...	Met. Log. 18.8.23 to 30.1.24 ...	22.2.24.
<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. 9.8.24 ...	9.8.24.
<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, H. Devlin, R. R. Soanes. ...	"	" ...	" 18.1.24 to 19.3.24 ...	8.4.24.
" <i>Rover</i> ...	Ashby Graves, F. ...	F. W. Harvey, S. G. King, F. Abbott. ...	"	" ...	" 8.5.24 to 8.7.24 ...	5.8.24.
" <i>Warrior</i> ...	Brooke, W. ...	W. T. Breen ...	No.	" ...	Form 911 12.3.24 to 2.5.24 ...	8.5.24.
<i>Hildebrand</i> ...	Maddrell, J. ...	H. Welsh ...	"	Booth ...	" 19.3.24 to 1.5.24 ...	5.5.24.
<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 ...	W.T.	Lampert & Holt ...	Form 911 12.1.24 to 10.3.24 ...	17.3.24.
<i>54 Homeric</i> ...	Metcalfe, G. R., Lt.-Commr., R.N.R. ...	H. Clark, H. Yates, A. Griffiths. ...	"	White Star ...	W.T. Reg. 3.7.24 to 18.7.24 ...	23.7.24.
<i>Honorius</i> ...	Samuels, C. ...	J. E. Martin, W. G. Iddes ...	No.	R. P. Houston ...	Form 911 27.9.23 to 13.10.23 ...	16.10.23.
<i>Huanchaco</i> ...	Redyard, A. ...	A. G. Litherland ...	"	" ...	" 31.5.24 to 26.6.24 ...	28.7.24.
<i>Hubert</i> ...	Evans, T. G. ...	C. C. Beal ...	"	Pacific S.N. Co. ...	" 15.7.24 to 5.8.24 ...	15.8.24.
<i>Hurumui</i> ...	Burton Davies, J. ...	Mr. Oxnard, J. Carpenter, Mr. Newington. ...	M.L.	Booth ...	" 23.6.24 to 11.7.24 ...	22.7.24.
"	"	"	"	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. 13.8.24 ...	13.8.24.
<i>Ikala</i> ...	Meetham, J. T. ...	E. Lightfoot ...	No.	J. H. Welsford & Co. ...	Form 911 28.6.24 to 17.7.24 ...	5.8.24.
<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. ...	R. H. Lucy, C. R. Brent, G. A. R. J. Leslie, E. E. Addis, G. A. Gould ...	M.L.	His Majesty's Ship ...	Met. Log. 29.11.23 to 16.3.24 ...	28.4.24.
<i>Ixion</i> ...	Baetens, F. ...	A. K. Sanderson ...	No.	A. Holt ...	Form 911 4.3.24 to 4.4.24 ...	14.4.24.
<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. ...	" 1.5.24 to 30.5.24 ...	3.6.24.
<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. ...	R. K. Lowry ...	No.	P. & O. ...	Form 911 15.5.24 to 15.6.24 ...	4.7.24.
<i>Kamo Maru</i> ...	Okano, Y. ...	F. Takaku ...	"	Nippon Yusen Kaisha ...	" 4.5.24 to 3.6.24 ...	12.6.24.
<i>Kangaroo</i> ...	Norris, H. C. ...	C. M. C. Clayton, R. J. Sinclair ...	M.L.	State Service Australia ...	Met. Log. 6.11.23 to 19.2.24 ...	23.4.24.
<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> ...	Shinomlya, T. ...	M. Takada ...	"	Nippon Yusen Kaisha ...	" 2.1.24 to 9.2.24 ...	14.3.24.
<i>Kashmir</i> ...	Bartlett, E. B., O.B.E. ...	F. Hopkins ...	"	P. & O. ...	" 24.5.24 to 30.6.24 ...	3.7.24.
<i>Kellett</i> ...	Haselfoot, F. E. B., D.S.O., Commr., R.N. ...	E. H. B. Baker, W. C. Jenks ...	M.L.	His Majesty's Ship ...	Met. Log. 28.10.23 to 15.11.23 ...	5.12.23.
<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>Khyber</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> ...	Kamada, N. ...	B. Nakane ...	"	Nippon Yusen Kaisha ...	" 8.4.24 to 2.5.24 ...	11.6.24.
<i>Knight Companion</i> ...	Beale, H. E. ...	J. H. Brown, W. Borrowes ...	"	A. Holt ...	" 18.6.24 to 3.7.24 ...	22.7.24.
<i>Kovno</i> ...	Casson, D. H., R.D., Commr., R.N.R. ...	E. R. Massam, G. H. Duncan, L. Griffiths ...	M.L.	Ellerman Wilson ...	Met. Log. 5.5.23 to 27.11.23 ...	3.12.23.
<i>Kyogle</i> ...	Coalstad, C. ...	C. B. Odman, E. W. Hughes ...	No.	Commonwealth Light-house Service. ...	" ...	"
<i>Lady Brenda</i> ...	Young, W. J. ...	B. L. Brind ...	"	Dawson ...	Form 911 25.9.23 to 4.10.23 ...	13.10.23.
<i>Lady Denison Pender, C.S.</i> ...	West, G. W. ...	A. G. Watts ...	"	Eastern Tel. Co. ...	" 26.5.24 to 15.6.24 ...	5.8.24.
<i>Lady Kindersley</i> ...	" ...	" ...	"	Hudson's Bay Co. ...	" ...	"
<i>Laguna</i> ...	Mander, F. ...	F. W. Parker ...	"	Pacific S.N. Co. ...	Form 911 22.3.24 to 14.4.24 ...	28.4.24.
<i>Lalande</i> ...	Bambra, W. A. ...	N. Webster ...	"	Lampert & Holt ...	" 25.5.24 to 21.6.24 ...	3.7.24.
<i>Lancashire</i> ...	Beckett, F. W. ...	T. L. Owen ...	"	Bibby ...	" 12.4.24 to 27.6.24 ...	7.7.24.
<i>Laomedon</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. ...	" 15.6.24 to 3.7.24 ...	5.8.24.

LIST OF VOLUNTARY OBSERVING SHIPS

V

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed.	Date Received.
<i>Laplace</i> ...	Davies, G. W. ...	A. Hughes I. O. Jones ...	No.	Lampport & Holt ...	Form 911 20.1.24 to 27.3.24 ...	7.4.24.
<i>55 Lapland</i> ...	Howell, T. ...	C. K. Knapp, G. H. Bowyer. A. Mather. ...	W.T.	Red Star ...	W.T. Reg. 7.7.24 to 26.7.24 ...	31.7.24.
<i>Lassell, M.V.</i> ...	Turner, J. E. ...	A. T. Crilly ...	No.	Lampport & Holt ...	Form 911 7.7.24 to 26.7.24 ...	31.7.24.
<i>Leicestershire</i> ...	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.
<i>Leitrim</i> ...	Robertson, A. ...	H. C. Roberts ...	No.	Dowie, J., & Co. ...	Met. Log. 24.5.24 to 4.8.24 ...	7.8.24.
<i>Levant C.S.</i> ...	West, G. W. ...	... ..	...	Eastern Tel. Co. ...	Form 911 6.5.24 to 22.5.24 ...	30.6.24.
<i>Ling Nam</i> ...	Waterson, W. H. V. ...	... ..	No.	Chunghwa Nav. Co. ...	Form 911 26.11.23 to 16.12.23 ...	30.12.23.
<i>Llanstephan Castle</i> ...	Wilford, T. H. ...	W. F. Malden ...	...	Union Castle ...	Form 911 27.10.23 to 12.1.24 ...	22.4.24.
<i>Loch Katrine</i> ...	Matthews, G. P. ...	C. Noakes ...	...	R.M.S.P. Co. ...	Form 911 19.3.24 to 10.4.24 ...	22.4.24.
<i>London Commerce</i> ...	Young, H. J., D.S.O. ...	P. G. Leverett ...	...	Furness Withy ...	Form 911 25.4.24 to 1.8.24 ...	13.8.24.
<i>Loreto, M.V.</i> ...	Barkley, E. ...	F. Binnion ...	...	Pacific S.N. Co. ...	Form 911 14.6.24 to 15.7.24 ...	22.7.24.
<i>Losada M.V.</i> ...	Meldrum, G. W. ...	A. H. Turner ...	...	...	Form 911 18.5.24 to 7.6.24 ...	12.6.24.
					Form 911 12.3.24 to 16.5.24 ...	21.5.24.
<i>Macedonia</i> ...	Potter, H. W., R.D., Commr., R.N.R. ...	J. B. Buggi ...	No.	P. & O. ...	Form 911 6.7.24 to 14.7.24 ...	28.7.24.
<i>Macharda</i> ...	Cochran, G. ...	W. Moore ...	...	Brocklebank ...	Form 911 12.12.23 to 8.3.24 ...	14.3.24.
<i>Mahana</i> ...	Kershaw, W. A. R. ...	F. M. Smith, R. Batley ...	...	Shaw Savill & Albion ...	Form 911 16.5.24 to 1.7.24 ...	8.7.24.
<i>Maharaja</i> ...	Peet, T. M. ...	E. Childs ...	...	Asiatic S.N. Co. ...	Form 911 5.5.24 to 19.7.24 ...	12.8.24.
<i>Maihar</i> ...	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.
<i>Maimyo</i> ...	Richardson, T. ...	R. A. L. Williams ...	No.	Atlantic Transport ...	Form 911 4.7.24 to 17.7.24 ...	11.8.24.
<i>Maine</i> ...	Seymour, H. ...	S. C. Skinner ...	...	White Star ...	Form 911 7.6.24 to 26.6.24 ...	13.8.24.
<i>58 Majestic</i> ...	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.	...	Form 911 10.7.24 to 24.7.24 ...	28.7.24.
<i>Makambo</i> ...	Butler, E. ...	F. C. Ree ...	M.L.	Burns Philp ...	Met. Log. 26.9.23 to 29.1.24 ...	7.7.24.
<i>Makura</i> ...	Griffiths, G. I. ...	G. O. Knaggs ...	M.L.	Canadian-Australasian ...	Form 911 8.3.24 to 26.6.24 ...	22.7.24.
<i>Malancha</i> ...	Crawford, R. ...	F. Boulding ...	No.	Brocklebank ...	Form 911 9.7.24 to 19.7.24 ...	29.7.24.
<i>Malda</i> ...	Barlow, A. E. ...	L. H. Cornish ...	...	British India ...	Form 911 17.2.24 to 9.5.24 ...	14.5.24.
<i>Manchester Corporation.</i> ...	Whitham, F. ...	L. H. Moorhouse ...	...	Manchester Liners ...	Form 911 5.7.24 to 4.8.24 ...	8.8.24.
<i>Manchester Mariner</i> ...	Gray, T. N. ...	...	...	...	Met. Log. 28.7.23 to 29.2.24 ...	19.3.24.
<i>Manchester Merchant.</i> ...	Everest J. E. ...	C. E. Stocker, J. F. Fisher, F. Stockton. ...	M.L.	...	Form 911 11.5.24 to 24.5.24 ...	6.6.24.
<i>Mandasor</i> ...	Riley, J. E. ...	A. H. Boyd, A. E. Ricketts... ..	No.	Brocklebank ...	Form 911 1.12.23 to 7.1.24 ...	28.1.24.
<i>Manhattan</i> ...	Kershaw, R. W. ...	W. Baxter ...	...	Atlantic Transport ...	Form 911 25.5.24 to 1.8.24 ...	11.8.24.
<i>Manipur</i> ...	Hutchison J. G. ...	S. K. Hawkins ...	...	Brocklebank ...	Form 911 6.2.24 to 22.4.24 ...	21.5.24.
<i>Manistee</i> ...	Scurr, T. W. ...	G. W. Barker ...	...	Elders & Fyffes ...	Met. Log. 22.3.24 to 20.7.24 ...	24.7.24.
	Isaacson, J. M. ...	F. McCollum, H. E. Lees, L. C. Bach, H. C. Slater. ...	M.L.	Canadian Pacific ...	Form 911 8.3.24 to 26.6.24 ...	16.7.24.
<i>Marburn</i> ...	Freer, A., R.D., Commr., R.N.R. ...	H. S. Knight, J. Shearer, J. Sharples. ...	M.L.	Burns Philp ...	Form 911 12.7.23 to 22.11.23... ..	3.3.24.
<i>Marella</i> ...	Mortimer S. ...	Burdiss, Pemberton, Thompson ...	M.L.	Ellerman Wilson ...	Form 911 17.2.24 to 7.5.24 ...	15.5.24.
<i>Marengo</i> ...	Bean, A. ...	J. Strachan, P. Wright, R. E. Tarran, D. Johnstone. ...	M.L.	British India ...	Form 911 16.2.24 to 7.3.24 ...	11.3.24.
<i>Margha</i> ...	Milne, R. A., R.D., Commr., R.N.R. ...	A. Pennington ...	No.	Atlantic Transport ...	Form 911 19.3.24 to 23.4.24 ...	8.5.24.
<i>Marglen</i> ...	Griffiths, J. N. ...	F. T. Good ...	...	British India ...	Form 911 4.4.24 to 25.4.24 ...	26.5.24.
<i>Maryland</i> ...	Pollard, F. W., D.S.O., R.D., Commr., R.N.R. ...	M. W. K. Bishop ...	...	Brocklebank ...	Form 911 9.5.24 to 13.6.24 ...	23.6.24.
<i>Mashobra</i> ...	Gallie ...	R. C. Baker ...	...	Anchor ...	Form 911 31.12.23 to 24.4.24... ..	29.4.24.
<i>Masirah</i> ...	Thowless, E. ...	E. Richardson ...	...	Shaw, Savill & Albion ...	Form 911 20.2.24 to 19.5.24 ...	12.6.24.
<i>Massilia</i> ...	Caithness, J. B. ...	J. J. Finn, J. W. Hart ...	...	Burns Philp & Co. ...	Form 911 23.5.24 to 23.6.24 ...	27.6.24.
<i>Matakana</i> ...	Bosdet, V. J. ...	G. B. Smith, F. Boulding, D. Hunter, G. E. Thomas. ...	M.L.	Brocklebank ...	Form 911 28.12.23 to 21.1.24... ..	1.2.24.
<i>Mataram</i> ...	Cornish, N. P. ...	H. H. Armstrong ...	No.	Elders & Fyffes ...	Form 911 3.9.23 to 28.5.24 ...	31.5.24.
<i>Mathura</i> ...	Hanna, R. G. ...	W. G. E. D. Rawlingson ...	M.L.	Cunard ...	Form 911 1.6.24 to 16.6.24 ...	19.6.24.
<i>Matiana</i> ...	Langlands, D. H. ...	...	...	...	Form 911 22.6.24 to 2.7.24 ...	9.7.24.
<i>Matina</i> ...	Henderson, J. ...	...	...	...	Form 911 1.6.24 to 16.6.24 ...	18.6.24.
<i>32 Mauretania</i> ...	Rostron, A. H., C.B.E., R.D., A.-d.-C., Capt., R.N.R. ...	J. A. Myles, P. A. Morgan, D. Forbes. ...	W.T.	White Star ...	Form 911 29.6.24 to 18.7.24 ...	22.7.24.
<i>56 Megantic</i> ...	Berry, G. ...	L. Thompson, H. J. C. Day, R. Conway. ...	W.T.	Canadian Pacific ...	Form 911 28.6.24 to 16.7.24 ...	17.7.24.
<i>22 Melita</i> ...	Clews, A. H. ...	C. Draper, W. Baker ...	W.T.	A. Holt ...	Form 911 30.6.24 to 9.7.24 ...	21.7.24.
<i>Memnon</i> ...	Salter, G. H. ...	E. D. Potts ...	No.	Atlantic Transport ...	Form 911 10.7.24 to 11.8.24 ...	14.8.24.
<i>Menominee</i> ...	Finch, E. ...	N. Seymour ...	...	Leyland ...	Form 911 22.5.24 to 30.6.24 ...	16.7.24.
<i>Mercian</i> ...	Carnon, J. R. ...	W. Baker ...	...	Canadian Pacific ...	Form 911 4.6.24 to 5.6.24 ...	10.6.24.
<i>21 Metagama</i> ...	Henderson, W. ...	B. Leslie, R. Jackson, A. Mansey, A. H. Piggott. ...	W.T.	Elders & Fyffes ...	Form 911 19.5.24 to 21.6.24 ...	24.6.24.
<i>Miami</i> ...	Maxwell Brown, W. E. ...	E. Lowndes ...	No.	Atlantic Transport ...	Form 911 11.6.24 to 20.6.24 ...	25.6.24.
<i>Michigan</i> ...	Tribe, A. E. ...	L. A. Williams ...	M.L.	West Australia Nav. Co. ...	Form 911 11.7.23 to 13.12.23... ..	14.4.24.
<i>Minderoo</i> ...	Richardson, E. ...	B. J. Bennie, W. J. McPhedron, J. H. Oxtan. ...	...	Scottish Fishery Board ...	Form 911 12.7.24 to 29.7.24 ...	2.8.24.
<i>Minna</i> ...	Mackenzie, G. G. ...	E. V. Glennie, D. I. C. Robertson, H. Scallan. ...	W.T.	Canadian Pacific ...	Form 911 11.7.24 to 30.7.24 ...	4.8.24.
<i>23 Minnedosa</i> ...	Sibbons, H. ...	H. E. McCartney ...	No.	Atlantic Transport ...	Form 911 29.6.24 to 19.7.24 ...	23.7.24.
<i>Minnetonka</i> ...	Gates, T. F. ...	W. S. Mackie ...	...	Eastern Tel. Co. ...	Form 911 13.7.24 to 2.8.24 ...	6.8.24.
<i>Minneapolis</i> ...	Claret, F. ...	C. B. F. St. John ...	...	Atlantic Transport ...	Form 911 12.4.24 to 25.5.24 ...	12.8.24.
<i>Mirror, C.S.</i> ...	Sherwood, C. A. ...	G. B. F. St. John ...	...	...	Form 911 6.4.24 to 18.4.24 ...	22.4.24.
<i>Mississippi, M.V.</i> ...	Wylie, J. T. J. ...	W. W. Howard ...	...	...	Form 911 30.7.23 to 2.9.23 ...	6.9.23.
<i>Missouri</i> ...	Hutchison, J. G. ...	P. de Viels ...	...	Nederland ...	Form 911 24.6.24 to 11.7.24 ...	5.8.24.
<i>Moena</i> ...	Morzer Bruyns, M. F. ...	E. T. Ferraby ...	...	P. & O. ...	Form 911 5.5.24 to 29.6.24 ...	14.7.24.
<i>Moldavia</i> ...	Burleigh, C. W., D.S.O., R.D., Capt., R.N.R. ...	...	...	...	Form 911 25.3.24 to 27.5.24 ...	2.6.24.
<i>Mongolian Prince</i> ...	Durrant, G. D. ...	R. S. Bibby ...	No.	Prince ...	Form 911 13.10.23 to 20.11.23 ...	21.1.24.
<i>Monkbarns, Ship</i> ...	Davies, W. ...	M. B. Glasier ...	W.T.	Stewart & Co. ...	Form 911 19.7.24 to 7.8.24 ...	8.8.24.
<i>24 Montcalm</i> ...	Rennie, A., O.B.E. ...	H. McFadyen ...	W.T.	Canadian Pacific ...	Form 911 5.7.24 to 24.7.24 ...	28.7.24.
<i>25 Montclare</i> ...	Webster, G. S., R.D., Commr., R.N.R. ...	R. Fegan, G. F. Hutchings, A. Phillips. ...	...	...	Form 911 25.6.24 to 13.8.24 ...	16.8.24.
<i>Montlaurier</i> ...	Turnbull, J., C.B.E., R.D., Capt., R.N.R. ...	H. H. Davies ...	No.	...	Form 911 25.6.24 to 13.8.24 ...	16.8.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed.	Date Received.
26 <i>Montrose</i> ...	Landy, E. ...	D. Loram ...	W.T.	Canadian Pacific ...	W.T. Reg. 29.6.24 to 17.7.24 ... Form 911 28.6.24 to 17.7.24 ...	21.7.24. 21.7.24.
20 <i>Montroyal</i> ...	Latta, R. G. ...	R. W. Jones, C. E. Duggan, E. V. Glennie, G. Marriott.	"	" " ...	W.T. Reg. 11.7.24 to 31.7.24 ... Met. Log. 12.7.24 to 31.7.24 ...	5.8.24. 5.8.24.
<i>Moreada</i> ...	Mills, T. L., O.B.E., R.D., Commr., R.N.R.	J. Norris, D. Lonie, F. Dyson	M.L.	British India ...	Met. Log. 15.9.23 to 27.11.23...	29.11.23.
<i>Mulbera</i> ...	Steadman, W. R. ...	H. Vaughan ...	No.	British India ...	Form 911 1.6.24 to 3.7.24 ...	8.7.24.
<i>Nagara</i> ...	Turner, E. A. ...	G. K. Brown ...	"	R.M.S.P. Co. ...	" 2.5.24 to 25.6.24 ...	30.6.24.
<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 ...	"	British India ...	" 27.4.24 to 26.5.24 ...	11.7.24.
<i>Nariva</i> ...	Buret, T. J. C. ...	J. E. Atkins, B. C. Dodds, S. H. Butler.	M.L.	R.M.S.P. Co. ...	Met. Log. 2.4.24 to 30.5.24 ...	4.6.24.
<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. ...	" 11.4.24 to 8.6.24 ...	18.6.24.
<i>Navab</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. Aspinall ...	"	P. & O. ...	" 9.4.24 to 27.5.24 ...	2.6.24.
<i>Nestor</i> ...	Owen, R. D., O.B.E.	O. V. Jones ...	"	A. Holt ...	" 19.4.24 to 25.5.24 ...	15.7.24.
<i>Nevasa</i> ...	Swanson, C. J. ...	E. C. T. West ...	"	British India ...	" 12.10.23 to 21.12.23	4.1.24.
<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. ...	R. M. Scott, N. G. Buxton, O. C. Bray, R. B. Denniston.	M.L.	Canadian-Australian... " ...	" 6.10.23 to 28.2.24 ...	30.4.24.
<i>Ningchow</i> ...	Wilson, C. A. ...	R. A. Hannay ...	No.	A. Holt ...	Form 911 20.4.24 to 18.6.24 ...	31.7.24.
<i>Nore</i> ...	Randall H. W. R.D., Capt., R.N.R.	J. C. Ablewhite R. W. Mackie, H. C. Slinn.	M.L.	P. & O. ...	Met. Log. 6.3.24 to 25.5.24 ...	29.5.24.
<i>Norman</i> ...	Morton Betts, W. ...	D. A. Hodgson ...	No.	Union Castle ...	Form 911 13.4.24 to 1.5.24 ...	29.5.24.
<i>Norna</i> ...	Wright, J. ...	" ...	"	Scottish Fishery Board ...	" ...	"
<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. ...	C. R. Stevens ...	No.	Leyland ...	Form 911 20.4.24 to 22.5.24 ...	29.5.24.
<i>Nubian</i> ...	Watmough, T. M. ...	W. J. Wright ...	"	" ...	" 25.4.24 to 11.5.24 ...	14.5.24.
<i>Nyanza</i> ...	Carpendale, F. W. J.	F. Aheir, C. H. Hand, F. Ardern.	M.L.	P. & O. ...	Met. Log. 11.2.24 to 6.5.24 ...	12.5.24.
<i>Oaklands Grange</i> ...	Routledge, R. ...	E. A. Insley ...	No.	Houlder Bros. ...	Form 911 15.2.24 to 3.5.24 ...	16.5.24.
<i>Odland I.</i> ...	Villiamsen ...	H. Svendgaard ...	"	Hannevig Bros. ...	" 19.12.23 to 2.1.24 ...	4.1.24.
<i>Ohio</i> ...	Lainson, W. H. ...	W. Paine, C. K. Brown, G. C. Clairmonte.	M.L.	R.M.S.P. Co. ...	Met. Log. 18.5.23 to 2.12.23 ...	13.12.23.
<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.
57 <i>Olympic</i> ...	Howarth, F. B., Commr., R.N.R.	J. C. M. Boyce, C. W. Couch, C. J. Warltire.	W.T.	White Star ...	W.T. Reg. 24.7.24 to 7.8.24 ... Form 911 4.6.24 to 10.7.24 ...	11.8.24. 14.7.24.
<i>Onitsha</i> ...	Williams, T. E. ...	D. Rollo ...	No.	Elder Dempster ...	Form 911 1.9.23 to 21.9.23 ...	20.11.23.
<i>Oranian</i> ...	Hoskins, W. ...	T. Miller ...	"	Leyland ...	" 4.2.24 to 29.3.24 ...	2.4.24.
<i>Orari</i> ...	Robinson, F. W. ...	R. Newman, T. Breen, F. Long- heed, G. Lant, H. Farrant.	M.L.	New Zealand S.S. Co. ...	Met. Log. 22.11.23 to 11.5.24...	16.5.24.
40 <i>Orbita</i> ...	Parker, W. H., C.B.E., R.D., Capt., R.N.R.	R. V. Rutley, O. S. Thomas, K. P. Alliston.	W.T.	R.M.S.P. Co. ...	W.T. Reg. 29.6.24 to 20.7.24 ... Form 911 29.6.24 to 20.7.24 ...	2.8.24. 23.7.24.
<i>Orcoma</i> ...	Pleignier, H. T. S. ...	G. B. Wardale, J. J. Buckley, C. H. Denton.	M.L.	Pacific S.N. Co. ...	Met. Log. 21.2.24 to 4.5.24 ...	8.5.24.
41 <i>Orduna</i> ...	Warner, G. E., R.D., Commr., R.N.R.	S. Robbins, J. Vivian, J. S. Wrake, A. A. Martin.	W.T.	R.M.S.P. Co. ...	W.T. Reg. 27.6.24 to 13.7.24 ... Form 911 22.6.24 to 13.7.24 ...	16.7.24. 16.7.24.
<i>Oriana</i> ...	Christian, G. H. ...	G. Pattison, Mason, G. F. Nicholson, Cruikshank.	M.L.	Pacific S.N. Co. ...	Met. Log. 26.1.23 to 14.8.23 ...	18.8.23.
<i>Orita</i> ...	Dominy, R. H., C.B.E., Commr., R.N.R.	H. S. Roberts, J. S. Ward- man.	M.L.	" " ...	Met. Log. 26.12.23 to 2.6.24 ...	5.6.24.
<i>Ormonde</i> ...	Douglas, H. P., C.M.G., Capt., R.N.	A. M. Hughes ...	M.L.	His Majesty's Ship ...	Met. Log. 4.3.24 to 23.6.24 ...	10.7.24.
<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. 2.3.24 to 15.6.24 ...	28.6.24.
<i>Ormuz</i> ...	James, L. V., D.S.C.	J. S. Metcalf, I. E. G. Goldsworthy, L. A. Keeble.	M.L.	" ...	Met. Log. 6.1.24 to 24.4.24 ...	30.4.24.
<i>Oroya</i> ...	Chittenden, A. ...	S. Lewis ...	No.	Pacific S.N. Co. ...	Form 911 1.5.24 to 7.7.24 ...	15.7.24.
<i>Orsova</i> ...	Matheson, C. G., D.S.O., R.D., Commr., R.N.R.	C. Fox, J. C. Jackson, C. V. Dodgson, P. P. Murphy.	M.L.	Orient ...	Met. Log. 3.2.24 to 20.5.24 ...	30.5.24.
<i>Ortega</i> ...	Christian, C. H. ...	" ...	No.	Pacific S.N. Co. ...	Form 911 10.3.24 to 21.5.24 ...	30.5.24.
<i>Oretieto</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. 30.3.24 to 2.7.24...	7.7.24.
<i>Osterley</i> ...	Cameron, E. P. ...	F. G. Goodman, E. Hatch, L. A. Keeble.	M.L.	" ...	" 27.4.24 to 30.7.24 ...	6.8.24.
<i>Othello</i> ...	Pearson, Z. C. ...	E. G. H. Huddleston ...	No.	Ellerman Wilson ...	Form 911 23.5.24 to 12.7.24 ...	18.7.24.
<i>Otira</i> ...	Elford, H. E. ...	V. R. Bowling ...	"	Shaw, Savill & Albion ...	" 7.6.24 to 28.6.24 ...	22.7.24.
<i>Ovid</i> ...	Groom, A. C. B. ...	" ...	"	Shakespeare Shipping Co.	" 8.6.24 to 7.7.24 ...	8.8.24.
<i>Pacific Shipper, M.V.</i> ...	Newman, G. ...	F. H. Perry ...	"	Furness Withy ...	" ...	"
<i>Pakeha</i> ...	W. P. Clifton Mogg	M. F. Armitage ...	"	Shaw, Savill & Albion ...	Form 911 1.7.24 to 10.8.24 ...	15.8.24.
<i>Paparoa</i> ...	Ashworth, F. ...	E. H. Hopkins ...	"	New Zealand S.S. Co. ...	" 25.3.24 to 10.5.24 ...	14.5.24.
<i>Paris</i> ...	Cook, C. L. ...	Mr. Biles ...	C.C.	Southern Rly. ...	Telegraphic Report. 19.2.24	19.2.24.
<i>Patia</i> ...	Bostock, R. J. ...	W. McIlwain ...	No.	Elders & Fyffes ...	Form 911 6.7.24 to 12.8.24 ...	15.8.24.
<i>Patrol, C.S.</i> ...	Bredenberg, F. ...	Gardiner, Albrecht, Morrell...	M.L.	Eastern Extension (A. & C.) Telegraph Co.	Met. Log. 1.7.23 to 14.9.23 ...	25.2.24.
<i>Persic</i> ...	Davies, E. ...	N. E. Banks ...	No.	White Star ...	Form 911 12.5.24 to 23.6.24 ...	2.7.24.
<i>Peshawur</i> ...	Hester, C. W., R.D., Commr., R.N.R.	C. E. Arundel ...	M.L.	P. & O. ...	Met. Log. 13.3.24 to 13.5.24 ...	19.5.24.
<i>Philadelphian</i> ...	Baker, J. A. ...	G. W. B. Lloyd ...	No.	Leyland ...	Form 911 7.2.24 to 22.4.24 ...	24.4.24.

LIST OF VOLUNTARY OBSERVING SHIPS

vii

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed.	Date Received.
<i>Polyphemus</i> ...	Hatfield, J. ...	F. Silva ...	No.	A. Holt ...	Form 911 5.5.24 to 24.5.24 ...	23.6.24.
<i>Poona</i> ...	Cherry, W. G. W. ...	F. J. Ablewhite ...	M.L.	P. & O. ...	21.4.24 to 3.5.24 ...	13.6.24.
<i>Port Albany</i> ...	Robinson, C. A. ...	G. L. Hazlewood, W. B. Craig, A. G. Newbury, W. Eastoe.	M.L.	Commonwealth & Dominion.	Met. Log. 18.10.23 to 19.3.24...	1.4.24.
„ <i>Augusta</i> ...	Brown, A. H. ...	R. C. Carter, C. F. Coate, H. Stone.	M.L.	„ „ „	„ 13.10.23 to 24.3.24...	7.4.24.
„ <i>Caroline</i> ...	Harris, G. T. C. ...	P. H. Pedrick, T. Copeland, E. Fenton.	M.L.	„ „ „	„ 22.12.24 to 19.7.24...	23.7.24.
„ <i>Curtis</i> ...	Sawbridge, I. R. ...	A. G. Rhind ...	No.	„ „ „	„ „ „	„
„ <i>Darwin</i> ...	Renaut, F. A. ...	E. T. N. Lawrey, E. W. R. Young.	„	„ „ „	Form 911 30.1.24 to 6.4.24 ...	9.4.24.
„ <i>Hacking</i> ...	Jack, J. ...	Rowland Hill ...	M.L.	„ „ „	„ 31.5.24 to 2.6.24 ...	30.7.24.
„ <i>Hunter</i> ...	Stickland, A. E. ...	A. Cooper, C. F. Post, J. H. Bower.	M.L.	„ „ „	Met. Log. 16.11.23 to 18.3.24...	21.3.24.
„ <i>Lyttelton</i> ...	Cottell, S. C. ...	W. L. Lynd, J. Buchan, H. M. Post, G. H. Harvey.	M.L.	„ „ „	„ 19.9.23 to 23.11.23...	3.6.24.
„ <i>Melbourne</i> ...	Ferris, J. ...	D. G. H. Bradley, J. A. Fairbairn, C. Newton.	M.L.	„ „ „	„ 13.3.24 to 25.7.24 ...	6.8.24.
„ <i>Nicholson</i> ...	Kearney, F. J. ...	W. G. Jones, C. R. Townshend, G. G. Langford.	M.L.	„ „ „	„ 5.10.23 to 4.2.24 ...	11.2.24.
„ <i>Pirie</i> ...	Hoad, A. C. ...	H. C. Jeffery, E. E. Roswell, R. S. Stannard, L. J. Brice.	M.L.	„ „ „	„ 9.2.24 to 22.6.24...	26.6.24.
„ <i>Sydney</i> ...	Higgs, W. G. ...	H. E. Higgs, A. W. Sams, C. Groves, A. M. Stanton.	M.L.	„ „ „	„ 9.12.23 to 27.4.24 ...	8.5.24.
„ <i>Victor</i> ...	Lea, W. H. ...	R. T. R. Tomsett, W. Pickup, G. Jones.	M.L.	„ „ „	„ 23.10.23 to 17.3.24...	19.3.24.
<i>President Jackson</i> ...	Swan, L. H. ...	E. Walker ...	No.	Pacific S.S. Co. ...	Form 911 19.4.24 to 19.5.24 ...	10.7.24.
<i>Protesilaus</i> ...	Griffith, J. ...	E. P. Gault, D. Reid, A. Woolfenden, F. Smith.	M.L.	A. Holt ...	Met. Log. 3.4.24 to 15.6.24 ...	22.7.24.
<i>Pyrrhus</i> ...	Wilkinson, H. ...	W. Owen ...	No.	„ „ „	Form 911 22.6.24 to 15.7.24 ...	13.8.24.
<i>Regina</i> ...	Elford, W. J. ...	A. Hulme ...	No.	White Star-Dominion	Form 911 6.7.24 to 25.7.24 ...	29.7.24.
<i>Reindeer</i> ...	Smith, R. G. ...	Mulhall, W. ...	C.C.	G.W. Railway ...	Telegraphic Report 14.8.24 ...	14.8.24.
<i>Rhodesian Transport</i> ...	Fowler, W. H. ...	A. E. Warburton ...	No.	Houlder Bros. ...	Form 911 19.2.24 to 29.5.24 ...	11.6.24.
<i>Rialto</i> ...	Mordue, J. A. ...	„ W. Smith, H. Horwood, R. S. Cox.	M.L.	Ellerman Bucknall ...	„ 11.6.24 to 29.6.24 ...	31.7.24.
<i>Rimutaka</i> ...	Hemming, F. A. ...	„ „ „	M.L.	New Zealand S.S. Co.	Met. Log. 22.9.23 to 6.2.24 ...	11.2.24.
<i>Risaldar</i> ...	Park, G. ...	W. H. Underhill, E. King ...	No.	Asiatic S.N. Co. ...	„ 18.4.24 to 16.7.24 ...	21.7.24.
<i>Romney</i> ...	Leicester, F. S. ...	J. Fraser ...	„	Lamport & Holt ...	Form 911 5.7.24 to 24.7.24 ...	28.7.24.
<i>Royal Fusilier</i> ...	Dawson, J. ...	„ „ „	„	London & Edinburgh S.S. Co.	„ 27.3.24 to 27.4.24 ...	29.4.24.
<i>Royal Transport</i> ...	Dove, J. ...	R. Martin ...	M.L.	Houlder Bros. ...	Met. Log. 6.11.23 to 7.3.24 ...	13.3.24.
<i>Ruapehu</i> ...	Holland, E. A. ...	J. D. Tooms, G. Kinnett, P. J. Connolly, F. Cooke.	M.L.	New Zealand S.S. Co.	„ „ „	„
<i>Sachem</i> ...	Furneaux, S. ...	C. Waldron, E. Sainty ...	No.	Furness Withy ...	Form 911 21.6.24 to 25.7.24 ...	29.7.24.
<i>Samaria</i> ...	Horsburgh, G., O.B.E.	R. P. Cambell ...	„	Cunard ...	„ 21.7.24 to 10.8.24 ...	15.8.24.
<i>Sandown Castle</i> ...	Jackson, C. R. ...	G. H. Mayhew ...	„	„ „ „	„ 14.6.24 to 10.7.24 ...	29.7.24.
<i>Saoirse, Yacht</i> ...	O'Brien, C. ...	H. S. Hodges ...	„	„ „ „	„ 1.9.23 to 6.10.23 ...	7.11.23.
<i>Sardinia</i> ...	Cadiz, F. G., D.S.C.	A. F. Wiles ...	„	„ „ „	„ 1.1.24 to 21.1.24 ...	4.2.24.
10 <i>Saturnia</i> ...	Black, J. ...	T. Ure ...	W.T.	Anchor Donaldson ...	W.T. Reg. 5.7.24 to 26.7.24 ...	31.7.24.
<i>Saxoleine</i> ...	Biddick, E. ...	S. Wood ...	No.	„ „ „	Form 911 5.7.24 to 26.7.24 ...	1.8.24.
<i>Saxon</i> ...	Stanley, W. F., R.D., Commr., R.N.R.	R. S. W. Harris ...	„	Hunting & Son ...	„ 25.6.24 to 28.7.24 ...	11.8.24.
<i>Saxonia</i> ...	Brown, A. T. ...	H. A. D. Waterhouse ...	„	„ „ „	„ 6.6.24 to 27.7.24 ...	29.7.24.
<i>Scholar</i> ...	O'Connor, T. ...	H. Hall ...	„	Cunard ...	„ 3.6.24 to 30.6.24 ...	7.7.24.
<i>Scientist</i> ...	Hansen, W. A. ...	D. G. Russell ...	„	Harrison ...	„ 26.3.24 to 14.6.24 ...	24.7.24.
<i>Scindia</i> ...	Smart, R. W. ...	H. D. Campsie ...	„	„ „ „	„ 21.5.24 to 9.8.24 ...	12.8.24.
<i>Scotia</i> ...	Telfer ...	O. W. L. Jones ...	C.C.	Anchor ...	„ 15.3.24 to 28.5.24 ...	3.6.24.
<i>Scottish Bard</i> ...	McDonnell, S. ...	W. H. Campbell ...	No.	L.M. & S. Rly. ...	Telegraphic Report 14.8.24 ...	14.8.24.
<i>Scottish Borderer</i> ...	Thompson, F. ...	G. F. Widger ...	„	Tankers, Ltd. ...	Form 911 25.8.23 to 14.9.23 ...	1.10.23.
33 <i>Scythia</i> ...	Prothero, W. ...	T. Parry, G. Overton, W. Cox.	W.T.	„ „ „	„ 12.6.24 to 13.7.24 ...	21.7.23.
<i>Sheaf Mount</i> ...	Groves, C. V. ...	C. A. Gould ...	No.	Cunard ...	W.T. Reg. 6.7.24 to 28.7.24 ...	31.7.24.
<i>Sheaf Spear</i> ...	Whitfield, G. A., O.B.E.	A. E. Harvey, W. H. Grise-wood.	M.L.	„ „ „	Form 911 9.6.24 to 27.6.24 ...	1.8.24.
<i>Sicilia</i> ...	Davis, H. C., D.S.C., R.D., Commr., R.N.R.	R. Rowe ...	No.	Souter, W. A. ...	„ 12.7.24 to 25.7.24 ...	1.8.24.
<i>Socrates</i> ...	James, F. R. ...	E. R. Hartley ...	„	„ „ „	Met. Log. 29.1.24 to 9.7.24 ...	29.7.24.
<i>Soekaboemi</i> ...	Ruhaak, G. H. ...	W. N. de Wijn ...	„	Lamport & Holt ...	„ 14.6.24 to 4.7.24 ...	29.7.24.
<i>Somerset</i> ...	Barnett, H. ...	C. H. Landfield ...	M.L.	„ „ „	„ 25.6.24 to 19.7.24 ...	28.7.24.
<i>Somersetshire</i> ...	Adamson, B. W. ...	„ „ „	M.L.	„ „ „	„ 17.11.23 to 1.1.24 ...	4.1.24.
<i>Somme</i> ...	Miles, F. R., Commr., R.N.R.	B. K. Berry, C. C. Prosser, D. P. Larham.	M.L.	Bibby ...	„ „ „	„
<i>Songster</i> ...	Thompson, W. ...	W. F. O'Neill ...	M.L.	R.M.S.P. Co. ...	Met. Log. 24.4.23 to 28.11.23...	17.12.23.
<i>Spectator</i> ...	Owen, W. F. ...	A. M. Dick ...	No.	„ „ „	„ 13.10.23 to 5.11.23...	19.2.24.
<i>Spero</i> ...	French, H. E. ...	E. A. Gould, G. Mussared ...	M.L.	Harrison ...	Form 911 2.1.24 to 18.4.24 ...	22.4.24.
<i>Stephan, C.S.</i> ...	Carlton, G. F., O.B.E., Commr., R.N.R.	J. Matthews, F. B. Bolingbroke, W. E. Allen.	M.L.	„ „ „	Met. Log. 8.6.23 to 17.2.24 ...	13.3.24.
<i>Surrey</i> ...	Field, H. E. B. ...	G. W. Allard, S. E. Hoblyn, R. R. Bennett.	M.L.	Ellerman Wilson ...	„ 14.5.24 to 17.6.24 ...	20.6.24.
<i>Sussex</i> ...	Upton, E. C. S. ...	W. A. Ewington ...	No.	Telegraph Construction & Maintenance.	„ 12.1.24 to 6.6.24 ...	11.6.24.
<i>St. Albans</i> ...	„ „ „	„ „ „	„	Federal ...	„ „ „	„
<i>St. George</i> ...	Blair, D., O.B.E., R.D., Commr., R.N.R.	„ „ „	M.L.	„ „ „	Form 911 3.4.24 to 8.5.24 ...	13.6.24.
<i>St. Patrick</i> ...	Bearpark, E. W. ...	W. P. Baker ...	No.	„ „ „	„ „ „	„
<i>Tainui</i> ...	Hartman, W. H. ...	J. Dickson ...	„	„ „ „	„ „ „	„
<i>Tairoa</i> ...	Summers, W. G. ...	P. Campbell ...	„	Shaw, Savill & Albion	„ 4.4.24 to 9.5.24 ...	14.5.24.
<i>Taiyuan</i> ...	Hamilton, H. E. ...	R. D. Thomas, W. Bailley, D. D. Tyer.	M.L.	„ „ „	„ 11.11.23 to 13.4.24 ...	22.4.24.
<i>Talthybius</i> ...	Beswick, W. ...	D. Rees ...	No.	Yull & Co. ...	Met. Log. 11.10.23 to 16.2.24...	30.4.24.
<i>Tambora</i> ...	Ruhaak, H. G. ...	H. Van Manen ...	„	„ „ „	„ „ „	„
<i>Tetresias</i> ...	Reynard, J. G. ...	H. Humphreys ...	„	A. Holt ...	Form 911 4.3.24 to 11.4.24 ...	14.4.24.
				„ „ „	„ 13.3.24 to 30.3.24 ...	14.5.24.
				A. Holt ...	„ 15.1.24 to 5.4.24 ...	22.4.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed.	Date Received.
<i>Teucer</i> ...	Hanney, T. W. ...	J. C. Norton ...	No.	A. Holt ...	Form 911 20.5.24 to 25.6.24 ...	1.7.24.
<i>Themistocles</i> ...	Jermyn, W. M. ...	R. H. Harrison ...	"	Aberdeen ...	" 28.3.24 to 21.7.24 ...	28.7.24.
<i>Theseus</i> ...	Batt, A. E. ...	J. R. Clement Evans ...	"	A. Holt ...	" 2.7.24 to 11.7.24 ...	17.7.24.
<i>Titan</i> ...	Ireland, T. R. ...	J. P. Williams, A. C. H. Jones ...	M.L.	" ...	Met. Log. 2.11.23 to 8.3.24 ...	12.3.24.
<i>Tolmie</i> , S.F.Bqtne.	Stewart, J. C. ...	D. J. Davies, C. Taylor, 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> ...	Mataukura, B. ...	K. H. Kubota ...	"	Nippon Yusen Kaisha	" 2.5.24 to 22.5.24 ...	23.6.24.
<i>Transmitter</i> , C.S.	Jones, L. 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. ...	C. Warren ...	"	Hain S.S. Co. ...	" 25.6.24 to 22.7.24 ...	28.7.24.
<i>Trematon</i> ...	Hicks, F. H. ...	J. Christopher, D. Thomas, F. J. Webb ...	M.L.	" ...	Met. Log. 28.8.22 to 30.3.23 ...	18.4.23.
<i>Triscania</i> ...	Bone, D. W. ...	T. S. Nixon ...	No.	Anchor ...	Form 911 21.6.24 to 13.7.24 ...	22.7.24.
<i>Tyndareus</i> ...	Adcock, F. ...	D. L. Hoare ...	"	A. Holt ...	" 13.3.24 to 26.4.24 ...	3.6.24.
<i>Ulinaroa</i> ...	Wyllie, W. J. ...	R. A. Dance ...	"	Huddart Parker, Ltd.	" 11.5.24 to 8.6.24 ...	7.8.24.
<i>Ulysses</i> ...	McHutcheon, W. ...	T. R. Phillips ...	"	A. Holt ...	" 7.6.24 to 27.6.24 ...	22.7.24.
<i>Umtali</i> ...	Rogers, W. G. ...	W. H. Foster ...	"	Bullard King ...	"	"
<i>Valacia</i> ...	Doyle, M. ...	J. W. Caunce ...	"	Cunard ...	" 5.6.24 to 12.6.24 ...	17.6.24.
<i>Valdura</i> ...	Mitchell, A. ...	J. Campbell, J. Anderson, A. M. S. Well. ...	M.L.	Gow Harrison ...	Met. Log. 21.9.23 to 10.12.23 ...	6.5.24.
<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 ...	" 29.6.24 to 9.7.24 ...	18.7.24.
<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 Larrinaga</i> .	Keay, W. S. ...	H. J. Kay ...	"	Larrinaga ...	" 7.5.24 to 3.7.24 ...	14.7.24.
<i>Verbania</i> ...	Hatcher, W. H. ...	J. G. Wiseman ...	"	Cunard ...	" 13.7.24 to 15.8.24 ...	16.8.24.
<i>Verentia</i> ...	Statford, 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. ...	" ...	"	Scottish Fishery Board ...	"	"
<i>Waioapu</i> ...	Brown, T. F. S. ...	B. S. Cave ...	No.	Canadian-Australasian	Form 911 10.6.24 to 1.7.24 ...	11.8.24.
<i>Walmer Castle</i> ...	Chave, Sir B., K.B.E.	C. Aylen ...	"	Union Castle ...	" 17.4.24 to 9.6.24 ...	10.6.24.
<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>Warfeld</i> ...	Steel, R. ...	E. V. Wilkinson ...	No.	" ...	Form 911 1.5.24 to 14.5.24 ...	29.5.24.
<i>War Nizam</i> ...	Putt, R. O. ...	E. R. Clark ...	"	British Tankers ...	" 25.5.24 to 12.7.24 ...	21.7.24.
<i>Welshman</i> ...	Rollerson, W. ...	W. A. Fletcher ...	"	White Star-Dominion	" 5.6.24 to 1.7.24 ...	5.7.24.
<i>Winifredian</i> ...	Harrocks, W. ...	A. R. Rose ...	"	Leyland ...	" 1.6.24 to 6.7.24 ...	14.7.24.
<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 3.5.24 to 7.7.24 ...	15.7.24.
<i>Zealand</i> ...	Thomas, A. J. ...	W. F. Jackman ...	No.	Red Star ...	Form 911 17.7.24 to 8.8.24 ...	11.8.24.
<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 1.7.23 to 31.12.23 ...	3.3.24.
<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 1.7.23 to 31.12.23 ...	3.3.24.

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.	Date Received.
<i>Alban</i> ...	Whayman, W. R. ...	R. Griffiths ...	Booth ...	Water Samples ...	23.4.24.
<i>Hildebrand</i> ...	Maddrell, J. ...	A. Blacklock ...	" ...	" ...	9.7.24.
<i>Patia</i> ...	Bostock, R. J. ...	S. A. Sapsworth, P. D. Allen ...	Elder & Fyffes ...	" ...	14.7.24.
<i>Tortuguero</i> ...	Martin ...	H. H. Dunning ...	" ...	" ...	24.7.24.