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The Marine Observer



The Review of the
Marine Division of the Meteorological
Office, in co-operation with Voluntary
Marine Observers

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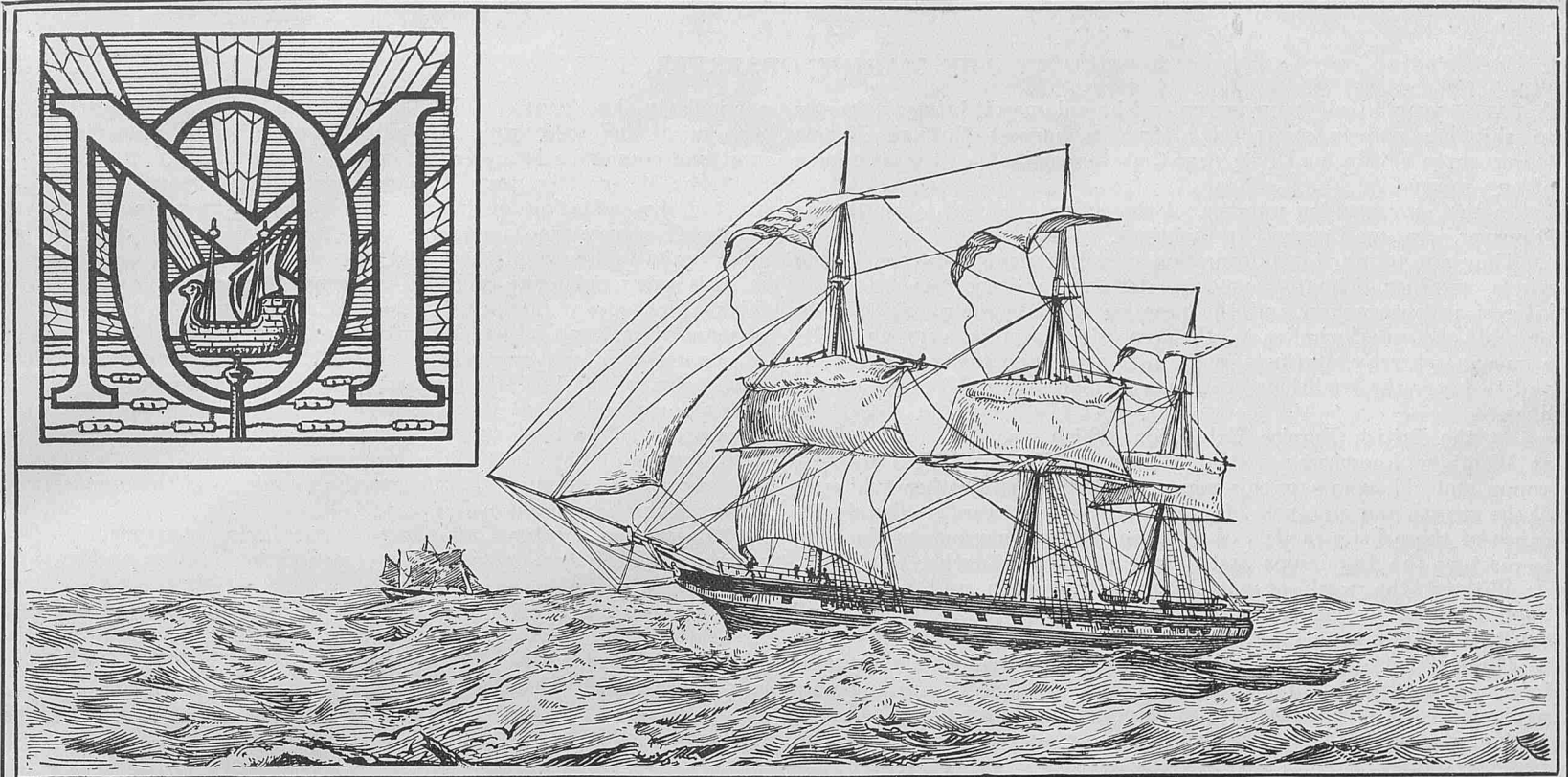


TABLE OF PRINCIPAL CONTENTS.

	PAGE		PAGE
Foreword to Volume II	1	Heavy Weather in Eastern North Atlantic, January 7-9, 1924	10
The Marine Observer, 1925	2	Weather Signals :—I. Ships' Wireless Weather Signals	11
A Meteorologist at Sea, August 21-28, 1924	2	Lithographic Illustrations, after page 16.	
Sir NAPIER SHAW, LL.D., Sc.D., F.R.S., with portrait	4	Charts of Currents on Route, Latitude of Cape Blanco to the Brazils, February, March, and April (with explanation), and Figures 1 and 2 (insets).	
The Marine Observer's Log, with illustrations	6	Weather Charts, Nos. I-III, Mornings of January 7, 8 and 9, 1924, with Track Chart (inset).	
Currents	8	Chart of Tracks of Typhoons in the Far East, 1893-1918, for month of January (From Zi-Ka-Wei Observatory "Atlas of the Tracks of 620 Typhoons, 1893-1918," by LOUIS FROC, S. J. Director, Zi-Ka-Wei Observatory).	
Notes upon Average Conditions in the Indian Ocean, North of Latitude 35° S., I. January	9		
Weather Charts	10		

FOREWORD TO VOLUME II.

By DR. G. C. SIMPSON, C.B.E., F.R.S.

"THE Marine Observer" has weathered her first year, always the most difficult period of a new journal, and my foreword to the second volume can only take the form of sincere thanks to all those who have helped us in our enterprise. Thanks are due to the contributors who have provided useful articles and notes, to the readers who have sent helpful suggestions, to those who have given encouragement, and my personal thanks go out in particular to the Marine Superintendent and Staff of the Marine Division, who have relieved me of all anxiety as to the success of this, their pet venture.

We can now look forward to the future with confidence: we are receiving the help we anticipated from our readers; there is an obvious

keenness to learn the new methods of synoptic meteorology; the explanations of meteorological phenomena are adding to the interest of our observers. There is, however, much more to be done. We really know very little about our atmosphere compared with what there is to know; there are many regions of the ocean from which we have very few data; and there is much we would like to communicate to sailors in return for what they give to us. In all this "The Marine Observer" will help, and so I send Volume II forward in full confidence of a successful second year of life.

DIRECTOR.

October, 1924.

THE MARINE OBSERVER, 1925.

A HAPPY year to all is our fervent wish, and may it bring prosperity to shipping and seamen and a fruitful harvest through Marine Observers to the Marine Division, so that we may increase the usefulness of our Journal.

In this, our opening number, of the second year of "The Marine Observer," we may repeat its functions.

They are, to provide information useful in navigation concerning winds, weather, climate, currents, derelicts and ice; to stimulate interest in observation and the practice of Meteorology at sea; to promote the use of wireless weather reporting for shipping; to provide a means whereby Mariners may give their experiences to others, and to foster the traditions of Marine Meteorology upon international lines.

At the British Empire Exhibition, which was held during 1924 at Wembley, there was a "live" map of the world. To seamen, young and old, who saw this map and all the many other evidences of the growth and greatness of our Empire, what reward! The significance of those little models of ships continually moving on the map connecting the Dominions and Colonies with the Mother Country!

Without the work of exploration, observation and survey the application of modern steam and motor ship service for regular and constant Empire connection could never have been.

Observation and investigation was the means of providing reliable information of wind and currents, which enabled the sailing ship navigator with skilled seamanship to make a passage.

Knowledge of Marine Meteorology with ability to predict weather,

particularly hurricanes and visibility, are just as essential for economical and safe navigation under power, while competition in maritime commerce is greater than ever.

"The Marine Observer" is now the established national medium for the dissemination of information obtained from the Corps of Marine Observers who command and officer 500 ships plying all the great ocean highways of the world.

It is sent regularly to each and every one of these regular observing ships which appear in the list published at the end of each Number, as some return, and in grateful acknowledgment for voluntary work.

A number of shipowners have shown the interest they take in the application of Marine Meteorology by the encouragement they give their officers, and by subscribing for the regular supply of "The Marine Observer" as part of the navigational equipment of their ships, whether those ships are included upon our list or not. Such interest is to the general good and testifies to the soundness of the observation upon which the work is based.

Let us then continue our efforts, remembering that accurate observation and systematic record, in fine weather as well as foul, are the backbone of the work.

MARINE SUPERINTENDENT.

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

A METEOROLOGIST AT SEA, AUGUST 21-28, 1924.

By SIR NAPIER SHAW, LL.D., Sc.D., F.R.S.

"I VERILY believe he liked sea-life because on the whole it is favourable to reflection." The change from sail to steam may have altered things so far as those who live at sea are concerned; but, for a passenger, days and nights at sea are pre-eminently times for reflection—he cannot throw away the hours in reading the same trifles of news in many newspapers as on a railway journey. There are intervals between meals which, with a certain assiduity, may be bridged without reflection; but for a meteorologist the inducement to reflection is particularly strong. You can see so far at sea, this way or that, although you may have to walk what seems a long way when you are in a hurry to get a view of the other side; you feel yourself to be a small item in a vast environment and can hardly avoid wondering how your experience of the imperious weather joins up with that of the rest of the world. You recognise that there are no water-tight bulkheads in the atmosphere. For days together, there is not even a coast to put up a line of cumulus to tell a tale of separation. We started from Quebec in the *Carmania* on a fine August afternoon; in the evening, looking up the river, beginning about twenty miles away from the ship, there was a complete representation of a cyclonic depression as pictured by the Norwegian meteorologists*—wisps of cirrus at the top tracing fantastic shapes on the pale blue sky; beneath them, further away, patches of alto-cumulus deepening to strato-cumulus and in the nick of the horizon, inky clouds with all the appearance of rain. Right and left it was all there was to see in the sky. It was a natural lantern-slide of a typical cyclone of the variety appropriate to middle latitudes. It was probably also eastward bound. Would it catch us? The next day was still beautifully fine, but with banks of clouds low down to the westward, our wind all this time westerly or northerly. We seemed to be keeping our distance from the pursuer; but, the following day, the first on the open Atlantic, after a beautifully fine morning, there was wind from the south, light but enough to stir up the cold surface into fog. Somehow "the cyclone" had apparently got us—but how? Very quietly during the fine weather, without coming up from the west in the regular way of a progressive cyclone: thereafter

a high barometer with hardly any change till the end of the passage. What had actually happened? Was there really a cyclone or was the grouping of the clouds that meteorologists have thought to be characteristic of the phenomenon, a mere coincidence? Did it overtake us and make the fog with its southerly wind; and if so, why did the barometer remain so high and steady afterwards?

As a rule there are no weather maps on board ship; we had a daily newspaper with latest news by wireless and were able to follow the careers of the best-known pugilists and other sportsmen, and prominent criminals of both hemispheres; but there was nothing about the weather which was busy shaping the year's food-store of the northern hemisphere and was actually at the time saving up for a knock at some liners at Nantucket a few days later. The omission from a newspaper which depends for its circulation on those at sea is a curious characteristic of the age. It was the more noticeable coming home because going out we had some enterprising meteorologists on board who, with the assistance of the ship's officers and operator, collected information enough out of the æther to make an excellent map and the omissions of the "Atlantic Daily" were more than remedied. But, coming home we had nothing but what we could see for ourselves—the ship's run day by day, but not the ship's weather as noted for transmission to meteorological centres east or west; and, with all the opportunity for reflection on the voyage, and any further opportunity since, I have not been able to think of sufficient reason, though obviously there must be one. In the curious circumstances of life at sea when reflection is inevitable and ordinary work impossible the mere comparison of one's own experience of weather with that of the authoritative record is of interest.

In the absence of any means of dealing with the Atlantic weather in a general sense on the Atlantic itself we had to wait to be home again before I could get at maps and look out for the elusive cyclone—it was hardly recognisable; what we looked into from the St. Lawrence was a long shallow trough of "low" between a "high" over the Atlantic and another over the Great Lakes. It changed; it cannot apparently be said to have moved: but, on the third day there was a very shallow "low" over the ship's place and its surroundings, and the southerly wind, coming over the cold water outside Belle Isle and

* See "Forecasting Weather," p. 154.

giving us the fog, was a true sign of it. There it remained, and we rode the rest of the way over the Atlantic in the north-west corner of a high pressure that showed all sorts of relative changes north and south of us but kept its own balance. Why that anti-cyclone travelled at about 18 knots and how the apparent cyclone managed to get over us without passing us invites a good deal of reflection as to what is doing in the upper air while we are glued to the surface.

But the behaviour of the weather out and home was not the only subject of reflection. The voyage ended in the last days of the last month of a professional career, with the study of the weather as its object, that began just a quarter of a century ago. What of the changes in meteorology since August 1899? On 29 July, in the course of the morning, the observations of weather on board the *Caronia* were placed on a map in juxtaposition with observations of the same morning from Europe, America, from various ships on the Atlantic, from Iceland, from Jan Mayen and Spitzbergen, and that without any more effort than listening for them at a telephone, taking them down and decoding them. A quarter of a century ago, observations could only be collected by the few privileged persons who sat in an office at some point of convergence of telegraph wires and cables; and the region that we used to watch day by day was very limited. We had to extend the map to provide for the messages from the Azores which Colonel CHAVES was offering us; a further extension was necessary in order to take in Iceland and wireless messages from H.M. ships in 1907, and from the Atlantic liners in 1909, then Madeira in 1910, and Spitzbergen in 1913. Nothing less than a map of the Northern Hemisphere is sufficient now to accommodate the observations that the offices of Europe and America collect and that a ship at sea or indeed any private individual can collect also if he is so minded.

Even now we have not reached the end. The atmosphere is always reminding us that it has thickness as well as length and breadth, height as well as longitude and latitude. The curious behaviour of the barometer on the way over is only one of many instances. Even at sea, the observations must be extended to the upper air. It has already been done to some extent over land but the sea covers an enormous area even of the Northern Hemisphere, and if meteorology is to move with an even stride sea and land must keep step in their co-operation.

Working at meteorology without knowing what is going on overhead, whether on sea or land, is like trying to make out the works of a clock by close attention to the dial: it takes an omniscient person to make things out in that way and as soon as one becomes omniscient enquiry ceases to be necessary.

More striking even than the extension of the area of the map within the last quarter of a century is the position of the science itself. In the nineties of last century it was suffering from chronic depression. Sixty years ago the practice of charting weather on daily maps had been introduced into this country by FITZROY. The effect was electrical in more senses than one. In 1867, scientific people thought that with the daily map and the self-recording observatories we should have the forecasting of weather at our mercy. The disillusionment reached its climax at the end of the century. Before the advent of the weather-map distinguished physicists could explain with every appearance of certainty the formation of dew, hoar frost, cloud, rain, snow, hail, thunder, lightning, rainbows, halos, pressure variation and temperature, and almost everything else that one can think of as meteorological—low pressure was due to moist air, rain to the condensation of water-vapour and so on; but when the daily map came the questions were changed and people asked themselves not what is the cause of rain but what is the cause of *this* rain; why is it fine with the barometer standing at "much rain"? Why fog to-day and no fog yesterday? It was confidently expected that the maps would answer their own questions—they did so to some extent but at the same time they asked more and harder ones—there is, I think, no more complicated bundle of paradoxes in the world than the daily maps of the Atlantic for 1882-3 in

what are called the "Thirteen months' charts." With maps it is possible and even easy to get a fair idea of the weather-changes in progress but the working out of the ideas in detail waits for the physicist to come back to the study of weather which he took up so lightly in the first half of the nineteenth century and dropped so completely in the second half.

The mathematicians had their turn and produced formulæ and equations of motion but nobody had succeeded in catching the weather with them, and the only formula that had really got a grip was BUYS BALLOT'S law of the relation of pressure to wind.

So towards 1900 we were very despondent; and we got very little encouragement from our scientific environment. It was acknowledged that the charts which had been produced of the Cape to New Zealand and those of the South Atlantic Ocean, which were being produced under Admiral WHARTON'S direction, were a substantial contribution to geography if not to meteorology in the stricter sense—forecasting was not much thought of, the work of the observatories was routine and the sheet anchor was the preparation of charts of mean values for the Oceans, begun in 1854, and oddly enough not finished even to-day. The meteorology of the land was like the meteorology of the sea though it was certainly much further advanced. The meteorology of the land could be treated in the form of hourly values, daily values, weekly values, monthly values and yearly values and the sequences hour by hour, day by day, week by week, month by month, and year by year could be followed; whereas, for the sea, the most we aspired to produce were the monthly means of occasional values ranging over a long series of years, and in 1899 this was regarded as the chief productive operation of the Meteorological Office.

But since 1900 things have changed. We were conscious that the mere inspection of weather maps would not tell us the secret of the working of the atmosphere. The regular investigation of the upper air had begun with kites by A. L. ROTCH at Blue Hill Observatory near Boston, Mass., and by L. TEISSERENC DE BORT at Paris, and with manned balloons in Germany, then came the kite-balloon and the ballon-sonde, free balloons unmanned yet carrying self-recording instruments, and with this assistance a good many of the chapters of the physics of the earth's atmosphere have been re-written, as may be seen from some of the lectures included in "The Air and its Ways."* Observations of the upper air over the sea have also been made but they are relatively few (one from H.M.S. *Kellett* has just been welcomed) and for the most part they require a ship that may be said to have leisure. A 20-knot liner with a fixed track is not the best form of floating observatory; a 15-knot yacht that can go where it likes is the ideal and if only yachtsmen could realise the sporting aspect of sending up a little balloon to carry instruments up to six or eight miles, catching it again, recovering the instrument and deciphering the records, a new zest could be added to sea life.†

And there is much more to be done at sea. We ought, of course, to finish the job of preparing maps of normal values for the whole sea-surface including the winter ice, and somehow or other we must get the variations in conditions over the sea-surface from year to year as we have got them now for the land in the "Réseau Mondial."‡ For this purpose trade routes are sufficient to begin with and liners are excellent observatories for that purpose. With very little additional organisation it could be done, and when a monthly table of meteorological results for the trade routes of the world has been put together for a whole year for the first time, we shall wonder why it has not been done for each year of the last quarter of a century. Up to now only the foundations of the meteorology of the sea have been laid, the superstructure has still to come and when it is finished, or even well-started, we shall really know something of the meteorology of the globe as a whole.

If these be the reflections of two short weeks at sea it is no wonder that "he liked sea-life because on the whole it is favourable to reflection."

* "The Air and its Ways," Cambridge University Press, 1923.

† An account of the method of using ballon-sondes at sea has just been reprinted from the original description of TEISSERENC DE BORT by the Meteorological Section of the International Union for Geodesy and Geophysics.

‡ British "Meteorological and Magnetic Year Book," Part V, Yearly, 1910-15 (M.O. 220g.).

SIR NAPIER SHAW.

By R. G. K. LEMPFERT, C.B.E., M.A., ASSISTANT DIRECTOR, METEOROLOGICAL OFFICE.

To no living man does Meteorology, more particularly British Meteorology, owe a greater debt than to Sir NAPIER SHAW, the late Director of the Meteorological Office. During the twenty years that he presided over its activities he succeeded in acquiring for the Office a foremost place among similar institutions. Born in Birmingham in 1854, Sir NAPIER received his early education at King Edward's School in that city, and passed on from there to Cambridge University where he entered as a scholar of Emmanuel College. He read Physics and Mathematics and took his degree in 1876, after taking a brilliant position as a high wrangler in the Mathematical Tripos and a First Class, with distinction, in Physics, in Part II of the Natural Sciences Tripos. The following year was spent in Berlin working in the University Physical Laboratory under the celebrated HELMHOLTZ, but in 1877 SHAW returned to Cambridge which remained his home until he came to London in 1900 to take charge of the Meteorological Office.

At Cambridge SHAW's activities were divided between his College and the University. He was elected to a Fellowship at Emmanuel in 1877 and became Senior Tutor in 1890. On the University side he took an active part in University politics and organisation, holding for a time the office of Proctor, but his scientific work centred on the Cavendish Laboratory of experimental physics, in which so many of the country's physicists have received their training. CLERK MAXWELL was still Professor of Physics, to be succeeded all too early by Lord RAYLEIGH and subsequently by THOMSON, now Sir JOSEPH THOMSON. SHAW worked both as experimenter and as teacher. He was appointed University Lecturer in Physics in 1887 and in 1898 was made Assistant Director of the Laboratory, jointly with Sir RICHARD GLAZEBROOK who subsequently became Director of the National Physical Laboratory. He was elected a Fellow of the Royal Society in 1891, the work in recognition of which the award was made being a new determination of the electrolytic equivalent of copper.

Such were the main episodes in Sir NAPIER's career up to the time of his becoming the head of the Office. It must not be supposed, however, that he was in any sense a newcomer to meteorology. All along he had had a bias towards meteorology. One of the earliest experimental researches which he undertook at the Cavendish Laboratory was an investigation into hygrometric methods which he undertook for the Meteorological Council in 1879, the results of which were published in the "Transactions of the Royal Society." Throughout his teaching of physics could be traced the desire to interest his students in atmospheric phenomena. I have a vivid recollection of an occasion on which we had been discussing the limits of accuracy within which the barometric pressure could be determined with the aid of the laboratory barometer. As the clock struck, SHAW dismissed his class with the remark: "If I really wished to know the pressure of the atmosphere in Cambridge on a given day, I should refer to that," and passed us a lithographed sheet containing many figures and maps. That was my first acquaintance with official meteorology. The sheet in question was the current "Daily Weather Report," which had arrived by post from London while the class was being held.

In 1897, three years before he went to London, Sir NAPIER had been appointed by the Royal Society to serve on the Meteorological Council, at that time responsible for the administration of the Meteorological Office. It is not without interest to recall that his first direct attempt to influence the work of the Office was in the field of marine meteorology. Being much intrigued by the persistence of mild stormy weather over the British Isles during the winter of 1898-9, he suggested to the Council that the Office should endeavour to trace the cause of the abnormal conditions at any rate a step further back by undertaking a detailed discussion of the conditions over the North Atlantic. It must be remembered that 1898 was before the days of wireless telegraphy, and synoptic charts of the North Atlantic could only be drawn by extracting the necessary data from logs and registers sent in by observing ships on arrival in port and plotting them. The Council adopted the suggestion and ultimately, in 1901, a set of synoptic charts for the whole season was published under the title "Charts illustrating the Weather of the North Atlantic Ocean in the Winter 1898-9." They form, perhaps, the most striking set of charts that exist for the North Atlantic, covering as they do

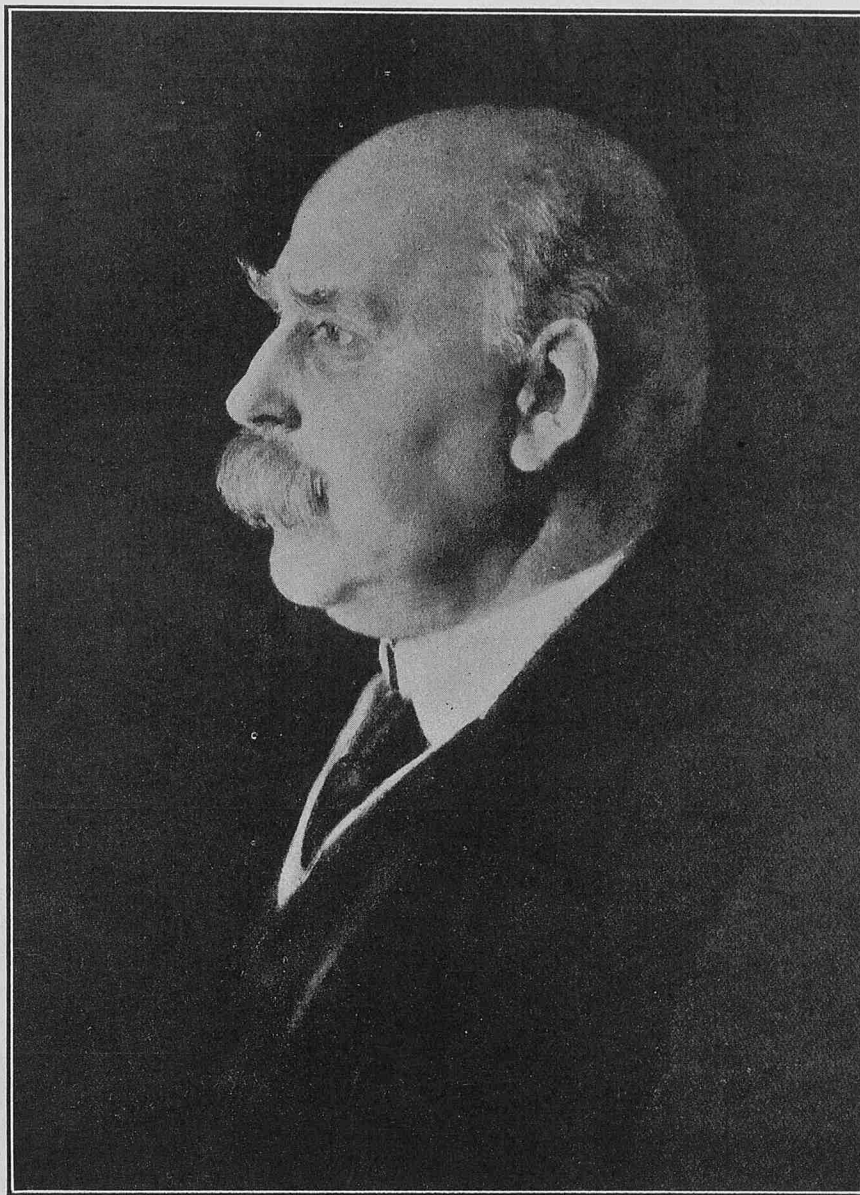
one of the stormiest winters on record.

From 1900 onwards the story of SHAW's scientific work is intimately bound up with that of the Office, and considerations of space make it impossible to attempt to set it out even in outline. We must limit ourselves to touching briefly on those aspects of it which bear directly on Marine meteorology. HEPWORTH had joined the staff of the Office as Marine Superintendent in the previous year. The Office had been founded in 1854 for the purpose of collecting and discussing observations from the oceans, and as the years went by a vast mass of material had been collected. It is always a matter of difficulty to decide how such material is to be discussed. On the one hand there is the very natural desire to produce results which may lead to the frittering away of energy on the publication of snippets, but a more serious danger arises from the, in itself very laudable, desire to be thorough, which may lead to the laying of plans on so comprehensive or so detailed a scale that the work becomes unmanageable, with the result that no part of it is brought up to the point at which publication is practicable. On those entrusted with the direction of the work of an Office is, therefore, laid the very serious responsibility of selecting the order in which the work shall be tackled and fixing the scope of each part in such a manner that it shall be thorough but not so big that it cannot be completed in reasonable time.

SHAW and HEPWORTH turned their attention in the first instance to the Southern Hemisphere, and in 1902 there were issued "Wind Chart for the Coastal Region of South America" (M.O. 159), and in the following year "Monthly Wind Charts of the South Atlantic" (M.O. 168).

Such publications represent the contribution of the marine division to the discussion of the material which has been entrusted to it by the co-operative observers. Much other work was accomplished in the Division which made heavy calls on the time and thought of the Director and Superintendent in fixing the lines on which it was to be carried out. We need only remind our readers of the "Monthly Charts of the North Atlantic Ocean," commenced in 1901 and the corresponding charts of the Indian Ocean started in 1906. The work done in connection with Captain SCOTT's first voyage to the Antarctic in the *Discovery* of 1901-04, which required from the Marine Division the preparation of a set of daily charts of the Southern Hemisphere, south of Latitude 30° S., and last, but not least, the application of wireless to the collection of current reports from the Atlantic. Nor must we omit to mention the work imposed on the Office as a result of the disaster of the *Titanic* in April, 1912. Though they did not appear until 1917, the set of "Monthly Meteorological Charts of Baffin Bay and Davis Straits," involved much work in the Office. It will be recalled that in the year after the disaster, the *Scotia* was sent out to cruise off the "Banks" with the primary object of collecting information regarding ice. Quick to seize an opportunity for furthering meteorological work, Sir NAPIER managed to arrange that she should carry a professional meteorologist and was fortunate enough to secure the services of Major G. I. TAYLOR for the post. A modest equipment of kites and instruments for obtaining observations for temperature and humidity in the free atmosphere was placed at his disposal, and with those Major TAYLOR was able to obtain observations extending up to a height of about 3,000 feet, which threw a flood of light on the processes at work in the formation of fog at sea and formed the starting point for the work on eddy motion in the atmosphere and the part which it plays in so many ways which has constituted one of the great advances in theoretical meteorology in the past ten years. This readiness to seize opportunities as they offered and to use the machinery which his Office had at its disposal in co-operation with other institutions or with private persons, was one of the leading characteristics of Sir NAPIER's administration. The intimate co-operation with Mr. W. H. DINES and Captain C. J. P. CAVE in the investigation of the upper air offer striking examples in another field of work.

The honour of Knighthood was conferred on Sir NAPIER in 1915 in recognition of his many services to Meteorology. He retired from the Directorship of the Office in 1920, having been its head for just on twenty years. The portrait, painted by Mr. W. W. RUSSELL, R.A., which is reproduced in this number of "The Marine Observer," was presented to him on the occasion of his retirement, by the



SIR NAPIER SHAW, LL.D., Sc.D., F.R.S.

(Reproduced from a portrait painted by W. W. Russell, Esq., R.A.)

Meteorological Committee, the staff, and friends, of the Office. The original hangs in the entrance hall to the Office at South Kensington.

During the following years Sir NAPIER held the position of Professor of Meteorology in the Imperial College of Science and Technology, a post which he has only just relinquished. Freed from the care and troubles of administration, he has been able to devote himself more intensely to scientific work. There is no branch of meteorology which he has not enriched by his clear and inspiring writings, but limitations of space make it impossible to attempt any sort of account of these in an article such as this. Throughout all his work, however, we may trace two guiding principles. Firstly, the importance of keeping steadily in view the facts as revealed by carefully made accurate observations. Whether we be dealing with the local circulations of cyclones and anti-cyclones or the general circulation of the atmosphere as a whole, let us approach the problem by finding out from the observations what those circulations actually are and refuse to be led away by theories of what they might be, or what we think they ought to be. If our reasoning leads us to certain

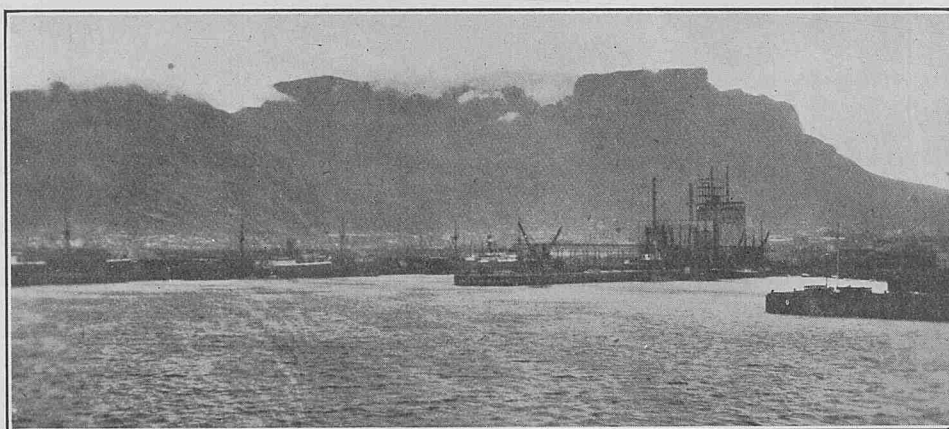
conclusions, let us at all stages test those conclusions by an appeal to the facts of observation, and if there are discrepancies let us revise our reasoning. Put in that crude form the proposition sounds obvious, but perhaps even some of the meteorologists' most cherished theories may turn out to be but half-truths when tested in this rigorous way. The other point which he is never tired of stressing is the importance of looking at the circulation of our atmosphere as a whole. We cannot hope to arrive at a full understanding of what is going on over a limited area, say, the North Atlantic, without at the same time taking into consideration what is happening elsewhere. We are still far from being able to apply that principle in its entirety; there are vast areas both on sea and on land from which observations even at the surface are all too few, while observations from the upper air are confined in the main to civilised regions on land, but each year sees some extension of the areas that are becoming meteorologically known. No man has done more than Sir NAPIER SHAW in bringing together the scattered fragments and helping us to view the isolated facts as part of one large and indivisible whole.

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.

TABLE CLOTH SPREAD OVER TABLE MOUNTAIN.



Photograph by Mr. C. H. WILLIAMS, 3rd officer, R.M.S. *Arundel Castle*, Captain J. W. HAGUE, at Alfred Docks, Cape Town.

"Thursday, January 24th, 1924, 7.35 p.m. local time.

"Bar 1014.9 (29.97) Temperatures, air 72°, Wet bulb 63°.

"Wind unsteady S.E. & S. force 5, gusty. Sky one-tenth clouded with cirrus from S.E."

In FINDLAY'S "Sailing Directions for the Indian Ocean," Sir THOMAS MACLEAR, the well-known Astronomer Royal of the Cape Observatory for many years, describes this remarkable sign of the "South Easter" and its cause as follows:—

"By observation, it appears that the temperature of the air decreases nearly 3°.38 for each 1,000 ft. of height, or about 300 ft. for 1° of Fahrenheit's thermometer. If, therefore, the stratum of air, in the ordinary humid condition, should be suddenly lifted 3,600 ft., viz., to about the height of Table Mountain, its temperature would be lowered by 12°, and a portion of the humidity would be condensed in the form of cloud or fog, irrespective of each cubic foot becoming lighter by about 61 grains.

"The strong and occasionally violent southerly winds, which prevail during these months, effect the displacement. Table Mountain, like a huge wall, receives some 4 miles in breadth of the current, which bounds up with diminishing temperature, and deposits the celebrated 'table cloth, or cap' on the top. The upper surface of this majestic white 'cap' is smoothed off like a well-dressed peruke; its North border hangs over the precipice, drapery fashion; but during very strong winds it pours down like a cataract to about 1,000 ft. from the top, where, entering a warmer temperature, it dissolves and disappears. Not the least interesting of the phenomena occasionally attending it is the revolving mass of detachments which hovers over Cape Town, fed by a stream of shreds from the 'cap' on one side, which are disbursed or thrown off on the other, and float towards Table Bay, where they

disappear. The 'black south-easter cap' differs from the preceding by the *nimbus* tint of a canopy cloud, which projects on the southern side of the mountain over Rondebosch and Claremont, and from which light rain occasionally falls. The strong southerly winds are ushered in by the *tops* of the higher elevations on each side of False Bay becoming covered in rapid succession from the southward; but these elevations seldom remain covered throughout the gale."

EASTERLY SET BETWEEN CEARA AND PARA.

THE following is an extract from a letter received from the Booth Steamship Company.

"We think you will be interested to know that Captain W. H. B. REYNOLDS of our S.S. *Cuthbert* reports the presence of a strong easterly set between Ceara and Para. The following is an extract from his report:—

'Leaving Ceara I received instructions to proceed to Braganza Lightship for Pilot, as the cutter was out of commission. After rounding Itapage Point we met with a strong easterly set, running from 3 to 4 knots.

'Forty miles east of Manuel Luiz Reef it attained a rate of 5 knots, gradually decreasing to 30 miles east of Salinas, where it became tidal.'

"The following is an extract from the Captain's Official Log:—

'January 30th, 1924 Noon Observation, Lat. 1° 12' S., Long. 43° 38' W.

'Current set S 72° E. 48 miles.

'Remarks.—Noon to 4 p.m. Current set S. 70° E. true 5 knots.

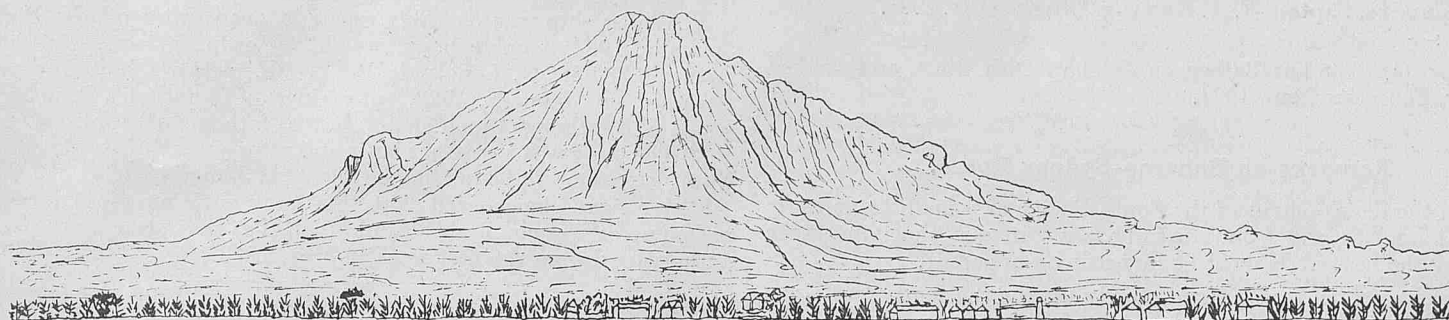
'January 31st. Noon observation Lat. 0° 39' S. Long. 46° 10' W.

'From 7 p.m. 30th January to noon 31st. Current set S. 74° E. 61, 3.6 knots.'

JAVA PORTS.

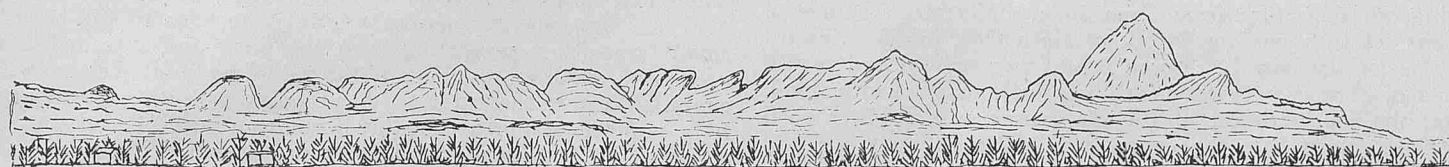
The following sketch and remarks are contributed by Captain G. PARK, of the Asiatic S.N. Co.

Cheribon, Java.

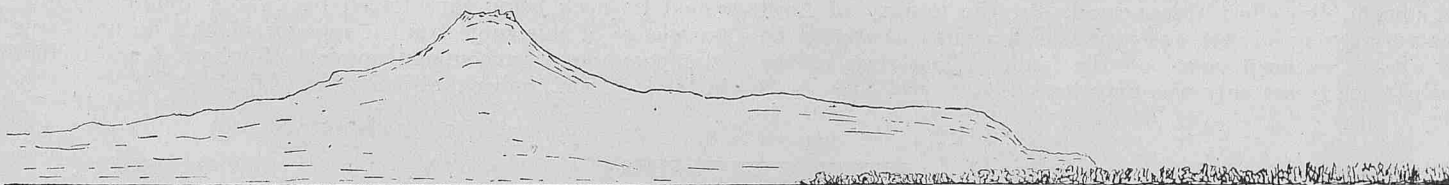


Cheribon Peak 10,076'

Cheribon Lighthouse S58°W 1.8.



Continuation of Cheribon Peak to the North

M^t Keramong 1919'

Tegal Peak Looking from Cheribon Roads



Jati Hill, N60°W 3.3.

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

"When making Cheribon Roads with a light steamer I favour crossing the Flats well to the North of the gas buoy off Losari Point; picking up Cheribon Light before daylight; placing the light on the required bearing for anchoring and bring up with a cross bearing of Jati Hill, and using the lead. Cheribon light is not first class nor can you rely absolutely on the gas buoy off Losari Point.

"The small white channel buoy is difficult to find.

"The anchor shown on the Chart gives a fair position only.

"You have a large and clear field to anchor no matter how many vessels are in the Roads.

"It is advisable to go well North of the Lighthouse bearing West.

"The anchorage is in very soft mud which allows you to close with less water than you would with hard ground.

"If the wind is favourable cargo boats will sail to you. If not, they are towed. Do not agree to make Cheribon your final loading

Port; 22 feet of draft is deep enough to be certain of getting clear of the Flats or Shoals."

METEORITE.

THE following received from Mr. REGINALD S. W. HARRIS, 4th Officer, S.S. *Saxon*, Captain W. F. STANLEY.

"At 6 p.m. G.M.T. January 5th in Latitude 44° 35' N., Longitude 8° 22' W., we observed an exceptional meteorite.

"Starting its journey at an altitude of about 60° due South, it travelled N.W., causing a blaze of light which illuminated the whole sea. It finally disappeared about 10° above the N.W. horizon leaving behind it a very pronounced trail of smoke which remained visible until 6.7 p.m.

"About 20 seconds after the disappearance of the meteorite, there was a loud report and many reverberations, closely resembling the explosion of a depth charge near the ship.

"At the time, the sky was cloudless, and visibility good. Wind S.E., force 3."

PANAMA-SYDNEY ROUTE.

THE following note was received with the Meteorological Log of S.S. *Port Caroline*, Captain F. A. RENAULT, Observer Mr. P. H. PEDRICK, 3rd officer :—

S.S. *Port Caroline* left Balboa on January 26th, 1924, and arrived at Sydney, February 22nd, 1924.

Remarks on Panama-Sydney Route.

"With the development of the South Pacific as a main trade route for ships bound to and from Australia *via* Panama, the importance of choosing the best trade must be increasingly apparent.

"The route which is at present chiefly used is the semi-great circle course, South of Pitcairn Is., and North of Cape Maria Van Diemen, New Zealand. The direct Great Circle track to Sydney passing through Cook Strait is hardly if ever utilised, the strong Westerly winds met with South of Latitude 35° S. being the great deterrent.

"The route which the *Port Caroline* took this voyage was of an experimental nature. It was hoped that the set of the current would more than compensate for the extra distance. The results were mainly disappointing.

"Making our departure from Cape Mala, a Mercator's course of S73° W. was set to a position North of Motu One, in the Leeward Group of the Society Islands. Cocos Island was sighted and passed at a distance of 43 miles. It was clearly visible but capped with cloud. Fatu Hiva, the southernmost of the Marquesas, was another good landfall. From Motu One the course was set to Sydney sighting Norfolk and Lord Howe Is.

"While navigating among the Islands weather reports were received regularly from Suva but none were sent out by Tahiti.

"The peculiar shoal-water effect produced by shadows of cloud upon the water was frequently noticed, and whilst passing Norfolk Island one such effect was so realistic that course was altered to clear it. When abeam, the effect disappeared. In the locality of Lord Howe Is. a very strong S'y set was experienced course having to be frequently altered to keep vessel off the land. When clear of the Island a slight S.E'y set only was experienced."

DRIFT OF CABLE BUOY.

THE following letter has been received from Captain T. W. SMYTHE, O.B.E., Cable Ship *John Pender* :—

"Whilst ship was on cable repair in deep water off the Burlings, January, 1923, a cable buoy, weight 30 cwts., attached to cable in Latitude 39° 38' N. Longitude 10° 21' W., depth 2,220 fathoms, was streamed in January, 1923, with rider of 3 fathoms $\frac{3}{4}$ inch chain, bridle of 6 fathoms $\frac{3}{8}$ inch chain, and 20 fathoms of wire rope.

"The buoy was a weather buoy and after a week of strong northerly winds was found to be missing on the 22nd January, 1923.

"We have since heard that this buoy with moorings intact was picked up off Tetuan Morocco and beached at that place by the Spanish authorities during the first week in May, 1923."

MARINE ORGANISMS.

THE following extract is taken from the Meteorological Log of S.S. *Port Stephens*, Captain I. R. SAWBRIDGE, Durban to Las Palmas.

"Lat. 17° S., Long. 4 $\frac{1}{2}$ ° E., January 22nd, 1924, 4.0 p.m.

"On examining the water drawn from overside for observations of temperature and density at the above time I found it contained a large number of marine organisms.

"They varied in size, the average being about a cm. in length and about half as much in diameter around the centre. The bodies were oval in shape and transparent. What I took to be the head was a small brown spot projecting from the body and surrounded at the neck by a small many-pointed star with four short feelers abaft this again. When in the water, the head looked as if it were only attached to a number of fibres probably forming a sort of skeleton, but on removal the body was found to be composed of a transparent skin blown out apparently with water. On being placed in the sun a small bubble forms under the skin and the liquid inside the creature evaporates, leaving only a slightly discoloured oval and the head on the paper on which it has been exposed. It moves in the water with quick spasmodic jerks by means of expanding and contracting its sides. This motion is stern first and appears to be worked by the star round its neck being thus forced backwards and forwards. As my knowledge of this subject is exceedingly slight I do not know if this is a common or uncommon specie. However, I am including this in the log book hoping that it may be of interest."

CURRENTS.

NOTE BY MARINE SUPERINTENDENT.

In this Number is published the first quarterly Chart of Currents on Route Latitude of Cape Blanco to The Brazils.

During the year it is proposed to publish charts for the remaining quarters on this route, also quarterly charts of currents on the Channel to Madeira, ports to the southward, and Mediterranean, which will embrace the waters covered by ships traversing that route between latitude 48° N. and latitude 37° N.

The charts are in continuation of those published for the route Cape Blanco to Table Bay in last year's "Marine Observer," following the principles outlined in the January, 1924, Number; which appear to have received general acceptance. They are intended to provide information of the general set and drift of current, its variations, with associated conditions where these are established, and to further the suggestions set out in Chapter IX. of "Wireless and Weather an Aid to Navigation," which we published in the September, 1924, Number.

In later Numbers it is intended to publish reports dealing with these charts; meanwhile it is earnestly hoped that Commanders will send in their views and experiences, for these will greatly increase the value of the worked-up observations and add to the interest of the reports.

The Charts are necessarily incomplete in that they only deal with

currents along routes. If they are used in conjunction with the old current charts their value will be increased, for the navigator may then obtain a more general idea of whence the water comes and whither it flows.

Marine Observers on other ocean routes will be rewarded for their work in time; meanwhile they may study these Charts with advantage, for though they do not give them the information they desire in daily navigation it is well to compare the currents on some ocean routes with those upon others within corresponding belts; for by comparison and enquiry observation may be improved and currents better investigated.

Hints for guidance in current observation will be found frequently amongst the notices upon the Ice Chart; they are also given in the "Original Note-Book."

Note.—As we go to press an interesting report has been received from the captain of a ship in the Pacific, through the Hydrographer of the Navy, which may result in a similar investigation of the Equatorial Current in that Ocean to the one made some years ago in the Atlantic.


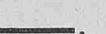
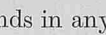
We mention this as illustrating how comparisons of currents on different routes in similar belts may all help to throw light upon this very important branch of Marine Meteorology.

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

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

WITH the advent of "The Marine Observer" in January 1924, the "Monthly Meteorological Charts of the East Indian Seas," hitherto published and distributed to the Corps of Voluntary Marine Observers were discontinued. In order that the valuable information contained in these charts should not be lost to seamen a new edition was published, containing all the information of a permanent nature which had appeared on the previous editions. They are issued on request to all ships on the Voluntary Observing Fleet List, and show the monthly normals of Pressure, Wind, Air and Sea Surface temperatures, tracks of Cyclones, Current flow lines and the recommended routes for both sail and steam. For the convenience of Marine Observers the following notes are based upon them.

Barometric Pressure.—Isobars or normal lines of equal barometric pressure are indicated by continuous red lines drawn for every four millibars, the corresponding value in inches also being recorded. The values used for the construction of the isobars have been corrected for index error of barometer and reduced to sea-level at a temperature of 32° F. at the Latitude of 45° N. or S.

Winds.—Wind roses are given for the areas comprising the five degrees of latitude and longitude within which they are situated. The arrows flying with the wind show by their length the frequency of the wind, their thickness giving the various forces according to the Beaufort notation, thus, light winds, forces 1-3 , moderate winds, forces 4-7 , gales, forces 8-12 . The circle supplies a scale for estimating the frequency of winds in any direction. From the heads of the arrows to the circumference of the circle represents five per cent. of the total number of observations, one hundred per cent. equalling 2½ inches. The upper figure in the centre of the wind rose represents the total number of observations, while the lower number gives the percentage of calms. The monthly limits of the perennial and seasonal wind systems are indicated by black pecked lines.

Air Temperature.—Isotherms giving the normal air temperature for the month are shown by continuous black lines drawn for each 5° F. the corresponding value on the absolute scale being added.

Sea Surface Temperature.—Isotherms showing the normal sea surface temperature for the month are indicated by continuous blue lines.

Currents.—Ocean currents are shown by arrows and waved flow lines in blue. The figures attached are the maximum and minimum amount of drift in nautical miles for twenty-four hours. When no figures are attached the direction only is indicated.

Cyclonic Storms.—The tracks followed by tropical cyclonic storms are shown by a red pecked line, the year and dates on which they occurred being entered at the commencement of the track.

Routes.—The recommended steam and sailing routes for the month are shown by continuous green lines.

Normal Distribution of Atmospheric Pressure.

In order to understand the permanent and seasonal system of winds to be found in the Indian Ocean, it is necessary to first examine the periodic changes in the normal or average distribution of pressure as indicated by the isobars on the Charts. All changes in atmospheric pressure depend largely on the changes of temperature arising at different places on the earth from various causes.

When a difference of pressure takes place air tends to flow from a region of high to a region of low pressure, and owing to the rotation of the earth, not directly towards the low-pressure centre, but with an inmoving spiral motion round it, such a movement is termed cyclonic.

Air also circulates round a region of high pressure, but with an outflowing movement from the centre, such movement being termed anti-cyclonic.

In the Northern Hemisphere the air circulates round a region of low pressure in a direction contrary to that of the movement of the hands of a watch, and round a region of high pressure, in the same direction as the hands of a watch.

In the Southern Hemisphere the converse is true in both cases.

When a difference of pressure exists between two points the strength of the flow of air or wind depends upon the distance apart of the isobars passing through them, being strong when the isobars are close together, and light when they are far apart.

These differences of pressure are termed Barometrical Gradients, and the unit for their comparison is one millibar of pressure per sixty nautical miles measured at right angles to the isobar.

It will be seen from the Charts that in both Hemispheres during the winter season, pressure is high over the land and low over the sea, the land being then colder than the sea; while, during the summer season the reverse applies owing to the land being then warmer than the sea.

The wind systems of the Northern Indian Ocean are essentially different from those of the other great oceans owing to the position at its head of the mass of the Asiatic Continent with the Indian Peninsula surrounded by its barrier of mountains. This land mass influences the distribution of pressure to such a marked extent that the isobars of winter and summer are of an entirely different type causing the seasonal winds known as monsoons.

The Southern Indian Ocean, being to the south an open sea, the seasonal variations of pressure are not sufficiently large to alter the general characteristics of pressure distribution; consequently there exists throughout the year, a permanent anti-cyclonic distribution of pressure which is most strongly developed during the southern winter and moves north and south following the motion of the sun in declination. The circulation of air around this area of high pressure causes the wind to blow steadily from a south-easterly direction which is termed the S.E. Trade winds.

It is proposed to deal with the monthly average conditions in each Number during the year.

I. January.

Barometric pressure is high over the Asiatic Continent. Over Northern India the average pressure is 1020 mb. (30·12 in.) decreasing in a southerly direction to the comparatively low-pressure area existing over the equatorial regions, the difference in average pressure being 12 mb. (-35 in.).

The winds blowing outwards from this high-pressure system come from a northerly direction at the head of the Arabian Sea and Bay of Bengal. South of latitude 20° N. the general direction of the wind over the whole surface of the Northern Ocean is from the N.E.

During this month the N.E. monsoon attains its maximum frequency and strength between the parallels of 10° and 15° North. Within this area calms are of rare occurrence. The average strength of the wind varies between forces 4 and 5, but stronger winds are not uncommon.

From the East African coast to about the 50th meridian the N.E. monsoon continues across the Equator, to about 8° S. From the 50th meridian eastward the N.E. wind on crossing the Equator, hauls to the N.W., becoming what is termed the N.W. monsoon.

The equatorial "low" in which there is an eastern and western area of minimum pressure about 1009 mb. (29·80 in.), forms a "trough" projecting in a WSW. direction between the west coast of Sumatra and the Mozambique Channel. Within this area the winds are variable in direction and light to moderate in force, calms occurring with the greatest frequency within 200 miles of the Sumatra coast.

South of the equatorial "low" pressure increases in a southerly direction to the centre of the permanent anticyclone situated in about 35° S. The average maximum pressure in this area for the month being 1020 mb. (30·12 in.), the normal range is the same as that over the northern ocean, namely 12 mb. (-35 in.).

The S.E. Trades blowing out of this high-pressure system extend from the western coast of Australia to within a few degrees of the east coast of Madagascar between the parallels of 10° and 30° south. During the month the "trades" are moderate in strength but unsteady in direction. Off the Australian coast they blow from a southerly direction, but westward of the 100th meridian may come from any point in the eastern quadrant. Off the east coast of Madagascar the predominating wind is from the N.E. Southward of the trade wind zone in the centre of the permanent high-pressure system the winds are variable.

Cyclonic Storms.—The Indian Ocean, north of the Equator, may be regarded as free from cyclones during this month, only three storms of moderate intensity having been reported in the Bay of Bengal since the year 1890.

South Indian Ocean.—January is a month of maximum frequency for cyclonic storms in this Ocean. In the years 1848–1917, 113 storms, giving a percentage frequency of 22 per cent., occurred during this month. They originate between the parallels of 5° and 10° south, to the westward of the 90th meridian. Travelling to the S.W. they generally re-curve in about latitude 20° S. to the S.E., continuing into the southern temperate regions as extra tropical cyclones. See chart giving tracks in January Number 1924.

Air Temperature.—The normal temperature of the air during January in the extreme north of the Arabian Sea and Bay of Bengal is a little below 75° F., gradually increasing to about 83° F. at the Equator. From the Equator southward, temperature decreases with latitude, and is at the 35th parallel slightly below 70° F. on the western side of the Ocean, while on the eastern side of the Ocean in the same parallel temperature falls below 60° F.

Sea Surface Temperature.—In the Bay of Bengal and Arabian Sea, north of the 20th parallel, the normal sea surface temperature is slightly above and below 75° F. respectively. From 20° N. latitude to the Equator temperature gradually increases over the whole North Indian Ocean to 83° F., except off the African coast, where it reaches 78° F.

South of the Equator temperature is between 82°–83° F., whence it uniformly decreases with latitude, being slightly below 70° F. in latitude 35° S.

Currents.—In the Arabian Sea north of the 20th parallel the currents are variable. Between the 20th and 10th parallels the set is to the S.W., excepting off the Indian coast, where the set follows the land. Off the African coast, in about 10° N. this current branches, one stream turning N.W. passes between Cape Guardafui and Socotra into the Gulf of Aden, while the other continues S.W., following the African coast. Over the Bay of Bengal and southward to the Equator the general flow is S.W. to West. South of the Peninsula, west of the 80th meridian, its direction gradually changes to N.W., from whence it flows, between latitude 10° N. and the Equator to the 60th meridian.

Within the same parallels between the 50th and 60th meridians the currents are variable.

South Indian Ocean.—The S.W. current flowing along the African coast and out of the Bay of Bengal on crossing the Equator, changes its direction to the eastward between the Equator and 8° S. Between latitude 8° and 30° S. the S.E. trade drift flows in a westerly direction from the 100th to the 60th meridian, where in about 17° S. it separates, one branch flowing around the north of Madagascar down the East African coast, the second branch turning S.W. again joins up with the first branch off the S.E. coast of Africa forming the Agulhas current. Within the Straits of Madagascar the currents are extremely variable.

East of the 100th meridian to the Australian coast the currents are variable, but generally set to the north-eastward and towards the land. South of the 30th parallel, east of the 50th meridian, the general flow is westerly.

WEATHER CHARTS.

NOTE BY MARINE SUPERINTENDENT.

It is our intention to publish this year in each Number a selection of Weather Charts illustrating weather experienced in the same month of last year by observing ships in all parts of the world where observations are sufficiently numerous.

The charts will be drawn upon the lines advocated in "Wireless and Weather, an Aid to Navigation," which appeared in the 1924 Numbers, *i.e.*, in a manner suitable for the practice of the navigator

at sea. They will be confined in area to that practicable to ships with long-range wireless telegraphy

These charts not only afford a means of describing weather, but provide a means of instruction to those who are learning the synoptic method. They also provide a most valuable check upon the whole system of observational work at sea, of which not the least is correct reduction of barometer readings to one datum, and they do much to stimulate interest in the work in the Marine Division.

HEAVY WEATHER IN EASTERN NORTH ATLANTIC, JANUARY 7th TO 9th, 1924.

PREPARED BY J. HENNESSY, SENIOR NAUTICAL ASSISTANT.

GENERALLY accepted as the stormiest month of the year in the North Atlantic Ocean, January, 1924 proved to be a month of unusual severity.

The heaviest gale of the month was caused by a deep quick-moving depression which swept the Atlantic tracks between the 6th and 9th.

CHARTS I to III show the conditions prevailing over the Eastern North Atlantic between the 7th and 9th, while inset on Chart III is shown the track of the storm from January 6th.

CHART I, FOR THE MORNING OF JANUARY 7TH, shows the depression to be centred in about Latitude 50° N., Longitude 37° W., having during the past twenty-four hours travelled approximately 1,300 miles, a rate of 54 knots.

It appears to be overtaking and coalescing with another depression centred to the N.E., which is influencing the weather eastward, and over the British Isles. Secondary depressions are indicated over the Scilly Isles and Bay of Biscay. The barometer tendencies of ships west of Longitude 25° show that the western depression is moving in an easterly direction.

The tendencies shown by *Columbia*, *Empress of Britain* and the northern land stations indicate that the northernmost depression is filling in, while the action of the barometer at the southern land stations and of those ships east of the 20th meridian, point to the passage of secondary systems in an E.N.E. direction.

Ships in waters adjacent to the British Isles and in the Bay would

expect the wind, varying considerably in strength, between south-east and west as secondaries passed, later veering to south-west and steadily increasing in force as they came under the influence of the depression moving in from the westward.

CHART II, FOR THE MORNING OF JANUARY 8TH, shows the depression to be centred in about Latitude 52° N., Longitude 19° W., having travelled during the past twenty-four hours 720 miles, a rate of 30 knots. A second depression appears to be following in rear. Winds are from strong to gale force before the centre, while in the south-west quadrant, winds of storm force are reported.

The barometer tendencies of ships in rear of centre are rising rapidly, while the tendencies of the barometer at shore stations indicate the probable movement of the centre to the south-east. This affords a striking example of a cyclone with a very steep barometer gradient in rear and a comparatively shallow gradient in front, travelling at great speed.

CHART III, FOR THE MORNING OF JANUARY 9TH, shows the depression to have moved in a south-easterly direction and to have considerably shallowed during the past 24 hours. It is now centred over the N.W. coast of France, having travelled approximately 630 miles, a rate of 26 knots.

The passage of this storm across the Atlantic will illustrate the value of the Atlantic Weather Reporting Service to the Meteorological Office for issuing Gale Warnings for the British coasts.

WEATHER SIGNALS.

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

- I. Ship's Wireless Weather Signals.
- II. Wireless Weather Signals made from the shore to ships and Wireless Weather Signals made ashore which may be useful to ships. (Bulletins and Wireless storm, and ice warnings.)
- III. Wireless Time Signals.
- IV. Visual Weather Signals made at the Coast. (Storm warnings.)

Sections II, III, and IV will be published as far as possible in geographical order, so that the most used of these signals for all parts of the world may be as complete as possible in each year's numbers of "The Marine Observer."

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

Last year, except in a few cases, notably in those of the British "Weather Shipping" Bulletin, and "Decode" for ships' reports from the North Atlantic to "Weather London" and "Government Observer Washington D.C." where key letters were given, we described in detail the signification of each group of figures used for reporting weather in code.

In view of the extension in the use of the New International Code by weather services, the descriptions (where the New International Code is used) will this year be published in a more concise form by using key letters. Those used for marine work are described below. Where the International Code is *not* used the same procedure as last year will be adopted, *i.e.*, each group will be described in detail.

ABRIDGED KEY TO THE NEW INTERNATIONAL CODE.

THE KEY LETTERS AND THEIR MEANINGS.

- A = Form of *predominating cloud lowest* in the scale of cloud forms.
 a = Form of *predominating cloud highest* in the scale of cloud forms when more than one type of cloud exists.
- BBB = Pressure in millibars and tenths (initial 9 or 10 omitted), or millimetres and tenths (initial 7 omitted). The values refer to sea level and include all corrections for index error, temperature and gravity.
- BB = Pressure in whole millibars or whole millimetres (initial 9, 10 or 7 omitted).
 b = Amount of barometric tendency during the three hours preceding the time of observation expressed in half-millibars or half-millimetres. For tendencies 10-19 the *second* figure only is reported and 33 is added to the wind direction number (DD). For tendencies 20-29 the *second* figure only is reported and 67 is added to the wind direction number. Tendencies greater than 29 are reported as 29.
- bb = Amount of barometric tendency during the three hours preceding the time of observation expressed in half-millibars or half-millimetres.
- C = Form of predominating cloud, according to the scale of cloud forms, when only one form is reported, as from ships at sea.
- c = Characteristic of barometric tendency during the period of 3 hours preceding the time of observation.
- DD = Direction of the wind near the ground on the scale (01-32) in which 08 = East, 16 = South, &c., 00 = calm.
- d = Direction from which swell comes, on scale (0-8), in which 2 = East, 4 = South, &c., 0 = no swell.
- F = Force of the wind on the Beaufort Scale. (Forces above 9 are reported as 9 in telegrams, with the actual force in a word at the end, *e.g.*, force 10 is reported at the end as "Storm ten," force 11 as "Storm eleven." Ships at sea, however, report "gale ten," "storm eleven," "hurricane twelve.")
- GG = Greenwich Time of observation (01 = 1 a.m., 12 = noon, 13 = 1 p.m., 24 = midnight).
- H = Relative humidity of the air.
 h = Height of base of lowest cloud present.
- I₁I_n = Index number of station.

jj = Meaning varies according to time of observation and between inland and coastal stations, as follows:—

	Inland Stations.	Coastal Stations.
At 0700 G.M.T. - -	jj = mm	jj = SV _s
At 1800 G.M.T. - -	jj = MM	jj = SV _s

K = The characteristic of the swell *in the open sea*.

K' = Amount and characteristic of barometric tendency expressed by a single figure.

L = Amount of sky (scale 0-10) covered by cloud form A and all forms of the same layer (*i.e.*, low, medium or high) as A, if "a" refers to a different layer.

LLL = Latitude in degrees and tenths, the tenths being obtained by dividing the number of minutes by 6 and neglecting the remainder.

lll = Longitude in degrees and tenths, the tenths being obtained as for latitude LLL.

MM = Maximum temperature in the interval of 11 hours ending at 18 h. G.M.T. (or at one of the hours 1 h., 7 h., 13 h., 18 h. G.M.T., following not less than 4 hours after noon, local time).

mm = Minimum temperature in the interval of 13 hours ending at 7 h. G.M.T. (or at the hour 13 hours after the time of reporting the maximum temperature).

N = *Total amount of sky covered with cloud*. (Scale 0-10).

P = Day of the week. 1 = Sunday, 2 = Monday, 3 = Tuesday, 4 = Wednesday, 5 = Thursday, 6 = Friday, 7 = Saturday. The day refers to G.M.T. and not to local time, *e.g.*, Sunday means the period from 00 h. to 24 h. on Sunday at Greenwich.

Q = Quarter of globe in which ship is situated.

RR = Rainfall (at 7 a.m. for preceding 13 hours and at 6 p.m. for preceding 11 hours).

R = Amount of rainfall for the preceding 24 hours.

r = Time of commencement of precipitation.

S = State of the sea and swell (coast stations).

TT = Temperature of the air in whole degrees Fahrenheit or Centigrade (50 added to negative values).

tt = Temperature of the sea (surface water) in whole degrees.

TTT = Temperature of air in degrees and tenths Fahrenheit or Centigrade (500 added to negative values).

ttt = Temperature of the sea (surface water) in degrees and tenths.

V = Visibility or distance at which objects can be seen in daylight (or at which lights can be seen at night).

v = Visibility at sea from ships at sea.

V_s = Visibility towards the sea (from coast stations).

W = The weather in the interval since the preceding time of report. This interval is 5, 6 or 7 hours for stations reporting 4 times daily.

ww = The actual weather at the time of observation with which is combined, whenever possible, the general character of the weather.

w₁ = The initial figure of the code ww, thus indicating the general state of the weather.

YY = Day of month.

I.

SHIPS' WIRELESS WEATHER SIGNALS.

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

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

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

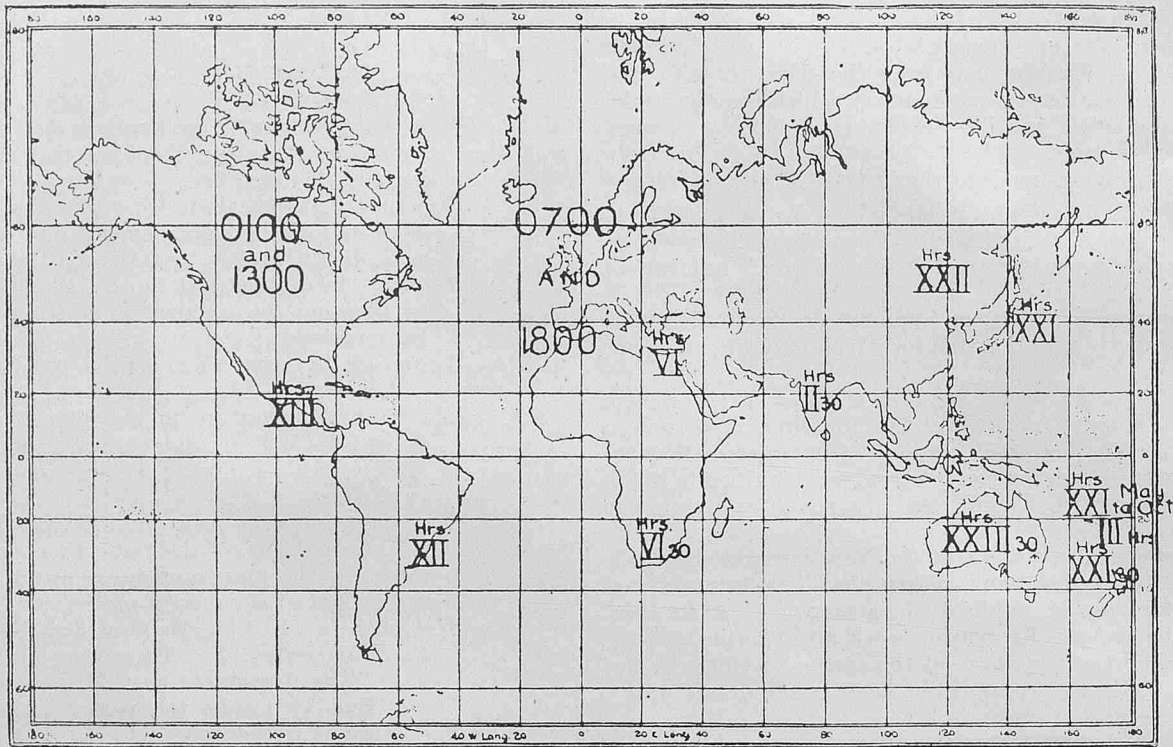
(3) Those which are based upon observations made at arranged times so that they provide synchronised data *in code*.

(2) and (3) are essential for the system which was explained in "Wireless and Weather, an Aid to Navigation," Marine Observer, 1924.

Until an organised plan has been established, in order that synchronised data may be available over ocean areas, observations

made for the purpose of Wireless Weather Reports should be taken at the same time as those of the nearest land weather service. These times are given upon the accompanying Chart of the World.

Chart showing Greenwich Civil Times of Shore Observations.



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

2. Standard Form not in Code.

TIMES of observation must not be confused with times of transmission of reports. So long as the observations are taken at these fixed times transmission of reports may follow as convenient, which should be addressed to all ships.

Wireless Weather Reports should always contain—

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

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

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

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

For this purpose the following notation and scales are recommended :—

The Beaufort Scale of Wind Force.

Admiral Beaufort's Numbers.	Seamen's Description of Wind.	Deep Sea Criterion.	Coastal Criterion.
0	Calm	—	—
1	Light air	Just sufficient to give steerage way with the wind free.	Sufficient to give good steerage way to fishing smacks with the wind free.

Admiral Beaufort's Numbers.	Seamen's Description of Wind.	Deep Sea Criterion.	Coastal Criterion.
2	Light breeze	Well conditioned ship with all sail set in smooth water "full and by" will make 2 knots.	Fishing smacks with topsails and light canvas "full and by" make up to 2 knots.
3	Gentle breeze	Ditto 3 to 4 knots	Smacks begin to heel over slightly; under topsails and light canvas, make up to 3 knots, "full and by."
4	Moderate breeze	Ditto 5 to 6 knots	Good working breeze. Smacks heel over considerably on a wind under all sail.
5	Fresh breeze	Ship "full and by" can just carry royals and light stay-sails.	Smacks shorten sail.
6	Strong breeze	Ship "full and by" can just carry topgallant sails.	Smacks double reef gaff mainsails.
7	Moderate gale (half a gale).	Ship "full and by" can just carry whole upper topsails.	Smacks remain in harbour and those at sea lie to.
8	Fresh gale	Ship "full and by" can just carry reefed upper topsails and whole foresail.	Smacks take shelter if possible.
9	Strong gale	Ship "full and by" can just carry lower topsails and reefed foresail.	—
10	Heavy gale (whole gale).	Ship "full and by" can only carry main lower topsail.	—
11	Storm	Ship can only carry storm stay-sail or trisail.	—
12	Hurricane	No canvas can stand	—

The Beaufort Notation of Weather.

LETTERS TO INDICATE THE STATE OF THE WEATHER.

*b Blue sky (not more than a quarter covered).	*o Overcast sky.
*bc Sky partly cloudy (one half covered).	p Passing showers.
*c Generally cloudy (three quarters covered).	q Squalls.
d Drizzle, or fine rain.	r Rain.
e Wet air without rain falling.	rs Sleet, i.e., rain and snow together.
f Fog.	s Snow.
g Gloom.	t Thunder.
h Hail.	u Ugly, threatening sky.
l Lightning.	v Unusual visibility.
m Mist.	w Dew.
	z Dust haze; the turbid atmosphere of dry weather.

* These letters are only intended to refer to the amount of cloud. They are regarded as the equivalents of the following cloud amounts, scale 0—10; b=0—3; bc=4—6; c=7 and 8; o=9 and 10.

It is well to bear in mind that w = dew, but d = drizzling rain, and e = wet air without rain; p = passing showers of rain, and q = squalls, but s = snow.

The International Weather Telegraphy Barometer Tendency Table.

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

Example of standard form not in Code (2).

To CQ.

Weather 4757N 1908 W Barometer corrected 2994 NNW2 Overcast 0700 Civil Greenwich Fifth Course N70E10 rising slowly current S59E quarter knot from 47N 24W to 48N 20W Air 59 sea 61 Catalina.

3. North Atlantic "Decode."

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

The reports are addressed to *Weather London* (Meteorological Office, London) and to *Government Observer, Washington, D.C.* (United States Weather Bureau). Those addressed to *Weather London* are made to Devizes W/T Station, call sign GKU, on a wavelength of 2,100 metres (c.w.). Those addressed to *Government Observer, Washington, D.C.*, are made to any of the following U.S. Navy radio stations at Bar Harbour, Me., call sign NBD, New York, N.Y., call sign NAH, Norfolk, Va., call sign NAM, or Charleston, S.C., call sign NAO, on a wavelength of 2,400 metres (c.w.). The respective transmissions take place as soon as possible after observation time.

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

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

The times of observation are :—

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

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

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

Ships at Sea from Longitude 40° W. to a Line Belle Isle—Virgin Rocks—Sable Island—Cape Hatteras.

0100 and 1300, Civil G.M.T.

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

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

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

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

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

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

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

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

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

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

Group 6 indicates the groups in which these errors occur.

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

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

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

NEW INTERNATIONAL CODE, WEATHER TELEGRAPHY TABLES.

Table I.

P.—Day of Week.

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

Table II.

Q.—Quarter of the Globe.

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

Table III.

DD.—Two Figure Compass.

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

DECODE FORM.

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

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

Table IV.

F.—Wind Force.

Code Figure.	Beaufort Number.	Code Figure.	Beaufort Number.
0 = Calm - - -	- Nought.	5 = Fresh breeze	- Five.
1 = Light airs -	- One.	6 = Strong breeze	- Six.
2 = Light breeze	- Two.	7 = Moderate gale	Seven.
3 = Gentle breeze	- Three.	(half a gale).	
4 = Moderate breeze	- Four.	8 = Fresh gale -	- Eight.
		9 = Strong gale	Nine.
		and above.	

When force 10, 11 or 12, word ten, eleven or twelve is added at the end of the message.

Table V.

ww.—Present Weather Scale.

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

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

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

Code figures.

Table V.

00	Blue sky or some cloud (Cloud 0-5)	Cloud has decreased.
01		No apparent change.
02		Cloud has increased.
03		Precipitation within sight.
04		With solar or lunar halo.
05		After fog or mist or dust storm.
06		After rain or drizzle.
07		After snow, sleet or hail.
08		With or after thunder and lightning in
09		After thunderstorm. [neighbourhood.
10	Cloudy or overcast (Cloud 6-10)	Cloud has decreased.
11		No apparent change.
12		Cloud has increased.
13		Precipitation within sight.
14		With solar or lunar halo.
15		After fog or mist or dust storm.
16		After rain or drizzle.
17		After snow, sleet, or hail.
18		With or after thunder and lightning in
19		After thunderstorm. [neighbourhood.
20	Fog or mist	But clear in zenith -
21		And apparently overcast -
22		But clear in zenith -
23		And apparently overcast -
24		But clear in zenith -
25		And apparently overcast -
26		But clear in zenith -
27		And apparently overcast -
28		But clear in zenith -
29		And apparently overcast -
30	Passing showers	Slight with rain.
31		„ hail or rain and hail.
32		„ sleet.
33		„ snow.
34		Heavy with rain has become better.
35		„ rain.
36		„ rain has become worse.
37		„ hail or rain and hail.
38		„ sleet.
39		„ snow.

Code Figures.

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Drizzle

Rain

Snow or snow and hail

Sleet or rain and snow

Hail or rain and hail

Thunder-storm (or Line Squall)

Table V.—continued.

Slight occasional.
„ continuous.
„ but has increased.
Moderate but has decreased.
„ occasional.
„ continuous.
„ but has increased.
Thick but has decreased.
„ occasional.
„ continuous.
Slight occasional.
„ continuous.
„ but has increased.
Moderate but has decreased.
Moderate occasional.
„ continuous.
„ but has increased.
Heavy but has decreased.
„ occasional.
„ continuous.
Slight occasional.
„ continuous.
„ but has increased.
Moderate but has decreased.
„ occasional.
„ continuous.
„ but has increased.
Heavy but has decreased.
„ occasional.
„ continuous.
Slight occasional.
„ continuous.
„ but has increased.
Moderate but has decreased.
„ occasional.
„ continuous.
„ but has increased.
Heavy but has decreased.
„ occasional.
„ continuous.
Slight thunderstorm without hail.
„ „ with hail.
Moderate thunderstorm without hail.
„ „ with hail.
Heavy thunderstorm without hail
„ „ with hail
„ „ without hail
„ „ with hail
Line squall without hail.
„ „ with hail.

Table VI.

v.—Visibility.

Code Figure.

0	Dense fog,	objects not visible at 50 yards.
1	Thick fog	„ „ 1 cable.
2	Fog	„ „ 2 cables.
3	Moderate fog	„ „ ½ mile (nautical).
4	Thin fog or mist	„ „ 1 mile (nautical).
5	Visibility poor	„ „ 2 miles (nautical).
6	Visibility moderate	„ „ 5 miles (nautical).
7	Visibility good	„ „ 10 miles (nautical).
8	Visibility very good	„ „ 30 miles (nautical).
9	Visibility excellent,	objects visible more than 30 miles (nautical).

Table VII.

K.—Swell.

Code Figure.	
0	No, or slight swell
1	Moderate swell
2	Heavy swell
3	Long low swell
4	Confused swell
5	No, or slight swell
6	Moderate swell
7	Heavy swell
8	Long low swell
9	Confused swell

and sea smooth to moderate.

and sea rough.

Table VIII.

d.—One figure compass.

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

Table IX.

C.—Cloud Predominating.

Code Figure.	
1—Cirrus	- - - - - Ci.
2—Cirro-Stratus	- - - - - Ci.-St.
3—Cirro-Cumulus	- - - - - Ci.-Cu.
4—Alto-Cumulus	- - - - - A.-Cu.
5—Alto-Stratus	- - - - - A.-St.
6—Strato-Cumulus	- - - - - St.-Cu.
7—Nimbus	- - - - - Nb.

Table IX.—continued.

C.—Cloud Predominating.

Code Figure.	
8—Cumulus or Fracto-Cumulus	- - - Cu. or Fr.-Cu.
9—Cumulo-Nimbus	- - - Cu.-Nb.
0—Stratus or Fracto-Stratus	- - - St. or Fr.-St.

Table X.

N.—Cloud Amount.

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

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

Table XI.

W.—Past Weather.

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

SPECIAL WEATHER TELEGRAPHY TABLES, NOT NEW INTERNATIONAL CODE.

Table XII.

U.—Unusual Phenomena.

Code Figure.	
0 = None of the following remarks appropriate.	
1 = Appearances indicate that a tropical storm has formed.	
2 = Appearances indicate that a tropical storm is forming.	
3 = Heavy squalls during last three hours.	
4 = Squally weather.	

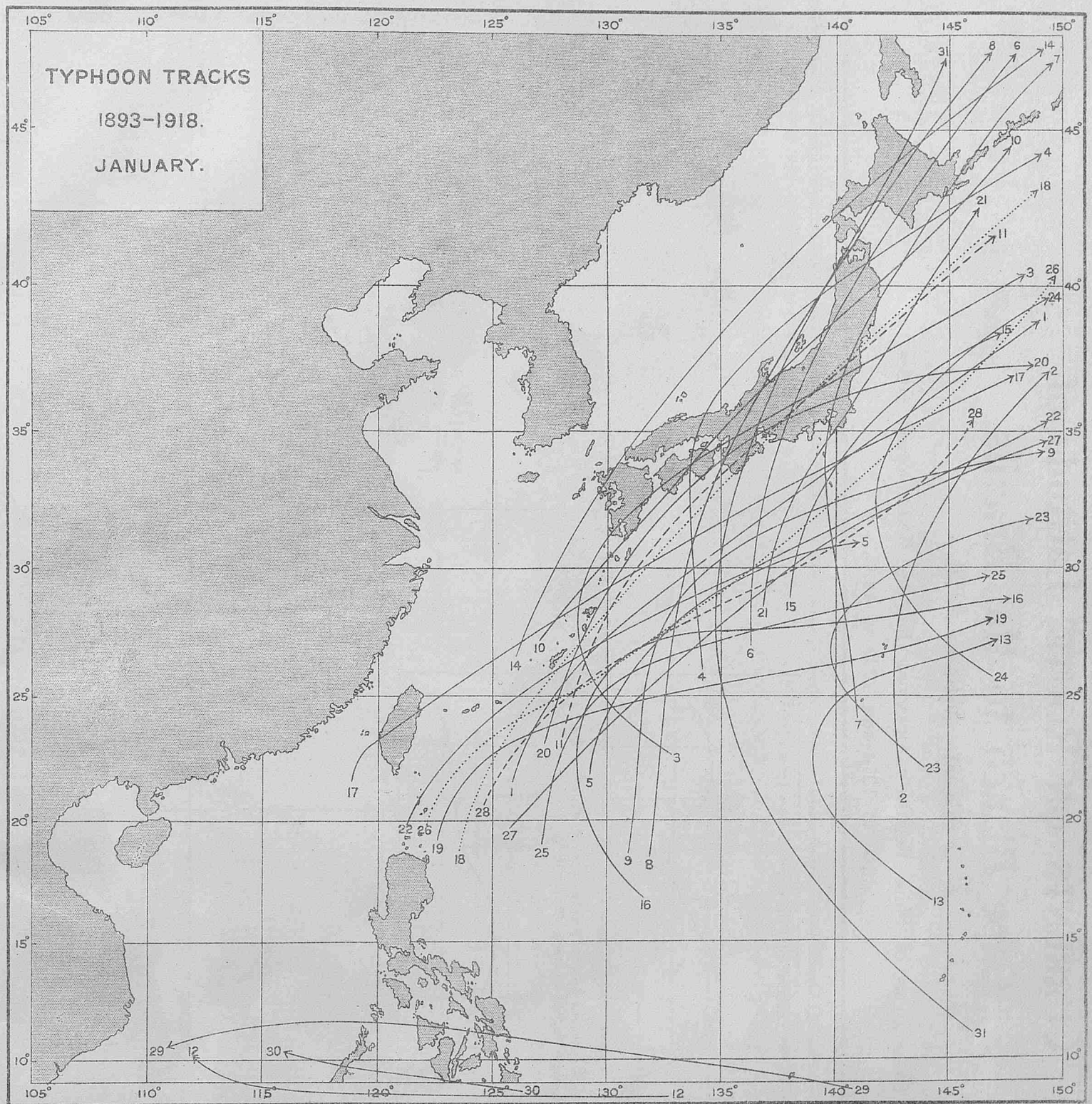
Code Figure.	
5 = Barometer <i>falling</i> very rapidly (more than 2 millibars an hour).	
6 = Barometer <i>rising</i> very rapidly (more than 2 millibars an hour).	
7 = Wind has <i>increased</i> decidedly during the last hour.	
8 = Wind has <i>decreased</i> decidedly during the last hour.	
9 = Unusually red sunset (or sunrise).	

Table XIII.—Conversion of Millibars to Inches.

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

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

TYPHOONS IN THE FAR EAST DURING 26 YEARS.



JANUARY. — Single chart: 31 tracks; a little more than one every year.

Remarks.— A diagonal traced on the map, from Cape St. James to La Pérouse Strait divides it in two halves; the one perfectly free of storms, comprises the China Sea, the Eastern Sea and the Sea of Japan; the other is the Pacific ploughed by the depressions. Four centres are seen on the edge of the Eastern Sea and near the W coast of Nippon, but they form a rare exception. The very few ones who venture off the W of Palawan, along the 10th parallel, are soon filled up before reaching the coast of the continent.

As regards their origin, there is a well marked focus between the Carolines and the Marianas, probably between lat. 5° and 8°, east of the 140th meridian; others take shape on the Pacific, off the N. of Luzon, but it is difficult to trace them up to the precise birth place. At first, they generally travel towards N or NW, recurve to NE between the 20th and the 25th parallels, the turning point is often found between the 130th meridian and Formosa. Most of the tracks are seen to pass between the Bonin group and Japan; some cross Nippon making for the Sea of Okhotsk, but the majority go away on the Pacific, where they frequently acquire a great violence, as shown by the reports of the ships sailing between the Far East and Vancouver or San Francisco.

[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.]

CURRENTS ON ROUTE, Latitude of Cape Blanco to the Brazils.

FEBRUARY, MARCH, APRIL,

Observations of Ships Regularly Observing for the Meteorological Office.
1910 to 1914 and 1920 to 1923.

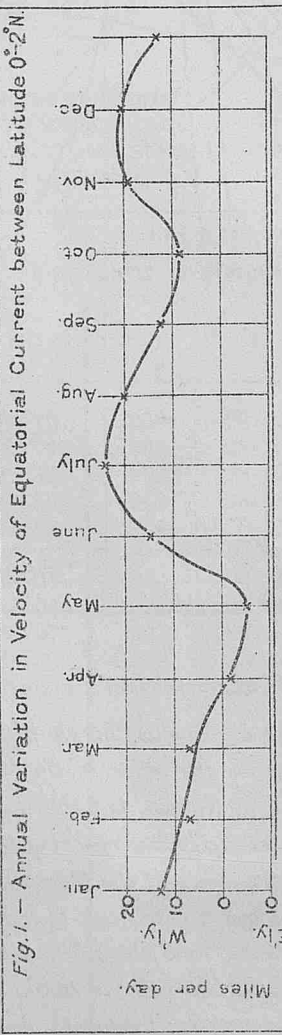
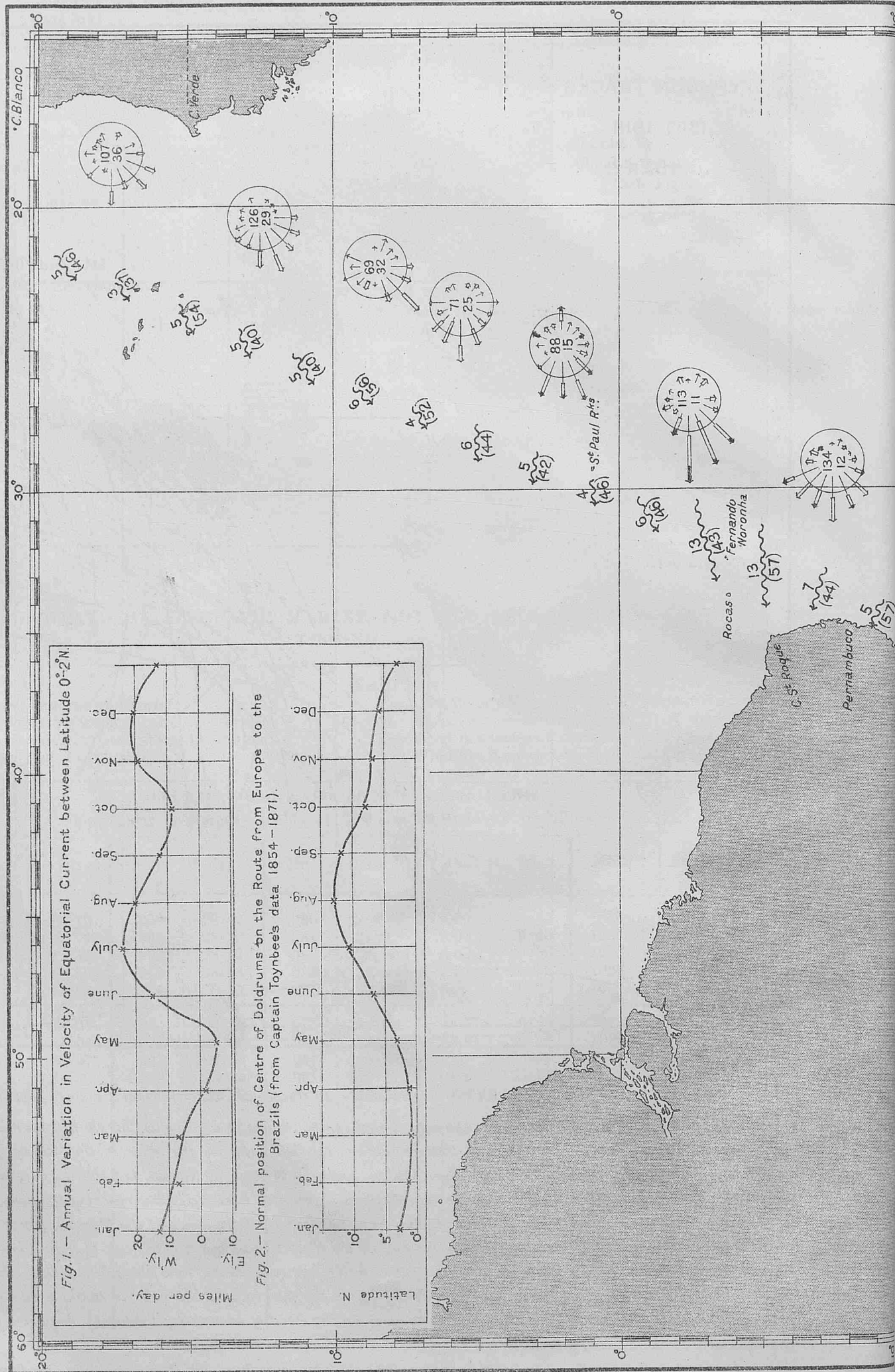
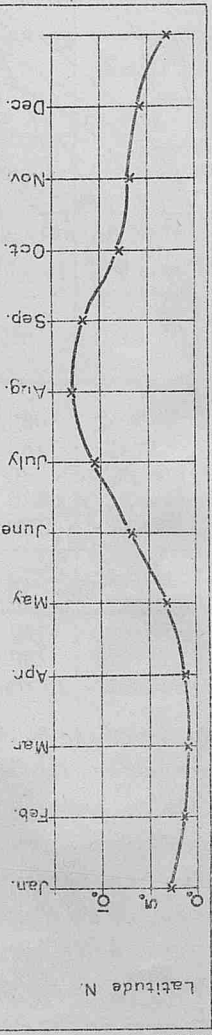
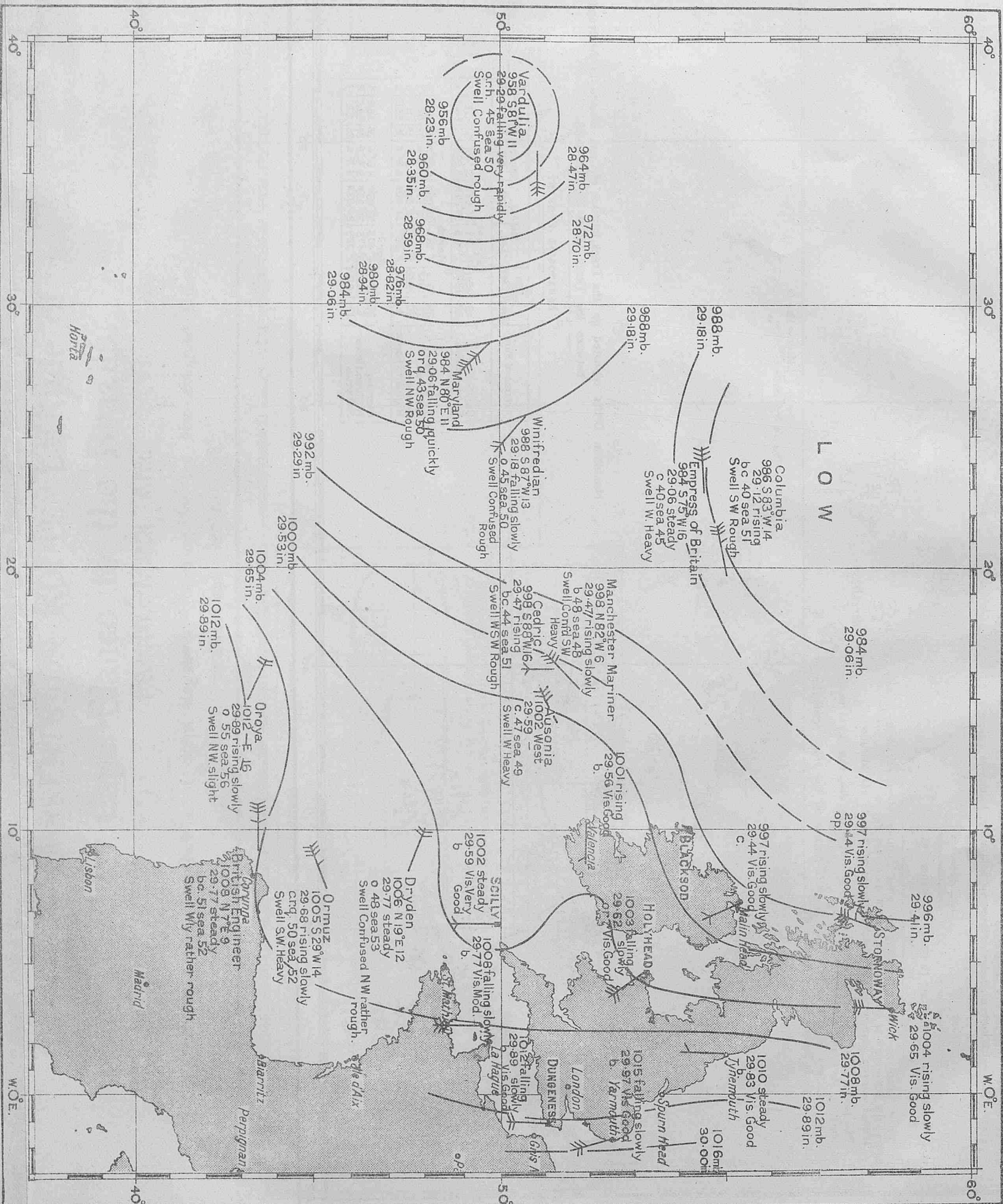
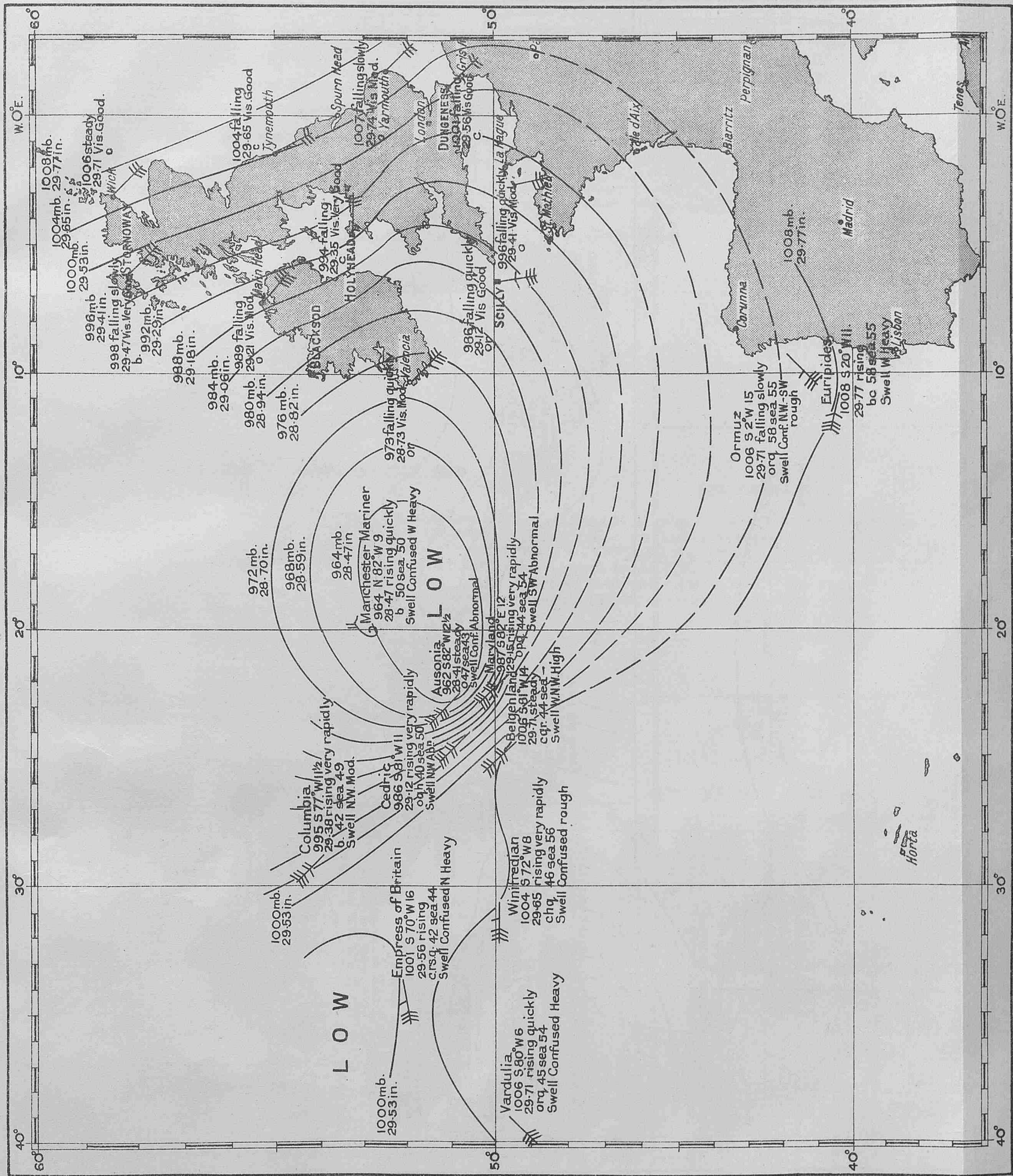
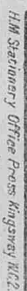


Fig. 2. - Normal position of Centre of Doldrums on the Route from Europe to the Brazils (from Captain Toyne's data 1854-1871).









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.

THE MARINE OBSERVER. DISTRIBUTION AND PRESERVATION.

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

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

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

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

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

POSTAL ARRANGEMENTS.

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

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

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

Port of Call.....

Date of Homeward Departure.....

Postal Address.....

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

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

The Reprints of Meteorological Charts notified in "Aims and Objects" of the January 1924 Number of this Journal are available.

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

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

ICE REPORTS.

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

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

CONVERSION TABLE.

To Convert Inches into Millibars.

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

ICE CHART.

WESTERN NORTH ATLANTIC.

LETTERS OF TRANSATLANTIC TRACKS INDICATE

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

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

ROUTE NOTICES.

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

SYMBOLS USED ON THE CHART.

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

PHENOMENAL DRIFTS OF ICE.

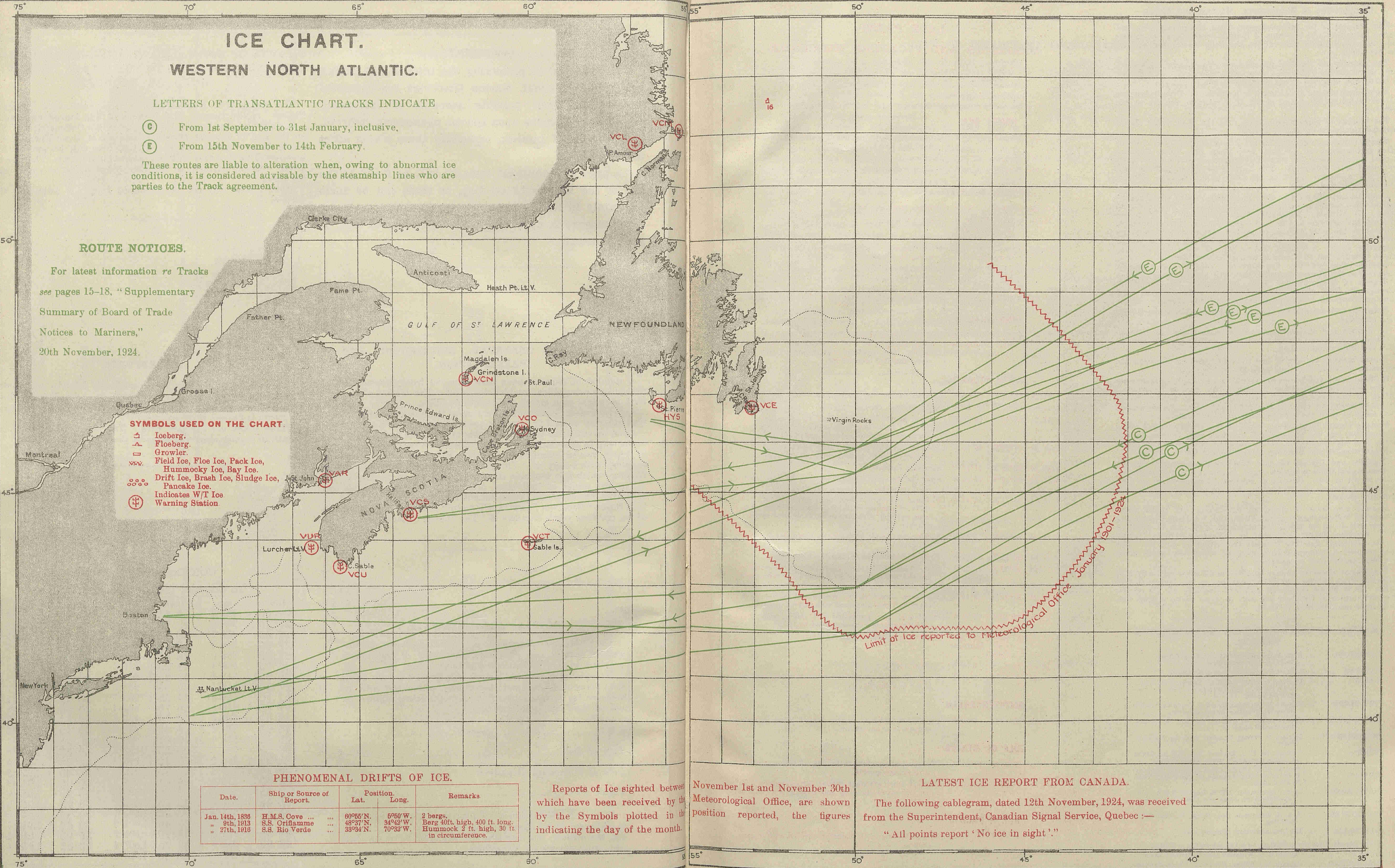
Date.	Ship or Source of Report.	Position.	Remarks
Jan. 14th, 1898	H.M.S. Cove ...	60°55' N. 5°50' W.	2 bergs.
" 9th, 1913	S.S. Oriflamme ...	48°37' N. 34°42' W.	Berg 40ft. high, 400 ft. long.
" 27th, 1918	S.S. Rio Verde ...	39°34' N. 70°33' W.	Hummock 2 ft. high, 30 ft. in circumference.

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

LATEST ICE REPORT FROM CANADA.

The following cablegram, dated 12th November, 1924, was received from the Superintendent, Canadian Signal Service, Quebec :—

"All points report 'No ice in sight'."



Co-operation of Shipowners, Masters and Mates.

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

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

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

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

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

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

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

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

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

Vessels making voyages of less than two months' duration are requested to retain their logs until nearly filled up.

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

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

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

Masters who wish to assist in developing the rapid interchange of Meteorological information and Weather Forecasting at sea can do so by using the standard form, not in code, of W/T Weather Report suggested in "Weather Signals," given in this Journal, January Number (see pages 11 and 12). For this purpose a mercurial barometer of which the index error has been ascertained is essential.

The Marine Observer is sent monthly to all ships regularly contributing Logs, Forms and W/T Registers to the Meteorological Office. It is hoped that each ship will preserve all her copies. Personal copies of Numbers are sent to those whose special contributions are published in them.

Marine Agencies and Port Meteorological Officers.

LIVERPOOL	..	(Port Meteorological Office), Dock Office. Telephone No.: Bank 8859.
CARDIFF	..	Captain T. Johnston, Technical College.
LEITH	..	Captains G. Black and C. G. Denner, V.O., D.S.C., Leith Salvage and Towing Co., Ltd., 2, Commercial Street.
THE OLYDE	..	Captain M. Corrance, Board of Trade Surveyor's Office, 73, Robertson Street, Glasgow.
HULL	..	Captain Geo. B. Sturdy, c/o Mr. W. Hakee, Commercial Road.
SOUTHAMPTON	..	Captain D. Forbes, Nautical Academy, 1, Albion Place.
TYNE	..	Commander E. S. Macleod, R.D., R.N.R., Board of Trade Surveyor's Office, North Shields.
DUBLIN	..	(Captain M. H. Clarke, Chief Surveyor, Ministry of Industry and Commerce, Marine Department, 27, Eden Quay.
HONG KONG	..	Lieut.-Commander C. R. H. Harvey, O.B.E., R.N., Superintendent, Admiralty Chart and Chrono- meter Depot.
VANCOUVER	..	T. S. H. Shearman, Esq., Room 40, Post Office Building.
AUSTRALIA	..	The Commonwealth Meteorologist.

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

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

LATE PRESS.

DERELICTS AND FLOATING WRECKAGE.

Date.	Position.		Description.
	Latitude.	Longitude.	
NORTH SEA.			
4.11.24	57°43'N.	2°17'W.	Broken mast projecting out of water and apparently fixed to a wreck.
6.11.24	18 miles	off Oxo.	Derelict.
8.11.24	53°47'N.	5°58'E.	Buoy or floating mine.
ENGLISH CHANNEL.			
3.11.24	49°20'N.	4°47'W.	Drifting large iron buoy.
6.11.24	3 mls. S.W. by W. from Royal Sovereign Lt. Vsl.		Sunken wreckage.
7.11.24	6½ mls., 120° from Owers Lt. Vsl.		White painted, empty, ship's boat, full of water, no name, no number.
9.11.24	Lizard, bearing N.W.¼W. (mag.) about 14 mls.		Submerged object.
14.11.24	50°56'N.	1°22'E.	Pillar buoy, with red and white horizontal stripes.
IRISH CHANNEL.			
2.11.24	2 mls. W. by S. from Mull of Galloway Lt. Ho.		Side of wooden vessel, about 40 ft. long and 25 ft. beam, rising 3 to 4 ft. in rough sea. No marks visible. The wreckage was apparently part of a vessel that had been ashore.
NORTH ATLANTIC.			
1.11.24	14°19'N.	76°02'W.	Derelict, 150 ft. long, submerged.
1.11.24	29°24'N.	30°30'W.	Red nun buoy, marked "2AFP."
1.11.24	40°32'N.	65°15'W.	Timber, about 25 ft. long and 12 ins. square, apparently deck beam with small section attached. The timber was covered with marine growth.
2.11.24	37°28'N.	75°19'W.	Abandoned, grey painted, twin screw motor boat, marked L—7797, in a waterlogged condition.
4.11.24	38°52'N.	41°49'W.	Schooner <i>Inspiration</i> .
6.11.24	36°17'N.	17°06'W.	Small sailing craft, about 30 tons, no crew on board, LBR on bows.
7.11.24	56°14'N.	16°41'W.	Floating structure, consisting of two 12 in. x 12 in. bulks of timber 10 ft. long, fastened with angle irons, covered with barnacles, dangerous to navigation.
9.11.24	35°59'N.	5°55'W.	Fishing boat adrift, no people on board, dangerous to navigation.
9.11.24	50°14'N.	24°22'W.	Portion of sailing vessel, floating bottom up.
9.11.24	40°08'N.	72°36'W.	Spar, 24 ins. in diameter, projecting out of water in upright position, apparently attached to submerged wreckage.
9.11.24	24°38'N.	79°48'W.	Wreckage, consisting of wooden hull, about 40 ft. long, 20 ft. wide, covered with marine growth.
11.11.24	33°13'N.	78°35'W.	Iron-bound spar, projecting 4 ft. out of water, apparently attached to submerged wreckage.
17.11.24	9 miles from Island	S.W.¼W. Faulkner	Apparently a loaded barge, abandoned.
19.11.24	49°21'N.	6°08'W.	Conical buoy.
19.11.24	50°18'N.	8°25'W.	Telegraph buoy marked with white cross, drifting in S.S.E. direction.
MEDITERRANEAN.			
17.11.24	36°12'N.	3°50'W.	Abandoned felucca partly loaded with barrels, dangerous to navigation.
GULF OF MEXICO.			
3.11.24	28°20'N.	91°54'W.	Pile, projecting about 4 ft. out of water, covered with marine growth.
5.11.24	25°20'N.	84°55'W.	Derelict, steel schooner <i>Jubilee</i> , painted white, with her two masts standing and floating high out of water.
NORTH PACIFIC.			
5.11.24	41°51'N.	124°45'W.	Log, 20 ft. long, 3 ft. diameter, covered with marine growth.

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 14.11.24.	Date Received.
<i>Aba</i> ...	Hughes, J. ...	G. P. Williams ...	No.	Elder Dempster ...	Form 911 21.8.24 to 27.9.24 ...	2.10.24.
<i>Abinsi</i> ...	Wright, J. B. ...	R. Redmore ...	"	Elder Dempster ...	" 1.10.24 to 12.10.24...	16.10.24.
<i>Actor</i> ...	Haylett, E. ...	W. Rennie ...	"	Harrison ...	" 22.8.24 to 6.9.24 ...	7.10.24.
<i>Adla</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 ...	W.T.	White Star ...	W.T. Reg. 13.10.24 to 31.10.24...	6.11.24.
<i>Agapenor</i> ...	Ramsay, J. ...	J. P. Makepeace ...	No.	A. Holt ...	Form 911 12.10.24 to 1.11.24...	7.11.24.
<i>Alban</i> ...	Torrible, R. H. ...	R. Griffiths ...	"	Booth ...	" 31.8.24 to 10.9.24 ...	23.9.24.
<i>Albania</i> ...	Irving, B. B. ...	E. W. Connell ...	"	Cunard ...	" 12.7.24 to 2.10.24 ...	16.10.24.
<i>Algerian Prince</i> ...	Rowlands, D. ...	G. Potts ...	"	Prince ...	" 20.9.24 to 20.10.24...	23.10.24.
<i>Alipore</i> ...	Gordon, L. M., R.D., Commr., R.N.R.	H. D. Case ...	"	P. and O. ...	" 30.9.24 to 12.10.24...	16.10.24.
<i>Almanzora</i> ...	Mackenzie G. A. ...	A. P. Portsmouth, E. B. Ingram.	"	R.M.S.P. ...	" 24.4.24 to 15.6.24 ...	14.7.24.
<i>Alondra</i> ...	J. Prendergast ...	H. Peters ...	"	Yeoward ...	" 8.8.24 to 22.9.24 ...	24.9.24.
<i>Ampelo</i> ...	Verstichelen, A. ...	E. Suret ...	"	American Petroleum ...	" 11.10.24 to 1.11.24...	3.11.24.
<i>Anglia</i> ...	Sorge, P. ...	W. H. Hughes ...	C.C.	L.M. & S. Rly. ...	" 26.5.24 to 27.7.24 ...	6.8.24.
<i>Antiochus</i> ...	Ireland, T. ...	A. C. D. Howes ...	No.	A. Holt ...	Telegraphic Report 11.4.24 ...	11.4.24.
<i>Appam</i> ...	Yardley, H. A. ...	... ..	M.L.	Elder Dempster ...	Form 911 6.8.24 to 18.10.24 ...	6.11.24.
30 <i>Aquitania</i> ...	Millsom, H. ...	... ..	"	... ..	Met. Log. 23.1.24 to 22.6.24 ...	8.7.24.
<i>Arafura</i> ...	Charles, Sir J. T. ...	J. L. Croasdaile, P. O. Davis, J. Locke.	W.T.	Cunard ...	W.T. Reg. 28.9.24 to 13.10.24...	17.10.24.
<i>Arana</i> ...	Gordon, A. S. ...	H. Jeans ...	No.	Eastern and Australian ...	" 19.10.24 to 3.11.24...	5.11.24.
<i>Armada Castle</i> ...	Moir, A. G. ...	R. Jones ...	"	R.M.S.P. ...	Form 911 9.2.24 to 1.5.24 ...	30.6.24.
<i>Arracan</i> ...	George, J., O.B.E. ...	L. G. May ...	"	Union Castle ...	"	"
<i>Arundel</i> ...	Willis, M. ...	H. Poole, D. Frame, J. Aitken ...	M.L.	P. Henderson ...	Form 911 5.9.24 to 21.9.24 ...	23.9.24.
<i>Arundel Castle</i> ...	Short, H. ...	Mr. Hill ...	C.C.	Southern Rly. ...	Met. Log. 17.5.24 to 7.9.24 ...	1.10.24.
<i>Assyria</i> ...	Hague, J. W., Commr., R.N.R.	C. Colburn, G. Blaiklock, C. Williams, F. Granger.	M.L.	Union Castle ...	Telegraphic Report 14.11.24 ...	14.11.24.
<i>Astronomer</i> ...	Erskine, R. ...	J. Hamilton ...	No.	Anchor ...	Met. Log. 2.5.24 to 31.8.24 ...	6.9.24.
<i>Athenic</i> ...	Booth, W. M. ...	E. S. Machon, A. M. Jeffries, J. Jackson.	M.L.	Harrison ...	Form 911 13.10.24 to 4.11.24...	10.11.24.
<i>Atsuta Maru</i> ...	Jones, J. L. ...	W. Hill ...	No.	White Star ...	Met. Log. 12.7.24 to 15.10.24...	30.10.24.
<i>Auditor</i> ...	Saito, B. ...	S. Mizogucki ...	"	Nippon Yusen Kaisha ...	Form 911 5.7.24 to 15.8.24 ...	16.8.24.
<i>Auldmuir</i> ...	Owen, W. F. ...	J. Harnden ...	"	Harrison ...	" 3.8.24 to 1.9.24 ...	7.10.24.
<i>Ausonia</i> ...	Ramsay, J. D. ...	J. A. S. Adams ...	"	Glen & Co. ...	" 23.8.24 to 22.10.24...	24.10.24.
	Gibbons, G., R.D., Commr., R.N.R.	A. T. Hamer ...	"	Cunard ...	" 11.10.24 to 27.10.24 ...	11.11.24.
					" 27.9.24 to 18.10.24...	30.10.24.
51 <i>Baltic</i> ...	Roberts, J., C.B.E., D.S.O., R.D., Capt., R.N.R.	E. A. A. Crowley, J. Law, F. Patchett.	W.T.	White Star ...	W.T. Reg. 29.9.24 to 17.10.24...	22.10.24.
<i>Bambra</i> ...	Wyles, W. S. ...	H. W. Norris, J. E. Turner, J. Eggleston, W. Walters.	M.L.	State Service, Australia ...	Form 911 28.9.24 to 18.10.24...	21.10.24.
<i>Bampton Castle</i> ...	Swiney, W. A. ...	L. C. Chapman, H. A. Deller, C. B. Hoggan.	"	Union Castle ...	Met. Log. 27.2.24 to 25.6.24 ...	12.8.24.
<i>Banbury Castle</i> ...	... ..	C. C. Page ...	No.	Turnbull Martin ...	" 25.1.24 to 7.10.24 ...	20.10.24.
<i>Banffshire</i> ...	Wynne, R. H. ...	L. W. Evans ...	"	Commonwealth Govt. ...	Form 911 23.7.24 to 13.8.24 ...	18.8.24.
<i>Barambah</i> ...	Daniel, F. ...	T. Swann ...	"	Hecarth & Sons ...	" 19.8.24 to 2.10.24 ...	16.10.24.
<i>Barpetta</i> ...	Baillie, T. ...	A. Campbell ...	"	British India ...	" 15.8.24 to 28.8.24 ...	16.10.24.
<i>Beaufort</i> ...	Rice, W. V., D.S.O., D.S.C., Commr., R.N.	W. G. E. Rawlingson ...	M.L.	His Majesty's Ship ...	Met. Log. 18.3.24 to 1.7.24 ...	16.8.24.
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 ...	4.11.24.
<i>Benalder</i> ...	Cole, J. H. D.S.C....	W. M. Webster ...	No.	Ben Line ...	Form 911 26.9.24 to 16.10.24...	20.10.24.
					" 26.9.24 to 15.10.24...	20.10.24.
					" 17.9.24 to 27.9.24 ...	7.10.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 14.11.24.	Date Received.
<i>Bengloe</i> ...	McCorquodale, A. ...	G. M. Duff ...	No.	Ben Line ...	Form 911 7.9.24 to 18.10.24 ...	10.11.24.
<i>31 Berengaria</i> ...	Irvine, W. R. D., R.D. Capt., R.N.R.	G. H. Jones, R. F. Bovey, W. C. A. Robson.	W.T.	Cunard ...	W.T. Reg. 5.10.24 to 20.10.24 ...	23.10.24.
<i>Bernini</i> ...	Evans, W. ...	H. L. Rudd ...	No.	Lampart & Holt	Form 911 26.10.24 to 10.11.24 ...	13.11.24.
<i>Berrima</i> ...	Hussey Cooper, E. M., R.D., Commr., R.N.R.	C. C. Smith ...	"	P. & O. Branch ...	" 23.5.24 to 5.8.24 ...	4.9.24.
<i>Bogota</i> ...	Dunn, R. E. ...	W. E. Mc. Mullen ...	No.	R.M.S.P. Co. ...	Form 911 12.9.24 to 1.10.24 ...	20.10.24.
<i>Bolingbroke</i> ...	Stewart, A. ...	C. E. Duggan ...	M.L.	Canadian Pacific	Met. Log. 25.8.24 to 23.9.24 ...	2.10.24.
<i>Borda</i> ...	Holland, R. ...	" ...	No.	P. & O. Branch	Form 911 27.3.24 to 4.5.24 ...	11.8.24.
<i>Bothwell</i> ...	Dott, J. F. ...	S. W. Keay ...	"	Canadian Pacific	" 7.9.24 to 9.10.24 ...	16.10.24.
<i>Brandon</i> ...	Freer, A., R.D., Commr., R.N.R.	J. Mackenzie ...	"	"	" 21.10.23 to 20.11.23	27.11.23.
<i>Brecon</i> ...	McDonald, J. ...	N. B. Glennie, W. W. J. Evans, W. J. P. Roberts.	M.L.	"	Met. Log. 20.9.23 to 6.5.24 ...	8.5.24.
<i>Brenda</i> ...	Murdoch, R. G. ...	A. M. Adams ...	No.	Scottish Fishery Board	Form 911 4.10.24 to 31.10.24 ...	5.11.24.
<i>Brighton</i> ...	Hill, A. ...	Mr. Munton ...	C.C.	Southern Railway	Telegraphic Report 17.10.24 ...	17.10.24.
<i>British Engineer</i> ...	Piper, H. C. ...	E. L. Miller ...	No.	British Tankers	Form 911 26.6.24 to 3.9.24 ...	5.9.24.
<i>British Lantern</i> ...	Taylor, R. J. ...	R. B. Page ...	"	"	" 9.7.24 to 13.8.24 ...	18.8.24.
<i>Browning</i> ...	Connorton, C. A. ...	W. E. Johnston ...	"	Lampart & Holt	" 21.9.24 to 17.10.24 ...	29.10.24.
<i>Bruyere</i> ...	Heasley, W. S. ...	C. E. Legg ...	"	"	" 11.7.24 to 24.9.24 ...	14.10.24.
<i>Cabotia</i> ...	Lowson, P. ...	T. G. Menzies ...	No.	Anchor Donaldson	Form 911 18.9.24 to 15.10.24 ...	20.10.24.
<i>Cambria C.S.</i> ...	Wightman, H. G. E., D.S.C.	E. N. L. Staples ...	M.L.	Eastern Tel. Co.	Met. Log. 1.12.23 to 28.3.24 ...	23.4.24.
<i>Cambria</i> ...	"	V. S. Phillips ...	C.C.	L.M. & S. Rly.	Telegraphic Report 13.11.24 ...	13.11.24.
<i>Camito</i> ...	Sudamore, J. H. H., D. S. C., R.D., Commr., R.N.R.	D. A. Jack, R. M. Cossantine, S. Borrie.	M.L.	Elders & Fyfes	Met. Log. 2.3.24 to 28.6.24 ...	2.7.24.
<i>Canada</i> ...	Jones, T. ...	F. W. Laws ...	No.	White Star-Dominion	Form 911 4.10.24 to 25.10.24 ...	27.10.24.
<i>Canadian Inventor</i> ...	Roberts, R. P. ...	S. M. Holinden ...	"	Canadian Govt. Mer- chant Marine.	" 16.12.23 to 6.2.24 ...	24.3.24.
<i>Canadian Scottish</i> ...	Forson, A. ...	S. Fieldhouse ...	"	"	" 15.5.24 to 16.8.24 ...	16.9.24.
<i>Canadian Seigneur</i> ...	Dixon, C. C. ...	"	"	"	"	"
<i>Canadian Skirmisher</i> ...	Millar, W. H. ...	J. Moller ...	"	"	Form 911 17.5.24 to 19.6.24 ...	24.6.24.
<i>Canadian Winner</i> ...	Hocking, N. P. ...	R. D. Rams ...	"	"	" 13.9.24 to 15.10.24 ...	13.11.24.
<i>Carlow Castle</i> ...	Harvey, H. B. ...	L. H. Stevens ...	"	Union Castle	" 13.6.24 to 10.7.24 ...	28.7.24.
<i>35 Carmania</i> ...	McNeil, S. G. S., R.D., Capt., R.N.R.	D. S. Kite, R. Allen, T. A. O. Ellis.	W.T.	Cunard ...	W.T. Reg. 3.10.24 to 22.10.24 ...	27.10.24.
<i>34 Caronia</i> ...	Diggle, E. G., R.D., Capt., R.N.R.	D. W. Sorrell, J. A. Quarrie, E. R. Taylor.	W.T.	Cunard ...	Form 911 2.10.24 to 22.10.24 ...	27.10.24.
<i>Cassandra</i> ...	Mitchell, W. E. ...	G. M. Sime ...	No.	Anchor Donaldson	W.T. Reg. 24.8.24 to 10.9.24 ...	12.9.24.
<i>52 Cedric</i> ...	Marshall, W., D.S.O., R.D., Capt., R.N.R.	A. E. Weller, J. A. Heenan, A. E. Harvey.	W.T.	White Star ...	Form 911 24.9.24 to 10.10.24 ...	14.10.24.
<i>53 Celtic</i> ...	Holme, A. ...	R. S. Walker, G. T. Kavanagh, D. W. Chamberlain.	W.T.	"	Form 911 30.5.24 to 12.10.24 ...	16.10.24.
<i>Ceramic</i> ...	Symons, J. ...	E. E. Bint ...	No.	"	W.T. Reg. 19.10.24 to 12.10.24 ...	11.11.24.
<i>Changsha</i> ...	Gambrill, F. C. ...	A. M. Frame, F. G. Strat- ford, H. Lishman, L. H. Baillie.	M.L.	Yuill & Co. ...	Form 911 27.7.24 to 16.8.24 ...	19.8.24.
<i>Charon</i> ...	Sturrock, R. G. ...	L. Johnstone ...	No.	Dalgety & Co. ...	W.T. Reg. 6.10.24 to 25.10.24 ...	29.10.24.
<i>Chimecto</i> ...	Green, J. ...	A. F. Walker ...	"	R.M.S.P. Co. ...	Form 911 5.10.24 to 16.9.24 ...	7.10.24.
<i>China</i> ...	King, A., D.S.C. ...	E. Cox Walker ...	"	P. & O. ...	" 19.1.24 to 26.2.24 ...	7.4.24.
<i>Chindwara</i> ...	Brisley, P. L. ...	A. G. Earl ...	"	British India	" 9.4.24 to 20.5.24 ...	26.5.24.
<i>Chindwin</i> ...	Esslemont, C. ...	J. Summers, W. Wilson, C. Owen.	M.L.	P. Henderson	Met. Log. 2.8.24 to 28.8.24 ...	22.9.24.
<i>Chinhua</i> ...	Byers, G. ...	Messrs. Shinn, Graybrook, Stringer, Taylor.	"	China Nav. Co. ...	Met. Log. 16.5.24 to 3.8.24 ...	12.8.24.
<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 ...	"	"	" 12.6.24 to 4.7.24 ...	18.8.24.
<i>City of Canterbury</i> ...	Pine, R. ...	W. Robinson ...	"	"	" 23.11.23 to 14.12.23	12.2.24.
<i>City of Edinburgh</i> ...	Macdonald, K., O.B.E.	A. M. Hamilton ...	"	"	" 3.9.24 to 9.11.24 ...	14.11.24.
<i>City of Chester</i> ...	Teague, R. E. ...	F. C. Wilson ...	M.L.	"	Met. Log. 22.12.23 to 4.4.24 ...	8.4.24.
<i>City of London</i> ...	Spencer, H. ...	E. V. Henday ...	No.	"	Form 911 31.8.24 to 30.9.24 ...	16.10.24.
<i>City of Marseilles</i> ...	Martin, D. ...	C. Inglis ...	"	"	" 29.9.24 to 7.10.24 ...	27.10.24.
<i>City of Rangoon</i> ...	Brown, G. ...	G. M. Womersley ...	"	"	" 23.2.24 to 12.3.24 ...	17.3.24.
<i>City of Valencia</i> ...	Williams, T. L. ...	W. Ibbotson, S. L. Hoare, T. A. Dexter.	M.L.	"	Met. Log. 25.4.23 to 9.8.23 ...	16.8.23.
<i>City of Yokohama</i> ...	Williamson, W. A., R.D., Lieut.- Commr., R.N.R.	C. C. Duncan ...	No.	"	Form 911 12.7.24 to 26.9.24 ...	16.10.24.
<i>Clan Buchanan</i> ...	Jinks, J. W. ...	R. Moloney ...	"	Clan ...	" 21.7.24 to 7.8.24 ...	12.9.24.
<i>Clan Lindsay</i> ...	George, L. S. ...	P. G. de Gruchy ...	"	"	" 11.10.23 to 10.1.24 ...	14.1.24.
<i>Clan Macbeth</i> ...	Baker, C. W. ...	S. J. Shennan ...	"	"	" 17.5.24 to 27.5.24 ...	30.5.24.
<i>Clan Macgillivray</i> ...	Young, A. H., R.D., Lieut.-Commr., R.N.R.	T. Lund ...	"	"	" 9.10.24 to 21.10.24 ...	27.10.24.
<i>Clan Macindoe</i> ...	West, W. F. ...	P. G. de Gruchy ...	"	"	" 4.9.24 to 9.10.24 ...	16.10.24.
<i>Clan Mackellar</i> ...	Miller, W. ...	F. G. Darnborough ...	"	"	" 14.7.24 to 23.9.24 ...	27.10.24.
<i>Clan Mackenzie</i> ...	T. Forreth ...	C. W. Banbury, E. N. Stewart	"	"	" 9.7.24 to 27.7.24 ...	8.9.24.
<i>Clan Mackinnon</i> ...	Young, G. ...	W. G. Arthur, J. M. Lorimer	"	"	" 10.5.24 to 10.6.24 ...	12.6.24.
<i>Clan Macnaughton</i> ...	Mackie, R. W. ...	W. S. Holden ...	M.L.	"	Met. Log. 9.4.24 to 8.8.24 ...	2.9.24.
<i>Clan Macphee</i> ...	Gray, J. N. ...	A. G. Storkey, F. Burnes ...	No.	"	Form 911 19.1.24 to 24.2.24 ...	26.2.24.
<i>Clan Macquhart</i> ...	Gourlay, J. B. ...	P. H. Avdon, W. D. E. Camp- bell, F. Buckley, — Carter.	M.L.	"	Met. Log. 26.1.24 to 12.6.24 ...	8.8.24.
<i>Clan Macvicar</i> ...	Gray, J. N. ...	J. H. Malpas ...	No.	"	Form 911 16.7.24 to 20.10.24 ...	23.10.24.
<i>Clan Malcolm</i> ...	Phillips, G. P. ...	L. S. Murrin ...	"	"	" 17.8.24 to 17.9.24 ...	16.10.24.
<i>Clan Morrison</i> ...	Higgins, C. J. ...	T. G. Young, R. F. Buckley	M.L.	"	Met. Log. 4.5.24 to 7.9.24 ...	22.9.24.
<i>Clan Murdoch</i> ...	Porterfield, W. M. ...	D. A. Evans ...	No.	"	Form 911 8.8.24 to 17.8.24 ...	20.10.24.
<i>Clan Ronald</i> ...	Pagan, J. C. ...	C. W. Thomas ...	"	"	" 23.10.24 to 4.11.24 ...	13.11.24.
<i>Clan Ross</i> ...	Openshaw, L. G. ...	W. H. D. Stephen ...	"	"	" 17.8.24 to 13.9.24 ...	7.10.24.
<i>Clan Sinclair</i> ...	Jones, R. C. ...	G. Short ...	"	"	" 24.9.24 to 12.10.24 ...	5.11.24.
<i>Clan Stuart</i> ...	Neill, G. A. ...	F. B. Parker ...	"	"	" 20.8.24 to 17.9.24 ...	22.9.24.
<i>Clan Urquhart</i> ...	Stenson, F. J. R. D., Commr., R.N.R.	R. Silk ...	"	"	" 2.9.24 to 1.10.24 ...	28.10.24.
<i>Colonla, C.S.</i> ...	Gibb, A. F. W. ...	R. H. Law ...	M.L.	Telegraph Construction & Maintenance.	Met. Log. 28.6.24 to 2.10.24 ...	3.10.24.
	Campos, V., O.B.E., Lt.-Commr., R.N.R.	S. A. Garnham, A. S. Muir, J. M. Matthews, F. Bolin- broke.	"		" 12.2.24 to 27.9.24 ...	30.9.24.

LIST OF VOLUNTARY OBSERVING SHIPS

iii

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 14.11.24.	Date Received.
<i>Colonial</i> ...	Barrow, R. K. ...	A. V. Jones ...	No.	Harrison ...	Form 911 7.5.24 to 23.7.24 ...	29.7.24.
<i>Colonian</i> ...	Gittins, R. P. ...	J. Crangle ...	"	Leyland ...	" 2.10.24 to 29.10.24...	6.11.24.
<i>Columbia</i> ...	Gemmell, W. ...	S. G. Taylor ...	"	Anchor ...	" 4.10.24 to 26.10.24...	29.10.24.
<i>Comino</i> ...	Nuttall, E. L. ...	A. McVicar ...	"	Furness Withy ...	" 9.9.24 to 14.10.24 ...	22.10.24.
<i>Cohee</i> ...	Festa, M. ...	C. Keen ...	"	Commonwealth Govt. ...	" 9.8.24 to 29.8.24 ...	7.10.24.
<i>Corinthic</i> ...	Hart, F. ...	" ...	M.L.	White Star ...	Met. Log. 13.6.24 to 3.10.24 ...	7.10.24.
<i>Cornish City</i> ...	Bowen, T. S. ...	G. S. Dawes ...	No.	Reardon Smith ...	Form 911 8.1.24 to 16.2.24 ...	7.4.24.
<i>Cornwall</i> ...	Robertson, H. W. ...	W. W. Glover ...	"	Dowie, J., & Co. ...	" 25.5.24 to 30.6.24 ...	7.8.24.
<i>Crawford Castle</i> ...	Hughes, E. G. ...	J. C. Brown ...	"	Union Castle ...	" 6.9.24 to 26.9.24 ...	4.11.24.
<i>Culebra</i> ...	Mackay A. S. ...	A. H. Dabree, S. J. Hill, R. Hocken. ...	M.L.	R.M.S.P. Co. ...	Met. Log. 17.8.24 to 14.10.24...	7.11.24.
<i>Cuthbert</i> ...	Reynolds, W. H. B. ...	A. B. Fastig, K. S. Munro ...	No.	Booth ...	Form 911 24.8.24 to 26.9.24 ...	31.10.24.
<i>Cyclops</i> ...	Cosker, W. ...	R. W. Ellis ...	"	A. Holt ...	" 25.8.24 to 14.9.24 ...	2.10.24.
<i>Dardanus</i> ...	Shaw, A. T. ...	" ...	No.	A. Holt ...	" 21.8.24 to 5.9.24 ...	7.10.24.
<i>Darian</i> ...	Masters, W. ...	A. S. Holland ...	"	Leyland ...	" 10.8.24 to 21.8.24 ...	1.9.24.
<i>Darro</i> ...	Smith, W. E., D.S.O., R.D., Capt., R.N.R. ...	H. D. Jackman ...	"	R.M.S.P. Co. ...	" 12.7.24 to 6.9.24 ...	10.9.24.
<i>Daytonian</i> ...	Walker, C. J., D.S.O. ...	W. T. Godwin ...	"	Leyland ...	" 15.8.24 to 25.8.24 ...	10.9.24.
<i>Delta</i> ...	Brooks, C., D.S.O., R.D., Commr., R.N.R. ...	J. O. V. Young ...	"	P. & O. ...	" 28.6.24 to 8.8.24 ...	13.8.24.
<i>Demerara</i> ...	Hill, T. A. ...	A. Hambly ...	"	R.M.S.P. Co. ...	" 25.8.24 to 18.10.24...	21.10.24.
<i>Demosthenes</i> ...	Williams, W. J. ...	R. A. Alcock ...	"	Aberdeen ...	" 12.9.24 to 1.10.24 ...	21.10.24.
<i>Desado</i> ...	Wakeman, E. C. ...	W. Scott, D. L. Neilson ...	"	R.M.S.P. Co. ...	" 7.9.24 to 31.10.24 ...	5.11.24.
<i>Desna</i> ...	Adam, C., R.D., Commr., R.N.R. ...	A. A. Martin ...	"	" ...	" 12.8.24 to 3.10.24 ...	7.10.24.
<i>Deucalion</i> ...	Findlay, J. ...	P. W. Savery, O. Thomas ...	"	A. Holt ...	" 17.9.24 to 5.10.24 ...	16.10.24.
<i>Devon</i> ...	Gardner, H. W. ...	A. Bell ...	"	New Zealand S.S. Co. ...	" 20.12.23 to 11.5.24...	4.6.24.
<i>Dieppe</i> ...	Marmery, S. ...	Mr. Parsons ...	O.C.	Southern Railway ...	Telegraphic Report. 13.11.24 ...	13.11.24.
<i>Digby</i> ...	Chambers, F. W., D.S.C. ...	J. Pascoe, J. W. Murphy, W. P. Paterson. ...	M.L.	Furness Withy ...	Met. Log. 2.10.23 to 8.4.24 ...	22.4.24.
<i>Dimboola</i> ...	Roy, C. M. ...	G. N. Baker ...	No.	Melbourne S.S. Co. ...	Form 911 2.8.24 to 9.8.24 ...	22.9.24.
<i>Discoverer</i> ...	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>Doric</i> ...	Davies, J. ...	A. Thompson ...	"	White Star ...	" 12.10.24 to 2.11.24...	10.11.24.
<i>Doric Star</i> ...	Thomas, R. T. ...	A. S. Menzies ...	"	Blue Star ...	" 17.9.24 to 28.9.24 ...	7.10.24.
<i>Dorington Court</i> ...	Isaacs, W. A. ...	E. V. Quickenden ...	"	Haldin & Co. ...	" 17.8.24 to 8.9.24 ...	18.9.24.
<i>Dorset</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 ...	" 14.8.24 to 3.9.24 ...	12.9.24.
<i>Dundrum Castle</i> ...	Kershaw, H. J. ...	R. May ...	"	Union Castle ...	" 4.9.24 to 3.10.24 ...	28.10.24.
<i>Duendes</i> ...	Pape, E. R. ...	D. P. Morgan ...	"	Pacific S.N. Co. ...	" 18.9.24 to 5.10.24 ...	27.10.24.
<i>Duffield</i> ...	" ...	T. S. Robertson ...	"	Hunting & Sons ...	" ...	"
<i>Duquesa</i> ...	Fyffe, F. M. ...	C. P. Lane ...	"	Furness Withy ...	Form 911 10.8.24 to 7.10.24 ...	16.10.24.
<i>Durenda</i> ...	Wilson, W. ...	W. H. Creese ...	"	British India ...	" 27.4.24 to 21.5.24 ...	7.8.24.
<i>Eastern</i> ...	Smith, G. L. ...	H. Murray, G. Munro, E. S. Birrell. ...	M.L.	Eastern and Australian ...	Met. Log. 27.8.23 to 3.5.24 ...	2.8.24.
<i>Ebani</i> ...	Faill, — ...	W. McKeown ...	No.	Elder Dempster ...	" ...	"
<i>Edinburgh Castle</i> ...	Strong, H., R.D., Commr., R.N.R. ...	" ...	M.L.	Union Castle ...	Met. Log. 11.4.24 to 12.10.24...	27.10.24.
<i>Eemland</i> ...	Van Noppen, C. D. ...	T. Doornbosch ...	No.	Holland Lloyd ...	Form 911 1.7.24 to 1.8.24 ...	18.8.24.
<i>Egori</i> ...	McDowall, F. J. ...	K. Redmore ...	"	Elder Dempster ...	" 25.11.23 to 10.12.23 ...	12.12.23.
<i>El Cordobes</i> ...	Noton, F. G. ...	N. H. Oldham ...	"	British & Argentine S.N. Co. ...	" 14.9.24 to 8.10.24 ...	30.10.24.
<i>Elmina</i> ...	Millson, H. E. ...	W. McKeown, J. H. Hall, C. H. Turner. ...	M.L.	Elder Dempster ...	Met. Log. 1.3.24 to 30.8.24 ...	8.9.24.
<i>El Paraguayo</i> ...	Ellis, F., D.S.C. ...	W. E. Williams ...	No.	Houlder Bros. ...	Form 911 16.8.24 to 16.10.24...	22.10.24.
<i>Elpenor</i> ...	Holden, W. R. F. ...	P. E. Wright, C. Mock ...	M.L.	A. Holt ...	Met. Log. 26.5.24 to 12.9.24 ...	17.9.24.
<i>Elysia</i> ...	Kinnaird, J. ...	A. Grant ...	No.	Anchor ...	Form 911 16.2.24 to 8.3.24 ...	1.4.24.
<i>Empress of Asia</i> ...	Douglas, L. D., R.D., Lt. - Commr., R.N.R. ...	" ...	M.L.	Canadian Pacific ...	Met. Log. 5.6.24 to 14.9.24 ...	14.10.24.
<i>Empress of Australia</i> ...	Robinson, S., C.B.E., R.D., Commr., R.N.R. ...	" ...	M.L.	" ...	" 1.6.23 to 9.3.24 ...	7.4.24.
<i>Empress of Canada</i> ...	Hopcraft, D. ...	" ...	"	" ...	" ...	"
<i>Empress of France</i> ...	Hailey, A. J. ...	" ...	"	" ...	" ...	"
<i>Empress of Russia</i> ...	Robinson, S., C.B.E., R.D., Commr., R.N.R. ...	W. S. Halliday ...	M.L.	" ...	Met. Log. 4.1.24 to 22.5.24 ...	7.7.24.
<i>Empress of Scotland</i> ...	Griffiths, E. ...	R. V. Everett, A. S. Phillips, B. Grant, ...	M.L.	" ...	" 13.6.23 to 17.11.23...	21.11.23.
<i>Endeavour</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>Essequibo</i> ...	Gillies, J., C.B.E. ...	" ...	M.L.	His Majesty's Ship ...	Met. Log. 23.10.23 to 19.2.24...	14.6.24.
<i>Eumaeus</i> ...	Nares, J. D., D.S.O., Capt., R.N. ...	H. Exton Turner ...	M.L.	" ...	" ...	"
<i>Euripides</i> ...	Duncan, E. E. ...	G. Pattison ...	No.	R.M.S.P. Co. ...	Form 911 20.8.24 to 1.9.24 ...	16.9.24.
<i>Eurybates</i> ...	Power, J. ...	E. R. Pritchard ...	"	A. Holt ...	" 23.9.24 to 16.10.24...	30.10.24.
<i>Explorer</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>Fitzroy</i> ...	Lloyd, R. ...	J. A. Havard ...	No.	A. Holt ...	Form 911 16.8.24 to 13.10.24...	16.10.24.
<i>Flandria</i> ...	Lamont, A. ...	Scientific Staff ...	M.L.	Scottish Fishery Board ...	Met. Log. 20.6.24 to 27.9.24 ...	24.10.24.
<i>Flinders</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>Francisco</i> ...	Veldkamp, G. J. ...	W. G. Ton ...	No.	Holland Lloyd ...	Form 911 16.5.24 to 29.6.24 ...	11.11.24.
<i>Frankol</i> ...	Henderson, D. A., Lt.-Commr., R.N. ...	A. B. Foulleston, K. F. Boxall ...	M.L.	His Majesty's Ship ...	Met. Log. 28.3.24 to 25.7.24 ...	7.8.24.
<i>Frankensels</i> ...	Wilkins, J., O.B.E. ...	F. D. Shaw ...	No.	Ellerman Wilson ...	Form 911 26.9.24 to 1.11.24 ...	7.11.24.
<i>Freienfels</i> ...	Gatley, E. ...	H. J. Prout ...	"	Royal Fleet Auxiliary ...	" 20.6.23 to 15.9.23 ...	27.11.23.
<i>Frey</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>Frey</i> ...	Cleugh, J. W. ...	C. F. Bennett, H. Wilson, R. Soper. ...	"	" ...	" 8.4.24 to 8.7.24 ...	13.8.24.
<i>Frey</i> ...	Angus, W. ...	J. Murray ...	No.	Scottish Fishery Board ...	Form 911 1.10.24 to 21.10.24...	29.10.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log Register, or Report Contributed. Received up to 14.11.24.	Date Received.
<i>Gallie</i> ...	Summers, F. F., R.D., Commr. R.N.R.	W. G. O. Jones ...	No.	White Star ...	Met. Log. 11.4.24 to 24.5.24 ...	27.5.24.
<i>Galtymore</i> ...	Ledsome, J. S. ...	N. Goubrough ...	"	Furness Withy ...	Form 911 28.9.24 to 9.10.24 ...	16.10.24.
<i>Garret</i> ...	Visser, C. W. ...	S. de Boo ...	"	Rotterdam Lloyd ...	" 18.7.24 to 29.8.24 ...	8.9.24.
<i>Gascoyne</i> ...	Mills, A. ...	P. G. Collins ...	"	Dalgety & Co. ...	" 9.6.24 to 9.8.24 ...	22.9.24.
<i>Gelria</i> ...	Kolkman, J. M. ...	J. N. F. Cordijs ...	"	Holland Lloyd ...	" 19.9.24 to 5.11.24 ...	10.11.24.
<i>Gladiator</i> ...	Ruffell, —. ...	D. H. Bryant, W. E. Shotton ...	"	Harrison ...	" 7.1.24 to 8.3.24 ...	12.3.24.
<i>Glenamoy, 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 ...	"	" ...	" 5.10.24 to 16.10.24 ...	10.11.24.
<i>Glenluce, M.V.</i> ...	Barkley, E. ...	J. D. Richards ...	"	" ...	" 28.7.24 to 4.8.24 ...	9.9.24.
<i>Glenishane</i> ...	Roberts, W. E. ...	" ...	"	" ...	" 10.2.24 to 21.6.24 ...	16.9.24.
<i>Goucestershire</i> ...	Robin, E. ...	T. E. Field ...	"	Bibby ...	" 21.6.24 to 31.8.24 ...	2.9.24.
<i>Gorgon...</i> ...	Hughes, J. W. ...	W. E. Crompton ...	"	Dalgety & Co. ...	" 13.7.24 to 27.7.24 ...	8.9.24.
<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. ...	R. P. Davies ...	"	" ...	" 18.6.24 to 17.7.24 ...	21.7.24.
<i>Harmony, Auxy.</i> ...	Jackson, J. C. ...	A. W. Bush ...	"	Moravian Mission ...	" 9.7.24 to 8.9.24 ...	26.9.24.
<i>Hatarana</i> ...	Mardon, T. T. ...	J. L. Durkee, F. Wells, E. B. Heath, E. C. McGuiness.	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. ...	" 25.9.24 to 15.10.24 ...	13.11.24.
<i>Henry Holmes, C.S.</i> ...	Geeve, G. E. ...	E. Hislop Tucker ...	"	W. I. & Panama Telegraph Co.	" 1.8.24 to 21.8.24 ...	22.9.24.
<i>Herald</i> ...	Harvey, J. R., Commr., R.N.	W. C. Jenks ...	M.L.	His Majesty's Ship ...	Met. Log. 7.2.24 to 5.6.24 ...	11.8.24.
<i>Herefordshire</i> ...	Stanley, W. ...	P. Flood, G. Whitworth, P. S. Cooper, S. M. Burton, G. Holdsworth.	"	Bibby ...	" 1.3.24 to 19.8.24 ...	8.9.24.
<i>Herschel</i> ...	Carey, W. J. ...	S. C. Smith ...	No.	Lampport & Holt ...	Form 911 16.8.24 to 20.10.24 ...	23.10.24.
<i>Hibernia</i> ...	Tanner ...	R. Woodall ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report. 8.11.24 ...	8.11.24.
<i>Highland Enterprise</i> ...	Pond, R. H. ...	D. R. S. Webster ...	No.	Nelson ...	Form 911 29.3.24 to 12.6.24 ...	8.7.24.
" <i>Glen</i> ...	Jones, T. J. ...	C. M. Best ...	"	" ...	" 18.8.24 to 10.10.24 ...	21.10.24.
" <i>Heather</i> ...	Powell, G. A. ...	G. Watson, R. Sinclair Davies, J. C. Morton.	M.L.	" ...	Met. Log. 23.12.22 to 22.3.23 ...	28.3.23.
" <i>Laddie...</i> ...	Alford, C. ...	G. L. Goodman ...	No.	" ...	Form 911 17.3.24 to 6.4.24 ...	6.6.24.
" <i>Piper</i> ...	Collings, D. ...	A. S. Jones, J. S. Collins, J. H. Cables.	M.L.	" ...	Met. Log. 4.2.24 to 23.6.24 ...	2.7.24.
" <i>Pride</i> ...	Robinson, R. H. ...	H. McKinnon, F. Falconer, R. R. Soanes.	"	" ...	" 15.4.24 to 31.8.24 ...	17.9.24.
" <i>Rover</i> ...	Ashby Graves, F. ...	F. W. Harvey, H. Thomas, F. Abbott.	"	" ...	" 31.7.24 to 29.9.24 ...	6.10.24.
" <i>Warrior</i> ...	Brooke, W. ...	W. T. Breen ...	No.	" ...	Form 911 20.5.24 to 23.7.24 ...	12.9.24.
<i>Hildebrand</i> ...	Maddrell, J. ...	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>Holheim</i> ...	Gough, W. A. ...	G. P. Kitto ...	No.	Lampport & Holt ...	Form 911 20.5.24 to 29.8.24 ...	8.9.24.
<i>54 Homeric</i> ...	Metcalfe, G. R., Lt.-Commr., R.N.R.	H. Clark, H. Yates, A. Griffiths.	W.T.	White Star ...	W.T. Reg. 2.10.24 to 17.10.24 ...	21.10.24.
<i>Honorius</i> ...	Samuels, C. ...	J. E. Martin, W. G. Idles ...	No.	R. P. Houston ...	Form 911 12.9.24 to 14.10.24 ...	11.11.24.
<i>Huancho</i> ...	Redyard, A. ...	A. G. Litherland ...	"	Pacific S.N. Co. ...	" 15.7.24 to 5.8.24 ...	11.8.24.
<i>Hubert...</i> ...	Jones, W. C. H. ...	S. G. Edwards ...	"	Booth ...	" 5.9.24 to 17.9.24 ...	21.10.24.
<i>Hurumi</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>Iber</i> ...	Langdon, C. ...	" ...	C.C.	G.W. Railway ...	Telegraphic Report. 13.11.24 ...	13.11.24.
<i>Ikala</i> ...	Meetham, J. T. ...	E. Lightfoot ...	No.	J. H. Welsford & Co. ...	Form 911 6.9.24 to 1.11.24 ...	13.11.24.
<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> ...	Baetens, F. ...	A. K. Sanderson ...	No.	A. Holt ...	Form 911 22.8.24 to 13.10.24 ...	17.10.24.
<i>John Pender, C.S.</i> ...	Gibson, L., M.B.E.	B. C. Farrow ...	No.	Eastern Tel. Co. ...	" 25.5.24 to 6.7.24 ...	15.7.24.
<i>Junin</i> ...	Benson, C. W. ...	R. D. Eckford ...	"	Pacific S.N. Co. ...	" 19.6.24 to 7.10.24 ...	14.10.24.
<i>Kaikoura</i> ...	Downton, M. ...	L. H. Whitfield, N. Anderson, J. Hopkins.	M.L.	New Zealand S.S. Co.	Met. Log. 17.9.23 to 31.3.24 ...	19.5.24.
<i>Kaisar-i-Hind</i> ...	Manley, G. ...	F. D. Forbes ...	No.	P. & O. ...	Form 911 15.8.24 to 22.10.24 ...	27.10.24.
<i>Kamo Maru</i> ...	Okano, Y. ...	F. Takaku ...	"	Nippon Yusen Kaisha	" 1.10.24 to 2.11.24 ...	7.11.24.
<i>Kangaroo</i> ...	Norris, H. C. ...	C. M. C. Clayton, R. J. Sinclair, F. Humble.	M.L.	State Service Australia	Met. Log. 26.2.24 to 14.8.24 ...	17.10.24.
<i>Karoo...</i> ...	Robinson, T. ...	H. J. Perrett ...	No.	Ellerman Bucknall ...	Form 911 2.6.24 to 16.6.24 ...	25.6.24.
<i>Kashima Maru</i> ...	Shinomiya, T. ...	M. Takada ...	"	Nippon Yusen Kaisha	" 2.1.24 to 9.2.24 ...	14.3.24.
<i>Kashmir</i> ...	Stringer, R. H., O.B.E., R.D., Commr. R.N.R.	F. Hopkins ...	"	P. & O. ...	" 2.8.24 to 22.8.24 ...	16.9.24.
<i>Kellett</i> ...	Haselfoot, F. E. B., D.S.O., Commr., R.N.	E. H. B. Baker, R. A. Stephens	M.L.	His Majesty's Ship ...	Met. Log. 30.7.24 to 15.10.24 ...	20.10.24.
<i>Kenilworth Castle</i> ...	Millard, L. A. ...	A. E. Denn, W. M. Tomkins	M.L.	Union Castle ...	" 28.12.23 to 28.4.24 ...	8.5.24.
<i>Khiva</i> ...	Redhead, C. M., D.S.O., R.D., Capt., R.N.R.	L. Fraser, A. L. Hill, R. G. Freeman.	M.L.	P. & O. ...	" 28.3.24 to 6.7.24 ...	10.7.24.
<i>Khyber...</i> ...	Pinckney, L. D., O.B.E.	N. B. S. Hewett ...	No.	" ...	Form 911 6.4.24 to 11.5.24 ...	14.5.24.
<i>Kia Ora</i> ...	Thurston, H. P. ...	A. E. Lockhart ...	"	Shaw Savill & Albion	" 18.3.24 to 2.5.24 ...	9.5.24.
<i>Kinderdijk</i> ...	Jochems, A. B. ...	A. Stenger ...	"	Holland America ...	" 27.3.24 to 3.5.24 ...	8.5.24.
<i>Kitano Maru</i> ...	Gotoh, M. ...	R. Nakane ...	"	Nippon Yusen Kaisha	" 8.6.24 to 5.10.24 ...	14.10.24.
<i>Knight Companion</i> ...	Beale, H. E. ...	J. H. Brown ...	"	A. Holt ...	" 21.7.24 to 29.7.24 ...	7.10.24.
<i>Kono</i> ...	Casson, D. H., R.D., Commr., R.N.R.	E. R. Massam, L. Griffiths, J. Sanders, T. Fea.	M.L.	Ellerman Wilson ...	Met. Log. 16.12.23 to 22.7.24 ...	2.9.24.
<i>Kyogle...</i> ...	Coalstad, C. ...	C. B. Odman, E. W. Hughes	No.	Commonwealth Light-house Service.	" ...	"
<i>Lady Denison Pender, C.S.</i> ...	West, G. W. ...	A. G. Watts ...	"	Eastern Tel. Co. ...	Form 911 6.9.24 to 13.10.24 ...	10.11.24.
<i>Laguna</i> ...	Mander, F. ...	F. W. Parker ...	"	Pacific S.N. Co. ...	" 22.3.24 to 14.4.24 ...	28.4.24.
<i>Lalande</i> ...	Bambra, W. A. ...	N. Webster ...	"	Lampport & Holt ...	" 17.7.24 to 8.8.24 ...	27.8.24.
<i>Lancashire</i> ...	Beckett, F. W. ...	T. L. Owen ...	"	Bibby ...	" 19.7.24 to 27.9.24 ...	14.10.24.
<i>Laomedon</i> ...	Smith, A. H. ...	A. J. Barclay ...	"	A. Holt ...	" 5.4.24 to 18.7.24 ...	25.7.24.
<i>La Paz, M.V.</i> ...	Ross, J. ...	R. D. Collister ...	"	Pacific S.N. Co. ...	" 29.8.24 to 19.9.24 ...	30.9.24.

LIST OF VOLUNTARY OBSERVING SHIPS

V

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 14.11.24.	Date Received.
<i>Laplace</i> ...	Davies, G. W. ...	A. Hughes, I. O. Jones ...	No.	Lamport & Holt ...	Form 911 20.1.24 to 27.3.24 ...	7.4.24.
55 <i>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... Form 911 4.10.24 to 23.10.24...	25.10.24. 27.10.24.
<i>Lassell, M.V.</i> ...	Turner, J. E. ...	A. T. Crilly ...	No.	Lamport & Holt ...	Met. Log. 5.8.23 to 24.10.23 ...	27.11.23.
<i>Leicestershire</i> ...	English, G. L. ...	W. Whiteside, P. H. Potter, D. Sharrock, W. H. Muirhead.	M.L.	Bibby ...	Met. Log. 30.8.24 to 8.11.24 ...	14.11.24.
<i>Leitrim</i> ...	Robertson, A. ...	H. C. Roberts ...	No.	Dowie, J., & Co. ...	" 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. ...	" ...	No.	Chunghwa Nav. Co. ...	Form 911 27.10.23 to 12.1.24... " 19.3.24 to 10.4.24 ...	22.4.24. 22.4.24.
<i>Llanstephan Castle</i> ...	Wilford, T. H. ...	W. F. Malden ...	"	Union Castle ...	" 25.4.24 to 1.8.24 ...	13.8.24.
<i>Loch Katrine</i> ...	Matthews, G. P. ...	C. Noakes ...	"	R.M.S.P. Co. ...	" 27.9.24 to 28.10.24...	10.11.24.
<i>London Commerce</i> ...	Young, H. J., D.S.C. ...	P. G. Leverett ...	"	Furness Withy ...	" 18.5.24 to 7.6.24 ...	12.6.24.
<i>Loreto M.V.</i> ...	Barkley, E. ...	F. Binnion ...	"	Pacific S.N. Co. ...	" 4.10.24 to 24.10.24...	27.10.24.
<i>Losada M.V.</i> ...	Meldrum, G. W. ...	A. H. Turner ...	"	P. & O. ...	" 6.7.24 to 14.7.24 ...	28.7.24.
<i>Macedonia</i> ...	Potter, H. W., R.D., Commr., R.N.R.	J. B. Buggi ...	No.	" ...	" ...	"
<i>Macharda</i> ...	Cochran, G. ...	W. Moore ...	"	Brocklebank ...	" 1.5.24 to 25.7.24 ...	18.8.24.
<i>Mahana</i> ...	Kershaw, W. A. R. ...	F. M. Smith, F. Gilroy ...	"	Shaw Savill & Albion ...	" 7.9.24 to 21.9.24 ...	16.10.24.
<i>Maharaja</i> ...	Peet, T. M. ...	E. Childs ...	"	Asiatic S.N. Co. ...	" 27.7.24 to 8.9.24 ...	16.10.24.
<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>Maimeo</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 ...	" 18.8.24 to 14.9.24 ...	22.9.24.
58 <i>Majestic</i> ...	Hayes, Sir B. F., K.C.M.G., D.S.O., R.D., Commadore, R.N.R.	A. F. Butcher, W. W. Pearson	W.T.	White Star ...	W.T. Reg. 9.10.24 to 23.10.24... Form 911 9.10.24 to 23.10.24...	27.10.24. 27.10.24.
<i>Makambo</i> ...	Butler, E. ...	F. C. Ree ...	M.L.	Burns Philp ...	Met. Log. 26.9.23 to 29.1.24 ...	7.7.24.
<i>Makura</i> ...	Griffiths, G. I. ...	" ...	"	" ...	" ...	"
<i>Malancha</i> ...	Crawford, R. ...	G. O. Knaggs ...	M.L.	Canadian-Australasian ...	" 8.3.24 to 26.6.24 ...	22.7.24.
<i>Malda</i> ...	Barlow, A. E. ...	" ...	"	" ...	" ...	"
<i>Manchester Corporation.</i>	Whitham, F. ...	F. Boulding ...	No.	Brocklebank ...	Form 911 20.7.24 to 1.10.24 ...	3.10.24.
<i>Manchester Mariner</i>	Gray, T. N. ...	W. Hunt ...	"	British India ...	" 5.9.24 to 29.9.24 ...	2.10.24.
<i>Manchester Merchant.</i>	Everest J. E. ...	L. H. Moorhouse ...	"	Manchester Liners ...	" 11.10.24 to 12.11.24	14.11.24.
<i>Mandador</i> ...	Riley, J. E. ...	C. E. Stocker, J. F. Fisher, F. Stockton.	M.L.	" ...	Met. Log. 28.7.23 to 29.2.24 ...	19.3.24.
<i>Manhattan</i> ...	Barclay J. ...	A. H. Boyd, A. E. Ricketts...	No.	" ...	Form 911 4.10.24 to 15.10.24...	23.10.24.
<i>Manipur</i> ...	Kershaw, R. W. ...	W. Baxter ...	"	Brocklebank ...	" 1.12.23 to 7.1.24 ...	28.1.24.
<i>Manistee</i> ...	Hutchison J. G. ...	S. K. Hawkins ...	"	Atlantic Transport ...	" 25.5.24 to 1.8.24 ...	11.8.24.
<i>Marella</i> ...	Scurr, T. W. ...	G. W. Barker ...	"	Brocklebank ...	" 4.6.24 to 4.9.24 ...	5.9.24.
<i>Marengo</i> ...	Isaacson, J. M. ...	F. McCollm, H. E. Lees, L. C. Bach, H. C. Slater.	M.L.	Elders & Fyffes ...	Met. Log. 22.3.24 to 20.7.24 ...	24.7.24.
<i>Margha</i> ...	Mortimer S. ...	Burdis, Pemberton, Thompson	M.L.	Burns Philp ...	" 12.7.23 to 22.11.23...	3.3.24.
<i>Marglen</i> ...	Bean, A. ...	W. G. Pearce, G. B. Bray, E. Wood.	M.L.	Ellerman Wilson ...	" 22.5.24 to 28.8.24 ...	3.9.24.
<i>Marloch</i> ...	Whittingham, W. E., O.B.E., R.D., Commr., R.N.R.	J. Strachan, P. Wright, N. A. Thatcher, H. E. Evans.	M.L.	British India ...	Met. Log. 5.7.24 to 17.9.24 ...	22.2.24.
<i>Maryland</i> ...	Griffiths, J. N. ...	A. Pennington ...	No.	Canadian Pacific ...	Form 911 16.2.24 to 7.3.24 ...	11.3.24.
<i>Masirah</i> ...	Hamilton, G. ...	M. Jack, J. McLellan, C. Crawley.	W.T.	" ...	W.T. Reg. 12.10.24 to 30.10.24	4.11.24.
<i>Massilia</i> ...	Pollard, F. W., D.S.O., R.D., Commr., R.N.R.	A. S. Mather ...	No.	Atlantic Transport ...	Form 911 11.10.24 to 31.10.24	5.11.24.
<i>Matakana</i> ...	Thowless, E. ...	" ...	"	" ...	" 15.9.24 to 22.10.24...	30.10.24.
<i>Mataran</i> ...	Henderson, J. L. ...	R. C. Baker ...	"	Brocklebank ...	Form 911 4.4.24 to 25.4.24 ...	26.5.24.
<i>Matheran</i> ...	Bosdet, V. J. ...	E. Richardson ...	"	Anchor ...	" 12.9.24 to 20.9.24 ...	22.9.24.
<i>Mathura</i> ...	McInnes, G. ...	J. J. Finn, J. W. Hart ...	"	Shaw, Savill & Albion ...	" 31.12.23 to 24.4.24...	29.4.24.
<i>Matiana</i> ...	Cornish, N. P. ...	K. Morris ...	"	Burns Philp & Co. ...	" 29.5.24 to 9.8.24 ...	7.10.24.
<i>Matina</i> ...	Hanna, R. G. ...	J. A. Embley, J. Robertson, D. Hunter.	M.L.	Brocklebank ...	Met. Log. 2.7.24 to 13.10.24 ...	7.11.24.
<i>Mauretania</i> ...	Langlands, D. H. ...	H. H. Armstrong ...	No.	British India ...	Form 911 21.9.24 to 23.10.24...	29.10.24.
<i>Megantic</i> ...	Henderson, J. ...	D. H. Bell ...	M.L.	Elders & Fyffes ...	" 29.8.24 to 3.10.24 ...	27.10.24.
<i>Melita</i> ...	Rostron, A. H., C.B.E., R.D., A.-d.-C., Capt., R.N.R.	J. A. Myles, P. A. Morgan, D. Forbes.	W.T.	Cunard ...	Met. Log. 3.9.23 to 28.5.24 ...	31.5.24.
<i>Memnon</i> ...	Berry, G. ...	H. J. C. Day, R. Conway ...	W.T.	" ...	W.T. Reg. 12.10.24 to 26.10.24	29.10.24.
<i>Menominee</i> ...	Clews, A. H. ...	H. A. MacCullum, W. E. Bacon, A. Benshaw.	W.T.	White Star ...	W.T. Reg. 18.10.24 to 7.11.24...	12.11.24.
<i>Mercian</i> ...	Salter, G. H. ...	E. D. Potts ...	No.	Canadian Pacific ...	" 2.11.24 to 6.11.24 ...	11.11.24.
<i>Metagama</i> ...	Finch, E. ...	N. Seymour ...	"	A. Holt ...	Form 911 3.10.24 to 19.10.24...	21.10.24.
<i>Miami</i> ...	Carnon, J. R. ...	W. R. C. Baker ...	"	Atlantic Transport ...	" 1.9.24 to 9.10.24 ...	16.10.24.
<i>Michigan</i> ...	Henderson, W. ...	B. Leslie, A. M. Watt, E. V. Glennie.	W.T.	Leyland ...	" 21.7.24 to 26.8.24 ...	9.9.24.
<i>Minderoo</i> ...	Maxwell Brown, W. E. ...	E. Lowndes ...	No.	Canadian Pacific ...	W.T. Reg. 5.10.24 to 23.10.24...	27.10.24.
<i>Minna</i> ...	Tribe, A. E. ...	L. A. Williams ...	"	Elders & Fyffes ...	Form 911 12.10.24 to 24.10.24	3.11.24.
<i>Minnetonka</i> ...	Richardson, E. ...	B. J. Bennie, W. J. McPhedron, J. H. Oxtan.	M.L.	Atlantic Transport ...	" 11.6.24 to 20.6.24 ...	25.6.24.
<i>Minnewaska</i> ...	Mackenzie, G. G. ...	D. Rattray ...	No.	West Australia Nav. Co. ...	Met. Log. 30.12.23 to 12.6.24...	27.8.24.
<i>Mirror, C.S.</i> ...	Sibbons, H. ...	— Carter, — Soame, — Mackenzie.	W.T.	Scottish Fishery Board ...	Form 911 22.9.24 to 18.10.24...	23.10.24.
<i>Mississippi, M.V.</i>	Gates, T. F. ...	H. E. McCartney ...	No.	Canadian Pacific ...	W.T. Reg. 4.10.24 to 22.10.24...	27.10.24.
<i>Moena</i> ...	Claret, F. ...	W. S. Mackie ...	"	" ...	Form 911 6.9.24 to 24.9.24 ...	26.9.24.
<i>Moldavia</i> ...	Sherwood, C. A. ...	C. E. F. St. John ...	"	Atlantic Transport ...	" 20.10.24 to 8.11.24...	11.11.24.
<i>Mongolian Prince</i>	Wylie, J. T. J. ...	H. K. Cockerill ...	"	Eastern Tel. Co. ...	" 6.10.24 to 25.10.24...	29.10.24.
<i>Monkbarns, Ship</i>	Morzer Bruyns, M. F. ...	P. de Viels ...	"	" ...	" 29.8.24 to 6.10.24 ...	20.10.24.
<i>Montcalm</i> ...	Griffin, R. H., O.B.E., R.D., Capt., R.N.R.	D. Buckley ...	"	Atlantic Transport ...	" 13.10.24 to 23.10.24	7.11.24.
<i>Montclair</i> ...	Durrant, G. D. ...	R. S. Bibby ...	No.	Nederland ...	" 12.7.24 to 17.9.24 ...	25.9.24.
<i>Montclair</i> ...	Davies, W. ...	M. B. Glasier ...	W.T.	P. & O. ...	" 2.8.24 to 8.11.24 ...	12.11.24.
<i>Montclair</i> ...	Rennie, A., O.B.E. ...	H. McFadyen ...	W.T.	" ...	" ...	"
<i>Montclair</i> ...	Webster, G. S., R.D., Commr., R.N.R.	R. Fegan, W. Phillips, A. S. Phillips.	W.T.	" ...	" ...	"
<i>Montclair</i> ...	Turnbull, J., C.B.E., R.D., Capt., R.N.R.	H. H. Davies ...	No.	" ...	" ...	"
<i>Montclair</i> ...	Landy, E. ...	T. Beck, A. Mansey, R. Robinson.	W.T.	" ...	W.T. Reg. 18.10.24 to 6.11.24...	11.11.24.
<i>Montclair</i> ...	Latta, R. G. ...	F. E. Williams ...	"	" ...	Form 911 17.10.24 to 6.11.24...	10.11.24.
<i>Montclair</i> ...	" ...	" ...	"	" ...	" 11.7.24 to 31.7.24 ...	5.8.24.
<i>Montclair</i> ...	" ...	" ...	"	" ...	W.T. Reg. 4.10.24 to 21.10.24 ...	23.10.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 14.11.24.	Date Received.
<i>Morvada</i> ...	Mills, T. L., O.B.E., R.D., Commr., R.N.R.	J. Norris, C. L. Hazeldine ...	M.L.	British India ...	Met. Log. 5.1.24 to 24.7.24 ...	11.9.24.
<i>Mulbera</i> ...	Steadman, W. R. ...	E. Holland, A. Russell ...	No.	British India ...	Form 911 11.9.24 to 19.10.24...	27.10.24.
<i>Nagara</i> ...	Shillitoe, B., R.D., Commr., R.N.R.	C. K. Brown ...	"	R.M.S.P. Co. ...	" 18.7.24 to 16.9.24 ...	22.9.24.
<i>Napierian</i> ...	Kerruish, W. ...	T. Griffiths ...	"	Leyland ...	" 14.2.24 to 26.2.24 ...	14.3.24.
<i>Nardana</i> ...	Brown, H. ...	S. C. T. Smith, W. E. Jackson ...	"	British India ...	" 25.7.24 to 29.8.24 ...	16.9.24.
<i>Nariva</i> ...	Buret, T. J. C. ...	H. M. S. Laidlaw, C. Waterhouse, E. N. Giller.	M.L.	R.M.S.P. Co. ...	Met. Log. 21.6.24 to 17.8.24 ...	21.8.24.
<i>Nascopie</i> ...	Smellie, T. F. ...	A. S. Watts, T. D. Roseburgh ...	M.L.	Hudson's Bay Co. ...	" 16.6.24 to 17.10.24...	23.10.24.
<i>Navarino</i> ...	Crichton, J. S. ...	J. Annam ...	No.	Glen & Co. ...	Form 911 13.12.23 to 12.1.24...	22.1.24.
<i>Navasota</i> ...	Willan, F. G. L., R.D., Commr., R.N.R.	W. A. Delap ...	"	R.M.S.P. Co. ...	" 23.6.24 to 20.8.24 ...	28.8.24.
<i>Nawab</i> ...	Smith J. F. ...	" ...	"	Asiatic S.N. Co. ...	" 20.7.24 to 27.9.24 ...	20.10.24.
<i>Nebraska</i> ...	Collins, A. R. D., O.B.E., R.D., Lt.-Commr., R.N.R.	A. F. Walker ...	"	R.M.S.P. Co. ...	" 15.3.24 to 21.4.24 ...	5.5.24.
<i>Nellore</i> ...	Murray, F. S., R.D., Lt. - Commr., R.N.R.	G. E. Owen ...	"	P. & O. ...	" 27.9.24 to 17.10.24...	20.10.24.
<i>Nestor</i> ...	Owen, R. D., O.B.E.	O. V. Jones ...	M.L.	A. Holt ...	" 10.7.24 to 22.8.24 ...	1.9.24.
<i>Nevasa</i> ...	Swanson, C. J. ...	D. Lorie ...	No.	British India ...	" 14.6.24 to 31.8.24 ...	12.9.24.
<i>Newby Hall</i> ...	Kendall, J. W. ...	E. J. Myles, C. H. Webb, T. A. Dexter.	M.L.	Ellerman ...	Met. Log. 25.1.24 to 11.9.24 ...	28.10.24.
<i>Niagara</i> ...	Rolls J. T. ...	N. G. Buxton, O. C. Bray, R. B. Denniston, T. A. Macpherson V. V. Bray.	M.L.	Canadian-Australian...	" 29.2.24 to 18.7.24 ...	16.8.24.
<i>Ningchow</i> ...	Wilson, C. A. ...	R. A. Hannay ...	No.	A. Holt ...	Form 911 7.9.24 to 12.10.24 ...	13.11.24.
<i>Nore</i> ...	Randall H. W. R.D., Capt., R.N.R.	J. C. Ablewhite R. W. Mackie, C. B. Roche, R. H. Turner.	M.L.	P. & O. ...	Met. Log. 12.7.24 to 2.10.24 ...	7.10.24.
<i>Norman</i> ...	Morton Betts W. ...	D. A. Hodgson ...	No.	Union Castle ...	Form 911 11.8.24 to 31.8.24 ...	16.10.24.
<i>Norna</i> ...	Wright, J. ...	T. Mather ...	"	Scottish Fishery Board	" 1.10.24 to 31.10.24...	6.11.24.
<i>Norseman, C.S.</i> ...	Barter, H. O., R.D., Commr., R.N.R.	" ...	M.L.	Western Tel. Co. ...	Met. Log. 11.9.23 to 28.3.24 ...	7.7.24.
<i>Nortonian</i> ...	McCormick, J. ...	T. Griffiths ...	No.	Leyland ...	Form 911 2.8.24 to 30.9.24 ...	4.10.24.
<i>Nubian</i> ...	Watmough, T. M. ...	H. R. Gaskill ...	"	" ...	" 19.10.24 to 28.10.24	3.11.24.
<i>Nyanza</i> ...	Carpendale, F. W. J.	H. C. G. C. Cumming, C. H. Hand, R. A. C. Beeching.	M.L.	P. & O. ...	Met. Log. 15.6.24 to 8.9.24 ...	13.9.24.
<i>Oaklands Grange</i> ...	Routledge, R. ...	E. A. Insley ...	No.	Houlder Bros. ...	Form 911 27.5.24 to 19.9.24 ...	26.9.24.
<i>Odland I.</i> ...	Villiamsen ...	H. Svendgaard ...	"	Hannevig Bros. ...	" 19.12.23 to 2.1.24...	4.1.24.
<i>42 Ohio</i> ...	Nicholson, M. S., R.D., Capt., R.N.R.	G. S. Bumphrey, W. Paine	W.T.	R.M.S.P. Co. ...	" 27.9.24 to 18.10.24...	21.10.24.
<i>Olympia</i> ...	Caldwell, R. ...	D. R. Urquhart, G. Lynas, C. Mortimer.	M.L.	Anchor ...	" 13.8.24 to 26.10.24...	29.10.24.
<i>57 Olympic</i> ...	Howarth, F. B., Commr., R.N.R.	J. C. M. Boyce, G. W. Couch, C. J. Warltire.	W.T.	White Star ...	W.T. Reg. 16.10.24 to 30.10.24	3.11.24.
<i>Onitsha</i> ...	Williams, T. E. ...	D. Rollo ...	No.	Elder Dempster ...	Form 911 16.10.24 to 30.10.24	3.11.24.
<i>Orama</i> ...	Staunton, H. G., C.B.E., R.D., Commr., R.N.R.	" ...	M.L.	Orient ...	" 1.9.23 to 21.9.23 ...	20.11.23.
<i>Oranian</i> ...	Hoskins, W. ...	T. Miller ...	"	Leyland ...	Form 911 4.2.24 to 29.3.24 ...	2.4.24.
<i>Orari</i> ...	Robinson, F. W. ...	R. Newman, T. Breen, F. Longheed, G. Lant, H. Farrant.	M.L.	New Zealand S.S. Co. ...	Met. Log. 22.11.23 to 11.5.24...	16.5.24.
<i>40 Orbita</i> ...	Parker, W. H., C.B.E., R.D., Capt., R.N.R.	R. V. Rutley, S. Page, A. A. Mackie, R. W. Morford, B. Gammon.	W.T.	R.M.S.P. Co. ...	W.T. Reg. 12.10.24 to 2.11.24...	5.11.24.
<i>Orcoma</i> ...	Pleignier, H. T. S...	G. B. Wardale, L. Jones, C. H. Denton.	M.L.	Pacific S.N. Co. ...	Form 911 11.10.24 to 3.11.24...	6.11.24.
<i>41 Orduna</i> ...	Warner, G. E., R.D., Commr., R.N.R.	S. Robbins, R. W. Sumpton, G. F. Russell, H. R. Hendin.	W.T.	R.M.S.P. Co. ...	Met. Log. 22.5.24 to 8.8.24 ...	21.8.24.
<i>Oriana</i> ...	{ Daniel, T. ... }	" ...	M.L.	Pacific S.N. Co. ...	W.T. Reg. 5.10.24 to 26.10.24...	29.10.24.
<i>Orita</i> ...	{ Kite, E. ... }	" ...	"	" ...	Form 911 4.10.24 to 27.10.24...	29.10.24.
<i>Ormonde</i> ...	Dominy, R. H., C.B.E., Commr., R.N.R.	J. S. Wardman ...	M.L.	" ...	Met. Log. 15.2.24 to 24.10.24 ...	8.11.24.
<i>Ormonde</i> ...	Douglas, H. P., C.M.G., Capt., R.N.	A. M. Hughes ...	M.L.	His Majesty's Ship ...	Met. Log. 19.6.24 to 6.9.24 ...	15.9.24.
<i>Ormonde</i> ...	Staunton, H. G., C.B.E., R.D., Commr., R.N.R.	T. G. McGregor, N. Savage, F. J. L. Butler, F. Firmstone.	M.L.	Orient ...	Met. Log. 4.3.24 to 23.6.24 ...	10.7.24.
<i>Ormuz</i> ...	James L. V., D.S.C.	G. A. Moir, J. C. K. Dowding, I. E. G. Goldsworthy N. A. Winfield.	M.L.	" ...	Met. Log. 2.3.24 to 15.6.24 ...	28.6.24.
<i>Oroya</i> ...	Pearce, A. ...	S. Lewis ...	No.	Pacific S.N. Co. ...	Met. Log. 25.5.24 to 28.8.24 ...	2.9.24.
<i>Orsova</i> ...	Matheson, C. G., D.S.O., R.D., Commr., R.N.R.	C. Fox, A. J. Croft Cohen, C. V. Dodgson, P. P. Murphy.	M.L.	Orient ...	Met. Log. 30.7.24 to 7.10.24 ...	16.10.24.
<i>Ortega</i> ...	Christian, C. H. ...	D. W. Hutchison ...	No.	Pacific S.N. Co. ...	Met. Log. 22.6.24 to 23.9.24 ...	25.9.24.
<i>Orvieto</i> ...	Simner, G. L., R.D., Commr., R.N.R.	C. G. Thorne, A. J. Baxter, G. B. Martin, A. O. H. O'Brien, M. C. Lester.	M.L.	Orient ...	Form 911 12.6.24 to 5.7.24 ...	26.8.24.
<i>Osterley</i> ...	Cameron, E. P. ...	F. G. Goodman, E. Hatch, L. A. Keeble.	M.L.	" ...	Met. Log. 20.7.24 to 21.10.24...	23.10.24.
<i>Othello</i> ...	Pearson, Z. C. ...	E. G. H. Huddleston ...	No.	Ellerman Wilson ...	" 27.4.24 to 30.7.24 ...	6.8.24.
<i>Otira</i> ...	Elford, H. E. ...	N. H. Campbell ...	"	Shaw, Savill & Albion	Form 911 23.5.24 to 12.7.24 ...	18.7.24.
<i>Ovid</i> ...	Groom, A. C. B. ...	" ...	"	Shakespeare Shipping Co.	" 24.9.24 to 8.10.24 ...	4.11.24.
<i>Pacific Shipper, M.V.</i> ...	Newman, G. W. A.	J. W. Woodward ...	"	Furness Withy ...	" 5.10.24 to 9.11.24 ...	11.11.24.
<i>Pakeha</i> ...	W. P. Clifton Mogg	M. F. Armitage ...	M.L.	" ...	" 8.9.24 to 24.9.24 ...	22.10.24.
<i>Paparoa</i> ...	Ashworth, F. ...	C. J. Brewer ...	No.	Shaw, Savill & Albion	Form 911 1.7.24 to 10.8.24 ...	15.8.24.
<i>Paris</i> ...	Cook, C. L. ...	Mr. Biles ...	C.C.	New Zealand S.S. Co. ...	" 22.9.24 to 19.10.24...	11.11.24.
<i>Patia</i> ...	Bostock, R. J. ...	W. Mellwaine ...	No.	Southern Rly. ...	Telegraphic Report. 19.2.24 ...	19.2.24.
<i>Patrol, C.S.</i> ...	Welsh, T. K. ...	H. A. Davison, B. L. Vinden, A. T. Morrell.	M.L.	Elders & Fyfes	Form 911 24.8.24 to 28.9.24 ...	14.10.24.
<i>Persic</i> ...	Davies, E. ...	H. Williams ...	No.	Eastern Extension (A. & C.) Telegraph Co.	Met. Log. 11.2.24 to 13.7.24 ...	25.8.24.
<i>Peshawur</i> ...	Hester, C. W., R.D., Commr., R.N.R.	C. E. Arundel ...	M.L.	White Star ...	Form 911 12.8.24 to 28.8.24 ...	7.10.24.
<i>Philadelphum</i> ...	Baker, J. A. ...	G. W. B. Lloyd ...	No.	P. & O. ...	Met. Log. 13.3.24 to 13.5.24 ...	19.5.24.
<i>Polyphemus</i> ...	Hatfield, J. ...	F. Silva ...	"	Leyland ...	Form 911 7.2.24 to 22.4.24 ...	24.4.24.
<i>Poona</i> ...	Cherry, W. G. W. ...	F. R. W. Page ...	"	A. Holt ...	" 25.7.24 to 30.9.24 ...	3.10.24.
			"	P. & O. ...	" 21.7.24 to 31.8.24 ...	15.9.24.

LIST OF VOLUNTARY OBSERVING SHIPS

vii

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received to 14.11.24.	Date Received.
<i>Port Albany</i> ...	Robinson, C. A. ...	A. Jenkyns, W. B. Craig, A. G. Newbury, W. Eastoe.	M.L.	Commonwealth & Dominion.	Met. Log. 4.5.24 to 3.10.24 ...	30.10.24.
„ <i>Augusta</i> ...	Sawbridge, I. R. ...	G. T. C. Harris, R. C. Carter, C. F. Coate.	M.L.	„ „ „	„ 6.4.24 to 15.10.24...	7.11.24.
„ <i>Caroline</i> ...	Renaut, F. A. ...	P. H. Pedrick, T. Copeland, E. Fenton.	M.L.	„ „ „	„ 22.12.24 to 19.7.24...	23.7.24.
„ <i>Curtis</i> ...	Van den Bergh, C. ...	A. G. Rhind ...	No.	„ „ „	„ „ „	„
„ <i>Darwin</i> ...	Jack, J. ...	E. T. N. Lawrey, E. W. R. Young.	„	„ „ „	Form 911 18.9.24 to 30.10.24...	5.11.24.
„ <i>Hacking</i> ...	Williams, R. ...	Rowland Hill ...	„	„ „ „	„ 31.7.24 to 10.9.24 ...	15.9.24.
„ <i>Hunter</i> ...	Cottell, S. C. ...	A. Cooper, C. F. Post, J. H. Bower.	M.L.	„ „ „	Met. Log. 12.4.24 to 23.9.24 ...	30.9.24.
„ <i>Melbourne</i> ...	Kearney, F. J. ...	D. G. H. Bradley, J. A. Fairbairn, C. Newton.	M.L.	„ „ „	„ 13.3.24 to 25.7.24 ...	6.8.24.
„ <i>Nicholson</i> ...	Hoad, A. C. ...	E. A. Leavett, C. R. Townshend, G. G. Langford.	M.L.	„ „ „	„ 12.3.24 to 14.8.24 ...	9.9.24.
„ <i>Pirie</i> ...	Higgs, W. G. ...	H. C. Jeffery, E. E. Roswell, R. S. Stannard, L. J. Brice.	M.L.	„ „ „	„ 9.2.24 to 22.6.24 ...	26.6.24.
„ <i>Sydney</i> ...	Lea, W. H. ...	H. E. Higgs, A. W. Sams, C. Groves, A. M. Stanton.	M.L.	„ „ „	„ 9.12.23 to 27.4.24 ...	8.5.24.
„ <i>Victor</i> ...	Swan, L. H. ...	E. G. Fullick, R. T. R. Tomsett, W. Pickup.	M.L.	„ „ „	„ 12.4.24 to 22.8.24 ...	28.8.24.
<i>President Jackson</i> ...	Griffith, J. ...	E. Walker ...	No.	Pacific S.S. Co. ...	Form 911 17.6.24 to 18.7.24 ...	8.9.24.
<i>Protea</i> , H.M.S.A.S. ...	Woodhouse, A. F. B., Lt.-Commr., R.N.	H. McMaster ...	„	South African Naval Service.	„ 8.9.24 to 28.9.24 ...	21.10.24.
<i>Protesilaus</i> ...	Williams, D. T. ...	„ „ „	M.L.	A. Holt ...	Met. Log. 11.7.24 to 16.9.24 ...	14.10.24.
<i>Pyrrhus</i> ...	Elford, W. J. ...	W. Owen ...	No.	„ „ „	Form 911 8.9.24 to 25.9.24 ...	26.9.24.
<i>Regina</i> ...	Smith, R. G. ...	A. Hulme ...	M.L.	White Star-Dominion	Form 911 27.9.24 to 18.10.24...	20.10.24.
<i>Reindeer</i> ...	Mulhall, W. ...	„ „ „	C.C.	G.W. Railway ...	Telegraphic Report. 16.10.24 ...	16.10.24.
<i>Rhodesian Transport</i> ...	Fowler, W. H. ...	A. E. Warburton ...	No.	Houlder Bros. ...	Form 911 5.7.24 to 28.9.24 ...	2.10.24.
<i>Rialto</i> ...	Mordue, J. A. ...	„ „ „	„	Ellerman Bucknall ...	„ 26.8.24 to 25.9.24 ...	16.10.24.
<i>Rimutaka</i> ...	Hemming, F. A. ...	H. Horwood, R. S. Cox, O. M. Watts.	M.L.	New Zealand S.S. Co. ...	Met. Log. 9.3.24 to 26.8.24 ...	4.9.24.
<i>Risaldar</i> ...	Park, G. ...	„ „ „	„	Asiatic S.N. Co. ...	„ „ „	„
<i>Romney</i> ...	Leicester, F. S. ...	W. H. Underhill ...	No.	Lamport & Holt ...	Form 911 13.8.24 to 9.11.24 ...	14.11.24.
<i>Royal Fusilier</i> ...	Dawson, J. ...	J. Fraser ...	„	London & Edinburgh S.S. Co. ...	„ 21.9.24 to 6.11.24 ...	10.11.24.
<i>Royal Transport</i> ...	Dove, J. ...	R. Martin ...	„	Houlder Bros. ...	„ 12.9.24 to 9.10.24 ...	10.11.24.
<i>Ruapehu</i> ...	McKellar, A. W., R.D., Capt., R.N.R.	P. J. Connolly, G. E. Hargreaves, F. Cooke.	M.L.	New Zealand S.S. Co. ...	Met. Log. 26.4.24 to 17.9.24 ...	24.9.24.
<i>Sachem</i> ...	Westgarth, W. A. ...	C. Waldron, E. Sainty ...	No.	Furness Withy ...	Form 911 18.9.24 to 23.10.24...	29.10.24.
<i>St. Albans</i> ...	Pitcher, E. ...	W. McIntyre ...	„	Eastern and Australian Scientific Expeditionary Research Assocn.	„ 11.6.24 to 20.8.24 ...	6.10.24.
<i>St. George</i> ...	Blair, D., O.B.E., R.D., Commr., R.N.R.	„ „ „	M.L.	„ „ „	„ „ „	„
<i>St. Patrick</i> ...	Bearpark, E. W. ...	J. Hill ...	No.	Rankin Gilmour ...	Form 911 6.10.24 to 20.10.24...	7.11.24.
<i>Salaga</i> ...	Sola, P., D.S.O. ...	F. A. Elston ...	„	Elder Dempster ...	„ 21.9.24 to 3.10.24 ...	7.10.24.
<i>Samaria</i> ...	Horsburgh, G., O.B.E.	R. P. Cambell ...	„	Cunard ...	„ 24.9.24 to 14.10.24...	22.10.24.
<i>Sandown Castle</i> ...	Jackson, C. R. ...	G. H. Mayhew ...	„	Union Castle ...	„ 20.7.24 to 26.9.24 ...	1.10.24.
<i>Sardinia</i> ...	Cadiz, F. G., D.S.C.	A. F. Wilks ...	„	P. & O. ...	„ 1.1.24 to 21.1.24 ...	4.2.24.
<i>10 Saturnia</i> ...	Black, J. ...	T. Ure ...	W.T.	Anchor Donaldson ...	W.T. Reg. 27.9.24 to 18.10.24...	22.10.24.
<i>Saxoleine</i> ...	Biddick, E. ...	S. Wood ...	No.	Hunting & Son ...	Form 911 27.9.24 to 18.10.24...	21.10.24.
<i>Saxon</i> ...	Stanley, W. F., R.D., Commr., R.N.R.	R. S. W. Harris ...	„	Union Castle ...	„ 30.9.24 to 16.10.24...	20.10.24.
<i>Saxon</i> ...	Jones, R. D. ...	H. A. D. Waterhouse ...	„	Cunard ...	„ 7.9.24 to 7.10.24 ...	16.10.24.
<i>Scholar</i> ...	O'Connor, T. ...	A. L. Cresswell ...	„	Harrison ...	„ 14.7.24 to 3.9.24 ...	9.9.24.
<i>Scientist</i> ...	Hansen, W. A. ...	D. G. Russell ...	„	„ „ „	„ 21.5.24 to 9.8.24 ...	12.8.24.
<i>Scindia</i> ...	Matthew, W. ...	H. D. Campsie ...	„	Anchor ...	„ 28.6.24 to 12.9.24 ...	17.9.24.
<i>Scotia</i> ...	Telfer ...	O. W. L. Jones ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report 7.11.24 ...	7.11.24.
<i>Scottish Bard</i> ...	McDonnell, S. ...	S. W. Watts ...	No.	Tankers, Ltd. ...	Form 911 13.9.24 to 12.10.24...	27.10.24.
<i>Scottish Borderer</i> ...	Thompson, F. ...	G. F. Widger ...	„	„ „ „	„ 12.6.24 to 13.7.24 ...	21.7.24.
<i>Scottish Strath</i> ...	Barlow, A. M. ...	W. Black ...	„	„ „ „	„ 5.4.24 to 11.6.24 ...	12.9.24.
<i>33 Scythia</i> ...	Brown, F. G., R.D., Capt., R.N.R.	T. Parry, G. Overton, W. Cox.	W.T.	Cunard ...	W.T. Reg. 6.10.24 to 27.10.24...	29.10.24.
<i>Sheafdart</i> ...	„ „ „	T. B. Griffiths ...	No.	Kaitian Mining Administration.	Form 911 5.10.24 to 27.10.24...	30.10.24.
<i>Sheaf Mount</i> ...	Groves, C. V. ...	C. A. Gould ...	„	Souter, W. A. ...	„ 17.8.24 to 26.8.24 ...	1.9.24.
<i>Sheaf Spear</i> ...	Whitfield, G. A., O.B.E.	A. E. Harvey, W. H. Grise-wood.	M.L.	„ „ „	Met. Log. 29.1.24 to 9.7.24 ...	29.7.24.
<i>Sicilia</i> ...	Davis, H. C., D.S.C., R.D., Commr., R.N.R.	R. Rowe ...	No.	P. & O. ...	Form 911 8.7.24 to 24.7.24 ...	19.9.24.
<i>Socrates</i> ...	James, F. R. ...	E. R. Hartley ...	„	Lamport & Holt ...	„ 19.8.24 to 9.9.24 ...	2.10.24.
<i>Soekaboemi</i> ...	Ter Maisch, K. J. ...	W. N. de Wijn ...	„	Rotterdam Lloyd ...	„ 8.10.24 to 17.10.24...	11.11.24.
<i>Somersetshire</i> ...	Adamson, B. W. ...	P. Hawkins, J. Cullen, M. Simmons.	M.L.	Bibby ...	Met. Log. 28.6.24 to 28.9.24 ...	3.10.24.
<i>Somme</i> ...	Miles, F. R., Commr., R.N.R.	B. K. Berry, C. C. Prosser, D. P. Larham.	M.L.	R.M.S.P. Co. ...	Met. Log. 24.4.23 to 28.11.23...	17.12.23.
<i>Songster</i> ...	Thompson, W. ...	W. F. O'Neill ...	M.L.	Harrison ...	„ 13.10.23 to 5.11.23...	19.2.24.
<i>Spectator</i> ...	Owen, W. F. ...	A. M. Dick ...	No.	„ „ „	Form 911 2.1.24 to 18.4.24 ...	22.4.24.
<i>Spero</i> ...	French, H. E. ...	E. A. Gould, G. Mussared, R. Higginbottom, J. Ruth-erford.	M.L.	Ellerman Wilson ...	Met. Log. 23.2.24 to 9.8.24 ...	19.8.24.
<i>Stephan</i> , C.S. ...	Carlton, G. F., O.B.E., Commr., R.N.R.	S. G. Elcoate, F. B. Boling-broke, W. E. Allen, T. J. Horan.	M.L.	Telegraph Construction & Maintenance.	„ 25.7.24 to 13.10.24...	17.10.24.
<i>Surrey</i> ...	Field, H. E. B. ...	G. W. Allard, S. E. Hoblyn, R. R. Bennett.	M.L.	Federal ...	„ 12.1.24 to 6.6.24 ...	11.6.24.
<i>Sussex</i> ...	Upton, E. C. S. ...	W. A. Ewington ...	No.	„ „ „	Form 911 3.4.24 to 8.5.24 ...	13.6.24.
<i>Tainui</i> ...	Hartman, W. H. ...	J. Dickson ...	„	Shaw, Savill & Albion	„ 4.4.24 to 9.5.24 ...	14.5.24.
<i>Tairoa</i> ...	Summers, W. G. ...	S. A. Bannister ...	„	„ „ „	„ 26.5.24 to 4.7.24 ...	23.8.24.
<i>Taiyuan</i> ...	Hamilton, H. E. ...	T. M. Young, W. Bailey, D. D. Tyer.	M.L.	Yuill & Co. ...	Met. Log. 22.2.24 to 6.7.24 ...	4.9.24.
<i>Talthybius</i> ...	Duggan, C. ...	J. H. Brown ...	No.	A. Holt ...	Form 911 13.8.24 to 25.8.24 ...	18.9.24.
<i>Tambora</i> ...	Ruhaak, H. G. ...	H. Van Manen ...	„	Rotterdam Lloyd ...	„ 3.7.24 to 21.8.24 ...	2.9.24.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log. Register, or Report Contributed. Received up to 14.11.24.	Date Received.
<i>Teiresias</i> ...	Reynard, J. G. ...	T. P. Griffith ...	No.	A. Holt ...	Form 911 23.6.24 to 22.9.24 ...	25.9.24.
<i>Teucer</i> ...	Hodgson, R. N. ...	G. Lancaster ...	"	" ...	" 9.8.24 to 6.9.24 ...	16.10.24.
<i>Themistocles</i> ...	Jernyn, W. M. ...	W. F. Sargent ...	"	Aberdeen ...	" 5.9.24 to 25.9.24 ...	5.11.24.
<i>Theseus</i> ...	Batt, A. E. ...	J. R. Clement Evans ...	"	A. Holt ...	" 18.8.24 to 6.9.24 ...	16.10.24.
<i>Titan</i> ...	Ireland, T. R. ...	J. P. Williams, A. C. H. Jones D. J. Davies, C. Taylor.	M.L.	" ...	Met. Log. 2.11.23 to 8.3.24 ...	12.3.24.
<i>Tolmie</i> , S.F.Bgtne.	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</i> , C.S.	Jones, L. T., M.B.E.	S. P. Sheldon ...	"	Eastern Tel. Co. ...	" 7.12.23 to 2.2.24 ...	18.2.24.
<i>Traveller</i> ...	Worthington, B. ...	A. Robertson ...	"	Harrison ...	" 19.6.24 to 18.7.24 ...	22.7.24.
<i>Tredenham</i> ...	Evans, J. O. ...	R. F. Hellings ...	"	Hain S.S. Co. ...	" 19.8.24 to 31.8.24 ...	17.9.24.
<i>Trematon</i> ...	Hicks, F. H. ... Evans, B. ...	J. Christopher, D. Thomas, F. J. Webb, S. Smith, C. Mayberry.	M.L.	" ...	Met. Log. 31.3.23 to 24.9.24 ...	14.10.24.
<i>Tuscania</i> ...	Bone, D. W. ...	T. S. Nixon ...	No.	Anchor ...	Form 911 30.9.24 to 18.10.24...	27.10.24.
<i>Tyndareus</i> ...	Adcock, F. ...	D. L. Hoare ...	"	A. Holt ...	" 17.5.24 to 22.8.24 ...	10.9.24.
<i>Ulinaroa</i> ...	Wyllie, W. J. ...	R. A. Dance ...	"	Huddart Parker, Ltd.	" 9.6.24 to 10.8.24 ...	7.10.24.
<i>Ulysses</i> ...	McHutcheon, W. ...	T. R. Phillips ...	"	A. Holt ...	" 28.8.24 to 9.10.24 ...	27.10.24.
<i>Umtali</i> ...	Barnes, E. W. ...	W. H. Foster ...	"	Bullard King ...	" 9.5.24 to 16.8.24 ...	18.8.24.
<i>Valacia</i> ...	Doyle, M. ...	J. W. Caunce ...	"	Cunard ...	" 5.6.24 to 12.6.24 ...	17.6.24.
<i>Valdura</i> ...	Mitchell, A. ...	H. J. Maughan, J. Anderson, A. M. S. Well.	M.L.	Gow Harrison ...	Met. Log. 10.1.24 to 18.6.24 ...	22.8.24.
<i>Valemore</i> ...	Griffiths, J. ...	H. Miller ...	No.	Furness Withy ...	Form 911 22.11.23 to 29.12.23	30.12.23.
<i>Vardulia</i> ...	Townley, J. C. ...	J. E. Deans ...	"	Cunard ...	" 29.9.24 to 9.10.24 ...	20.10.24.
<i>Vasconia</i> ...	Inch F. ...	E. Gleave ...	"	" ...	" 25.8.24 to 14.10.24 ...	29.10.24.
<i>Vellavia</i> ...	Fear, E. T. C. ...	H. H. Kidwell ...	"	" ...	" 30.3.24 to 11.4.24 ...	22.4.24.
<i>Ventura de Lar-rinaga.</i>	Keay, W. S. ...	H. J. Kay ...	"	Larrinaga ...	" 31.7.24 to 30.8.24 ...	7.10.24.
<i>Verbania</i> ...	Hatcher, W. H. ...	J. G. Wiseman ...	"	Cunard ...	" 24.8.24 to 3.10.24 ...	6.10.24.
<i>Verentia</i> ...	Stafford, W., D.S.C., R.D., Lt.-Commr., R.N.R.	A. F. Watts ...	"	" ...	" 18.8.24 to 29.10.24...	6.11.24.
<i>Victoria</i> ...	Fisher, F. T. ...	J. Males, E. Peacock, J. Archer	M.L.	China-Australia ...	Met. Log. 3.9.23 to 16.2.24 ...	2.8.24.
<i>Vigilant</i> ...	Simpson, E. S. S. ...	J. Hunter ...	No.	Scottish Fishery Board	Form 911 6.10.24 to 3.11.24 ...	11.11.24.
<i>Waiotapu</i> ...	Brown, T. F. S. ... Davey, A. ...	B. S. Cave ...	No.	Canadian-Australasian	Form 911 2.7.24 to 16.9.24 ...	4.10.24.
<i>Walmer Castle</i> ...	Chave, Sir B., K.B.E.	C. Aylen ...	"	Union Castle ...	" 29.8.24 to 20.10.24...	21.10.24.
<i>Wangaratta</i> ...	Scutt, W. ...	T. W. Wordingham, M. Chant, K. M. Morrison.	M.L.	British India ...	Met. Log. 14.1.24 to 20.5.24 ...	27.5.24.
<i>Warfield</i> ...	Steel, R. ...	E. V. Wilkinson ...	No.	" ...	Form 911 11.8.24 to 29.9.24 ...	6.11.24.
<i>War Nizam</i> ...	Putt, R. O. ...	E. R. Clark ...	"	British Tankers ...	" 19.9.24 to 23.10.24...	7.11.24.
<i>Welshman</i> ...	Rollerson, W. ...	W. A. Fletcher ...	"	White Star-Dominion	" 9.10.24 to 4.11.24 ...	10.11.24.
<i>Winifredian</i> ...	Harrocks, W. ...	A. R. Rose ...	"	Leyland ...	" 7.9.24 to 14.10.24 ...	17.10.24.
<i>Woodarra</i> ...	Reilly, J. V. ...	L. D. Graham, A. V. Fisher, L. C. Comber, J. Wallace.	M.L.	British India ...	Met. Log. 3.4.24 to 22.6.24 ...	2.8.24.
<i>Yorkshire</i> ...	Millson, G. C. ...	E. Jones ...	No.	Bibby ...	Form 911 2.8.24 to 10.10.24 ...	16.10.24.
<i>Zeeland</i> ...	Thomas, A. J. ...	W. F. Jackman ...	No.	Red Star ...	Form 911 10.10.24 to 30.10.24	3.11.24.
<i>Conway</i> , H.M.S.	Broadbent, H. W., R.D. Capt., R.N.R.	The Senior Cadets...	Cadets' M.L.	" ...	Cadets' Met. Log. 4.5.24 to 19.7.24	31.7.24.
<i>Pangbourne Nautical College.</i>	Tracy, A. F. G., Commr., R.N.	" ...	"	" ...	Cadets' Met. Log. 12.5.24 to 26.7.24	29.7.24.
<i>Worcester</i> , H.M.S.	Sayer M.B., O.B.E., R.D., Capt., R.N.R.	" ...	"	" ...	Cadets' Met. Log. 9.5.24 to 30.7.24	13.8.24.
<i>Abaco</i> ...	" ...	The Keepers ...	Lighthouse Register.	" ...	Lighthouse Register 2.1.24 to 6.7.24	13.8.24.
<i>Cay Lobos</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.24 to 30.6.24	13.8.24.
<i>Double Headed Shot</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.6.24 to 30.6.24	5.9.24.
<i>Inagua</i> ...	" ...	" ...	"	" ...	Lighthouse Register 8.1.24 to 9.7.24	13.8.24.
<i>Sombrero</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.24 to 30.6.24	6.8.24.
<i>Walling Island</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.24 to 30.6.24	13.8.24.
<i>Cape Pembroke</i> (Falkland Is.).	" ...	" ...	"	" ...	Lighthouse Register 1.1.24 to 30.6.24	23.9.24.

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

Name of Vessel.	Captain.	Observing Officer.	Line.	Last Case of Water Samples, Reports, etc., Received up to 30.9.24.	Date Received.
<i>Alban</i> ...	Whayman, W. R. ...	R. Griffiths ...	Booth ...	Water Samples ...	23.4.24.
<i>Denis</i> ...	Harris, F. C. P. ...	" ...	" ...	" ...	"
<i>Hildebrand</i> ...	Maddrell, J. ...	R. S. Hulme Goodier ...	" ...	" ...	4.9.24.
<i>Patia</i> ...	Bostock, R. J. ...	W. Mellwaine ...	Elder & Fyffes ...	" ...	20.10.24.
<i>Tortuguero</i> ...	Martin ...	H. H. Dunning ...	" ...	" ...	28.10.24.

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