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METEOROLOGICAL OFFICE FORECASTS AND THE WEATHER SHIPPING BULLETIN.

By J. S. DINES, M.A., SUPERINTENDENT OF FORECAST DIVISION.

ALTHOUGH the Meteorological Office was established in 1854, under Admiral FITZROY, as a Department of the Board of Trade with the primary object of dealing with the meteorology of the sea, and the collection of reports made by ships has always been an important part of its work, the issue of regular forecasts to seamen has only been developed upon systematic lines in the last few years. The reasons for this are discussed later and it may first be appropriate to say a few words about the early history of forecasting in this country.

The issue of land forecasts for the different sections of the British Isles was undertaken early in the history of the Meteorological Office. On the copy of the Daily Weather Report for July 30th, 1861, bound in the file at the Meteorological Office, a simple blue foolscap sheet with printed headings, there is a pencilled footnote giving a general anticipation of conditions for two days to come in each of the three districts into which the United Kingdom was then divided. That for the South reads: "Probable weather next two days in the South strong south-westerly winds, squally." These pioneers were not lacking in boldness in issuing a forecast for two days ahead. On

the following day a similar note appeared, but this was in ink; and on the report for August 1st the note appeared with the addition "Copy as above to all papers sent out to-day." This marked the beginning of the issue of regular forecasts, based on synoptic charts, in the British Isles. The attempt proved to be premature, for the state of knowledge at the time did not justify the venture, and after FITZROY's death, in 1865, it was considered desirable to suspend the issue to the public and to devote a period to the study of the changes shown from day to day on weather charts with a view to placing the art of forecasting on a surer foundation. This period of study was fruitful both in the gaining of experience of the sequence of weather changes and also in learning by trial and error the best means of plotting the observations on charts so that the significance of the readings received from a network of stations could readily be grasped by the forecaster and no important detail overlooked. By 1879 this experimental work had led to considerable advances and the charts of that day were presented in a form not essentially different from that adopted at the present time. On April 1st of that year the issue of regular daily forecasts to the newspapers was resumed

after an interval of 14 years and has continued to the present day without interruption, apart from a short break during the late war for military reasons.

A service of gale warnings issued to ports on the British Coasts, which was commenced in 1861, was maintained and developed with but a short break in 1867-8. This work, undertaken directly for the benefit of seamen, has always formed an important part of the activities of the Meteorological Office.

The reason for the absence of an issue of regular daily forecasts to ships at this time was two-fold. It is well known that the travel of weather systems is mainly from west to east in these latitudes, and the absence of reports from the westward of Ireland in the days prior to the introduction of Wireless Telegraphy made it difficult to forecast with confidence for the waters off our western seaboard—a region in which weather systems might arrive at any time without previous warning to the forecast staff.

A second reason for the slow development of this side of the forecast work lay in the difficulty or impossibility of passing a forecast to a ship before the days of wireless communication. Forecasts could be telegraphed to a ship in port, but these would be of little use if no means existed for communicating later reports after the vessel had put to sea.

The advent of Wireless Telegraphy early in the present century was destined to mark an important epoch in the history of synoptic meteorology. It was no longer necessary that the seas should remain a blank space upon the weather map. Observations of high accuracy could be taken, and transmitted to London with the same promptitude from the ocean to the westward as from the Continent to the eastward. The blind spot which had always hampered the vision of the British forecaster was in a fair way to be removed. In 1907 an arrangement was made between the Meteorological Office and the Admiralty, under which weather reports were received from H.M. Ships when cruising in the Atlantic. Two years later the first reports were received from Atlantic liners and steady progress was made up to the year 1914, when the war intervened and necessitated a complete suspension of activities in this direction.

The break caused by the war afforded a convenient opportunity for reviewing the whole situation and, while no doubt was felt concerning the need for reports from ships on the Atlantic, it was considered that, having regard to the need for strict economy, the best results could be obtained by limiting the number of ships from which reports were received, and obtaining regular messages from these ships on every voyage. The lines to be followed having been worked out, and the willing co-operation of owners and ships' officers obtained, the new service was inaugurated with a report from the *Mauretania* on March 26th, 1921. From that date onwards the Forecast Service has seldom been without reliable reports from the Atlantic, and these reports have been of the utmost value in the preparation of the daily forecasts, and of the spell notifications covering a longer period which are issued from time to time to farmers and others.

The receipt of regular and reliable reports from the Atlantic made it possible to issue with some confidence forecasts for the sea districts off the western coasts of the British Isles. It was felt that the time had come when district weather forecasts covering all the waters round the British Coasts should be prepared for ships at sea as a regular daily routine in the same way as forecasts had been prepared for so many years for workers on land, and plans were accordingly made for the issue by wireless telegraphy twice daily on high power of the "Weather Shipping" Bulletin. Issue of the bulletin was commenced on January 1st, 1924, and particulars were published in the first number of *THE MARINE OBSERVER* at the beginning of the previous month. The bulletin is divided into three principal parts:—(1) a General Inference, (2) station reports of existing weather, and (3) forecasts for the sea districts around the British Isles. Some notes on these three parts follow:—

The General Inference.

Before describing the "General Inference" in detail, a short account of how forecasts are drawn up will be helpful. It is in the first place necessary that a forecaster should have in mind the general characteristics of the weather of the preceding few weeks. Thus he should know whether conditions have been quiet or disturbed, whether cyclonic depressions have been following each other quickly or slowly,

whether they have taken a northerly or a southerly track, and many other similar points which are almost unconsciously stored in the mind of the experienced forecaster. These features of the past history of the weather are of value from the fact that weather types tend to persist and in anticipating the future it is not safe to neglect the past. Coupling with this general knowledge a detailed knowledge of the changes of the past 24 hours as shown by the preceding synoptic charts, the forecaster is in a position to commence study of the chart on which the forecasts are to be drawn up. This chart is not complete when he commences to work upon it. It is built up gradually by messages coming in by telegraph and wireless, first from the British Isles, Iceland and from the nearer European countries, and later from the more remote regions.

This incompleteness of the chart is one of the difficulties with which the forecaster has to contend, and it not infrequently happens that the arrival of some later information, particularly from the westward, such as that given in a ship's report makes it necessary to modify the view which the forecaster has based on the incomplete chart. It is hardly possible to over-emphasise the importance of punctuality of despatch and speed in transmission of all messages used in forecast work.

Under normal circumstances, the synoptic chart at Headquarters has a sufficient number of readings upon it sixty minutes after the standard hour of observation to enable the forecaster to begin sketching out the forecasts in his mind. It is, first, necessary to picture the movements which will take place in the principal pressure systems. In this the forecaster is guided by the barometric tendencies or changes of pressure which have taken place in the past 3 hours, by the behaviour of the pressure systems in the past 24 hours and over a longer period, sometimes by the winds in the upper atmosphere as revealed by cloud movements, and by his knowledge of what developments have generally followed in similar circumstances in the past. He also pays careful attention to any detailed changes of wind or of the state of the sky, particularly at key stations, such as those on the western coasts, which may indicate fresh developments or the arrival of "secondaries." Having carefully weighed these matters in his mind the forecaster puts his inferences on paper, so producing what is conveniently called the "General Inference." It is worth paying attention to the methods of wording these Inferences. They may be definite statements as "The depression off the west of Scotland is moving north-east slowly and will cause, etc., etc." This indicates that the forecaster is sure of his ground. Or the wording may be "There are indications of another depression over the Atlantic to the north-west of Ireland." In this case the forecaster, through lack of observations, is unable to make a definite statement. The word "indications" should be interpreted to mean that the forecasts are based upon a hypothesis which is probably correct, but the grounds for which are less sure than in the former instance. Or, again: "Further secondaries will probably cross the British Isles within the next 24 hours." This may not be based on any definite indication shown upon the map, but upon the experience of the forecaster of what generally occurs in similar conditions and his knowledge of what has occurred in the recent past. If attention is directed to the phraseology of the Inference it will help the recipient of the message in interpreting the forecasts, and on occasions when the weather experienced does not turn out entirely in the manner anticipated he may yet be able to turn the forecast to good account, after forming an opinion of the manner in which the pressure changes have deviated from those anticipated.

The Station Reports.

The station reports contain information concerning the weather existing at 10 British stations, one station in the Færoe Islands and one in the west of Iceland. In using these reports it is necessary to remember that observations of wind and visibility are affected to some extent by the "exposure" of a station. Satisfactory estimates of wind direction and force can be made in level country not too broken by trees or houses or on gently undulating ground, but the presence of hills causes the air to be deflected from its true course so that the wind at an observing station may not be representative of the wind blowing over the open sea in the neighbourhood. With regard to visibility this is determined by observation of a set of fixed objects which are chosen at definite known distances from each station. In making an observation the observer notes the most distant of these objects which is visible. Thus if the object at 1 sea mile distance

is visible, whereas that at 2 miles is not, the extreme range of visibility must lie between 1 and 2 miles, and the message is coded accordingly as "5." Very reliable records are obtainable by this means when there is an unobstructed view from the station up to a distance of 30 miles, with islands, lightships or other marks at suitable distances to form the required "objects." At some stations the view is restricted and the higher degrees of visibility become difficult to estimate accurately. Thus it will be realised that if vision at a station is restricted by hills to a distance of 5 miles it is difficult on a clear day to estimate whether the visibility should be coded as 8 (10-30 miles) or 9 (over 30 miles). The following notes on the individual stations may be useful in interpreting the messages. They are based on maps and written reports filed in the Meteorological Office, supplemented in nearly all cases by personal knowledge of the stations on the part of the writer.

(1) **Stornoway.** Being situated on the eastern side of the island of Lewis the station is more representative of conditions in the Minch than over the Atlantic. The site is on the outskirts of the town of Stornoway, a little distance back from the sea. Estimates of wind force are affected by the presence of the town. The view from the station is much restricted, which makes estimates of the higher visibilities uncertain.

(2) **Malin Head.** The instruments are exposed near to the former coastguard station about 150 yards from the shore. There is an open look-out over the sea to the north and east, while to the south and south-east the country is flat in the vicinity of the station. To the west and south-west it is hilly. The situation is good both for wind and visibility observations.

(3) **Valencia.** The observatory is situated in mountainous country half way up the estuary known as the Valencia River and about 4 miles from the open sea. The surrounding mountains affect the wind-flow to some extent and shield the station somewhat from high winds, but the river valley is wide at this spot and the exposure to the wind, therefore, need not be classed as unsatisfactory. There is a clear view down the valley to seaward, but owing to the distance of the station from the open sea and the short length of sea horizon visible, the observations of sea visibility present some difficulty.

(4) **Holyhead.** The station is well exposed on Salt Island, and the surrounding country is open, with the exception of Holyhead mountain, which rises to 720 feet two miles to the westward. For both wind and visibility observations the exposure is good.

(5) **Scilly.** The situation is situated on a hill adjoining Hugh Town in St. Mary's, the largest island of the group. There is an open view of the other islands and the surrounding sea in all directions, giving an excellent exposure for wind and visibility.

(6) **Guernsey.** The station at Fort George is at a considerable height (320 feet) above the sea, close to the summit of the cliffs. There is an excellent look-out over the sea and islands to the eastward, but the cliffs rise sufficiently sharply to cause considerable interference with and deflection of the wind when in this quarter. The land to the westward is somewhat broken and would cause obstruction to the free flow of the wind.

(7) **Dungeness.** The station is situated at the Lighthouse, almost at the point of the level spit of land which juts out into the Channel. The site is excellent both for wind and visibility observations.

(8) **Yarmouth.** The site of the station at Gorleston, at the mouth of the River Yare, allows of an unobstructed view to seawards over the eastern half of the horizon. The land rises sharply to the west to an elevation of about 50 feet and there are houses at the top of the cliff, so that exposure to winds from the westward and north-westward is not so satisfactory as to those from the eastward.

(9) **Tynemouth.** The station is on Freestone Point, overlooking the entrance to the Tyne. The ground to westward, though level, is much broken by houses. To the eastward the exposure is open, and there is a good range of vision for determining visibility seawards. The large industrial area in the immediate neighbourhood adversely affects the visibility, which, for this reason, should not be regarded as representative of the conditions outside a limited area surrounding the mouth of the Tyne.

(10) **Wick.** Situated near the summit of the cliffs at the south entrance to Wick Harbour and at a height of 80 feet above the sea, the site is excellent for observations both of visibility and wind.

The Forecasts.

For purposes of forecasting, the seas surrounding the British Isles are divided into three areas, the Western Area, the Southern Area and the Eastern Area, and each of these areas is sub-divided into districts. If the same forecast is applicable to a whole area no mention is made in the message of the individual districts, the forecast is simply preceded by the name of the area. In the more common case where the weather anticipated differs in different parts of the area the names of the districts are given, each followed by the appropriate forecast. In these forecasts no reference is made to the state of the sky or precipitation, wind and visibility only being forecasted. Visibility is, however, affected by precipitation falling in the form of rain or snow and when occasional rain is expected the visibility forecast will frequently reflect this by phraseology such as "visibility poor at times." Reference to the General Inference will generally indicate whether either rain or snow is the cause of the anticipation of poor visibility.

In interpreting forecasts for sea districts of this nature it is necessary to bear in mind that the weather does not recognise the existence of any arbitrary boundaries and that sometimes conditions may vary over one district. This is particularly true of the North Sea districts "Forties" and "Dogger," which cover both the eastern and central parts of the North Sea. It happens under certain conditions, as, for example, when a depression lies over Denmark or the Kattegat, that there is a wide difference between the weather anticipated in the eastern and western portions of these districts. In the example cited there may be northerly gales with poor visibility due to heavy precipitation on the eastern side of "Dogger" and "Forties," while on the western side the wind may be fresh only, and the visibility excellent apart from occasional showers. If arbitrary districts could be chosen on each occasion this difficulty could be overcome, but in view of the necessity of keeping the messages within a definite limit of length, this method is not practicable, and it is necessary to choose certain districts in advance and adhere to these.

In order to interpret the forecasts correctly the user should study the whole message and not confine his attention to the single part in which he is most particularly interested. Thus, in the instance noted above the recipient would observe from the Inference that a depression was centred in Scandinavian regions and would, by reading the whole of the Eastern Area Forecasts, learn that wind was likely to be less strong and visibility better off the east coast of England than over the North Sea further to the east. He could then picture for himself a gradual transition from the one state to the other, and would realise that the conditions in the extreme western portion of the Dogger district would be nearly similar to those given for the Humber, and that the "Dogger" forecast must not be applied to this part of the district without consideration of these facts. The forecaster is constantly faced with this difficulty in drawing up district forecasts, but the point is one which may not be so prominently in the mind of the user of the forecasts though it is one of considerable importance.

It is on almost all occasions possible to foresee the weather for a longer period in advance than 12 hours, though the precision of forecasts necessarily diminishes as the period covered increases. For this reason, though an "Outlook" that is a forecast of the weather beyond the 12-hour period is nearly always added to the "Weather Shipping" Message, it is given in general terms, and is intended to indicate the nature of the weather, as for example whether it will be stormy or quiet, rather than details of the wind and the visibility in a particular spot at a particular time.

It is hoped that these notes may be of value to those making use of the "Weather Shipping" Bulletin. The forecasting methods adopted in the Meteorological Office are the result of a grafting of modern meteorological knowledge upon many years of practical experience and it is impossible to do more than refer to some of the points which are of most importance to the recipient of the forecasts in the course of a short article. The Director of the Meteorological Office is always glad to grant facilities for seeing the work of the Forecast Division to those who are seriously interested in the subject.

THE DOLDRUMS OF THE NORTH ATLANTIC.

By C. S. DURST, SENIOR PROFESSIONAL ASSISTANT, MARINE DIVISION.

THE term Doldrums is used by seamen to denote the region of calms and light variable airs confined to the trough of low pressure between the Trades, which surrounds the earth within a few degrees of the Equator, the essential features of the Doldrums being copious precipitation, violent thunderstorms and squalls, and variability of wind which on some occasions presents a most marked and sudden discontinuity with the steady Trades.

According to the Oxford Dictionary the word Doldrum is derived from the early English Dold, *stupid*, but seamen have long understood that the term was derived from the Portuguese Dolorio, *tormenting*. FINDLAY gives this latter derivation in his "Sailing Directory of the Atlantic."

The Doldrum belt is not continuous around the globe. Broadly speaking it tends to be situated more on the eastern side of an Ocean than on the western, as may be seen from the Pressure Charts published in the "Barometer Manual" (1919 Edition).

In the seasonal march of the year the Doldrum belt oscillates north and south following the sun but with a pronounced lag of one or two months. In addition there is a decided tendency for the Doldrum belt in the Atlantic and Pacific Oceans to broaden out when at its most northern position.

FIGURE 1 illustrates the movement of the Doldrums in the Atlantic. It shows the mean positions of the Northern and Southern edges of the Doldrums between Longitude 25° and 30° W. as obtained from the "Charts of Nine Ten Degree Squares between Latitude 10° S. and 20° N. and Longitude 10° W. and 40° W." For comparison FIGURE 2 is given which shows the variation in the Northern and Southern limits of the Trades in Longitude 130° W. in the Pacific Ocean.

The discussion of the Doldrum region of the Atlantic Ocean may be considered to be the origin of research in organised Marine Meteorology; for the position and width of the calm equatorial belt first led MAURY to construct his normal charts of wind and pressure in support of a westerly crossing of the Equator for sailing ships bound south round the Cape of Good Hope. It was, too, the area in which Captain TOYNBEE collected and collated a mass of data for the construction of the "Charts of Nine Ten Degree Squares."

Both MAURY and TOYNBEE, however, were dealing with normals, and in the process of forming means it often happens that minor fluctuations which are of considerable interest are smoothed out so that only the main broad features are left exposed. In order then to carry further MAURY's and TOYNBEE's work in this region an endeavour has now been made to submit the area to a still more

minute examination. For this purpose daily synoptic charts were not found suitable but another method was adopted which will best be understood by an examination of FIGURE 3.

Steamships running down to the Brazils do not diverge materially from a track passing St. Paul's rocks and so will all cross the Doldrums in approximately the same longitude. Their position at any time then is known within a little if we know the latitude only.

Squared paper was taken and along the top edge was written the day of the month; along the left-hand edge was written the latitude. The position of a ship in a certain latitude on this route and at a certain day of the month corresponds to a definite point on this diagram. In that position a wind arrow was drawn showing the force and direction of the wind she reported. This was done for all ships keeping meteorological logs or forms 911 for the whole of the year 1923.

FIGURE 3 is a specimen of the type of diagram obtained and shows the general features found in those of other months.

It will be noticed that the conditions obtaining as the month progresses are shown in succession from left to right of the diagram and the winds plotted show markedly that the position of the Doldrums oscillates north and south of its normal position (shown by the thick line on the diagram).

The approximate limits of the Doldrums, in which is included the area where the wind is light or calm, are shown on FIGURE 3 by *pecked* curves. It will be noted that on some days there are few observations while on others there are many, and undue weight must not be attached to the limits established for periods when there are few observations.

For days at a time the Doldrum belt is wide,—as wide as 600 miles in extreme cases,—then there comes a sudden burst of the Trade Winds invading the area of calms and in some cases the width of the region between the Trades becomes practically nil, just as is described by MAURY. "We find," he says, speaking of the Doldrums region, "that such is its state that within certain boundaries it is continually changing place and limits. This fact is abundantly proved by the speed of ships, whose log-books show that it is by no means a rare occurrence for one vessel, after she has been dallying in the Doldrums for days, in the vain effort to cross that calm belt, to see another coming up to her 'hand over fist' with fair winds, and crossing the belt after a delay in it of only a few hours instead of days." Then after this burst of the Trades the Doldrum conditions reassert themselves and the belt sways to and fro with its ever present accompaniment of rain and squalls.

Seasonal variation in position of the Doldrums between Long. 25° and 30° W.

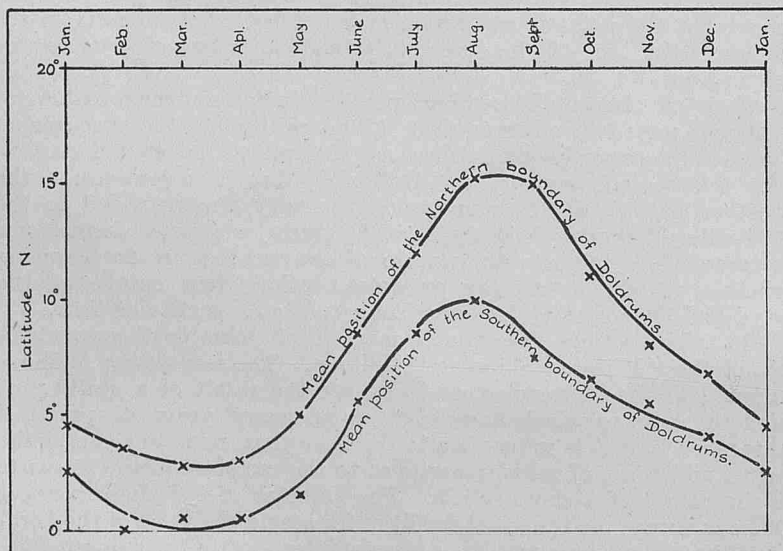


Figure 1.

Seasonal variation in position of the Doldrums in Long. 130° W.

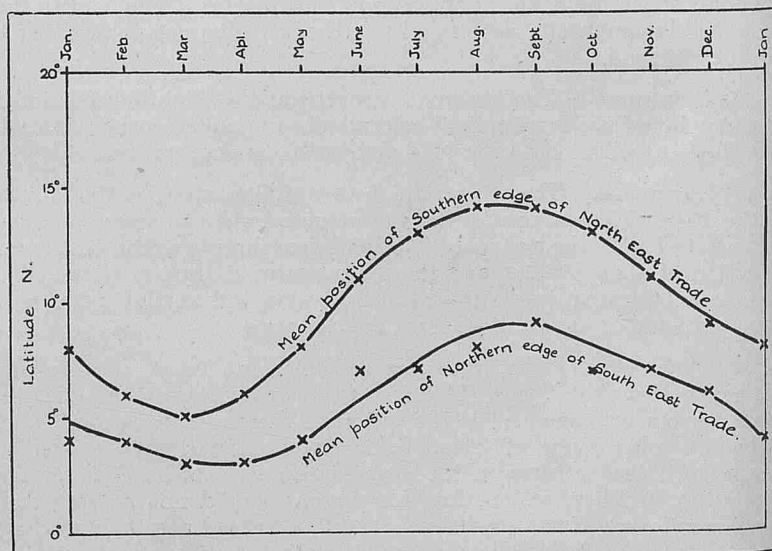


Figure 2.

Variation of Wind from day to day in the neighbourhood of the Doldrums, on the route from Europe to the Brazils.

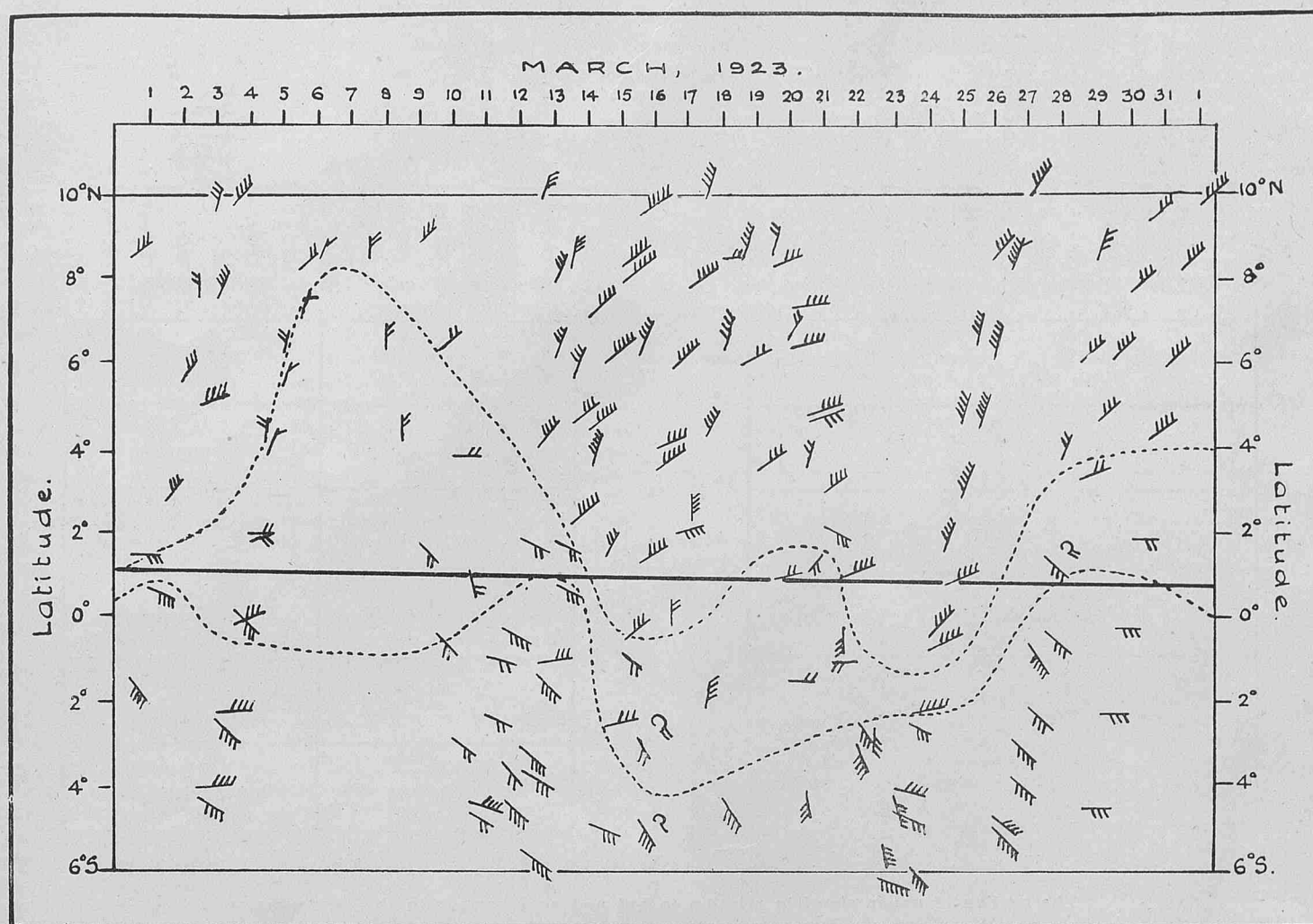


Figure 3.

Each arrow gives the direction and force of the wind experienced in the Latitude shown by the figures on either side of the diagram and on the date shown at the top of the diagram.

The heavy line shows the mean position of the centre of the Doldrums as obtained from the wind observations in the "Charts of Meteorological Data for Nine ten degree Squares."

The pecked lines show the approximate limits of the Doldrums in March 1923.

Diagrams on similar lines to FIGURE 3 were also constructed for air temperature, sea temperature, rainfall, and upper cloud motion.

The air temperature (at 8 a.m. and 8 p.m.) was found to be remarkably constant in the Doldrums. Throughout the whole year 1923 it only varied 9° between 74° and 83° F. (the average temperature in the Doldrums is about 79½° F.).

In spite, however, of the smallness of the temperature variation there were found to be definite hot and cold periods lasting for three or four days or in some cases for a week or more, during which time the temperature was consistently high or consistently low.

It was then found that there was a definite relationship between the direction of the movement of upper cloud and these hot and cold periods, as will be seen from FIGURES 4 and 5 which are composite of several occasions on which hot and cold periods were found. The centre of FIGURE 4 is situated on the normal line of centre of the Doldrums on the day when a hot period was at its maximum. The arrows show the direction of motion of upper cloud as observed before (to the left) and after (to the right) the day of maximum temperature. Before the day of maximum temperature there is a north-easterly current of air blowing right across the Doldrum region. This current gradually recedes northwards until about three days after the maximum temperature high cloud is as likely to have been reported moving from east, south-east, or south as from north or north-east over the Doldrum region. FIGURE 5 confirms that an opposite change takes place with days of low temperature.

No explanation of this phenomenon is attempted, but as evidence of the skill of Marine Observers, the consistency of these two Figures

is most satisfactory, when it is considered how extremely difficult the observation of the motion of high cloud must be at sea.

The cause of the lowering of temperature in the cold periods is shown by FIGURE 6. With high temperature rainfall is rare, with low temperature rainfall is frequent, the reason being that water vapour is evaporated off the falling drops and by that means the temperature of the air is reduced. Hence it can be assumed that the cold periods found in the Doldrums are periods when rainfall is frequent.

Rainfall in the Doldrums is almost always true convectional rainfall, that is to say it is caused by the elevation of large masses of air which are seen rising in the form of towering Nimbus clouds. These clouds accompany the squalls which are such a typical feature of the Doldrums. Detailed reports on such squalls would be most welcome especially if illustrated by photographs or drawings, particular note being made of the variations in the meteorological instruments during the passage of the squall.

It would seem from this that the temperature observed by a ship in the Doldrums at 8 a.m. or 8 p.m. is an indication of whether convection is taking place to a greater or lesser extent according as the reading is low or high. The amount of convection going on in the Doldrums will be roughly proportional to the amount of air passing into the Doldrum belt from the Trade Winds to north and south; in other words if the Trade Winds are strong and much air is crossing into the Doldrums it can only be disposed of by ascent (convection) and so it is to be expected that there should be a relationship between the force of the Trade Wind and the temperature in the Doldrums. This relationship is shown by FIGURE 7 in which it will be seen that strong

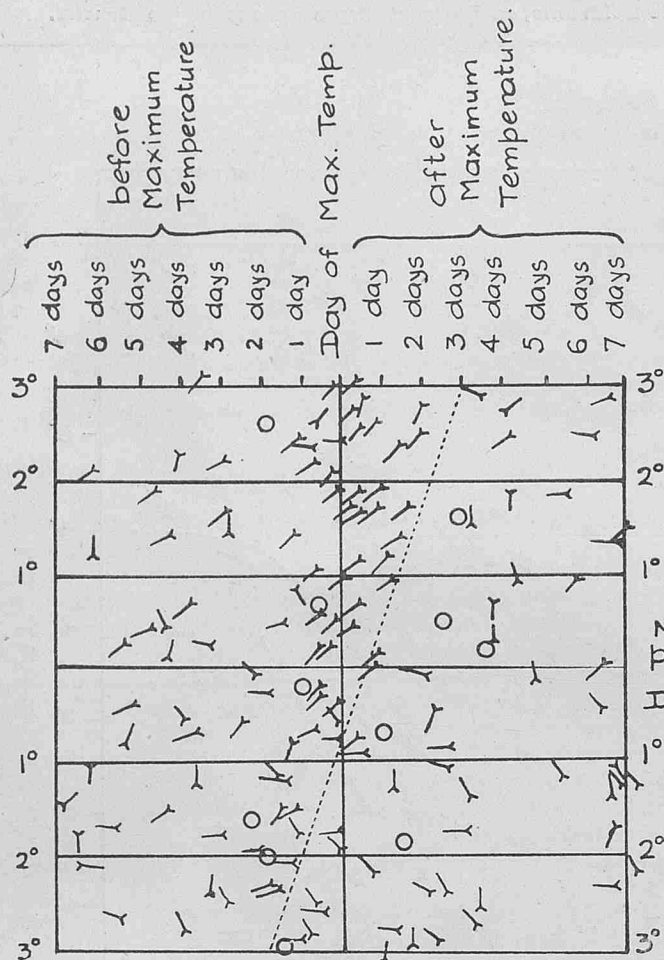


Figure 4.

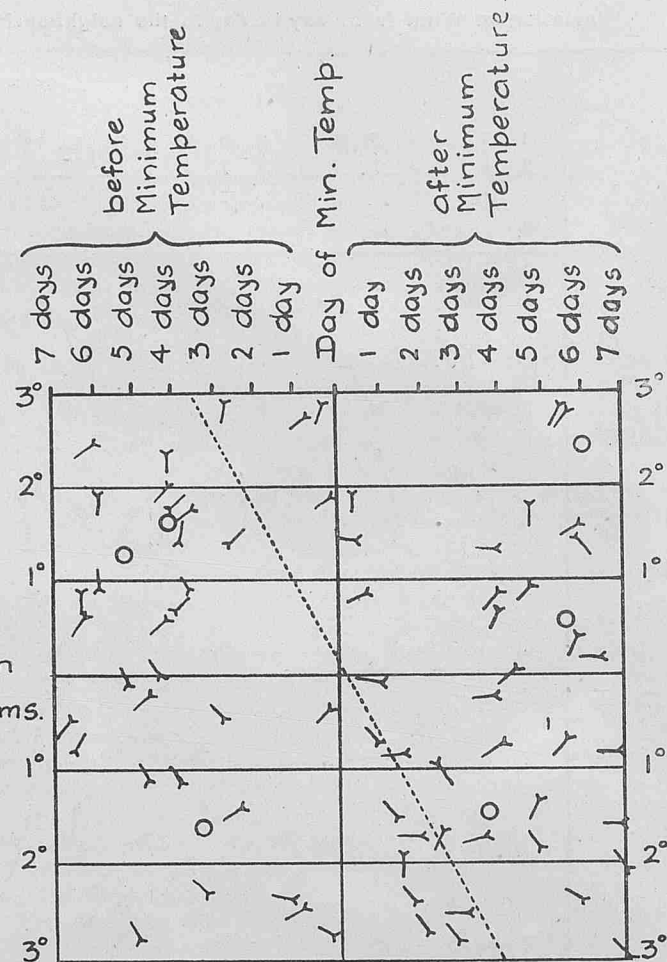


Figure 5.

The motion of upper cloud in relation to hot and cold periods in the Doldrums.

In the diagrams above, Latitude is represented by the vertical scale, and Time by the horizontal scale. They are compiled from the conditions prevailing when several hot and several cold periods are recorded at the surface in the Doldrums on the days when the temperature is at a maximum or a minimum. The arrows show the directions of motion of upper cloud observed, flying with the cloud, O signifies stationary upper cloud.

Relationship between Temperature at 8 a.m. and 8 p.m., and Rainfall in the Doldrums (1855-1871).

June. Lat. 6°-8° N. Long. 20°-30° W.

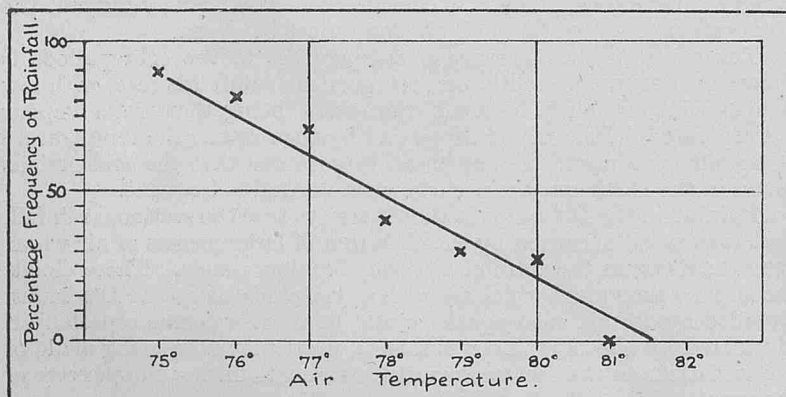


Figure 6.

N.E. Trade Winds are associated with low temperature in the Doldrums and light Trades with high temperature. Since as we have seen earlier in this article low temperature is likely to occur in the Doldrums over a period of several days, it is possible to obtain an indication of the force of the Trade a ship is likely to encounter by reports of the careful observation of the air temperature experienced in the Doldrums. If the thermometer reads above the normal the Trade will probably be light, if below the normal the Trade will probably be strong.

Percentage Frequency of Wind Force in the N.E. Trade when various temperatures prevail in the Doldrums at 8 a.m. and 8 p.m. (1923).

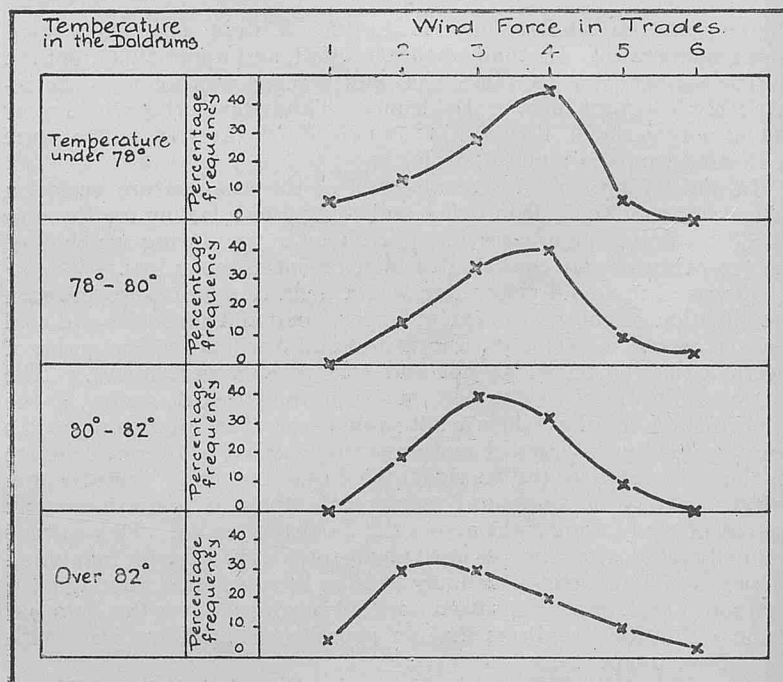


Figure 7.

THE MARINE OBSERVER'S LOG.

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

Responsibility for statements rests with the Contributor.

SHORT ACCOUNT OF A STORM IN 47° N., 9° W.

THE following "Additional Remark" is from the Meteorological Log of S.S. *Manistee*, Captain J. M. ISAACSON, United Kingdom to West Indies :—

"12th February 1924 at 4.45 a.m. in Lat. 48° 30' N., Long. 7° 13' W., the wind, after having been light and variable, suddenly sprang up in gale force from S.S.E. (true). The barometer (29.32 in.) then tumbling down at the rate of 1/10th inch per hour. Wind increased steadily to force 9, with frequent squalls of misty rain : at 9 a.m., wind backed to E.S.E. (true), force 10. Bar. 28.87 ins., A-Cu., and Stratus moving *slowly* from S.S.E. At 10 a.m., sea became dangerous, short and breaking in all directions from S. to E. (used oil bags on quarter with noteworthy effect). At 12.5 p.m. wind hauled to south and decreased somewhat ; at 1.0 p.m. wind hauled to S.S.W. (true), force 8, Bar. 28.50, steady. At 5.0 p.m. wind backed to S.S.E., force 8. Bar. 28.50, but now falling again at the same rate as above. At 9.0 p.m. wind backed to S.E. and fell to force 4. Barometer now reached its lowest point, 28.09 ins. The swell from the commencement up to this time running heavy from S.W. (true). Clouds Ci-Cu., and Cu.-Nb., hardly moving.

"13th February 1924 : at 12.30 a.m. wind variable, SE-E (true), force 3. Barometer 28.18 in., steady. A very heavy long swell was now observed from W. by S. (true); changing at 2.0 a.m. into a confused and heavy N.N.E. swell. At 3.40 a.m. wind backed to N.N.E. (true), force 7, increasing rapidly (1 hour) to force 8. The barometer now began to fly up at an equivalent rate to which it fell; the sea becoming confused and breaking heavily, the swell long and heavy from N.N.E. At 9 a.m. wind decreasing slightly, sea still very high. Barometer 28.95 in., rising rapidly.

"At noon in Lat. 46° 33' N., Long. 13° 33' W., wind backed to N. (true), force 6, remaining steady in both force and direction up to midnight, when both wind and sea moderated rapidly. The barometer although still rising had steadied down to normal.

"The outstanding features of this storm from the observer's point of view are :—

- "(1) The entire absence of any warning.
- "(The wireless gale warning from Valencia was not received until the storm had been in progress some hours.)
- "(2) The extreme rate at which the barometer fell and then rose again.
- "(3) The slow movement of the clouds and the complete absence of 'scud.'
- "(4) The soft and quiet appearance of moon and stars (when visible).
- "(5) The peculiar movement of the swell, which at no time was an indication of the wind then blowing—only falling into line at the latter end of the storm—and at that being hopelessly confused."

NOTE.—For explanation of (1), (2) and (5) see "A Sudden February Gale," page 26.

SOUTH EASTER.

THE following is an extract from the Log of C.S. *Cambria*, Captain H. G. E. WIGHTMAN, D.S.C., at Cape Town. Observer, Mr. E. N. L. STAPLES.

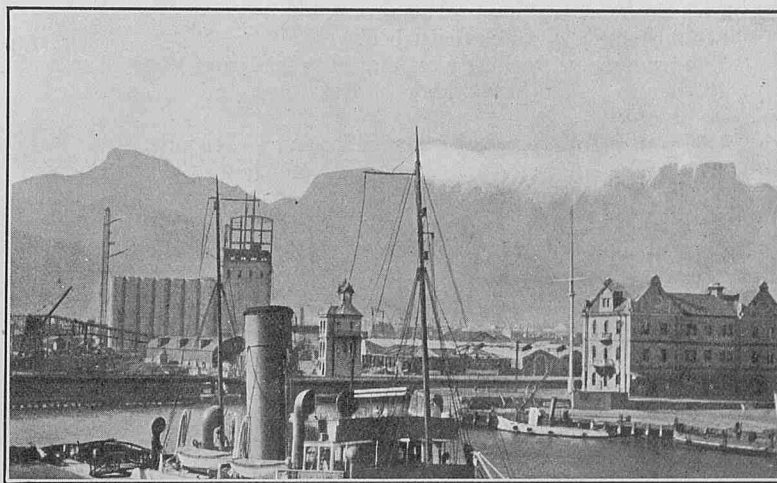
"At midnight on Monday, 24-25th February, the weather was perfect, but at 8.00 a.m., the wind increased to force 5, and continued increasing, until at noon it reached to force 10, the wind blowing

at the rate of from 47 to 50 miles per hour, causing a rough and choppy sea in the docks.

"The sky for the most time being overcast and cloudy to-day's weather, I think, has been the worst experienced at the Cape Docks for some years. It was impossible to obtain photographs of the Mountain as it was covered in by the dust created by the force of the wind.

"At 8 p.m., and thereon to midnight, the wind commenced decreasing gradually to force 8, and it was not until noon of the 26th instant that it fell to force 4.

Also it prevented vessels from leaving port which is a particularly rare occurrence."



The "South-Easter" approaching.

LIGHTNING.

THE following has been received from S.S. *Royal Transport*, Captain J. DOVE, Hull to River Plate :—

"Herewith please find an extract from the above steamer's Log Book on a passage from Hull to the River Plate dated 16th February, 1924.

"6.15 a.m. Thunderstorm approaching and lightning struck ship with deafening roar which shook the ship fore and aft, the fore topmast truck and part above the eyes of the stays came tumbling down on deck amongst a shower of sparks and the compass card was sent spinning around; the Wireless Operator reported damage to his instruments and his room was badly shaken causing the roof to leak.

"7.15 a.m. Sighted Garda Point (Palma Island) bearing by compass S. 37° W. a/c to S.W. ½ W., Log 19.

"9.30 a.m. Garda Point abeam distant 3 miles, Log 44.

"10 a.m. The sky cleared and it was possible to get bearings of the sun, and on a S.W. course there was found to be 18 degrees of westerly deviation, and before the ship was struck by lightning there was 3 degrees easterly deviation on the same course, a/c to W.S.W., Log 48.

"Noon. Mod. N.E. wind and sea, sky cloudy and showery. Lat. 28° 23' N. Long. 18° 19' W. Course S. 26° W., 257 miles from Noon yesterday. Temp. Air 62½°. Sea 67°.

"My course had been shaped to pass 20 miles to the westward of Palma Island and when that Island was sighted we were obliged to haul out to the west to clear it, so the consequences might have been

very serious if the foregoing had happened during the dark hours under the same weather conditions.

"I have swung the ship on the passage and found very large deviations greatest on northerly and southerly courses and almost disappearing on easterly and westerly courses, the steamer's compasses were adjusted in the Humber on the 6th February when there was practically no deviation on any course. The magnetism appears quite changed but I am hoping it is only sub-permanent and will gradually disappear."

EARTHQUAKE.

THE following report has been received from the Barquentine *S.F. Tolmie*, Captain J. C. STEWART, Vancouver to Brisbane :—

"February 21st, 1924, 4.35 a.m. In Lat. 40° 32' N., Long. 126° 38' W. approx. Calm, clear weather, full moon, heavy W.S.W. swell running. Experienced a violent earthquake tremor accompanied by a roar similar to that caused by a heavy squall of wind.

"The vessel was shaken from stem to stern, masts and rigging jumping, lamp glasses and crockery rattling, those below could hear the ship's timbers creaking and straining.

"Sea surface very much disturbed.

"The tremor was variously estimated to last from 15 to 20 seconds.

"10.10 a.m. Another tremor of less force and accompanied by noise as before.

"1.46 p.m. Another slight tremor lasting 10 seconds.

"5.25 p.m. Another tremor, more severe than last, same noise.

"9.50 p.m. Slight tremors felt, three in succession, sea surface disturbed.

"A good look-out was kept for any heavy sea or Seismic wave, but none was observed."

SQUALLS AT ZANZIBAR.

EXTRACT from Meteorological Form of C.S. *Lady Denison Pender*, Captain G. W. WEST, Observer, Mr. A. G. WATTS, 3rd Officer.

At Zanzibar.

"February 13th, 1924. 3.40–4.30 p.m. Heavy squall. Wind shifted suddenly to S.W. and blew for 40 minutes, reaching force 9, accompanied by torrential rain and lightning from S.W.'ly direction. Sky completely covered with Cu-Nb., 4.30 p.m., wind veered slowly to N.E. and rain ceased.

"February 14th. 8 a.m. Visibility exceptional. Mountains on mainland plainly visible.

"February 15th. 8 a.m. S.W.'ly squall.

"February 17th. 4.50 p.m. Heavy wind and rain squall, wind shifted suddenly to S.W. overcast heavy rain.

"February 19th. 3 p.m. Barometer 29.65 ins. Thermometer 82°. Wind freshening and backed to N.W. increasing in force to 10. 3.40 p.m. Torrential rain obscuring objects distant less than $\frac{1}{4}$ mile. Barometer 29.61 ins. Thermometer 82°. Heavy rough sea and swell running. Sky to N.W. completely covered with Cu-Nb., line squall to S.E. 4.10. Squall passed. Barometer 29.66 ins. Thermometer 82°.

"February 20th. 8.10 a.m. Heavy rain commenced and lasted until 0.35 p.m.

"March 2nd. 11.50 a.m. to 0.5 p.m. Heavy rain squall from N.N.E., passing away to S.E., followed by calm."

HARMATTAN.

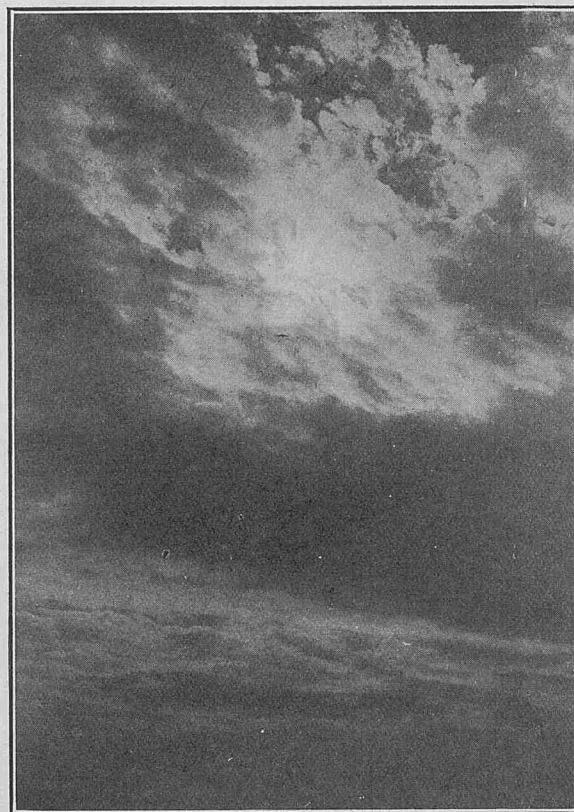
EXTRACT from the Meteorological Log of H.M.S. *Endeavour*, Captain J. D. NARES, D.S.O., R.N., surveying St. Ann's Shoals, West Africa. Observer, Lieut. H. EXTON TURNER, R.N.

"The 'Harmattan' season at Freetown this year (1923–1924) has been remarkable for the large number of days on which the visibility has been quite average. Last year it was often necessary to stop sounding in the Sierra Leone River owing to the haze which was experienced practically every day.

"During 1924, westerly winds have prevailed for long periods, and the weather appeared to be considerably cooler than the equivalent months of 1923.

"A remarkable incident is the 'tornado' experienced during the night of February 7th, 1924. The observing Officer was living ashore at the time, and the weather was far more severe than that experienced on board. The S.S. *Sapeli* dragged both anchors and was driven ashore on King Tom Point, Sierra Leone River."

CLOUD PHOTOGRAPH.



THE photograph above was taken on board S.S. *Maihar*, Captain J. P. ROWE, Suez to Colombo, at 4 p.m. on February 8th, 1924, in the Gulf of Suez.

The weather reported at the time was "Wind N.W.4. Bar. 1015 mb., air temperature, dry bulb 72°, wet bulb 58°, cloud, A-Cu/Cu/St-Cu, 8, weather z, sea temperature 68°."

NOTE.—Plates produced by Lithographic process, including Charts and other large diagrams, will be found in each number after "Weather Signals."

NOTES UPON AVERAGE CONDITIONS IN THE INDIAN OCEAN, NORTH OF LATITUDE 35° S.

II.—February.

THE general characteristics of pressure distribution over the whole Ocean are similar to the previous month.

In the north Indian Ocean pressure has decreased slightly in the north and increased in the south. Over northern India the maximum average pressure is 1016 mb. (30.00 in.), decreasing in a south-easterly direction to the equatorial "low," the difference in normal pressure over this area being 7 mb. (.21 in.).

At the head of the Arabian Sea and Bay of Bengal, winds are generally from N.W. to north. South of 20° N. winds of the N.E. monsoon prevail down to the Equator, but are more northerly in direction and slightly weaker in force with a greater prevalence of calms than during the preceding month. The average strength of the monsoon varies between 2 and 4 in this month. Off the African coast the N.E. monsoon continues to about 5° S.

Between the 50th and 95th meridian and the Equator and 5° S., a light to moderate N.W. monsoon prevails. Off the coast of Sumatra there are light variable breezes with a large percentage of calms.

The equatorial "low" with an average minimum pressure of 1009 mb. (29.80 in.) is situated further south than was the case in January. It now occupies a region between the parallels of 8° and 12° S. on the eastern side of the Ocean trending in a W. by S. direction to the African coast. Within this area light to moderate variable winds and calms are general.

South of the equatorial "low," average pressure over the south Indian Ocean differs little from the month of January. The centre of the permanent "anti-cyclone" has moved a little to the south drawing the northern and southern limits of the south-east Trades with it. The difference in normal pressure over this area for the month is 11 mb. (.33 in.).

From the Australian coast to the 100th meridian the Trades blow steadily from a south-easterly direction, but westward of this area their direction varies from N.E. to S.E. Off the east coast of Madagascar the general direction of the wind is from N.E. In the northern part of the Mozambique Channel winds are variable in direction and force, but in the southern portion the general direction of the wind varies between S.W. and S.E. Immediately south of the Trade Wind zone there exists an area of light to moderate variable winds.

Cyclonic Storms.—In the Indian Ocean, north of the Equator, no storms of a cyclonic nature are recorded in the month of February.

South Indian Ocean.—As in the preceding month cyclonic storms again attain a maximum frequency. The number of storms occurring in this month recorded during the years 1848–1917 was 115, giving a percentage frequency of 22 per cent., the same as that of January. Few storms originate east of the 90th meridian. The majority occur west of 70° E., travel in a south-westerly direction and recurve to the S.E. in about Latitude 20° S. See Chart giving tracks in February Number, MARINE OBSERVER, 1924.

Air Temperature.—The normal temperature of the air during February in the Arabian Sea ranges from 72° F. in the north to 80° F.

in the south, while over the Bay of Bengal the temperature ranges from 77° F. in the north to 81° F. in the south.

Over the central equatorial regions, approximately between Latitude 15° N. and Latitude 15° S., temperature is between 81° and 82° F. South of this region temperature decreases with increased Latitude and is at the 35th parallel 70° F. on the western side, and 65° F. on the eastern side of the Ocean.

Sea Surface Temperature.—The normal sea surface temperature over the Arabian Sea during February ranges from 73° F. at the head of the sea to 79° F. and 82° F. in the south on the eastern and western sides respectively. Over the Bay of Bengal the sea surface temperature ranges from about 77° F. at the head of the Bay to 81° F. in the south. Over the central equatorial region the average temperature is 82° F., except off the African coast, where it ranges from about 78° F. in Latitude 10° N., to about 83° F. in Latitude 10° S.,

From Latitude 10° S., temperature gradually decreases to the southward, averaging in Latitude 35° S., about 65° F.,

Currents.—In the Arabian Sea north of the 10th parallel the surface currents are weak and variable, but on the west coast of India the set follows the land to the S.S.E.

In the Bay of Bengal the currents completely circulate the Bay, setting to the north and N.E. on the western side, east and S.E. at the head of the Bay, south and S.W. on the eastern side and west and N.W. in the south of the Bay.

The current setting to the S.W. and west in the south of the Bay expands between Latitude 10° N., and Latitude 2° S., South of the Peninsula it is joined by the current running down the west coast and continues strongly in a westerly direction to the 60th meridian when it curves to the N.W. and branches off the African coast. One branch continues N.W. flowing around Cape Guardafui into the Gulf of Aden, while the other branch turns to the S.W. and flows down the African coast as far as the Equator.

South Indian Ocean.—The current setting down the African coast on crossing the Equator gradually turns to the eastward and flows in this direction to the 90th meridian between the parallels of 2° and 8° S.,

East of the 90th meridian between the Equator and Latitude 10° S., the current sets south to the 95th meridian. Between the same parallels, east of the 95th meridian to the coast of Sumatra, the general set is to the north. Between Latitudes 10° and 30° S., east of the 100th meridian, the S.E. Trade drift flows in a westerly direction to the 70th meridian where, in about 20° S., it branches, running to the north and south of Madagascar. The branch running north of Madagascar again separates off Cape Delgado, one branch turning north sweeps up the Zanzibar coast, while the other, turning south, follows the African coast.

Within the Straits of Madagascar the currents are variable.

East of the 100th meridian to the Australian coast the general set is to the N.N.E.

South of the 30th parallel the currents are variable.

WEATHER CHARTS, WESTERN NORTH ATLANTIC, FEBRUARY 2-5, 1924.

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

In order to illustrate the utility of weather charts constructed in ships at sea in the Western North Atlantic, CHARTS IV. to VII. have been made from observations which may be obtained from the Arlington Weather Bulletin (see April 1924 "Marine Observer"), and from ships' meteorological logs and reports.

Supposing that S.S. *Bolingbroke*, Captain E. AIKMAN, bound for St. John's, N.B., had on this occasion been able to obtain the observations at the time she could have made the following deductions.

CHART IV. FOR THE MORNING OF FEBRUARY 2ND, shows *Bolingbroke*, steaming S. 68° W. 8 knots, to be situated in an area of high pressure centred S.E. of Cape Race. There is a small "low" centred over

the east coast of Nova Scotia, while a large depression centred S.E. of Cape Hatteras influences the weather over practically the whole of the United States Atlantic Seaboard.

This being the first chart constructed it is difficult to estimate from it alone the probable changes in pressure distribution during the next 24 hours. The barometer tendencies of coast stations and ships (allowing for course and speed) north of the 40th parallel, indicate that the "anti-cyclone" centred S.E. of Cape Race will intensify and move in an easterly direction, while the small "low" off the Nova Scotian coast is filling up. The weather that *Bolingbroke* will experience, maintaining her course and speed during the next

24 hours, will therefore depend on the movement of the large depression now centred S.E. of Cape Hatteras.

The barometer tendencies of both shore stations and ships south of Latitude 40° N. show that it is deepening but give little indication of its probable movement.

From the normal chart of the North Atlantic Ocean for this month, it is seen that the normal track of cyclonic centres runs in a north-easterly direction from this position.

The "Arlington" report does not give the temperature readings for the coast stations, but it may be presumed that the flow of air recorded at these stations coming from a north-westerly direction is at this time of year very considerably colder than the air feeding the depression from the south-east. The warm sector of the depression will be situated roughly in that area bounded by lines joining *Canadian Inventor* and *Anjer* and *Canadian Inventor* and *Camito*.

According to Professor BJERKNES'S theory (see October 1924 Number, MARINE OBSERVER, Chapter X., "Wireless and Weather, an Aid to Navigation"), depressions follow a track parallel to the direction of the isobars in the warm sector, and a depression with a decided difference of temperature between the warm and cold sectors will deepen.

Bolingbroke will therefore expect this disturbance to deepen and move in a N.N.E. direction. With a falling barometer her wind will back to the S.W. as she moves out of the "high." Later as she comes under the influence of the approaching depression it will back to the S.E. gradually increasing in force with probability of rain.

CHART V., FOR THE MORNING OF FEBRUARY 3RD. Comparing this chart with that of the previous morning, it is seen that in the past 24 hours the depression has moved in a north-easterly direction, at the rate of 32.5 knots, and has deepened considerably. The barometer tendencies, marked difference of temperatures in the cold and warm sectors, and the lie of the isobars in the warm sector, indicate that the depression will continue to deepen and move in a north-easterly direction.

Assuming that the depression maintains its previous rate of progression, *Bolingbroke*, now situated in the north-east quadrant of the storm, steering S. 70° W. 10 knots, will enter the centre early in the first watch.

She will, therefore, expect the barometer to fall rapidly, the wind to remain steady in direction but increase to a heavy gale as the centre is approached, the sea to rise rapidly, and the weather to become gloomy with heavy rain. When in the centre the wind will probably lull, after which with a rising glass it will come with the strength of a strong gale from the north-west, violent squalls being frequent as the squall line is crossed.

CHART VI., FOR THE MORNING OF FEBRUARY 4TH, shows the depression, now centred S. by E. of Cape Race, to have continued its advance in a north-easterly direction at the rate of 25 knots; during the past 24 hours, *Bolingbroke* was throughout the first watch passing through the storm's centre, when she reports light to moderate variable winds. At midnight the wind came from the N.N.W. freshening rapidly into a strong gale. At 4 a.m. the sea became so heavy, ship could not steam against it. She is now situated in the S.W. quadrant of the storm, reporting a strong W.N.W. gale, very high sea and frequent violent squalls. At this time the barometer was broken owing to the labouring of the ship.

During the next 24 hours as the depression continues N.E. she may expect the wind to gradually back and diminish in force with a general improvement in the weather conditions.

CHART VII., FOR THE MORNING OF FEBRUARY 5TH, shows *Bolingbroke* to be steaming out of the S.W. quadrant of the storm field.

The "low" indicated on the previous morning's chart centred over the Southern States is seen to have moved in a north-easterly direction, being now centred just west of Cape Hatteras.

During the next twenty-four hours *Bolingbroke* steaming S. 70° W. 8 knots will expect the weather to clear up and wind to lighten temporarily. Later as she is approaching the Bay of Fundy she will probably come under the influence of the advancing "low," when her wind will veer to the eastward increasing in force, the weather becoming gloomy with probable mist and rain.

Comparing the charts discussed above with those accompanying the article "A Sudden February Gale" in this Number, it is seen how great is the advantage of land reports to ships at sea in the Western North Atlantic over those received from the land in the Eastern North Atlantic, owing to the weather systems in these latitudes normally travelling to the eastward.

A SUDDEN FEBRUARY GALE.

By L. A. BROOKE SMITH, MARINE SUPERINTENDENT.

THE points raised by Captain J. M. ISAACSON of S.S. *Manistee* in the Meteorological Log at the end of his account of a storm which is reproduced in the "Marine Observer's Log" are best answered with the aid of Weather Charts.

It will be well to refer to "Weather Signals" and to ascertain the limits of the Wireless Gale Warnings made by Great Britain.

The areas are bounded by a distance up to about 150 miles of the eight stations named.

On February 12th, 1924, at 0923 G.M.T. the following telegram was despatched for issue through Fishguard, Land's End, Niton and Valencia W/T stations.

Gale Warning Risk of South Easterly to Easterly winds touching force 8 locally S.W. coasts and W. Channel Hartland Point to Exmouth and Channel Islands.

At this time *Manistee* was in a position some 170 miles S.W. by S. from Land's End, the nearest Gale Warning Wireless Station.

In the Wireless "Weather Shipping" Bulletin the following was included in the 0900 G.M.T. issue on February 12th, 1924, also:—

Southern Area District Channel Wind S.E. or E. strong with risk of gale visibility deteriorating. District Wight Wind S.E. or E. increasing to fresh or strong visibility deteriorating.

At this time *Manistee* was outside the limit of the Southern Area. It may be asked:—

(a) Why was the gale warning not issued earlier?

(b) Why restrict the geographical limits of gale warnings and forecasts to such small distances west and south-west of the British coasts?

FIGURES 1 AND 2 are portions of the Daily Weather Maps for the mornings of February 11th and 12th, 1924, reproduced. The latter represents the material information upon which the forecaster based these warnings and forecasts for shipping.

The map of February 11th, 1924, indicates a complete absence of reported observations to the westward of the British Isles; it shows a shallow depression off the mouth of the English Channel and that the barometer is rising generally over the British Isles and northern France. There are no indications of coming bad weather.

As has often happened in previous years during the winter, when there are a number of Atlantic liners laid up for overhaul or they are away from their regular service upon yachting cruises, there was a complete absence of British regular wireless weather reporters in the Eastern North Atlantic just as the gale *Manistee* encountered was springing up; no reports being received between those from *Metagama* for 1800 G.M.T., on February 9th and *Montcalm* for 1300 G.M.T., on February 12th.

The map of February 12th, 1924, indicates that a report was received through Paris from a French ship which enabled the forecaster to locate and, to some extent, define a secondary depression S.W. of Ireland. The falling barometer at south-western stations and the general pressure distribution indicated that this depression would probably travel S.E. and deepen. Upon this the Warnings were issued.

WEATHER CHART VIII., FOR THE MORNING OF FEBRUARY 11TH, 1924, may be compared with FIGURE 1. With the aid of this chart the depression which caused the sudden gale is revealed to the westward of the 20th meridian by *Verentia's* observations. Twenty minutes after observation time she "encountered a 'line squall' lying N.E. and S.W., heavy rain, wind hauled to west and barometer rose suddenly .03 inch and fell again soon afterwards."

Here no doubt the trouble was brewing. WEATHER CHART IX., FOR THE MORNING OF FEBRUARY 12TH, 1924, may be compared with FIGURE 2. It indicates a deep depression developing and travelling to the S.E. with a marked sector of warm air.*

* See "Wireless and Weather, an Aid to Navigation," Chapter X., "Marine Observer," October, 1924.

Manistee on her course S. 63° W. (True) in the middle watch crossed the "wedge" separating the two depressions shown on CHART VIII. where the barometer was 994 (29.35) and the wind light and variable, and entered the new depression in the advance left-hand quadrant as it moved across her track ahead deepening rapidly, thus causing the barometer to "tumble down."

With the foregoing evidence at our disposal the answers to the questions (a) and (b) are as follows:—

(a) Because information was lacking at the Meteorological Office which, had it been available, would undoubtedly have led to a warning being issued much earlier.

(b) Because with the resources at our disposal a regular and sufficient service of reports from the westward cannot be always guaranteed, without which sound forecasts and warnings cannot be always made for areas further removed from Telegraphic Reporting Land Stations.

In the autumn of last year steps were taken which should ensure, as far as our resources at present permit, that there will be a more regular service of Coded Wireless Weather Reports from the Trans-North Atlantic Tracks.

It should be noted that the position *Manistee* was in on the morning of February 12th is within the French area "Bretagne" for Wireless Storm Signals issued from Eiffel Tower.

With regard to the sea and swell observed, these may be accounted for with CHART IX. before us. At 10 a.m. when the sea became dangerous, breaking in all directions from S. to E., there had shortly before been a shift of wind from S.S.E. to E.S.E. with the force of a whole gale. The swell running heavily from S.W. from the commencement of the gale until the centre passed, was probably due to the strong gales in the advance right-hand quadrant of the depression where the barometer gradient is steep, with a fetch of several hundred miles.

The long swell from W. by S., when the wind was east, light, for a while after midnight, may have been due to westerly winds of another depression at some distance, and to the westerly winds of the depression present, when it was further to the N.W. some time previously.

The swell from the N.N.E. was due to the winds from that direction in rear of the depression.

Not only does this example prove the value of Coded Wireless Weather Reports to the shore for the purpose of issuing warnings for the coasts, which are of tremendous importance, and to small craft in particular; but it affords another example of the aid which wireless weather reporting to all ships by Marine Observers may be to navigation.

Desire to help coastwise shipping and the air and shore services are sufficient incentive for the first, while professional pride of the seaman should do much to promote the latter.

WEATHER SIGNALS.

II. WIRELESS WEATHER SIGNALS.

Bulletins.

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

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

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

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

WIRELESS WEATHER BULLETINS, GREAT BRITAIN AND IRELAND.

C.W. Issue, "Weather Shipping Bulletin."

W/T Station, Air Ministry. Latitude 51° 27' 50" N.

Longitude 0° 01' 35" E.

Call sign G.F.A.

Wave length 4,100 metres, C.W.

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

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

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

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

Part I. is a general inference of weather conditions over N.W. Europe and the adjacent seas.

Part II. is a report in code giving actual observations, with station number, of Barometer tendency, weather, visibility, Barometric Pressure, Direction and Force of Wind, at the ten British stations shown upon the accompanying Chartlet (p. 28) numbered from 1 to 10 (the initial 1 being omitted in the case of Station 10).

Two stations not shown on the Chartlet (p. 28) also follow in this part. They are No. 1, Reykjavik, Latitude 64° 09' N., Longitude

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

21° 55' W. (approx.) and No. 2, Thorshavn, Latitude 62° 03' N., Longitude 6° 45' W. (approx.) preceded by the word "Foreign."

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

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

Explanation of Chartlet.

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

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

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

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

DESCRIPTION OF CODE

AND

INSTRUCTIONS FOR DECODING PART II.

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

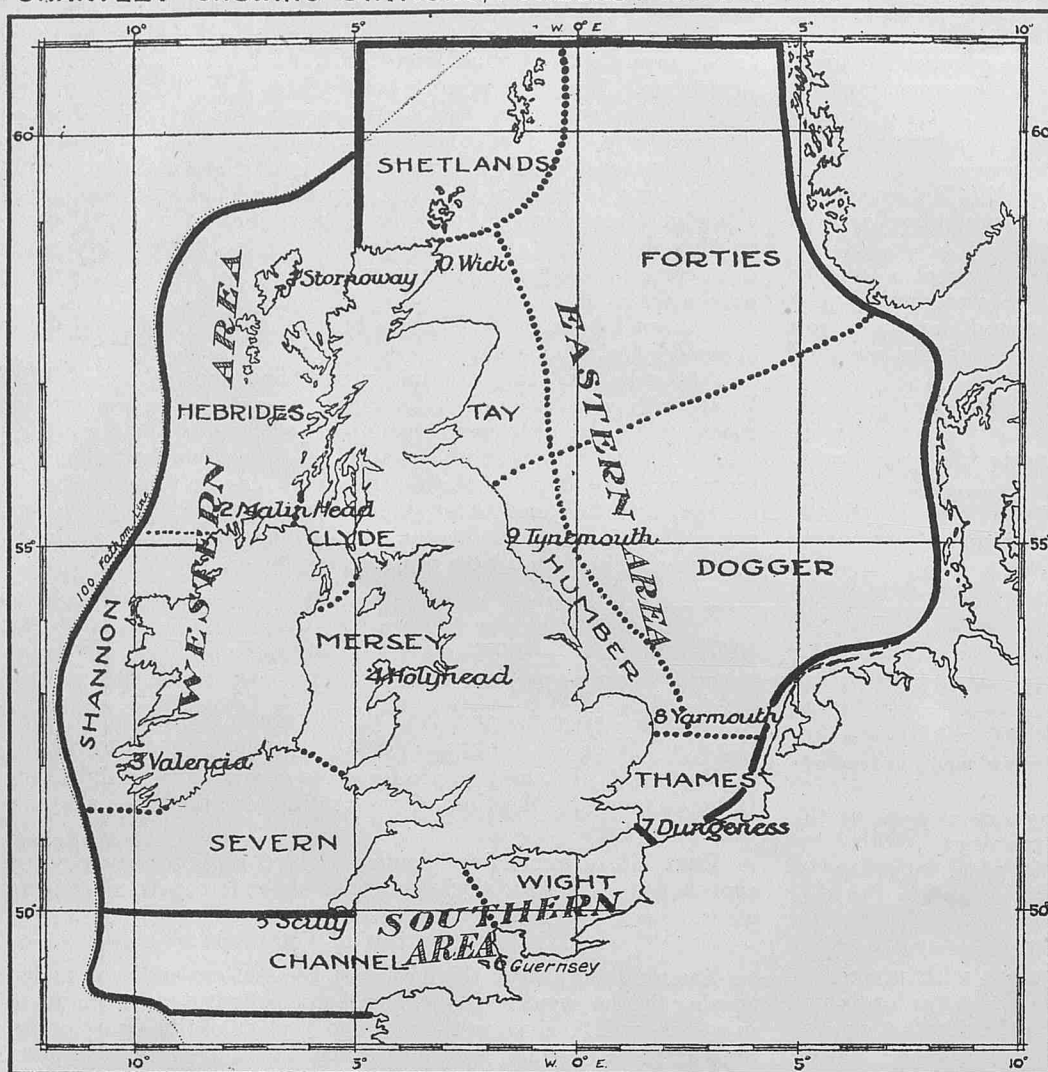
Odd Groups. The 1st Figure indicates the station to which the pair of groups refers. From 1 to 9 and 0 for British stations. The Foreign groups being numbered 1 and 2 as above and indicated by the word "Foreign."

The 2nd Figure gives the Barometer tendency, Table XIV.

The 3rd and 4th Figures give the weather, Table V., January 1925, "Marine Observer."

The 5th Figure gives the visibility, Table VI., January, 1925, "Marine Observer." Caution is necessary in the use of these visibility reports owing to the conditions of view to seaward at some stations. The two foreign stations' visibility reports are *landward*.

CHARTLET SHOWING STATIONS, FORECAST AREAS AND DISTRICTS.

**WESTERN AREA.**

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

DISTRICTS.

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

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

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

MERSEY.—The Irish Sea and approaches.

CLYDE.—The North Channel and approaches to Clyde.

SOUTHERN AREA.

The English Channel from Dover to the 100 fathom line.

DISTRICTS.

CHANNEL.—West of Portland.

WIGHT.—East of Portland.

EASTERN AREA.

The North Sea south of Lat. 61° N., and east of Long. 5° W. to the north and to the Straits of Dover in the south.

DISTRICTS.

THAMES.—Thames Estuary and its approaches.

HUMBER.—East coasts from Yarmouth to Tweed.

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

SHETLANDS.—Orkneys and Shetlands.

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

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

Even Groups. The 1st and 2nd Figures indicate the last two whole figures of the corrected barometer reading in millibars.* To convert to inches, see conversion table published monthly on back of ice chart, and Table XII., January, 1925, "Marine Observer."

The 3rd and 4th Figures give the True Direction of the Wind, Table III., January, 1925, "Marine Observer."

The 5th Figure gives the force of the wind by Beaufort scale. All forces 9 and above, as 9.

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

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

$I_n K' ww V_s$ BB DD F.

Thus I_n = Station. BB = Barometer Pressure.
 K' = Barometer tendency. DD = Wind Direction.
 ww = Weather. F = Wind Force.
 V_s = Visibility.

It will be noticed that the above symbols and their meanings are taken from the Abridged Key to the New International Code which was published in the January, 1925, Number of this Journal.

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

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

Though at first decoding may be tedious a little practice will show that this can be done with ease and rapidity. A form ruled and used as suggested in the specimen shown on pp. 29 and 30 will be of great assistance.

A Sample Message.

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

Weather Shipping.

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

Station	17535	99041	2155—	93283	34117	12266
Reports	46356	97208	55167	13267	65417	19185
	77124	15206	87526	14186	97275	99206
	0856—	00146	Foreign 1112—	96162	2012—	05000.

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

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

For the purpose of decoding and recording the W/T Weather Bulletin for all coasts, the following form may be ruled and used with advantage. The code figures should be entered under the names of the Stations. An example is recorded and decoded on this form overleaf.

Weather Shipping.

Part I							
INFERENCE							
PART II		Odd Groups			Even Groups		
Station Reports Code figures		K' Bar Tendency	ww Weather	Vs Visibility	BB Barometer	DD Wind	F Force
1 Stornoway							
2 Malin Head							
3 Valencia							
4 Holyhead							
5 Scilly							
6 Guernsey							
7 Dungeness							
8 Yarmouth							
9 Tynemouth							
0 Wick							
Foreign							
1 Reykjavik							
2 Thorshavn							
Part III		FORECAST				Part VI. OUTLOOK	
District							
Western Area							
Part IV							
Southern Area							
PART V							
Eastern Area							

Weather Shipping.

Part I		A deep depression over the North Channel which is moving E.N.E. will cause strong winds or gales in all districts with much rain at first. Improving weather will spread across the country in its rear.							
INFERENCE									
PART II		Odd Groups			Even Groups				
Station Reports Code figures		K' Bar Tendency	ww Weather	V _s Visibility	BB Barometer	DD Wind	F Force		
1 Stornoway 17535 99041		Falling quickly	r. mod. but has decreased	poor	999 mb. 29.50 in.	N.E.	1		
2 Malin Head 2155- 93283		Rising slowly	r. continuous	—	993 mb. 29.32 in.	N.W.	3		
3 Valencia 34117 12266		Rising very rapidly	c. or o. no apparent change	good	1,012 mb. 29.89 in.	W.N.W.	6		
4 Holyhead 46356 97208		Falling	p. heavy with rain	moderate	997 mb. 29.44 in.	S.W.	8		
5 Scilly 55167 13267		Falling slowly	c. or o. after rain or drizzle	good	1,013 mb. 29.92 in.	W.N.W.	7		
6 Guernsey 65417 19185		Falling slowly	d. slight continuous	good	1,019 mb. 30.09 in.	S.S.W.	5		
7 Dungeness 77124 15206		Falling quickly	c. or o. cloud has increased	Thin fog or mist	1,015 mb. 29.97 in.	S.W.	6		
8 Yarmouth 87526 14186		Falling quickly	r. slight but has increased	moderate	1,014 mb. 29.94 in.	S.S.W.	6		
9 Tynemouth 97275 99206		Falling quickly	f. or m. apparently overcast	poor	999 mb. 29.50 in.	S.W.	6		
0 Wick 0856- 00146		Falling very rapidly	r. moderate but has increased	—	1,000 mb. 29.53 in.	S.S.E.	6		
Foreign									
1 Reykjavik 1112- 96162		Rising slowly	c. or o. cloud has increased	—	996 mb. 29.41 in.	S.	2		
2 Thorshavn 2012- 05000		Steady	c. or o. cloud has increased	—	1,005 mb. 29.68 in.	—	Calm		
Western Area	Part III		FORECAST			Part VI. OUTLOOK			
	District								
	Mersey Severn Shannon Clyde Hebrides		} Westerly gale, veering and moderating, visibility becoming good.		Eastern area, northerly gales.				
			} Strong northerly winds, moderating, visibility moderate.						
Southern Area	Part IV								
	Wight Channel								
Eastern Area	PART V					Western area, temporary improvement.			
	Dogger Humber Thames							} South westerly gales, visibility poor.	
	Tay Forties Shetlands							} Southerly winds, strong to gale, backing, visibility poor. Fresh easterly winds, visibility moderate.	

Spark Issue "Western Seaboard" Weather Messages.

W/T Stations, **Valencia** (Lat. 51° 56' N., Long. 10° 21' W. approx.), **Malin Head** (Lat. 55° 22' N., Long. 7° 20' W., approx.).

Call Signs, GCK GMH
Wave lengths, 600 m. spark. 600 m. spark.

Times of transmission, 0918 & 2118 G.M.T. (civil). 0930 & 2130 G.M.T. (civil).

Messages addressed to CQ.

The messages refer to the observations taken at 0700 and 1800 G.M.T. (civil) respectively. They are in two parts:—

The **first part** is preceded by the word **Western**, and is a forecast, sent **en clair**, for the **24 hour period** to cover the waters included between the Western coasts and the 100 fathom line, including the mouth of the English Channel. When practicable information concerning the dominant weather system is given.

The **second part** is a data message, in code, giving the actual observations of the barometer, direction and force of the wind, visibility and tendency of the barometer, during the last 3 hours at the following stations:—

Stornoway ...	Lat. 58° 11' N., Long. 6° 22' W. (approx.)
Blacksod ...	Lat. 54° 06' N., Long. 10° 04' W. "
Holyhead ...	Lat. 53° 18' N., Long. 4° 39' W. "
Scilly ...	Lat. 49° 58' N., Long. 6° 18' W. "
Dungeness ...	Lat. 50° 55' N., Long. 0° 58' E. "

The **first five groups** of five figures each are always given in the order of the stations above, and the figures of the **sixth group** are given in the same order, so that the first group refers to Stornoway, the second to Blacksod, and so on to the fifth group.

In the **sixth group**, the first figure refers to Stornoway, the second to Blacksod, and so on.

Expressed by symbols the groups are as follows:—

Groups 1-5 BBDFV_s

Group 6 K'₁K'₂K'₃K'₄K'₅.

where

BB = corrected barometer in millibars to the nearest whole millibar, the first 9 or 10 being omitted. See Conversion Table XIII.* January, 1925, "Marine Observer."

D = true direction of the wind to the nearest cardinal or half-cardinal point. See Table VIII., January, 1925, "Marine Observer."

F = wind force by Beaufort notation, 9 representing forces of 9 and above.

V_s = visibility by scale. Caution is necessary in the use of these visibility reports owing to the conditions of view to seaward at some stations. See Table VI., January, 1925, "Marine Observer."

K' = barometer tendency. See Table XIV.

Example of Parts I. and II.

Part I.—A typical forecast.

Western. Depression off mouth of Channel nearly stationary, forecast strong south-easterly winds occasional rain visibility poor at times.

Part II.—Data Message:—

10347 04457 09256 05357 10336 00655.

The figures decoded:—

10347 = Stornoway—Bar., 1010 mb; wind S.E.4; visibility good.

04457 = Blacksod—Bar., 1004 mb; wind S.5; visibility good.

09256 = Holyhead—Bar., 1009 mb; wind E.5; visibility moderate.

05357 = Scilly—Bar., 1005 mb; wind S.E.5; visibility good.

10336 = Dungeness—Bar., 1010 mb; wind S.E.3; visibility moderate.

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

00655 = Barometer—Stornoway—Steady.

Blacksod —Steady.

Holyhead —Falling.

Scilly —Falling slowly.

Dungeness—Falling slowly.

Note.—When observations are missing a hyphen is given in the place of each missing figure. This is necessary to preserve the order. If observations from one of the above stations are lacking and observations are available for another station in the vicinity the name of the station is indicated before the figure group referring to it.

NEW INTERNATIONAL CODE, WEATHER TELEGRAPHY TABLE.

Table XIV. K'.—Barometer Tendency.

0	Barometer steady. (The barometer has not fallen or risen more than $\frac{1}{4}$ millibar in 3 hours).				
1	Do. rising slowly. (The barometer has risen 1 to 1½ mb. (.03-.04 in.) in last 3 hours).	Do.	2 to 3½	(.06-.10 in.)	do.
2	Do. rising.	Do.	4 to 6	(.12-.18 in.)	do.
3	Do. rising quickly.	Do.	over 6	(.18 in.)	do.
4	Do. rising very rapidly.	Do.	fallen 1 to 1½	(.03-.04 in.)	do.
5	Do. falling slowly.	Do.	2 to 3½	(.06-.10 in.)	do.
6	Do. falling.	Do.	4 to 6	(.12-.18 in.)	do.
7	Do. falling quickly.	Do.	over 6	(.18 in.)	do.
8	Do. falling very rapidly.	Do.			

WIRELESS STORM WARNINGS.**Great Britain and Ireland.**

These messages are broadcast in plain language and refer to the area which lies within about 150 miles of the station sending out the message.

The signals are made on 600 m. wave length (spark) preceded by the **International safety signal TTT**. They are repeated three times at intervals of ten minutes. Should the signal be sent during the period when one operator ships do not keep watch they are repeated at the commencement of the next single operator watch.

Stations making these signals.

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

Example:— "Gale Warning. Deep depression off N.W. Ireland moving east. Gales from S.E. backing north probable north of latitude 54°. Southerly gales veering N.W. other coasts."

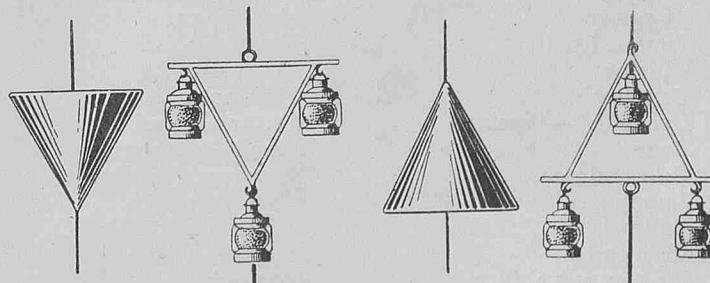
IV. VISUAL STORM WARNINGS.**Great Britain and Ireland.****SOUTH CONE.****NORTH CONE.**

By Day.

By Night.

By Day.

By Night.

**Hoisted for Gales.**

from S.E., veering to S.W., W., or N.W.	from S.E., E., or N.E., backing to N.
" S.W., veering to W. or N.W.	" N.W., veering to N., N.E., or E.
" W., veering to N.W.	" N., veering to N.E. or E.
And also from E., veering to S. or S.W.	" N.E., veering to E.

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

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

The stations are as follows :—

England, East Coast.

Berwick-upon-Tweed	Boston
Blyth	King's Lynn
Tynemouth	Sheringham
North Shields	Cromer
Souter point	Yarmouth
Sunderland	Gorleston
Seaham	Lowestoft
Hartlepool	Southwold
Middlesbrough	Orfordness
Redcar	Ipswich
Whitby	Gunfleet
Filey	Shoeburyness
Flamborough head	Greenhithe (H.M.S. <i>Worcester</i>)
Bridlington	Chatham
Spurn head	Sheerness
Hull	†Southend
Goole	Tilbury
Grimsby	Rotherhithe

England, South Coast.

Reculvers	Portland
Ramsgate	Jersey
Deal	Exmouth
Dover	Torquay
Sandgate	Dartmouth
Dungeness	Berry head
Rye	Prawle point
Eastbourne	Salcombe
Beachy head	Plymouth
†Newhaven	Devonport
Brighton	Rame head
Littlehampton	Portwrinkle
Hayling island	Looe
Portsmouth	Fowey
Southampton	Gorran haven
Cowes	Mevagissey
Ryde	Coverack
St. Catherine point	St. Anthony
Needles (Freshwater)	Lizard
Poole	Mullion
Swanage	Porthleven
Anvil point	Tol Peden Penwith
Weymouth	Scilly (St. Mary's)

England, West Coast, and Wales.

Sennen	Swansea
Godrevy	Mumbles
St. Ives	Rhos-sili
Newquay	Burry port
Trevose head	Tenby
Padstow	Caldy island
Port Isaac	Pembroke dock
Lynmouth—Foreland	St. Ann's head
Bude	Smalls lighthouse
Hartland point	Newquay (Cardigan)
Lundy isle	Carnarvon
Bull point	South Stack
Ilfracombe	Holyhead
Weston-super-Mare	Amlwch
Newport (Mon.)	Hoylake
Cardiff	Formby light-vessel
Penarth	Crosby light-vessel
Nells point	New Brighton
Barry dock	Runcorn
Nash	Liverpool
Briton ferry	Preston

Blackpool
Fleetwood
Heysham
Morecambe
Barrow

Walney island
Douglas (Isle of Man)
Ayre point (Isle of Man)
Ramsey (Isle of Man)

Scotland, West Coast.

Stranraer	Mull of Cantyre
Mull of Galloway	Rinn of Islay
Corsewall point	Rudha Mhail
Ballantrae	Glas island
Ardrossan	Stornoway
Greenock	Ru Stoer
Campbeltown	

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

Cape Wrath	Port Knockie
Lerwick	Portsoy
Sumburgh head	Banff
Fair isle	Fraserburgh
Noup head	Peterhead
Kirkwall	Aberdeen
Stronsay	Nairn
Stromness (Orkney isles)	Girdleness
Cantick head	Seurdyness
Dunnet head	St. Andrews
Wick	Anstruther
Tarbetness	Methil
Cromarty	Rosyth
Burghead	Grangemouth
Lossiemouth	Dunbar
Buckie	St. Abbs head

Ireland, North and East Coasts.

Rathmullen	Belfast
Malin head	Kingstown
Portrush	

Ireland, South Coast.

Queenstown	Galley head
Cork	

Ireland, West Coast.

Killybegs (St. John's point)	Loop head
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Special Notices regarding Personnel.

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

Commodore Sir Bertram F. Hayes, K.C.M.G., D.S.O., R.D., R.N.R.

Commodore Sir BERTRAM HAYES of the *Majestic* has retired after long and meritorious service with the White Star Line, which he joined in 1889.

He obtained his first command in 1899, and was promoted to the rank of Commodore, R.N.R. (retired) in 1921, and in May, 1922, was appointed in command of the *Majestic*. Just previous to this he was created Commodore of the White Star Line.

He has been a continuous Marine Observer for the British Meteorological Office for a quarter of a century.

Captain Frank B. Howarth.

Captain HOWARTH of the *Olympic* has also retired from the White Star Line after 31 years' service.

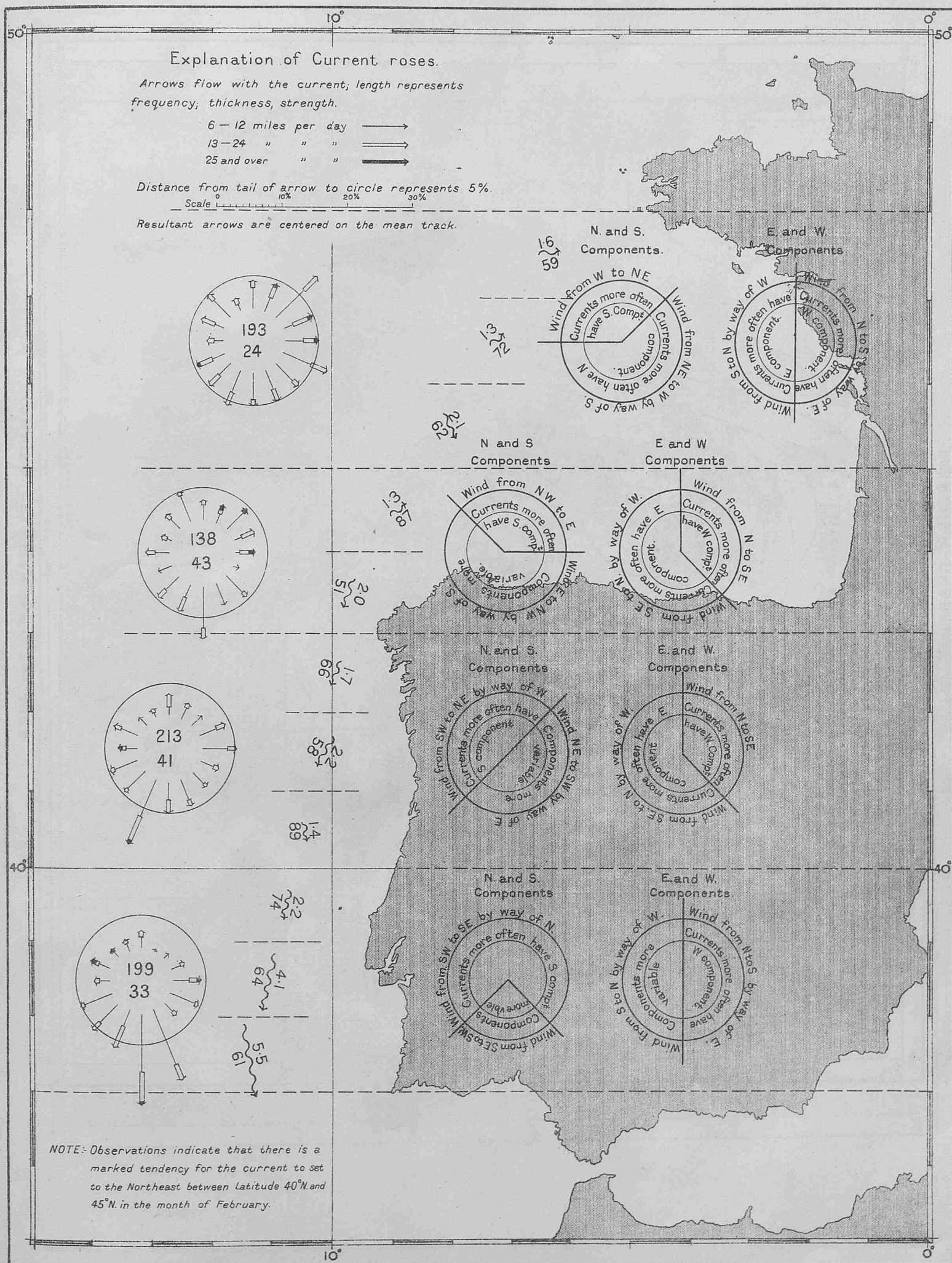
Commencing his sea career at the age of 17, he joined the White Star Line in the early nineties. Among the well-known steamers commanded by him prior to his promotion to the *Olympic* were the *Celtic*, *Cedric*, *Baltic*, *Adriatic* and *Homeric*.

He has been a Member of the Corps of Voluntary Marine Observers since 1905.

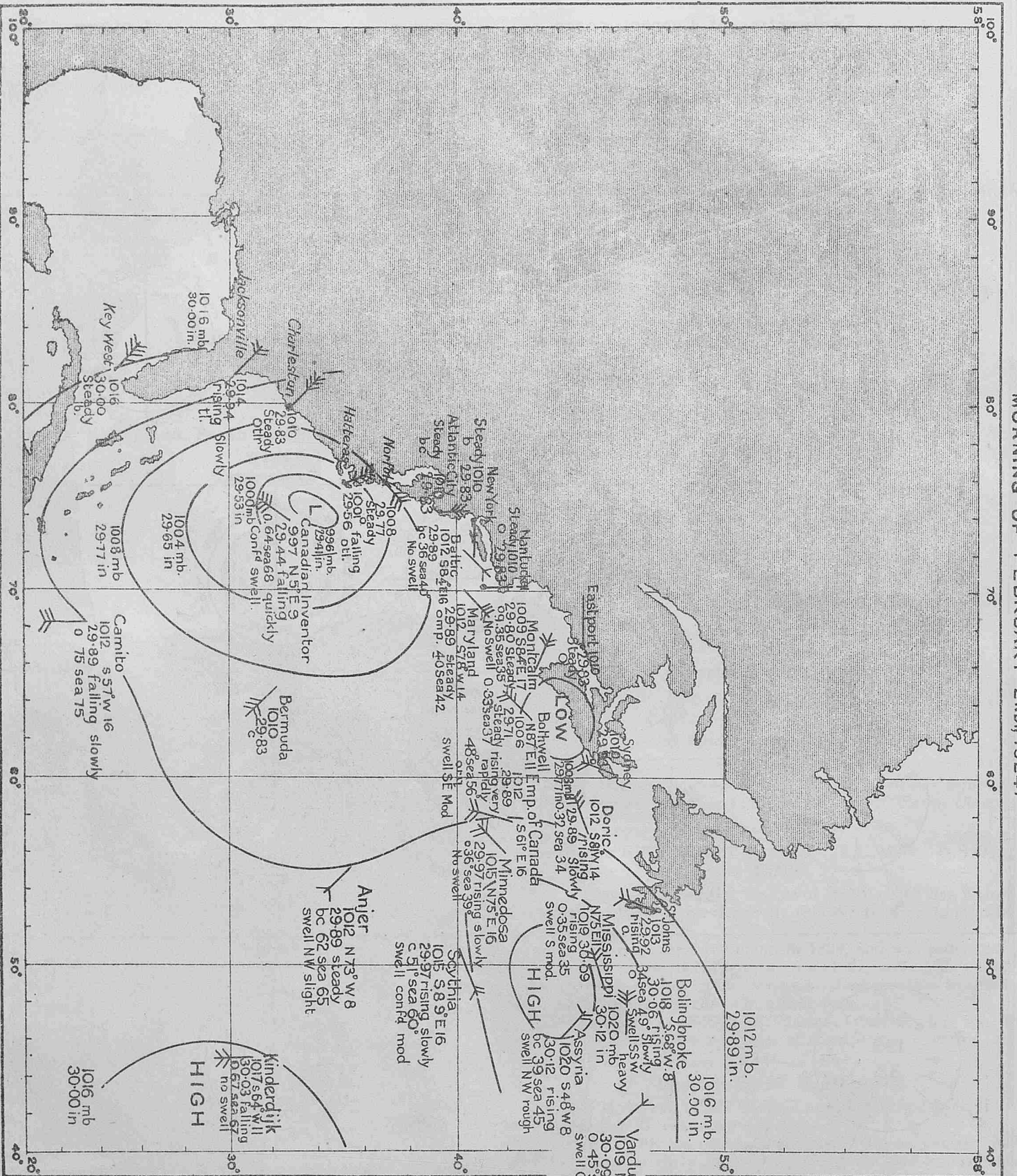
Marine Observers will join with the Marine Division in wishing these Officers long life and happiness in a well earned retirement.

CURRENT CHART, CHANNEL TO LATITUDE OF CAPE ST VINCENT.

Compiled from observations made by ships using the routes from the Channel to Madeira and southward, and the Mediterranean, in the months of February, March and April, during the years 1910 - 1923.

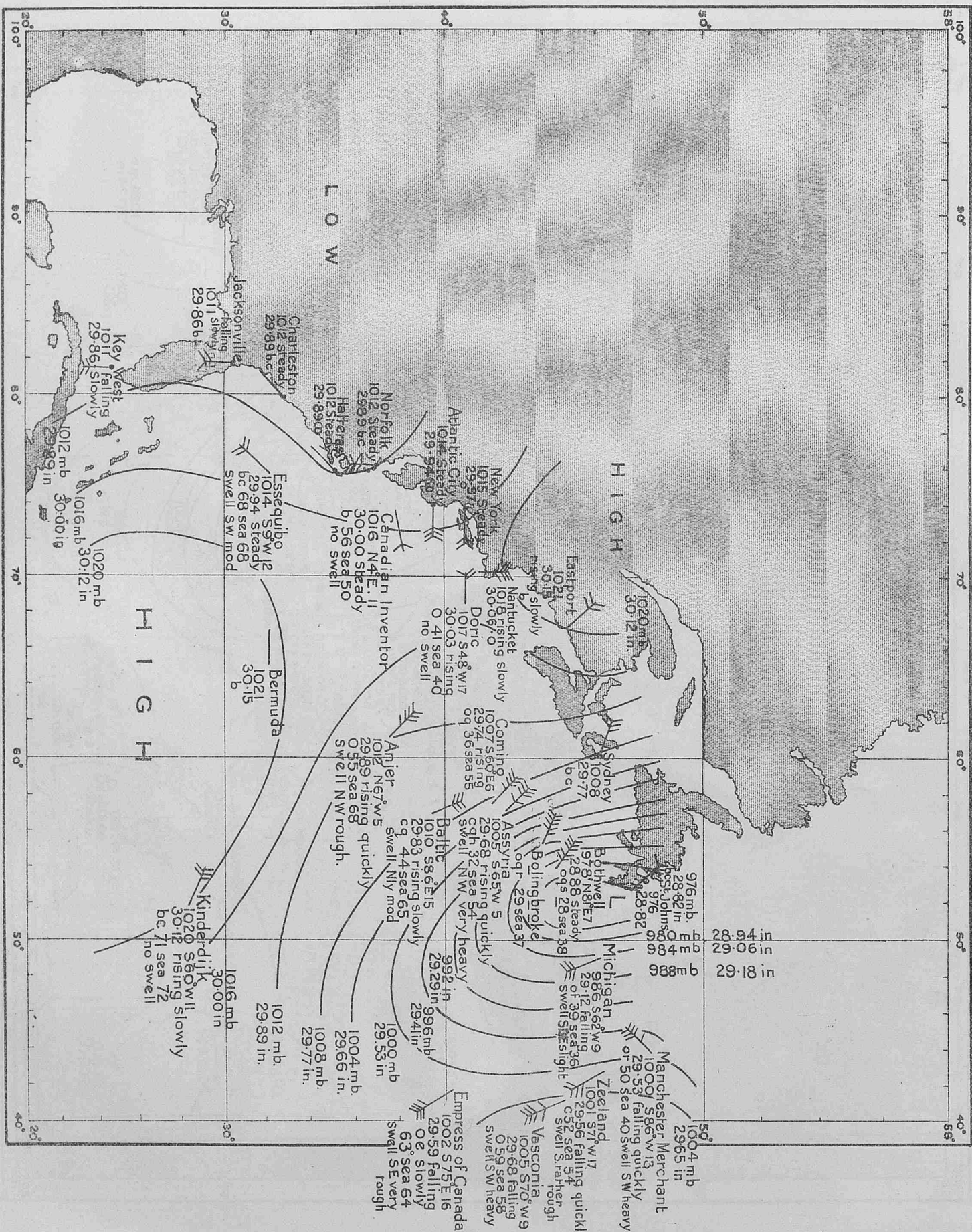


MORNING OF FEBRUARY 2ND, 1924.



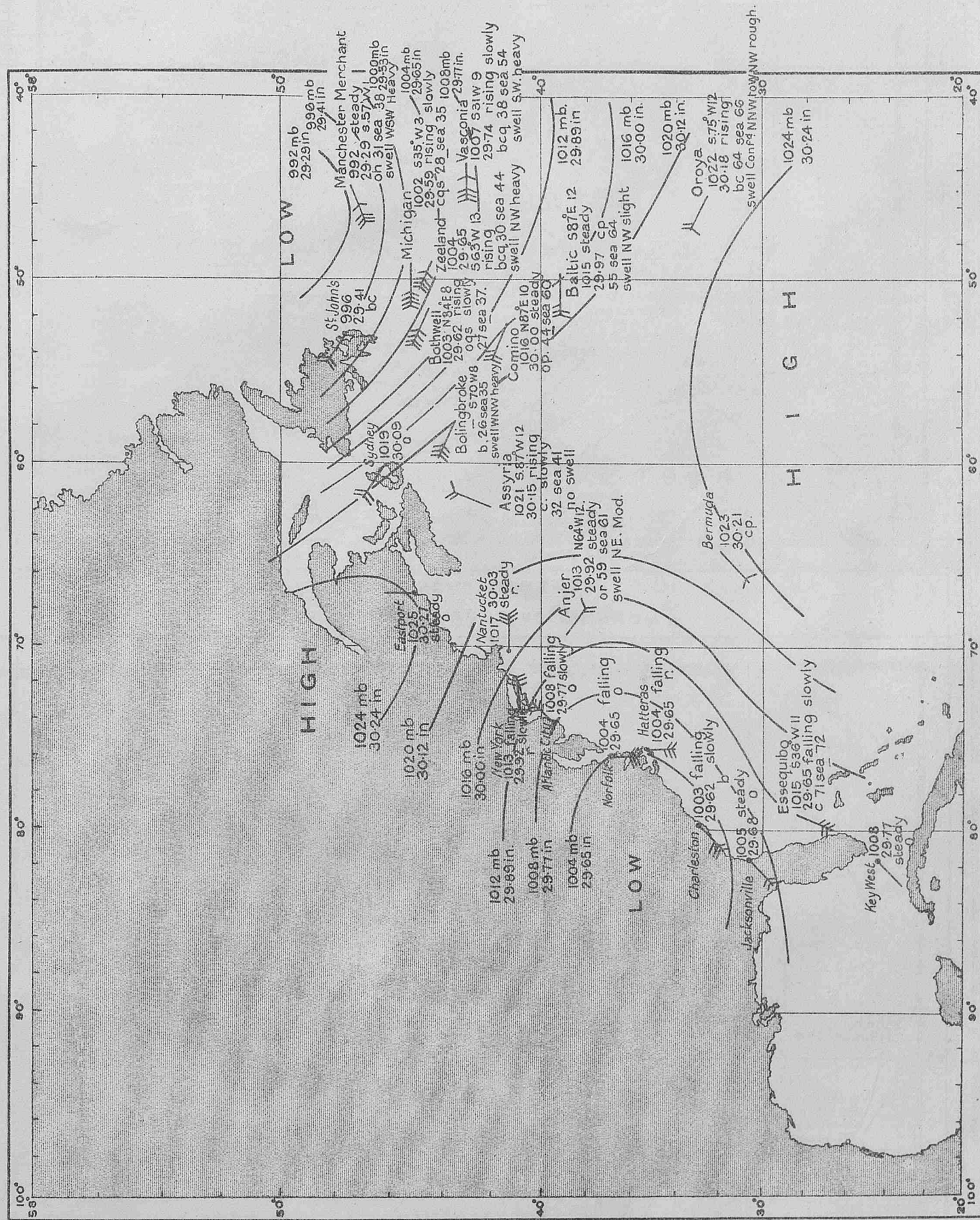
WEATHER CHART, IV.

[illegible]

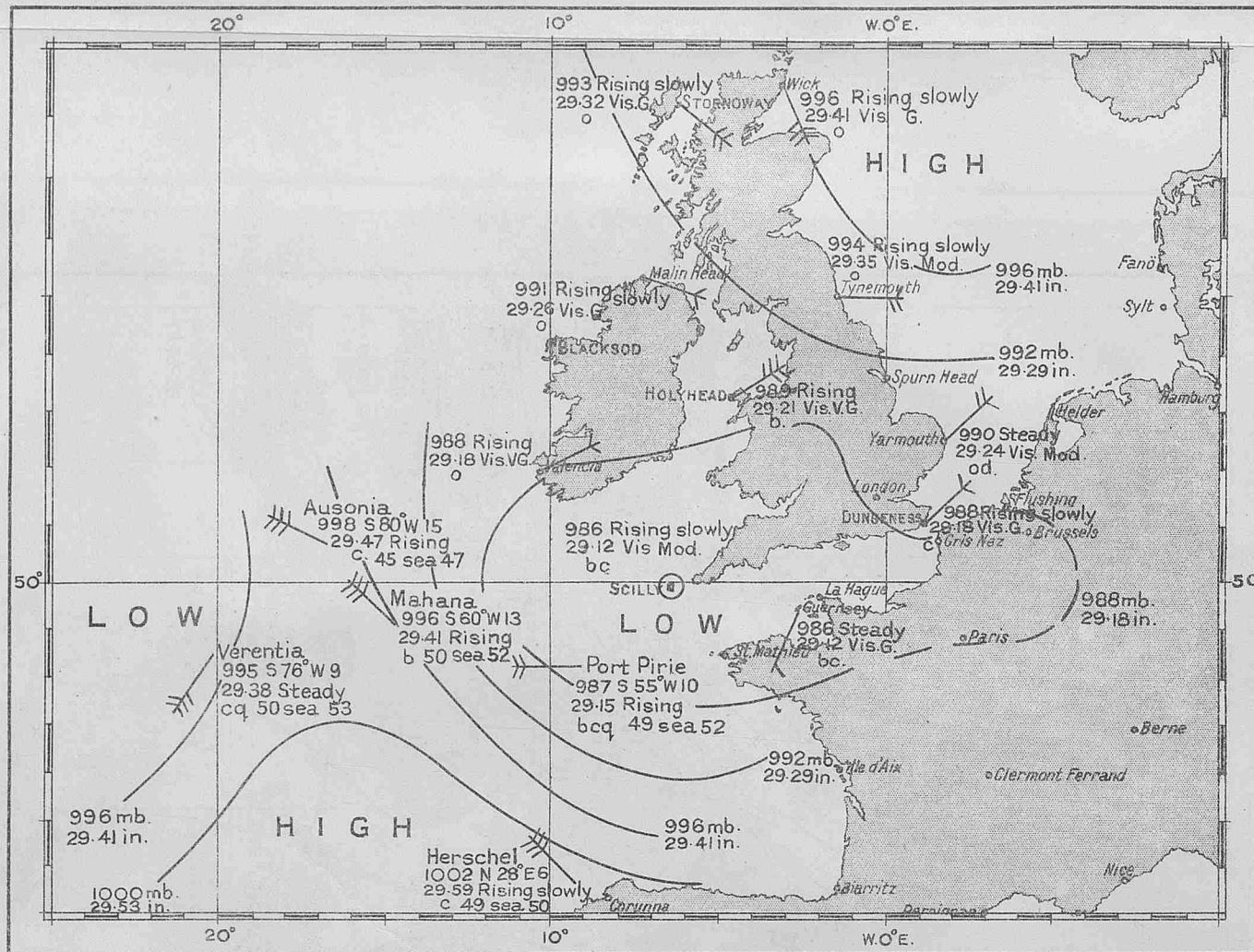


WEATHER CHART VI.

MORNING OF FEBRUARY 5TH 1924.

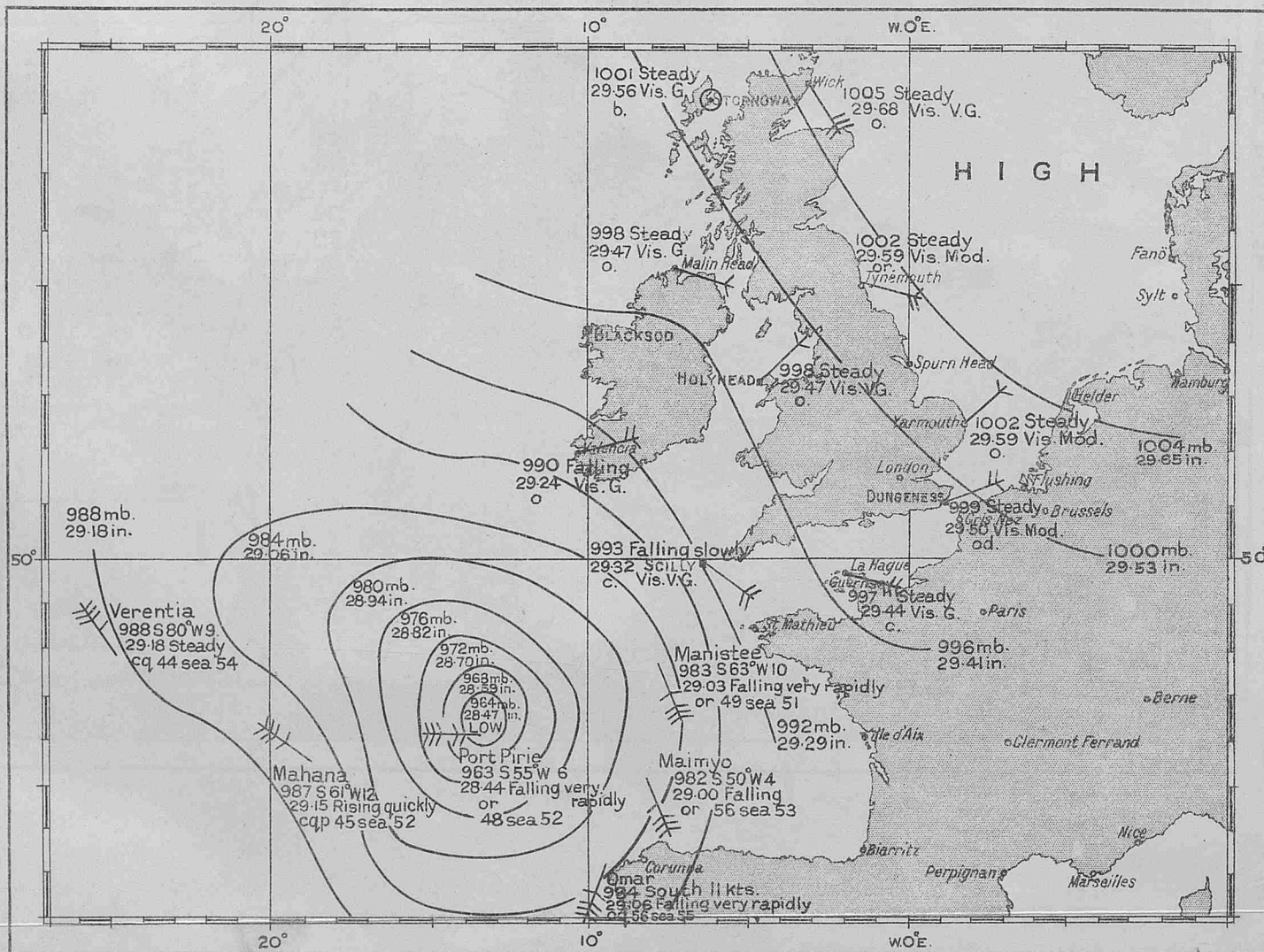


MORNING OF FEBRUARY 11TH., 1924.



WEATHER CHART, VIII.

MORNING OF FEBRUARY 12TH., 1924.



WEATHER CHART, IX.

PORTIONS OF BRITISH DAILY WEATHER MAPS.

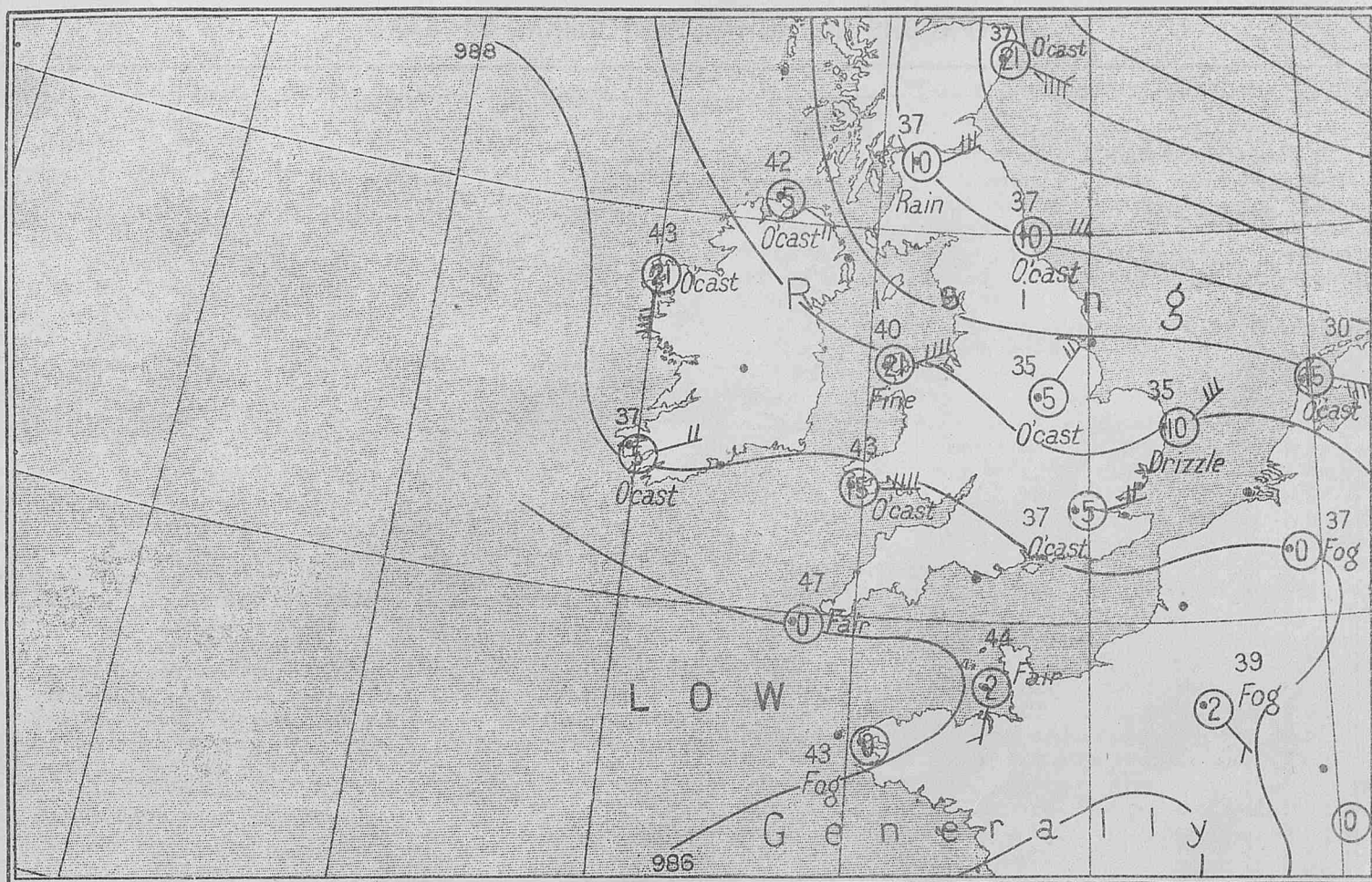


Fig. 1.— Morning of February 11th, 1924. "A Sudden February Gale."

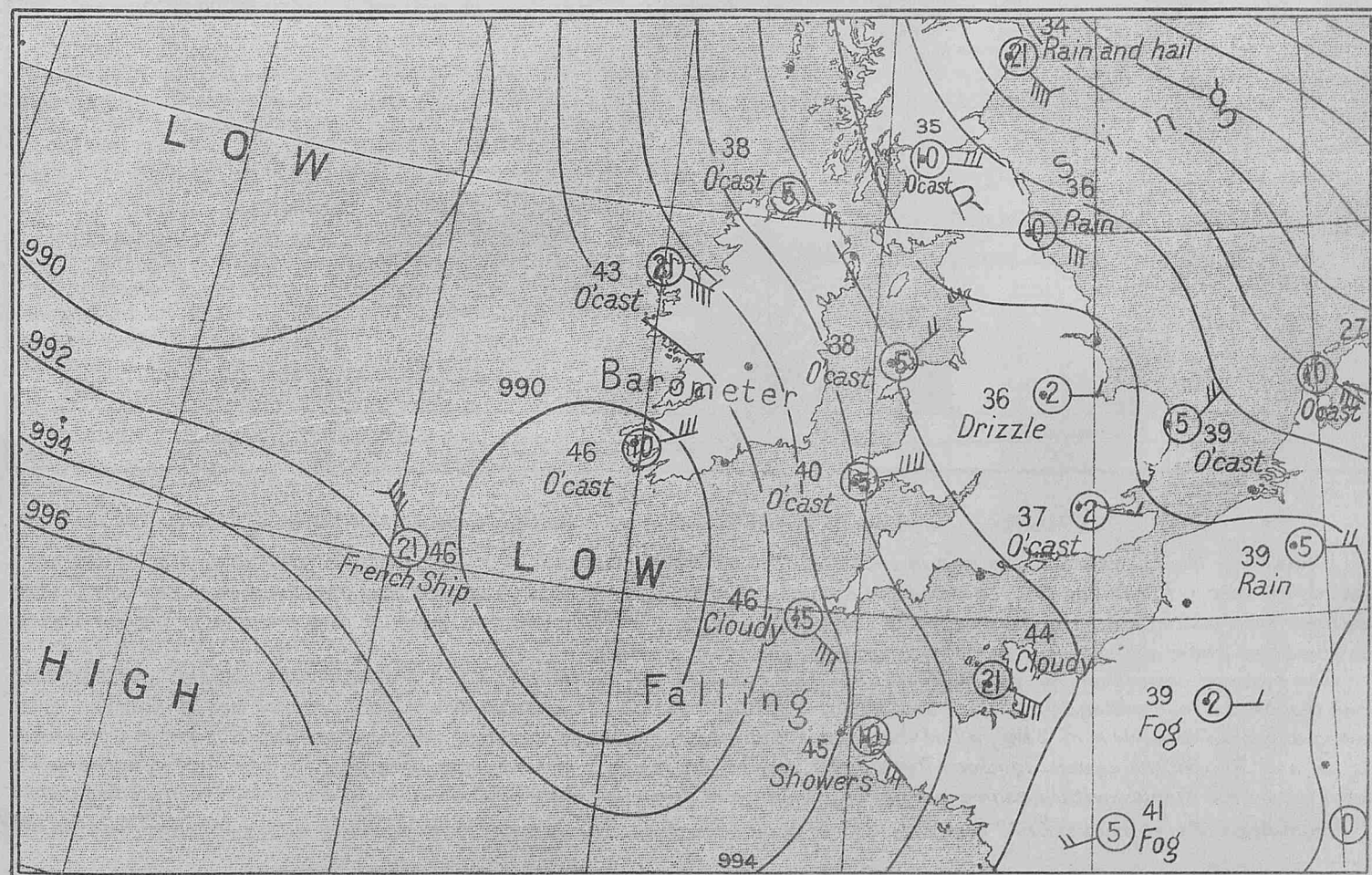
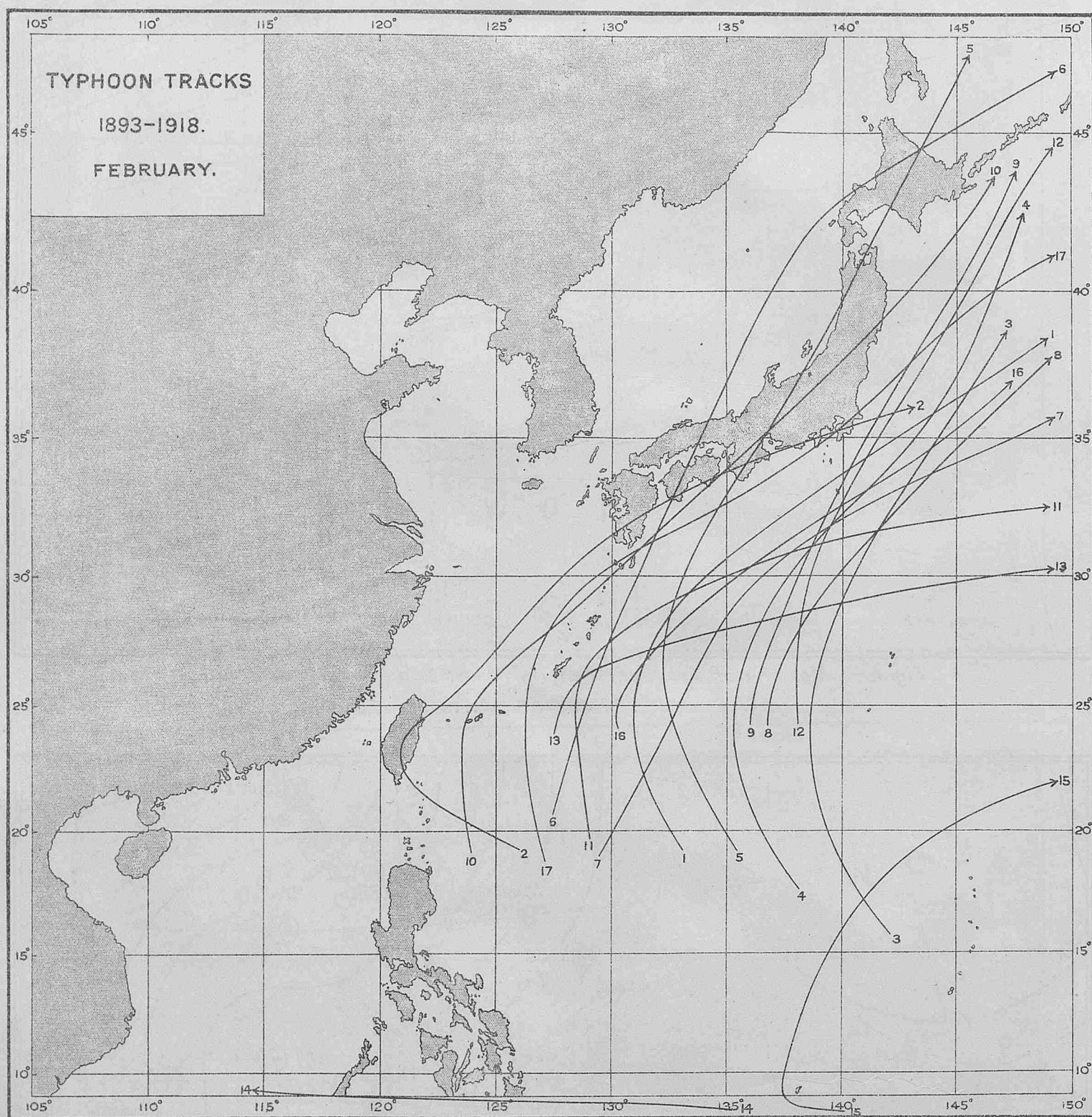


Fig. 2.— Morning of February 12th, 1924. "A Sudden February Gale."

TYPHOONS IN THE FAR EAST DURING 26 YEARS.



FEBRUARY.—Single chart: 17 tracks; a little more than two cases in three years.

Remarks.—The line dividing the map in two areas, the one calm, the other disturbed, has advanced some 8 or 10 degrees towards the East. The Philippines, Formosa and Kiusiu are practically out of the dangerous zone; the Sea of Japan and the Eastern Sea have been visited, in their eastern border, only once or twice; the Pacific, east of Luzon, is also remarkably free, as well as the China Sea where only one depression ventured a few miles W. of Palawan.

The centre of origin remains at the low latitudes, but is considerably less fertile: many depressions are detected only after they have travelled a long distance, but their convergence continues to point to a spot between the Carolines and Marianas. After having advanced towards N. or NNW, all of them recurve at a higher latitude than last month, about the 25th parallel or between lat. 25° and 30°, off the eastern Loochoos. They are then seen to run towards the NE., and disappear on the Pacific, between the Bonin Is. and the Kuriles, with the same increase of strength and deepening of the central minimum as during the preceding month.

[From Atlas of the Tracks of 620 Typhoons, 1893-1918, by Louis Froc, S.J., Director Zi-ka-wei Observatory, Zi-ka-wei-Chang-hai, 1920]

COPY OF BOARD OF TRADE NOTICE TO MARINERS.

26th November, 1924.

INTENDED ALTERATION IN METHOD OF EXPRESSING TIME.

I. ADMIRALTY LIST OF LIGHTS AND VISUAL TIME SIGNALS.

In the 1924 Edition of the Admiralty List of Lights and Visual Time Signals, the Greenwich Mean Time and Standard Time given under the heading "Time Signals" are reckoned from Noon (0^h. 00^m. 00^s).

Attention is drawn to the fact that on and after 1st Jan. 1925 the times will be reckoned throughout the 24 hours commencing at Midnight (0^h. 00^m. 00^s) as in Civil usage, and will be shown thus in the 1925 Supplement and subsequent Supplements.

II. ADMIRALTY LIST OF WIRELESS SIGNALS.

In the 1924 Edition of Admiralty List of Wireless Signals Greenwich Mean Time is given two designations, one being referred to as "G.M.T. (Astronomical)" (*i.e.*, with the day commencing at Noon) in the Section dealing with W/T Time Signals; the other being "G.M.T. (Civil)" (*i.e.*, with the day commencing at Midnight) which is used generally throughout the whole of the remaining Sections comprising this work.

On and after 1st Jan. 1925, G.M.T. (Astronomical) will be altered to G.M.T. (Civil), *i.e.*, will reckon from Midnight (0^h. 00^m. 00^s).

"Civil reckoning" is also to be adopted for Standard Times of various countries, at present shown as "Astronomical reckoning" in the W/T Time Signal Section of this publication.

A note to the above effect will be found pasted on all copies of the 1925 Edition when issued.

III. ADMIRALTY CHARTS.

On Admiralty Charts, where details of Time Signals are shown, the intended new method of expressing time outlined above will be adopted from 1st Jan. 1925. All charts thus affected, which are printed on and after that date, will show the new times prescribed and will bear under "Small Corrections," in the bottom left hand corner, the corresponding date "1925 [1-1]."

IV. NOTICES TO MARINERS.

The times given in the Admiralty and Board of Trade Notices to Mariners will conform with the above publications. As from the 1st Jan. 1925, the term Greenwich Mean Time will be considered as the Standard Time of the meridian of Greenwich commencing at midnight (0^h. 00^m. 00^s) and reckoned throughout the 24 hours.

V. NAUTICAL ALMANAC.

In both the abridged and complete Nautical Almanac the times styled G.M.T. are at present reckoned from noon, corresponding to 12 hours (Civil Time); but in the issue for the year 1925 and thenceforward the times styled G.M.T. in these publications will be given commencing at midnight.

ICE REPORTS.

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

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

CURRENT OBSERVATION.

It is very desirable that good current data should be recorded. Spaces are provided for current experienced throughout the day and for current determined at shorter intervals in Meteorological Logs, while Form 911 (late 121) provides for either or both.

Generally the difference between the *Dead Reckoning Position* at noon, reckoned from previous noon, and the *observed position* has been accepted as attributable to a single current for the whole 24 hours.

It is necessary to make careful distinction between *Dead Reckoning Position* and *Estimated Position*, the former being the position as reckoned from the last fix by courses steered and distances run, corrected for all known errors and disturbances *except* current. When a fix cannot be obtained, an estimation for current (when one is known generally to exist) is sometimes applied to the D.R.; the result may then be conveniently termed the *Estimated Position*.

If this estimated position is given in the Meteorological Log or Form 911 (late 121), it should be clearly stated, otherwise it may be misleading.

Currents of varying velocity and direction may be experienced along the track made in 24 hours; therefore, when reliable fixes such as by Stellar observations at twilight are obtained, the current should be determined for the intervals, and all should be checked with the noon to noon result. Each of these currents determined at shorter intervals than 24 hours should be entered in the Meteorological Log in the appropriate column, and the time and latitude and longitude of each observation position should be given in the latitude and longitude columns. The times given on Form 911 (late 121) indicate the interval. The period of short interval currents should usually not be less than, say, six hours. The best interval is probably from twilight to twilight.

It is desirable that whenever possible two methods of ascertaining the distance run through the water should be used, as recent investigation goes to show that with one means of measuring the speed the inclination has been to credit the ship. When possible it is recommended that both patent log and revolutions should be used.

For working out the set and drift of current the position *from* as well as the position *to* must always be *fixes*. Some observers have used an *estimated position from*, which makes the set and drift false. The same remarks apply to course allowances for set; the latter are naturally necessary to make an *estimated course*.

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

- (B) { Westbound. From 1st February to 31st March, inclusive.
Eastbound. From 1st February to 24th March, inclusive.
- (D) From 15th February to 10th April, inclusive.
- (E) From 15th November to 14th February.

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

ROUTE NOTICES.

For latest information *re* Tracks
see pages 15-18, "Supplementary
Summary of Board of Trade
Notices to Mariners,"
20th November, 1924.

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.	Position.	Remarks.
Feb. 3rd, 1922	S.S. Weehawken	41°42' N. 58°59' W.	Ice (sustained bow damage).

Reports of Ice sighted between December 1st and December 31st 1924, which have been received by the Meteorological Office, are shown by the Symbols plotted in the chart, indicating the day of the month.

LATEST ICE REPORT FROM CANADA.

The following cablegram, dated 12th December, 1924, was received from the Superintendent, Canadian Signal Service, Quebec :—
"Montreal to Saguenay River, light open ice everywhere eastward to Magdalen Islands and Cabot Strait Belle Isle Strait Cape Race, no ice in sight."

Co-operation of Shipowners, Masters and Mates.

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

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

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

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

Vessels observing regularly for the Meteorological Office to which office instruments are not lent, keep Form 911, 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, not in code, of W/T Weather Report suggested in "Weather Signals," given in this Journal, January Number (see pages 11 and 12). 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), Lieut.-Commander M. Crosswell, R.N.R., 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. C. 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 Chronometer Depot.
VANCOUVER	..	T. S. H. Shearman, Esq., Room 40, Post Office Building.
AUSTRALIA	..	The Commonwealth Meteorologist.

The Deputy Directors of Navigation act as sub-agents as follows:—

SYDNEY	..	Captain G. D. Williams, D.S.O., Customs House.
MELBOURNE	..	Captain L. J. Bolger, Electricity Commissioners Building, 22, William Street.
FREMANTLE	..	Captain J. J. Airey, Dalgety's Buildings.

LATE PRESS.

DERELICTS AND FLOATING WRECKAGE.

Date.	Position.		Description.
	Latitude.	Longitude.	
BALTIC.			
3.12.24	59°08'N.	19°—'E.	Floating wreckage.
4.12.24	58°00'N.	10°00'E.	Swedish s.s. <i>Siri</i> on fire.
10.12.24	57°43'N.	10°58'E.	Wreck, two masts projecting.
NORTH SEA.			
13.12.24	56°30'N.	4°20'E.	Large quantity of floating deals.
19.12.24	E. by S. (mag.) $\frac{3}{4}$ mile from West Hinder Lt. Vsl..		Two derricks sighted, attached to submerged wreck.
27.12.24	51°54'N.	2°56'E.	Two conical buoys and one cylinder buoy.
ENGLISH CHANNEL.			
5.12.24	50°32'N.	0°48'W.	Black conical buoy with <i>D.F.</i> on side.
7.12.24	3 miles N. of Ower's Lt. Vsl.		Small ship's boat bottom up, painted black.
11.12.24	50°07'N.	3°43'W.	Medium sized black spherical buoy. Dangerous to navigation.
11.12.24	50°04'N.	2°—'W.	Heavy spar standing on end, showing 14 ft. above surface with jagged end.
BRISTOL CHANNEL.			
20.12.24	S. 81° E. (true), 6 miles from St. Goven Lt. Vsl.		Red conical buoy adrift.
NORTH ATLANTIC.			
2.12.24	37°39'N.	74°57'W.	Mast, apparently foremast of a vessel, projecting 20 ft. out of water. Truck white with backstays taut as if attached to submerged hull. A gaff or boom and other wreckage floating near.
3.12.24	46°50'N.	7°10'W.	Large barge.
3.12.24	39°59'N.	32°18'W.	Broken mast projecting 12 ft. above water, apparently attached to submerged wreckage. Dangerous to navigation.
4.12.24	33°34'N.	75°43'W.	Drifting black conical steel buoy with staff and yard all about 15 ft. high.
7.12.24	19°50'N.	72°16'W.	Heavy spar.
7.12.24	37°38'N.	74°58'W.	Part of schooner's mast projecting 20 ft. out of water, wreckage attached; spar had a white top, lower part bright.
7.12.24	42°24'N.	69°45'W.	Submerged wreck, two masts showing 10 ft. above water.
8.12.24	39°38'N.	52°05'W.	Large black object resembling buoy.
9.12.24	47°48'N.	6°04'W.	Wreck, dangerous to navigation.
15.12.24	48°28'N.	6°—'W.	Heavy cask or drum, dangerous.
15.12.24	50°35'N.	10°53'W.	Large gas buoy, drifting.
18.12.24	32°51'N.	13°45'W.	Can buoy, painted red. Dangerous to navigation.
22.12.24	38°21'N.	9°23'W.	Gas buoy, every 10 sec. flash, above light ball and flag: buoy vertically striped black and white.
MEDITERRANEAN.			
4.12.24	38°02'N.	9°07'E.	Large red buoy, with staff surmounted by yellow flag, adrift. Dangerous to navigation.
9.12.24	36°39'N.	1°35'E.	Derelict wooden three-masted schooner, recently capsized, together with a spar painted green, with white keel and white stern. Dangerous to navigation.
9.12.24	37°10'N.	0°28'W.	Schooner <i>Villa de Rabat</i> .
13.12.24	25 miles W.N.W. of C. Caxine Lt. Ho., Algiers.		Derelict sailing vessel lying on her side and floating awash. The side of the vessel was about 5 ft. out of water. She was built of wood, painted black, apparently laden, and the stumps of two or three masts were floating.
NORTH PACIFIC.			
3.12.24	47°40'N.	125°52'W.	Square timber about 30 ft. long, 3 ft. in diameter.
3.12.24	3 miles from Bonita Pt. California.		Waterlogged scow.
3.12.24	2 miles off Gaviota, California		Fishing boat burned to water's edge.

LIST OF VOLUNTARY OBSERVING SHIPS.

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

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

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

Only in special cases will individual letters be sent.

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

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

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

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

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

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

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

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

No. = Keeps Ship's Meteorological Report Form 911 with ship's instruments.

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

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

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed Received up to 19.12.24.	Date Received.
<i>Aba</i> ...	Hughes, J. ...	E. A. Jones ...	No.	Elder Dempster ...	Form 911 17.10.24 to 21.11.24	26.11.24.
<i>Abinsi</i> ...	Wright, J. B. ...	R. Redmore ...	"	Elder Dempster ...	" 1.10.24 to 12.10.24...	16.10.24.
<i>Actor</i> ...	Haylett, E. ...	W. Rennie ...	"	Harrison ...	" 22.8.24 to 6.9.24 ...	7.10.24.
<i>Adda</i> ...	Toft, J. T. ...	J. E. Wood, E. H. Gatward ...	"	Elder Dempster ...	" 12.6.24 to 18.7.24 ...	21.7.24.
50 <i>Adriatic</i> ...	Beadnell, F. E., Commr., R.N.R.	J. Collins, R. Hawkins, A. C. I. Anson.	W.T.	White Star ...	W.T. Reg. 10.11.24 to 29.11.24 ...	4.12.24.
<i>Agapenor</i> ...	Ramsay, J. ...	J. P. Makepeace ...	No.	A. Holt ...	Form 911 9.11.24 to 29.11.24 ...	4.12.24.
<i>Alban</i> ...	Torrible, R. H. ...	G. E. Freeman ...	"	Booth ...	" 31.8.24 to 10.9.24 ...	23.9.24.
<i>Albania</i> ...	Gronow, S. ...	E. W. Connell ...	"	Cunard ...	" 21.10.24 to 10.11.24 ...	8.12.24.
<i>Algerian Prince</i> ...	Rowlands, D. ...	G. Potts ...	"	Prince ...	" 3.11.24 to 11.11.24 ...	28.11.24.
<i>Alipore</i> ...	Gordon, L. M., R.D., Commr., R.N.R.	H. D. Case ...	"	P. and O. ...	" 30.9.24 to 12.10.24 ...	16.10.24.
<i>Almanzora</i> ...	Mackenzie G. A. ...	E. B. Ingram ...	"	R.M.S.P. ...	" 24.4.24 to 15.6.24 ...	14.7.24.
<i>Alondra</i> ...	J. J. Prendergast ...	H. Peters ...	"	Yeoward ...	" 3.10.24 to 16.11.24 ...	20.11.24.
<i>Ampetco</i> ...	Verstichelen, A. ...	E. Suret ...	"	American Petroleum ...	" 8.11.24 to 30.11.24 ...	8.12.24.
<i>Anglia</i> ...	Sorge, P. ...	W. H. Hughes ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report 11.4.24 ...	11.4.24.
<i>Antiochus</i> ...	Ireland, T. ...	A. C. D. Howes ...	No.	A. Holt ...	Form 911 19.10.24 to 15.11.24	25.11.24.
<i>Aorangi</i> ...	Crawford, R. ...	R. B. Denniston ...	M.L.	Canadian-Australasian ...	" ...	"
<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. 9.11.24 to 24.11.24...	26.11.24.
<i>Arafura</i> ...	Gordon, A. S. ...	R. Lloyd Harry ...	No.	Eastern and Australian ...	Form 911 17.8.24 to 18.10.24...	15.12.24.
<i>Armada Castle</i> ...	George, J., O.B.E. ...	L. G. May ...	"	Union Castle ...	" 5.9.24 to 21.9.24 ...	23.9.24.
<i>Arracan</i> ...	Willis, M. ...	H. Poole, D. Frame, J. Aitken ...	M.L.	P. Henderson ...	Met. Log. 17.5.24 to 7.9.24 ...	1.10.24.
<i>Arundel</i> ...	Short, H. ...	Mr. Hill ...	C.C.	Southern Rly. ...	Telegraphic Report 18.12.24 ...	18.12.24.
<i>Arundel Castle</i> ...	Hague, J. W., Commr., R.N.R.	C. Colburn, G. Blaiklock, C. Williamus, F. Granger.	M.L.	Union Castle ...	Met. Log. 2.5.24 to 31.8.24 ...	6.9.24.
<i>Assyria</i> ...	Erskine, K. ...	J. Hamilton ...	No.	Anchor ...	Form 911 9.11.24 to 3.12.24 ...	12.12.24.
<i>Astronomer</i> ...	Booth, W. M. ...	E. S. Machon, A. M. Jeffries, J. Jackson.	M.L.	Harrison ...	Met. Log. 12.7.24 to 15.10.24...	30.10.24.
<i>Athenic</i> ...	Jones, J. L. ...	C. Cochrane ...	No.	White Star ...	Form 911 17.10.24 to 1.11.24...	19.11.24.
<i>Atsuta Maru</i> ...	Furuhashi, M. ...	S. Mizozucki ...	"	Nippon Yusen Kaisha ...	" 29.10.24 to 30.11.24 ...	5.12.24.
<i>Auditor</i> ...	Owen, W. F. ...	J. Harnden ...	"	Harrison ...	" 23.8.24 to 22.10.24...	24.10.24.
<i>Auldmuir</i> ...	Ramsay, J. D. ...	J. A. S. Adams ...	"	Glen & Co. ...	" 11.10.24 to 27.10.24 ...	11.11.24.
<i>Ausonia</i> ...	Gibbons, G., R.D., Commr., R.N.R.	A. T. Hamer ...	"	Cunard ...	" 27.9.24 to 18.10.24...	30.10.24.
51 <i>Baltic</i> ...	Hickson, V. W. ...	E. A. A. Crowley, J. Law, F. Patchett.	W.T.	White Star ...	W.T. Reg. 24.11.24 to 13.12.24 ...	17.12.24.
<i>Bambra</i> ...	Wyles, W. S. ...	H. W. Norris, J. E. Turner, J. Eggleston, W. Walters.	M.L.	State Service, Australia ...	Form 911 27.10.24 to 14.11.24 ...	18.11.24.
<i>Bampton Castle</i> ...	Swiney, W. A. ...	L. C. Chapman, H. A. Deller, C. B. Hoggan.	"	Union Castle ...	Met. Log. 27.2.24 to 25.6.24 ...	12.8.24.
<i>Banbury Castle</i> ...	... ..	C. C. Page ...	No.	Turnbull Martin ...	Form 911 23.7.24 to 13.8.24 ...	18.8.24.
<i>Banffshire</i> ...	Wynne, R. H. ...	L. W. Evans ...	"	Commonwealth Govt. ...	" 6.11.24 to 25.11.24...	15.12.24.
<i>Barambah</i> ...	Daniel, F. ...	T. Swann ...	"	Hogarth & Sons ...	" 15.8.24 to 28.8.24 ...	16.10.24.
<i>Baron Cawder</i> ...	Baillie, T. ...	A. Campbell ...	"	British India ...	Met. Log. 28.7.24 to 3.11.24 ...	28.11.24.
<i>Barpeta</i> ...	Rice, W. V., D.S.O., D.S.C., Commr., R.N.	W. G. E. Rawlingson ...	M.L.	His Majesty's Ship ...	" ...	"
<i>Beaufort</i> ...	Bradshaw, J. ...	C. J. Murray, J. M. Appleby, H. H. Grace.	W.T.	Red Star ...	W.T. Reg. 21.7.24 to 11.9.24 ...	4.11.24.
<i>Benalder</i> ...	Cole, J. H. D.S.C. ...	W. M. Webster ...	No.	Ben Line ...	Form 911 26.9.24 to 16.10.24...	20.10.24.
<i>Bengloe</i> ...	McCorquodale, A. ...	G. M. Duff ...	"	Ben Line ...	" 26.9.24 to 15.10.24...	20.10.24.
31 <i>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. 29.9.24 to 28.10.24...	2.12.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 19.12.24.	Date Received.
<i>Bernini</i> ...	Evans, W. ...	H. L. Rudd ...	No.	Lampert & Holt ...	Form 911 28.8.24 to 21.9.24 ...	1.12.24.
<i>Berrina</i> ...	Townshend, W. P. ...	H. C. Slinn ...	"	P. & O. Branch ...	" 28.10.24 to 11.11.24 ...	15.12.24.
<i>Bogota</i> ...	Dunn, R. E. ...	W. E. Mc. Mullen ...	"	R.M.S.P. Co. ...	" 28.9.24 to 1.10.24 ...	20.10.24.
<i>Bolingbroke</i> ...	Stewart, A. ...	C. E. Duggan ...	M.L.	Canadian Pacific ...	Met. Log. 25.8.24 to 23.9.24 ...	2.10.24.
<i>Borda</i> ...	Holland, R. ...	" ...	No.	P. & O. Branch ...	Form 911 27.3.24 to 4.5.24 ...	11.8.24.
<i>Bothwell</i> ...	Dott, J. F. ...	S. W. Keay ...	"	Canadian Pacific ...	" 3.11.24 to 4.12.24 ...	8.12.24.
<i>Brandon</i> ...	Newman, J. H. ...	W. J. P. Roberts ...	"	" ...	" 15.10.24 to 12.11.24 ...	17.11.24.
<i>Brecon</i> ...	McDonald, J. ...	N. B. Glennie, W. W. J. Evans, W. J. P. Roberts.	M.L.	" ...	Met. Log. 20.9.23 to 6.5.24 ...	8.5.24.
<i>Brenda</i> ...	Murdoch, R. G. ...	A. M. Adams ...	No.	Scottish Fishery Board ...	Form 911 11.11.24 to 30.11.24 ...	3.12.24.
<i>Brighton</i> ...	Hill, A. ...	Mr. Munton ...	C.C.	Southern Railway ...	Telegraphic Report 19.12.24 ...	19.12.24.
<i>British Engineer</i> ...	Piper, H. C. ...	E. L. Miller ...	No.	British Tankers ...	Form 911 17.9.24 to 20.11.24 ...	27.11.24.
<i>British Lantern</i> ...	Taylor, R. J. ...	R. B. Page ...	"	" ...	" 9.7.24 to 13.8.24 ...	18.8.24.
<i>Browning</i> ...	Connorton, C. A. ...	W. E. Johnston ...	"	Lampert & Holt ...	" 21.9.24 to 17.10.24 ...	29.10.24.
<i>Bruyere</i> ...	Hesley, W. S. ...	C. E. Legg ...	"	" ...	" 11.7.24 to 24.9.24 ...	14.10.24.
<i>Cabotia</i> ...	Lowson, P. ...	T. G. Menzies ...	M.L.	Anchor Donaldson ...	Form 911 31.10.24 to 28.11.24 ...	5.12.24.
<i>Cambria C.S.</i> ...	Wightman, H. G. E., D.S.C.	E. N. L. Staples ...	"	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 28.11.24 ...	28.11.24.
<i>Camito</i> ...	Scudamore, J. H. H., D. S. C., R. D. Commr., R.N.R.	D. A. Jack, R. M. Cossantine, S. Borrie, S. Ray.	M.L.	Elders & Fyffes ...	Met. Log. 8.7.24 to 13.12.24 ...	19.12.24.
<i>Canada</i> ...	Jones, T. ...	F. W. Laws ...	No.	White Star-Dominion Canadian Govt. Merchant Marine.	Form 911 1.11.24 to 22.11.24 ...	25.11.24.
<i>Canadian Inventor</i> ...	Roberts, R. P. ...	S. M. Holinden ...	"	" ...	" 16.12.23 to 6.2.24 ...	24.3.24.
<i>Canadian Scottish</i> ...	Forson, A. ...	S. Fieldhouse ...	"	" ...	" 15.5.24 to 16.8.24 ...	16.9.24.
<i>Canadian Seigneur</i> ...	Dixon, C. C. ...	" ...	"	" ...	" ...	"
<i>Canadian Skirmisher</i> ...	Millar, W. H. ...	J. Moller ...	"	" ...	Form 911 17.5.24 to 19.6.24 ...	24.6.24.
<i>Canadian Winner</i> ...	Hocking, N. P. ...	R. D. Ranns ...	"	" ...	" 13.9.24 to 15.10.24 ...	13.11.24.
<i>Carlton 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.	D. S. Kite, R. Allen, T. A. O. Ellis.	W.T.	Cunard ...	W.T. Reg. 3.10.24 to 22.10.24 ...	27.10.24.
<i>34 Caronia</i> ...	Diggle, E. G., R.D., Capt., R.N.R.	D. W. Sorrell, J. A. Quarrie, E. B. Taylor.	W.T.	Cunard ...	Form 911 2.10.24 to 22.10.24 ...	27.10.24.
<i>Cassandra</i> ...	Mitchell, W. E. ...	G. M. Sime ...	No.	Anchor Donaldson ...	W.T. Reg. 24.8.24 to 10.9.24 ...	12.9.24.
<i>52 Cedric</i> ...	Marshall, W., D.S.O., R.D., Capt., R.N.R.	A. E. Weller, J. A. Heenan, A. E. Harvey.	W.T.	White Star ...	Form 911 24.9.24 to 10.10.24 ...	14.10.24.
<i>53 Celtic</i> ...	Holme, A. ...	R. S. Walker, G. T. Kavanagh, D. W. Chamberlain.	W.T.	" ...	Form 911 8.10.24 to 16.12.24 ...	18.12.24.
<i>Ceramic</i> ...	Symons, J. ...	E. E. Bint ...	No.	" ...	W.T. Reg. 17.11.24 to 6.12.24 ...	10.12.24.
<i>Changsha</i> ...	Gambrell, F. C. ...	A. M. Frame, F. G. Stratford, H. Lishman, L. H. Ballie.	M.L.	Yuill & Co. ...	Form 911 27.7.24 to 16.8.24 ...	19.8.24.
<i>Charon</i> ...	Sturrock, R. G. ...	L. Johnstone ...	No.	Dalgely & Co. ...	Met. Log. 2.11.24 to 22.11.24 ...	26.11.24.
<i>Chignecto</i> ...	Green, J. ...	A. F. Walker ...	"	R.M.S.P. Co. ...	Form 911 18.9.24 to 1.10.24 ...	11.11.24.
<i>China</i> ...	King, A., D.S.C.	E. Cox Walker ...	"	P. & O. ...	" 19.1.24 to 26.2.24 ...	7.4.24.
<i>Chindwara</i> ...	Brisley, P. L. ...	A. G. Earl ...	"	British India ...	" 9.4.24 to 20.5.24 ...	26.5.24.
<i>Chindwin</i> ...	Esslemont, C. ...	J. Summers, W. Wilson, C. Owen, J. G. Walker.	M.L.	P. Henderson ...	" 2.10.24 to 12.11.24 ...	1.12.24.
<i>Chinkua</i> ...	Byers, G. ...	Messrs. Shinn, Graybrook, Stringer, Taylor.	"	China Nav. Co. ...	Met. Log. 6.9.24 to 20.11.24 ...	10.12.24.
<i>City of Alexandria</i> ...	Bedford, G. B. ...	T. C. Higgins ...	No.	Ellerman ...	" 22.2.24 to 3.7.24 ...	4.9.24.
<i>City of Baroda</i> ...	Houghton, W. ...	A. D. Henderson ...	M.L.	" ...	" ...	"
<i>City of Batavia</i> ...	Sproule, A. ...	S. J. Nash ...	No.	" ...	Met. Log. 29.10.23 to 29.9.24 ...	6.11.24.
<i>City of Benares</i> ...	Nancollas, H. E. ...	A. A. Fullerton ...	"	" ...	Form 911 4.7.24 to 31.7.24 ...	18.8.24.
<i>City of Brisbane</i> ...	McArthur, J. ...	W. E. Fletcher ...	"	" ...	" 24.8.24 to 5.12.24 ...	15.12.24.
<i>City of Canterbury</i> ...	Seaborne, F. O. ...	A. M. Hamilton ...	"	" ...	" 29.9.24 to 23.10.24 ...	18.11.24.
<i>City of Chester</i> ...	Macdonald, K., O.B.E.	" ...	"	" ...	" 3.9.24 to 9.11.24 ...	14.11.24.
<i>City of Edinburgh</i> ...	Teague, R. E. ...	F. C. Wilson ...	M.L.	" ...	Met. Log. 29.4.24 to 27.10.24 ...	18.11.24.
<i>City of London</i> ...	Spencer, H. ...	E. V. Henday ...	No.	" ...	Form 911 31.8.24 to 30.9.24 ...	16.10.24.
<i>City of Marseilles</i> ...	Martin, D. ...	C. Inglis ...	"	" ...	" 31.10.24 to 18.11.24 ...	20.11.24.
<i>City of Rangoon</i> ...	Brown, G. ...	W. J. Nixon ...	"	" ...	" 4.11.24 to 23.11.24 ...	8.12.24.
<i>City of Valencia</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 Yokohama</i> ...	Williamson, W. A., R.D., Lieut.-Commr. R.N.R.	C. C. Duncan ...	No.	" ...	Form 911 12.7.24 to 26.9.24 ...	16.10.24.
<i>Clan Buchanan</i> ...	Jinks, J. W. ...	R. Moloney ...	"	" ...	" 24.10.24 to 21.11.24 ...	27.11.24.
<i>Clan Cumming</i> ...	George, L. S. ...	P. G. de Gruchy ...	"	Clan ...	" 11.10.23 to 10.1.24 ...	14.1.24.
<i>Clan Lindsay</i> ...	Worthington, C. D. ...	S. M. Werrey Easterbrook ...	"	" ...	" ...	"
<i>Clan Macbeth</i> ...	Young, A. H., R.D., Lieut.-Commr., R.N.R.	G. K. Johnson ...	"	" ...	Form 911 8.10.24 to 13.11.24 ...	19.11.24.
<i>Clan Macgillivray</i> ...	West, W. F. ...	T. Lund ...	"	" ...	" 2.12.24 to 6.12.24 ...	15.12.24.
<i>Clan Macindoe</i> ...	Miller, W. ...	" ...	"	" ...	" 15.11.24 to 24.11.24 ...	11.12.24.
<i>Clan Mackellar</i> ...	Jones, M. H. ...	" ...	"	" ...	" 24.9.24 to 27.11.24 ...	3.12.24.
<i>Clan Mackenzie</i> ...	Young, G. ...	" ...	"	" ...	" 28.9.24 to 14.11.24 ...	3.12.24.
<i>Clan Mackinnon</i> ...	Mackie, R. W. ...	" ...	"	" ...	" 7.11.24 to 21.11.24 ...	12.12.24.
<i>Clan Maenoughton</i> ...	Gray, J. N. ...	W. S. Holden ...	M.L.	" ...	Met. Log. 9.4.24 to 8.8.24 ...	2.9.24.
<i>Clan Macphee</i> ...	Gourlay, J. B. ...	A. G. Storkey, F. Burnes ...	No.	" ...	Form 911 19.1.24 to 24.2.24 ...	26.2.24.
<i>Clan Mactaggart</i> ...	Gray, J. N. ...	P. H. Aydon, W. D. E. Campbell, F. Buckley, — Carter.	M.L.	" ...	Met. Log. 26.1.24 to 12.6.24 ...	8.8.24.
<i>Clan Macneil</i> ...	Phillips, G. P. ...	J. H. Malpas ...	No.	" ...	Form 911 16.7.24 to 20.10.24 ...	23.10.24.
<i>Clan Malcolm</i> ...	Higgins, C. J. ...	L. S. Murrin ...	"	" ...	" 2.10.24 to 21.11.24 ...	27.11.24.
<i>Clan Morrison</i> ...	Porterfield, W. M. ...	T. G. Young, R. F. Buckley ...	M.L.	" ...	Met. Log. 4.5.24 to 7.9.24 ...	22.9.24.
<i>Clan Murdoch</i> ...	Pagan, J. C. ...	D. A. Evans ...	No.	" ...	Form 911 11.10.24 to 19.11.24 ...	9.12.24.
<i>Clan Ranald</i> ...	Openshaw, L. G. ...	C. W. Thomas ...	"	" ...	" 6.11.24 to 23.11.24 ...	25.11.24.
<i>Clan Ross</i> ...	Jones, R. C. ...	W. H. D. Stephen ...	"	" ...	" 15.10.24 to 4.11.24 ...	2.12.24.
<i>Clan Stenclair</i> ...	Neill, G. A. ...	G. Short ...	"	" ...	" 25.10.24 to 2.12.24 ...	9.12.24.
<i>Clan Stuart</i> ...	Stenson, F. J. R. D., Commr. R.N.R.	F. B. Parker ...	"	" ...	" 20.10.24 to 18.11.24 ...	15.12.24.
<i>Clan Urquhart</i> ...	Gibb, A. F. W. ...	R. Silk ...	"	" ...	" 2.9.24 to 1.10.24 ...	28.10.24.
<i>Colonia, C.S.</i> ...	Campos, V., O.B.E., Lt.-Commr., R.N.R.	R. H. Law ...	M.L.	Telegraph Construction & Maintenance.	Met. Log. 28.6.24 to 2.10.24 ...	3.10.24.
<i>Colonial</i> ...	Barrow, R. K. ...	S. A. Garnham, A. S. Muir, J. M. Matthews, F. Bolinbroke.	"	" ...	" 12.2.24 to 27.9.24 ...	30.9.24.
<i>Colonian</i> ...	Gittins, R. P. ...	A. V. Jones ...	No.	Harrison ...	Form 911 23.8.24 to 28.11.24 ...	3.12.24.
<i>Columbia</i> ...	Gemmell, W. ...	J. Crangle ...	"	Leyland ...	" 9.11.24 to 8.12.24 ...	11.12.24.
		S. G. Taylor ...	"	Anchor ...	" 2.11.24 to 23.11.24 ...	27.11.24.

LIST OF VOLUNTARY OBSERVING SHIPS

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Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 19.12.24.	Date Received.
<i>Comino</i> ...	Nuttall, E. L. ...	A. McVicar ...	No.	Furness Withy ...	Form 911 9.9.24 to 14.10.24 ...	22.10.24.
<i>Cooee</i> ...	Festa, M. ...	C. Keen ...	"	Commonwealth Govt. ...	" 9.8.24 to 29.8.24 ...	7.10.24.
<i>Corinthic</i> ...	Hart, F. ...	" ...	M.L.	White Star ...	Met. Log. 13.6.24 to 3.10.24 ...	7.10.24.
<i>Cornish City</i> ...	Bowen, T. S. ...	G. S. Dawes ...	No.	Reardon Smith ...	Form 911 8.1.24 to 16.2.24 ...	7.4.24.
<i>Cornwall</i> ...	Robertson, H. W. ...	W. W. Glover ...	"	Dowie, J., & Co. ...	" 12.9.24 to 18.10.24 ...	18.11.24.
<i>Crawford Castle</i> ...	Hughes, E. G. ...	J. C. Brown ...	"	Union Castle ...	" 6.9.24 to 26.9.24 ...	4.11.24.
<i>Culebra</i> ...	Mackay A. S. ...	A. H. Dabree, S. J. Hill, R. Hocken. ...	M.L.	R.M.S.P. Co. ...	Met. Log. 17.8.24 to 14.10.24 ...	7.11.24.
<i>Cuthbert</i> ...	Reynolds, W. H. B. ...	A. B. Fastig, K. S. Munro ...	No.	Booth ...	Form 911 24.8.24 to 26.9.24 ...	31.10.24.
<i>Cyclops</i> ...	Cosker, W. ...	R. W. Ellis ...	"	A. Holt ...	" 25.8.24 to 14.9.24 ...	2.10.24.
<i>Dardanus</i> ...	Shaw, A. T. ...	" ...	No.	A. Holt ...	" 9.9.24 to 6.12.24 ...	12.12.24.
<i>Darian</i> ...	Masters, W. ...	A. S. Holland ...	"	Leyland ...	" 10.8.24 to 21.8.24 ...	1.9.24.
<i>Darro</i> ...	Smith, W. E., D.S.O. ...	H. D. Jackman ...	"	R.M.S.P. Co. ...	" 20.9.24 to 14.11.24 ...	18.11.24.
<i>Daytonian</i> ...	Walker, C. J., D.S.O. ...	W. T. Godwin ...	"	Leyland ...	" 15.10.24 to 23.11.24 ...	6.12.24.
<i>Delta</i> ...	Brooks, C., D.S.O. ...	J. O. V. Young ...	"	P. & O. ...	" 28.6.24 to 8.8.24 ...	13.8.24.
<i>Demerara</i> ...	Hill, T. A. ...	E. Hewitt ...	"	R.M.S.P. Co. ...	" 2.11.24 to 23.11.24 ...	17.12.24.
<i>Demosthenes</i> ...	Williams, W. J. ...	R. A. Alcock ...	"	Aberdeen ...	" 2.10.24 to 19.10.24 ...	15.12.24.
<i>Desado</i> ...	Wakeman, E. C. ...	W. Scott, D. L. Neilson ...	"	R.M.S.P. Co. ...	" 7.9.24 to 31.10.24 ...	5.11.24.
<i>Desna</i> ...	Adam, C., R.D., Commr., R.N.R. ...	A. Hambly ...	"	" ...	" 20.10.24 to 13.12.24 ...	17.12.24.
<i>Deucalion</i> ...	Findlay, J. ...	P. W. Savery, O. Thomas ...	"	A. Holt ...	" 6.10.24 to 26.10.24 ...	10.12.24.
<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. 13.12.24 ...	13.12.24.
<i>Digby</i> ...	Westgarth, W. A., D.S.C. ...	J. Pascoe, J. W. Murphy, W. P. Paterson. ...	M.L.	Furness Withy ...	Met. Log. 17.4.24 to 9.11.24 ...	26.11.24.
<i>Dimboola</i> ...	Chambers, F. W., D.S.C. ...	" ...	"	" ...	" ...	" ...
<i>Discoverer</i> ...	Roy, C. M. ...	G. N. Baker ...	No.	Melbourne S.S. Co. ...	Form 911 2.8.24 to 9.8.24 ...	22.9.24.
<i>Dogra</i> ...	Ling, J. T. ...	W. E. Shotton ...	"	Harrison ...	" 18.6.24 to 14.10.24 ...	23.10.24.
<i>Domala, M.V.</i> ...	Hartcock, L. ...	E. C. Akers ...	"	Asiatic S.N. Co. ...	" 25.9.24 to 15.10.24 ...	10.11.24.
<i>Doric</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 Star</i> ...	Davies, J. ...	A. Thompson ...	"	White Star ...	" 9.11.24 to 30.11.24 ...	3.12.24.
<i>Dorington Court</i> ...	Thomas, R. T. ...	A. S. Menzies ...	"	Blue Star ...	" 29.9.24 to 27.10.24 ...	5.12.24.
<i>Dorsel</i> ...	Isaacs, W. A. ...	E. V. Quickenden ...	"	Haldin & Co. ...	" 17.8.24 to 8.9.24 ...	18.9.24.
<i>Dromore Castle</i> ...	Kettlewell, C. R. ...	H. S. White, H. Neagle, J. S. Bloomfield, L. Cann. ...	M.L.	New Zealand S.S. Co. ...	Met. Log. 3.4.24 to 6.10.24 ...	10.10.24.
<i>Dryden</i> ...	Linklater, H. ...	S. S. Smith ...	No.	Union Castle ...	Form 911 29.8.24 to 29.9.24 ...	21.10.24.
<i>Dundrum Castle</i> ...	Knight, R. A. ...	G. D. Oldfield ...	"	Lampart & Holt ...	" 14.8.24 to 3.9.24 ...	12.9.24.
<i>Duendes</i> ...	Kershaw, H. J. ...	R. May ...	"	Union Castle ...	" 4.9.24 to 3.10.24 ...	28.10.24.
<i>Duffield</i> ...	Pape, E. R. ...	D. P. Morgan ...	"	Pacific S.N. Co. ...	" 18.9.24 to 5.10.24 ...	27.10.24.
<i>Duquesa</i> ...	King A. ...	T. S. Robertson ...	"	Hunting & Sons ...	" 10.11.24 to 9.12.24 ...	16.12.24.
<i>Durenda</i> ...	Fyffe, F. M. ...	C. P. Lane ...	"	Furness Withy ...	Form 911 10.8.24 to 7.10.24 ...	16.10.24.
<i>Eastern</i> ...	Wilson, W. ...	W. H. Creese ...	"	British India ...	" 6.10.24 to 12.11.24 ...	15.12.24.
<i>Ebani</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>Edinburgh Castle</i> ...	Faill, — ...	W. McKeown ...	No.	Elder Dempster ...	" ...	" ...
<i>Eemland</i> ...	Strong, H., R.D., Commr., R.N.R. ...	" ...	M.L.	Union Castle ...	Met. Log. 11.4.24 to 12.10.24 ...	27.10.24.
<i>El Cordobes</i> ...	Van Noppen, C. D. ...	J. G. Sander ...	No.	Holland Lloyd ...	Form 911 26.8.24 to 25.11.24 ...	15.12.24.
<i>Elmina</i> ...	Noton, F. G. ...	N. H. Oldham ...	"	British & Argentine S.N. Co. ...	" 14.9.24 to 8.10.24 ...	30.10.24.
<i>El Paraguay</i> ...	Millson, H. E. ...	W. McKeown, J. H. Hall, C. H. Turner. ...	M.L.	Elder Dempster ...	Met. Log. 1.3.24 to 30.8.24 ...	8.9.24.
<i>Elpenor</i> ...	Ellis, F., D.S.C. ...	W. E. Williams ...	No.	Houlder Bros. ...	Form 911 16.8.24 to 16.10.24 ...	22.10.24.
<i>Etysia</i> ...	Holden, W. R. F. ...	P. E. Wright, C. Mock ...	M.L.	A. Holt ...	Met. Log. 26.5.24 to 12.9.24 ...	17.9.24.
<i>Empress of Asia</i> ...	Kinnaird, J. ...	A. Grant ...	No.	Anchor ...	Form 911 16.2.24 to 8.3.24 ...	1.4.24.
<i>Empress of Australia</i> ...	Douglas, L. D., R.D., Lt. - Commr., R.N.R. ...	" ...	M.L.	Canadian Pacific ...	Met. Log. 5.6.24 to 14.9.24 ...	14.10.24.
<i>Empress of Canada</i> ...	Hailey, A. J. ...	C. Critchley, R. A. Leicester, A. B. Smith ...	M.L.	" ...	" 24.4.24 to 28.10.24 ...	24.11.24.
<i>Empress of France</i> ...	Robinson, S., C.B.E., R.D., Commr., R.N.R. ...	W. S. Halliday ...	M.L.	" ...	Met. Log. 4.1.24 to 22.5.24 ...	7.7.24.
<i>Empress of Russia</i> ...	Griffiths, E. ...	O. Pennington, E. Roberts, A. W. Patrick. ...	M.L.	" ...	" 7.6.24 to 11.11.24 ...	18.11.24.
<i>Empress of Scotland</i> ...	Hosken, A. J. ...	A. M. Barff, J. P. Napier, C. S. Morris, R. H. Graham. ...	M.L.	" ...	" 1.5.24 to 18.8.24 ...	18.9.24.
<i>Endeavour</i> ...	Gillies, J., C.B.E. ...	B. Grant, S. C. Fox, D. Loran, L. W. Akerman, W. J. Phillips. ...	M.L.	" ...	Met. Log. 26.4.24 to 29.10.24 ...	11.12.24.
<i>Essequibo</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>Eumaeus</i> ...	Duncan, E. E. ...	G. Pattison ...	No.	R.M.S.P. Co. ...	Form 911 20.8.24 to 1.9.24 ...	16.9.24.
<i>Euripides</i> ...	Power, J. ...	E. R. Pritchard ...	"	A. Holt ...	" 23.9.24 to 16.10.24 ...	30.10.24.
<i>Eurybates</i> ...	Collins, P. J., O.B.E. ...	H. S. Cox, A. R. Payne, A. K. Cameron. ...	M.L.	Aberdeen ...	Met. Log. 23.5.24 to 11.9.24 ...	18.9.24.
<i>Explorer</i> ...	Lloyd, R. ...	J. A. Havard ...	No.	A. Holt ...	Form 911 16.8.24 to 13.10.24 ...	16.10.24.
<i>Fitzroy</i> ...	Lamont, A. ...	Scientific Staff ...	M.L.	Scottish Fishery Board ...	Met. Log. 20.6.24 to 27.9.24 ...	24.10.24.
<i>Flandria</i> ...	Silk, H. V., Lt.-Commr., R.N. ...	C. W. Sabine ...	M.L.	His Majesty's Ship ...	" 24.7.24 to 31.10.24 ...	11.11.24.
<i>Flinders</i> ...	Veldkamp, G. J. ...	T. Doornbosch ...	No.	Holland Lloyd ...	Form 911 3.10.24 to 22.11.24 ...	25.11.24.
<i>Francisco</i> ...	Henderson, D. A., Lt.-Commr., R.N. ...	K. F. Boxall ...	M.L.	His Majesty's Ship ...	Met. Log. 26.7.24 to 30.10.24 ...	18.11.24.
<i>Frankenfels</i> ...	Wilkins, J., O.B.E. ...	F. D. Shaw ...	No.	Ellerman Wilson ...	Form 911 26.9.24 to 1.11.24 ...	7.11.24.
<i>Freienfels</i> ...	Cartmer, G. E., O.B.E. ...	L. M. Burfitt, J. H. A. Mackie, J. Garmory. ...	M.L.	India Office Shipping ...	Met. Log. 12.6.24 to 17.9.24 ...	14.10.24.
<i>Friza</i> ...	Cleugh, J. W. ...	C. H. Porter, V. R. Watkins, H. Wilson. ...	"	" ...	" 7.9.24 to 7.12.24 ...	17.12.24.
<i>Gallic</i> ...	Angus, W. ...	J. Murray ...	No.	Scottish Fishery Board ...	Form 911 22.10.24 to 21.11.24 ...	24.11.24.
<i>Gallymore</i> ...	Summers, F. F., R.D., Commr., R.N.R. ...	W. G. O. Jones ...	"	White Star ...	Met. Log. 3.8.24 to 9.12.24 ...	12.12.24.
<i>Garret</i> ...	Ledsome, J. S. ...	N. Goubrough ...	"	Furness Withy ...	Form 911 28.9.24 to 9.11.24 ...	6.10.24.
<i>Gascoyne</i> ...	Visser, C. W. ...	F. Weeda ...	"	Rotterdam Lloyd ...	" 6.10.24 to 9.11.24 ...	9.12.24.
	Mills, A. ...	P. G. Collins ...	"	Dalgely & Co. ...	" 9.6.24 to 9.8.24 ...	22.9.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log Register, or Report Contributed. Received up to 19.12.24.	Date Received.
<i>Gelria</i> ...	Kolkman, J. M. ...	J. N. F. Cordijs ...	No.	Holland Lloyd ...	Form 911 19.9.24 to 5.11.24 ...	10.11.24.
<i>Gladiator</i> ...	Ruffell, — ...	D. H. Bryant, W. E. Shotton ...	"	Harrison ...	" 7.1.24 to 8.3.24 ...	12.3.24.
<i>Glenamoy</i> , M.V. ...	Angier, J. ...	L. C. Riggs ...	"	Glen Line ...	" 15.4.24 to 11.5.24 ...	18.8.24.
<i>Glenapp</i> , M.V. ...	Griffith, J. E. ...	F. Poate ...	"	" ...	" 5.10.24 to 16.10.24 ...	10.11.24.
<i>Glenluce</i> , M.V. ...	Barsley, E. ...	J. D. Richards ...	"	" ...	" 20.10.24 to 14.11.24 ...	18.11.24.
<i>Glenishane</i> ...	Roberts, W. E. ...	" ...	"	" ...	" 10.2.24 to 21.6.24 ...	16.9.24.
<i>Gloucestershire</i> ...	Kobin, E. ...	T. E. Field ...	"	Bibby ...	" 27.9.24 to 4.12.24 ...	8.12.24.
<i>Gorgon</i> ...	Hughes, J. W. ...	W. E. Crompton ...	"	Dalgety & Co. ...	" 7.8.24 to 24.10.24 ...	24.11.24.
<i>Gourko</i> ...	Montgomery, H. ...	G. H. Kirk, N. J. Donovan ...	M.L.	Ellerman Wilson ...	Met. Log. 22.5.24 to 2.11.24 ...	11.11.24.
<i>Haliartus</i> ...	Marsh, L. V. ...	W. H. Upton ...	No.	R. P. Houston ...	Form 911 4.9.24 to 23.9.24 ...	28.10.24.
<i>Harmonides</i> ...	Hughes, W. J. ...	D. L. Roberts ...	"	" ...	" 10.9.24 to 3.10.24 ...	18.11.24.
<i>Harmony</i> , Auxy. ...	Jackson, J. C. ...	A. W. Bush ...	"	Moravian Mission ...	" 20.9.24 to 15.11.24 ...	4.12.24.
<i>Hatarana</i> ...	Mardon, T. T. ...	J. L. Durkee, F. Wells, E. B. Heath, E. C. McGuinness. ...	M.L.	British India ...	" 12.9.23 to 26.3.24 ...	22.4.24.
<i>Hauraki</i> , M.V. ...	Frew, J. D. ...	E. A. Buckingham ...	No.	Union S.S. Co., N.Z. ...	" 25.9.24 to 15.10.24 ...	13.11.24.
<i>Henry Holmes</i> , C.S. ...	Geeve, G. E. ...	E. Hislop Tucker, E. S. C. Hale. ...	"	W. I. & Panama Telegraph Co. ...	" 22.8.24 to 9.11.24 ...	10.12.24.
<i>Herald</i> ...	Bicker Caarten, A. ...	Harvey, J. R. ...	M.L.	His Majesty's Ship ...	Met. Log. 7.2.24 to 5.6.24 ...	11.8.24.
<i>Herefordshire</i> ...	Commr., R.N. Stanley, W. ...	P. Flood, G. Whitworth, P. S. Cooper, S. M. Burton, G. Holdsworth. ...	"	Bibby ...	" 1.3.24 to 19.8.24 ...	8.9.24.
<i>Herschel</i> ...	Carey, W. J. ...	S. C. Smith ...	No.	Lampport & Holt ...	Form 911 16.8.24 to 20.10.24 ...	23.10.24.
<i>Hibernia</i> ...	Tanner ...	R. Woodall ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report. 18.12.24 ...	18.12.24.
<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>Gln</i> ...	Jones, T. J. ...	C. M. Best ...	"	" ...	" 18.8.24 to 10.10.24 ...	21.10.24.
" <i>Heather</i> ...	Powell, G. A. ...	" ...	M.L.	" ...	" ...	"
" <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, G. E. Leech. ...	M.L.	" ...	Met. Log. 21.7.24 to 8.12.24 ...	17.12.24.
" <i>Pride</i> ...	Robinson, R. H. ...	H. McKinnon, F. Falconer, R. R. Soanes. ...	"	" ...	" 15.4.24 to 31.8.24 ...	17.9.24.
" <i>Rover</i> ...	Ashby Graves, F. ...	F. W. Harvey, H. Thomas, F. Abbott. ...	"	" ...	" 31.7.24 to 29.9.24 ...	6.10.24.
" <i>Warrior</i> ...	Brooke, W. ...	W. T. Breen ...	No.	" ...	Form 911 20.5.24 to 23.7.24 ...	12.9.24.
<i>Hildebrand</i> ...	Maddrell, J. ...	F. M. Lyons ...	"	Booth ...	" 17.9.24 to 31.10.24 ...	3.11.24.
<i>Hobsons Bay</i> ...	Kydd, O. J. ...	J. E. Williams, O. J. Edwards, M. P. Pearce. ...	M.L.	Commonwealth Govt. ...	Met. Log. 29.7.24 to 2.11.24 ...	18.11.24.
<i>Holbein</i> ...	Gough, W. A. ...	G. P. Kitto ...	No.	Lampport & Holt ...	Form 911 18.9.24 to 17.11.24 ...	19.11.24.
<i>54 Homer</i> ...	Metcalfe, G. R., Lt.-Commr., R.N.R. ...	H. Clark, H. Yates, A. Griffiths. ...	W.T.	White Star ...	W.T. Reg. 13.11.24 to 28.11.24 ...	2.12.24.
<i>Honorius</i> ...	Samuels, C. ...	J. E. Martin, W. G. Idles ...	No.	R. P. Houston ...	Form 911 12.9.24 to 14.10.24 ...	11.11.24.
<i>Huanchaco</i> ...	Redyard, A. ...	A. G. Litherland ...	"	Pacific S.N. Co. ...	" 15.7.24 to 5.8.24 ...	15.8.24.
<i>Hubert</i> ...	Jones, W. C. H. ...	S. G. Edwards ...	"	Booth ...	" 6.11.24 to 18.11.24 ...	6.12.24.
<i>Hurunui</i> ...	Burton Davies, J. ...	P. McCallum, C. D. Watt, L. A. Beale. ...	M.L.	New Zealand S.S. Co. ...	Met. Log. 29.3.24 to 24.10.24 ...	29.10.24.
<i>Ibez</i> ...	Langdon, C. ...	E. Lightfoot ...	C.C.	G.W. Railway ...	Telegraphic Report. 6.12.24 ...	6.12.24.
<i>Ikala</i> ...	Meetham, J. T. ...	T. B. Littlechild ...	No.	J. H. Welsford & Co. ...	Form 911 8.11.24 to 24.11.24 ...	15.12.24.
<i>Intaba</i> ...	Gibbins, W. A. ...	J. Richardson ...	"	Harrison ...	" 11.7.24 to 3.11.24 ...	7.11.24.
<i>Intombi</i> ...	Sawyer, E. I. ...	J. Sinclair ...	"	" ...	" 3.8.24 to 19.10.24 ...	22.10.24.
<i>Ionic Star</i> ...	Wilson, G. ...	G. A. Gould ...	M.L.	Blue Star ...	" 29.1.24 to 26.3.24 ...	29.3.24.
<i>Iroquois</i> ...	Tinson, C. W., O.B.E., Commr., R.N. ...	" ...	"	His Majesty's Ship ...	Met. Log. 17.3.24 to 14.7.24 ...	26.8.24.
<i>Ixion</i> ...	Baetens, F. ...	A. K. Sanderson ...	No.	A. Holt ...	Form 911 22.8.24 to 13.10.24 ...	17.10.24.
<i>John Pender</i> , C.S. ...	Smythe, T. W., O.B.E. ...	B. C. Farrow ...	No.	Eastern Tel. Co. ...	" 5.12.24 to 13.12.24 ...	18.12.24.
<i>Junin</i> ...	Benson, C. W. ...	R. D. Eckford ...	"	Pacific S.N. Co. ...	" 19.6.24 to 7.10.24 ...	14.10.24.
<i>Kaikoura</i> ...	Downton, M. ...	L. H. Whitfield, N. Anderson, J. Hopkins. ...	M.L.	New Zealand S.S. Co. ...	Met. Log. 17.9.23 to 31.3.24 ...	19.5.24.
<i>Kaisar-i-Hind</i> ...	Manley, G. ...	T. F. Wrigley ...	No.	P. & O. ...	Form 911 2.11.24 to 20.11.24 ...	15.12.24.
<i>Kamo Maru</i> ...	Okano, Y. ...	F. Takaku ...	"	Nippon Yusen Kaisha ...	" 1.10.24 to 2.11.24 ...	7.11.24.
<i>Kangaroo</i> ...	Norris, H. C. ...	C. M. C. Clayton, R. J. Sinclair, F. Humble. ...	M.L.	State Service Australia ...	Met. Log. 26.2.24 to 14.8.24 ...	17.10.24.
<i>Karoo</i> ...	Robinson, T. ...	H. J. Perrett ...	No.	Ellerman Bucknall ...	Form 911 2.6.24 to 16.6.24 ...	25.6.24.
<i>Kashima Maru</i> ...	Shinomiya, T. ...	M. Takada ...	"	Nippon Yusen Kaisha ...	" 2.1.24 to 9.2.24 ...	14.3.24.
<i>Kashmir</i> ...	Stringer, R. H., O.B.E., R.D., Commr., R.N.R. ...	F. Hopkins ...	"	P. & O. ...	" 24.8.24 to 8.9.24 ...	18.11.24.
<i>Kellett</i> ...	Haselfoot, F. E. B., D.S.O., Commr., R.N. ...	E. H. B. Baker, R. A. Stephens ...	M.L.	His Majesty's Ship ...	Met. Log. 30.7.24 to 15.10.24 ...	20.10.24.
<i>Kenilworth Castle</i> ...	Millard, L. A. ...	A. E. Denn, W. M. Tomkins ...	M.L.	Union Castle ...	" 28.12.23 to 28.4.24 ...	8.5.24.
<i>Khiva</i> ...	Redhead, C. M., D.S.O., R.D., Capt., R.N.R. ...	L. Fraser, A. L. Hill, R. G. Freeman. ...	M.L.	P. & O. ...	" 28.3.24 to 6.7.24 ...	10.7.24.
<i>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>Kildonan Castle</i> ...	Wilford, T. H. ...	R. S. W. Harris ...	"	Union Castle ...	" 17.10.24 to 7.12.24 ...	10.12.24.
<i>Kinderdijk</i> ...	Jochems, A. B. ...	A. Stenger ...	"	Holland America ...	" 27.3.24 to 3.5.24 ...	8.5.24.
<i>Kitano Maru</i> ...	Gotoh, M. ...	R. Nakane ...	"	Nippon Yusen Kaisha ...	" 8.6.24 to 5.10.24 ...	14.10.24.
<i>Knight Companion</i> ...	Beale, H. E. ...	J. H. Brown, W. Borrowes ...	"	A. Holt ...	" 28.8.24 to 8.10.24 ...	21.11.24.
<i>Kovno</i> ...	Casson, D. H., R.D., Commr., R.N.R. ...	E. R. Massam, L. Griffiths, J. Sanders, T. Fea. ...	M.L.	Ellerman Wilson ...	Met. Log. 16.12.23 to 22.7.24 ...	2.9.24.
<i>Kyogle</i> ...	Coalstad, C. ...	C. B. Odman, E. W. Hughes ...	No.	Commonwealth Light-house Service. ...	Form 911 18.9.24 to 7.10.24 ...	17.11.24.
<i>Lady Denison Pender</i> , C.S. ...	West, G. W. ...	A. G. Watts ...	"	Eastern Tel. Co. ...	" 6.9.24 to 13.10.24 ...	10.11.24.
<i>Laguna</i> ...	Mander, F. ...	F. W. Parker ...	"	Pacific S.N. Co. ...	" 22.3.24 to 14.4.24 ...	28.4.24.
<i>Lalande</i> ...	Bambra, W. A. ...	N. Webster ...	"	Lampport & Holt ...	" 17.7.24 to 3.8.24 ...	27.8.24.
<i>Lancashire</i> ...	Beckett, F. W. ...	T. L. Owen ...	"	Bibby ...	" 19.7.24 to 27.9.24 ...	14.10.24.
<i>Laomedon</i> ...	Smith, A. H. ...	A. J. Barclay ...	"	A. Holt ...	" 25.8.24 to 2.10.24 ...	1.12.24.
<i>La Paz</i> , M.V. ...	Ross, J. ...	A. Lyall ...	"	Pacific S.N. Co. ...	" 12.11.24 to 28.11.24 ...	17.12.24.
<i>Laplace</i> ...	Davies, G. W. ...	W. Boyde, R. B. Langley ...	"	Lampport & Holt ...	" 24.8.24 to 11.11.24 ...	17.11.24.
<i>55 Lapland</i> ...	Howell, T. ...	B. T. Harries, C. H. Knapp, W. Hesketh. ...	W.T.	Red Star ...	W.T. Reg. 4.10.24 to 23.10.24 ...	25.10.24.
<i>Lassell</i> , M.V. ...	Hickman, V. T. ...	H. G. Cuthill ...	No.	Lampport & Holt ...	" 3.11.24 to 28.11.24 ...	19.12.24.
<i>Leicestershire</i> ...	English, G. L. ...	W. White-side, P. H. Potter, D. Sharrock, W. H. Muirhead. ...	M.L.	Bibby ...	Met. Log. 30.8.24 to 8.11.24 ...	14.11.24.
<i>Leitrim</i> ...	Robertson, A. ...	H. C. Roberts ...	No.	Dowie, J., & Co. ...	Form 911 16.8.24 to 25.9.24 ...	30.9.24.
<i>Levant</i> , C.S. ...	West, G. W. ...	" ...	"	Eastern Tel. Co. ...	" 26.11.23 to 16.12.23 ...	30.12.23.
<i>Ling Nam</i> ...	Waterson, W. H. V. ...	" ...	"	Chunghwa Nav. Co. ...	" 27.10.23 to 12.1.24 ...	22.4.24.

LIST OF VOLUNTARY OBSERVING SHIPS

7

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 19.12.24.	Date Received.
<i>Llanstephan Castle</i>	Owen, S. H. ...	J. B. M. Reynolds... ..	No.	Union Castle ...	Form 911 20.9.24 to 25.11.24...	29.11.24.
<i>Loch Katrine</i> ...	Matthews, G. P. ...	C. Noakes	"	R.M.S.P. Co. ...	" 25.4.24 to 1.8.24 ...	13.8.24.
<i>London Commerce</i>	Young, H. J., D.S.C.	P. G. Leverett	"	Furness Withy ...	" 27.9.24 to 28.10.24...	10.11.24.
<i>Loreto M.V.</i> ...	Barkley, E. ...	F. Binnion	"	Pacific S.N. Co. ...	" 18.5.24 to 7.6.24 ...	12.6.24.
<i>Losada M.V.</i> ...	Meldrum, G. W. ...	A. H. Turner	"	" ...	" 4.10.24 to 24.10.24...	27.10.24.
<i>Macedonia</i> ...	Potter, H. W., R.D., Commr., R.N.R.	J. B. Buggi	No.	P. & O. ...	" 6.7.24 to 14.7.24 ...	28.7.24.
<i>Macharda</i> ...	Cochran, G. ...	W. Moore	"	Brocklebank ...	" 6.9.24 to 24.11.24 ...	5.12.24.
<i>Mahana</i> ...	Kershaw, W. A. R. ...	F. M. Smith, F. Gilroy ...	"	Shaw Savill & Albion ...	" 7.9.24 to 21.9.24 ...	16.10.24.
<i>Maharaja</i> ...	Peet, T. M. ...	R. C. P. Boermel	"	Asiatic S.N. Co. ...	" 9.9.24 to 19.10.24 ...	17.11.24.
<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.	" ...	Form 911 4.7.24 to 17.7.24 ...	11.8.24.
<i>Maine</i> ...	Seymour, H. ...	S. C. Skinner	"	Atlantic Transport ...	" 24.10.24 to 26.11.24 ...	1.12.24.
<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.	White Star ...	W.T. Reg. 20.11.24 to 4.12.24... Form 911 30.10.24 to 14.11.24 30.10.24 to 14.11.24	8.12.24. 18.11.24. 18.11.24.
<i>Makambo</i> ...	Brown, T. M. ...	F. C. Ree, H. Mann, D. G. Irvine, D. Wilson, J. Abbot, K. Thompson.	M.L.	Burns Philp ...	Met. Log. 13.2.24 to 28.8.24 ...	6.12.24. 2.12.24.
<i>Makura</i> ...	Barlow, A. E. Showman, A. C. ...	G. O. Knaggs, J. D. Lundie, W. A. Todd, J. Joyes.	M.L.	Canadian-Australasian	" 3.7.24 to 17.10.24 ...	14.11.24.
<i>Malancha</i> ...	Whitham, F. ...	F. Boulding	No.	Brocklebank ...	Form 911 20.7.24 to 1.10.24 ...	3.10.24.
<i>Malda</i> ...	Gray, T. N. ...	W. Hunt	"	British India ...	" 5.9.24 to 29.9.24 ...	2.10.24.
<i>Manchester Corporation.</i>	Everest J. E. ...	L. H. Moorhouse	"	Manchester Liners ...	" 11.10.24 to 12.11.24 ...	14.11.24.
<i>Manchester Marine.</i>	Riley, J. E. ...	C. E. Stocker, J. F. Fisher, W. H. Downing.	M.L.	" ...	Met. Log. 23.3.24 to 25.11.24...	5.12.24.
<i>Manchester Merchant.</i>	Dormer, A. E. Barclay J. ...	A. H. Boyd, A. E. Ricketts...	No.	" ...	Form 911 4.10.24 to 15.10.24...	23.10.24.
<i>Mandasor</i> ...	Kershaw, R. W. ...	W. Baxter	"	Brocklebank ...	" 1.12.23 to 7.1.24 ...	28.1.24.
<i>Manhattan</i> ...	Hutchison J. G. ...	S. K. Hawkins	"	Atlantic Transport ...	" 25.5.24 to 1.8.24 ...	11.8.24.
<i>Manipur</i> ...	Scurr, T. W. ...	G. W. Barker	"	Brocklebank ...	" 4.6.24 to 4.9.24 ...	5.9.24.
<i>Manistee</i> ...	Isaacson, J. M. ...	S. Browne, J. Blower, F. R. Inch.	M.L.	Elders & Fyffes ...	Met. Log. 26.7.24 to 7.12.24 ...	16.12.24.
<i>29 Marburn</i> ...	Mortimer S. ...	T. W. Burdis, D. Pemberton, K. L. Thomson, W. McBride, A. M. Hill.	W.T.	Canadian Pacific	" ...	" ...
<i>Marella</i> ...	Bean, A. ...	W. G. Pearce, G. B. Bray, E. Wood.	M.L.	Burns Philp ...	" 24.11.23 to 17.4.24...	2.12.24.
<i>Marengo</i> ...	Whittingham, W. E., O.B.E., R.D., Commr., R.N.R.	J. Strachan, P. Wright, N. A. Thatcher, H. E. Evans.	"	Ellerman Wilson ...	" 22.5.24 to 28.8.24 ...	3.9.24.
<i>Margha</i> ...	Griffiths, J. N. ...	A. Pennington	"	British India ...	" 5.7.24 to 17.9.24 ...	22.2.24.
<i>Marglen</i> ...	Hamilton, G. ...	J. McLellan, C. Crawley, C. Draper.	No.	Canadian Pacific ...	Form 911 16.2.24 to 7.3.24 ...	11.3.24.
<i>27 Marloch</i> ...	Pollard, F. W., D.S.O., R.D., Commr., R.N.R.	A. S. Mather	W.T.	" ...	W.T. Reg. 9.11.24 to 28.11.24...	4.12.24.
<i>Maryland</i> ...	Thowless, E. ...	R. C. Baker	No.	Atlantic Transport ...	Form 911 9.11.24 to 28.11.24...	5.12.24.
<i>Masirah</i> ...	Henderson, J. L. ...	E. Richardson	"	" ...	" 15.9.24 to 22.10.24...	30.10.24.
<i>Massilia</i> ...	Bosdet, V. J. ...	A. Chrystal, D. N. MacGregor.	"	Brocklebank ...	Form 911 4.4.24 to 25.4.24 ...	26.5.24.
<i>Matakana</i> ...	Kenworthy, V. ...	K. Morris	"	Anchor ...	" 12.9.24 to 20.9.24 ...	22.9.24.
<i>Matarum</i> ...	McInnes, G. ...	J. A. Embley, J. Robertson, D. Hunter.	"	Shaw, Savill & Albion ...	" 5.7.24 to 25.11.24 ...	10.12.24.
<i>Matheran</i> ...	Hanna, R. G. ...	H. H. Armstrong	"	Burns Philp & Co. ...	" 19.8.24 to 18.9.24 ...	2.12.24.
<i>Mathura</i> ...	Langlands, D. H. ...	D. H. Bell	M.L.	Brocklebank ...	Met. Log. 2.7.24 to 13.10.24 ...	7.11.24.
<i>Mahiana</i> ...	Henderson, J. ...	Rostron, A. H., C.B.E., R.D., A.-d.-C., Capt., R.N.R.	No.	British India ...	Form 911 21.9.24 to 23.10.24...	29.10.24.
<i>Matina</i> ...	Rostron, A. H., C.B.E., R.D., A.-d.-C., Capt., R.N.R.	J. A. Myles, A. N. Sargent, R. Allen.	"	Elders & Fyffes ...	" 29.8.24 to 3.10.24 ...	27.10.24.
<i>32 Mauretania</i> ...	Berry, G. ...	H. J. C. Day, R. Conway ...	W.T.	Met. Log. 3.9.23 to 28.5.24 ...	W.T. Reg. 2.11.24 to 7.11.24 ...	20.11.24.
<i>56 Megantic</i> ...	Clews, A. H. ...	H. A. MacCullum, W. E. Bacon, A. Benshaw.	W.T.	Cunard ...	" 22.11.24 to 8.12.24...	12.12.24.
<i>22 Melita</i> ...	Salter, G. H. ...	E. D. Potts	"	White Star ...	W.T. Reg. 18.10.24 to 7.11.24...	12.11.24.
<i>Memnon</i> ...	Finch, E. ...	W. S. Mackie	"	Canadian Pacific ...	" 2.11.24 to 6.11.24 ...	11.11.24.
<i>Menominee</i> ...	Carnon, J. R. ...	B. Leslie A. M. Watt, E. V. Glennie.	No.	A. Holt ...	Form 911 3.10.24 to 19.10.24...	21.10.24.
<i>21 Metagama</i> ...	Henderson, W. ...	E. Lowndes	"	Atlantic Transport ...	" 27.11.24 to 4.12.24...	8.12.24.
<i>Miami</i> ...	Maxwell Brown, W. E.	L. A. Williams	"	Leyland ...	W.T. Reg. 21.7.24 to 26.8.24 ...	9.9.24.
<i>Michigan</i> ...	Tribe, A. E. ...	B. J. Bennie, W. J. McPhedron, J. H. Oxtan.	W.T.	Canadian Pacific ...	" 1.11.24 to 20.11.24...	24.11.24.
<i>Minderoo</i> ...	Richardson, E. ...	D. Rattray	No.	Elders & Fyffes ...	Form 911 5.11.24 to 6.12.24 ...	11.12.24.
<i>Minna</i> ...	Mackenzie, G. G. ...	— Carter, — Soame, — MacKenzie.	"	Atlantic Transport ...	" 11.6.24 to 20.6.24 ...	25.6.24.
<i>23 Minnedosa</i> ...	Gates, T. F. ...	H. E. McCartney	M.L.	West Australia Nav. Co.	Met. Log. 30.12.23 to 12.6.24...	27.8.24.
<i>Minnetonka</i> ...	Claret, F. ...	W. S. Mackie, F. J. Mummery	No.	Scottish Fishery Board	Form 911 19.10.24 to 14.11.24 ...	20.11.24.
<i>Minnewaska</i> ...	Sherwood, C. A. ...	C. E. F. St. John	W.T.	Canadian Pacific ...	W.T. Reg. 4.10.24 to 22.10.24 ...	27.10.24.
<i>Mirror, C.S.</i> ...	Wylie, J. T. J. ...	H. K. Cockerill	"	Form 911 6.9.24 to 24.9.24 ...	" 17.11.24 to 6.12.24...	10.12.24.
<i>Mississippi, M.V.</i>	Morzer Bruyns, M. F.	P. de Viels	"	Atlantic Transport ...	" 3.11.24 to 22.11.24...	28.11.24.
<i>Moena</i> ...	Griffin, R. H., O.B.E., R.D., Capt., R.N.R.	R. S. Bibby	"	Eastern Tel. Co. ...	" 29.8.24 to 6.10.24 ...	20.10.24.
<i>Mohlavia</i> ...	Dutran, G. D. ...	M. B. Glasier	"	Atlantic Transport ...	" 8.11.24 to 20.11.24...	28.11.24.
<i>Mongolian Prince</i>	Davies, W. ...	H. McFadyen	"	Nederland ...	" 9.10.24 to 4.12.24 ...	13.12.24.
<i>Monkbarns, Ship</i>	Rennie, A. O.B.E.	R. Fegan, W. Phillips, A. S. Phillips.	"	P. & O. ...	" 2.8.24 to 8.11.24 ...	12.11.24.
<i>24 Montcalm</i> ...	Webster, G. S., R.D., Commr., R.N.R.	H. H. Davies	"	Prince ...	" 7.7.24 to 3.10.24 ...	14.10.24.
<i>25 Montclare</i> ...	Turnbull, J., C.B.E., R.D., Capt., R.N.R.	T. Beck, A. Mansey, R. Robinson.	"	J. Stewart & Co. ...	" 13.10.23 to 20.11.23 ...	21.1.24.
<i>28 Montlaurier</i> ...	Latta, R. G. ...	F. E. Williams	"	Canadian Pacific ...	W.T. Reg. 9.11.24 to 28.11.24...	2.12.24.
<i>26 Montrose</i> ...	Mills, T. L., O.B.E., R.D., Commr., R.N.R.	J. Norris, C. L. Hazeldine ...	W.T.	" ...	" 25.10.24 to 14.11.24 ...	18.11.24.
<i>20 Montroyal</i> ...	Mills, T. L., O.B.E., R.D., Commr., R.N.R.	J. Norris, C. L. Hazeldine ...	"	" ...	Form 911 24.11.24 to 12.12.24...	15.12.24.
<i>Morada</i> ...	Mills, T. L., O.B.E., R.D., Commr., R.N.R.	J. Norris, C. L. Hazeldine ...	"	" ...	" 1.11.24 to 21.11.24...	19.11.24.
					W.T. Reg. 15.11.24 to 3.12.24...	9.12.24.
					Form 911 14.11.24 to 4.12.24...	10.12.24.
					" 11.7.24 to 31.7.24 ...	5.8.24.
					W.T. Reg. 4.10.24 to 21.10.24...	23.10.24.
					Met. Log. 5.1.24 to 24.7.24 ...	11.9.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 19.12.24.	Date Received.
<i>Mulbera</i> ...	Steadman, W. R. ...	E. Holland, A. Russell ...	No.	British India ...	Form 911 11.9.24 to 19.10.24...	27.10.24.
<i>Nagara</i> ...	Shillitoe, B., R.D., Commr., R.N.R.	C. K. Brown ...	"	R.M.S.P. Co. ...	" 18.7.24 to 16.9.24 ...	22.9.24.
<i>Napierian</i> ...	Kerruish, W. ...	T. Griffiths ...	"	Leyland ...	" 14.2.24 to 26.2.24 ...	14.3.24.
<i>Nardana</i> ...	Brown, H. ...	S. C. T. Smith, W. E. Jackson ...	"	British India ...	" 25.7.24 to 29.8.24 ...	16.9.24.
<i>Nariva</i> ...	Buret, T. J. C. ...	H. M. S. Laidlaw, C. Waterhouse, E. N. Giller, D. Parsons.	M.L.	R.M.S.P. Co. ...	Met. Log. 4.10.24 to 4.12.24 ...	10.12.24.
<i>Nascopie</i> ...	Smellie, T. F. ...	A. S. Watts, T. D. Roseburgh ...	M.L.	Hudson's Bay Co. ...	" 16.6.24 to 17.10.24...	23.10.24.
<i>Navarino</i> ...	Crichton, J. S. ...	J. Annam ...	No.	Glen & Co. ...	Form 911 13.12.23 to 12.1.24...	22.1.24.
<i>Nicasota</i> ...	Willan, F. G. L., R.D. Commr., R.N.R.	W. A. Delap ...	"	R.M.S.P. Co. ...	" 23.6.24 to 20.8.24 ...	28.8.24.
<i>Navab...</i> ...	Smith, J. F. ...	" ...	"	Asiatic S.N. Co. ...	" 20.7.24 to 27.9.24 ...	20.10.24.
<i>Nebraska</i> ...	Collins, A. R. D., O.B.E., R.D., Lt.-Commr., R.N.R.	A. F. Walker ...	"	R.M.S.P. Co. ...	" 15.3.24 to 21.4.24 ...	5.5.24.
<i>Nellore</i> ...	Murray, F. S., R.D., Lt. - Commr., R.N.R.	G. E. Owen ...	"	P. & O. ...	" 27.9.24 to 17.10.24...	20.10.24.
<i>Nestor</i> ...	Owen, R. D., O.B.E.	O. V. Jones ...	M.L.	A. Holt ...	" 10.7.24 to 22.8.24 ...	1.9.24.
<i>Nevasa</i> ...	Swanson, C. J. ...	D. Lorrie ...	No.	British India ...	" 14.6.24 to 31.8.24 ...	12.9.24.
<i>Newby Hall</i> ...	Kendall, J. W. ...	E. J. Myles, C. H. Webb, T. A. Dexter.	M.L.	Ellerman ...	Met. Log. 25.1.24 to 11.9.24 ...	28.10.24.
<i>Niagara</i> ...	Rolls J. T. ...	R. B. Deaniston, T. A. Macpherson, J. V. Bray, J. Dawson.	M.L.	Canadian-Australian...	" 19.7.24 to 13.11.24...	8.12.24.
<i>Ningchow</i> ...	Wilson, C. A. ...	R. A. Hannay ...	No.	A. Holt ...	Form 911 7.9.24 to 12.10.24 ...	13.11.24.
<i>Nore</i> ...	Randall H. W. R.D., Capt., R.N.R.	J. C. Ablewhite, R. W. Mackie, C. B. Roche, R. H. Turner.	M.L.	P. & O. ...	Met. Log. 12.7.24 to 2.10.24 ...	7.10.24.
<i>Norman</i> ...	Morton Betts W. ...	D. A. Hodgson ...	No.	Union Castle ...	Form 911 11.8.24 to 31.8.24 ...	16.10.24.
<i>Norna</i> ...	Wright, J. ...	T. Mather ...	"	Scottish Fishery Board ...	" 1.11.24 to 30.11.24...	2.12.24.
<i>Norseman, C.S.</i> ...	Barter, H. O., R.D., Commr., R.N.R.	" ...	M.L.	Western Tel. Co. ...	Met. Log. 11.9.23 to 28.3.24 ...	7.7.24.
<i>Nortonian</i> ...	McCormick, J. ...	T. Griffiths ...	No.	Leyland ...	Form 911 2.8.24 to 30.9.24 ...	4.10.24.
<i>Nubian</i> ...	Watmough, T. M. ...	H. R. Gaskill ...	"	" ...	" 24.11.24 to 7.12.24...	19.12.24.
<i>Nyanza</i> ...	Carpendale, F. W. J.	H. C. G. Cumming, C. H. Hand, R. A. C. Beeching.	M.L.	P. & O. ...	Met. Log. 15.6.24 to 8.9.24 ...	13.9.24.
<i>Oaklands Grange</i> ...	Routledge, R. ...	E. A. Insley ...	No.	Houlder Bros. ...	Form 911 27.5.24 to 19.9.24 ...	26.9.24.
<i>Odland I.</i> ...	Villiamsen ...	H. Svendgaard ...	"	Hannevig Bros. ...	" 19.12.23 to 2.1.24 ...	4.1.24.
<i>42 Ohio</i> ...	Nicholson, M. S., R.D., Capt., R.N.R.	G. S. Bounphrey, W. Paine	W.T.	R.M.S.P. Co. ...	" 27.9.24 to 18.10.24...	21.10.24.
<i>Olympia</i> ...	Caldwell, R. ...	D. R. Urquhart, G. Lynas, C. Mortimer.	M.L.	Anchor ...	" 13.8.24 to 26.10.24...	29.10.24.
<i>57 Olympic</i> ...	Howarth, F. B., Commr., R.N.R.	J. C. M. Boyce, G. W. Couch, C. J. Warltire.	W.T.	White Star ...	W.T. Reg. 27.11.24 to 11.12.24 Form 911 6.11.24 to 20.11.24...	15.12.24. 22.11.24. 15.12.24.
<i>Orama</i> ...	Staunton, H. G., C.B.E., R.D., Commr., R.N.R.	" ...	M.L.	Orient ...	" ...	"
<i>Oranian</i> ...	Hoskins, W. ...	D. Hewett ...	"	Leyland ...	Form 911 4.9.24 to 17.11.24 ...	24.11.24.
<i>Orari</i> ...	Robinson, F. W. ...	R. Newman, T. Breen, F. Logheed, G. Lant, H. Farrant.	M.L.	New Zealand S.S. Co.	Met. Log. 22.11.23 to 11.5.24...	16.5.24.
<i>40 Orbita</i> ...	Parker, W. H., C.B.E., R.D., Capt., R.N.R.	R. V. Rutley, S. Page, A. A. Mackie, R. W. Morford, B. Gammon.	W.T.	R.M.S.P. Co. ...	W.T. Reg. 12.10.24 to 2.11.24... Form 911 11.10.24 to 3.11.24...	5.11.24. 6.11.24.
<i>Orcoma</i> ...	Pleignier, H. T. S. ...	G. B. Wardale, L. Jones, C. H. Denton.	M.L.	Pacific S.N. Co. ...	Met. Log. 21.8.24 to 6.11.24 ...	21.11.24.
<i>41 Orduña</i> ...	Warner, G. F., R.D., Commr., R.N.R.	S. Robbins, R. W. Sumpton, G. F. Russell, H. R. Hendin.	W.T.	R.M.S.P. Co. ...	W.T. Reg. 5.10.24 to 26.10.24... Form 911 4.10.24 to 27.10.24...	29.10.24. 29.10.24.
<i>Oriana</i> ...	{ Daniel, T. ... } Kite, E. ...	" ...	M.L.	Pacific S.N. Co. ...	Met. Log. 15.2.24 to 24.10.24 ...	8.11.24.
<i>Orita</i> ...	Splatt, W. A. ...	J. G. Harvey, T. R. Scott, D. W. Hutchinson, C. P. D. Dean.	M.L.	" ...	Met. Log. 19.9.24 to 6.12.24 ...	19.12.24.
<i>Ormonde</i> ...	Knowles, C. H., D.S.O., Commr., R.N.	A. M. Hughes ...	M.L.	His Majesty's Ship ...	Met. Log. 24.6.24 to 17.10.24...	27.11.24.
<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.	G. A. Moir, J. C. K. Dowding, I. E. G. Goldsworthy N. A. Whinfield.	M.L.	" ...	Met. Log. 25.5.24 to 28.8.24 ...	2.9.24.
<i>Oroya</i> ...	Pearce, A. ...	S. Lewis ...	No.	Pacific S.N. Co. ...	Form 911 30.7.24 to 7.10.24 ...	16.10.24.
<i>Orsova</i> ...	Matheson, C. G., D.S.O., R.D., Commr., R.N.R.	C. Fox, A. J. Croft Cohen, C. V. Dodgson, P. P. Murphy.	M.L.	Orient ...	Met. Log. 22.6.24 to 23.9.24 ...	25.9.24.
<i>Ortega</i> ...	Christian, C. H. ...	D. W. Hutchison ...	No.	Pacific S.N. Co. ...	Form 911 12.6.24 to 5.7.24 ...	26.8.24.
<i>Orvieto</i> ...	Simner, G. L., R.D., 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. 20.7.24 to 21.10.24...	23.10.24.
<i>Osterley</i> ...	Cameron, E. P. ...	F. G. Goodman, E. Hatch, J. C. Jackson, H. Tanner.	M.L.	" ...	" 17.8.24 to 19.11.24...	28.11.24.
<i>Othello</i> ...	Pearson, Z. C. ...	J. W. Botheroyd ...	No.	Ellerman Wilson ...	Form 911 17.8.24 to 14.11.24...	20.11.24.
<i>Otira</i> ...	Elford, H. E. ...	J. H. Fuller ...	"	Shaw, Savill & Albion ...	" 11.10.24 to 31.10.24 ...	3.12.24.
<i>Ovid</i> ...	Groom, A. C. B. ...	" ...	"	Shakespeare Shipping Co. ...	" 5.10.24 to 9.11.24 ...	11.11.24.
<i>Oxfordshire</i> ...	Crumplin, W. E. ...	F. C. Brooks ...	"	Bibby Bros. ...	" 13.10.24 to 9.11.24...	4.12.24.
<i>Pacific Shipper, M.V.</i> ...	Newman, G. W. A. ...	J. W. Woodward ...	"	Furness Withy ...	" 8.9.24 to 24.9.24 ...	22.10.24.
<i>Pakeha</i> ...	W. P. Clifton Mogg ...	M. F. Armitage ...	M.L.	Shaw, Savill & Albion ...	Form 911 1.7.24 to 10.8.24 ...	15.8.24.
<i>Paparoa</i> ...	Ashworth, F. ...	C. J. Brewer ...	No.	New Zealand S.S. Co. ...	" 22.9.24 to 19.10.24...	11.11.24.
<i>Paparoa</i> ...	Evans, J. O. ...	R. F. Hillings ...	"	Hain S.S. Co. ...	" 18.9.24 to 27.10.24...	8.12.24.
<i>Paris</i> ...	Cook, C. L. ...	Mr. Biles ...	C.C.	Southern Rly. ...	Telegraphic Report. 19.2.24 ...	19.2.24.
<i>Putia</i> ...	Bostock, R. J. ...	W. McIlwaine ...	No.	Elders & Fyffes ...	Form 911 10.10.24 to 17.11.24	25.11.24.
<i>Patrol, C.S.</i> ...	Welsh, T. K. ...	H. A. Davison, B. L. Vinden, A. T. Morrell.	M.L.	Eastern Extension (A. & C.) Telegraph Co. ...	Met. Log. 11.2.24 to 13.7.24 ...	25.8.24.
<i>Persic</i> ...	Davies, E. ...	H. Williams ...	No.	White Star ...	Form 911 19.10.24 to 1.12.24...	3.12.24.
<i>Peshawur</i> ...	Hester, C. W., R.D., Commr., R.N.R.	D. G. Baillie, E. J. R. North, J. R. Alleyne.	M.L.	P. & O. ...	Met. Log. 24.7.24 to 4.12.24 ...	10.12.24.
<i>Philadelphian</i> ...	Baker, J. A. ...	W. Lawton ...	No.	Leyland ...	Form 911 2.10.24 to 20.11.24...	26.11.24.
<i>Polyphemus</i> ...	Hatfield, J. ...	C. Wilson, R. E. Wilkes ...	"	A. Holt ...	" 28.10.24 to 8.11.24...	18.11.24.
<i>Poona</i> ...	Cherry, W. G. W. ...	F. R. W. Page ...	"	P. & O. ...	" 21.7.24 to 31.8.24 ...	15.9.24.

LIST OF VOLUNTARY OBSERVING SHIPS

vii

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received to 19.12.24.	Date Received.
<i>Port Adelaide</i> ...	Hayter, S. W. ...	... ..	M.L.	Commonwealth & Dominion.	... ..	...
„ <i>Albany</i> ...	Robinson, C. A. ...	A. Jenkyns, W. B. Craig, A. G. Newbury, W. Eastoe.	M.L.	„ „ „	Met. Log. 4.5.24 to 3.10.24 ...	30.10.24.
„ <i>Augusta</i> ...	Sawbridge, I. R. ...	G. T. C. Harris, R. C. Carter, C. F. Coate.	M.L.	„ „ „	„ 6.4.24 to 15.10.24...	7.11.24.
„ <i>Caroline</i> ...	Renaut, F. A. ...	P. H. Peirick, T. Copeland E. Fenton.	M.L.	„ „ „	„ 22.12.24 to 19.7.24...	23.7.24.
„ <i>Curtis</i> ...	Van den Bergh, C. ...	W. H. Miles	No.	„ „ „	Form 911 10.11.24 to 21.11.24	6.12.24.
„ <i>Darwin</i> ...	Jack, J.	E. T. N. Lawrey, E. W. R. Young.	„	„ „ „	„ 18.9.24 to 30.10.24...	5.11.24.
„ <i>Hacking</i> ...	Williams, R.	Rowland Hill	„	„ „ „	„ 31.7.24 to 10.9.24 ...	15.9.24.
„ <i>Hunter</i> ...	Cottell, S. C.	A. Cooper, C. F. Post, J. H. Bower.	M.L.	„ „ „	Met. Log. 12.4.24 to 23.9.24 ...	30.9.24.
„ <i>Melbourne</i> ...	Kearney, F. 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> ...	Hoad, A. C.	E. A. Leavett, C. R. Townshend, G. G. Langford.	M.L.	„ „ „	„ 12.3.24 to 14.8.24 ...	9.9.24.
„ <i>Pirie</i> ...	Higgs, W. G.	H. C. Jeffery, W. G. Jones, J. T. Nicholson, E. G. L. Jones.	M.L.	„ „ „	„ 9.8.24 to 13.12.24...	19.12.24.
„ <i>Sydney</i> ...	Lea, W. H.	A. W. Sams, C. Groves, A. M. Stanton, G. Freeman-Pannett.	M.L.	„ „ „	„ 13.6.24 to 15.11.24...	18.11.24.
„ <i>Victor</i> ...	Swan, L. H.	E. G. Fullick, R. T. R. Tomsett, W. Pickup.	M.L.	„ „ „	„ 12.4.24 to 22.8.24 ...	28.8.24.
<i>President Jackson</i> ...	Griffith, J.	E. Walker	No.	Pacific S.S. Co. ...	Form 911 17.6.24 to 18.7.24 ...	8.9.24.
<i>Protea</i> , H.M.S.A.S. ...	Woodhouse, A. F. B., Lt.-Commr., R.N.	H. McMaster	„	South African Naval Service.	„ 8.9.24 to 28.9.24 ...	21.10.24.
<i>Protesilaus</i> ...	Williams, D. T. ... ..	... ..	M.L.	A. Holt	Met. Log. 11.7.24 to 16.9.24 ...	14.10.24.
<i>Pyrrhus</i> ...	Elford, W. J.	W. Owen	No.	„ „ „	Form 911 8.9.24 to 25.9.24 ...	26.9.24.
<i>Regina</i>	Smith, R. G.	A. Hulme	M.L.	White Star-Dominion	Form 911 27.9.24 to 18.10.24...	20.10.24.
<i>Reindeer</i> ...	Mulhall, W. ... ..	... ..	C.C.	G.W. Railway ...	Telegraphic Report. 18.12.24 ...	18.12.24.
<i>Rhodesian Transport</i> ...	Fowler, W. H.	A. E. Warburton	No.	Houlder Bros. ...	Form 911 5.7.24 to 28.9.24 ...	2.10.24.
<i>Rialto</i> ...	Mordue, J. A. ... ..	... ..	„	Ellerman Bucknall ...	„ 23.10.24 to 25.11.24	17.12.24.
<i>Rimutaka</i> ...	Hemming, F. A.	H. Horwood, R. S. Cox, O. M. Watts.	M.L.	New Zealand S.S. Co.	Met. Log. 9.3.24 to 26.8.24 ...	4.9.24.
<i>Risaldar</i> ...	Park, G.	H. Gibson, N. W. Heard, T. E. Ward.	„	Asiatic S.N. Co. ...	„ 8.3.24 to 13.10.24 ...	18.11.24.
<i>Romney</i> ...	Leicester, F. S.	W. H. Underhill	No.	Lamport & Holt ...	Form 911 13.8.24 to 9.11.24 ...	14.11.24.
<i>Royal Fusilier</i> ...	Dawson, J.	J. Fraser	„	London & Edinburgh S.S. Co.	„ 9.11.24 to 30.11.24...	2.12.24.
<i>Royal Transport</i>	Dove, J.	R. Martin	„	Houlder Bros. ...	„ 2.11.24 to 2.12.24 ...	5.12.24.
<i>Ruapehu</i> ...	McKellar, A. W., R.D., Capt., R.N.R.	P. J. Connolly, G. E. Hargreaves, F. Cooke.	M.L.	New Zealand S.S. Co.	Met. Log. 26.4.24 to 17.9.24 ...	24.9.24.
<i>Sachem</i>	Westgarth, W. A.	C. Waldron, E. Sainty	M.L.	Furness Withy ...	Form 911 2.11.24 to 14.12.24...	15.12.24.
<i>St. Albans</i> ...	Pilcher, E.	W. McIntyre	„	Eastern and Australian Scientific Expeditionary Research Assn.	„ 11.6.24 to 20.8.24 ...	6.10.24.
<i>St. George</i> ...	Blair, D., O.B.E., R.D., Commr., R.N.R.	... ..	„	„ „ „	... ..	...
<i>St. Patrick</i> ...	Bearpark, E. W.	J. Hill	No.	Rankin Gilmour ...	Form 911 6.10.24 to 20.10.24...	7.11.24.
<i>Salaga</i> ...	Sola, P., D.S.O.	F. A. Elston	„	Elder Dempster ...	„ 25.10.24 to 5.11.24...	24.11.24.
<i>Samaria</i> ...	Horsburgh, G., O.B.E.	R. P. Cambell	„	Cunard	„ 26.10.24 to 16.11.24	20.11.24.
<i>Sandown Castle</i> ...	Jackson, C. R.	G. H. Mayhew	„	Union Castle ...	„ 20.7.24 to 26.9.24 ...	1.10.24.
<i>Sardinia</i> ...	Cadiz, F. G., D.S.C.	A. F. Wiles	„	P. & O.	„ 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. 26.10.24 to 14.11.24	18.11.24.
<i>Saxoleine</i> ...	Biddick, E.	S. Wood	No.	Hunting & Son ...	Form 911 25.10.24 to 15.11.24	19.11.24.
<i>Saxon</i> ...	Stanley, W. F., R.D., Commr., R.N.R.	R. S. W. Harris	„	Union Castle ...	„ 30.9.24 to 16.10.24...	20.10.24.
<i>Saxonia</i> ...	Jones, R. D.	H. A. D. Waterhouse	„	Cunard	„ 7.9.24 to 7.10.24 ...	16.10.24.
<i>Scholar</i> ...	O'Connor, T.	A. L. Cresswell	„	Harrison	„ 14.7.24 to 3.9.24 ...	9.9.24.
<i>Scientist</i> ...	Hansen, W. A.	D. G. Russell	„	„ „ „	„ 21.5.24 to 9.8.24 ...	12.8.24.
<i>Scindia</i> ...	Matthew, W.	H. D. Campsie	„	Anchor	„ 28.6.24 to 12.9.24 ...	17.9.24.
<i>Scotia</i> ...	Telfer	O. W. L. Jones	C.C.	L.M. & S. Rly. ...	Telegraphic Report. 13.12.24 ...	13.12.24.
<i>Scottish Bard</i> ...	McDonnell, S.	S. W. Watts	No.	Tankers, Ltd. ...	Form 911 15.10.24 to 16.11.24	24.11.24.
<i>Scottish Borderer</i> ...	Thompson, F.	G. F. Widger	„	„ „ „	„ 12.6.24 to 13.7.24 ...	21.7.24.
<i>Scottish Strath</i> ...	Barlow, A. M.	W. Black	„	„ „ „	„ 5.4.24 to 11.6.24 ...	12.9.24.
33 <i>Scythia</i> ...	Brown, F. G., R.D., Capt., R.N.R.	T. Parry, G. Overton, W. Cox.	W.T.	Cunard	W.T. Reg. 3.11.24 to 23.11.24...	25.11.24.
<i>Sheafdart</i> ...	... ..	T. B. Griffiths	No.	Kaitian Mining Administration.	... ..	...
<i>Sheaf Mount</i> ...	Groves, C. V.	C. A. Gould	„	Souter, W. A. ...	„ 17.8.24 to 26.8.24 ...	1.9.24.
<i>Sheaf Spear</i> ...	Whitfield, G. A., O.B.E.	A. E. Harvey, W. H. Grisewood.	M.L.	„ „ „	Met. Log. 29.1.24 to 9.7.24 ...	29.7.24.
<i>Sicilia</i> ...	Davis, H. C., D.S.C., R.D., Commr., R.N.R.	R. Rowe	No.	P. & O.	Form 911 8.7.24 to 24.7.24 ...	19.9.24.
<i>Socrates</i> ...	James, F. R.	E. R. Hartley	„	Lamport & Holt ...	„ 4.10.24 to 23.10.24...	18.11.24.
<i>Soekaboemi</i> ...	Ter Maisch, K. J.	W. N. de Wijn	„	Rotterdam Lloyd ...	„ 8.10.24 to 17.10.24...	11.11.24.
<i>Somersetshire</i> ...	Adamson, B. W.	P. Hawkins, J. Cullen, M. Simmons.	M.L.	Bibby	Met. Log. 28.6.24 to 28.9.24 ...	3.10.24.
<i>Somme</i>	Spriddell, F. G.	K. W. Simpton, H. Chamberlain, V. Hill, C. C. Prosser.	M.L.	R.M.S.P. Co. ...	Met. Log. 16.2.24 to 29.9.24 ...	18.11.24.
<i>Songster</i> ...	Miles, F. R., Commr., R.N.R.	... ..	„	„ „ „	„ 13.10.23 to 5.11.23...	19.2.24.
<i>Spectator</i> ...	Thompson, W.	W. F. O'Neill	M.L.	Harrison	Form 911 2.1.24 to 18.4.24 ...	22.4.24.
<i>Spero</i> ...	Owen, W. F.	A. M. Dick	No.	„ „ „	„ 2.1.24 to 18.4.24 ...	22.4.24.
„	French, H. E.	E. A. Gould, G. Mussard, R. Higginbottom, J. Ruthenford.	M.L.	Ellerman Wilson ...	Met. Log. 23.2.24 to 9.8.24 ...	19.8.24.
<i>Stephan</i> , C.S. ...	Carlton, G. F., O.B.E., Commr., R.N.R.	S. G. Elcoate, F. B. Bolingbroke, W. E. Allen, T. J. Horan.	M.L.	Telegraph Construction & Maintenance.	„ 25.7.24 to 13.10.24...	17.10.24.
<i>Surrey</i> ...	Field, H. E. B.	G. W. Allard, S. E. Hoblyn, R. R. Bennett.	M.L.	Federal	„ 12.1.24 to 6.6.24 ...	11.6.24.
<i>Sussex</i> ...	Upton, E. C. S.	W. A. Ewington	No.	„ „ „	Form 911 28.10.24 to 13.11.24	15.12.24.
<i>Tainui</i> ...	Hartman, W. H.	P. S. Horwood	„	Shaw, Savill & Albion	„ 27.9.24 to 7.11.24 ...	9.12.24.
<i>Tairoa</i> ...	Summers, W. G.	S. A. Bannister	„	„ „ „	„ 26.5.24 to 4.7.24 ...	23.8.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 19.12.24.	Date Received.
<i>Taiyuan</i> ...	Hamilton, H. E. ...	T. M. Young, W. Bailey, D. D. Tyer.	M.L.	Yuill & Co. ...	Met. Log. 22.2.24 to 6.7.24 ...	4.9.24.
<i>Talthybius</i> ...	Duggan, C. ...	J. H. Brown ...	No.	A. Holt ...	Form 911 18.9.24 to 5.10.24 ...	20.11.24.
<i>Tambora</i> ...	Ruhaak, H. G. ...	H. Van Manen ...	"	Rotterdam Lloyd ...	" 3.7.24 to 21.8.24 ...	2.9.24.
<i>Teiresias</i> ...	Reynard, J. G. ...	T. P. Griffith ...	"	A. Holt ...	" 23.6.24 to 22.9.24 ...	25.9.24.
<i>Teucer</i> ...	Hodgson, R. N. ...	G. Lancaster ...	"	" ...	" 19.9.24 to 26.11.24 ...	2.12.24.
<i>Themistocles</i> ...	Jernyn, W. M. ...	W. F. Sargent ...	"	Aberdeen ...	" 22.10.24 to 6.12.24 ...	15.12.24.
<i>Theseus</i> ...	Batt, A. E. ...	J. R. Clement Evans ...	"	A. Holt ...	" 7.9.24 to 11.12.24 ...	15.12.24.
<i>Titan</i> ...	Wilkinson, T. G. ...	G. Gow, L. Horton, S. C. Timmouth.	M.L.	" ...	Met. Log. 6.6.24 to 12.10.24 ...	11.12.24.
<i>Tolmie, S.F.Bqtne.</i>	Stewart, J. C. ...	E. F. Collins R. E. Smith ...	No.	B. C. Mills, Tug and Barge Co.	Form 911 18.6.24 to 24.9.24 ...	27.10.24.
<i>Tottori Maru</i> ...	Matsukura, B. ...	S. Ibori ...	"	Nippon Yusen Kaisha	" 7.9.24 to 13.10.24 ...	20.10.24.
<i>Transmitter, C.S.</i>	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>Trematon</i> ...	Hicks, F. H. ...	J. Christopher, D. Thomas, F. J. Webb, S. Smith, C. Mayberry.	M.L.	" ...	Met. Log. 31.3.23 to 24.9.24 ...	14.10.24.
<i>Tuscania</i> ...	Bone, D. W. ...	J. W. Cherry ...	No.	Anchor ...	Form 911 26.10.24 to 16.11.24 ...	20.11.24.
<i>Tyndareus</i> ...	Adcock, F. ...	D. L. Hoare ...	"	A. Holt ...	" 17.5.24 to 22.8.24 ...	10.9.24.
<i>Ulimaroa</i> ...	Wyllie, W. J. ...	R. A. Vance, A. J. Angelin ...	"	Huddart Parker, Ltd.	" 11.8.24 to 15.9.24 ...	2.12.24.
<i>Ulysses</i> ...	McHutcheon, W. ...	T. R. Phillips ...	"	A. Holt ...	" 28.8.24 to 9.10.24 ...	27.10.24.
<i>Umtali</i> ...	Barnes, E. W. ...	W. H. Foster ...	"	Bullard King ...	" 25.9.24 to 12.11.24 ...	8.12.24.
<i>Valencia</i> ...	Doyle, M. ...	J. W. Caunce ...	"	Cunard ...	" 5.6.24 to 12.6.24 ...	17.6.24.
<i>Valdura</i> ...	Mitchell, A. ...	H. J. Maughan, J. Anderson, A. M. S. Well.	M.L.	Gow Harrison ...	Met. Log. 19.6.24 to 20.11.24 ...	8.12.24.
<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 ...	" 9.11.24 to 20.11.24 ...	26.11.24.
<i>Vasconia</i> ...	Inch, F. ...	E. Gleave ...	"	" ...	" 22.10.24 to 25.11.24 ...	9.12.24.
<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 ...	" 2.10.24 to 4.11.24 ...	25.11.24.
<i>Verbania</i> ...	Hatcher, W. H. ...	J. G. Wiseman ...	"	Cunard ...	" 12.10.24 to 14.11.24 ...	17.11.24.
<i>Verentia</i> ...	Edkin, E. ...	A. F. Watts ...	"	" ...	" 7.11.24 to 9.12.24 ...	15.12.24.
<i>Vigilant</i> ...	Simpson, E. S. S. ...	J. Hunter ...	No.	Scottish Fishery Board	Form 911 4.11.24 to 28.11.24 ...	5.12.24.
<i>Waioapu</i> ...	Davey, A. ...	B. S. Cave ...	No.	Canadian-Australasian	Form 911 2.10.24 to 22.10.24 ...	9.12.24.
<i>Walmer Castle</i> ...	Chave, Sir B., K.B.E.	C. Aylen ...	"	Union Castle ...	" 29.8.24 to 20.10.24 ...	21.10.24.
<i>Wangaratta</i> ...	Scutt, W. ...	T. W. Wordingham, W. C. Cripps, K. M. Morrison.	M.L.	British India ...	Met. Log. 30.6.24 to 26.11.24 ...	1.12.24.
<i>Warfeld</i> ...	Steel, R. ...	E. V. Wilkinson ...	No.	" ...	Form 911 11.8.24 to 29.9.24 ...	6.11.24.
<i>War Nizam</i> ...	Putt, R. O. ...	E. R. Clark ...	"	British Tankers ...	" 19.9.24 to 28.10.24 ...	7.11.24.
<i>Welshman</i> ...	Rollerson, W. ...	W. A. Fletcher ...	"	White Star-Dominion ...	" 9.10.24 to 4.11.24 ...	10.11.24.
<i>Winifredian</i> ...	Harrocks, W. ...	W. E. Boyle ...	"	Leyland ...	" 27.10.24 to 29.12.24 ...	6.12.24.
<i>Woodarra</i> ...	Reilly, J. V. ...	L. D. Graham, A. V. Fisher, L. C. Comber, J. Wallace.	M.L.	British India ...	Met. Log. 3.4.24 to 22.6.24 ...	2.8.24.
<i>Yorkshire</i> ...	Millson, G. C. ...	E. Jones ...	No.	Bibby ...	Form 911 2.8.24 to 10.10.24 ...	16.10.24.
<i>Zeeland</i> ...	Thomas, A. J. ...	W. F. Jackman ...	No.	Red Star ...	Form 911 14.11.24 to 5.12.24 ...	8.12.24.
<i>Conway H.M.S.</i>	Broadbent, H. W., R.D. Capt., R.N.R.	The Senior Cadets ...	Cadets' M.L.	" ...	Cadets' Met. Log. 21.9.24 to 13.12.24 ...	19.12.24.
<i>Pangbourne Nautical College.</i>	Tracy, A. F. G., Commr., R.N.	" ...	"	" ...	Cadets' Met. Log. 21.9.24 to 13.12.24 ...	19.12.24.
<i>Worcester, H.M.S.</i>	Sayer M. B., O.B.E., R.D., Capt., R.N.R.	" ...	"	" ...	Cadets' Met. Log. 26.9.24 to 17.12.24 ...	19.12.24.
<i>Abaco</i> ...	" ...	The Keepers ...	Lighthouse Register.	" ...	Lighthouse Register 2.1.24 to 6.7.24 ...	13.8.24.
<i>Cay Lobos</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.24 to 30.6.24 ...	13.8.24.
<i>Double Headed Shot</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.6.24 to 30.6.24 ...	5.9.24.
<i>Inagua</i> ...	" ...	" ...	"	" ...	Lighthouse Register 8.1.24 to 9.7.24 ...	13.8.24.
<i>Sombrero</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.24 to 30.6.24 ...	6.8.24.
<i>Watling Island</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.24 to 30.6.24 ...	13.8.24.
<i>Cape Pembroke (Falkland Is.)</i>	" ...	" ...	"	" ...	Lighthouse Register 1.1.24 to 30.6.24 ...	23.9.24.

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

Name of Vessel.	Captain.	Observing Officer.	Line.	Last Case of Water Samples, Reports, etc., Received up to 30.11.24.	Date Received.
<i>Alban</i> ...	Whayman, W. R. ...	R. Griffiths ...	Booth ...	Water Samples ...	23.4.24.
<i>Denis</i> ...	Harris, F. C. P. ...	" ...	" ...	" ...	"
<i>Hildebrand</i> ...	Maddrell, J. ...	R. S. Hulme Goodier ...	" ...	" ...	6.11.24.
<i>Patia</i> ...	Bostock, R. J. ...	W. McIlwaine ...	Elder & Fyffes ...	" ...	28.11.24.
<i>Tortuguero</i> ...	Martin ...	H. H. Dunning ...	" ...	" ...	28.10.24.