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QUARTERLY CHARTS OF PERCENTAGE FREQUENCY OF GALES IN ALL OCEANS.

THE first of this series is published in this Number. These charts will be the subject of an article in a later Number. Meanwhile, they give a useful indication to the mariner of the regions in which gales are frequent during the months shown, and where few gales are encountered.

MARINE METEOROLOGY, HISTORY AND PROGRESS.

PREPARED IN THE MARINE DIVISION by H. T. SMITH, CLERICAL ASSISTANT.

1. Early History.

The history of marine meteorology is of necessity linked with the history of the development of shipping, but it is a peculiar fact that while shipping made almost incredible advances during the seventeenth and eighteenth centuries, the advantages to be gained from a systematic collection and compilation of weather observations at sea, was not realised until half way through the nineteenth century. Possibly sea sense—that knack of finding a fair wind or of doing the right thing in a storm—may to some extent account for this.

In the early stages of man's attempt to master the seas, weather was a more decisive factor than in later times, and the Phœnicians and the Greeks had perforce to limit their voyages to two seasons; one in spring and the other between Midsummer and Autumn, beaching their ships between times. By the time of the Roman Empire, shipping was carried on from the middle of March to the middle of November. There is evidence that a fund of weather lore and weather prognostics was being accumulated from observation of weather at sea, as will be seen from a quotation from VIRGIL (37 B.C.), "Hence we can learn coming changes of weather in the dubious sky . . . when 'tis meet with oars to cut the faithless sea, when to launch our rigged fleets . . . The wave can but ill forbear to do a mischief to the crooked keels, even when gulls fly swiftly back from the high seas, sending their screams before them . . . Oft, too, when wind impends, you will see stars shoot headlong from the sky . . . The sun also, both when rising and when he hides himself beneath the waves, will give you signs, infallible signs attend the sun . . . a blue colour announcing rain, or fiery wind; but, if the spots begin to be mixed with glowing red, then you will see all nature rage with wind and stormy rain together. On such a night let no one advise me to venture on the deep, or pluck my cable from its mooring on the shore."

But as ship construction developed, the seaman was able to face the perils of bad weather with less apprehension and by A.D. 1000

the Vikings, then the dominant sea race, were able to keep afloat throughout the winter.

Navigation remained more or less traditional and instinctive throughout the Middle Ages, although PRINCE HENRY OF PORTUGAL, known as "Henry the Navigator," introduced a Naval School at Sagres, a fact which accounts largely for Portuguese sea activity at this time and the discovery of America by COLUMBUS in 1492 and the rounding of the Cape of Good Hope by VASCO DA GAMA in 1486. It was in Elizabethan times, when the great commercial highways of the world were being opened up, that navigation began to develop into a science and all facts that would enhance safe navigation on future voyages began to be carefully noted in ships' logs and journals. Schools of Navigation were established and manuals of seamanship published. An interesting feature in one of these, entitled "An Accidence, or the Pathway to Experience necessary for all young Seamen," by Captain JOHN SMITH, published in 1626, is the names given to the winds: "A calme, a breze, a fresh gaile, a pleasant gaile, a stiffe gaile, it ouerblows, a gust, a storme, a spoute, a loume gaile, an eddy wind, a flake of wind, a Turnado, a monthsoune, a Herycano." No definition of the terms is given and presumably the young seaman was expected to learn that from his practical experience at sea. RICHARD NORWOOD, in his "Seaman's Practice," published 1637, gives the method of determining current, namely by comparing the reckoning outwards and homewards.

In 1675, JOHN SELLAR, Hydrographer to the King, published a description of the Trade Winds, which was found in 1807 to substantially correspond with the results obtained by a detailed examination, using the logs of the East Indiamen.

The fleet of the Hon. East India Company, which continued uninterrupted from 1599 to 1834, was of course the pick of the Mercantile Marine, and the knowledge of both the navigation and the weather of the Indian Seas which their captains acquired, and passed on mainly by tradition, must have been prodigious. A large number of these old logs are preserved at the India Office and, although they do not contain instrumental observations, they do contain a wealth of information about the wind and weather. The direction of the wind is generally entered at intervals during the day and a summary giving a description of the force of the wind and weather generally during the twenty-four hours. It is interesting to notice that some of the old terms quoted above, such as a "pleasant gaile" were still in use to describe the wind as long after as 1750. How far these logs were used in compiling the information about winds, etc., in contemporary books on seamanship and directories, it is impossible to estimate. But they form the basis of the "India Directory" compiled by Captain JAMES HORSBURGH, Hydrographer to the Company, and published 1809-11, which gives very full descriptions of the prevailing winds on the Eastern routes, and contains an analysis of a number of East Indiamen's logs for the period of 1791-1807 to determine the limits of the Trades.

The invention of the barometer in 1643 by TORICELLI and the discovery, some years later, that this instrument gave indications of changes in the weather might have been expected to have inaugurated a new era in the development of observation at sea. But, although HOOKE invented a Marine Barometer before 1700, there is little evidence that it was adopted at sea until very much later, except on expeditions such as that made by HALLEY, the astronomer. It should be borne in mind, however, that barometers in those days were fitted with a scale of weather changes similar to an ornamental aneroid of to-day, in addition to the inch graduation, and the fact that, in practice, weather changes do not always conform exactly with the simple rise and fall of the mercury, may explain some of its lack of popularity. As long after as 1777, Captain WILLIAM HUTCHINSON, in his "Treatise on Practical Seamanship," says: "But (as a sailor), I venture to say, that the weather often proves very different from what is pointed out by our weather glasses, or by any other of those improved instruments and rules that have been made by later and more accurate observers of the air and weather, that I have yet seen, and I doubt their being of any great service to sea-faring people: for, I have seen strong gales with a high glass not only Easterly (which commonly raises the mercury) but when up at thirty inches, I have known it blow strong Westerly, with rain and snow. I have likewise seen moderate and fair weather, with the mercury as low as twenty-eight inches, three tenths." He goes on to admit, however, that he once received warning of a gale in the Channel by the rapid fall of a Tampion barometer on board and was able to prepare for the storm in which many ships were lost. HUTCHINSON also mentions what must have been a serious problem in those days when no attempt had been made to eliminate

the roll of the ship, namely the pumping of the barometer. WADDINGTON, in his "Navigation," published the same year, although he gives a detailed description of the general circulation of the winds over the Globe, seems more concerned with the barometer as a means of determining the height of the atmosphere.

The foreign mail service was first established during the reign of ELIZABETH, and a packet service to the West Indies, based on Falmouth, was in operation by 1688. By 1770 there was a regular mail service between Falmouth and Boston. It was noticed that the mail packets were often a fortnight longer going from Falmouth to Boston than ordinary merchantmen trading from London to Providence, Rhode Island, and this delay was the subject of a memorial from the Boston Customs to the English Treasury. Dr. BENJAMIN FRANKLIN, who was connected with the American Postal Service, and who happened to be in England on a diplomatic mission, was asked to investigate the matter. In consultation with Captain FOLGER, a Nantucket whaler, he discovered the delay was due to the fact that the mail packets kept in the Gulf Stream right across and were thus set back sixty or seventy miles a day, while the traders avoided it altogether. Captain FOLGER, by means of his knowledge of the whale grounds which existed either side of the Gulf Stream, was able to give Dr. FRANKLIN sufficient data to plot its course and limits. FRANKLIN had the chart engraved and it remained the standard chart of the Gulf Stream for the next seventy years. The definition of the Gulf Stream was far-reaching in its effect, owing to the peculiar thermal properties of that current. The determination of longitude at sea was still practically an unsolved problem for the mariner. The chronometer invented by HARRISON in 1765 and which was to provide the ultimate solution, was still in the experimental stage. The charting of the Gulf Stream, therefore, offered a new method of determining longitude in the North Atlantic, namely by means of the thermometer. This view was brought forward by Dr. FRANKLIN in 1795, the delay in publication being caused by political considerations. There is little doubt that this "Thermometrical Navigation," as it was called, did materially assist in the safe navigation of the Atlantic and not only that, but it diverted trade from the Southern States of North America to the Northern States and considerably shortened passages, for ships were now able to utilise the swift moving current, whereas formerly they had been drifted helplessly out of their course by it.

It cannot be definitely stated when the barometer first came into general use at sea, but that it was beginning to be recognised as a valuable instrument for use at sea by the beginning of the nineteenth century is indicated by HORSBURGH's "India Directory," although no pressure readings are recorded in early man-o'-war logs until some years later. Further, HORSBURGH describes the flux and reflux of the mercury which occurs twice every day in the Tropics resembling the tides of the sea. The first attempt at standardising observations was made in 1805, when a scale for observing the force of the wind was introduced by Admiral Sir FRANCIS BEAUFORT. Thirty years later there began investigations to try and explain what actually happened in those dreaded tropical storms which were such a menace to the stoutest ship. Colonel REID and WILLIAM REDFIELD worked on the problem of the West India hurricane and PIDDINGTON on the cyclones of the Indian Ocean, with the result of REID's "Law of Storms" being published in 1838 and PIDDINGTON's "Sailor's Horn Book" in 1848. The latter was immediately adopted as a text-book for mariners, a position it retained for more than thirty years.

In 1841, Lieutenant MATTHEW FONTAINE MAURY, of the United States Navy, was appointed in charge of the Depôt of Charts and Instruments at Washington, a position he obtained as the result of the marked ability he had shown in a series of articles entitled "Scraps from the Lucky Bag," which dealt in a masterly fashion with such diverse subjects as naval reforms, the Gulf Stream and its causes, and terrestrial magnetism. While in command, he had felt the necessity for a chart which gave a general idea of the winds and currents prevailing along the trade routes. Accordingly, when MAURY went to the Chart Depôt he issued an abstract log to the U.S. Navy and such captains of the Mercantile Marine who cared to co-operate, ruled for recording observations of wind, barometer, current, etc. He also commenced extracting wind and current data from the old Navy logs stored in the Hydrographic Department. In a few years, sufficient data had been extracted to issue the first wind and current chart—that from New York to Rio de Janeiro. Like most innovations they were at first coldly received, but their use once demonstrated, they were in large demand by the ships of all countries.

They were issued free to all ships of friendly Powers who applied for them, the only condition being that, in return, an abstract log should be kept and returned to the Chart Depôt. The utility of these charts may be judged from the fact that the passage to Australia, which had taken on an average 124 days, was reduced to 97 days by their use.

Thus began the first organised attempt to collect and compile weather observations at sea. Previous knowledge had been confined to the results of individual investigation and research. MAURY established the work of observing and the practical application of wind and current to navigation on a national and international basis. For the U.S. Government were so impressed with the importance of this work and the need for extending its field of operation, that they called a conference of the maritime nations of the West to consider the possibilities of mutual co-operation in this matter and the establishment of a uniform system of observing. This conference, which consisted of representatives from England, America, France, Belgium, Holland, Portugal, Norway, Sweden and Denmark, met at Brussels in 1853. It recommended that each country should establish a system for collecting data, a mutual exchange of data taking place where

desirable; also, that tested instruments should be used as far as possible and an agreed form of abstract log kept.

The Brussels Conference may, therefore, be said to mark the birth of marine meteorology as an organised science of sufficient importance to demand State aid and its inception was undoubtedly due to the untiring effort and practical foresight of MAURY, one of the foremost navigators of his day. It was organised for the express purpose of improving navigation, both from the point of view of safety of life at sea and that of commercial enterprise.

By 1858, all the countries represented at the Conference had established weather services for the collection of observations over the sea, the British Meteorological Office coming into being as a Department of the Board of Trade in 1854.

(To be continued.)

Acknowledgment is made to :—

“Ships and Ways of Other Days” by E. KEBLE CHATTERTON.

MAURY’S “Physical Geography of the Seas.”

“Brief Historical Account of the Barometer,” ELLIS. (*Quarterly Journal R. Met. Soc.*, 1886.)

ICE IN THE WESTERN NORTH ATLANTIC.

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

ALTHOUGH ice may be met with in the Western North Atlantic during every month of the year, the season during which it becomes of the greatest menace to shipping is during the five months March to July.

It is then that the ice moving down the east side of the Grand Banks drifts south of the Tail of the Bank and fouls the Trans-Atlantic steamship lanes.

Each year during the above season the International Ice Patrol, conducted by vessels of the United States Coastguard, scour the Banks locating ice and warning vessels of danger, collect data concerning ice movement, and investigate the cause.

Following the *Titanic* disaster in 1912 the principal shipping companies engaged in the North Atlantic trade agreed to follow prescribed routes. These tracks are revised from time to time and laid down so as to avoid, as far as possible, the normal ice zone during the different seasons of the year.

The Cunard Steamship Company, through which communication on General Track matters between the British lines pass, recently promulgated particulars of amended routes which contain many alterations.

The following is a copy of the revised tracks dated October, 1924.

North Atlantic Lane Routes. United States.

Track “A” (extra Southern).

Westbound. From April 1st to June 30th (both days inclusive).

Steer from Fastnet or Bishop Rock on Great Circle course, but nothing South, to cross the meridian of 47° 00' W. in Latitude 40° 30' N., thence by either rhumb line or Great Circle to Boston Light Vessel or to a position South of Nantucket Light Vessel.

Eastbound.—From March 25th to July 7th (both days inclusive).

From the position of 70° 00' W. and 40° 10' N. or from Boston steer by rhumb line to cross the meridian of 47° 00' W. in Latitude 39° 30' N. and from this last position nothing North of the Great Circle to Fastnet or Bishop Rock.

Track “B” (Southern).

Westbound.—From February 1st to March 31st and from July 1st to August 31st (both days inclusive).

Steer from Fastnet or Bishop Rock on Great Circle course, but nothing South to cross the meridian of 47° 00' W. in Latitude 41° 30' N. thence by either rhumb line or Great Circle to Boston Light Vessel or to a position South of Nantucket Light Vessel.

Eastbound.—From February 1st to March 24th and from July 8th to August 31st (both days inclusive).

From the position of 70° 00' W. and 40° 10' N., or from Boston, steer by rhumb line to cross the meridian of 47° 00' W. in Latitude 40° 30' N. and from this last position nothing North of the Great Circle to Fastnet or Bishop Rock.

Track “C” (Northern).

Westbound.—From September 1st to January 31st (both days inclusive).

Steer from Fastnet or Bishop Rock on Great Circle course but nothing South, to cross the meridian of 50° 00' W. in Latitude 43° 00' N. thence by either rhumb line or Great Circle to Boston Light Vessel, or to a position South of Nantucket Light Vessel.

Eastbound.—From September 1st to January 31st (both days inclusive).

From the position of 70° 00' W. in 40° 10' N., or from Boston, steer by rhumb line, to cross the meridian of 50° 00' W. in Latitude 42° 00' N. and from this last position nothing North of the Great Circle to Fastnet or Bishop Rock.

General Instructions.

Vessels bound to or from United States ports calling at Halifax have the option of following either the Canadian or United States

Seasonal Tracks to or from that port passing 40 miles South of Sable Island Westbound, and 60 miles South of Sable Island Eastbound, when proceeding on U.S. Tracks; or 20 miles South of Sable Island Eastbound, when proceeding on Canadian Tracks.

Vessels bound direct to Portland (Maine) may follow the Canadian Seasonal Tracks.

When courses are changed at the intersections of meridians any time before or after noon, Commanders must note in their logs both distances to and from the meridians that the ship has sailed from noon to noon, and not the distance from the position at noon the day before to the position at noon the day after the meridian is crossed.

The date on which tracks change is to apply to the meridian of the Fastnet for Westbound steamers and the meridian of 70° 00' W. for Eastbound vessels.

Communications on General Track matters between the British Lines will pass through the Cunard Line. The Holland-America Line will communicate with the Continental Lines excepting that during the Ice Season the Cunard Line will communicate direct with all Lines.

With regard to proposals for changes in Tracks owing to prevalence of ice the Cunard and White Star Lines in Liverpool will confer and decide dates on which changes are to become operative, advising lines by telegraph. Lines undertake to give immediate instructions to their steamers in accordance with such advices.

North Atlantic Lane Routes. Canada.

Track "D".

From 15th February to 10th April (both days inclusive).

Westbound.—Steer from the Fastnet, Inishtrahull, or 10 miles South of the Bishop Rock on Great Circle course to cross the meridian of 47° W. in Latitude 42° N. thence to Halifax or other Port, passing not less than 40 miles South of Sable Island.

Eastbound.—Steer from Halifax or other Port to pass 20 miles South of Sable Island to Longitude 47° W. in Latitude 43° N., thence on the Great Circle course to the Fastnet, Inishtrahull, or 10 miles South of the Bishop Rock.

Track "E".

From 11th April to 15th May, or until the Cape Race Route clear of ice, and November 15th to February 14th.

Westbound.—Steer from the Fastnet, Inishtrahull, or 10 miles South of the Bishop Rock on the Great Circle course, to the meridian of 50° W. in 45° 55' N., thence to Halifax or the Gulf of St. Lawrence.

NOTE.—The DONALDSON LINE reserve the right to cross Long. 45° W. in Lat. 45° N. on this track.

Eastbound.—Steer from Halifax or the Gulf of St. Lawrence to cross the meridian of 50° W. in Latitude 45° 25' N., thence on the Great Circle course to the Fastnet, Inishtrahull, or 10 miles South of the Bishop Rock.

Track "F".

From 16th May to the opening of Belle Isle Route.

Westbound.—Steer from Fastnet, Inishtrahull, or 10 miles South of the Bishop Rock, on a course 10 miles North of the Great Circle track until approaching Cape Race, then steer a course to pass 10 miles South of Cape Race thence to the St. Lawrence.

Eastbound.—Steer from position 25 miles South of Cape Race on a course 10 miles South of the Great Circle track until approaching Fastnet, Inishtrahull, or 10 miles South of Bishop Rock.

Track "G".

Belle Isle Route—From the opening of the Straits of Belle Isle to November 14th.

Westbound.—Steer from Fastnet, Inishtrahull, or 10 miles South of Bishop Rock, on a course 10 miles North of the Great Circle track until approaching Belle Isle.

Eastbound.—Steer from Belle Isle on a course 10 miles South of the Great Circle track until approaching Fastnet, Inishtrahull, or 10 miles South of the Bishop Rock.

General Instructions.

Vessels bound to or from U.S. Ports from or to the North of Ireland

have the option of following the Canadian Seasonal Tracks D., E. and F., remaining on Track F. during the operative dates of Track G.

On Tracks E. and F. vessels passing 40 miles South of Sable Island Westbound, thence to position South of Nantucket, and Eastbound from position 40° 10' N. in 70° 00' W., to position 60 miles South of Sable Island.

On Track D. Westbound proceeding by rhumb line from position 42° 00' N. in 47° 00' W. to position South of Nantucket, and Eastbound from position 40° 10' N. in 70° 00' W. to position 43° 00' N. in 47° 00' W.

Commanders on encountering ice have permission to deviate from these tracks and after the end of October to leave the Belle Isle for the more Southerly route at their discretion according to weather conditions.

The Lines have the option of continuing the use of the Belle Isle Route after November 14th should they wish to do so.

New Admiralty Route Charts showing the above tracks have recently been published in two sections:—

Chart No. 2058b showing Lane Routes South of Ireland and English Channel.

Chart No. 2058c showing Lane Routes North of Ireland.

That section of the routes running through the ice region in operation for the month is shown on the ICE CHART published with each number of "The Marine Observer."

Examining the above routes it is seen that the tracks laid down for vessels bound to U.S. ports run south of the normal ice zone, and with the assistance of the Ice Patrol Cutter, on duty throughout the season, danger of ice to the navigation of these ships is reduced, but the utmost vigilance is still necessary.

Ships bound to Canadian ports are not so fortunate, as their courses must necessarily pass through the ice region, calling not only for the utmost vigilance and caution but even greater individual knowledge of ice navigation.

From experience obtained in the United States Coastguard Cutters on Ice Patrol duty, it is found that the seaman navigating the ice area in thick weather or at night can depend upon no forewarning of a berg beyond the limit of his visibility. Observations show that on ordinary clear days the average berg can be picked up by the masthead look-out when 18 miles distant and will be seen from the bridge when between 12 to 15 miles away. On a cloudy day with good visibility deduct about 2 miles from the foregoing.

In clear weather, with hazy horizon, the tops of bergs have been observed 11 miles. During light fog or drizzling rain bergs are visible at from two to three miles. In light low fogs bergs are generally picked up by the look-out aloft before observed from the bridge.

In dense fog a berg cannot be seen more than 200 yards ahead of ship, when, if the sun is shining, it appears as a luminous white mass. With no sun it first appears close aboard as a dark mass. In dense fog the bow look-out will probably first detect the ice as the first visible sign is the swash and breaking of the sea on the base of the berg.

On a clear dark starlight night a berg will not be seen with the naked eye further than one quarter of a mile, but should the bearing be known it may be picked up with glasses when one mile distant.

The distance that a berg may be seen on a clear moonlight night depends upon (a) the altitude and age of the moon, and (b) the relative position of moon, berg and ship.

A berg placed between a ship and the moon when low is the most difficult to observe.

With a full moon at not less than 35° in altitude, covered by a thin film of Cirro-Stratus clouds, a berg is visible to the naked eye at a distance of 5 miles, irrespective of the relative position of moon, berg and ship.

A Gulf of St. Lawrence Ice Patrol Service (distinct from the North Atlantic International Ice Patrol) was inaugurated last season by the Canadian Government and will be maintained each year. The Patrol will be carried out by a Canadian Government vessel between Heath Pt. and Cape Ray from the opening of navigation in the spring until the route is clear of ice.

A regular message embodying ice conditions from Cape Race to Quebec and recommendations as to the route to be followed is compiled by the Patrol every four hours commencing at 0500 G.M.T. and kept for immediate transmission to ships upon request. Ships requiring the latest information should call up the Ice Patrol Vessel on 600 metres, spark, call sign VCO.

An ice message is broadcast twice daily at 1300 and 0100 G.M.T. on 600 metres, spark.

Incoming vessels are asked to facilitate the work of the patrol by supplying information regarding ice conditions in their vicinity.

Ice Conditions in 1924.

During the 1924 season there were fewer reports of icebergs in the North Atlantic Ocean than has been the case for several years.

In the month of January reports of three bergs to the north of Latitude 45° N. and east of the Grand Banks were received. In the early part of February field ice extended from 15 miles east of St. Johns in a W.N.W. direction to the 48th meridian, and other large fields were reported during the month to the north of Sable Island over the Barquereau and Mesaine Banks.

The field ice reported over the Banks dispersed early in March, but towards the end of this month a small Arctic field existed along the Newfoundland coast from Cape Race to St. Johns, and small patches of St. Lawrence ice were reported between Halifax and Latitude 44° 30' N., Longitude 60° 00' W. The ice jamb in the Cabot Strait was heavy. The S.S. *Kyle* was held fast for two days in a field of heavy raft ice, seven miles from Sydney, Nova Scotia, and the Schooner *Gordon E. Moulton* was so badly damaged by ice off Burgeo, Newfoundland, that she had to be abandoned in a sinking condition after being set on fire.

The International Ice Patrol resumed duty during this month, and on the 26th reported.—“Oceanographic investigations reveal no distinct current from the north; remarkable absence of ice; ocean temperature above normal.” At the end of the month only two bergs were reported in the vicinity of the Grand Banks.

In the first week in April the Grand Banks were entirely free of field ice. On the 6th one large berg and numerous growlers were reported south of the Tail of the Bank but these had all dissipated by the 12th. On the 22nd a berg was observed in Latitude 44° 57' N., Longitude 52° W. which must have disintegrated quickly, for the Patrol Vessel searching the Banks during the last days of the month reports, “No ice seen or reported by other vessels.” In the Gulf of St. Lawrence, ice conditions were bad throughout April but eased up considerably during the first half of May.

The month of May is normally the worst month in the year for ice, fouling the Atlantic Steamship Lanes in the vicinity of the Grand Banks. This season the Ice Patrol Vessel reports that Arctic water flowing past Cape Race through Gully was below normal and searching the banks during this month, sighted no ice. Numerous steamers crossing this area from Cape Race southward similarly report. On the 23rd the Patrol Vessel sighted a grounded berg one mile south of the entrance to St. John's Harbour and on the 26th a berg was reported in Latitude 48° 42' N., Longitude 51° 31' W. North of the 50th parallel, however, ice conditions were somewhat different, for on the 28th the Patrol Vessel searching the N.E. coast of Newfoundland, found 67 bergs between Notre Dame Bay and Cape Bauld with field ice extending along the coast southward from Belle Isle to the 51st parallel. The majority of the bergs were trapped in the Bight and disintegrating, and the field ice driven off shore by the wind was melting rapidly.

In the Gulf of St. Lawrence some scattered ice and a few bergs were reported between Anticosti and Cape Breton Islands while in the Straits of Belle Isle there was close packed ice, numerous bergs and many growlers.

During the month of June a few bergs were sighted north of the 46th parallel and west of the 50th meridian, but no ice was observed likely to cause danger to vessels proceeding on the normal summer Trans-Atlantic routes; the Ice Patrol Vessels were, therefore, withdrawn for the season on June 30th.

In the Gulf of St. Lawrence the only ice reported was in the Straits of Belle Isle. The S.S. *Cairnross*, passing through the Straits on June 23rd., reported twenty bergs and numerous growlers widely scattered between Point Amour and Belle Isle.

In July numerous bergs were reported within and in the vicinity of Belle Isle Straits but no reports of ice were received for any other area.

In August reports of a few bergs and growlers in the entrance to Belle Isle Straits were received. In the months of September and October, the whole of the western North Atlantic to the southward of Belle Isle was free from ice, with the exception of one small berg reported early in September off Cape Bonavista, Newfoundland. On the 12th October a large berg was reported to the north of the Belle Isle—Inishtrahull Great Circle route in Latitude 55° 51' N., Longitude 43° 21' W., and on November 16th a small low lying berg was reported in Latitude 52° 33' N., Longitude 52° 42' W.

On December 3rd the departure of three steamers from Montreal marked the close of navigation in the St. Lawrence. December 6th one berg was reported off Belle Isle, and on December 29th the Canadian Signal Service reported close packed ice everywhere west of Fame point. The accompanying Chart shows the monthly limits within which reports of ice have been received by the Meteorological Office during the year 1924, also the monthly limits reached by ice over the period 1901–24.

Occasionally bergs in the last stages of disintegration are reported drifting in the Gulf Stream to the southward or eastward of the above limits but such reports are exceptional.

The following table by Lieut. Edward H. Smith, U.S. Coastguard, Oceanographer, International Ice Patrol, shows the number of bergs that may be expected south of the Tail of the Grand Banks each month during a normal year, based on the records of the period 1911–1923.

January	-	0	May	-	18	September	-	1
February	-	1	June	-	13	October	-	0
March	-	4	July	-	3	November	-	0
April	-	9	August	-	2	December	-	0

He says “A berg of average size in the mixed waters south of the Tail of the Banks will survive as a menace to navigation for a period of 12 to 14 days during April, May, and June, but will not survive longer than 10 to 12 days after July 1st. A medium sized one farther south within the confines of the Gulf Stream will survive approximately seven days. Bergs grounded on the banks on its south-west slope or north-west of the Tail survive the longest. There are records of several bergs existing as a menace to navigation for a month to six weeks.

“The approximate temperature of the warm water abutting the cold wall is as follows. Throughout the winter and up to April, 54°, April, 54°–56°, May, 58°–60° and from June throughout the summer to November, 61°–63° when it falls to a minimum in February.”

In order that the Ice Patrol Vessel may be enabled to plot an accurate surface temperature chart of the area under observation and predict the probable movement and behaviour of icebergs in the vicinity of the Tail of the Bank, Commanders of ships entering the zone between the 43rd and 55th meridians are requested to report the following data by wireless to the vessel on patrol.

(a) Icebergs or other obstructions sighted, giving date, time and position, together with the temperature of the water at the time.

(b) Surface temperature of the sea water every four hours when between Latitudes 39° N. and 48° N. and crossing Longitudes 55° W. and 43° W. and giving Latitude and Longitude, course and speed at the time of each observation.

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

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.

SOUTHERLY BUSTER.

THE following is an extract from the Meteorological Log of S.S. *Port Caroline*, Captain F. A. RENAULT, Panama to Sydney, Observer, Mr. P. H. PEDRICK.

"February 22nd, 1924. Making Sydney, New South Wales.

- " 5 p.m. (Lat. 33° 14' S. Long. 152° 49' E.). Long belt of heavy thick and low Nimbus stretching from S. to N.W. Remainder of sky Ci and Cu. Wind N.N.W. force 4, temp. 76°.
- " 5.30 p.m. Remarked that Nimbus clouds unchanged in formation were proceeding in opposite direction to wind.
- " 5.45 p.m. Nimbus clouds overhead in the form of an arch, from which descended streamers of forked lightning. The outside edge of this line of clouds was turned upwards and backwards and presented a most extraordinary appearance. The wind suddenly changing from N.N.W. to S. and increasing to force 7, heaped up the sea in a most peculiar manner. The whole phenomena was accompanied by heavy rain. Barometer, falling before, now commenced to rise. Temp. 73°.
- " 6 p.m. Rain ceased, wind veering to S.S.W. Temp. 73°.
- " 8 p.m. Wind veered S.W. force 7 increasing in force.
- " 9 p.m. Wind S.W., force 9, sky cloudless, stars dim.
- " 9 p.m.—12 p.m. Wind and sea gradually decreasing. On making the coast, exceptional visibility was experienced. All lights were seen at greatly increased distances. Barranjoey Light (a red light) usual visibility ten miles was seen clearly at 25 miles."

NOTE:—An examination of the Australian Daily Weather Map for February 22nd, 1924, shows that the pressure distribution was almost identical to Figure 20 accompanying Chapter VII of "Wireless and Weather," Volume I, No. 7, where a description of the "Southerly Buster" is given.

STRONG SET INTO THE BAY OF BISCAIY.

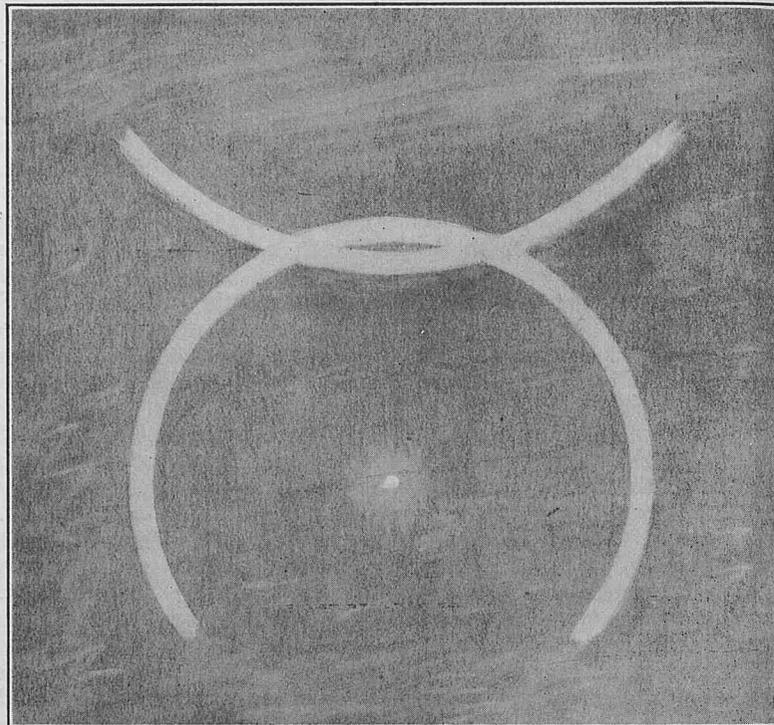
THE following is an extract from the Meteorological Log of S.S. *Asironomer*, Captain W. B. BOOTH, Liverpool to Calcutta, Observing Officer, Mr. E. S. MACHON, Second Officer.

"After passing South Bishop's Light at 00.32 a.m., and Smalls at 1.19 a.m., 21st March, 1924, nothing was seen of land until making Cape St. Vincent on the afternoon of 24th March, but we certainly had a set into the land as we made the coast just south of Cape Sines, having to haul out 1½ points for position off Cape St. Vincent. We judge that most of the inset occurred crossing the Bay, as, steering for position 40 miles west of Finisterre, we ran into the north-bound traffic before we should have seen any at all, notably the Union Castle Liner *Edinburgh Castle* bound in for the English Channel. Taking everything into consideration we think that we had, at least, a 20 miles set into the Bay."

Between 20th March, and 24th, 1924, a large depression was situated to S.W. of Ireland, giving strong south westerly winds over the route, Channel to Gibraltar, which would tend to create an easterly current into the Bay of Biscay.

S.S. *Edinburgh Castle*, Captain H. STRONG, Cape Town to Southampton, reported a current of S.85° E. 22 miles, in the two days, March 21st to 23rd, between Lat. 38° 05' N., Long. 13° 02' W., and Lat. 49° 15' N., Long. 4° 58' W.

LUNAR HALO.



THE halo sketched above was seen off Cape Trafalgar from S.S. *Chindwin*, Captain C. ESSLEMONT, Port Said to London, Observer, Mr. W. WILSON, 3rd Officer, on the night of March 22nd, 1924, between 10.30 and 10.55 p.m.

"At 10.55 p.m., the upper part disappeared, and the part to the left-hand side grew faint and indistinct, finally disappearing altogether.

"The altitude of the moon at the time was 35½° approx., and rising. Radius of halo 23°.

"The lower half of the halo (or slightly less than half) not visible, the upper halo though not curved quite so much as above was clearly visible inside the lower halo.

"Clouds, Upper, Ci-St., Lower, Cu., Amount 3. Wind, W.S.W.2."

A SMALL TROPICAL REVOLVING STORM.

THE following account has been received from H.M.S. *Herald*, Commander J. R. HARVEY, R.N., Colombo to Singapore, Observing Officer, Lieutenant W. C. JENKS, R.N.

"The Ship's position at noon on 7th March, 1924, was Lat. 5° 43' 07" N., Long. 88° 01' 04" E.

"The wind, which until 0400 had been between N.N.E. and N.E. since the ship cleared Point de Galle backed to N.N.W., force 2-3. Barometer read 1015 mbs., and weather was fine with Ci-Cu/A-Cu upper clouds, and St-Cu, lower clouds, 4/10ths clouded. Sea N.N.E. 1 and a slight swell. Ship's course 089°, speed 9 knots.

"During the afternoon the sky clouded over from N.E. and the barometer fell to 1013.5 mbs; at 1600, wind N.N.W. 1-2, upper clouds Ci-St./A-Cu, lower clouds Cu/Cu-Nb., 9/10ths clouded. Sea, N.N.W 2 and a slight confused swell comprised of a long shallow S. swell and a short N.E. swell.

"In the evening the wind increased very slightly, and backed slowly. The barometer rose to 1015 mbs. again at 2000. The sky remained 8/10ths clouded with much Cu.

"At midnight 7th-8th, the wind was W.N.W., force 3. Barometer 1015, sky 8/10ths clouded, Cu., sea N.W. 2, and a slight swell as before. At this time vivid lightning was observed on the N.E. horizon, which gradually shifted to N.W. (at 0200) and diminished in frequency. The sky was completely clouded and it commenced to drizzle. At 0300, rain came down heavily until 0400, when it cleared slightly. The wind continued to freshen, but remained steady in direction W.N.W., force 5 at 0400. Barometer 1013.5 mbs.

"Heavy rain recommenced at 0440 and was practically continuous until 0800 when it changed to a light rain which continued with short and frequent very heavy rain squalls throughout the forenoon. Wind and sea increased steadily. At noon the wind was still W.N.W., force 6. Barometer 1013.3.

"Similar weather held during the afternoon with an increasing wind and sea and direction of the wind remained steady until 1600 when it backed to W. by N., force was then 7 and the barometer had fallen to 1008.8. Sea was W.N.W. 5, short and much broken, and the ship rolling heavily.

"The wind now backed swiftly and the glass fell faster. At 1730 wind was W. by S. 7, barometer 1007.8. At 1800 wind was S.W. by W. force 8, barometer 1007.5. At 1810, wind had gone round to S.S.W. and increased to force 9. At 1830 wind was still S.S.W., force 9 and the barometer steady at 1007.5. A continuous succession of very heavy rain squalls swept across during this time.

"The wind now veered slightly and at 1900 was S.W., force 8. At 1930 the sky broke overhead and rain ceased. The sky clouded over again at 2000, but a wind squall which occurred at this time was not accompanied by rain.

"The barometer now rose quickly being 1009.6 at 2100. Heavy rain squalls with slightly increasing wind during squalls were frequent until midnight. No rain fell between the squalls and the sky cleared partially in the intervals. The wind fell slowly and backed steadily.

"At midnight the wind was S. by W., force 7, sea W.S.W. 4, barometer 1011.7 mbs.

"Heavy rain came on at 0015 of the 9th March, and continued without intermission until 0350. At 0200, the wind swung right around to E.

"At 0400, wind E., force 7, sea confused 5. Barometer 1010 mbs.

"The wind decreased still, and at 0800 was S.E. by S., force 5, barometer 1014. Shortly after the weather became calm and at noon on the 9th, the ship was in the Malacca passage. Light air, calm sea, overcast sky with heavy rain squalls over the land and N. horizon.

"Barometer readings are in all cases uncorrected."

PHOSPHORESCENCE.

THE following has been received from S.S. *Glenshane*, Captain W. E. ROBERTS, London to China. Observer, Mr. V. ROWE, 2nd Officer.

"March 6th, 1924, 3.30 to 3.35 a.m. Lat. 11° 13' N., Long. 56° 12' E. Wind N.E. 3, slight sea, passing clouds, fine and clear weather.

"Six patches of abnormally bright phosphorescence were observed at distances varying from alongside to about three quarters of a mile from the ship.

"From observation of the patch we passed alongside and the nearer ones the diameters were about 40 feet.

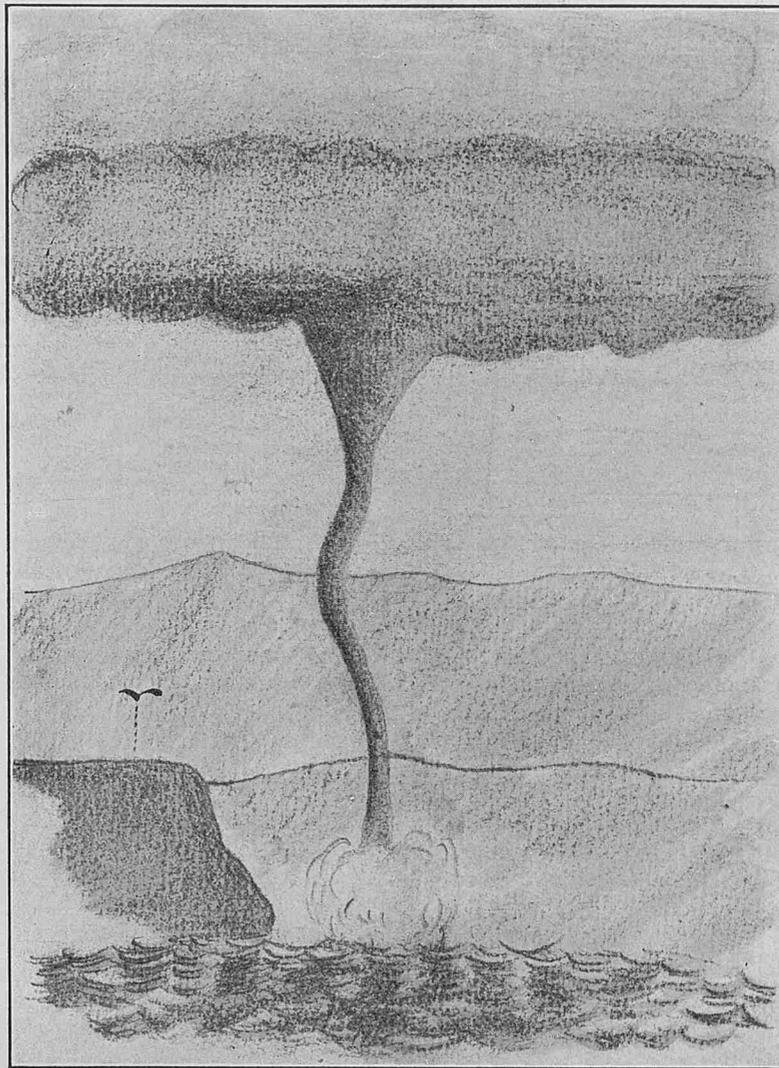
"The whole patch seemed to suddenly flash into abnormal brightness. This would last about two seconds and then fade right away in about twenty seconds.

"The luminescence appeared to come from near the surface, but there was no unusual breaking of the sea or other indications of a shoal of small fish.

"To show the brightness of this luminescence, the momentary light given off from the patch alongside was enough so that on the bridge it was possible to read small print.

"It did not appear to have anything to do with the presence of the ship, as the first patches to flash up were those furthest away."

WATERSPOUT.



LAT. 36° 25' N. LONG. 0° 36' E

11.40 AM A.T.S.

BEARING SOUTH (T) DIST: 5 MILES APPROX:

CAPE KHAMIS

SS "FRANKENFELS"

S.W. ALLINGHAM.

2nd OFFICER.

6.2.25

EXTRACT from Meteorological Log kept on board S.S. *Frankenfels*, Captain A. TAYLOR, O.B.E., Port Said to Oran. Observer, Mr. J. W. ALLINGHAM, 2nd Officer.

"6th February, 1923, 11.40 a.m., A.T.S., 2352, G.M.T. Ship in Lat. 36° 25' N., Long. 0° 38' E., bound to Oran. Cape Khamis, S. 10° E. (T) dist. 5½ miles. Wind west (T), Force 3, weather clear and cloudy, sea slight. Heavy Cu-Nb clouds to southward over coast, where rain observed to be falling. Barometer 1013.5 mb. (29.93 ins.), dry bulb 56°.5, wet bulb 53°.

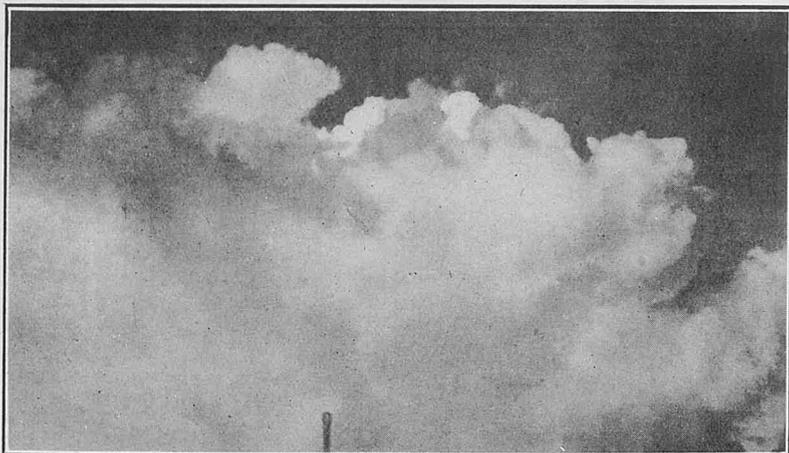
"An inverted cone of dark cloud observed to be reaching down from flat base of Nimbus and first seen slightly to the west of Cape Khamis. In two minutes this had reached down to the sea close to the coast and developed into a waterspout, around the base of which the sea was observed to be agitated.

"The summit of spout, which was computed by sextant measurements to be 2,300 feet high, appeared to be travelling along with the mass of Cu-Nb cloud, to the base of which it was attached, in a E.N.E. direction, and the base of the spout appeared to strike Cape Khamis.

"The spout remained intact for four minutes and then fractured about 300 feet down from base of clouds and the broken inverted cone gradually disappeared.

"Several other slight inverted cones, which did not actually develop into spouts, were observed also on the base of same cloud."

CLOUD PHOTOGRAPH.



THE above photograph was taken from R.M.S. *Orsova*, Commander C. G. MATHESON, D.S.O., R.N.R., Colombo to Fremantle, by Mr. C. V. DODGSON, 4th Officer, on March 27th, 1924, at 5 p.m., in Lat. 7° S., Long. 91° E.

“At the time the wind was calm and there were numerous flat bottomed Cumulus clouds at even altitude all round the horizon.”

A LOCAL WEATHER BOUNDARY ON THE WEST COAST OF SOUTH AMERICA.

THE following is extracted from the Meteorological Report of M.V. *Losada*, Captain G. W. MELDRUM, Hull to Valparaiso, Observer, Mr. A. H. TURNER.

“It has been observed by those who have spent many years on this coast that the Island of Chanaral (Lat. 29° S., Long. 71½° W.) or the vicinity thereof generally, forms a sort of weather and current boundary, which is to say that the weather and currents north and south thereof are seldom similar.”

WATERSPOUT.

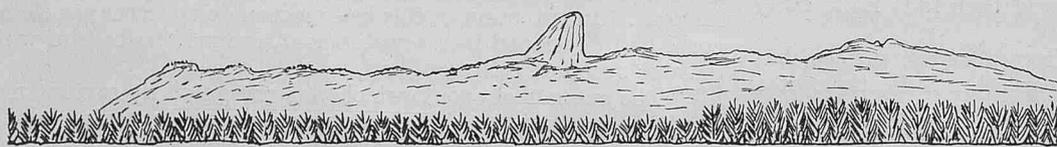
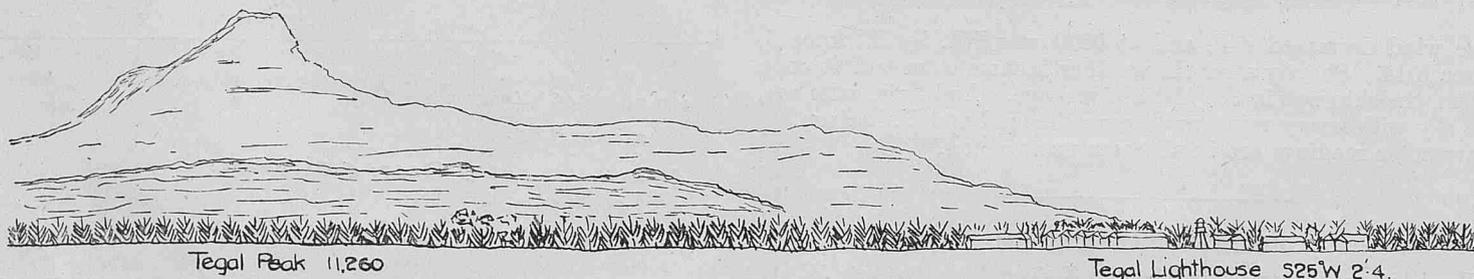
EXTRACT from Meteorological Report of S.S. *Cornwall*, Captain H. W. ROBERTSON, Monte Video to London, Observer, Mr. W. M. GLOVER.

“30.3.24. 10.20 a.m. Lat. 10° 50' S., Long. 35° 52' W., observed waterspout form bearing N.N.W. approx. dist. 1½ miles. Wind E.S.E. force 3. Barometer 29.42. Temperature 78° F. Cloud, heavy Nimbus, sextant angular height 12°, movement in S.W. direction, motion of whirl clockwise. Spout broke within five minutes of forming and shortly afterwards wind backed to N.N.W. in light shower.”

JAVA PORTS.

THE following sketches and remarks are contributed by Captain G. PARK, of the Asiatic Steam Navigation Company.

Tegal, Java.



Karang Jeruk Beacon Approx 15' high

“Charts.—Island of Java, Western Portion No. 1653. Anchorages on North Coast of Java No. 3311.

“The lighthouse is difficult to pick up even in very clear weather.

“Karang Jeruk Beacon is also difficult to find and when once found, to find again.

“Your main guides to an anchorage are the grey-white godowns, which are near the Lighthouse as per sketch.

“Steer for these godowns on the bearing you desire to anchor. Use the lead and go slow. Do not rely on making use of Karang Jeruk Beacon.

"During the East Monsoon anchor well east even as far as the Lighthouse bearing S. 35° W. This allows the lighters to return by sail.

"During the West Monsoon anchor with the Lighthouse bearing South or S. 5° E. You must allow for the lighters to return, and the West Monsoon is dangerous for them.

"If there is any swell the lighters will only go on one side of you.

"Tegal has the reputation for a speedy Port with very good labour. I agree.

"I offer you Mt. Gajah, which may help you."

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

III. March.

PRESSURE continues to decrease over Northern India, the normal reading for this month being 1012 mb. (29.89 in.).

The 1012 isobar follows a very irregular course. Trending in a general S.W.—N.E. direction over the Arabian Sea, it curves over Northern India and continues in a N.W.—S.E. direction over the Bay of Bengal, thus forming the southern boundary of two distinct areas of high pressure centred over the Persian Gulf and middle Chinese Provinces respectively.

From the centre of these highs, pressure decreases in a S.E. direction over the Arabian Sea and in a S.W. direction over the Bay of Bengal to the equatorial low, which, with an average minimum pressure of 1009 mb. (29.80 in.) forms a wedge-shaped "trough" across the ocean extending between Latitude 5° N., and 10° S. on the eastern side and between the Equator and Latitude 10° S. on the western side.

Over the North Indian Ocean the normal difference for the month is 5 mb. (.15 in.).

In the northern part of the Arabian Sea, the winds are light to moderate in strength and variable in direction. South of Latitude 20° N., the N.E. monsoon continues to blow steadily with moderate force, decreasing in strength as the Equator is approached, calms being not infrequent.

At the extreme head of the Bay of Bengal winds are light and variable. On the western side of the Bay, moderate to light south-westerly winds predominate. On the eastern side, the winds are from west to north, while in the south of the Bay, they come from north-east to east. From the Equator to Latitude 5° S., eastward of the 60th meridian, a light N.W. monsoon continues.

Within the equatorial low winds are light and variable, excepting off the African coast, where light easterly winds predominate. Calms are frequent, especially off the coast of Sumatra.

Over the South Indian Ocean, pressure is increasing. With maximum pressure of 1022 mb. (30.18 in.) situated in approximately Latitude 32° S., Longitude 97° E., it decreases in a northerly direction to the equatorial low, the difference in pressure over this area being 13 mb. (0.38 in.).

The trades blow steadily between the parallels of 10° and 30° S. from the Australian coast to within a few degrees of the east coast of Madagascar. Averaging force 5 in strength they occasionally increase and blow with the force of a moderate gale. The winds off the east coast of Madagascar are variable both in direction and force, being greatly affected by land and sea breezes. During this month, gales are not infrequent.

In the northern part of the Mozambique Channel, the winds are variable in direction with a large percentage of calms, but in the southern part, the general direction of the wind is from a southerly point. Strong winds and gales may also be experienced in this locality during this month. In the area of highest pressure, south of the Trade Wind belt, winds are variable both in direction and force.

Cyclonic Storms.—In the Indian Ocean north of the Equator, only two storms of a cyclonic nature are recorded since the year 1890. This area, may, therefore, be regarded as free from cyclones during the month of March.

South Indian Ocean.—In the South Indian Ocean the percentage of cyclonic storms recorded during March is only a little less than in January and February. Ninety-eight storms, giving a percentage frequency of 19 per cent., were recorded in this month during the years 1848–1917.

Few storms originate east of the 90th meridian, while the majority originate west of 70° E. A few storms have penetrated into Madagascar, but there is no record of a cyclone passing down the Mozambique Channel in March.

Air Temperatures.—Over the Arabian Sea, temperature ranges from 72° F. in the north to about 82° F. in the south. In the Bay of Bengal the range is not so great, temperature being 80° F. in the north and 82° F. in the south. Between Latitude 5° N. and 10° S. the average temperature is 82° F., whence it decreases gradually with increased Latitude, being between 65° F. and 70° F. in Latitude 35° S.

Sea Surface Temperature.—In the Arabian Sea the normal sea surface temperature increases from 74° F. in the north to between 82° F. and 84° F. in the south, being slightly lower on the western side of the Sea. In the Bay of Bengal, the range is between 80° F. in the north and 83° F. in the south. Over the central equatorial regions between Latitude 10° north and south, the average temperature is between 83° F. and 85° F., being lowest off the African coast.

From Latitude 10° S., temperature decreases to the southward to between 65° F., and 70° F. in Latitude 35° S.

Currents.—In the western half of the Arabian Sea, north of the 10th parallel, the sea surface currents are very irregular both in set and drift. On the eastern side the current setting down the east coast of the peninsula spreads fan-shape at the mouth of the Gulf of Cambay and covers the whole of the eastern half of the Sea. Reaching the 10th meridian it gradually turns W.S.W., flowing in this direction down to the Equator, between the meridians of 80° and 60° E. In 66° E., it branches, one branch turns N.W., and flowing up the African coast, turns into the Gulf of Aden; the other branch sets S.W. flowing down the African coast.

In the Bay of Bengal, the currents, conforming generally with the prevailing wind direction, completely encircle the Bay. Following the land to the north and N.E. on the western side, it sets to the eastward in the north of the Bay, to the S.E. and S.W. on the eastern side and to the westward in the south of the Bay. South of Ceylon to the Equator, between the 80th meridian and the Sumatra coast, the currents are extremely variable.

South Indian Ocean.—The currents setting up and down the African coast, meeting in about Latitude 3° S., turn to the eastward and flow in this direction between the Equator and Latitude 10° S. to the 95th meridian. Between the 95th meridian and the coast of Sumatra the currents are irregular.

West of the 110th meridian, between the parallels of 10° and 30° S., the S.E. trade drift sets across the whole Ocean. Separating at about the 60th meridian it flows north and south of Madagascar.

The branch flowing to the north strikes the African coast off Cape Delgado and again branches, one branch running along the coast to the north, while the other, following the coast to the S.W., joins with that branch flowing to the south of Madagascar,

off Delagoa Bay whence it follows the coast to the south.

Between the 110th meridian and the west coast of Australia, the currents are variable with frequent tendency towards the land.

South of the 30th parallel the currents are variable.

PAMPERO OFF THE ARGENTINE COAST.

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

IN the Meteorological Report of the S.S. *Royal Transport*, (Captain J. DOVE), on passage from Hull to Montevideo it is recorded that on March 3rd, 1924, when off the coast of Argentine, a Pampero was encountered, the wind blowing with hurricane force accompanied with torrential rain and vivid lightning.

Pampero is the local name given to the heavy line squall which may be encountered on the cold front of a depression passing seaward over the Argentine coast.

The normal track of depressions leaving this coast is to the E.S.E., in which case the squall line is situated N.W. of the centre, where the cold S.W. or west current of air coming from over the Pampas undercuts the warmer N.W. current originating in equatorial regions.

Pamperos are most frequent during the southern winter. They are generally preceded by unsettled weather which is followed by a northerly wind, later freshening and backing to N.W. with rain or haze. Should the weather be hazy with lightning to the S.W. a Pampero is certain.

The Pampero bursts with violent and dangerous squalls from a westerly direction accompanied by rain, hail and vivid lightning. Later, with a clearing sky and a decided drop in temperature, the wind shifts to the S.W.

The above sequence of weather being that generally understood by seamen as typical of a Pampero, it is interesting to note that the *Royal Transport* in south Latitude experienced all the general characteristics of a line squall when situated on the polar side of a depression, experiencing the shift of wind from E.N.E. to south. By a line squall is meant a violent squall moving up in a dark line or arch of cloud stretching across the sky athwart the wind, accompanied by rain, hail, thunder and lightning.

WEATHER CHARTS NOS. X, XI AND XII, are drawn from the Wireless Weather Reports broadcast from Rio de Janeiro (for particulars of which see "Weather Signals," MARINE OBSERVER, December, 1924) and from observations contained in ships' meteorological logs and forms.

On these charts isobars are drawn in for every two instead of four millibars as is the custom at sea, in order to show as clearly as possible, the distribution of pressure in the vicinity of *Royal Transport* on the 2nd, 3rd and 4th March.

CHART X, 0800, MORNING OF MARCH 2ND, shows *Royal Transport* to be situated on the polar side of a secondary to a shallow oval shaped depression centred over Uruguay. Steering S 37° W. 11 knots

she has for the previous 24 hours experienced a steady, normal barometer 1016 mb. (30.00 in.) moderate easterly wind and fine clear weather. Shortly after the time of the observations on which the chart is drawn her barometer commenced to fall, and at 2000 registered 1012.5 mb. (29.90 in.) when she reports no change in direction or force of wind, but overcast sky and rain.

CHART XI, 0800, MORNING OF MARCH 3RD.—During the past 24 hours the depression centred over Uruguay on the previous morning has moved in an easterly direction and has intensified. The centre is now situated between *Royal Transport* and *Darro*. It appears that the secondary shown on yesterday's chart has deepened but remained practically stationary. *Royal Transport* steaming S. 40° W. 11 knots with barometer at 1009 mb. (29.80 in.) falling slowly, reports that at 10 a.m. she encountered a Pampero and broadcasted the following message to all ships:—

Latitude 31° 20' S. Longitude 49° 55' W. Barometer 29.40 in. (29.80 corrected), wind S.W. 12. Hove to.

At 8 a.m. on this day *Royal Transport's* wind, which had been steady from east, force 4, for the past twenty-four hours, backed to E.N.E. and freshened, when the temperature of both air and sea dropped from 77° F. to 73° and 74° F. respectively, the air then becoming colder than the sea, which seems to point to this air current originating from a southern source. The temperature of the S.W. and westerly currents of air blowing off the land reported by *Deseado* and *Darro* are both warmer than the sea and warmer than that reported by *Royal Transport*.

From the above observation of reported temperatures it would seem that *Royal Transport* crossed from a warm sector of the depression to a cold sector at 8 a.m. and the fierce line squall experienced two hours later was the effect of encountering the line of separation between the warm S.W. wind coming from off the heated land and the colder current from the E.N.E.

CHART XII, 0800, MORNING OF MARCH 4TH, shows the depression to have moved in a N.N.E. direction during the previous twenty-four hours. This unusual path might be explained by the fact that the air feeding the N.W. sector of the depression was relatively warmer than that feeding the S.E. sector.

According to the BJERKNES theory, a short account of which was published in the October, 1924, Number of the MARINE OBSERVER, Chapter X, "Wireless and Weather, an Aid to Navigation," a depression should move parallel to the isobars in the warm sector. In this case the isobars of the warm sector run in approximately a N.N.E. direction, the same as that followed by the path of the depression.

WEATHER SIGNALS.

II.—WIRELESS WEATHER BULLETINS.

HOLLAND.

North Sea. (Spark Issue.)

Scheveningen W/T station approximate Latitude 52° 06' N. Longitude 4° 16' E., call sign **PCH**, broadcasts a weather message, in code, at 1115 G.M.T. daily (Sundays and holidays excepted) on a wave length of 1,800 metres (spark) giving the 0700 G.M.T. observations of the undermentioned stations, always in the following order:—

Station	Latitude	Longitude	(approx.)
Helder	52° 58' N.	4° 45' E.	(approx.)
Flushing	51° 26' N.	3° 34' E.	„
Gris Nez	50° 54' N.	1° 35' E.	„
La Hague	49° 43' N.	1° 57' W.	„
Yarmouth	52° 35' N.	1° 43' E.	„
Tynemouth	55° 01' N.	1° 25' W.	„
Skudesnaes	59° 08' N.	5° 16' E.	„
Sylt	54° 54' N.	8° 21' E.	„

The name of the station is omitted, but the sets of observations will be easily recognised by the order in which they are given. When the data for one or more of the stations is missing, each group of figures is replaced by the letter "X." The message is preceded by the letters KNMI and is in three parts.

Part I.

Gives the observations of Helder, Flushing, Gris Nez and La Hague, two groups of five figures for each station.

First Group.—The first 3 figures give the barometer reading corrected in millimetres and tenths, the initial 7 being omitted. (To convert to millibars and inches see Table XV.) The 4th and 5th figures give the wind direction true (Table III, p. 13, January, 1925, MARINE OBSERVER).

Second Group.—1st figure gives the wind force by Beaufort Scale. Forces 9 and above sent as 9. 2nd figure gives the state of sky and weather (see Table XVI). 3rd and 4th figures give the temperature in whole degrees Centigrade. (To convert to Fahrenheit see Table XVII.) 5th figure gives the state of the sea (Table XVIII).

Part II.

Gives the observations of Yarmouth, Tynemouth, Skudesnaes and Sylt in two groups for each station, the first group containing five figures and the second only four figures. The figures in these groups have the same meaning as in Part I, the figure representing the state of the sea, in the second group being omitted.

Part III.

Consists of a storm signal. For particulars see under "Wireless Storm Warnings, Holland," p. 47.

NOTE.—When the weather message is sent on request a charge is debited to the ship concerned.

North Sea. (C.W. Issue.)

Soesterberg W/T station, approximate Latitude 52° 08' N. Longitude 5° 17' E., call sign **STB**, broadcasts weather bulletins, in code, containing observations of the undermentioned stations as follows:—

Wave length, 1900 metres C.W.

Times of transmission:—

0730 G.M.T. (observations at 0700 G.M.T.)

1330 G.M.T. (observations at 1300 G.M.T.)

1830 G.M.T. (observations at 1800 G.M.T.)

Observation stations.

Index Numbers.	Name.	Latitude.	Longitude.
01	Helder	52° 58' N.	4° 45' E. (approx.)
02	Flushing	51° 26' N.	3° 34' E. „
03	Utrecht (de Bilt).	52° 06' N.	5° 11' E. „
08	Noord-Hinder Lt. Vsl.	51° 35' N.	2° 37' E. „

Code and Form of individual bulletins—New International Code used; bulletins commence with the words "Météo Holland":—

0730 Bulletin—In three parts.

Part 1—Expressed by symbols (see p. 11, January, 1925, MARINE OBSERVER) is as follows:—

$I_n I_n$ BBBDD FwwTT cbWVH ALaNH RRjjr

where,

$I_n I_n$ = Index number of station.

BBB = Corrected barometer reading in millimetres and tenths, initial 7 omitted. (To convert to mbs. and ins. see Table XV.)

DD = Wind direction, true (Table III, p. 13, January, 1925, MARINE OBSERVER).

F = Wind force, by Beaufort scale. Forces 9 and above sent as 9.

ww = Present weather (Table V, p. 15, January, 1925, MARINE OBSERVER.)

TT = Air temperature, Centigrade. (See Table XVII to convert to Faht.)

c = Characteristic of barometer tendency during the 3 hours previous to the time of observation. (Table XIX.)

b = Amount of barometric tendency during last 3 hours in half-millimetres.

W = Past weather. (Table XI, p. 16, January, 1925, MARINE OBSERVER.)

V = Visibility. (Table XX.)

H = Relative humidity of the air. (Table XXI.)

A = Cloud form lowest in the table of cloud forms. (Table IX, p. 16, January, 1925, MARINE OBSERVER.)

L = Amount of sky covered by cloud form "A."

a = Cloud form highest in the table of cloud forms. (Table IX, p. 16, January, 1925, MARINE OBSERVER.)

N = Total amount of cloud.

h = Height of base of lowest cloud present. (Table XXII.)

RR = Rainfall during last 13 hours, in whole millimetres. (See also Table XXIII.)

jj = For station 03, minimum air temperature during last 13 hours in whole degrees Centigrade. (See Table XVII to convert to Faht.)

For stations 01, 02 and 08, one figure gives the state of the sea and swell (S.—Table XXIV.)

Other figure gives the visibility seawards (V_s —Table XX.)

r = Time of commencement of precipitation (Table XXV.)

A group of 5 figures relating to upper air observations then follows if observations are available.

Part II.—preceded by word "pilot" contains upper wind observations from stations 01 and 03.

Part III.—preceded by word "temp" contains upper air temperatures from stations 01 and 03.

1330 Bulletin.—Same form as the 0730 Bulletin. The 5th group of Part I, RRjjr is omitted.

1830 Bulletin.—Same form as the 0730 Bulletin. In the 5th group of Part I the figures sent for jj = the maximum air temperature (whole degrees Centigrade) during the last 11 hours, for station 03. For remaining stations jj = state of sea and swell, one figure, and visibility seaward, one figure, as in the 0730 Bulletin.

GERMANY.

North Sea. (Spark Issue.)

Norddeich W/T station, approximate Latitude 53° 36' N. Longitude 7° 08' E., call sign **KAV**, broadcasts on a wave length of 1,100 metres spark, at 1015 and 2130 G.M.T. weather bulletins, *en clair*, containing the 0700 and 1800 G.M.T. observations, respectively, of wind direction and force, state of the sea, clouds, rain, mist, fog, etc., of the following stations:—

	Latitude.	Longitude.
Borkum Riff Light vessel	53° 45' N.	6° 04' E. (approx.)
Amrum Bank Light vessel	54° 33' N.	7° 53' E. „
Utsire - - - -	59° 18' N.	4° 53' E. „
Tynemouth - - -	55° 01' N.	1° 25' W. „

Followed by atmospheric pressure over Europe and a weather forecast for the North Sea.

Western and Middle Baltic. (Spark Issue.)

Swinemünde W/T station, approximate Latitude 53° 55' N. Longitude 14° 16' E., call sign KAW, broadcasts on a wave length of 1,100 metres, spark, at 1030 and 2145 G.M.T. weather bulletins *en clair*, preceded by the word "Funkwetter," containing the 0700 and 1800 G.M.T. observations, respectively, of wind direction and force, state of the sea, etc.—as for Norddeich, of the following stations :—

	Latitude.	Longitude.
Bülk - - - -	54° 27' N.	10° 12' E. (approx.)
Adlergrund Light vessel	54° 50' N.	14° 22' E. „
Skagen - - - -	57° 45' N.	10° 38' E. „
Visby - - - -	57° 39' N.	18° 18' E. „

Followed by a general review of the weather, and a forecast for the western and middle Baltic.

Eastern Baltic. (Spark Issue.)

Pillau W/T station, approximate Latitude 54° 39' N. Longitude 19° 53' E., call sign KAP, broadcasts on a wave length of 600 metres, spark, at 1130 G.M.T. a weather bulletin, *en clair*, containing the 0700 G.M.T. observations of wind direction and force, state of the sea, etc., as for Norddeich, of the following stations :—

	Latitude.	Longitude.
Pillau - - - -	54° 39' N.	19° 53' E. (approx.)
Brüsterort - - -	54° 56' N.	19° 56' E. „
Memel - - - -	55° 44' N.	21° 06' E. „
Visby - - - -	57° 39' N.	18° 18' E. „

Followed by a general review of the weather, and a forecast for the eastern Baltic.

DENMARK.

North Sea and Baltic. (C.W. Issue.)

Lynby W/T station, approximate Latitude 55° 46' N. Longitude 12° 29' E., call sign OXE, broadcasts weather bulletins, in code, containing observations of the undermentioned stations, and ships, as follows :—

Wave length, 3,650 metres, C.W.

Times of transmission :—

- 0735 G.M.T. (observations at 0700 G.M.T., land stations and ships).
- 1335 G.M.T. (observations at 1300 G.M.T., land stations and ships).
- 1835 G.M.T. (observations at 1800 G.M.T., land stations and ships).

Observation stations.

Index Numbers.	Name.	Latitude.	Longitude.
01	Copenhagen - -	55° 42' N.	12° 37' E. (approx.)
02	Skagen - - - -	57° 46' N.	10° 38' E. „
03	Hantsholm - - -	57° 07' N.	8° 36' E. „
04	Blaavandshuk - -	55° 33' N.	8° 05' E. „
05	Hammeren - - -	55° 17' N.	14° 46' E. „

Code and Form of individual bulletins—New International Code used; bulletins commence with the words "Météo Danois" and are in two parts :—

0735 Bulletin—Part I (Land Station observations), expressed by symbols, is as follows :—

I_nI_n BBBDD FwwTT cbWVH ALAnh RRSV_r

These have the same meanings as given in the Soesterberg (Holland) issue, p. 43 of this Number.

In the 5th group, the third symbol S represents the state of the sea and swell (Table XXIV) and the fourth, V_s, the visibility seawards (Table XX).

Part II (Ships' observations, preceded by the word "Navires") :

PQLLL 111GG BBDDF wvwKd CNTTT Wrttt,

in which the first four groups have the same meanings, as given on the "Decode Form," p. 14, January 1925, MARINE OBSERVER, barometric pressure being in millimetres. Remaining symbols as follows :—

C = Cloud predominating (Table IX, p. 16, January, 1925, MARINE OBSERVER).

N = Cloud amount (Table X, p. 16, January, 1925, MARINE OBSERVER).

TTT = Air temperature in degrees and tenths, Centigrade. (See Table XVII for conversion to Faht.)

W = Past weather (Table XI, p. 16, January, 1925, MARINE OBSERVER).

r = Time of commencement of precipitation (Table XXV).

ttt = Sea temperature in degrees and tenths Centigrade.

1335 Bulletin—Part I, same as in 0735 bulletin, group RRSV_r, omitted.

Part II, same as in 0735 bulletin.

1835 Bulletin—Parts I and II, same as in 0735 bulletin.

NOTE.—An extra group relating to upper air observations may be added to the bulletins.

SWEDEN.

North Sea and Baltic. (Spark or C.W. Issue.)

Karlsborg W/T station, approximate Latitude 58° 29' N. Longitude 14° 29' E., call sign SAJ, broadcasts a weather bulletin as follows :—

Wave length, 2,600 metres, spark or C.W.

Time of transmission, 1215 G.M.T.

The Bulletin is divided into 4 parts, viz :—

Part I.

Contains observations in special code of the following stations :—

Index Letter.	Station.	Latitude.	Longitude.
R	Röst - - - -	67° 30' N.	12° 04' E. (approx.)
K	Kinn - - - -	61° 34' N.	4° 47' E. „
U	Utsire - - - -	59° 18' N.	4° 53' E. „
HM	Hantsholm - - -	57° 07' N.	8° 36' E. „
V	Vinga - - - -	57° 38' N.	11° 36' E. „
HS	Hammershus (Bornholm)	55° 17' N.	14° 46' E. „
G	Gotska Sandön - -	58° 23' N.	19° 11' E. „
B	Bremo - - - -	62° 13' N.	17° 44' E. „

The observations preceded by the word "Weatherreport," are broadcast in two groups of five figures for each station.

1st Group.—First three figures give the corrected barometer reading in millimetres and tenths, initial figure omitted (see Conversion Table XV).

Fourth and fifth figures give the wind direction (true). (Table III, p. 13, January, 1925 MARINE OBSERVER.)

2nd Group.—First figure gives the wind force by Beaufort scale. When the wind force is greater than 9 the figure 9 is sent but the actual force is given at the end of the information for the station concerned preceded by the word "storm," for example, force 11 would be sent as "Storm 11."

Second figure gives the state of the sky or weather (Table XVI.)

Third and fourth figures give the air temperature in whole degrees Centigrade. (See Conversion Table XVII.)

Fifth figure gives the state of the sea and swell (Table XXIV.)
X = No observations.

Part 2.

Gives the distribution of atmospheric pressure and changes in the same for Europe at 0700 G.M.T. and is sent *en clair* (English).

Part 3.

Contains weather forecasts for the ensuing 24 hours preceded by the word "Forecasts," and consists of a group of 5 figures for each of the following districts, each group being prefixed by a code letter:—

Code Letter.	District.
N	Eastern portion of North Sea.
V	West Coast of Sweden.
Oe	Baltic.
B	Gulf of Bothnia.

Explanation.—1st and 2nd figures give forecasts of the wind on the following scale:—

Wind.	Direction between—								
	N.-E.	N.E.-S.E.	E.-S.	S.E.-S.W.	S.-W.	S.W.-N.W.	W.-N.	N.W.-N.E.	Variable.
Light... ..	01	06	11	16	21	26	31	36	41
Moderate ...	02	07	12	17	22	27	32	37	42
Fresh... ..	03	08	13	18	23	28	33	38	43
Strong ...	04	09	14	19	24	29	34	39	44
Storm ...	05	10	15	20	25	30	35	40	45

00 = very light wind or calm.

Third figure gives forecasts of changes in direction and force of wind on the following scale:—

- | | |
|--------------------------|------------------------------------|
| 0—No change. | 5—Shifting to the left. |
| 1—Unchanged. | 6—Gradually increasing. |
| 2—Increasing. | 7—Gradually decreasing. |
| 3—Decreasing. | 8—Gradually shifting to the right. |
| 4—Shifting to the right. | 9—Gradually shifting to the left. |

Fourth figure gives forecasts regarding rain as follows:—

- | | |
|---------------------------|--|
| 0—Unchanging weather. | 6—Showers in most places (snow squalls in winter). |
| 1—None or little rain. | 7—Showers in several places (snow in winter). |
| 2—Rain in some places. | 8—Showers in some places (snow in winter). |
| 3—Rain in several places. | 9—Fog probable. |
| 4—Rain at most places. | |
| 5—Rain everywhere. | |

Fifth figure gives forecasts regarding changes in temperature according to the following scale:—

- | | |
|---------------------------|--|
| 0—Unchanged. | 6—Above mean temperature (more than 3°). |
| 1—Rising. | 7—Below mean temperature (more than 3°). |
| 2—Gradually rising. | 8—Probable thaw. |
| 3—Falling. | 9—Probable frost. |
| 4—Gradually falling. | |
| 5—About mean temperature. | |

x = no information.

Part 4.

Contains information regarding storm warnings. For explanation see under "Wireless Storm Warnings," Sweden, p. 47.

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

Table XV.

Conversion of Millimetres into Millibars and Inches.

Mm.	Mb.	In.	Mm.	Mb.	In.	Mm.	Mb.	In.
695	926.6	27.37	743	990.6	29.25	759	1011.9	29.88
700	933.2	27.56	744	991.9	29.29	760	1013.2	29.92
705	939.9	27.76	745	993.2	29.33	761	1014.6	29.96
710	946.6	27.95	746	994.6	29.37	762	1015.9	30.00
715	953.2	28.15	747	995.9	29.41	763	1017.2	30.04
720	959.9	28.35	748	997.2	29.45	764	1018.6	30.08
725	966.6	28.54	749	998.6	29.49	765	1019.9	30.12
730	973.2	28.74	750	999.9	29.53	766	1021.2	30.16
735	979.9	28.94	751	1001.2	29.57	767	1022.6	30.20
736	981.2	28.98	752	1002.6	29.61	768	1023.9	30.24
737	982.6	29.02	753	1003.9	29.65	769	1025.2	30.28
738	983.9	29.06	754	1005.2	29.69	770	1026.6	30.32
739	985.2	29.10	755	1006.6	29.73	775	1033.2	30.51
740	986.6	29.13	756	1007.9	29.76	780	1039.9	30.71
741	987.9	29.17	757	1009.2	29.80	785	1046.6	30.91
742	989.2	29.21	758	1010.6	29.84			

Table XVI.

State of Sky and Weather (Scheveningen Message).

Code Figure.	Code Figure.
0 = Sky clear	5 = Rain
1 = „ $\frac{1}{4}$ clouded	6 = Snow
2 = „ $\frac{1}{2}$ clouded	7 = Mist
3 = „ $\frac{3}{4}$ clouded	8 = Fog
4 = „ Overcast	9 = Thunderstorm

TABLE XVII.

Conversion of Centigrade Temperatures into Fahrenheit.

Cent.*	Fahr.	Cent.	Fahr.	Cent.	Fahr.	Cent.	Fahr.
50	32	0	32	10	50	21	70
51	30	1	34	11	52	22	72
52	28	2	36	12	54	23	73
53	27	3	37	13	55	24	75
54	25	4	39	14	57	25	77
55	23	5	41	15	59	26	79
56	21	6	43	16	61	27	81
57	19	7	45	17	63	28	82
58	18	8	46	18	64	29	84
59	16	9	48	19	66	30	86
				20	68		

* 50 is added to the amount to indicate minus temperatures Centigrade.

Table XVIII.

State of the Sea (Scheveningen Message).

Code Figure.	Code Figure.
0 = calm.	5 = rough.
1 = very smooth.	6 = very rough.
2 = smooth.	7 = high.
3 = slight.	8 = very high.
4 = moderate.	9 = phenomenal.

NEW INTERNATIONAL CODE, WEATHER TELEGRAPHY

TABLES.

Table XIX.

c.—Characteristic of Barometer tendency during last 3 hours.

Code Figure.		
0 = 0 or +	Steady or rising	} The barometer is now higher than, or the same as, 3 hours ago.
1 = + 0	Rising then steady	
2 = + -	Rising then falling	
3 = - + or 0 +	Falling or steady then rising	
4 = Unsteady +	Unsteady but rising	} The barometer is now lower than, or the same as, 3 hours ago.
5 = -	Falling	
6 = - 0	Falling then steady	
7 = - +	Falling then rising	
8 = 0 - or + -	Steady or rising then falling	
9 = Unsteady -	Unsteady but falling	

Table XXIII.

Amount of Rainfall. (Used for amounts 0.1—0.6 mm.)

Code Figures.	Meaning.
91 - - - -	0.1 mm.
92 - - - -	0.2 "
93 - - - -	0.3 "
94 - - - -	0.4 "
95 - - - -	0.5 "
96 - - - -	0.6 "
97 - - - -	Some rain, but not measurable.
98 - - - -	More than 90 millimetres.
99 - - - -	Measurement impossible or unreliable.

Amounts of 0.7 mm. or more are coded as whole millimetres, e.g., 17.2 mm. coded as 17.

Table XX.

V and V_s—Visibility.

Code Figure.		
0 =	Objects not visible at	50 metres (55 yards).
1 =	" " "	200 metres (220 yards).
2 =	" " "	500 metres (550 yards).
3 =	" " "	1,000 metres (1,100 yards).
4 =	" " "	2,000 metres (1½ miles).
5 =	" " "	4,000 metres (2½ miles).
6 =	" " "	10,000 metres (6¼ miles).
7 =	" " "	20,000 metres (12½ miles).
8 =	" " "	50,000 metres (31¼ miles).
9 =	Objects visible at	50,000 metres or more.

Table XXIV.

S.—State of Sea and Swell (Coast Stations).

Code Figures.		
0 - - - -	No swell	} Calm or slight sea.
1 - - - -	Moderate swell	
2 - - - -	Heavy swell	
3 - - - -	No swell	} Moderate sea.
4 - - - -	Moderate swell	
5 - - - -	Heavy swell	
6 - - - -	Rather rough sea.	
7 - - - -	Rough sea.	
8 - - - -	Very rough sea.	
9 - - - -	Mountainous sea.	

Table XXI.

H.—Relative humidity.

Code Figure.		
0 - - - -	- - - -	95 to 100 per cent.
9 - - - -	- - - -	90 " 94 "
8 - - - -	- - - -	80 " 89 "
7 - - - -	- - - -	70 " 79 "
6 - - - -	- - - -	60 " 69 "
5 - - - -	- - - -	50 " 59 "
4 - - - -	- - - -	40 " 49 "
3 - - - -	- - - -	30 " 39 "
2 - - - -	- - - -	20 " 29 "
1 - - - -	- - - -	10 " 19 "

Table XXV.

r.—Time of commencement of Precipitation.

Code Figure.	
0 - - - -	No rain.
1 - - - -	0 to 1 hour before time of observation.
2 - - - -	1 to 2 hours before time of observation.
3 - - - -	2 to 3 " " "
4 - - - -	3 to 4 " " "
5 - - - -	4 to 5 " " "
6 - - - -	5 to 6 " " "
7 - - - -	6 to 8 " " "
8 - - - -	8 to 10 " " "
9 - - - -	Above 10 hours before time of observation.
- - - -	No observation.

Table XXII.

h.—Height of base of lowest cloud present.

Code Figure.	Metres.	Feet.
0 - - - -	0 to 50	0 to 150
1 - - - -	50 " 100	150 " 300
2 - - - -	100 " 200	300 " 600
3 - - - -	200 " 300	600 " 1,000
4 - - - -	300 " 600	1,000 " 2,000
5 - - - -	600 " 1,000	2,000 " 3,000
6 - - - -	1,000 " 1,500	3,000 " 5,000
7 - - - -	1,500 " 2,000	5,000 " 6,500
8 - - - -	2,000 " 2,500	6,500 " 8,000
9 - - - -	No low cloud	No Low cloud.

WIRELESS STORM WARNINGS.

HOLLAND.

North Sea. (Spark Issue.)

Scheveningen W/T station, call sign PCH, transmits a storm signal when necessary, both in Dutch and English, immediately after the daily weather bulletin at 1115 G.M.T., and also at 2315 G.M.T. Wave length used is 1,800 metres (spark). If the signal should be sent out on Sundays and holidays (when the station does not transmit a weather bulletin) it will be preceded by the letters KNMI.

The messages are sent three times in succession, the first quickly, the second and third slowly.

NOTE.—If the storm signal is sent on request a charge will be debited to the ship concerned.

GERMANY.

North Sea. (Spark Issue.)

Norddeich W/T station, call sign KAV, broadcasts storm warnings when necessary, for the North Sea at 0515 G.M.T., 1015 G.M.T. (immediately after the daily weather bulletin), 1630 G.M.T., and 2130 G.M.T. (after the daily weather bulletin), on a wave length of 1,100 metres, spark.

The warnings are broadcast, *en clair*, twice in succession immediately after receipt, and at the four scheduled times unless previously cancelled.

Western and Middle Baltic. (Flensburg to Leba) Spark Issue.

Swinemünde W/T station, call sign KAW, broadcasts storm warnings, when necessary, for the western and middle Baltic at 0530, 1030 (after the weather bulletin), 1650 and 2145 G.M.T. (after the weather bulletin), on a wave length of 1,100 metres, spark. The routine of transmission is the same as for Norddeich W/T station.

Eastern Baltic. (Spark Issue.)

Pillau W/T station, call sign KAP, broadcasts storm warnings, when necessary, for the eastern Baltic, at 1130 G.M.T. (after the weather bulletin) on a wave length of 600 metres, spark.

The warnings are broadcast, *en clair*, thrice in succession, immediately after receipt, as well as at the scheduled time.

DENMARK.

Kattegat and Baltic. (Spark Issue.)

Copenhagen W/T station, approximate Latitude 55° 42' N., Longitude 12° 37' E., call sign OXA, broadcasts storm warnings for the Kattegat and Baltic on request. Wave length used, 600 metres, spark.

LATVIA.

Eastern Baltic and Gulf of Riga. (Spark Issue.)

Riga W/T station, approximate Latitude 56° 27' N., Longitude 24° 05' E., call sign KCA, broadcasts a storm warning, when necessary, for the eastern Baltic and Gulf of Riga, *en clair*, in English, at 1005 G.M.T. on a wave length of 600 metres, spark.

SWEDEN.

Skagerak, Baltic, Gulf of Bothnia, etc. (Spark or C.W. Issue.)

Karlsborg W/T station, call sign SAJ, broadcasts storm warnings (which form Part IV of the weather bulletin), when necessary, at 1215 G.M.T. on a wave length of 2,600 metres, spark or C.W.

The warnings, valid until 0700 the following day, are made by a group consisting of five figures preceded by the words "Gale Warning."

The first figure refers to	The Skagerrak	} and the meaning of the figure is as follows:—
" second "	" Kattegat	
" third "	" South Baltic	
" fourth "	" North Baltic	
" fifth "	" Gulf of Bothnia	

0 = No storm warning.

1 = Gale (7–10 Beaufort) from between N. and W.

2 = " " " " S. and W.

3 = " " " " N. and E.

4 = " " " " S. and E.

5 = " " " without given direction.

6 = Storm (11–12 Beaufort) from between N. and W.

7 = " " " " S. and W.

8 = " " " " N. and E.

9 = " " " " S. and E.

" X " = No information.

WIRELESS ICE WARNINGS.

GERMANY.

Baltic. (Spark Issues.)

Kiel—Friedrichsort W/T station, approximate Latitude 54° 24' N., Longitude 10° 11' E., call sign KBK, transmits information regarding ice conditions in the Baltic, on request. Wave length 600 metres, spark.

Pillau W/T station, call sign KAP, transmits information regarding ice conditions in the Baltic, on request. Wave length, 600 metres, spark.

Danzig W/T station, approximate Latitude 54° 21' N., Longitude 18° 39' E., call sign KAZ, transmits ice information for the Baltic coast, on request. Wave length 600 metres, spark.

DENMARK.

Danish Waters. (Spark Issues.)

The following W/T stations broadcast a summary of ice conditions in Danish waters, in winter, *en clair* (English). Wave length, 600 metres, spark.

Copenhagen W/T station, call sign OXA at 1100 and 2100 G.M.T.

Blaavand W/T station, call sign OXB, at 1120 and 2120 G.M.T.

The approximate position of Blaavand W/T station is Latitude 55° 33' N., Longitude 8° 05' E.

Ice Breakers—The Danish Government's ice breaker *Isbjorn* (call signal OXP) listens continuously. No charge is made for this service. The call signal for the Copenhagen Harbour Authority's ice breaker *Væderen* is OYK.

IV. VISUAL STORM WARNINGS.

DAY SIGNALS.

Netherlands, Germany, Denmark, Sweden, Norway.

Signal.	Meaning.
	Indicates that a gale is expected, or is probable from S.W. (Denmark and Sweden, <i>between</i> S. and W.).
	Indicates that a gale is expected, or is probable from S.E. (Denmark and Sweden, <i>between</i> S. and E.).
	Indicates that a gale is expected, or is probable from N.W. (Denmark and Sweden, <i>between</i> N. and W.).
	Indicates that a gale is expected, or is probable from N.E. (Denmark and Sweden, <i>between</i> N. and E.).
	"Atmospheric disturbance, be alert and look out for further information."
	Germany only :—Indicates the probability of a storm of which the direction of approach is not indicated.

A *red* or *black* flag indicates (except Sweden) that the wind may be expected to veer during the gale.

Two *red* or *black* flags indicate (except Sweden) that the wind may be expected to *back* during the gale. *Red* flags exhibited at German, Danish and Norwegian stations. *Black* flags by Dutch stations.

NIGHT SIGNALS.

Netherlands, Germany.

Signal.	Meaning.
Two <i>white</i> lights vertical - - -	Gale probable from S.W'd.
Two <i>red</i> lights vertical - - -	Gale probable from N.W'd.
A <i>white</i> light over a <i>red</i> light - - -	Gale probable from S.E'd.
A <i>red</i> light over a <i>white</i> light - - -	Gale probable from N.E'd.
One <i>red</i> light - - - - -	Same as for <i>black</i> ball above.

Norway.

Signal.	Meaning.
Three <i>white</i> lights, triangle point up -	Gale from N.W.
Three <i>white</i> lights, triangle point down -	Gale from S.W.
Four <i>white</i> lights, triangle point up (one light above) - - - - -	Gale from N.E.
Four <i>white</i> lights, triangle point down (one light below) - - - - -	Gale from S.E.
One <i>red</i> light - - - - -	Same as for <i>black</i> ball above.

STORM SIGNALS BY SEARCHLIGHT.

Germany.

Storm warning signals are made by searchlight at List on Sylt island, Heligoland, Arkona and Pillau. At Heligoland, however, these signals are not (1924) made between the hours of 0200 and 0600.

The signals are made by searchlight directed towards the sky at an elevation of about 35°, and are repeated in various directions at intervals.

The day storm signals, indicated by cones, are made by long and short flashes. A short flash of about *three seconds* duration corresponds with the point of the cone, and a long flash of about *nine seconds* duration corresponds with the base of the cone; thus the day storm signals, indicated by cones, are made as follows :—

- One cone point down — -
- Two cones points down — - - -
- One cone point up - -
- Two cones points up - - - -
- Two cones bases towards each other - - - -

The day storm signal, indicated by a red flag, is made by a circular movement of the beam of light on the sky in a clockwise direction.

The day storm signal, indicated by two red flags, is made by a circular movement of the beam of light on the sky in an anti-clockwise direction.

The day storm signal, indicated by a ball, is made by a circular movement of the beam of light on the sky in a direction alternately clockwise and anti-clockwise.

The cone signal is preceded and followed by the flag signal. When no flag signal is made, the cone signal is preceded and followed by the ball signal, indicating that no direction of shift of wind can be given.

The warnings hold good for a distance of about 50 miles from the vicinity of the signal station; they continue in force until the evening of the day following the day of issue.

Special Notices regarding Personnel.

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

Retirements.

Captain J. T. Rolls.

Captain J. T. ROLLS of the Canadian-Australasian Mail Steamer *Niagara*, has recently retired, after 50 years' sea service.

Captain J. T. ROLLS has been an observer to the Meteorological Office since 1920.

Captain A. Rennie, O.B.E.

Captain A. RENNIE, O.B.E., of the Canadian Pacific S.S. *Montcalm*, retired in January last.

Of his 47 years at sea, 30 were spent in command of ships of the Allan and Canadian Pacific Steamship Companies.

Captain RENNIE has been a regular member of the Corps of Voluntary Marine Observers since 1920.

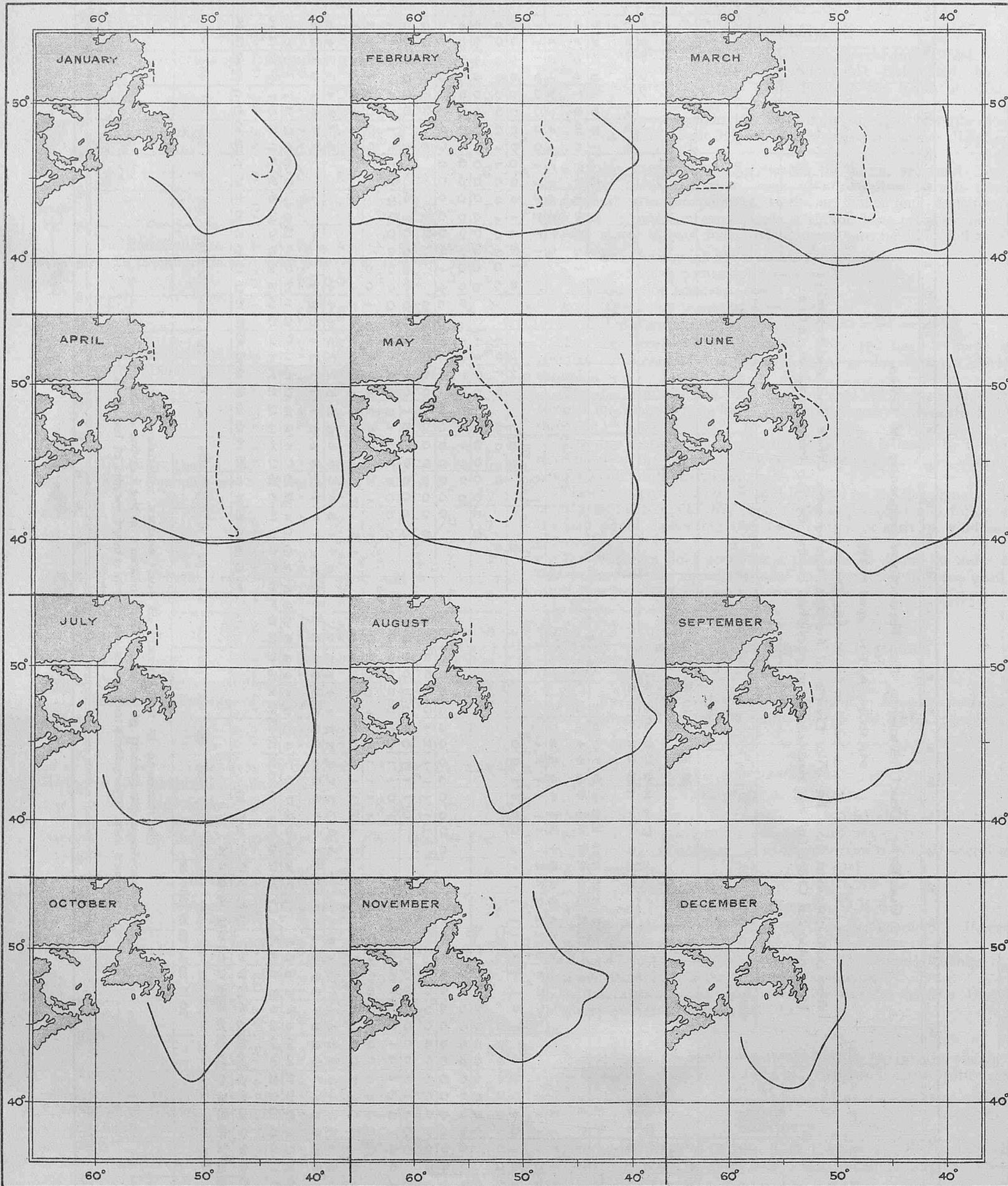
Marine Observers will join with the Marine Division in wishing the above officers long life and happiness in their well-earned retirement.

Obituary.

The sudden death of Captain L. D. PINCKNEY, S.S. *Mantua*, which recently took place at Port Said when bound to the Far East, is noted with deep regret.

Captain PINCKNEY was a regular member of the Corps of Voluntary Marine Observers from 1920 to the time of his death.

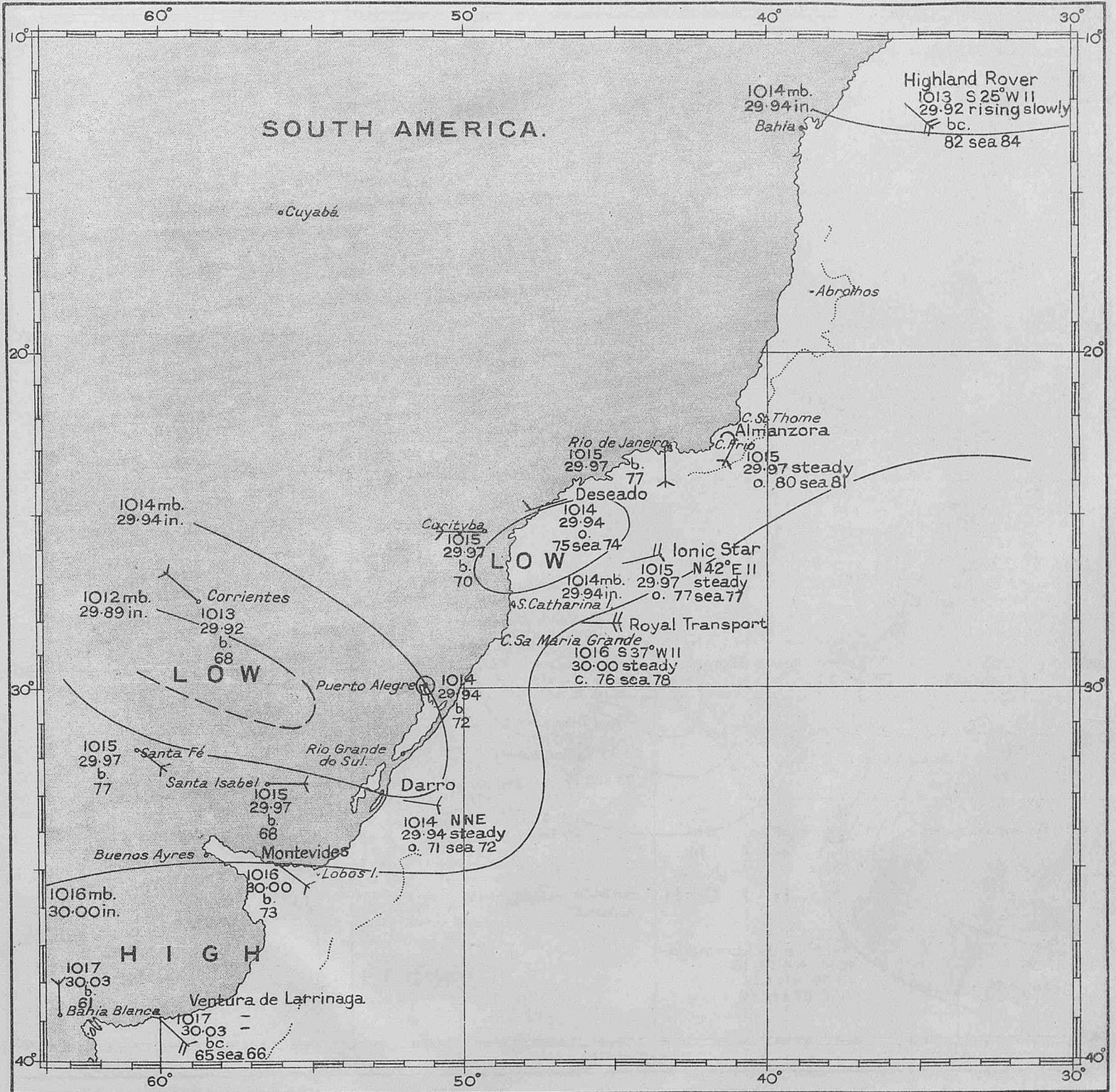
ICE IN THE WESTERN NORTH ATLANTIC.



Limits of Ice Western North Atlantic.

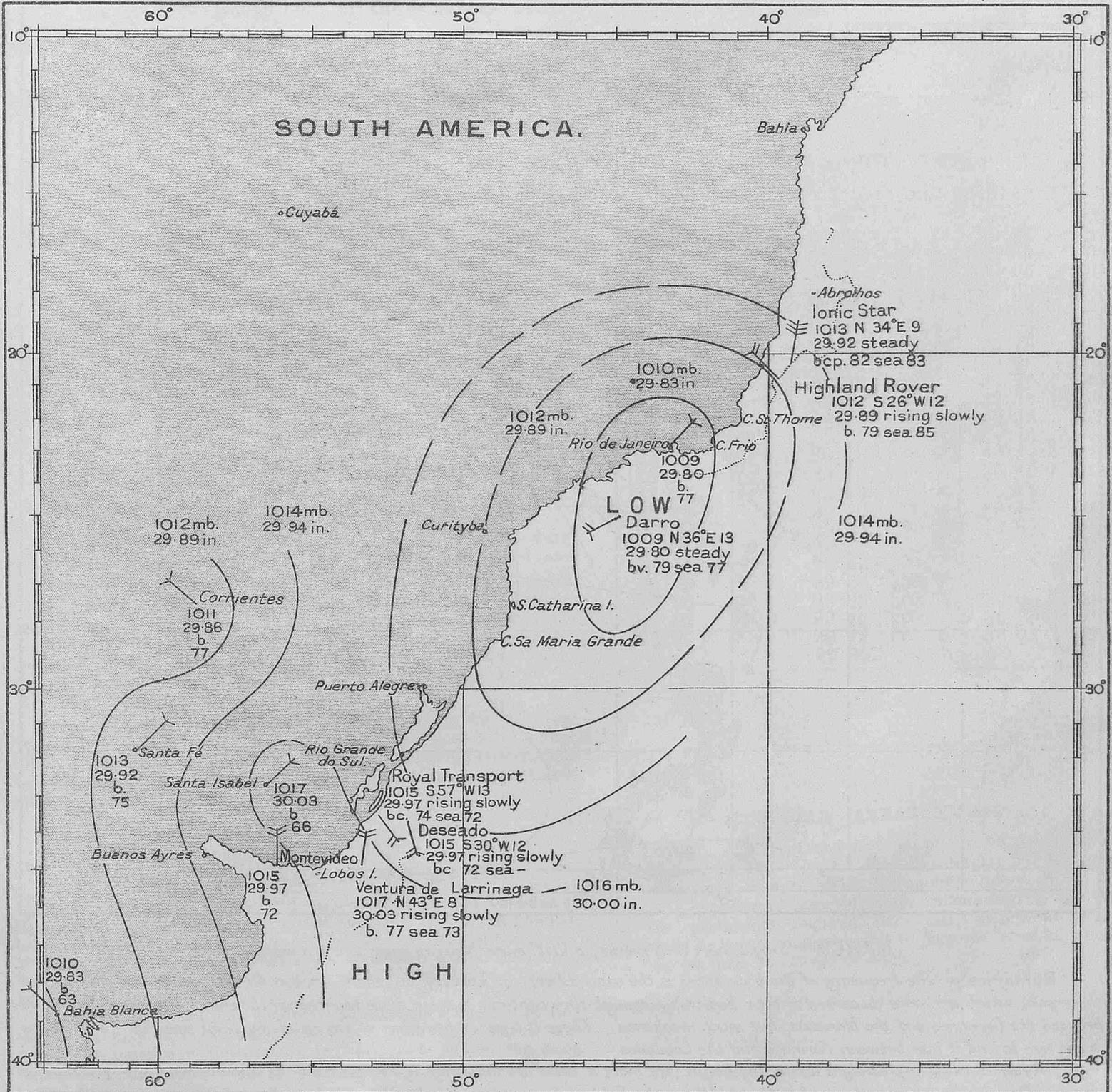
*Limit from 1901 to 1924 shown thus ———— Limit for December is from 1901 to 1923.
Limit for 1924 shown thus - - - - -*

MORNING OF MARCH 2ND 1924.



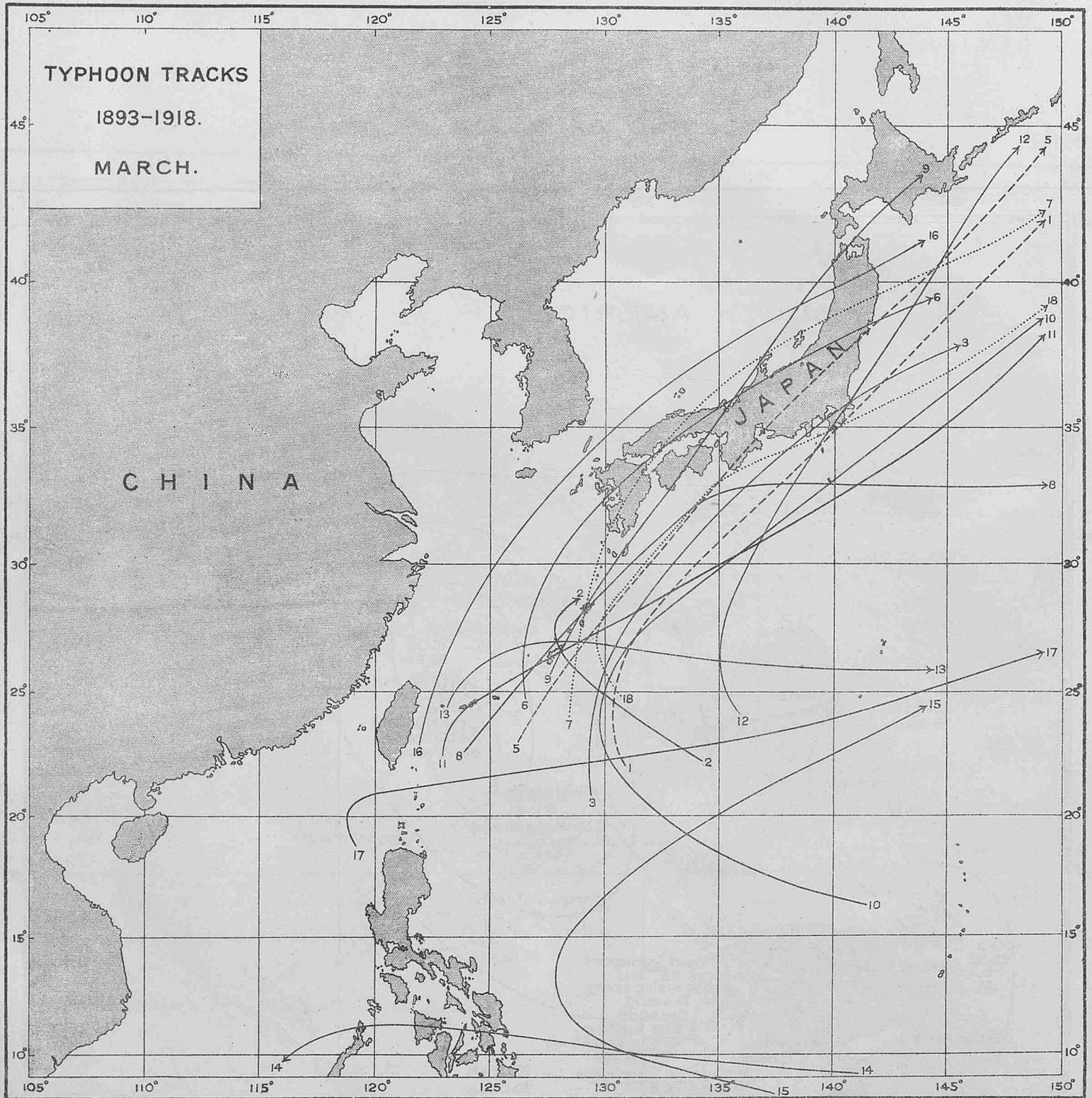
WEATHER CHART X.

MORNING OF MARCH 4TH 1924.



WEATHER CHART XII.

TYPHOONS IN THE FAR EAST DURING 26 YEARS.



MARCH — Single chart: 18 tracks; a little more than two cases in three years.

Remarks.— The frequency of the occurrences is the same as during February, but there is a distinct change in the grouping of the tracks, which are more dispersed at their beginning, though they continue to come close together at the end. The focus still exists between the Carolines and the Marianas, but much weakened. There is a general advance of the recurving point towards the W, and it is not rare to find it now between Formosa and the Loochoos.

A few tracks sweep straight across the Bonin, but most of them are following higher latitudes to come close near the coast of Japan. One depression has advanced to the middle of the Eastern Sea, and across the S.E. part of the Sea of Japan; another is shown in the straits between Formosa and Luzon. But it is still the epoch of calm for the China Sea, and practically for the area situated to the N.W. of a line joining Formosa to Hokkaido. It must be noted that during the same period that part of the map is crossed by many continental depressions. It is well to remark that the advance of the tracks westward corresponds to a movement of the isobaric line 764^{mm} from Japan and the Loochoos to the W part of the Eastern Sea and Korea.

[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]

NOTICES.

IMPORTANT.

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

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

Photographs, sketches and weather charts will be most welcome.

ILLUSTRATIONS FOR THE MARINE OBSERVER.

When making sketches, charts or plans, Marine Observers will give us great assistance if they will give consideration to reproduction in "The Marine Observer."

The size of any chart or drawing should not, if possible, exceed that of a page of "The Marine Observer," and if charts and drawings of all kinds are made with Indian Ink upon white drawing paper their reproduction will be greatly facilitated.

When photographs are sent in it would give us great assistance if they are accompanied by the plate or film, which will be returned if desired.

METEOROLOGICAL LOG REPRINT.

In the last reprint of the Meteorological Log for use with official instruments a column is provided for both the uncorrected and corrected barometer readings.

The uncorrected barometer, and attached thermometer readings are required to be entered in all cases, but it will be of great assistance to the Marine Division if Observers will also enter the corrected reading using the method explained in the Marine Observer's Handbook, pages 16-19, or that in Volume I, No. 2, of "The Marine Observer," pages 22-24.

Attention is also drawn to the page at end of log for recording Wireless Weather Reports made to other ships, and to the page allotted for Additional Remarks, where any interesting observations may be entered in detail, with a view to publication in the Marine Observer's Log of this Journal.

INVITATION TO MARINE OBSERVERS.

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

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

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

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

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

The Reprints of Meteorological Charts notified in "Aims and Objects," Volume I, No. 1, of this Journal are available.

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

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

CONVERSION TABLE.

To Convert Inches into Millibars.

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

POSTAL ARRANGEMENTS.

"The Marine Observer" is published, when circumstances permit, on the first Wednesday of the month previous to that to which the number refers.

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

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

Port of Call.....

Date of Homeward Departure.....

Postal Address.....

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

ICE CHART.

WESTERN NORTH ATLANTIC.

LETTERS OF TRANSATLANTIC TRACKS INDICATE

- (A) Eastbound. From 25th March to 7th July, inclusive.
- (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.

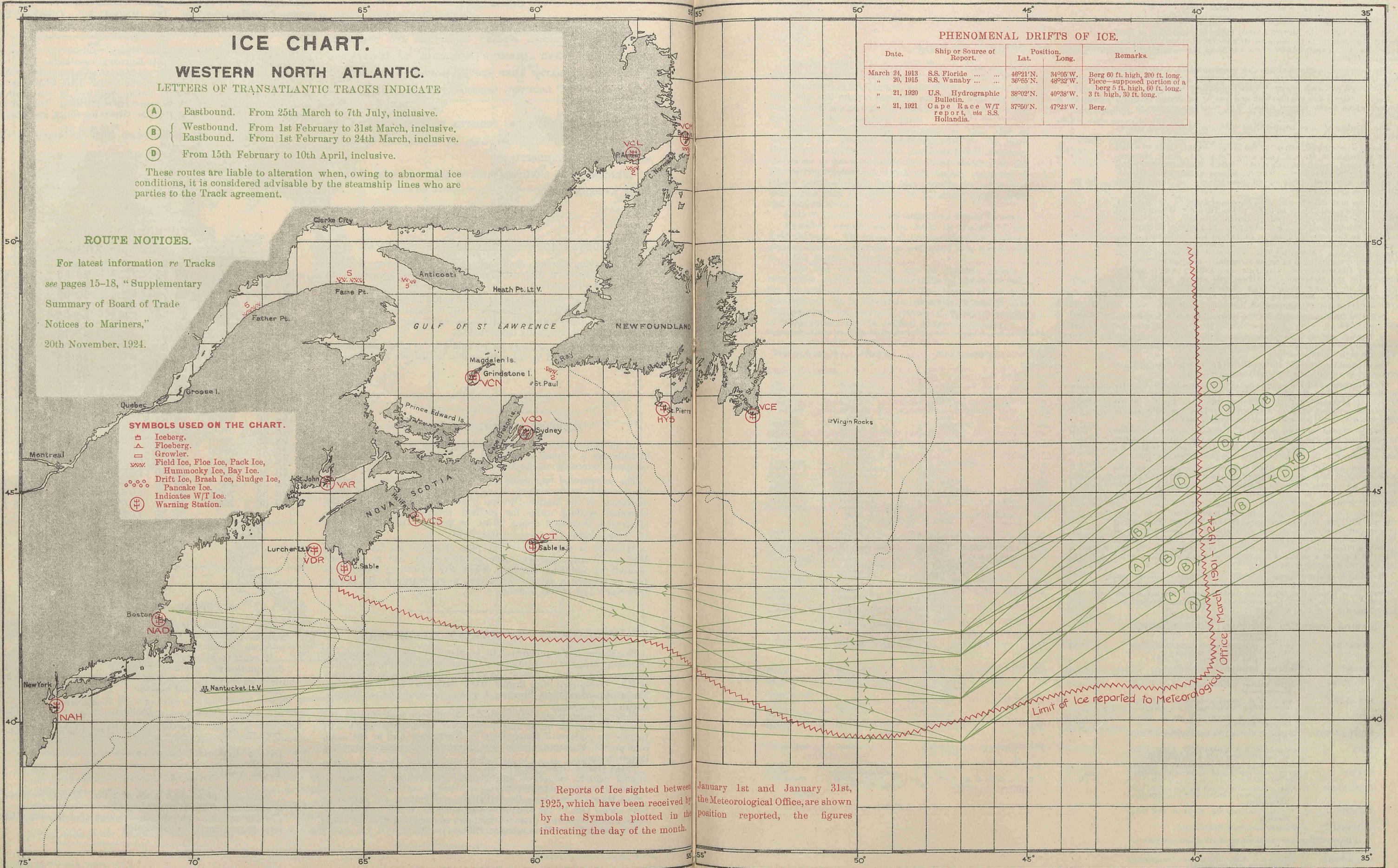
These routes are liable to alteration when, owing to abnormal ice conditions, it is considered advisable by the steamship lines who are parties to the Track agreement.

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



Date.	Ship or Source of Report.	Position.		Remarks.
		Lat.	Long.	
March 24, 1913	S.S. Floride	48°21'N.	34°05'W.	Berg 60 ft. high, 200 ft. long.
" 20, 1915	S.S. Wanaby	38°55'N.	48°32'W.	Piece—supposed portion of a berg 5 ft. high, 60 ft. long.
" 21, 1920	U.S. Hydrographic Bulletin.	38°02'N.	40°38'W.	3 ft. high, 30 ft. long.
" 21, 1921	Cape Race W/T report, via S.S. Hollandia.	37°50'N.	47°23'W.	Berg.

Reports of Ice sighted between January 1st and January 31st, 1925, which have been received by the Meteorological Office, are shown by the Symbols plotted in the position reported, the figures indicating the day of the month.

Limit of Ice reported to Meteorological Office March 1901-1924.

NOTICES.

MARINE METEOROLOGY.

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, 1925 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. Cresswell, R.N.R., Dock Office. <i>Telephone No.: Bank 8959.</i>
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. Corraine, 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.	
NORTH SEA.			
3.1.25	54°20'N.	3°20'E.	Drifting submerged wreck, two masts projecting out of water, 15 ft. and 10 ft. respectively.
7.1.25	7 miles E. (mag.) of Seaham Harbour.		Waterlogged ship's boat.
8.1.25	33 miles N.W. of Horns Rev. Lt. Vsl.		Drifting wreck.
16.1.25	52°00'N.	2°45'E.	Heavy floating wreckage—Dangerous to shipping.
20.1.25	E. by S. (mag.) $\frac{3}{4}$ mile from West Hinder Lt. Vsl.		Two derricks, attached to submerged wreck.
ENGLISH CHANNEL.			
4.1.25	50°47'N.	0°0 $\frac{1}{2}$ 'E.	Spar, showing 2 to 3 ft. above water, apparently attached to submerged wreckage.
4.1.25	50°35'N.	0°35'W.	Cage light buoy, adrift, light extinguished.
7.1.25	N.31°E., 2 miles from Royal Sovereign Lt. Vsl.		Mast, 6 ft., above water, apparently attached to submerged wreck.
7.1.25	S.83°W. (true) 15 miles from Ower's Lt. Vsl.		Mast, projecting 6 ft., above water apparently attached to submerged wreckage.
14.1.25	3 miles S.E. of Ower's Lt. Vsl.		Apparently drifting green buoy, with cage top, with lamp giving two flashes green.
22.1.25	50°31'N.	5°19'W.	Floating wreck.
BRISTOL CHANNEL.			
13.1.25	5 miles E. by S. from Lundy Isd., South Light.		Submerged wreckage, spar showing above water.
15.1.25	N.60°W. (mag.) 15 miles from Minehead Lt. House.		Buoy, marked "Telegraph," surmounted by a cylindrical structure, projecting about 15 ft., above water.
NORTH ATLANTIC.			
4.1.25	26°47'N.	64°24'W.	Wreckage, apparently ship's hull bottom up.
4.1.25	51°53'N.	7°15'W.	Red spherical buoy.
6.1.25	39°32'N.	9°27'W.	Dangerous waterlogged derelict, about 15 ft. square, with two short uprights, 3 or 4 ft. high, in the middle.
9.1.25	37°40'N.	74°53'W.	Schooner's mast, with blocks and falls attached, projecting about 10 ft., out of water, apparently fast to submerged wreckage.
10.1.25	38°05'N.	67°40'W.	Uruguyan schooner, <i>Manuel Caragol</i> , abandoned and set on fire, menace to navigation.
10.1.25	51°55'N.	7°15'W.	Large conical buoy, much weather worn, dangerous to navigation.
23.1.25	48°33'N.	24°25'W.	Steamer, <i>Waldrant Horn</i> , abandoned, in S.E. gale, sinking rapidly, also 3 boats adrift.
NORTH PACIFIC.			
3.1.25	39°31'N.	124°27'W.	Log, about 30 ft. long, 5 ft. in diameter.

LIST OF VOLUNTARY OBSERVING SHIPS.

i

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

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

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

Only in special cases will individual letters be sent.

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

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

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

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

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

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

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

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

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

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

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

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 16.1.25.	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... Form 911 9.11.24 to 29.11.24...	4.12.24. 4.12.24.
<i>Agapenor</i> ...	Ramsay, J. ...	J. P. Makepeace ...	No.	A. Holt ...	" 31.8.24 to 10.9.24 ...	23.9.24.
<i>Alban</i> ...	Torrible, R. H. ...	G. E. Freeman ...	"	Booth ...	" 21.10.24 to 10.11.24	8.12.24.
<i>Albania</i> ...	Gronow, S. ...	E. W. Connell ...	"	Cunard ...	" 3.11.24 to 11.11.24...	28.11.24.
<i>Algerian Prince</i> ...	Rowlands, D. ...	G. Potts ...	"	Prince ...	" 30.9.24 to 12.10.24...	16.10.24.
<i>Atipore</i> ...	Gordon, L. M., R.D., Commr., R.N.R.	H. D. Case ...	"	P. and O. ...	" 24.4.24 to 15.6.24 ...	14.7.24.
<i>Almanzora</i> ...	Mackenzie, G. A. ...	A. P. Portsmouth ...	"	R.M.S.P. ...	" 28.11.24 to 11.1.25...	16.1.25.
<i>Alondra</i> ...	J. J. Prendergast ...	H. Martin ...	"	Yeoward ...	" 6.12.24 to 27.12.24...	3.1.25.
<i>Ampetco</i> ...	Verstichelen, A. ...	E. Suret ...	"	American Petroleum... L.M. & S. Rly.	" 31.10.24 to 30.11.24 Telegraphic Report 11.4.24 ...	9.12.24. 11.4.24.
<i>Anglia</i> ...	Sorge, P. ...	W. H. Hughes ...	C.C.	A. Holt ...	Form 911 19.10.24 to 15.11.24	25.11.24.
<i>Antiochus</i> ...	Ireland, T. ...	A. C. D. Howes ...	No.	A. Holt ...	"	"
<i>Aorangi</i> ...	Crawford, R. ...	R. B. Denniston ...	M.L.	Canadian-Australasian Elder Dempster	Met. Log. 9.7.24 to 21.12.24 ...	29.12.24.
<i>Appam</i> ...	Yardley, H. A. ...	B. Holt, J. Doyle, P. Marriott	M.L.	Cunard ...	W.T. Reg. 4.12.24 to 18.12.24 " 25.12.24 to 8.1.25 ...	22.12.24. 12.1.25.
30 <i>Aquitania</i> ...	Charles, Sir J. T., W. K.B.E., C.B., R.D., Commodore, R.N.R.	J. L. Croasdale, P. O. Davis, J. Locke.	W.T.	Cunard ...	"	"
<i>Arafura</i> ...	Gordon, A. S. ...	R. Lloyd Harry ...	No.	Eastern and Australian Union Castle	Form 911 17.8.24 to 18.10.24... " 5.9.24 to 21.9.24 ...	15.12.24. 23.9.24.
<i>Armada Castle</i> ...	George, J., O.B.E. ...	L. G. May ...	"	P. Henderson ...	Met. Log. 17.5.24 to 7.9.24 ...	1.10.24.
<i>Arracan</i> ...	Willis, M. ...	H. Poole, D. Frame, J. Aitken	M.L.	Southern Rly.	Telegraphic Report 7.1.25 ...	7.1.25.
<i>Arundel</i> ...	Short, H. ...	Mr. Hill ...	C.C.	Union Castle	Met. Log. 12.9.24 to 4.1.25 ...	12.1.25.
<i>Arundel Castle</i> ...	Hague, J. W., Commr., R.N.R.	G. Blaiklock, C. Williams, F. Granger.	M.L.	"	"	"
<i>Assyria</i> ...	Erskine, R. ...	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>Athens</i> ...	Jones, J. L. ...	C. Cochrane ...	No.	White Star ...	Form 911 2.11.24 to 24.12.24...	12.1.25.
<i>Atsuta Maru</i> ...	Furuhashi, M. ...	S. Mizoguchi ...	"	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 " 27.10.24 to 14.11.24 Form 911 26.10.24 to 16.11.24 " 23.11.24 to 14.12.24	17.12.24. 18.11.24. 19.11.24. 17.12.24.
<i>Bambra</i> ...	Wyles, W. S. ...	H. W. Norris, J. E. Turner, J. Eggleston, W. Walters.	M.L.	State Service, Australia	Met. Log. 27.2.24 to 25.6.24 ...	12.8.24.
<i>Bampton Castle</i> ...	Buckeridge, G. ...	L. C. Chapman, H. A. Deller, C. B. Hoggan, C. C. Page	"	Union Castle	" 25.1.24 to 7.10.24 ...	20.10.24.
<i>Banbury Castle</i> ...	Wynne, R. H. ...	J. M. Bowie ...	No.	Turnbull Martin ...	Form 911 27.10.24 to 4.12.24...	16.1.25.
<i>Banffshire</i> ...	Daniel, E. ...	T. Swann ...	"	Commonwealth Govt.	" 6.11.24 to 25.11.24...	15.12.24.
<i>Barambah</i> ...	Baillie, T. ...	A. Campbell ...	"	Hogarth & Sons ...	" 15.8.24 to 28.8.24 ...	16.10.24.
<i>Baron Caudor</i> ...	Baillie, T. ...	W. G. E. Rawlingson ...	"	British India	" 13.11.24 to 14.12.24	5.1.25.
<i>Barpeta</i> ...	Beedle, T. S. ...	H. M. S. Forbes ...	M.L.	His Majesty's Ship	Met. Log. 28.7.24 to 3.11.24 ...	28.11.24.
<i>Beaufort</i> ...	Rice, W. V., D.S.O., D.S.C., Commr., R.N.	"	"	"	"	"
59 <i>Belgenland</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 ... Form 911 26.9.24 to 16.10.24... " 26.9.24 to 15.10.24... " 29.9.24 to 28.10.24...	4.11.24. 20.10.24. 20.10.24. 2.12.21.
<i>Benalder</i> ...	Cole J. H. D.S.C. ...	W. M. Webster ...	No.	Ben Line ...	" 25.11.24 to 13.12.24	20.12.24.
<i>Bengloe</i> ...	McCorquodale, A. ...	G. M. Duff ...	"	Ben Line ...	"	"
1 <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. 16.11.24 to 1.12.24...	5.12.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 16.1.25.	Date Received.
<i>Bernini</i> ...	Evans, W. ...	H. L. Rudd ...	No.	Lampport & Holt ...	Form 911 28.8.24 to 21.9.24 ...	1.12.24.
<i>Berrima</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. ...	" 3.10.24 to 22.12.24 ...	8.1.25.
<i>Bolinbroke</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. ...	P. H. Moore, J. Mackenzie, H. C. Waters.	M.L.	" ...	Met. Log. 15.5.24 to 30.10.24 ...	6.1.25.
<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. Munro ...	C.C.	Southern Railway ...	Telegraphic Report 14.1.25 ...	14.1.25.
<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 15.8.24 ...	18.8.24.
<i>Browning</i> ...	Connorton, C. A. ...	W. E. Johnston ...	"	Lampport & Holt ...	" 21.9.24 to 17.10.24 ...	29.10.24.
<i>Bruyere</i> ...	Fugh, E. ...	C. E. Legg ...	"	" ...	" 14.10.24 to 23.12.24 ...	16.1.25.
<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. B., 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 9.1.25 ...	9.1.25.
<i>Camito</i> ...	Soudamore, J. H. H., D.S.C., R.D., Commr. R.N.R.	D. A. Jaek, R. M. Cossantine, S. Borrie, S. Ray.	M.L.	Elders & Fyfes ...	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 29.11.24 to 20.12.24 ...	30.12.24.
<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 ...	"	" ...	" 8.10.24 to 23.12.24 ...	29.12.24.
<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. Rams ...	"	" ...	" 13.9.24 to 15.10.24 ...	13.11.24.
<i>Carlton Castle</i> ...	Whitfield, G. J. ...	L. H. Stevens ...	"	Union Castle ...	" 21.8.24 to 3.1.25 ...	6.1.25.
<i>35 Carmania</i> ...	McNeil, S. G. S., R.D., Capt., R.N.R.	D. S. Kite, W. M. Stewart, T. A. O. Ellis.	W.T.	Cunard ...	W.T. Reg. 1.12.24 to 20.12.24 ...	23.12.24.
<i>34 Caronia</i> ...	Diggle, E. G., R.D., Capt., R.N.R.	D. W. Sorrell, J. A. Quarrie, E. R. Taylor.	W.T.	Cunard ...	Form 911 29.11.24 to 21.12.24 ...	23.12.24.
<i>Cassandra</i> ...	Mitchell, W. E. ...	G. M. Sime ...	No.	Anchor Donaldson ...	Form 911 24.11.24 to 13.12.24 ...	20.12.24.
<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> ...	Berry, G. ...	R. S. Walker, G. T. Kavanagh, D. W. Chamberlain.	W.T.	" ...	Form 911 8.10.24 to 16.12.24 ...	18.12.24.
<i>Centaur</i> ...	Rose, A. F. ...	L. Johnstone ...	No.	A. Holt & Co. ...	W.T. Reg. 15.12.24 to 3.1.25 ...	7.1.25.
<i>Ceramic</i> ...	Summers, F. F. ...	E. E. Burt ...	"	" ...	Form 911 27.7.24 to 16.8.24 ...	19.8.24.
<i>Changsha</i> ...	Gambrill, F. C. ...	A. M. Frame, F. G. Stratford, H. Lishman, L. H. Bailie.	M.L.	Yubil & Co. ...	W.T. Reg. 1.12.24 to 20.12.24 ...	23.12.24.
<i>Chignecto</i> ...	Green, J. ...	A. F. Walker ...	No.	R.M.S.P. Co. ...	Form 911 30.11.24 to 21.12.24 ...	29.12.24.
<i>China</i> ...	King, A. D.S.C. ...	E. Cox Walker ...	"	P. & O. ...	Form 911 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> ...	Besslemont, C. ...	J. Summers, W. Wilson, C. Owen, J. G. Walker.	M.L.	P. Henderson ...	Met. Log. 2.10.24 to 12.11.24 ...	1.12.24.
<i>Chinhua</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. ...	" ...	"	" ...	" ...	" ...
<i>City of Batavia</i> ...	Sproule, A. ...	A. D. Henderson ...	M.L.	" ...	Met. Log. 29.10.23 to 29.9.24 ...	6.11.24.
<i>City of Benares</i> ...	Nancollas, H. E. ...	S. J. Nash ...	No.	" ...	Form 911 4.7.24 to 31.7.24 ...	18.8.24.
<i>City of Brisbane</i> ...	McArthur, J. ...	A. A. Fullerton ...	"	" ...	" 24.8.24 to 5.12.24 ...	15.12.24.
<i>City of Canterbury</i> ...	Seaborne, F. O. ...	W. E. Fletcher ...	"	" ...	" 29.9.24 to 23.10.24 ...	18.11.24.
<i>City of Chester</i> ...	Macdonald, K., O.B.E.	A. M. Hamilton ...	"	" ...	" 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. ...	J. L. Mumford ...	"	" ...	" 19.12.24 to 29.12.24 ...	8.1.25.
<i>City of Rangoon</i> ...	Brown, G. ...	W. J. Nixon ...	"	" ...	" 5.12.24 to 28.12.24 ...	6.1.25.
<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 ...	"	" ...	" 22.11.24 to 8.12.24 ...	22.12.24.
<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 ...	"	" ...	" 7.12.24 to 14.12.24 ...	30.12.24.
<i>Clan Macindoe</i> ...	Miller, W. ...	P. G. de Gruchy ...	"	" ...	" 28.11.24 to 17.12.24 ...	12.1.25.
<i>Clan Mackellar</i> ...	Jones, M. H. ...	F. G. Darnborough ...	"	" ...	" 24.9.24 to 27.11.24 ...	3.12.24.
<i>Clan Mackenzie</i> ...	Young, G. ...	E. N. Stewart ...	"	" ...	" 28.9.24 to 14.11.24 ...	3.12.24.
<i>Clan Mackinnon</i> ...	Mackie, R. W. ...	W. G. Arthur, F. B. Fairweather.	"	" ...	" 7.11.24 to 21.11.24 ...	12.12.24.
<i>Clan Macnaughton</i> ...	Gray, J. N. ...	W. S. Holden ...	M.L.	" ...	Met. Log. 9.4.24 to 8.8.24 ...	2.9.24.
<i>Clan Macphie</i> ...	Gray, J. N. ...	A. G. Storkey, F. Burnes ...	No.	" ...	Form 911 19.1.24 to 24.2.24 ...	26.2.24.
<i>Clan Mactaggart</i> ...	Phillips, G. P. ...	P. H. Avdon, W. D. E. Campbell, F. Buckley, — Carter.	M.L.	" ...	Met. Log. 26.1.24 to 12.6.24 ...	8.8.24.
<i>Clan Maclachlan</i> ...	Higgins, C. J. ...	J. H. Malpas ...	No.	" ...	Form 911 16.7.24 to 20.10.24 ...	23.10.24.
<i>Clan Malcolm</i> ...	Porterfield, W. M. ...	L. S. Murrin ...	"	" ...	" 22.11.24 to 11.12.24 ...	31.12.24.
<i>Clan Morrison</i> ...	Pagan, J. C. ...	T. G. Young, R. F. Buckley ...	M.L.	" ...	Met. Log. 4.5.24 to 7.9.24 ...	22.9.24.
<i>Clan Murdoch</i> ...	Openshaw, L. G. ...	D. A. Evans ...	No.	" ...	Form 911 11.10.24 to 19.11.24 ...	9.12.24.
<i>Clan Ramald</i> ...	Jones, R. C. ...	C. W. Thomas ...	"	" ...	" 6.11.24 to 23.11.24 ...	25.11.24.
<i>Clan Ross</i> ...	Neill, G. A. ...	W. H. D. Stephen ...	"	" ...	" 8.11.24 to 21.11.24 ...	29.12.24.
<i>Clan Sinclair</i> ...	Stenson, F. J., R. D., Commr. R.N.R.	G. Short ...	"	" ...	" 25.10.24 to 2.12.24 ...	9.12.24.
<i>Clan Stuart</i> ...	Gibb, A. F. W. ...	F. B. Parker ...	"	" ...	" 22.11.24 to 14.12.24 ...	12.1.25.
<i>Clan Urquhart</i> ...	Campos, V., O.B.E., Lt-Commr., R.N.R.	R. Silk ...	"	" ...	" 20.11.24 to 26.11.24 ...	16.1.25.
<i>Colonia, C.S.</i> ...	Gibb, A. F. W. ...	R. H. Law ...	"	" ...	" 7.11.24 to 28.11.24 ...	29.12.24.
<i>Colonial</i> ...	Giffins, R. P. ...	S. A. Garnham, A. S. Muir, J. M. Matthews, F. Bolinbroke.	M.L.	Telegraph Construction & Maintenance.	Met. Log. 12.2.24 to 27.9.24 ...	30.9.24.
<i>Colombian</i> ...	Barrow, R. K. ...	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 ...	" 30.11.24 to 21.12.24 ...	29.12.24.

LIST OF VOLUNTARY OBSERVING SHIPS

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 16.1.25.	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>Coote</i> ...	Festa, M. ...	C. Keen ...	No.	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. Fastling ...	No.	Booth ...	Form 911 2.10.24 to 10.12.24...	30.12.24.
<i>Cyclops</i> ...	Cosker, W. ...	R. W. Ellis ...	"	A. Holt ...	" 22.10.24 to 30.11.24 ...	29.12.24.
<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 ...	" 14.12.24 to 27.12.24 ...	12.1.25.
<i>Darro</i> ...	Smith, W. E., D.S.O., R.D., Capt., R.N.R.	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.C.	W. T. Golwin ...	"	Leyland ...	" 15.10.24 to 23.11.24 ...	6.12.24.
<i>Delta</i> ...	Brooks, C., D.S.O., R.D., Commr., R.N.R.	J. O. V. Young ...	"	P. & O. ...	" 28.6.24 to 8.8.24 ...	13.8.24.
<i>Demerara</i> ...	Hill, T. A. ...	E. Hewitt ...	"	R.M.S.P. Co.	" 7.12.24 to 29.12.24...	6.1.25.
<i>Demosthenes</i> ...	Cormick, R. E. ...	R. A. Alcock ...	"	Aberdeen ...	" 19.10.24 to 6.1.25 ...	16.1.25.
<i>Deseado</i> ...	William, W. J. ...	S. G. Dawson ...	"	R.M.S.P. Co.	" 21.11.24 to 10.1.25...	16.1.25.
<i>Desna</i> ...	Wakeman, E. C. ...	A. Hambly ...	"	"	" 20.10.24 to 13.12.24 ...	17.12.24.
<i>Deucalion</i> ...	Adam, C., R.D., Commr., R.N.R.	...	"	"	"	"
<i>Devon</i> ...	Findlay, J. ...	P. W. Savery, O. Thomas ...	"	A. Holt ...	" 2.11.24 to 22.12.24...	1.1.25.
<i>Dieppe</i> ...	Gardner, H. W. ...	A. Bell ...	"	New Zealand S.S. Co.	" 20.12.23 to 11.5.24...	4.6.24.
<i>Dieppe</i> ...	Marmery, S. ...	Mr. Parsons ...	C.C.	Southern Railway	Telegraphic Report. 15.1.25 ...	15.1.25.
<i>Dieppe</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>Digby</i> ...	Chambers, F. W., D.S.C.	...	"	"	"	"
<i>Dimboola</i> ...	Roy, C. M. ...	G. A. Molyneux ...	No.	Melbourne S.S. Co.	Form 911 7.11.24 to 18.11.24...	29.12.24.
<i>Discoverer</i> ...	Ling, J. T. ...	W. E. Shotton ...	"	Harrison ...	" 18.6.24 to 14.10.24...	23.10.24.
<i>Dogra</i> ...	Hartock, L. ...	E. C. Akers ...	"	Asiatic S.N. Co.	" 25.9.24 to 15.10.24...	10.11.24.
<i>Domala, M.V.</i> ...	Whittingham, W. E., O.B.E., R.D., Commr., R.N.R.	C. E. Merchant ...	"	British India	" 12.1.24 to 6.2.24 ...	18.3.24.
<i>61 Doric</i> ...	Davies, J. ...	A. Thompson ...	W.T.	White Star	" 9.11.24 to 30.11.24...	3.12.24.
<i>Doric Star</i> ...	Thomas, R. T. ...	A. S. Menzies ...	No.	Blue Star	" 29.9.24 to 27.10.24...	5.12.24.
<i>Dorington Court</i> ...	Isaacs, W. A. ...	E. V. Quickenden ...	"	Haldin & Co.	" 17.8.24 to 8.9.24 ...	18.9.24.
<i>Dorsel</i> ...	Kettlewell, C. R. ...	H. S. White, H. Neagle, J. S. Bloomfield, L. Cann.	M.L.	New Zealand S.S. Co.	Met. Log. 3.4.24 to 6.10.24 ...	10.10.24.
<i>Dromore Castle</i> ...	Linklater, H. ...	S. S. Smith ...	No.	Union Castle	Form 911 29.8.24 to 29.9.24 ...	21.10.24.
<i>Dryden</i> ...	Knight, R. A. ...	G. D. Oldfield ...	"	Lampport & Holt	" 28.9.24 to 7.12.24 ...	6.1.25.
<i>Dundrum Castle</i> ...	Kershaw, H. J. ...	R. May ...	"	Union Castle	" 29.11.24 to 30.12.24 ...	16.1.25.
<i>Duendes</i> ...	Pape, E. R. ...	D. P. Morgan ...	"	Pacific S.N. Co.	" 22.11.24 to 24.12.24 ...	29.12.24.
<i>Duffield</i> ...	King A. ...	T. S. Robertson ...	"	Hunting & Sons	" 10.11.24 to 9.12.24 ...	16.12.24.
<i>Duquesa</i> ...	Pearson, J. M. ...	C. P. Lane ...	"	Furness Withy	Form 911 25.10.24 to 31.12.24 ...	5.1.25.
<i>Durenda</i> ...	Wilson, W. ...	W. H. Creese ...	"	British India	" 6.10.24 to 12.11.24...	15.12.24.
<i>Eastern</i> ...	Smith, G. L. ...	H. Murray, G. Munro, E. S. Birrell.	M.L.	Eastern and Australian	Met. Log. 27.8.23 to 3.5.24 ...	2.8.24.
<i>Ebani</i> ...	Fail, — ...	W. McKeown ...	No.	Elder Dempster	"	"
<i>Edinburgh Castle</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>Eemland</i> ...	Van Noppen, C. D. ...	J. G. Sander ...	No.	Holland Lloyd	Form 911 26.8.24 to 25.11.24...	15.12.24.
<i>El Cordobes</i> ...	Noton, F. G. ...	N. H. Oldham ...	"	British & Argentine S.N. Co.	" 29.11.24 to 29.12.24 ...	16.1.25.
<i>Elmina</i> ...	Millson, H. E. ...	W. McKeown, J. H. Hall, C. H. Turner.	M.L.	Elder Dempster	Met. Log. 1.3.24 to 30.8.24 ...	8.9.24.
<i>El Paraguay</i> ...	Ellis, F., D.S.C. ...	W. E. Williams ...	No.	Houlder Bros.	Form 911 8.11.24 to 8.1.25 ...	16.1.25.
<i>Elpenor</i> ...	Holden, W. R. F. ...	P. E. Wright, C. Mock ...	M.L.	A. Holt ...	Met. Log. 26.5.24 to 12.9.24 ...	17.9.24.
<i>Elysia</i> ...	Kinnaird, J. ...	A. Grant ...	No.	Anchor ...	Form 911 16.2.24 to 8.3.24 ...	1.4.24.
<i>Empress of Asia</i> ...	Douglas, L. D., R.D., Lt., Commr., R.N.R.	...	M.L.	Canadian Pacific	Met. Log. 5.6.24 to 14.9.24 ...	14.10.24.
<i>Empress of Australia</i> ...	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 Canada</i> ...	Robinson, S., C.B.E., R.D., Commr., R.N.R.	W. S. Halliday, L. C. Barry ..	M.L.	"	Met. Log. 19.6.24 to 13.11.24...	29.12.24.
<i>Empress of France</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 Russia</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>Empress of Scotland</i> ...	Gillies, J., C.B.E. ...	B. Grant, S. C. Fox, D. Loram, L. W. Akerman, W. J. Phillips.	M.L.	"	Met. Log. 26.4.24 to 29.10.24...	11.12.24.
<i>Endeavour</i> ...	Nares, J. D., D.S.O., Capt., R.N.	H. Exton Turner ...	M.L.	His Majesty's Ship	Met. Log. 23.10.23 to 19.2.24...	14.6.24.
<i>Essequibo</i> ...	Duncan, E. E. ...	L. W. Hanson ...	No.	R.M.S.P. Co.	Form 911 6.11.24 to 23.12.24...	5.1.25.
<i>Eumaeus</i> ...	Power, J. ...	E. R. Pritchard ...	"	A. Holt ...	" 23.9.24 to 16.10.24...	30.10.24.
<i>Eurypides</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>Eurybates</i> ...	Lloyd, R. ...	J. J. Goldsmith ...	No.	A. Holt ...	Form 911 30.11.24 to 19.12.24 ...	12.1.25.
<i>Explorer</i> ...	Lamont, A. ...	Scientific Staff ...	M.L.	Scottish Fishery Board	Met. Log. 20.6.24 to 27.9.24 ...	24.10.24.
<i>Fitzroy</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>Flandria</i> ...	Veldkamp, G. J. ...	T. Doornbosch ...	No.	Holland Lloyd	Form 911 3.10.24 to 22.11.24...	25.11.24.
<i>Flinders</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>Francisco</i> ...	Wilkins, J., O.B.E.	F. D. Shaw ...	No.	Ellerman Wilson	Form 911 21.11.24 to 26.12.24 ...	31.12.24.
<i>Frankenfels</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>Freienfels</i> ...	Cleugh, J. W. ...	C. H. Porter, V. R. Watkins, H. Wilson.	"	"	" 7.9.24 to 7.12.24 ...	17.12.24.
<i>Frya</i> ...	Angus, W. ...	J. Murray ...	No.	Scottish Fishery Board	Form 911 2.12.24 to 31.12.24...	5.1.25.
<i>Galic</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>Galtymore</i> ...	Ledsome, J. S. ...	N. Goubrough ...	"	Furness Withy	Form 911 28.9.24 to 9.11.24 ...	6.10.24.
<i>Garcoet</i> ...	Visser, C. W. ...	F. Weeda ...	"	Rotterdam Lloyd	" 19.11.24 to 6.1.25 ...	12.1.25.
<i>Gascoyne</i> ...	Mills, A. ...	P. G. Collins ...	"	Dalgaty & 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 16.1.25.	Date Received.
<i>Gabria</i> ...	Kolkman, J. M. ...	J. N. F. Cordijs ...	No.	Holland Lloyd	Form 911 21.11.24 to 12.1.25...	16.1.25.
<i>Gladiator</i> ...	Ruffell, — ...	D. H. Bryant, W. E. Shotton ...	"	Harrison ...	" 7.1.24 to 8.3.24 ...	12.3.24.
<i>Glenamoy, M.V.</i> ...	Angier, J. ...	L. C. Riggs ...	"	Glen Line ...	" 15.4.24 to 11.5.24 ...	18.8.24.
<i>Glenapp, M.V.</i> ...	Griffith, J. E. ...	F. Poate ...	"	" ...	" 17.12.24 to 28.12.24 ...	8.1.25.
<i>Glenluce, M.V.</i> ...	Barkley, E. ...	J. D. Richards ...	"	" ...	" 20.10.24 to 14.11.24 ...	18.11.24.
<i>Glenishane</i> ...	Roberts, W. E. ...	V. Rowe, R. A. Dale ...	"	" ...	" 22.12.24 to 7.1.25 ...	16.1.25.
<i>Gloucestershire</i> ...	Robin, E. ...	T. E. Field ...	"	Bibby ...	" 27.9.24 to 4.12.24 ...	8.12.24.
<i>Gorgon</i> ...	Hughes, J. W. ...	W. E. Crompton ...	"	A. Holt & 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 ...	"	" ...	" 23.11.24 to 23.12.24 ...	16.1.25.
<i>Harmony, Auxy.</i> ...	Jackson, J. C. ...	A. W. Bush ...	"	Moravian Mission ...	" 4.12.24 to 20.12.24 ...	6.1.25.
<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, M.V.</i> ...	Frew, J. D. ...	E. A. Buckingham ...	No.	Union S.S. Co., N.Z. ...	" 10.11.24 to 1.12.24 ...	12.1.25.
<i>Henry Holmes, C.S.</i> ...	Geeve, G. E. ...	E. Hislop Tucker, E. S. C. Hale.	No.	W. I. & Panama Telegraph Co. ...	" 22.8.24 to 9.11.24 ...	10.12.24.
<i>Herald</i> ...	Harvey, J. R., O.B.E., Commr., R.N.	W. C. Jenks ...	M.L.	His Majesty's Ship ...	Met. Log. 6.6.24 to 3.10.24 ...	29.12.24.
<i>Herefordshire</i> ...	Stanley, W. ...	P. Flood, G. Whitworth, P. S. Cooper, S. M. Burton, G. Holdsworth.	"	Bibby ...	" 1.3.24 to 19.8.24 ...	8.9.24.
<i>Herschel</i> ...	Carey, W. J. ...	A. N. Blundell ...	No.	Lampport & Holt ...	Form 911 15.11.24 to 9.1.25 ...	16.1.25.
<i>Hibernia</i> ...	Tanner ...	R. Woodall ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report. 10.1.25 ...	10.1.25.
<i>Highland Enterprise</i> ...	Pond, R. H. ...	D. R. S. Webster ...	No.	Nelson ...	Form 911 29.3.24 to 12.6.24 ...	8.7.24.
<i>Glen</i> ...	Jones, T. J. ...	C. M. Best ...	"	" ...	" 14.12.24 to 2.1.25 ...	16.1.25.
<i>Heather</i> ...	Powell, G. A. ...	" ...	M.L.	" ...	" ...	" ...
<i>Laddie</i> ...	Alford, C. ...	G. L. Goodman ...	No.	" ...	Form 911 16.9.24 to 8.11.24 ...	22.12.24.
<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. Scanes.	"	" ...	" 15.4.24 to 31.8.24 ...	17.9.24.
<i>Rover</i> ...	Ashby Graves, F. ...	F. W. Harvey, H. Thomas, F. Abbott.	"	" ...	" 24.10.24 to 21.12.24 ...	29.12.24.
<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 ...	13.11.24.
<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 Homeric</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. Iddes ...	No.	R. P. Houston ...	Form 911 12.9.24 to 14.10.24 ...	11.11.24.
<i>Huanachaco</i> ...	Redyard, A. ...	A. G. Litherland ...	"	Pacific S.N. Co. ...	" 15.7.24 to 5.8.24 ...	15.8.24.
<i>Hubert</i> ...	Jones, W. C. H. ...	S. G. Edwards ...	"	Booth ...	" 6.11.24 to 18.11.24 ...	6.12.24.
<i>Hurumui</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. ...	" ...	C.C.	G.W. Railway ...	Telegraphic Report. 6.12.24 ...	6.12.24.
<i>Ikala</i> ...	Meetham, J. T. ...	E. Lightfoot ...	No.	J. H. Welsford & Co. ...	Form 911 8.11.24 to 24.11.24 ...	15.12.24.
<i>Intaba</i> ...	Gibbings, W. A. ...	T. B. Littlechild ...	"	Harrison ...	" 11.7.24 to 3.11.24 ...	7.11.24.
<i>Intombi</i> ...	Sawyer, E. I. ...	J. Richardson ...	"	" ...	" 3.8.24 to 19.10.24 ...	22.10.24.
<i>Ionic Star</i> ...	Wilson, G. ...	J. Sinclair ...	"	Blue Star ...	" 29.1.24 to 26.3.24 ...	29.3.24.
<i>Iroquois</i> ...	Tinson, C. W., O.B.E., Commr., R.N.	G. A. Gould ...	M.L.	His Majesty's Ship ...	Met. Log. 17.3.24 to 14.7.24 ...	26.8.24.
<i>Ixion</i> ...	Carnon, C. G. ...	A. R. Cook ...	No.	A. Holt ...	Form 911 12.11.24 to 2.12.24 ...	16.1.25.
<i>John Pender, C.S.</i> ...	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>Kaitoura</i> ...	Downton, M. ...	H. E. Reilly, F. T. Bisley, G. T. Webb, F. Vesington.	M.L.	New Zealand S.S. Co. ...	Met. Log. 15.7.24 to 19.12.24 ...	29.12.24.
<i>Kaisar-i-Hind</i> ...	Manley, G. ...	T. F. Wrigley ...	No.	P. & O. ...	Form 911 6.12.24 to 23.12.24 ...	1.1.25.
<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. Takaga ...	"	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>Kin Ora</i> ...	McIntosh, A. ...	A. E. Lockhart ...	"	Shaw Savill & Albion ...	" 26.9.24 to 7.11.24 ...	16.1.25.
<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> ...	Jochens, 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. ...	E. D. Potts ...	"	A. Holt ...	" 7.12.24 to 18.12.24 ...	29.12.24.
<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. Eastern Tel. Co. ...	Form 911 8.10.24 to 28.10.24 ...	22.12.24.
<i>Lady Denison Pender, C.S.</i> ...	West, G. W. ...	F. Lawrence ...	"	" ...	" 13.10.24 to 18.11.24 ...	5.1.25.
<i>Laguna</i> ...	Mander, F. ...	F. W. Parker ...	"	Pacific S.N. Co. ...	" 22.3.24 to 14.4.24 ...	28.4.24.
<i>Lalante</i> ...	Bambra, W. A. ...	T. J. A. Thomson ...	"	Lampport & Holt ...	" 20.11.24 to 13.12.24 ...	30.12.24.
<i>Lancashire</i> ...	Beckett, F. W. ...	W. M. S. Higginson ...	"	Bibby ...	" 26.10.24 to 1.1.25 ...	12.1.25.
<i>Laomedon</i> ...	Smith, A. H. ...	A. J. Barclay ...	"	A. Holt ...	" 19.11.24 to 23.12.24 ...	5.1.25.
<i>La Paz, M.V.</i> ...	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, M.V.</i> ...	Hickman, V. T. ...	H. G. Cuthill ...	No.	Lampport & Holt ...	Form 911 4.10.24 to 28.10.24 ...	27.10.24.
<i>Leicestershire</i> ...	English, G. L. ...	W. Whiteside, P. H. Potter, D. Sharrock, W. H. Muirhead.	M.L.	Bibby ...	Met. Log. 3.11.24 to 23.11.24 ...	19.12.24.
<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 C.S.</i> ...	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

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 16.1.25.	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 ...	" 8.11.24 to 11.12.24...	22.12.24.
<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. Gilroy	"	Shaw Savill & Albion	" 22.9.24 to 15.10.24...	12.1.25.
<i>Maharaja</i> ...	Peeet, T. M. ...	R. C. P. Boermel	"	Asiatic S.N. Co. ...	" 29.10.24 to 30.11.24	29.12.24.
<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., Commodore, R.N.R.	A. F. Butcher, W. W. Pearson	W.T.	White Star ...	W.T. Reg. 10.12.24 to 22.12.24	29.12.24.
<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 ...	2.12.24.
<i>Makura</i> ...	Barlow, A. E. ... Showman, A. C. ... Mawson, J. ...	G. O. Knaggs, J. D. Lundie, W. A. Todd, J. Joyes.	M.L.	Canadian-Australasian	" 3.7.24 to 17.10.24 ...	5.1.25.
<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 ...	" 29.11.24 to 1.1.25 ...	5.1.25.
<i>Manchester Mariner.</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	No.	" " ...	Form 911 2.11.24 to 17.12.24...	22.12.24.
<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. ...	R. Day	"	Atlantic Transport ...	" 10.11.24 to 18.12.24	22.12.24.
<i>Manipur</i> ...	Scurr, T. W. ...	G. W. Barker	"	Brocklebank ...	" 12.10.24 to 1.1.25 ...	3.1.25.
<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> ...	...	...	W.T.	Canadian Pacific ...	...	...
<i>Marella</i> ...	Mortimer S. ...	T. W. Burdis, D. Pemberton, K. L. Thomson, W. McBride, A. M. Hill.	M.L.	Burns Philp ...	" 24.11.23 to 17.4.24...	2.12.24.
<i>Marengo</i> ...	Bean, A. ...	W. G. Pearce, G. B. Bray, E. Wood.	"	Ellerman Wilson ...	" 22.5.24 to 28.8.24 ...	3.9.24.
<i>Margha</i> ...	Whittingham, W. E., O.B.E., R.D., Commr., R.N.R.	J. Strachan, P. Wright, N. A. Thatcher, H. E. Evans.	"	British India ...	" 5.7.24 to 17.9.24 ...	22.2.24.
<i>Marglen</i> ...	Griffiths, J. N. ...	A. Pennington	No.	Canadian Pacific ...	Form 911 16.2.24 to 7.3.24 ...	11.3.24.
<i>27 Marloch</i> ...	Hamilton, G. ...	J. McLellan, C. Crawley, C. Draper.	W.T.	" " ...	W.T. Reg. 9.11.24 to 28.11.24...	4.12.24.
<i>Maryland</i> ...	Pollard, F. W., D.S.O., R.D., Commr., R.N.R.	A. S. Mather	No.	Atlantic Transport ...	Form 911 9.11.24 to 28.11.24...	5.12.24.
<i>Masirah</i> ...	Thowless, E. ...	R. C. Baker	"	Brocklebank ...	" 4.4.24 to 25.4.24 ...	26.5.24.
<i>Massilia</i> ...	Henderson, J. L. ...	E. Richardson	"	Anchor ...	" 12.9.24 to 20.9.24 ...	22.9.24.
<i>Matakana</i> ...	Bosdet, V. J. ...	A. Chrystal, D. N. Mac- Kenworthy, V. ...	"	Shaw, Savill & Albion	" 5.7.24 to 25.11.24 ...	10.12.24.
<i>Mataram</i> ...	McInnes, G. ...	K. Morris	"	Burns Philp & Co. ...	" 19.8.24 to 18.9.24 ...	2.12.24.
<i>Matheran</i> ...	Cornish, N. P. ...	J. A. Embley, J. Robertson, D. Hunter.	M.L.	Brocklebank ...	Met. Log. 2.7.24 to 13.10.24 ...	7.11.24.
<i>Mathura</i> ...	Hanna, R. G. ...	H. H. Armstrong	No.	" " ...	Form 911 3.12.24 to 14.12.24...	29.12.24.
<i>Matina</i> ...	Langlands, D. H. ...	D. H. Bell	"	British India ...	" 29.8.24 to 3.10.24 ...	27.10.24.
<i>Matina</i> ...	Henderson, J. ...	...	M.L.	Elders & Fyffes ...	Met. Log. 3.9.23 to 28.5.24 ...	31.5.24.
<i>32 Mauretania</i> ...	Rostron, A. H., C.B.E., R.D., A.-d.-C., Capt., R.N.R.	J. A. Myles, A. N. Sargent, R. Allen.	W.T.	Cunard ...	W.T. Reg. 2.11.24 to 7.11.24 ...	20.11.24.
<i>56 Megantic</i> ...	Berry, G. ...	H. J. C. Day, R. Conway ...	W.T.	White Star ...	W.T. Reg. 18.10.24 to 7.11.24...	12.11.24.
<i>22 Melita</i> ...	Clews, A. H. ...	H. A. MacCullum, W. E. Bacon, A. Benshaw.	W.T.	Canadian Pacific ...	" 2.11.24 to 6.11.24 ...	11.11.24.
<i>Memnon</i> ...	Salter, G. H. ...	E. D. Potts	No.	A. Holt ...	Form 911 3.10.24 to 19.10.24...	21.10.24.
<i>Memominee</i> ...	Finch, E. ...	W. S. Mackie	"	Atlantic Transport ...	" 27.11.24 to 4.12.24 ...	8.12.24.
<i>Mercian</i> ...	Gardner, J. ...	R. Hughes	"	Leyland ...	" 10.11.24 to 18.12.24	22.12.24.
<i>21 Metagama</i> ...	Henderson, W. ...	B. Leslie, A. M. Watt, E. V. Glennie.	W.T.	Canadian Pacific ...	W.T. Reg. 29.11.24 to 18.12.24	22.12.24.
<i>Miami</i> ...	Maxwell Brown, W. E.	E. Lowndes	No.	Elders & Fyffes ...	Form 911 5.11.24 to 6.12.24 ...	11.12.24.
<i>Michigan</i> ...	Tribe, A. E. ...	L. A. Williams	"	Atlantic Transport ...	" 11.6.24 to 20.6.24 ...	25.6.24.
<i>Minderoo</i> ...	Richardson, E. ...	B. J. Bennie, W. J. McPhedron, J. H. Oxtan.	M.L.	West Australia Nav. Co.	Met. Log. 30.12.23 to 12.6.24...	27.8.24.
<i>Minna</i> ...	Mackenzie, G. G. ...	D. Rattray	No.	Scottish Fishery Board	Form 911 15.11.24 to 17.12.24	22.12.24.
<i>23 Minnedosa</i> ...	Sibbons, H. ... Notley, A. ...	— Carter, — Soame, — Mac- kenzie.	W.T.	Canadian Pacific ...	W.T. Reg. 1.11.24 to 20.11.24...	22.12.24.
<i>Minnetonka</i> ...	Gates, T. F. ...	H. E. McCartney	No.	Atlantic Transport ...	Form 911 6.9.24 to 24.9.24 ...	26.9.24.
<i>Minnewaska</i> ...	Claret, F. ...	W. S. Mackie, F. J. Mummery	"	" " ...	" 14.12.24 to 3.1.25 ...	6.1.25.
<i>Mirror, C.S.</i> ...	Sherwood, C. A. ...	C. E. F. St. John	"	Eastern Tel. Co. ...	" 3.11.24 to 22.11.24...	28.11.24.
<i>Mississippi, M.V.</i>	Wylie, J. T. J. ...	H. K. Cookerill	"	Atlantic Transport ...	" 29.8.24 to 6.10.24 ...	20.10.24.
<i>Moena</i> ...	Morzer Bruyns, M. F.	P. de Viels	"	Nederland ...	" 8.12.24 to 24.12.24...	5.1.25.
<i>Moldavia</i> ...	Griffin, R. H., O.B.E., R.D., Capt., R.N.R.	D. Buckley	"	P. & O. ...	" 9.10.24 to 4.12.24 ...	13.12.24.
<i>Mongolian Prince</i>	Durrant, G. D. ...	R. S. Bibby	"	Prince ...	" 7.7.24 to 3.10.24 ...	14.10.24.
<i>Monkbarns, Ship</i>	Davies, W. ...	M. B. Glasier	"	J. Stewart & Co. ...	" 13.10.23 to 20.11.23	21.1.24.
<i>24 Montcalm</i> ...	Rennie, A., O.B.E.	H. McFadyen	W.T.	Canadian Pacific ...	W.T. Reg. 7.12.24 to 22.12.24...	29.12.24.
<i>25 Montclare</i> ...	Webster, G. S., R.D., Commr., R.N.R.	R. Fegan, W. Phillips, H. S. Knight.	"	" " ...	Form 911 21.12.24 to 9.1.25 ...	15.1.25.
<i>28 Montlaurier</i> ...	Turnbull, J., C.B.E., R.D., Capt., R.N.R.	F. E. Williams	"	" " ...	" 21.12.24 to 9.1.25 ...	16.1.25.
<i>26 Montrose</i> ...	Landy, E. ...	T. Beck, A. Mansey, R. Robinson.	"	" " ...	" 29.11.24 to 19.12.24	22.12.24.
<i>20 Montroyal</i> ...	Latta, R. G. ...	F. E. Williams	"	" " ...	W.T. Reg. 15.11.24 to 3.12.24...	9.12.24.
<i>Morvada</i> ...	Mills, T. L., O.B.E., R.D., Commr., R.N.R.	J. Norris, C. L. Hazeldine ...	M.L.	British India ...	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 16.1.25.	Date Received.
Mulbera ...	Steadman, W. R. ...	E. Holland ...	No.	British India ...	Form 911 28.11.24 to 10.12.24	22.12.24.
Nagara ...	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.
Napierian ...	Kerruish, W. ...	T. Griffiths ...	"	Leyland ...	" 14.2.24 to 26.2.24 ...	14.3.24.
Nardana ...	Brown, H. ...	S. C. T. Smith, W. E. Jackson	"	British India ...	" 25.7.24 to 29.8.24 ...	16.9.24.
Nariva ...	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.
Nascopie ...	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.
Navarino ...	Crichton, J. S. ...	J. Annam ...	No.	Glen & Co. ...	Form 911 13.12.23 to 12.1.24...	22.1.24.
Navasota ...	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.
Nauab... Nebraska ...	Smith, J. F. ... Collins, A. R. D., O.B.E., R.D., Lt.-Commr., R.N.R.	... A. F. Walker ...	"	Asiatic S.N. Co. ... R.M.S.P. Co. ...	" 20.7.24 to 27.9.24 ... " 15.3.24 to 21.4.24 ...	22.12.24. 5.5.24.
Nellore ...	Murray, F. S., R.D., Lt. - Commr., R.N.R.	G. E. Owen ...	"	P. & O. ...	" 15.11.24 to 4.12.24...	22.12.24.
Nestor ...	Owen, R. D., O.B.E.	O. V. Jones ...	M.L.	A. Holt ...	" 10.7.24 to 22.8.24 ...	1.9.24.
Nevasa ...	Swanson, C. J. ...	D. Lorrie ...	No.	British India ...	" 13.10.24 to 30.12.24	6.1.25.
Newby Hall ...	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.
Niagara ...	Rolls J. T. ...	R. B. Denniston, T. A. Macpherson, J. V. Bray, J. Dawson.	M.L.	Canadian-Australian...	" 19.7.24 to 13.11.24...	8.12.24.
Ningchow ...	Wilson, C. A. ...	R. A. Hannay ...	No.	A. Holt ...	Form 911 14.10.24 to 8.1.25 ...	16.1.25.
Nore ...	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.
Norman ...	Morton Betts W. ...	D. A. Hodgson ...	No.	Union Castle ...	Form 911 11.8.24 to 31.8.24 ...	16.10.24.
Norna ...	Wright, J. ...	T. Mather ...	"	Scottish Fishery Board	" 1.12.24 to 31.12.24...	6.1.25.
Norseman, C.S. ...	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.
Nortonian ...	McCormick, J. ...	T. Griffiths ...	No.	Leyland ...	Form 911 2.8.24 to 30.9.24 ...	4.10.24.
Nubian ...	Watmough, T. M. ...	H. R. Gaskill ...	"	" ...	" 21.12.24 to 2.1.25 ...	6.1.25.
Nyanza ...	Carpendale, F. W. J.	G. D. Brown, C. H. Hand, S. Ferguson.	M.L.	P. & O. ...	Met. Log. 20.10.24 to 4.1.25 ...	9.1.25.
Oaklands Grange... Olland I. ...	Routledge, R. ... Villiamsen ...	E. A. Insley ... H. Svendgaard ...	No.	Houlder Bros. ... Hannevig Bros. ...	Form 911 27.5.24 to 19.9.24 ... " 19.12.23 to 2.1.24 ...	26.9.24. 4.1.24.
42 Ohio ...	Nicholson, M. S., R.D., Capt., R.N.R.	R. W. Morford ...	W.T.	R.M.S.P. Co. ...	" 12.12.24 to 9.1.25 ...	12.1.25.
Olympia ...	Caldwell, R. ...	D. R. Urquhart, G. Lynas, C. Mortimer.	M.L.	Anchor ...	" 13.8.24 to 26.10.24...	29.10.24.
57 Olympic ...	Howarth, F. B., Commr., R.N.R.	J. C. M. Boyce, G. W. Couch, C. J. Warfrire.	W.T.	White Star ...	W.T. Reg. 19.12.24 to 2.1.25 ... Form 911 18.12.24 to 3.1.25 ...	5.1.25. 6.1.25.
Orama ...	Staunton, H. G., C.B.E., R.D., Commr, R.N.R.	... ... ...	M.L.	Orient ...	.........	...
Oranian ...	Hoskins, W. ...	D. Hewett ...	"	Leyland ...	Form 911 4.9.24 to 17.11.24 ...	24.11.24.
Orari ...	Robinson, F. W. ...	R. Newman, T. Breen, F. Long- heed, G. Lant, H. Farrant.	M.L.	New Zealand S.S. Co.	Met. Log. 22.11.23 to 11.5.24...	16.5.24.
40 Orbita ...	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.
Orcoma ...	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.
41 Orduna ...	Warner, G. E., R.D., Commr., R.N.R.	R. W. Sumpton, J. Vivian, B. C. Dodds.	W.T.	R.M.S.P. Co. ...	W.T. Reg. 22.11.24 to 18.12.24 Form 911 21.11.24 to 18.12.24	22.12.24. 22.12.24.
Oriana ...	{ Daniel, T. ... } { Kite, E. ... }	... ... ...	M.L.	Pacific S.N. Co. ...	Met. Log. 15.2.24 to 24.10.24 ...	8.11.24.
Orita ...	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.
Ormonde ...	Knowles, C. H., D.S.O., Commr., R.N.	A. M. Hughes ...	M.L.	His Majesty's Ship ...	Met. Log. 8.11.24 to 6.12.24 ...	31.12.24.
Ormonde ...	Coad, A. J., Commr., R.N.R.	N. Savage, T. B. Grieve, N. A. Whinfield, W. A. Wickham.	M.L.	Orient ...	Met. Log. 14.9.24 to 16.12.24...	31.12.24.
Ormuz ...	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.
Oroya ...	Pearce, A. ...	S. Lewis ...	No.	Pacific S.N. Co. ...	Form 911 29.10.24 to 5.1.25 ...	12.1.25.
Orsova ...	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.
Ortega ...	Christian, C. H. ...	D. W. Hutchison ...	No.	Pacific S.N. Co. ...	Form 911 12.6.24 to 5.7.24 ...	26.8.24.
Orvieto ...	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.
Osterley ...	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.
Othello ...	Pearson, Z. C. ...	J. W. Botheroyd ...	No.	Ellerman Wilson ...	Form 911 14.12.24 to 29.12.24	6.1.25.
Otira ...	Elford, H. E. ...	J. H. Fuller ...	"	Shaw, Savill & Albion	" 11.10.24 to 31.10.24	3.12.24.
Ovid ...	Groom, A. C. B. ...	... ... ...	"	Shakespeare Shipping Co.	" 5.10.24 to 9.11.24 ...	11.11.24.
Oxfordshire ...	C umplin, W. E. ...	F. C. Brooks ...	"	Bibby Bros. ...	" 20.11.24 to 19.12.24	22.12.24.
Pacific Shipper, M.V.	Newman, G. W. A.	J. W. Woodward ...	"	Furness Withy ...	" 8.9.24 to 24.9.24 ...	22.10.24.
Pakeha ...	W. P. Clifton Mogg	M. F. Armitage ...	M.L.	Shaw, Savill & Albion	Form 911 1.7.24 to 10.8.24 ...	15.8.24.
Paparoa ...	Ashworth, F. ...	C. J. Brewer ...	No.	New Zealand S.S. Co.	" 21.10.24 to 14.11.24	30.12.24.
Pareora ...	Evans, J. O. ...	R. F. Hillings ...	"	Hain S.S. Co. ...	" 18.9.24 to 27.10.24...	8.12.24.
Paris ...	Cook, C. L. ...	Mr. Bies...	C.C.	Southern Ry. ...	Telegraphic Report. 19.2.24	19.2.24.
Patia ...	Bostock, R. J. ...	W. McIlwaine ...	No.	Elders & Fyffes	Form 911 30.11.24 to 4.1.25 ...	12.1.25.
Patrol, C.S.	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.
Persic ...	Davies, E. ...	H. Williams ...	No.	White Star ...	Form 911 19.10.24 to 1.12.24...	3.12.24.
Peshawur ...	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.
Philadelphia ...	Baker, J. A. ...	W. Lawton ...	No.	Leyland ...	Form 911 2.10.24 to 20.11.24...	26.11.24.
Polyphebus ...	Hatfield, J. ...	R. E. Wilkes ...	"	" ...	" 11.11.24 to 30.11.24	5.1.25.
Poona ...	Cherry, W. G. W. ...	F. R. W. Page ...	"	P. & O. ...	" 21.7.24 to 31.8.24 ...	15.9.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 16.1.25.	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>Talhybius</i> ...	Duggan, C. ...	J. H. Brown ...	No.	A. Holt ...	Form 911 22.11.24 to 5.12.24...	29.12.24.
<i>Tambora</i> ...	Ruhaak, H. G. ...	H. Van Manen ...	"	Rotterdam Lloyd ...	" 23.10.24 to 10.12.24 ...	22.12.24.
<i>Tetresias</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 ...	"	" ...	" 27.11.24 to 12.12.24 ...	5.1.25.
<i>Themistocles</i> ...	Jermyn, 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, Ll. T., M.B.E.	S. P. Sheldon ...	"	Eastern Tel. Co. ...	" 7.12.23 to 2.2.24 ...	18.2.24.
<i>Traveller</i> ...	Worthington, B. ...	A. Robertson ...	"	Harrison ...	" 19.6.24 to 18.7.24 ...	22.7.24.
<i>Trematon</i> ...	Hicks, F. H. ...	J. Christopher, D. Thomas, F. J. Webb, S. Smith, C. Mayberry.	M.L.	" ...	Met. Log. 31.8.23 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> ...	Adecock, F. ...	D. L. Hoare ...	"	A. Holt ...	" 17.5.24 to 22.8.24 ...	10.9.24.
<i>Ulimaroa</i> ...	Wyllie, W. J. ...	A. J. Angelin ...	"	Huddart Parker, Ltd.	" 16.9.24 to 14.10.24...	12.1.25.
<i>Ulysses</i> ...	McHutcheon, W. ...	T. R. Phillips ...	"	A. Holt ...	" 23.8.24 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>Valocia</i> ...	Doyle, M. ...	J. W. Canuce ...	"	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>Vardulia</i> ...	Murchie, P. A., R.D., Commr., R.N.	J. E. Deans ...	No.	Cunard ...	Form 911 23.12.24 to 4.1.25 ...	6.1.25.
<i>Vasconia</i> ...	Inch F. ...	E. Gleave ...	"	" ...	" 7.12.24 to 19.12.24 ...	22.12.24.
<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 ...	" 23.11.24 to 31.12.24 ...	1.1.25.
<i>Verehtia</i> ...	Edkin, E. ...	A. E. 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 29.11.24 to 19.12.24 ...	16.1.25.
<i>Waiotapu</i> ...	Davey, A. ...	B. S. Cave ...	No.	Canadian-Australasian Union Castle	Form 911 2.10.24 to 22.10.24...	9.12.24.
<i>Walmer Castle</i> ...	Stanley, W. P., R.D., Commr., R.N.R.	C. Aylen ...	"	" ...	" 31.10.24 to 22.12.24 ...	23.12.24.
<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 18.11.24 to 12.1.25...	16.1.25.
<i>War Nizam</i> ...	Putt, R. O. ...	E. R. Clark ...	"	British Tankers ...	" 23.11.24 to 28.12.24 ...	3.1.25.
<i>Welshman</i> ...	Rollerson, W. ...	W. A. Fletcher ...	"	White Star-Dominion ...	" 3.12.24 to 30.12.24...	6.1.25.
<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>Zealand</i> ...	Thomas, A. J. ...	W. F. Jackman ...	No.	Red Star ...	Form 911 20.12.24 to 8.1.25 ...	12.1.25.
<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>Walling 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 31.12.24.	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>Tortiguero</i> ...	Martin ...	H. H. Dunning ...	" ...	" ...	15.12.24.