

VOL. II. No. 18.

THE MARINE OBSERVER.

JUNE 1925.

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WORK OF THE YEAR.

Note to Marine Observers.

CONTINUING the practice introduced in 1921, the Director wishes an expression of appreciation to be made to the Corps of Voluntary Marine Observers for their co-operation during the financial year ended March 31st, 1925, in this the earliest possible number of THE MARINE OBSERVER. There is no pleasanter duty devolving upon the Editor of this journal and incidentally the seaman deputed from among your number to co-ordinate your work. The year has been an eventful one in that it has seen THE MARINE OBSERVER proved and established as the 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. Though like last year, this has been one of hard work to the Marine Division, it has been far less fatiguing, for this journal has much reduced routine correspondence, at the same time making the work more interesting and more gratifying, for we have felt that we were making a better return with resulting interest and usefulness to seamen. The publication of the list of voluntary observing ships, their Commanders and Observing Officers with acknowledgment of logs, registers and reports has proved of great value; it has brought

many together and has led to better continuity in the Observing Fleet. Not only is the spirit of ready co-operation generally existing in the Corps of Voluntary Marine Observers commendable, but *esprit de corps* is growing, which has in the past year made itself felt, tending to the enhancement of the position and traditions of the science of Marine Meteorology. The immediate results of your voluntary work at sea and our efforts in the Marine Division to co-ordinate it are summarised as follows: the ultimate results will be more far-reaching than it is possible to say now.

Collection of Data.

Meteorological Logs (4-hourly) used with Instruments lent by the Meteorological Office.

GENERALLY the standard of the routine observations recorded in the logs has maintained a steady improvement; this year 33.6 per cent. were classed excellent as against 31.3 per cent. last year. There has been a very great improvement in "Additional Remarks," as is

reflected in more recent numbers of this Journal under the heading of "The Marine Observer's Log," thus enhancing the value of the Meteorological Log for the purpose of improving human knowledge of natural phenomena occurring at sea.

The classifications of logs received this year and in the two previous years were as follows:—

Classification.	1924-1925.	1923-1924.	1922-1923.
Excellent	92	80	83
Very Good	178	169	170
Good	3	6	11
Not classed	1	1	8
Total received ...	274	256	272

A large number of Marine Observers have responded to the invitation given last year to correct the barometer reading and enter the absolute pressure in the new column provided; we hope that this year all will do so. The Gold scales described in No. 11, Vol. 1, page 145, will be provided in time. There is little that we can suggest to those who enquire as to how they may attain the excellent standard which is not already given in "The Marine Observer's Handbook," 3rd Edition, and it is hoped that all will refer to it from time to time. As these logs are the backbone of the work the steady improvement in them is perhaps the best gauge as to the state of progressive efficiency of British Marine Meteorology.

Ships' Meteorological Reports Form 911 (twice daily) used with Ships' Instruments.

Generally, the same remarks with regard to Meteorological Logs apply to Ships' Meteorological Reports, but the improvement is even more marked, probably owing to the knowledge that these are now classified upon receipt. It has been noted that current observations by many ships keeping these forms is of a high order. As this is the first complete year that a definite classification has been used, it is not possible to provide numerical comparison. Forms 911 received during the year were classed as follows:—

Classification.	Year 1924-1925.
Excellent	393
Very Good	1,721
Good	75
Not classed	0
Total received ...	2,189

The published acknowledgment in THE MARINE OBSERVER has resulted in a very marked improvement of continuity of observation with these forms, the same number of ships providing 404 more than last year. These forms are most useful in completing a network of observations over all the oceans, which would be too expensive with the Meteorological Log.

Ice Report, Form 912.

These forms are supplied to ships whose trades take them through regions where ice may be encountered in both Northern and Southern hemispheres. The information provided has been good, but it would be still more valuable if all ships provided with these forms when passing through the normal limits for ice would send in *nil* returns when none is sighted, for it is not only desired to chart ice existing but to show its absence in season, as far as possible in these regions. The compilation of ice limits remains an important need for navigation as well as meteorology.

Report of Tropical Revolving Storms, Form 905.

A number of these forms have been completed by regular observing ships and ships not upon our list; they are welcome and valued from all. Many are needed before hurricanes can be adequately charted and investigated.

These forms are intended for all ships not keeping a Meteorological Log, which Log provides for ample observations. Members of the

Corps of Marine Observers are asked to direct the attention of mariners generally to this form, a copy of which is reproduced on the back of the ice chart in this number. They may be obtained by application to any of the Marine Agents.

North Atlantic Wireless Telegraphy Weather Report Registers, used with instruments lent by the Meteorological Office.

Last year the registers showed a marked improvement in this work; this year the standard has been maintained as the comparative table below shows, notwithstanding changes which generally tend to make work difficult at first and which will be mentioned later.

Classification.	1924-1925.	1923-1924.	1922-1923.
Excellent	162	155	73
Very Good	100	90	150
Good	0	5	3
Not classed	2	0	2
Total received ...	264	250	228

Cross-Channel Steamers' Telegraphic Reports.

Ten Packet Steamers on the Newhaven-Dieppe, Guernsey-Weymouth and Holyhead-Dublin services have continued to report observations made in mid-Channel on their homeward passage by telegram to the Meteorological Office. Lately the Newhaven and Weymouth packets have been able to accelerate this service by means of wireless through the courtesy of their owners. During the year 802 reports were received. By this means home trade seamen are enabled to indirectly assist their brethren, as these reports are of material assistance to the forecasters in notifying mariners through the medium of the "Weather Shipping" Bulletin as to the probabilities of general visibility in the Southern and Western areas.

Miscellaneous Contributions.

In addition to the prescribed forms for recording observations, a large number of interesting manuscripts, sketches, photographs and weather charts have been received from commanders and officers, both regular members of the Corps of Marine Observers and others. We are also indebted to a number of gentlemen, amongst them distinguished meteorologists and technical experts, for articles for THE MARINE OBSERVER, to whom the Director extended his thanks in his Foreword to Volume II.

Sea Water Samples.

Five ships in the Liverpool to South American and West Indian trades have collected water samples, for which work the Director of the Fisheries Laboratory expresses his appreciation. The Port Meteorological Officer, Liverpool, arranges this work and Mr. LUMBY of the Fishery Laboratory has told us in two articles in this Journal of the results being achieved. The Marine Biological Association of Plymouth is also interested in this work.

The Use made of the Data.

Last year we gave a brief sketch of the work of the three sections of the Marine Division so that the Corps of Marine Observers may now be better enabled to picture in their minds' eye what is being done with the data which they so carefully and unselfishly record in the Logs, Forms and Registers, and we may pass on to an attempt to show results, feeling that we now have some mutual acquaintance with the work both ashore and afloat, and that the Corps of Marine Observers have confidence that their work is duly made use of.

Data Extraction and Research.

The new system of data extraction established on the 1st April, 1920, by which as far as possible Meteorological Logs reaching the classification of very good or above are extracted and indexed as received from all oceans, has been vigorously continued. During the year, 65,060 sets of observations were extracted and punched on cards; and 5,746 sets of additional current observations dating back to 1910 for Atlantic routes have been extracted. In all, since April 1st

1920, 384,537 sets of observations have been extracted. MARS DEN CHART No. I shows the distribution and number of sets of observations extracted from logs between April 1st, 1924, and March 31st, 1925, and MARS DEN CHART No. II shows the distribution and number of sets of observations extracted since April, 1920. During the last twelve months 55 per cent. of logs received reaching the required standard have been prepared for extraction on to Hollerith cards.

The results of researches made are published in THE MARINE OBSERVER, but we may remind Marine Observers of one example in which the Hollerith system has proved a great labour-saving device in computing the table for correcting the barometer within the southern tropic for diurnal range for the purpose of obtaining more knowledge of hurricanes, *i.e.* page 150, Vol. I, No. 11. This table was constructed from 15,306 observations in one working day. This could not have been done under one month by the old system.

Exchange of Data with other Services and International Co-operation.

The importance of the interchange of marine data with foreign countries was stressed in last year's "Work of the Year."

During the year, 5,511 sets of weather observations made in 1923 in selected regions in all oceans were sent to the Dutch Marine Division on Hollerith cards; also 2,315 observations for June, July and August, for certain areas in the Atlantic, for incorporation in new charts which Holland is publishing. The "Réseau Mondial," a publication published by the Meteorological Office with international support for the purpose of putting meteorological data at the disposal of all countries, was provided with means of pressure, sea, and air temperature for the year 1922, incorporated with foreign data for the Marsden Squares 3, 182 and 218; also with observations made by the lighthouse keepers at Cape Pembroke, Falkland Islands and Watling Island, West Indies, for the year 1918.

The Dutch were supplied with 5,457 current observations on the route Cape Blanco to Table Bay and the Fishery Board for Scotland with 244 observations of current for the year 1923 in the middle latitudes of the North Atlantic.

Monthly means of air temperature at Cape Pembroke, Falkland Islands, based on 25 years' observations were also supplied for a special purpose of the International Meteorological Conference, 1923.

Many enquiries have been received from shipowners, underwriters, lawyers and others regarding weather for the purpose of investigating maritime casualties and claims, answers to which have been given very largely from the Meteorological Logs, Ships' Meteorological Reports, and Coast Station Reports, kept by the Corps of Voluntary Marine Observers. Indeed, this service has become a very important part of the work of the Marine Division for which a charge is made to cover the cost of transcription. It undoubtedly contributes to justice, for the observations are of high order and are therefore impartial.

Wireless Telegraphy Coded Reports from North Atlantic Liners.

On June 1st, 1924, the new International Code, the outcome of the provisional code used since March 27th, 1921, was brought into force, and on August 15th, 1924, the United States Weather Bureau having asked for co-operation, the service was extended across the North Atlantic, ships westward of Longitude 40° W. sending their reports to America. The reports received in England and America are exchanged by means of international data messages.

During the year, 4,018 weather reports were received at the Meteorological Office and used by the forecasters while approximately 996 reports were sent by ships on our list with distinguishing numbers, to America.

These reports have come to be regarded as so important that the forecasters ask for more; the number is necessarily restricted by the cost to the Meteorological Office of coast charge and land wire, also by the capacity of the Marine Division to handle the Registers and correspondence necessary for supervision.

Of 4,018 reports received at the Meteorological Office, 1,014 were received within one hour of observation, 1,314 within two hours, 852 within four hours, while 848 were over four hours in transmission from the hour of observation.

Seven hundred and fifty errors in transmission were corrected by the check system; when the registers were received we found that in only 33 cases had the check failed.

As soon as all material changes in code and instructions required

by the land service that could be foreseen were made, the decode was published (*see* Vol. I, No. 9). A number of Marine Observers and others have suggested organised times for the despatch of these messages, according to zones, in order that all ships capable of C.W. reception may have a better opportunity of intercepting these valuable synchronised reports direct, and in our last number the Observing Officers of the Cable Steamer *Stephan*, Commander G. F. CARLTON, O.B.E., R.N.R., contributed an interesting article upon the subject. The views of more Marine Observers are desired.

Practical Application of the work as a branch of Seamanship and an aid to Navigation and its bearing upon the advancement of Meteorological Science.

For upwards of 70 years Marine Observers have faithfully recorded and sent in meteorological observations to the British Office, and this has contributed a wealth of knowledge to the science of meteorology. Towards the end of the sailing ship era, the organised work, under MAURY in America, FITZROY and TOYNBEE in Britain, and JANSEN in Holland, had been the means of providing charts and directions which were of tremendous practical value to navigators; the visual storm-warning service had contributed very considerably to safety of life and property afloat on many coasts, and the Laws of Storms had been developed which gave mariners rules for handling ships, all tending to enhance skilled seamanship. As steam took the place of sail, the tendency for recording observations and sending them in without giving so much consideration to their immediate significance and utility to navigation tended to grow; and with the length of time before the worked-up observations were returned suitable to aid navigation, interest was lost, resulting in some deterioration of the art. Competition in trade and the knowledge derived from the past have done much of late years to revive this art—skill for applying the work to navigation—now that we have an almost perfect means of long-distance communication.

Modern requirements are far more exacting than those of old and there is greater need for clearness and brevity. Two modern inventions are enhancing the value of the work. By means of the electric sorting and tabulating machine it is hoped in time to reconstruct Meteorological Charts of those oceans already charted, and to chart the Pacific, upon a uniform scale and with greater clearness, at the same time leaving the data available for many purposes, present and future. While wireless telegraphy places in the hands of the navigator the means of communication which will enable him to use his skill in the matter of weather and currents.

Thus by furnishing mariners with information and suggestions based on their own work to assist them in navigation, observation is being improved and a better contribution is being made to the science by seamen.

Wireless and Weather an Aid to Navigation.

The year has seen the completion of the serial on this subject published in the 1924 numbers based upon your work at sea.

In the December 1924 number, we published a series of weather charts made in the Cable Ship *Stephan*, indicating progress at sea towards the mastery of this subject. In last month's number the *Stephan* contributed a short article in which they mentioned that by the use of this method they had gained at least twelve hours on their homeward passage on other ships enveloped in fog off the coast of Portugal.

In "The Marine Observer's Log" in this number, samples of further results obtained are given. Amongst them we would invite special attention here to that of *Culebra*, for this is typical of work in smaller ships which can only receive spark. Now generally speaking, the smaller the ship the greater her need of information of wind and current, and the larger and faster the ship the greater her need for information of visibility. Generally long range is desired, but do not let small ships gain the impression that liners favoured each other. In the Marine Division we see much evidence of their desire to help all at sea. It must be remembered, however, that generally the larger the ship the greater amount of wireless traffic there is to be handled.

Ultimate success of the methods advocated must almost entirely depend upon the response to the invitation given in the concluding chapter in Vol. I, No. 12 to Meteorological Logkeeping ships on all ocean routes of the world, and there is, we think, a great deal to be gained by professional seamen in the success of this system, for its

influence would extend to all other branches of seamanship.

The "Weather Shipping" Bulletin has steadily been proving its value throughout the year, not only as a means of giving seamen data upon which to draw their own conclusions but it has enabled the Forecast Service to give them forecasts for home waters when too busily occupied to attempt to make a chart.

The following example which we only learned through a chance meeting with an old friend, Commander I. J. KAY, R.N.R., of the Liverpool Salvage Association at the Old Conway's dinner, is perhaps the most striking of the year. It will be remembered that Captain KAY was the officer responsible for the successful salvage of the White Star Liner *Bardic* stranded at the Lizard. She lay in a position where they could only approach the wreck in moderately fine weather, the passage between the outlying rocks being narrow, made it impossible for small craft to live when the sea was breaking. "It was," said Captain KAY, "essential to get the salvage party, which consisted of nearly one hundred men, off the wreck before any change of weather for the worse, with the wind from certain directions, took place. The weather in September was the worst and most unsettled experienced locally for many years. You can imagine in the circumstances what a help it was to have forecasts for wind for short periods for the district and we found them generally most accurate. In former years I had had special forecasts telegraphed from the Meteorological Office to the nearest post office when engaged in salvage; there were often delays and they were not so accurate nor so concise as those now broadcast for shipping. In the case of the *Bardic* we simply intercepted these." With regard to the former arrangement the writer can substantiate Captain KAY's remarks, for our first meeting was during salvage operations in 1915 on the N.E. coast of Ireland, and the forecasts then received by telegram were certainly not so clear nor were they received so early by land wire.

Of these forecasts, Mr. DINES contributed an article in Vol. II, No. 14. Captain M. H. CLARKE, Chief Surveyor Ministry of Industry and Commerce, our Marine Agent at Dublin, is to be congratulated upon being the first to make successful arrangements for the local interception and dissemination of the "Weather Shipping" Bulletin at his port. The Port of Liverpool and the Meteorological Office are indebted to the Cunard Line for their courtesy in permitting one of their ships in port to intercept this message and send it to the Port Meteorological Office, whence it is distributed for the information of ships about to proceed to sea. It would be a benefit generally to ships about to sail if at other ports ships would take turns to intercept this Bulletin and pass it to the Mercantile Marine Office or Marine Agent for the information of the port generally, but small craft in particular.

From June 1st, 1925, the respective parts of the Bulletin will be issued through coast stations on **spark** (see "Weather Signals" Great Britain and Ireland Amendment, page 102), and we may expect that shipping will more generally benefit.

Old Marine Observers, Port Officers, Marine Agents, and Co-operators at the Ports.

We were gratified to learn of the appointment as Hydrographer of the Navy of Captain H. P. DOUGLAS, C.M.G., R.N., who figures in the list of "excellent" awards and has made a number of contributions to this Journal.

The Service is indebted to the Marine Agents for their interest and unselfish help during the year. These gentlemen and a number of others do much to assist the Corps of Marine Observers and to help us in our work.

Commander G. ff. H. LLOYD, R.N.R., left the Port Meteorological Office, Liverpool, to take up the post of Assistant Marine Superintendent, Coast Lines Ltd., last summer, and his successor, Lieut. Commander M. CRESSWELL, R.N.R., took over that office on January 1st, after performing a course in the Marine Division.

Captain GEORGE STURDY, the Marine Agent at Hull, retired from his post of Assistant Marine Superintendent of the Ellerman Wilson Line on March 31st, 1924, and has since been able to devote more time to Marine Meteorology. Generally the Marine Agencies at home ports are in very capable hands and we wish to thank these gentlemen and the following institutions for bringing Commanders and Officers and others at their ports together to discuss Marine Meteorology in their Lecture Halls, where lanterns were provided:—

The Engineering and Scientific Society of Ireland, Dublin.
The Royal Technical College, Glasgow.

The Nautical College, Leith.

The Marine School, North Shields.

The Boulevard Navigation School, Hull.

The British Empire is far flung and we have the very good fortune to have the interest and help of a number of prominent seamen at the principal ports of the Dominions and Colonies, all of whom are giving valuable assistance in furthering the work. To mention a few, there are Captain BROWNE, Harbour Master at Barbados, indefatigable in collecting observations of West Indian hurricanes; Captain LEIGH, Port Captain at Cape Town, the Senior Nautical Officer in the Service of the South African Union, who paid us a visit last year in London; while another South African, Captain TWENTYMAN, Harbour Master of Suva, Fiji, who is responsible for hurricane warnings in that part of the Pacific, was with us for a course in Marine Meteorology last summer at the request of His Excellency the Governor of Fiji and the Colonial Office. Thus we are fortunate in that there is an officer in the South Pacific who is conversant with our methods, for in this region there is need for extensive co-operation at sea. In Australia, Captain J. KING DAVIS, the Director of Navigation, himself a keen weather worker, has recently expressed a wish that it should be made more generally known that his deputies who are our Marine Agents, Captain G. D. WILLIAMS, D.S.O., at Sydney, Captain L. J. BOLGER at Melbourne, and Captain J. J. AIREY at Fremantle, are not only anxious to assist Marine Observers in work for this Office, but that they will furnish any navigational information required regarding Australian waters to mariners visiting their ports. Then on either side of the North Pacific we have Marine Agents, Lieut. Commander C. R. H. HARVEY, O.B.E., R.N., at Hong Kong, who has recently collected several excellent logs and to whom we look to for typhoon observations, and Mr. T. S. H. SHEARMAN, Meteorologist at Vancouver, who is our sole agent in the Dominion of Canada. The Pacific stands in great need of investigation, and now that after 5 years post war work, the Corps of Voluntary Marine Observers has been so well re-established, it is intended to fill more of the vacancies occurring from time to time in the Fleet List of 500 ships by accepting the offers of ships in the Pacific. The Marine Agencies at ports bordering the Pacific will be notified as vacancies occur and Marine Observers are invited to refer prospective members of our Corps to them.

Exhibits.

At the British Empire Exhibition at Wembley opportunity was taken to bring to the notice of the general public the work of marine observers and the exhibits of the Meteorological Office included the Meteorological Logs of H.M.S. *Thrush*, when HIS MAJESTY THE KING, then Captain PRINCE GEORGE, commanded that ship. The Logs kept in H.M. Ships *Terror* and *Erebus*, Captain J. C. ROSS, Antarctic 1841-1843; Ship *Gloriana*, Captain H. TOYNBEE, 1856-1857, beautifully illustrated with drawings by Mrs. TOYNBEE, and the Cable Ship *Stephan*, Captain G. F. CARLTON, 1924; the latter coded for extraction and accompanied by a Hollerith Card.

HIS MAJESTY THE KING on the occasion of one of his many visits to the Exhibition inspected the Meteorological Office section and expressed his pleasure to the Director, who was in attendance, at seeing his log which brought back recollections of the work of his observing officer.

Numbers of this Journal were also exhibited as representing the latest results of the work.

In passing it is well to mention that the greater the circulation of THE MARINE OBSERVER so will the value of your work be increased, for it contains information resulting from your work which is intended to be of assistance to all mariners. As is now well known in the Corps of Marine Observers, it is sent regularly to every one of the 500 ships upon the list and to their owners, but it is not generally known that this Journal is available to all by purchase from H.M. Stationery Office, through any bookseller. Marine Observers would be adding to the service they are voluntarily performing if they would bring this to the notice of shipowners and others.

Excellent Awards and Conclusion.

A list of commanders and principal observing officers to whom the Meteorological Committee have made "excellent" awards for Meteorological Logs and Wireless Weather Registers is appended. The publications awarded will be forwarded as soon as the inscriptions have been made. The interest shown and the support and co-operation given by the whole Corps of Voluntary Marine Observers throughout the year and the progress made by them at sea is very much

appreciated. You have responded well to the appeal made with the advent of THE MARINE OBSERVER to redouble our efforts remembering that accurate observation and systematic record in fine weather as well as foul, are the backbone of the work.

MARINE SUPERINTENDENT.

Meteorological Office, London.
April 1st, 1925.

LIST OF CAPTAINS AND PRINCIPAL OBSERVING OFFICERS TO WHOM THE METEOROLOGICAL COMMITTEE HAVE MADE EXCELLENT AWARDS.

Captain.	Principal Observing Officer.	Ship.
ADAMSON, B. W. ...	HAWKINS, P. ...	<i>Somersetshire.</i>
BEADNELL, F. E., Capt., R.N.R.	COLLINS, J. ...	<i>Adriatic.</i>
*BEAN, A., O.B.E. ...	WOOD, E. ...	<i>Marengo.</i>
BERRY, G. ...	CONWAY, R. ...	<i>Megantic.</i>
BLACK, J. ...	URE, T. ...	<i>Saturnia.</i>
*BOOTH, W. M. ...	HARRIMAN, L. ...	<i>Astronomer.</i>
*BROUGHTON, C. ...	LANDFIELD, C. A. H.	<i>Somerset.</i>
*BROWN, A. H. ...	COATE, C. F. ...	<i>Port Augusta.</i>
*BURET, T. J. C. ...	GILLER, E. N. ...	<i>Nariva.</i>
BYERS, G. ...	STRINGER, — ...	<i>Chinhua.</i>
CAMPOS, V., O.B.E., Lieut. Commr., R.N.R.	MUIR, A. S. ...	<i>C.S. Colonia.</i>
Carlton, G. F., O.B.E., Commr., R.N.R.	ALLEN, W. E. ...	<i>C.S. Stephan.</i>
CARPENDALE, F. W. J.	HAND, R. H. ...	<i>Nyanza.</i>
CARTMER, G. E., O.B.E.	BURFITT, L. M. ...	<i>Frankenfels.</i>
*CASSON, D. H. ...	SANDERS, J. ...	<i>Kovno.</i>
CHAMBERS, F. W., D.S.C.	PASCOE, J. ...	<i>Digby.</i>
CHARLES, Sir J. T. W., K.B.E., C.B., Commadore, R.N.R., R.D.	DAVIS, P. O. ...	<i>Aquitania.</i>
*CLEWS, A. H. ...	DRAPER, C. ...	<i>Melita.</i>
*CLIFTON - MOGG, W. P., Lieut.-Comdr., R.N.R.	VANDERVAARD, R. K.	<i>Pakeha.</i>
COLLINS, P. J., O.B.E. ...	COX, H. S. ...	<i>Euripides.</i>
*COLUMBINE, F. F. ...	CRAMB, S. C. ...	<i>Matheran.</i>
COTTELL, S. C. ...	POST, C. F. ...	<i>Port Hunter.</i>
DIGGLE, E. G., Capt., R.N.R., R.D.	TAYLOR, E. R. ...	<i>Caronia.</i>
*DOMINY, R. H., C.B.E., Lieut.-Commr., R.N.R.	WARDALE, G. B.	<i>Orcoma.</i>
DOUGLAS, H. P., C.M.G., Capt., R.N.	HUGHES, A. M. ...	<i>H.M.S. Ormonde.</i>
*DUNCAN, A. R. ...	MORTIMER, C. ...	<i>Olympia.</i>
*EAST, H. RAYNER ...	FORSTER, J. A.	<i>Clan Mackay.</i>
*EDWARDS, A. ...	CLOWSER, S. E.	<i>Kurmark.</i>
ENGLISH, G. L. ...	SHARROCK, D. Y.	<i>Leicestershire.</i>
*ESSELMONT, C. ...	WILSON, W. ...	<i>Chindwin.</i>
*EVANS, D. L. ...	MOCK, C. E. ...	<i>Elpenor.</i>
*FIELD, H. E. B. ...	ALLARD, G. W. ...	<i>Surrey.</i>
*GAMBRILL, F. C. ...	BAILLE, L. A. ...	<i>Changsha.</i>
*GEORGE, J., O.B.E. ...	TOMKINS, W. M.	<i>Kenilworth Castle.</i>
*GILLIES, J., C.B.E. ...	AKERMAN, L. W.	<i>Empress of Scotland.</i>
GRIFFITHS, E., Lieut.-Commr., R.N.R.	ROBERTS, E. ...	<i>Empress of France.</i>
HAGUE, J. W., Commr., R.N.R.	GRANGER, F. ...	<i>Arundel Castle.</i>
*HAILEY, A. J., Lieut.-Commr., R.N.R.	LEICESTER, R. A.	<i>Empress of Australia.</i>
*HANNEY, T. W. ...	WRIGHT, P. E.	<i>Elpenor.</i>
HAYES, Sir B. F., K.C.M.G., D.S.O., Commadore, R.N.R., R.D.	BUTCHER, A. F.	<i>Majestic.</i>
HENDERSON, W. ...	LESLIE, B. L. ...	<i>Metagama.</i>

Captain.	Principal Observing Officer.	Ship.
HESTER, C., Commr., R.N.R., R.D.	NORTH, E. J. R.	<i>Peshawur.</i>
HIGGINS, C. J. ...	YOUNG, T. G. ...	<i>Clan Malcolm.</i>
HIGGS, W. G. ...	JEFFERY, H. C.	<i>Port Pirie.</i>
HOAD, A. C. ...	TOWNSHEND, C. R.	<i>Port Nicholson.</i>
*HOLDEN, W. R. F. ...	MOCK, C. E. ...	<i>Elpenor.</i>
*HOLME, A. ...	CHAMBERLAIN, D. W.	<i>Celtic.</i>
HOWARTH, F. B., Commr., R.N.R.	COUCH, G. W. ...	<i>Olympic.</i>
HOWELL, T. ...	HARRIES, B. T.	<i>Lapland.</i>
IRVINE, W. R. D., Commr., R.N.R., R.D.	BOVEY, R. F. ...	<i>Berengaria.</i>
*JAMES, L. V., D.S.C. ...	WHINFIELD, N. A.	<i>Ormuz.</i>
KEARNEY, F. J. ...	BRADLEY, D. G. H.	<i>Port Melbourne.</i>
KETTLEWELL, C. R. ...	NEAGLE, H. ...	<i>Dorset.</i>
*KNOWLES, C. H., D.S.O., Commr., R.N.	HUGHES, A. M. ...	<i>H.M.S. Ormonde.</i>
*LANDY, E. ...	MANSEY, A. ...	<i>Montrose.</i>
LATTA, R. G. ...	WILLIAMS, F. E.	<i>Montroyal.</i>
MACKAY, A. S., Commr., R.N.R., R.D.	HILL, S. J. ...	<i>Culebra.</i>
MARSHALL, W., D.S.O., Capt., R.N.R., R.D.	WELLER, A. E.	<i>Cedric.</i>
MATHESON, C. G., D.S.O., Commr., R.N.R., R.D.	MURPHY, P. P.	<i>Orsova.</i>
MCKELLAR, A. W., Capt., R.N.R., R.D.	{ CONNOLLY, P. J. BENNETT, T. N. CLARK, H. ...	{ <i>Ruapehu.</i> <i>Homeric.</i>
METCALFE, G. R., Lieut.-Commr., R.N.R.	TOMKINS, W. M.	<i>Kenilworth Castle.</i>
*MILLARD, L. A. ...	EXTON TURNER, H.	<i>H.M.S. Endeavour.</i>
NARES, J. D., D.S.O., Capt., R.N.	GIBSON, H. ...	<i>Risaldar.</i>
*PARK, G. ...	ABLEWHITE, J. C.	<i>Nore.</i>
RANDALL, H. W., Capt., R.N.R., R.D.	GRAHAM, L. D. ...	<i>Woodarra.</i>
REILLY, J. V. ...	{ PEDRICK, P. H. CHAMBERLIN, C.	{ <i>Port Caroline.</i> <i>Montcalm.</i>
RENAUT, F. A. ...	MACFADYEN, H.	<i>Minderoo.</i>
RENNIE, A., O.B.E. ...	OXTON, J. H. ...	<i>Manchester Mariner.</i>
*RICHARDSON, E. ...	STOCKER, C. E. ...	<i>Baltic.</i>
RILEY, J. E. ...	LAW, J. ...	
ROBERTS, J., C.B.E., D.S.O., Capt., R.N.R., R.D.	EASTOE, W. ...	<i>Port Albany.</i>
ROBINSON, C. A. ...	LONGHEED, F. ...	<i>Orari.</i>
*ROBINSON, F. W. ...	MORGAN, P. A. ...	<i>Mauretania.</i>
ROSTRON, A. H., C.B.E., Capt., R.N.R., A.d.C., R.D.	TRELEAVEN, J. C.	<i>Carpentaria.</i>
ROWE, S. N. ...	COATE, C. F. ...	<i>Port Augusta.</i>
SAWBRIDGE, I. R. ...	WORDINGHAM, W.	<i>Wangaratta.</i>
*SCUTT, W. ...	LESTER, M. C. ...	<i>Orviato.</i>
SHELFORD, W. S., Lieut.-Commr., R.N.R., R.D.	GLENNIE, E. V.	<i>Minnedosa.</i>
SIBBONS, H. ...	LESTER, M. C. ...	<i>Orviato.</i>
SIMNER, G. L., Commr., R.N.R., R.D.	FULLICK, E. G. ...	<i>Port Victor.</i>
*SWAN, L. H. ...	WILSON, F. G. ...	<i>City of Chester.</i>
*TEAGUE, R. E. ...	GOULD, G. A. ...	<i>H.M.S. Iroquois.</i>
*TINSON, C. W., Commr., R.N.	VIVIAN, J. ...	<i>Orduna.</i>
WARNER, G. E., Commr., R.N.R., R.D.	FEGAN, R. ...	<i>Montclare.</i>
WEBSTER, G. S., Lieut.-Commr., R.N.R., R.D.	REID, D. A. B.	<i>Protesilaus.</i>
*WILLIAMS, D. G. ...	POOLE, H. ...	<i>Arracan.</i>
WILLIS, M. ...	WELLS, F. ...	<i>Hatarana.</i>
*WOODGET, H. T. ...	EGGLESTONE, J.	<i>Bambra.</i>
WYLES, W. S. ...		

* Those marked with an asterisk appear in the list of "Excellent" observers for the first time.

MARINE METEOROLOGY, HISTORY AND PROGRESS.

II. Middle Period.

THE British Meteorological Department, founded in 1854, was established as a Department of the Board of Trade under Captain (afterwards Admiral) ROBERT FITZROY. The programme of the new department was drawn up in consultation with the Royal Society and the principal of its functions were agreed as being:

- (1) The preparation of monthly, quarterly and annual means of pressure, temperature and humidity, in suitable geographical limits over all oceans.
- (2) The careful observation of and enquiry into the temperature of the sea and the temperature, direction and velocity of ocean currents.
- (3) An examination of the varying limits of the Trade Winds and Monsoons.
- (4) The investigation of the fluctuations of temperature on a large scale.
- (5) The collection of statistics of the force and direction of the wind over the Atlantic Ocean.
- (6) The establishment of certain specified colonial stations.

It will be seen from this, that the function of the department was primarily a marine one. Its data were to be produced by the co-operation of seamen and the publication of its results would be in the interests of seamen, in accordance with the recommendations of the Brussels Conference.

Captain FITZROY issued a circular letter to captains of ships in the Mercantile Marine, inviting their co-operation in the work of observing at sea and by 1855, 105 ships of the Mercantile Marine and 32 ships of the Royal Navy were equipped with tested Meteorological instruments, and meteorological registers as they were called in those days, began to accumulate.

As far as possible the work was carried out on the lines laid down by the Royal Society. The "geographical limit" was fixed at 10° of Latitude by 10° of Longitude each 10° Square, on Mercator's Projection, being numbered in accordance with the plan devised by Marsden early in the nineteenth century (see Marsden Charts accompanying "Work of the Year"). For the purpose of grouping the observations, a further sub-division of the 10° Square into 5° Squares was made. The first method of dealing with the observations adopted by FITZROY was the use of "collection" books and from these to group the observations. One collection book was assigned for each element such as wind, barometer, etc. One page was allocated to each 5° Square, the ship's name or the number of the register and the date being copied with the particular element on the appropriate page. When sufficient observations had been copied for the investigation, the pages of the collection book were gone through and the entries re-copied on to sheets according to months, this process being called "grouping."

This method, of course, entailed the handling of the register many times and an enormous amount of duplication of copying, while at the same time, it was impossible to use the data for any other purpose, except in certain cases where the Latitude and Longitude was extracted with the observations.

Nevertheless several papers and charts were compiled and published. FIGURE 1 is taken from the Board of Trade Wind Charts, published 1859. The wind is shown by wind stars, the arrows represent the current; sea surface temperature, dip and magnetic variation are shown by figures. The whole diagram is extremely complicated but it must be remembered that it was a first attempt.

The introduction of synoptic meteorology and the establishment of land stations.

Up to 1860, the Department had confined itself solely to the programme indicated by the Royal Society concentrating all its attention on the collection and reduction of marine observations. But following the investigation of the storm in 1859 in which the *Royal Charter* was lost, and acting on a suggestion put forward by the British Association under the Presidency of H.R.H. the PRINCE CONSORT, FITZROY considered that it would be both possible and practical, if a number of land stations were established which could telegraph their weather to London, to foretell or as he termed it "forecast" the weather for a period ahead by means of synoptic charts. This was carried into effect in 1860, fifteen stations being

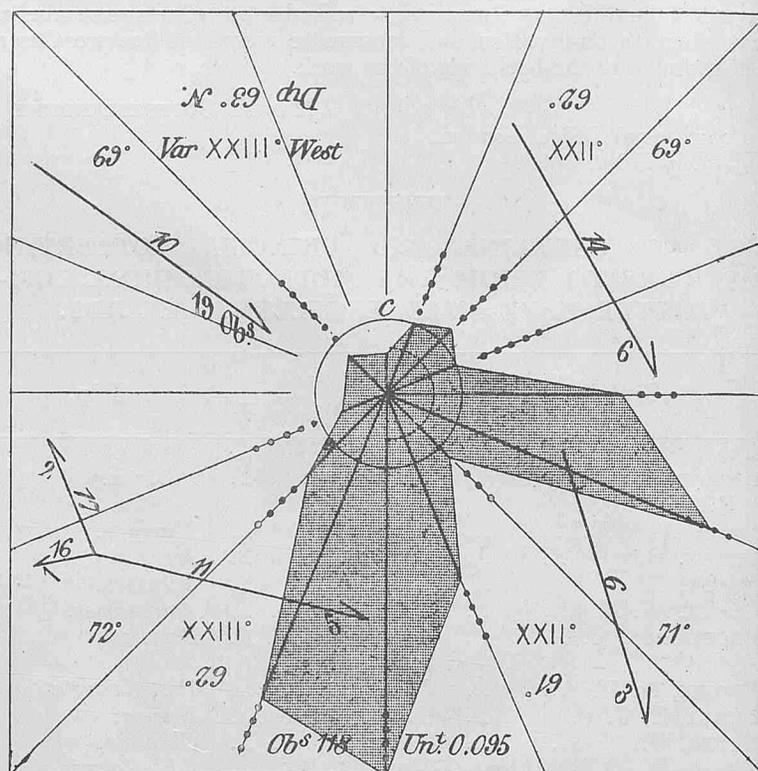


Figure 1.—5° Square [Latitude 35°-40° N., Longitude 10°-15° W.] from Board of Trade Wind Charts, 1859.

established in the British Isles which telegraphed their morning observations of weather to London.

In 1861, Admiral FITZROY instituted the system of issuing Gale Warnings to certain ports, where a signal was hoisted when a gale was expected. This was a material advance from the sailor's point of view and undoubtedly has contributed very largely to the safety of life and property afloat on our coasts. The same year the first forecast was issued to the Daily Press.

Revision of the Constitution of the Department.

With the small staff available to the Department, the establishment of the Forecast Service, necessarily affected adversely the reduction and computation of Marine Data and this fact was emphasised by a Committee of Enquiry appointed to examine the work of the Meteorological Department after the death of Admiral FITZROY in 1865. This Committee stressed the importance of the collection and reduction of ocean observations as being the "foundation" from which the "superstructure" of weather forecasting should be raised. At the same time they found that the system of forecasts and in particular the storm warnings were of sufficient utility to justify the continuance of this branch of meteorology, except that the forecasts should not be issued to the public until further knowledge of weather changes had been obtained by the study of the records of seven stations which were to be equipped with self-recording instruments. Consequently the issue of the daily forecasts to the public was discontinued until 1879 although storm warnings were continued except for the years 1867-68.

As a result of their recommendations, the Meteorological Office came into being as a separate Government Department in 1867, administered by a Committee consisting of representatives from the Royal Society, Admiralty and the British Association. It was now found necessary to divide the work of land and sea meteorology. A Director was placed in charge of the whole office and a Marine Superintendent was appointed to take charge of sea weather work, it being intended to co-ordinate the two functions of land and sea meteorology. The first Marine Superintendent to be appointed was Captain HENRY TOYNBEE. Captain TOYNBEE of the *Hotspur* had been a keen "excellent" observer for many years, co-operating with both MAURY in the U.S.A. and FITZROY in England, and his logs are still exhibited with pride in the Marine Division as models of a very high excellent standard.

The Committee of 1865 had recommended a new method of dealing with the observations received, by means of a card on which was extracted each set of observations the reference to the log, latitude and longitude being given. It was thought that these cards would facilitate the grouping of the observations and allow of their being used for various investigations without re-copying. On being put into practice, however, it was found that the process of copying each set of observations on to separate cards was a long one and in addition the cards became difficult to handle as their numbers increased. This system was therefore replaced by TOYNBEE'S system of "data-books." Each book contained the observations for one month in a ten degree square which was divided up into a hundred sub-squares of 1° of Latitude by 1° of Longitude.

The data book was a distinct advance on previous methods since it allowed the observations to be computed in an area of 1° square or combined into larger areas as the occasion warranted and also enabled the same observations to be used again and again without labour of re-copying. Using this system of data extraction, a considerable output of atlases and publications were achieved during the next thirty years under the supervision of TOYNBEE and continued by his successor in 1888, Navigating Lieutenant C. W. BAILLIE, R.N. The scope of these publications followed as far as possible the lines laid down by the Royal Society and quoted above although Captain TOYNBEE made it a rule to carry out whenever possible investigations having a direct bearing on navigation and answering questions which were constantly being asked by seamen themselves. Thus the "Charts and Remarks of Meteorological Data for Square 3" published in 1873 and "Charts and Remarks of Meteorological Data for the Nine 10° Squares (Latitude 20° N.—10° S. Longitude 10°—40° W.)" published in 1876, aimed at determining the best route for crossing the Equator, the position of the Doldrums and in obtaining some clue as to the place of origin of West Indian Hurricanes, all problems of considerable interest to the sailing ship master. FIGURE 2 reproduced from the publication quoted above shows how progress had been made in producing a clearer and more easily understood chart since the first attempt in 1859.

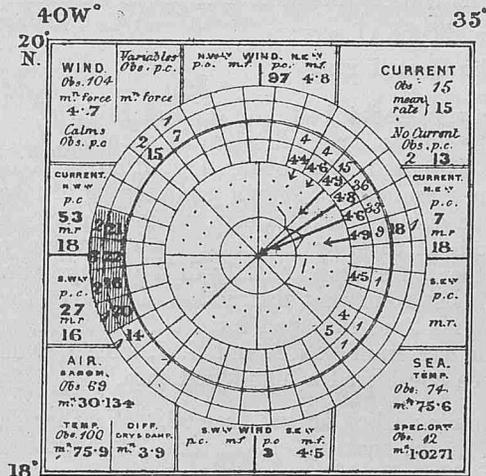


Figure 2.

Space does not permit a review of the publications issued during this period, but it must be remarked that they were confined to the investigation of small portions of the ocean and consequently a log was never completely exhausted of data and so in the course of years there has accumulated in the Marine Division a vast amount of unused data. Early in the 'nineties, too, the method of plotting observations on charts instead of extracting them into data books was adopted for some investigations,—in particular for the Current Charts of the Atlantic, Pacific and Indian Oceans. This method while perhaps facilitating the work at the time has barred any extension of the work by the addition of subsequent observations, without first re-extracting all the original observations. It may have been noticed by observers who have received copies of some of these works published in the 'nineties that they were printed and published by the Admiralty. There has, of course, always been mutual co-operation between the Marine Division and the Hydrographic Department of the Admiralty, the Hydrographer of the Navy being the Admiralty's representative on the Meteorological Committee, and the reason for the production of these publications by the Admiralty was that they could in those

days publish them at a price considerably lower than the Stationery Office. Also their distributing agents were in constant touch with the officers of the Mercantile Marine and so these charts were brought before the notice of those for whom they were intended.

The application of marine observations to the advancement of knowledge of synoptic meteorology was not forgotten and a series of weather charts made by international co-operation, "The Synchronous Weather Charts of the North Atlantic, 1st August, 1882, to 3rd September, 1883" and TOYNBEE'S own contribution in the "Meteorology of the North Atlantic," were the basis from which the later discussions of weather systems and their movements by ABERCROMBY and others, was developed.

That the utility and reliability of TOYNBEE'S work was recognised by the seafaring community is evident from the extensive quotations made from it, in such an authoritative manual as FINDLAY'S "Sailing Directions."

The Introduction of Periodical Ocean Charts.

Navigating Lieutenant BAILLIE died in 1899 and was succeeded by Captain CAMPBELL HEPWORTH, an "excellent" observer for the Office for thirty years. He came into office impressed, as an observer, with the necessity of presenting to observers the results of their observations in a more general and convenient form than the atlases published hitherto. In 1901, therefore, a meteorological chart of the North Atlantic compiled from all available sources was first issued month by month. These charts presented to the mariner the mean or average meteorological conditions for the whole ocean for the month, while the backs of the charts served as a means of communication between the Marine Superintendent and the observers afloat, for the issue of notices and instructions, and notes upon any particularly interesting phenomena reported. It also provided for the dissemination of the latest information concerning ice, derelicts, etc.

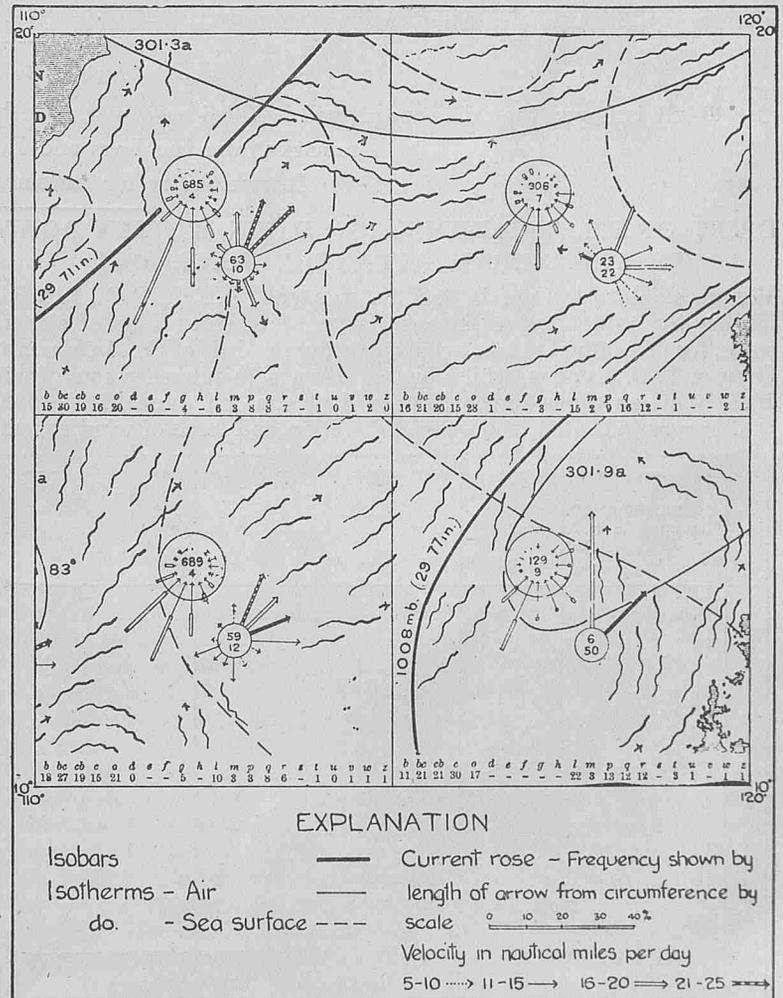


Figure 3.—Square 61. China Sea.

In conjunction with these charts of the North Atlantic the number of observing ships was increased in that ocean with a view to obtaining as much information as possible about ice in particular for dissemination by the charts. This was done by the introduction of a form whereby

observations were taken at 8 a.m. and 8 p.m., using the ship's instruments. These forms provided a wealth of observations which, if not of sufficiently high standard for inclusion in the computation of means, were yet of sufficient reliability for the investigation of immediate phenomena. The blue post-card method (*see* "Wireless and Weather, an Aid to Navigation," Chapter II, Vol. I, No. 2, p. 23), provided a means of obtaining the error of the ship's barometer.

In 1906, similar charts of the Indian Ocean, compiled from data computed in the Marine Division entirely from logs, were issued. FIGURE 3 is a specimen of these charts. The wind rose is of the pattern introduced by Lieutenant BAILLIE, and is a considerable improvement on previous forms.

With regard to the observations themselves, a fairly regular stream of logs continued to flow in to the Office year by year; but it is noticeable that as steam superseded sail, the logs tended to become more perfunctory and less detailed than in the old sailing ship days.

The invention of wireless telegraphy as a means of communication and its gradual adoption at sea offered a new means of obtaining information of weather over the ocean for the improvement of the Forecast Service. The necessity for the organisation of such a scheme was included in the recommendations of a Committee which investigated the administration of the Office in 1904, and upon whose report the Office was re-organised under a Committee appointed by H.M. Treasury, and not, as heretofore, by the Royal Society. In 1906, by the courtesy of the Lords Commissioners of the Admiralty, an arrangement was made whereby H.M. Ships sent observations of weather to the Meteorological Office by W/T. This was helpful, although the distribution of the reports was necessarily limited, but at that time the financial resources of the Office would not permit of the introduction of reports from the Mercantile Marine. But in 1908, the Marconi Company offered to accept the messages at 6*d.* per word, waiving their minimum charge of 6*s.* 6*d.* per message, and after a preliminary trial commencing in January, 1909, a service

whereby a number of trans-Atlantic liners already co-operating with the Office, transmitted their weather observations in code to London by W/T was inaugurated. These ships were not specially equipped with tested instruments, and many of them used the ship's instruments. While the resulting observations to the westward undoubtedly materially assisted the forecaster ashore, the difficulty of obtaining reliable errors for the ships' barometers was very apparent when the observations were charted and diminished to some extent their value. At that time few of the reports came to hand early. Nevertheless their loss was a considerable handicap when the outbreak of war in 1914 made it impossible for any further messages to be sent.

The years of the war necessarily form a blank in the continuity of marine observations. The majority of observing ships were on duties which made it impossible to record observations and where the exigencies of service allowed of the observations being taken, the conditions of war did not permit the logging of the ship's position, while many went forth to return to port no more. One important investigation was undertaken early in the War by the Marine Division, namely the preparation of data for the construction of charts for the Mediterranean (issued after the War as M.O. 224 "Monthly Meteorological Charts of the Mediterranean") which were compiled by Colonel H. G. LYONS, Sc. D., F.R.S., R.E., for the requirements of the Forces operating in this region. The staff of the Division was depleted by all the junior members who were fit being on active service.

The period from 1900 to the end of the War may be regarded as one in which the interests of the marine meteorological service were widening in their scope. The output of atlases and publications decreased, but the publication of periodical charts provided information to a far greater number of officers in the Mercantile Marine, and if results are not so apparent during this time it is because marine meteorology was slowly adapting itself to the different conditions imposed by the dominance of steam.

(To be continued.)

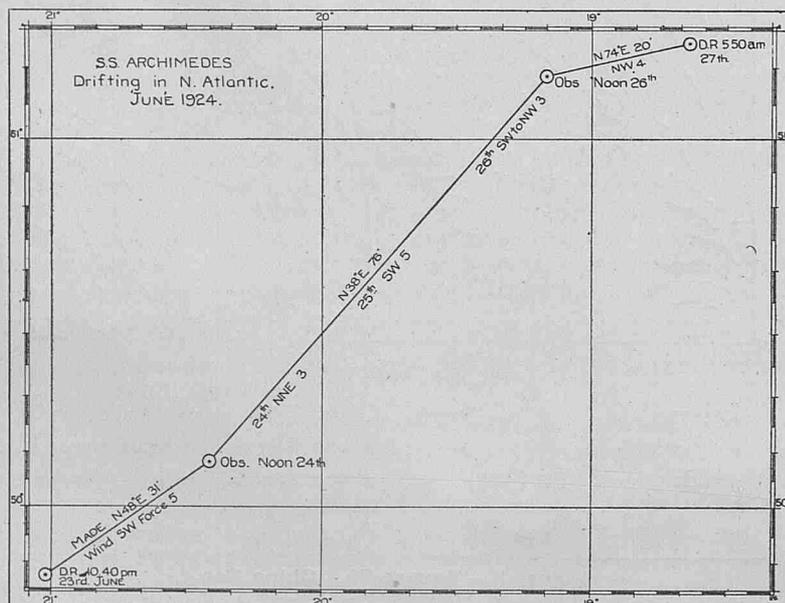
THE MARINE OBSERVER'S LOG.

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.

DRIFT OF S.S. "ARCHIMEDES" WHEN BROKEN DOWN IN THE NORTH ATLANTIC, JUNE, 1924.

WE are indebted to Captain S. S. RICHARDSON, O.B.E., R.D., R.N.R., Marine Superintendent of Messrs. LAMPORT & HOLT Line of steamships, for providing the track chart showing the drift of SS. *Archimedes*, Captain F. C. TAYLOR, whilst broken down with propeller gone, from 10.40 p.m. on June 23rd, 1924, to 5.50 a.m. on June 27th, 1924, positions as indicated, and general direction and force of wind shown.



Captain RICHARDSON remarks :

"This is a cargo steamer, shelter deck type, and at the time of the accident was in a fairly light condition, no sail set,

and drawing about 14 ft. for'd., and 19 ft. aft.

"The positions are all tolerably accurate, the D.R. positions on the 23rd and 27th being both from good observations at noon on those dates. It will probably be of interest to you to know the actual drift of a ship whilst stopped under the above conditions in those waters, and I would value your opinion as to whether an average N.E.ly drift of approximately 38 miles a day is not somewhat instructive in view of the fact that the wind at no time exceeded force 5 from S.W., and for part of the time was from N.N.E. and N.W. force 3, while the ship can hardly be considered a high sided ship."

For the opinion asked for, *see* page 98, "Weather Charts and Wind and Current in the vicinity of Latitude 20° N., Longitude 50° W., June 23rd to 26th, 1924."

SAND STORM.

EXTRACT from Meteorological Log of S.S. *Nyanza*. Captain F. W. J. CARPENDALE, Observer, Mr. R. H. HAND, 3rd Officer.

"June 26th, 1924—In transit Suez Canal.

"Extremely hot wind during afternoon and moderating from 4-6 p.m., 4.30-5.30 p.m. experienced very strong and violent sand storm. Visibility reduced to one mile and at times half mile.

"Dry Thermometer very high but not due to sun's rays on screen.

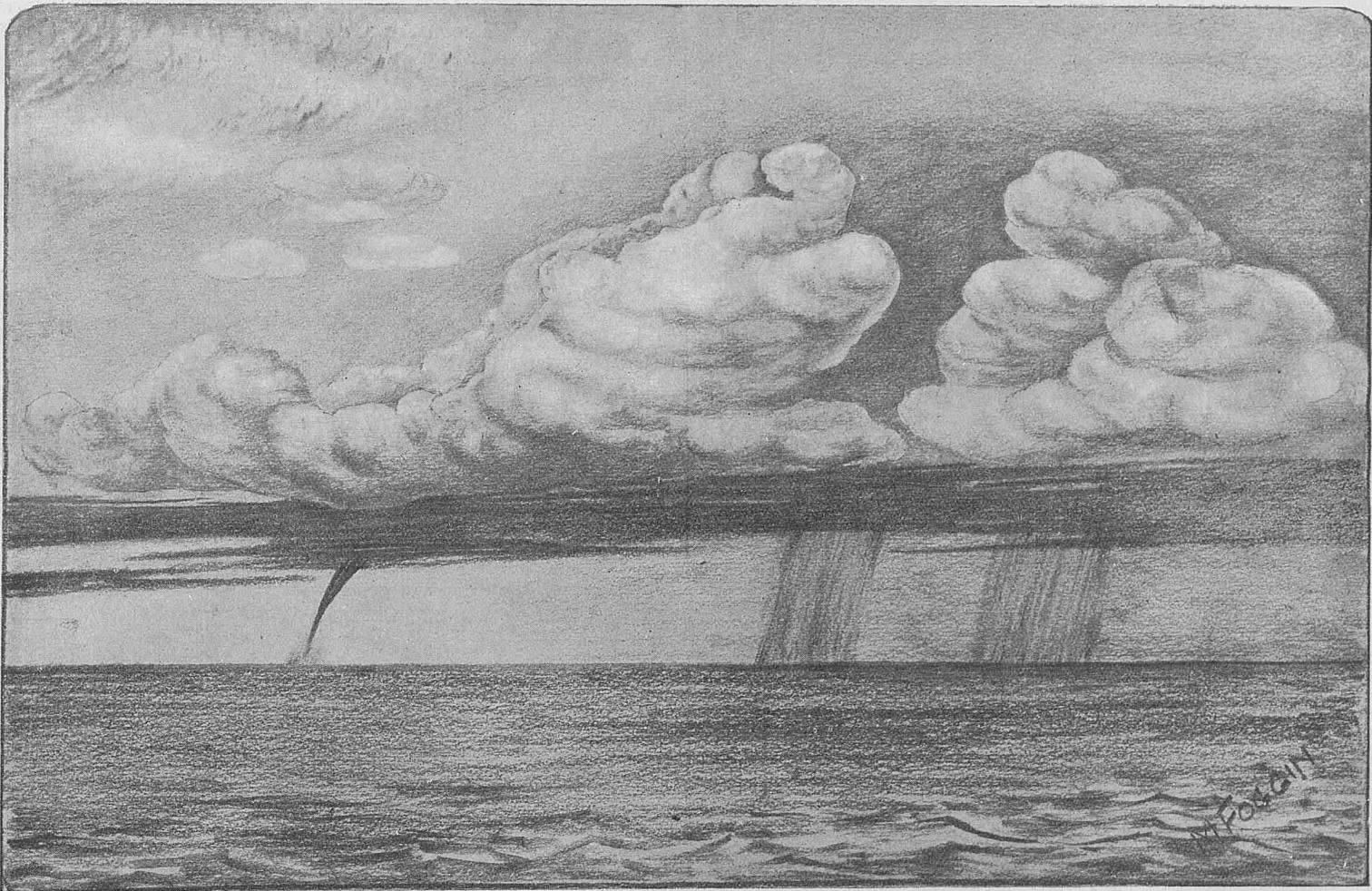
"Noon. Wind West 4-5. 6-7, Dry Bulb 104° Wet 73° Sea 85° Weather b."

WATERPOUT.

EXTRACT from Meteorological Log of H.M.S. *Iroquois*, Captain C. W. TINSON, O.B.E., R.N., Observer, Lieutenant G. A. GOULD, R.A.N.

"Waterspout observed 0800 June 11th, 1924.

"When first personally observed, waterspout appeared as a thin



tapering pencil and distinctly curved. Very little rain appeared at base, and visibility in immediate vicinity of spout was high (about 8). A little to the right were two distinct patches of rain, which remained for an hour after waterspout had disappeared.

"The phenomenon disappeared about five minutes after first observed withdrawing upward and still retaining its shape and clear-cut edges—the only difference being that the centre appeared to hollow out as it lifted. The phenomenon took about 3 minutes to lift and disappear. Although not personally observed, other observers state that waterspout descended from clouds and was at first about four times its final thickness.

WESTERN AUSTRALIA.

Port of Fremantle and Approaches—Notes on Wind, Weather, and Tides, etc.

THE following notes are compiled by Captain J. J. AIREY, Deputy Director of Navigation, Commonwealth of Australia and Marine Agent to the Meteorological Office at Fremantle, from his own and the experience of others navigating the locality, with the assistance of the Australian Pilot and verified by the State Meteorologist. We commend them to the special attention of strangers visiting the port of Fremantle.

"The weather conditions at the port of Fremantle are, generally speaking, agreeable. The winters are not severe, and periods of rough weather and heavy rains are followed by similar intervals of bright, clear weather. The summers are warm and the rainfall is light. The months of January, February and March are the warmest, the highest temperatures being experienced during February, but cool nights are the rule all the year round.

"During the summer months, October to March inclusive, winds are generally from some southern point, mostly between S.W. and S.S.E., and clear weather prevails. In the months December, January and February, the sea breezes are strong (force 6 to 7) over intervals of three to five days continuing throughout the night, but drawing more to the southward after midnight, and then moderating at S.S.E. and S.E. in the early morning. In the middle of the day the wind

"State of sky. Stratus (elevation 3°) Cu-Nb, Cu and Ci-Cu. Total area clouded 8—average visibility 7.

"N.B.—July 2nd. Since seeing the above, waterspouts are frequent occurrences usually from 7–8 a.m.

"Position, surveying East Coast of Johore, Singapore."

The sketch above was made by M. Foggin, Able Seaman.

Direction of Spout North 10 miles.

Height of Spout (computed) 2,750 ft.

Dry bulb 86°, Wet Bulb 81°, Dew point 79°, Relative Humidity 80 per cent., Vapour pressure 33.9 mb.

Wind S. by E.2.

backs again to the southward, and S.S.W. from which point there are strong breezes until midnight.

"The land wind almost invariably goes round from N.E. through S.E. and S. to S.S.W.; occasionally it backs through N. and N.W. to W.S.W., and in these instances this behaviour is usually regarded as indicating a change.

"Intervals of such weather are followed by a similar number of days of more moderate weather with winds off the land, and sometimes strong easterly winds for a few hours with high temperatures and a resultant heat wave.

"Occasionally during February and March, the easterly winds are light for part of the day. These conditions are generally accompanied by thick smoke haze which obscures and distorts landmarks, making navigation in the vicinity of the port, at times, difficult. These smoke hazes rarely last longer than a day or two and upon the advent of sea breezes the atmosphere is soon cleared.

"During November, December and January, when the sea breeze sets in from a point to the west of S.W., it is not so strong and generally lulls about sunset, but if from S.S.W. it is a strong breeze and lasts until midnight. Generally speaking, when the sea breezes are strongest the land winds are light, and the reverse.

"During March and April, the sea breezes are not strong. There are frequent calms and land winds veering to the northward with occasional thunderstorms and light rains, indicating the breaking up of the summer season.

"The winter sets in during May, when heavy rains may be expected with northerly and N.E. winds. As the wind shifts to westward of north, it increases in strength and heavy N.W. and westerly gales and thick weather are experienced at intervals throughout the winter months. This weather usually lasts about a week, and is then succeeded by a similar period of fine, clear weather. As the winter advances, the rains are more constant, and the intervals of fine weather shorter. These weather conditions last sometimes until, and sometimes throughout the month of October. During the intervals of fine weather, the land and sea breezes are almost as regular as during the summer, the sea breeze being lighter and the weather conditions are ideal.

"The north-west gales that occur on the west coast and in the approaches to Fremantle are of longer duration and more violent to the southward than to the northward of this port. The barometer generally indicates the approach of these gales, especially if the falling glass is accompanied by strong N.E. winds. The rising of the tide above the usual sea level and the observing of a southerly current are almost certain indications of bad weather conditions and N.W. and westerly gales approaching. These gales are at times severe, and are accompanied by violent squalls and heavy rains. The direction of the wind at the commencement of the disturbance is N.E., increasing to a gale at N.N.E., and N., increasing in strength at N.W., and blowing hardest generally at W.N.W. to W.S.W.

"On the wind shifting to the S.W. and the barometer not rising, it is almost certain that the wind will veer up again towards the N.W. and blow as hard, or perhaps harder. The gale usually blows itself out from the S.W., gradually falling to a moderate breeze, sky clearing, and the barometer rising steadily.

"Towards the end of the winter, there are longer intervals between gales, but persistent strong winds frequently remain constant between W.N.W. and W.S.W. for several days at a time during September and October.

"The currents experienced in the approaches to Fremantle at all seasons usually run with the prevailing wind. This is generally in a Northerly direction at a rate of one to one-and-a-half knots, and frequently setting towards the land.

"The cable steamer *Patrol* whilst repairing the submarine cable in Latitude 32° 19' 00" S. and Longitude 114° 51' 00" E., during the period October 25th to November 2nd of this year (1924), experienced a N.W.'ly. set at an average rate of one-and-a-half knots. The Commander kindly furnished the following particulars:—

"October 23rd. Lat. 32° 19' 00" S., Long. 114° 51' 00" E.
Wind S.S.E. to South. Force 5. Vessel keeping station on buoy, for 8 hours current was found to be setting N.W. (true) rate 3 knots.

"October 24th. Lat. 32° 27' 00" S., Long. 114° 49' 00" E.
Wind South to S.S.W. Force 6. Current ascertained to still run at the rate of 2½ knots, N.W. (true).

"October 29th. Lat 32° 20' 00" S., Long. 114° 49' 00" E.
Wind W.N.W. Force 7 to 8. Vessel standing by to leeward of buoy for 11 hours, it was noticed that ship kept station on buoy at a radius of 1 mile without any movement of engines, shewing a very strong N.W.'ly set.

"In the winter months, prior to and during N.W. gales, this current is reversed, a strong set of 1 to 2 knots to the southward being experienced. This southerly set continues during winter gales for some days, even when the gale is then blowing strongly from the S.W. This set also converges towards the land and has to be guarded against when making the port during thick weather.

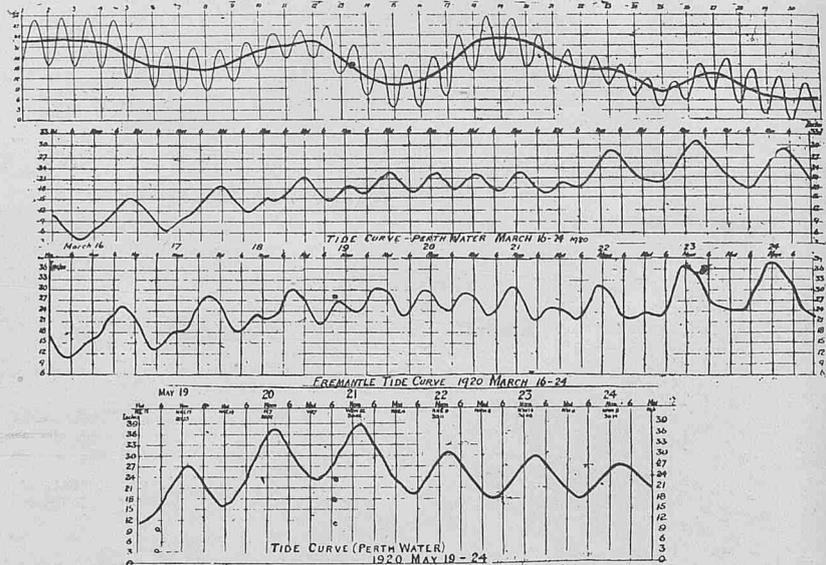
"The tides at Fremantle are extremely complicated. They are not marked by the comparative simplicity that obtains in the tides of British and American waters, where, in many cases, the interval elapsing between successive Meridian passages of the moon and the time of high and low water is almost a constant quantity, and where the heights of consecutive high and low water follows a fairly constant law. At Fremantle the difference in height and the inequality of successive intervals appears to be governed by no fixed law, but seems to be as variable as the weather.

"The disturbing influence of the wind and weather has a marked effect on the comparatively small range of tide prevailing at this port, which, except in certain short intervals during each month, when it exceeds 2 feet 6 inches, rarely averages more than 18 inches. During strong land winds, the time of high water is delayed and the height also diminished.

"Strong sea breezes, especially westerly gales, bank up the water to a greater or lesser degree, exceptionally high water level being observed during the winter months before and during north-westerly gales, but it must be understood that the high and low tides prevail whatever the mean level of the water may be.

"The tidal records indicate that at about the time of first quarter of the moon, and also at the last quarter, the diurnal tides prevail, and at full and new moon the semi-diurnal tide is usually apparent, marked by small range and considerable irregularity, but this is at times departed from. However, for all practical purposes it may be concluded that the tides at this port are largely influenced by the effect of 'on shore' or 'off shore' winds.

"The appended graph prepared by Mr. CURLEWIS, the Government Astronomer, clearly indicates the tidal irregularities at Fremantle and Perth water.



"The first curve is for the month of January, the heavy line indicating the mean water level. The faint line shows the daily high and low water."

WINDS AND WEATHER AT WALVIS BAY, S. AFRICA.

THE following account has been received from Captain W. WELLER, Port Captain, Walvis Bay, S. Africa.

"Walvis Bay, which is open to the North, is well sheltered by a long sand spit from the South and Westerly swell that is sometimes very heavy outside, especially if bad weather is being experienced at Cape Town. The prevailing wind which commences at noon, or later (Cape Time), but never before, is from S.S.W. to S.W., and blows hard until about sun-down, when it usually drops until noon the next day. It has reached as much as 60 miles per hour, but is usually about 40 to 50. If the mornings are fine and clear it always blows in the afternoon, and the barometer rises to 30.30 before it commences, and drops to 30.20 during the afternoon.

"N.W. winds are frequent in the winter months, but they never blow hard, a moderate breeze is the most I have experienced. They come in with a low glass, just below 30.00 and start early morning, and very seldom keep on till afternoon, when we usually get a fine afternoon. This is the only wind that could bring the swell in, but fortunately being on the edge of the trades it does not blow hard enough, or long enough, to raise a sea. A short sea is experienced as with the S.W. wind, but a vessel at anchor in the Bay does not feel it at all.

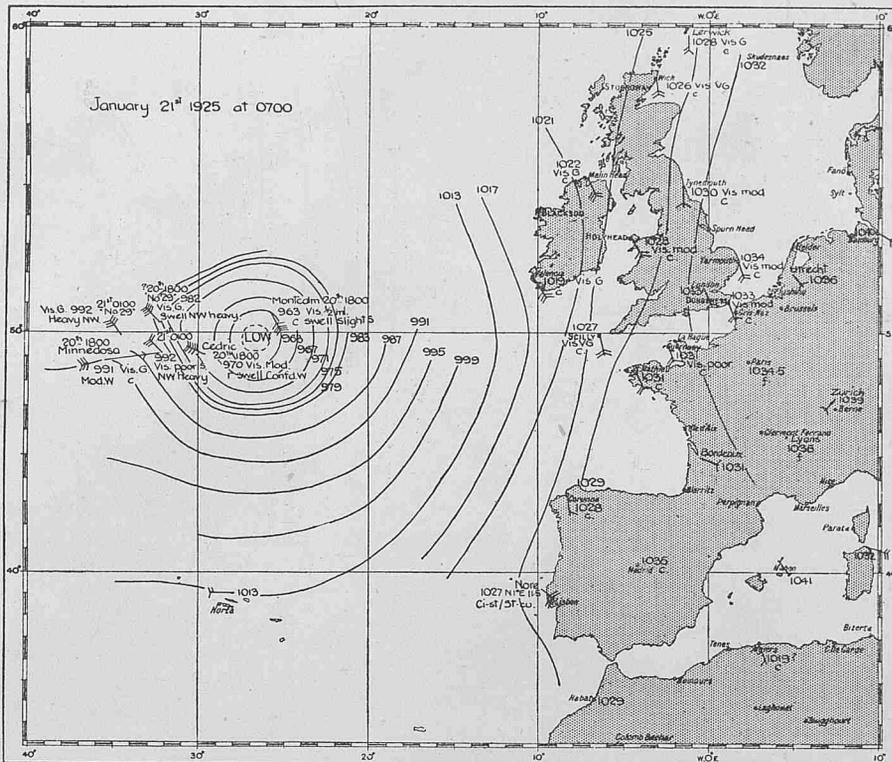
"After the rains up country (it seldom rains at Walvis) E.N.E. winds are sometimes experienced from midnight to noon, when they fade away until midnight. These winds are very hot coming across the desert, and also reach the maximum of 60 miles per hour.

"December, January and February are the best months here, when there is less wind, but even then hard blows are often experienced from the S.W.

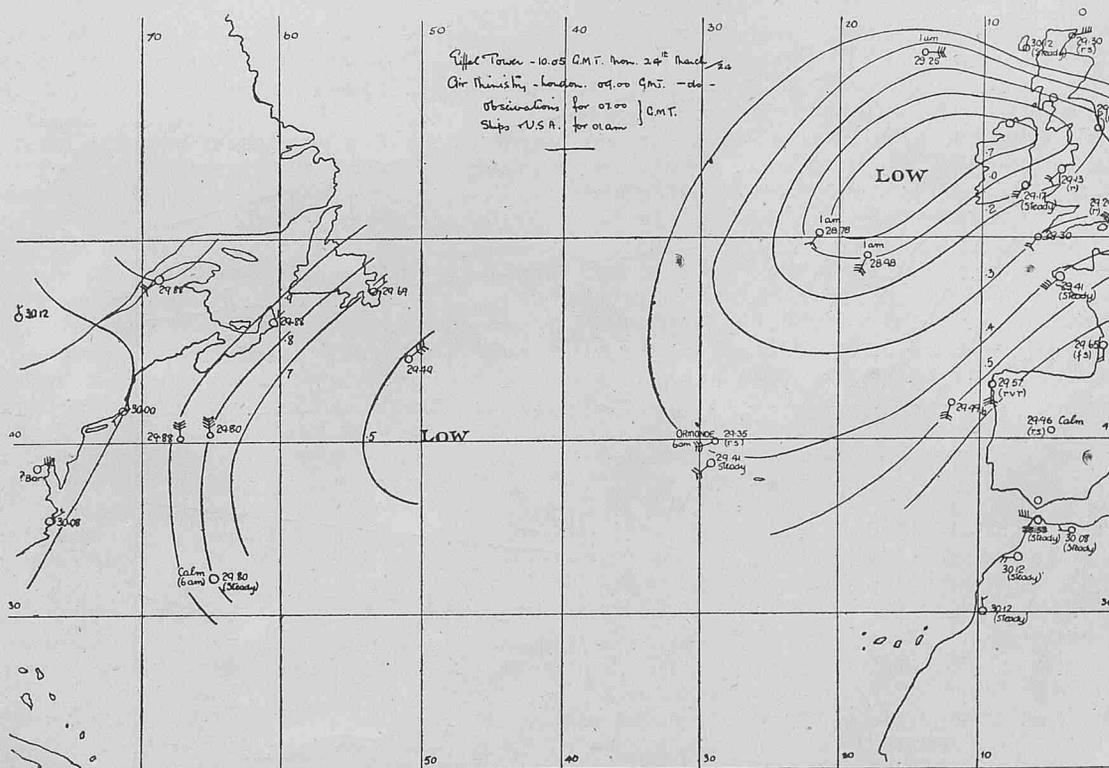
"I have not had much experience along the coast, but I know that at times when it is blowing hard in the Bay, vessels outside have reported no wind at all."

WEATHER CHARTS MADE AT SEA.

BELOW are reproduced a selection of the weather charts which have been sent in by Marine Observers.

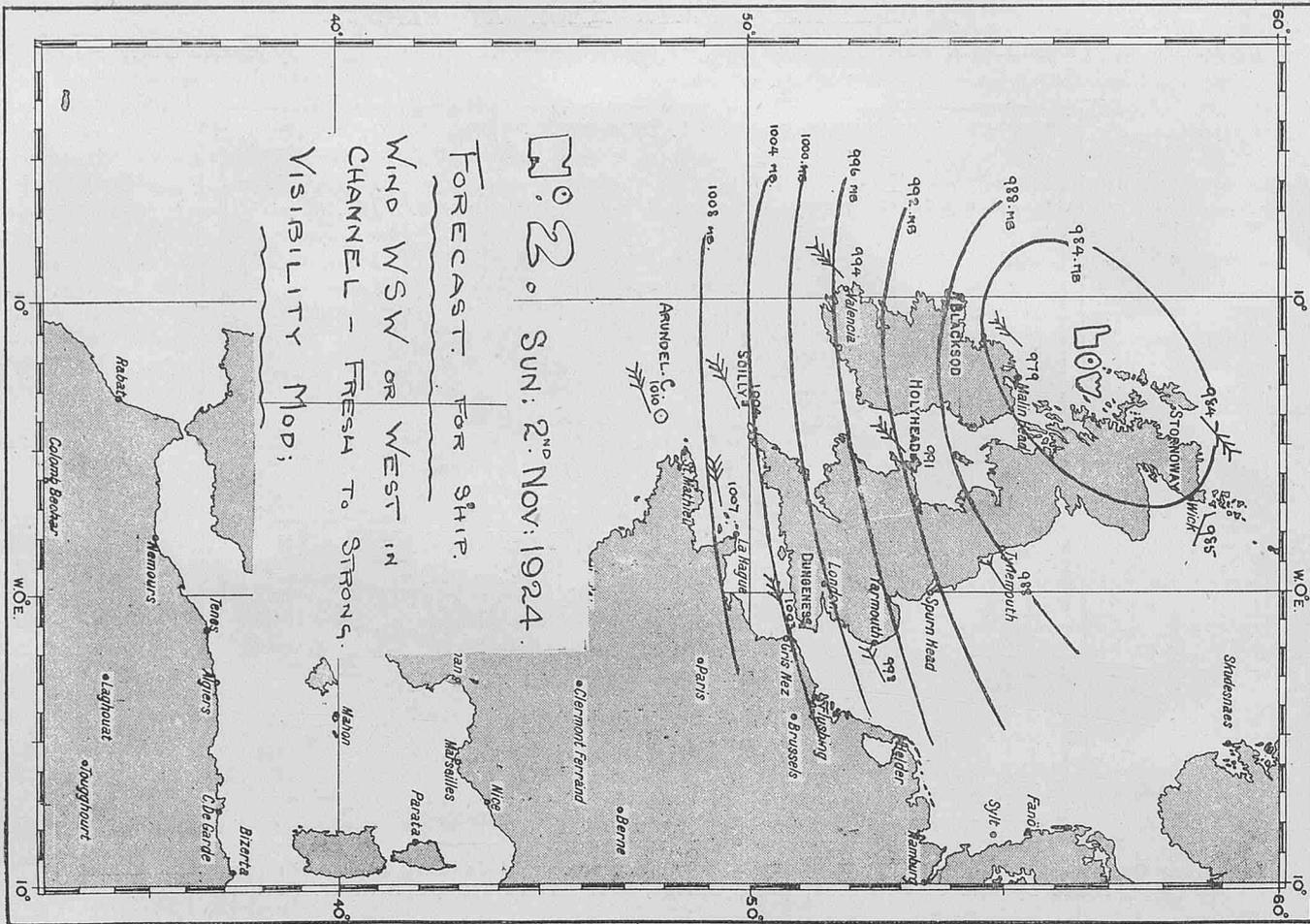


Weather Chart for the Eastern North Atlantic, for the morning of January 21st, 1925 (one of a series) made by Mr. C. B. Roche, Chief Officer, S.S. "Nore," Captain J. W. Parker.

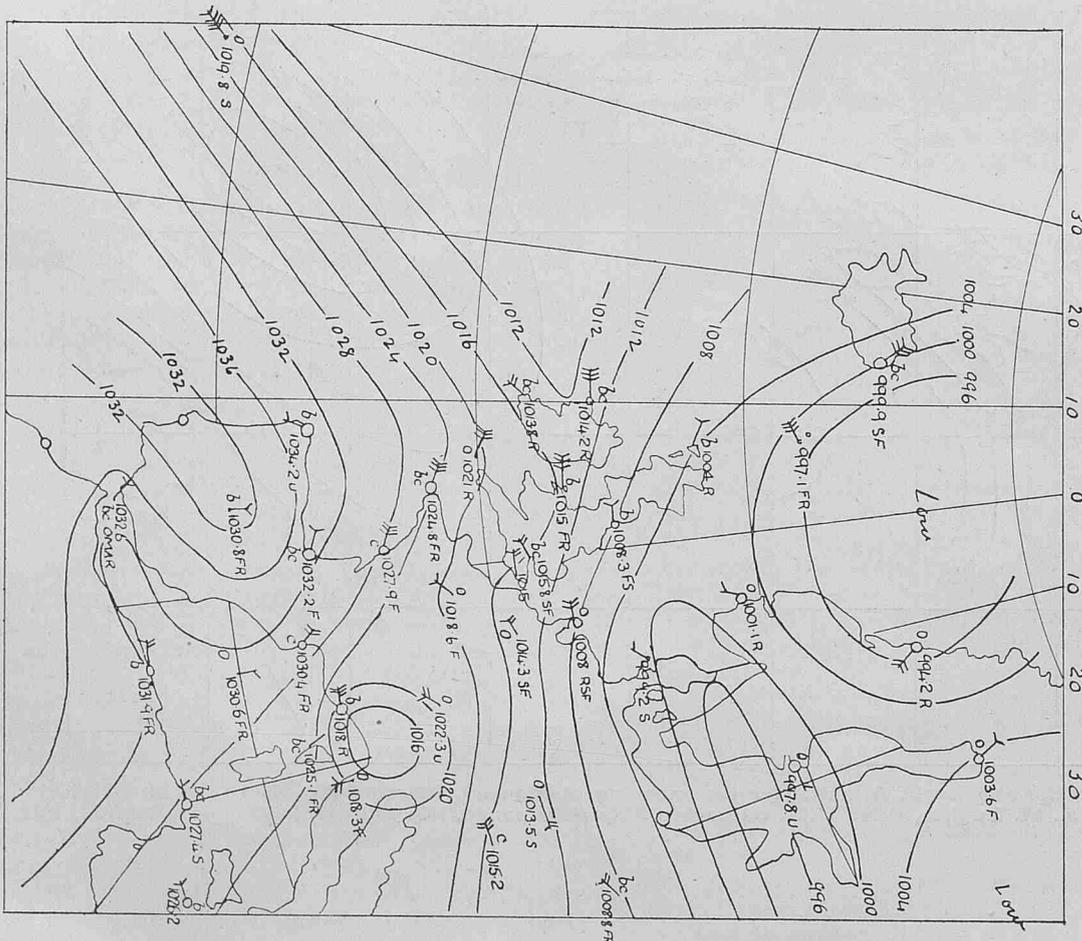


Weather Chart for the North Atlantic, for the morning of Monday, March 24th, 1924 (one of a series) made by Lieut. A. M. Hughes, R.N., H.M. Surveying Ship "Ormonde," Captain H. P. Douglas, C.M.G., R.N.

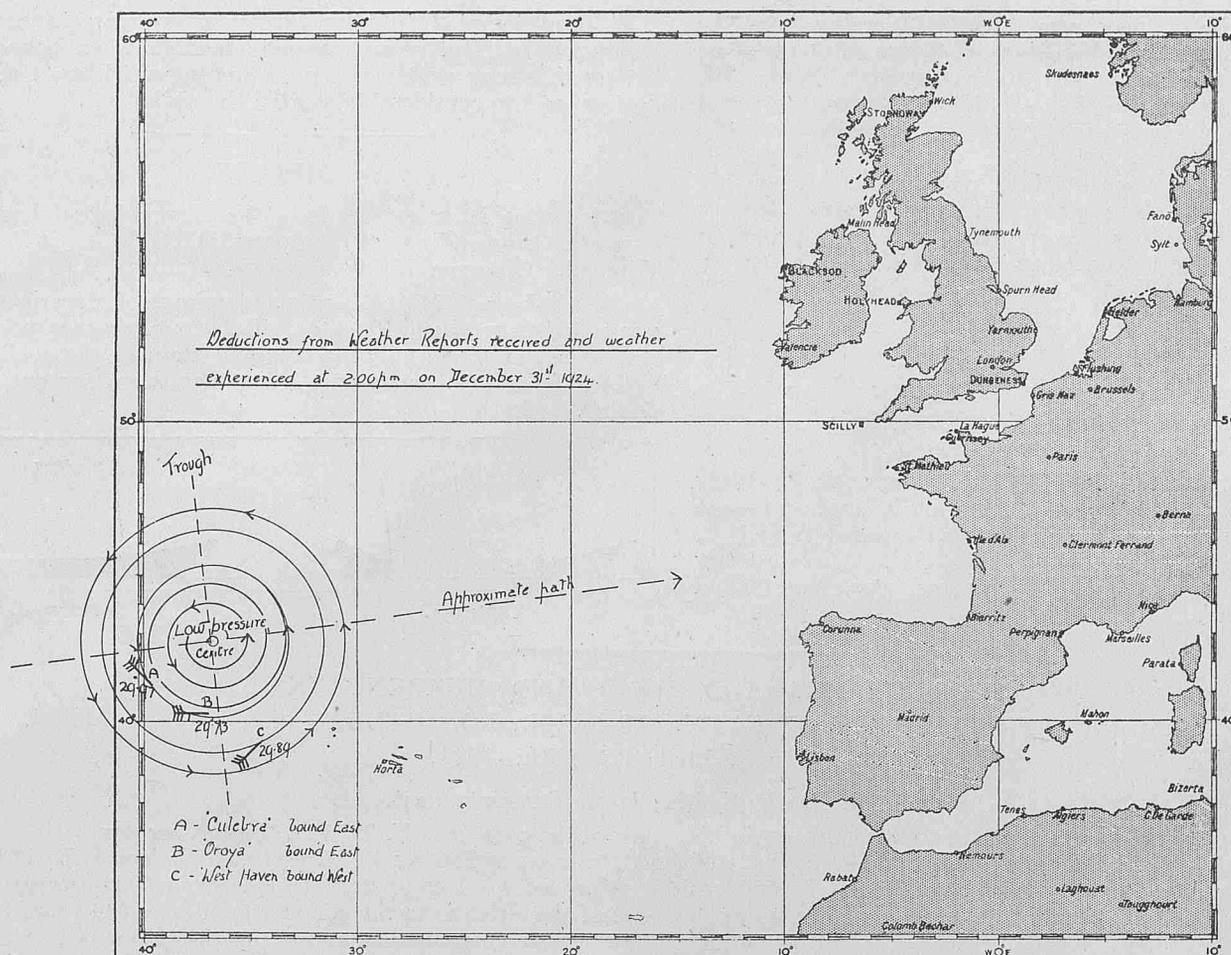
R.M.S. "ARUNDEL CASTLE"



Weather Chart for Home Waters, for the morning of Sunday, November 2nd, 1924 (one of a series), with forecast for ship made by Mr. G. H. Williams, 3rd Officer, R.M.S. "Arundel Castle," Commander J. W. Hague, R.N.R.



Weather Chart for Western Europe and adjacent seas, for the morning of March 2nd 1922 (one of a series), made by Commander L. Simmern, R.D., R.N.R., S.S. "Omar."



**Storm diagram for Eastern North Atlantic, afternoon of December 31st, 1924, made by the 2nd Officer, S.S. "Culebra,"
Commander Alex. Mackay, R.D., R.N.R.**

NOTE BY MARINE SUPERINTENDENT.

The following remarks are offered with no spirit of criticism, but with the hope that they may be of general assistance to Marine Observers.

These charts are selected as typical examples of what can be done and is being done at sea, and are a credit to the officers responsible for them and the whole Corps of Voluntary Marine Observers. It must be remembered that these officers have been their own instructors.

Nore, January 21st, 1925, is perhaps the most interesting of the four, for it shows the value of reports from the westward to a ship homeward bound from the southward.

It should be noted that the gradient shown on this chart is incorrect to the eastward of the depression owing to the omission of the isobars 1003 mb. and 1007 mb. and that the reports of the ships to the Westward are for the evening before, or earlier than the observations of *Nore* and the land stations, being timed 1800 of 20th and 0100 of 21st, they do not synchronise and therefore do not give a correct representation of the pressure and weather distribution at 0700 on January 21st, 1925, for the reasons given in "Wireless and Weather, an aid to Navigation," Chapter IV, "Time," Vol. I, No. 3, page 39. It should be noted that the isobars near the vortex are drawn on the 1800 hour observations and therefore westward of Longitude 20°, give a fair representation of the pressure on the evening of the 20th of January, 1925, while the pressure distribution shown to the eastward of Longitude 10° W. represents that of the morning of January 21st, 1925.

Ormonde, H.M.S., March 24th, 1924, is an exceedingly useful chart, for it shows how the North Atlantic may be charted at sea aided by the International system of the reciprocated reports of Europe and North America with observations from other ships. The isobars drawn are correct for the observations used, but it will be noted that the same remarks with regard to synchronization apply.

Arundel Castle, November 2nd, 1924. This chart is correct as regards the isobars, but we should like to see the barometer tendency and visibility charted abreast the stations for the probable movement of the depression would then be seen without referring to the general

"Weather Shipping" Bulletin message again. It is an excellent example of what may be done with one ship observation and the Station reports in the "Weather Shipping" Bulletin only, approaching home waters when little time is available for dealing with more data. The forecast is a sound one for this chart, and the weather predicted was actually experienced. It will be remembered that the officer responsible for this chart was the first to send in a Weather Chart made at sea from British observations.

Omar, March 2nd, 1922, one of the early charts received and a most excellent example of what may be done in the Mediterranean and to the southward with the Eiffel Tower report. The Low indicated in the far N.E. is really a High, the wind reported at Haparanda at the head of the Gulf of Bothnia either being affected by local causes and so not following Buys Ballot's Law or the direction reported was an error.

The 1032 isobar within the 1036 is incorrect, but Captain SIMNER was misled by the pressure reported to him for Madrid, which was 1037 mbs.

It will be remembered that in "The Work of the Year," dated April 3rd, 1923, it was stated:—

"Of Marine Observers who have sent in Weather Charts constructed at sea, Commander G. L. SIMNER, R.D., R.N.R., of S.S. *Omar*, has shown most perseverance and on a homeward passage he was able to forecast some time ahead a heavy westerly gale which he encountered in the Bay of Biscay and Channel."

Culebra, Storm diagram, December 31st, 1924, shows how wireless reports at short range may be used in conjunction with the "Horn Card," which was probably invented by HENRY PIDDINGTON, for it was published with "The Sailor's Horn Book." The fact that Captain MACKAY says that he considers on the homeward passage from the West Indies he saved quite two days steaming, all due to the study of weather, is proof of the utility of the old conjectural method modified and enhanced by the use of short range Wireless Telegraphy in ships which are not fitted for C.W. reception, and, therefore, are unable to pick up reports at sufficient range to complete a weather chart.

It should, however, be remembered that isobars especially in

Middle and High latitudes, may vary very considerably from the circular form of the "Horn Card" of which a modern edition is given with "Wireless and Weather an aid to Navigation," Chapter VI, "Tropical Revolving Storms," Volume 1, No. 5. It will be noted that in this case the conjectural isobars do not fit with the pressures observed.

It will be realised that full benefit of the synoptic method can only be obtained from reported observations which synchronise with the nearest coast stations and, therefore, progress must largely depend upon response to the invitation issued in "Wireless and Weather an aid to Navigation," Chapter XII, "Conclusion," Volume 1, No. 12, page 162.

SAND SQUALL.

THE following is an extract from the Meteorological Log of S.S. *Risaldar*, Captain G. PARK, at anchor Tuticorin.

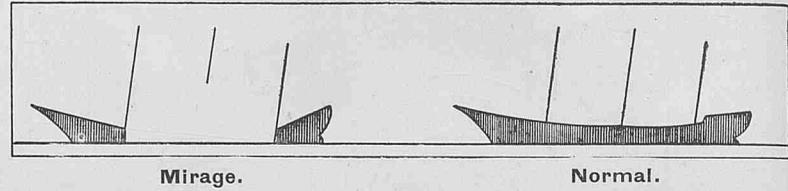
"June 25th, 1924, 3 p.m. Red fire-like glare to S.W. slowly rising to form the rain squall shape but colouring being deep orange and the colour lightening. This dust or sand squall passed to the N.E. through S. and E. showing St. for that arc and 6° Alt. Wind unsteady at the anchorage between S. and W. Air and sky clear. Land obscured 5 miles to S.W.

"I am tempted to offer this as a warning to navigators:— 'Manapad Lt. Ho. being the main landfall when bound Tuticorin beware of strong west winds off Manapad which are liable to carry dust or sand to considerably shorten the visibility.'"

MIRAGE.

THE following is an extract from the Meteorological Log of H.M.S. *Ormonde*, Commander C. H. KNOWLES, D.S.O., R.N., at Port of Spain, Trinidad. Observer, Lieutenant A. M. HUGHES, R.N.

"24th June, 1924. A continuous mirage of ships in the harbour was noted from about 10.0 a.m. till 6.0 p.m., from a position about 5' W.N.W. of them, only the bow and stern of the coal hulks were visible, the general appearance being that they were cut in two and sinking."



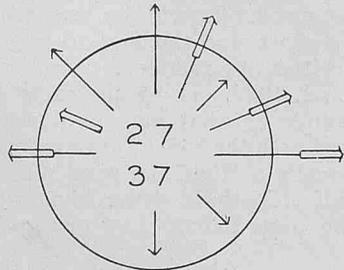
WEATHER CHARTS AND WIND AND CURRENT IN THE VICINITY OF LATITUDE 20° N., LONGITUDE 50° W., JUNE 23rd TO 26th, 1924.

By L. A. Brooke Smith, Marine Superintendent.

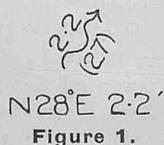
In order to give the opinion asked for by Captain RICHARDSON in his remarks upon the drift of S.S. *Archimedes*, Captain F. C. TAYLOR, when broken down, we have made weather charts from observations of ships in the Eastern North Atlantic, only including those which logged currents, and of course the station reports broadcast in the "Weather Shipping" Bulletin.

With the current data we have already extracted for the immediate vicinity of *Archimedes* the current rose below is made.

Compiled from observations made in the month of June during the years 1909 - 1924 between Latitude 49° and 52° N. Longitude 18° and 22° W. Current Rose.



Mean Resultant Current.



This indicates so far as these 37 observations made in the month of June during the years 1909 to 1924 are concerned, that no current was logged of over 24 miles in a day, that the current is variable, setting with greatest frequency to the eastward and N.E., and that frequently no appreciable current has been found, i.e., 37 per cent. of observations are for nil or less than 6 miles per day. The general

flow of the current is N. 28° E. 2.2 miles per day.

Referring to FIGURE 35, page 119, No. 9, Vol. I, it will be seen that it is proved by a computation made from 509 observations for this part of the Atlantic in the summer months of the years 1909 to 1920 that the tendency of the current is to flow before the wind, but with an inclination of 45° to the right.

CHART NO. XVII, JUNE 23RD, 1924, indicates that before *Archimedes* broke down there was a large and probably shallow depression situated to the N.W., and that there were secondaries to the westward and south-westward of her position; that winds from a light to a strong breeze mainly from the south-west but variable were to be expected. The currents for the day observed are not sufficient to indicate the set and drift which had occurred in the vicinity during the 24 hours.

CHART NO. XVIII, JUNE 24TH, 1924. On this day at noon the position was fixed by observation, and it is the distance from this fix to that of noon June 26th, 1924, when another fix was obtained, which gives the drift of the ship when broken down as N.38° E. 76 miles in 48 hours. The chart indicates that generally the weather conditions had changed little, but a depression is developing in the W.S.W., the light N.N.E. wind recorded by *Archimedes* for the day ending noon June 25th probably being occasioned by a secondary to the eastward of her, probably the one which is shown on the chart of the previous morning west of *Brecon*; but generally in the vicinity we should expect south-westerly winds with the pressure distribution shown. During these 24 hours, i.e., ended noon June 24th, *Daytonian* approaching *Archimedes* found a northerly current at the rate of 10 miles a day some 4° to the eastward; while *Tuscania* and *Orduna* found a southerly current of 12 and 10 miles a day respectively some 5° to the westward. In view of the currents reported in the vicinity in the month of June from 1909 to 1924, see FIGURE 1, it is unlikely that with these reported northerly and southerly currents of half a knot there was a strong N.E. current.

CHART NO. XIX, JUNE 25TH, 1924, indicates that the depression noted yesterday in the W.S.W. has developed and moved east, causing a freshening of southerly winds to the S.W. of *Archimedes*' position. *Daytonian* and *Patia* have found that the current is running to the N.N.E. at 16 miles and 12 miles per day respectively, some 3° to the westward and 4° to the southward of *Archimedes*, i.e., before the wind and with inclination to the right. It is probable that during the 24 hours ended noon June 25th there was a N.E.'ly current of about 3/4 of a knot with *Archimedes*.

CHART NO. XX, JUNE 26TH, 1924, indicates that the S.W. depression has moved east and is filling in while the northern depression has probably moved S.E.; this occasioned the S.W. and N.W. gentle

breeze experienced by *Archimedes*. On this day *Verbania* found a current setting N. 7° E. 11 miles in the 24 hours when she steamed across the wake of *Archimedes* and passed within 30 miles of that ship.

It will be remembered (see page 121, Vol. I., No. 9) that before the German S.S. *Hammonia* foundered off the West coast of Portugal in September, 1922, she drifted, disabled and becoming waterlogged, at the rate of about 4 knots. At this time the nearest ship, *Nore*, recorded set and drift to be one-eighth of that velocity. We then remarked: "It would be interesting to know exactly to what extent the leewardly drift of a vessel stopped broadside to wind for a certain interval of time would exceed the leeway measured in distance when the same ship steams at speed with the true wind abeam."

Captain RICHARDSON tells us that *Archimedes* is not a high-sided ship, that she had no sail set, and was fairly light, her mean draught being only $16\frac{1}{2}$ feet. He has also supplied us with the following information. At mean draught of $16\frac{1}{2}$ feet the ship displaces 8,297 tons, and the area above the waterline in the fore and aft line upon which a beam wind would exert its pressure is 14,750 square feet; while the surface in the vertical fore and aft plane in the water would be approximately half that above the water.

The pressure of the wind at force 5 is 1.36 lbs. to the square foot, so that a fresh breeze would theoretically exert a pressure of about

9 tons upon the broadside superstructure, masts and funnel of *Archimedes*, but we have no information as to the direction of the ship's head during her drift.

The observations of ships steaming available in this vicinity would lead us to conclude that not more than 30 miles of the 78 drifted by *Archimedes* between noon on June 24th and noon June 26th was due to current, from which it might be supposed that the remaining 48 miles was mainly due to the wind sailing or forcing the ship to leeward when it was fresh from S.W. The light N.N.E. winds reported probably being of shorter duration and covering a small area in the wake of a secondary moving east which was of too short duration and covered too small an area to stop or turn the surface water from its N.E.'ly course, or to force the ship appreciably to the southward.

This example, though not conclusive, we think has gone some way to answer the question we asked, already referred to, and so Captain RICHARDSON has given valuable assistance.

It is such enquiries as these which are always welcome from Marine Observers.

It remains to be proved to what extent the difference between D.R. and Observed position can be relied upon, whether ships are steaming or with engines stopped, and further investigation is necessary regarding leeway or wind drift. This experience points to the need for continuous observation and research.

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

VI.—June.

THE low over northern India continues to develop, thereby causing a decrease in normal pressure over that of May in the northern Indian Ocean.

The difference in pressure from the area of lowest reading 1000 mb. (29.53 in.) over northern India to the Equator is 9 mb. (.27 in.) which is 5 mb. (.15 in.) in excess of the previous month. Over the Arabian Sea and the Bay of Bengal the trend of the isobars is in an E. by N. direction causing the wind to blow from between west and S.W. except at the head of the Bay where the wind comes from between S.W. and S.E.

In the Arabian Sea the strongest winds occur in the vicinity and to the southward of Sokotra Island, where the normal force varies between 5 and 7. Over the centre of the Sea the average force is 5, and in the east of the Sea the force of the wind varies between 3 and 5.

Navigators homeward bound from Colombo and the East are advised to consult "Steamship Routes from Colombo and the East to Perim during the S.W. Monsoon," Vol. I, No. 6, page 79.

Over the Bay of Bengal the average strength of the wind decreases from force 5 in the south to force 4 in the north. Both in the Bay of Bengal and Arabian Sea winds of force 8 or above are not infrequently experienced.

From the Equator pressure increases in a southerly direction to the region of highest pressure 1022 mb. (30.18 in.) situated in about Latitude 30° S. Longitude 70° E. The normal difference in pressure over this area is 13 mb. (.38 in.).

From the Equator to Latitude 5° S. between the coast of Sumatra and the 60th meridian there is a zone of variable winds.

From the Australian coast westward to Madagascar the S.E. trades with force varying between 3 and 5 blow steadily from Latitude 25° S. to Latitude 5° S. and between the 60th meridian and the African coast extend to the Equator where they change into the S.W. monsoon.

Off the west coast of Madagascar the trades may come from any point between N.E. and S.E.

In the Mozambique Channel the southern monsoon blowing with moderate strength varies in direction from between S.W. and S.E.

Immediately south of the trade wind zone is a belt of variable winds which frequently attain gale force.

Cyclonic Storms.—In the Arabian Sea the percentage frequency of storms reaches a maximum in this month. Eleven storms or twenty-three per cent. of the total number of storms recorded in the

years 1890–1912 occurred in June. The majority of storms develop during the first half of the month on the eastern side of the Sea advancing in a N.W'ly direction towards the coast of Arabia or the Persian Gulf. They are generally of great intensity.

Bay of Bengal.—Cyclonic storms in the Bay are twice as frequent as in May, but are not generally of great severity. Forty-three storms giving a percentage frequency of 11 per cent. for the years 1877–1923 are recorded in June. The majority of storms originate in the northern part of the Bay and move in a N.W'ly direction but they may also develop in the south of the Bay and travel to the N.E.

See charts giving tracks in Vol. I, No. 6.

South Indian Ocean.—No cyclonic storm has been reported south of the Equator in this month during recent years.

Air Temperature.—In the Arabian Sea the normal air temperature for the month is 85°·5 F. in the north, and 82° F. in the south over the centre and eastern side of the Sea. On the western side it is 85° F. in the north decreasing to 81° F. in the south.

In the Bay of Bengal temperature ranges from 85° F. in the north to 83° F. in the south except off the coast of Lower Burma where it averages 81° F.

Between Latitude 10° N. and the Equator east of the 60th meridian, the normal air temperature is 82°·5 F. West of the 60th meridian temperature ranges from 81° F. to 79° F.

From the Equator southward temperature gradually decreases, reaching 65° F. in Latitude 35° S.

Sea Surface Temperature.—The normal sea surface temperature for the month is about 84° F. at the head of the Arabian Sea, decreasing to 82° F. in the south. In the Bay of Bengal, north of Latitude 20° N. the normal sea surface temperature is about 86° F. Southward over the remainder of the Bay the average temperature is 84° F. except off the Lower Burma coast where it is between 80° and 81° F.

Between Latitude 10° N. and the Equator from the African coast to the 60th meridian, sea surface temperature ranges from 79° to 83° F. East of the 60th meridian to the Sumatra coast the normal temperature is about 83° F.

From the Equator southward, sea surface temperature gradually diminishes with increased Latitude, being about 60° F. in Latitude 35° S.

Currents.—In the South Indian Ocean, northward from the 35th parallel, the general set is in a N.W'y direction. On reaching the 25th parallel, it gradually turns to the eastward and joining with the S.E. trade drift, flows steadily in this direction between Latitudes 20° and 8° South to the 50th meridian. Between the parallels of 8° and 4° South, east of the 50th meridian, the currents are irregular but the general set is to the east.

The S.E. Trade drift flowing to the northward of Madagascar divides into two off Cape Delgado. One stream running down and parallel to the African coast continues around the Cape forming the Agulhas current. The second stream turns N.E. and sets strongly up the Zanzibar coast.

North Indian Ocean.—Between the parallels of 2° north and south a branch of the African coast current steadily flows in an easterly direction to the 90th meridian. East of the 90th meridian to the coast of Sumatra the set becomes irregular. The strong N.E. set up the coast of Somali becomes much weaker north of Sokotra, where it merges with a stream setting out of the Gulf of Aden along the Arabian coast. On the western side of the ocean offshoots from the main stream set in an East to S.E. direction across the centre and down the east side of the Arabian Sea. South of Ceylon the current turns to north and N.E. The northerly stream flows up the western side of the Bay of Bengal keeping parallel with the coast, while the N.E'y set flows over the central and eastern part of the Bay.

WEATHER CHARTING.

Notes on influence of inaccurate data and value of Ships' Reports to the Navigator.

By L. A. BROOKE SMITH, MARINE SUPERINTENDENT.

THE CHART NUMBERED XXI FOR THE MORNING OF JUNE 21ST, 1924, was made by Mr. C. H. WILLIAMS, 3rd Officer, R.M.S. *Arundel Castle*, Captain J. W. HAGUE.

In forwarding this chart enquiry was made as to the accuracy of the observation of wind reported at Scilly, accompanied by a copy of the "Weather Shipping" Bulletin as received on the bridge of *Arundel Castle* on the forenoon of June 21st, 1924.

The last three figures of the pair of groups referring to Scilly were received as 267, i.e., wind W.N.W., force 7; this was investigated, with the result that it was found that a checking station had intercepted these figures as 242, the figures actually supplied by the Forecast Division. i.e., wind west force 2.

Had we been in the position of the navigating officers of *Arundel Castle* with the station reports as received by them in the "Weather Shipping" Bulletin, we should have drawn the isobars much as they are shown on CHART No. XXI. The moderate gale from W.N.W. shown to be reported at Scilly having led Mr. WILLIAMS to draw the 1020 mb. isobar trending west close to that station where with a wind of force 7 a fairly steep barometer gradient would occur.

But to continue the 1022 mb. isobar from *Arundel Castle* round the lower barometer which lay to the N.E. of that ship according to BUYS BALLOT'S Law to south of Guernsey where the same pressure is reported is incorrect, and we should have been content to draw a portion of two 1022 mb. isobars where they have been since dotted in on Mr. WILLIAMS' chart.

If imaginary wind arrows, following BUYS BALLOT'S Law, are placed along this isobar the reason for this will be evident.

The forecast made by Mr. WILLIAMS at the time indicates that he anticipated that *Arundel Castle* would be passing into the rear southern quadrant of the depression in which he expected winds conforming to the circulation of a large cyclonic system, the wind force at Scilly having misled him into not seeing that there was probably a secondary depression south of that station.

CHART No. XXIA is made with the observations as they were

reported and drafted by the Forecast Division and transmitted in the "Weather Shipping" Bulletin with observations of four other ships all within easy wireless range. It shows that the wind at Scilly was actually west force 2, a light breeze, and that there was a secondary depression south of that station.

With this chart the weather experienced may be explained and it could have been predicted.

As *Arundel Castle* proceeded across the Bay of Biscay she came in rear of the trough of the secondary depression and consequently experienced a W. by N. wind veering N.N.W. Showers of rain and mist might be expected early near the line of trough and good visibility later as the N.N.W. breeze asserted itself in rear of the trough as was the case when *Arundel Castle* was 100 miles north of Finisterre. Since this occurrence an automatic means of record has been adopted for the "Weather Shipping" Bulletin by the Air Ministry W/T station and so errors of transmission are reduced and a record is kept of what is actually sent.

It must be remembered that the Forecast Service is receiving by telegram and wireless a tremendous volume of reports amounting to 6,000 groups daily; that errors in reporting to the Meteorological Office are made, may be in recording or transmission, and therefore it is impossible to guarantee that the data embodied in the station reports in the "Weather Shipping" Bulletin is always correct in every detail.

The importance of accuracy of coast reports to shipping is realised and great care is taken, but mariners will do well to observe due caution in the use of any individual observation reported, particularly visibility, hence the caution given in the description of this bulletin under "Weather Signals."

To render the "Weather Shipping" Bulletin clear to those who receive it, it is urged that the form recommended on page 29, Volume II, No. 14, be used in the wireless house and on the bridge of ships, also at harbour offices. Marine Observers who detect errors are requested to report them in order that the service can be made as reliable as possible.

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

WEATHER SIGNALS.

II.—WIRELESS WEATHER BULLETINS.

MEDITERRANEAN SEA (WESTERN PORTION).

C.W. Issue—Land Stations' and Ships' Observations.

Marignane W/T Station, approximate Latitude 43° 27' N., Longitude 5° 13' E., call sign FNM, transmits weather bulletins in code at 0840, 1440 and 1940 G.M.T. on a wave length of 1,525 metres (C.W.). The bulletins are in two parts.

Part I commences with the words "Météo Méditerranée," and contains the 0700, 1300 and 1800 G.M.T. observations respectively of the following land stations:—

Indicator Figures.	Station.	Position (Approx.)	
		Lat.	Long.
022	Genoa	44° 23' N.	8° 55' E.
030	Mahon	39° 54' N.	4° 16' E.
047	Oran	35° 42' N.	0° 41' W.
049	Malta	35° 53' N.	14° 31' E.
053	Bizerta (1440 G.M.T. only) ...	37° 16' N.	9° 52' E.
064	Barcelona	41° 23' N.	2° 09' E.
086	València	39° 28' N.	0° 22' W.
087	Cap Béar	42° 32' N.	3° 05' E.
088	Cette	43° 25' N.	3° 40' E.
089	Montpellier	43° 37' N.	3° 59' E.
090	Marignane	43° 27' N.	5° 13' E.
091	Toulon	43° 07' N.	5° 53' E.
092	Antibes	43° 35' N.	7° 07' E.
093	I. du Levant	43° 05' N.	6° 30' E.
094	Cuers	43° 15' N.	6° 01' E.
095	Ajaccio	41° 55' N.	8° 44' E.
096	Cap Corse	43° 01' N.	9° 25' E.
097	Iles Sanguinaires	41° 52' N.	8° 36' E.
098	Pertusato	41° 22' N.	9° 11' E.
099	Algiers	36° 45' N.	3° 03' E.
100	Cap Falcon	35° 47' N.	0° 48' W.
101	Croisette... ..	43° 14' N.	5° 21' E.
102	St. Raphaël	43° 25' N.	6° 45' E.

Code used:—Mostly New International, expressed by symbols as follows:—

I_nI_nI_n BBDDF P₁ TTcN bbSV₁

- I_nI_nI_n = Indicator figures of observation station.
- BB = Barometric pressure (corrected) in whole millimetres, initial 7 omitted. (To convert to mbs. and ins., see Table XV, p. 45, March, 1925, MARINE OBSERVER.)
- DD = Wind direction true (Table III, p. 13, January, 1925, MARINE OBSERVER.)
- F = Wind force by Beaufort scale.
- P₁ = Weather at the time of observation. (For stations 022 and 049 see Table XXVI, p. 62, April, 1925, MARINE OBSERVER. Remaining stations Table XXXVIII.)
- TT = Air temperature in whole degrees Centigrade. (To convert to Fahr. see Table XVII, p. 45, March, 1925, MARINE OBSERVER.)
- c = Characteristic of barometer tendency during 3 hours previous to observation. (Table XIX, p. 46, March, 1925, MARINE OBSERVER.)
- N = Cloud amount (Table X, p. 16, January, 1925, MARINE OBSERVER.)
- bb = Amount of barometer tendency during 3 hours previous to observation, in tenths of a millimetre.
- S = State of the sea and swell. (Table XXIV, p. 46, March, 1925, MARINE OBSERVER.)
- V₁ = Visibility seawards. (Table XX, p. 46, March, 1925, MARINE OBSERVER.)

Part II, ships' observations, commences with the word "Navires," code used mostly New International, expressed by symbols as follows:—

I_nI_n JQLLL 111GG BBDDF PP₁ VSN A₁ nA₂ bb

in which the first three groups have the same meanings as those on the "Decode Form," p. 14, January, 1925, MARINE OBSERVER, J having the same meaning as P on the "Decode Form." The barometer reading is given in whole millimetres, (to convert to mbs. and ins., see Table XV, p. 45, March, 1925, MARINE OBSERVER.)

Remaining groups as follows:—

- P = Present weather. (Table XXXVIII.)
- P₁ = Past weather. (Table XXXVIII.)
- V = Visibility. (Table XX, p. 46, March, 1925, MARINE OBSERVER.)
- S = State of sea and swell. (Table XXIV, p. 46, March, 1925, MARINE OBSERVER.)
- N = Cloud amount. (Table X, p. 16, January, 1925, MARINE OBSERVER.)
- A₁ = Form of low cloud. (Table XXXIX.)
- n = Amount of low cloud.
- A₂ = Form of upper cloud. (Table XL.)
- bb = Barometer tendency during 3 hours previous to observation, in tenths of a millimetre, 50 being added when the tendency is negative.

- NOTE (1).—Missing observations from land stations are replaced by X's.
- (2).—When there are no ships' observations for transmission the word "Navires"—*Nil*—will be sent.
- (3).—The messages "Météo Méditerranée" are transmitted by either Marignane (FNM) or Marignane-Gignac (FOM).

Spark Issue—Land Stations' Observations.

Bizerta-Sidi-Abdallah W/T Station, approximate Latitude 37° 09' N., Longitude 9° 48' E., call sign FUA, broadcasts a weather bulletin in code at 1200 G.M.T. on a wave length of 1,350 metres (spark).

The bulletin contains (a) 0700 G.M.T. observations from the undermentioned stations and (b) a weather forecast for ships.

Code used:—Mostly New International. Form of message:—

(a) Observations of 0700 G.M.T. "Météo Alger" I_nI_nI_n BBDDF wb₁ (SV₁).

(b) State of weather and forecast for North Africa *en clair*.

Observation Stations:—

Indicator Letters.	Station.	Position (Approx.)	
		Lat.	Long.
SFX	Sfax	34° 44' N.	10° 45' E.
BZR	Bizerta	37° 14' N.	9° 52' E.
GAR	Cap de Garde	36° 58' N.	7° 43' E.
CST	Constantine	36° 23' N.	6° 36' E.
FAL	Cap Falcon	35° 47' N.	0° 48' W.
TGR	Tangier	35° 45' N.	5° 47' W.
RAB	Rabat	34° 02' N.	6° 46' W.
ALG	Algiers	36° 45' N.	3° 03' E.
TNS	Tenès	36° 31' N.	1° 20' E.
NEM	Nemours	35° 07' N.	1° 52' W.
CLB	Colomb Béchar	31° 38' N.	2° 13' W.
LAG	Laghout	33° 48' N.	2° 53' E.
TOU	Toughourt	33° 07' N.	6° 08' E.

Explanation of code.

Bulletins commence with the words "Météo Alger":—

- I_nI_nI_n = Indicator letters of station.
- BB = Barometric pressure (corrected) in whole millimetres, initial 7 omitted. (To convert to mbs. and ins. see Table XV, p. 45, March, 1925, MARINE OBSERVER.)
- DD = Wind direction true. (Table III, p. 13, January, 1925, MARINE OBSERVER.)
- F = Wind force by Beaufort scale.
- w = Cloud amount and general state of weather (same as Table XXVI, p. 62, April, 1925, MARINE OBSERVER.)
- b₁ = Barometer tendency. (Table XLI.)
- S = State of sea and swell. (Table XXIV, p. 46, March, 1925, MARINE OBSERVER.) Not reported from Constantine, Colomb Béchar, Laghouat and Toughourt.
- V₁ = Visibility seawards. (Table XX, p. 46, March, 1925, MARINE OBSERVER.) Not reported from Constantine, Colomb Béchar, Laghouat and Toughourt.

Rinella W/T Station, Malta, approximate Latitude $35^{\circ} 53' N.$, Longitude $14^{\circ} 32' E.$ Call sign **BYZ** transmits weather bulletins at 0900 and 2100 G.M.T. on a wave length of 4,700 metres (C.W.). The bulletins are sent *en clair* and contain local observations of barometric pressure, wind, temperature, visibility, state of sea and swell, together with a forecast of local weather conditions.

SPECIAL WEATHER TELEGRAPHY TABLES, NOT NEW INTERNATIONAL CODE.

Table XXXVIII.

P Present Weather, or P₁ Past Weather.

Code Figure.	
0	= Present weather determined by amount of cloud.
1	= Continuous rain or drizzle.
2	= Continuous snow.
3	= Rain showers, intermittent rain or hail showers.
4	= Snow showers.
5	= Thunderstorm (with or without squall).
6	= Squall (or line squall), or rain and hail, or heavy rain showers.
7	= Squall, wind very strong at or near the surface.
8	= Thick mist or fog; visibility below 1,000 metres (1,100 yards).
9	= Mist or fog of appreciable vertical thickness.

Table XXXIX.

A₁—Form of Low Cloud.

Code Figure.	
0	= No low cloud.
1	= St. or Fr. St. or both.
2	= Cu. or Fr. Cu. or both.
3	= St. and Cu. or St. and St. Cu.
4	= St. Cu. alone.
5	= Nb. and Cu.
6	= Cu. Nb. and Cu.
7	= Nb. and Cu. Nb.
8	= Cu. Nb. alone.
9	= Nb. alone.

Table XL.

A₂—Form of Upper Cloud.

Code Figure.	
0	= No high or middle cloud observable.
1	= Ci. alone.
2	= Ci. Cu. alone or Ci. Cu. and Ci.
3	= Ci. St. alone or Ci. St. and Ci.
4	= Cirro-cloud and A. Cu.
5	= Cirro-cloud and A. St.
6	= Cirro-cloud and A. Cu. and A. St.
7	= A. Cu. alone visible.
8	= A. Cu. and A. St.
9	= A. St. (uniform, or alone visible).

Table XLI.

b₁—Barometric Tendency (millimetres).

0	Barometer stationary—tendency	0	m/m to 0.5 m/m.
1	Rising slowly	0.5	" " 1.5 "
2	Rising	2.5	" " 3.5 "
3	" rapidly	3.5	" " 6 "
4	" very rapidly		more than 6
5	Falling slowly	0	m/m to 1.5 m/m.
6	Falling	1.5	" " 3.5 "
7	" rapidly	3.5	" " 6 "
8	" very rapidly		more than 6 "

WIRELESS STORM WARNINGS.

MEDITERRANEAN SEA (WESTERN PORTION).

Oran-Ain-el-Turck, Algeria, W/T station, approximate Latitude $35^{\circ} 45' N.$, Longitude $0^{\circ} 45' W.$, call sign **FUK**, broadcasts storm warnings when necessary at 1400 G.M.T. on a wave length of 1,350 metres (spark). The direction of the centre of the cyclonic depression is transmitted *en clair*.

Marignane W/T Station broadcasts storm warnings when necessary on a wave length of 1,525 metres (C.W.).

GREAT BRITAIN AND IRELAND.—AMENDMENT.

New Spark Issues.

AFTER May 31st, 1925, the "Western Seaboard" Weather message now issued through Malin Head and Valentia, described in THE MARINE OBSERVER, February number, 1925, p. 31, will be discontinued.

On and after June 1st, 1925, certain portions of the "Weather Shipping" Bulletin described in the same number, p. 27, will be broadcast by coast W/T stations on spark as follows. A.M. issues refer to 7 a.m. observations and p.m. issues refer to 6 p.m. observations, all times are G.M.T.

For the Western Area.

Valentia, Lat. $51^{\circ} 56' N.$, Long. $10^{\circ} 21' W.$ (approx.), call sign **GCK**, wave length 600 metres spark. At 0948 G.M.T. and at 2048 G.M.T.

Seaforth, Lat. $53^{\circ} 28' N.$ Long. $3^{\circ} 01' W.$ (approx.), call sign **GLV**, wave length 600 metres spark. At 0930 G.M.T. and at 2030 G.M.T.

Commencing **Western Area** followed by ten groups of figures which indicate observations made at the five stations numbered 1 to 5 in the "Weather Shipping" Bulletin followed by the word **Forecast** after which the 12-hour forecast for the Western Area will be given.

For the Southern Area.

Niton, Lat. $50^{\circ} 35' N.$, Long. $1^{\circ} 17' W.$ (approx.), call sign **GNI**, wave length 600 metres spark. At 0930 G.M.T. and at 2030 G.M.T.

Commencing **Southern Area**, followed by six groups of figures which indicate observations made at the three stations numbered 5, 6 and 7 in the "Weather Shipping" Bulletin, followed by the word **Forecast**, after which the 12-hour forecast for the Southern Area is given.

For the Eastern Area.

Cullercoats, Lat. $55^{\circ} 02' N.$, Long. $1^{\circ} 26' W.$ (approx.) call sign **GCC**, wave length 600 metres spark. At 0948 G.M.T. and at 2048 G.M.T.

Commencing **Eastern Area**, followed by eight groups of figures which indicate observations made at the four stations numbered 7, 8, 9 and 0 in the "Weather Shipping" Bulletin, followed by the word **Forecast**, after which the 12-hour forecast for the Eastern Area is given.

ERRATA.

WEATHER SIGNALS. I—Ships' Wireless Weather Signals. Page 13, Vol. II., No. 13, THE MARINE OBSERVER.

Column 1, *thirteenth line*, under heading 3 North Atlantic Decode, delete 2,400 metres (C.W.) and substitute 2,100 metres (C.W.).

WEATHER SIGNALS. III—Wireless Time Signals. France. Page 64, Col. II., No. 16, THE MARINE OBSERVER.

The "X's" (— • • —) of the Time Signal in the second line of FIGURE 1, "New International System Automatic," are of slightly longer duration than is shown in the diagram.

Special Notices regarding Personnel.

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

Mr. J. T. Williams.

Mr. J. T. WILLIAMS, Staff Assistant, Marine Division, who joined the staff of the Meteorological Office in 1881, retired on March 31st, 1925.

Mr. WILLIAMS was in the Marine Division for the greater part of his 44 years' service in the Meteorological Office and was employed for the most part upon data extraction.

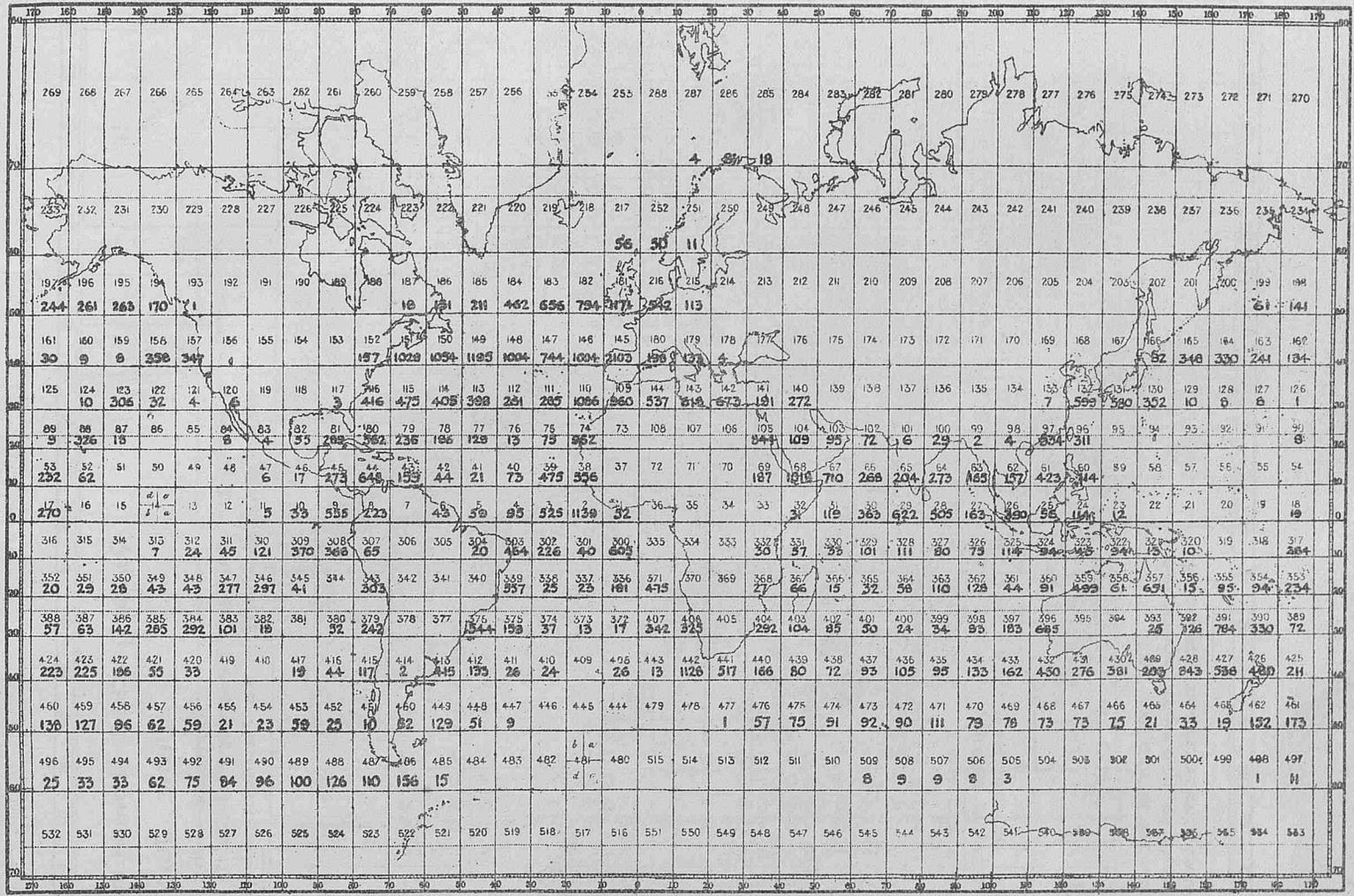
Marine Observers will realise that it is largely through the patient, continuous work of such assistants that their observations are returned to them in the form of Charts, Directions, and latterly THE MARINE OBSERVER.

Mr. WILLIAMS joined under Captain HENRY TOYNBEE and continued through the time when Lieutenant BAILLIE and Captain CAMPBELL HEPWORTH were Marine Superintendents.

Marine Observers will join the Marine Division in wishing him long life and happiness in his retirement.

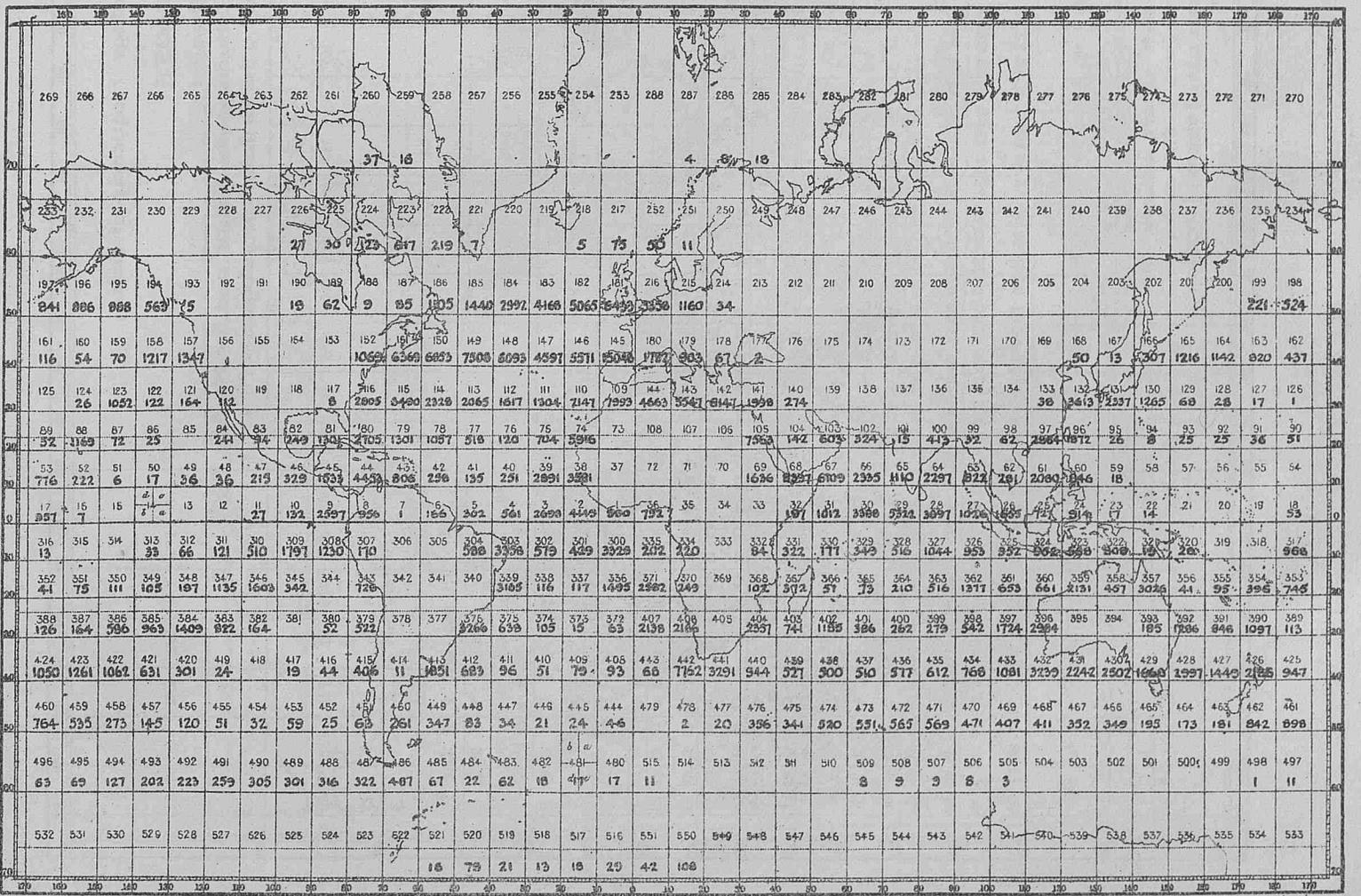
MARSDEN CHART I.

SHOWING NUMBER OF SETS OF OBSERVATIONS EXTRACTED BETWEEN APRIL 1st. 1924 & MARCH 31st. 1925.

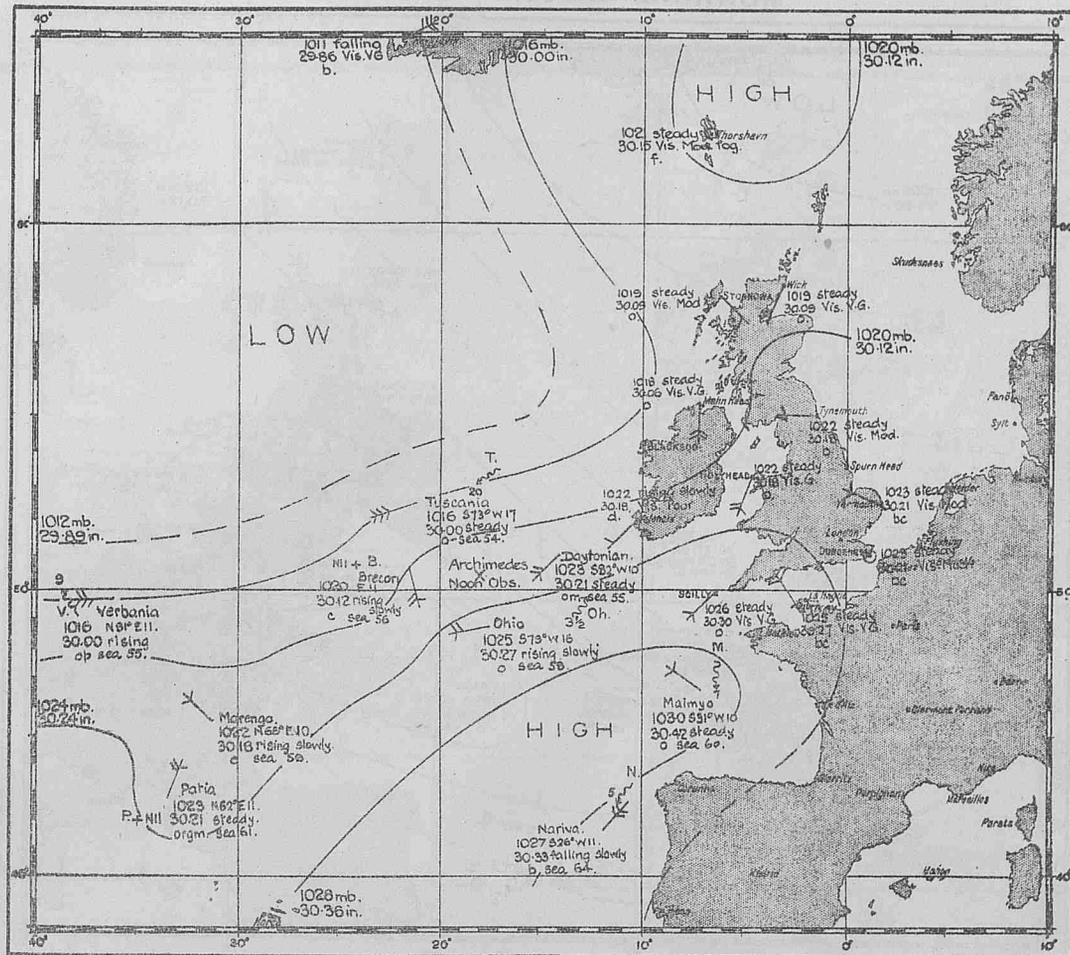


MARSDEN CHART II.

SHOWING NUMBER OF SETS OF OBSERVATIONS EXTRACTED BETWEEN APRIL 1st. 1920 & MARCH 31st. 1925.

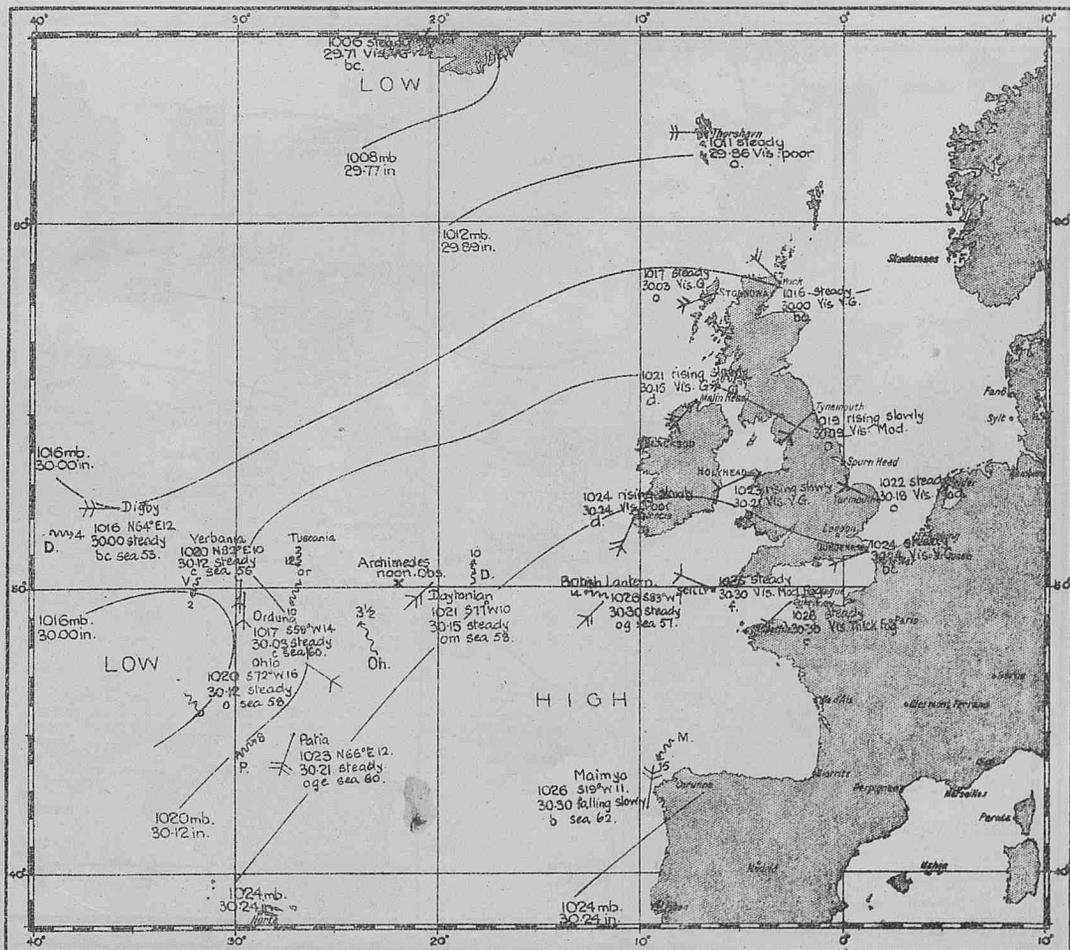


MORNING OF JUNE 23RD. 1924.



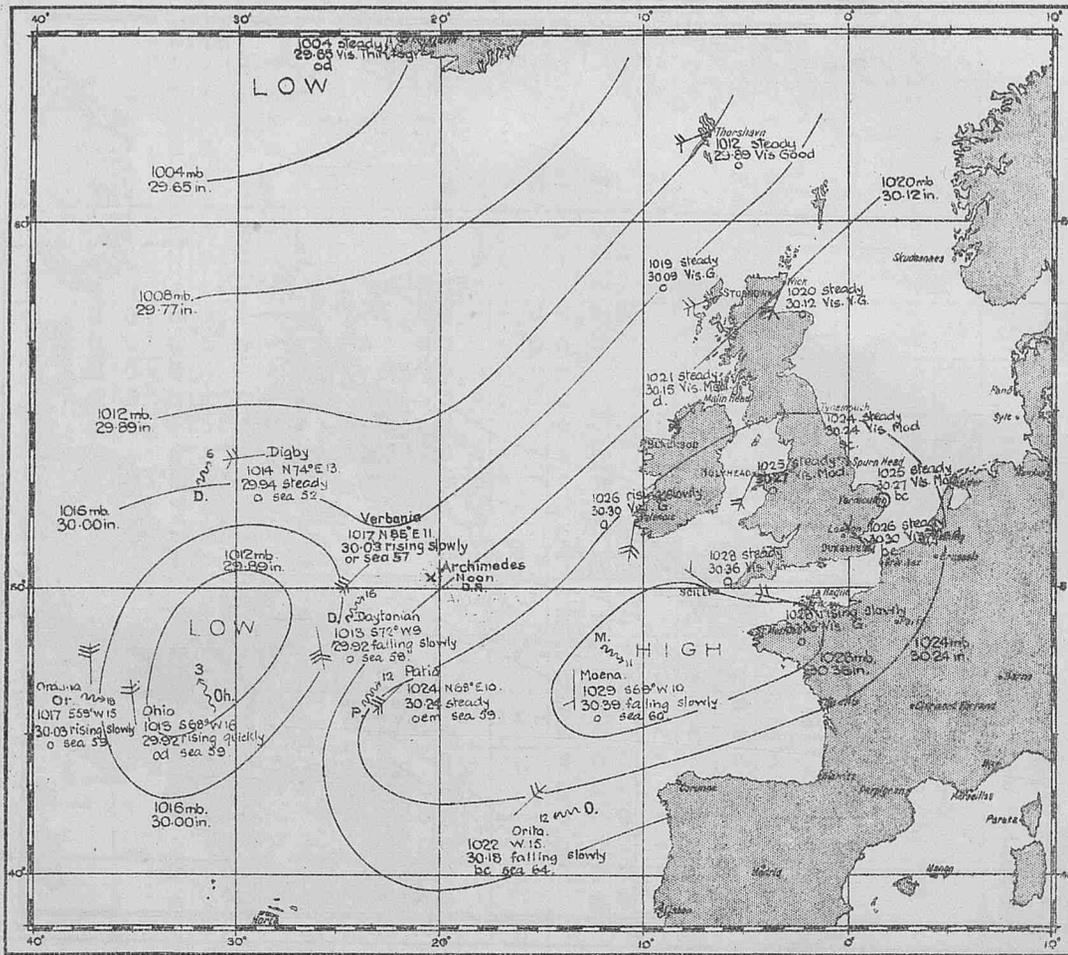
WEATHER CHART XVII.

MORNING OF JUNE 24TH. 1924.



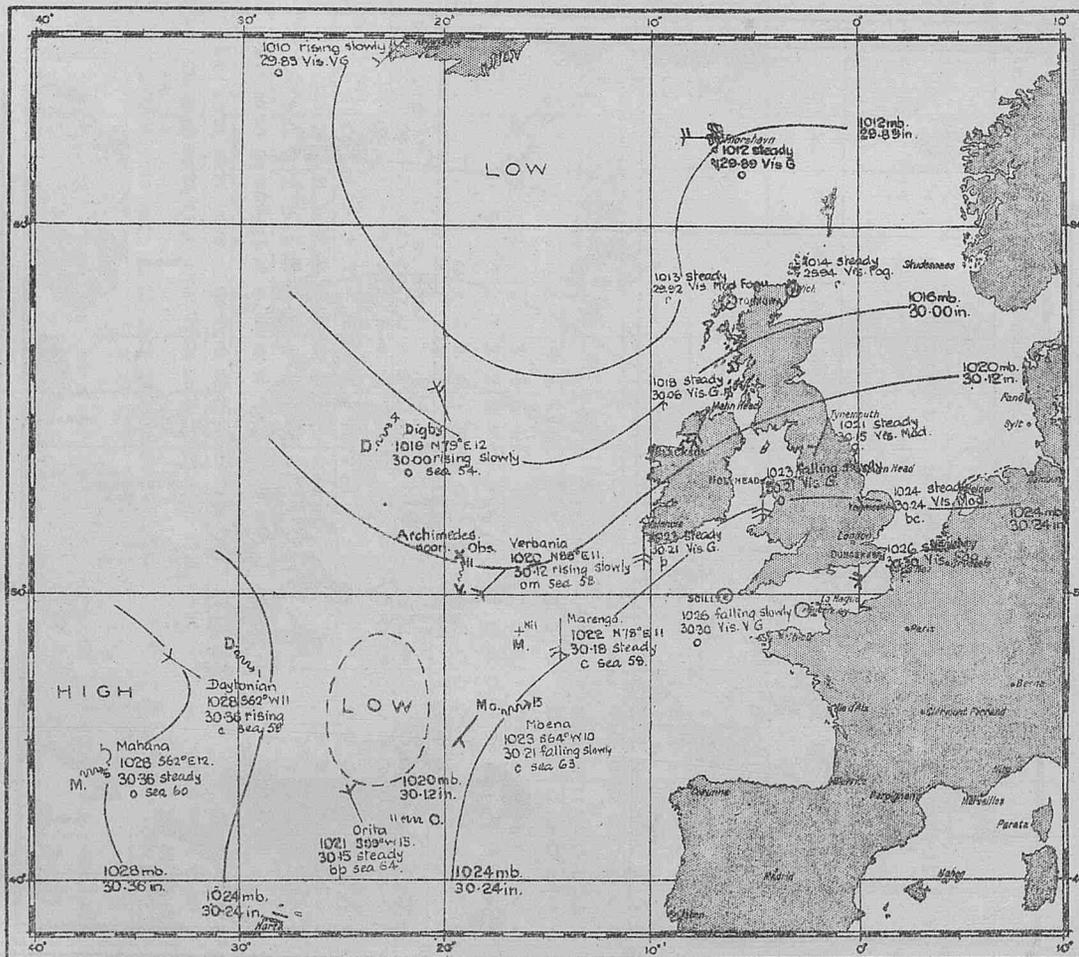
WEATHER CHART XVIII.

MORNING OF JUNE 25TH. 1924.

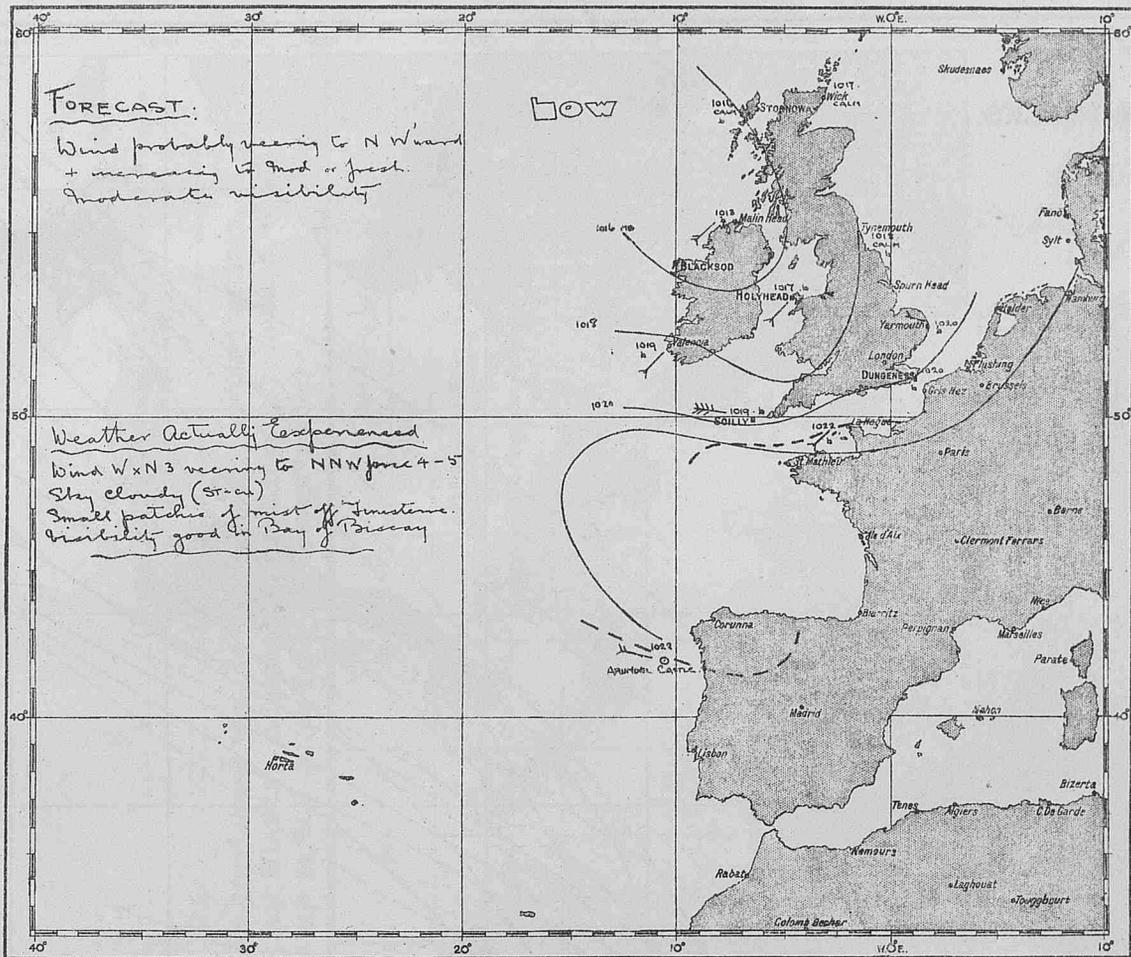


WEATHER CHART XIX.

MORNING OF JUNE 26TH. 1924.

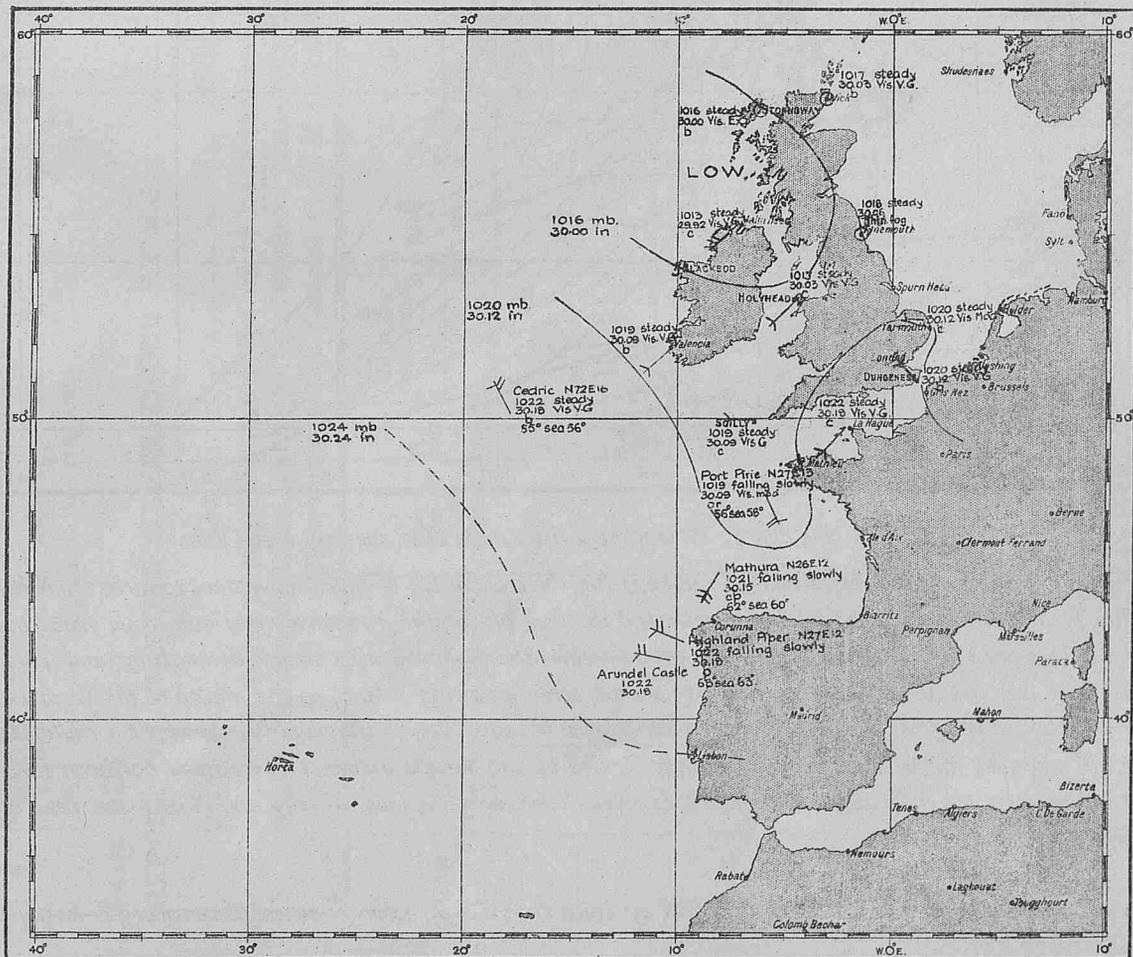


WEATHER CHART XX.



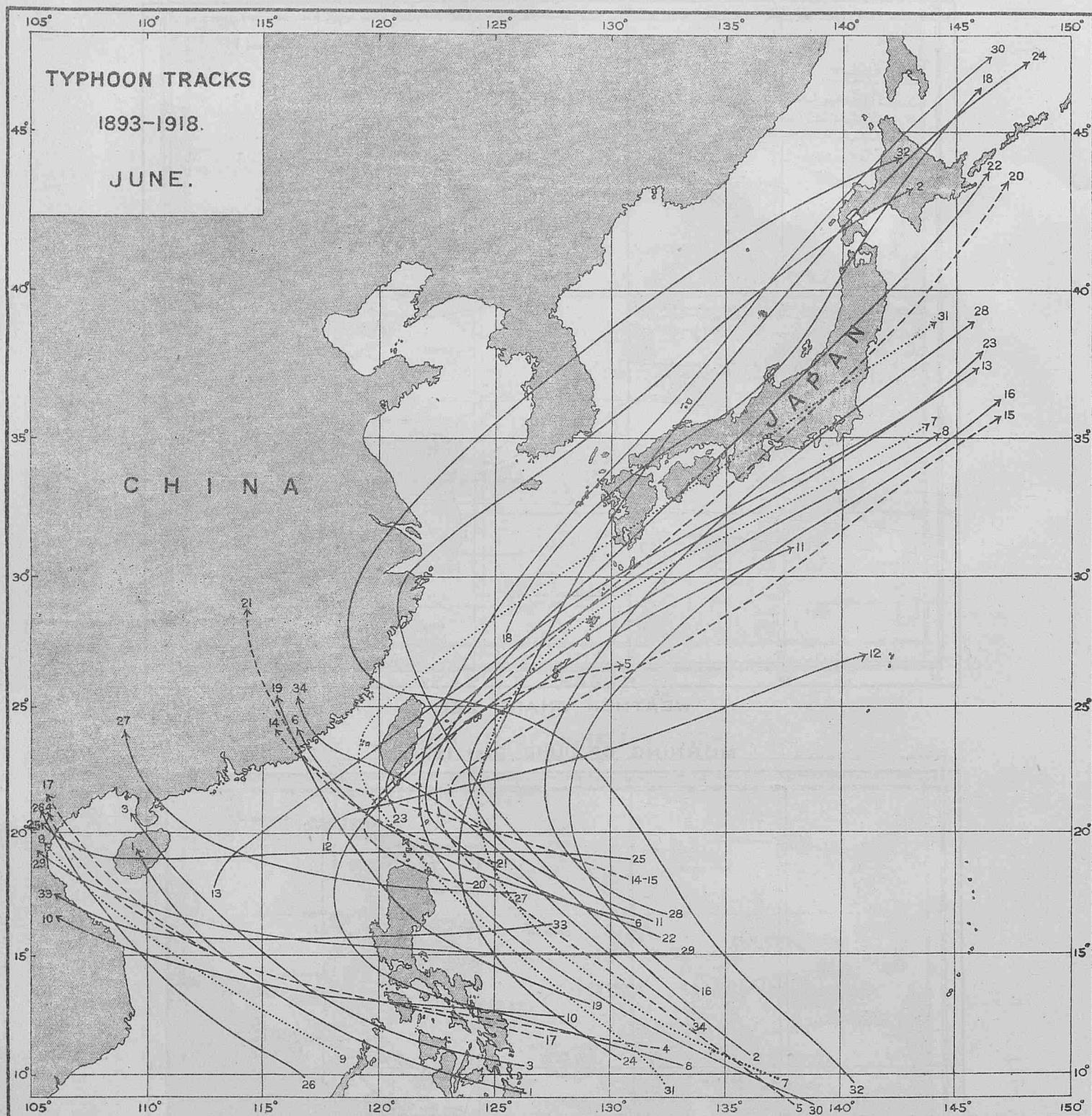
WEATHER CHART XXI.

MORNING OF JUNE 21st. 1924.



WEATHER CHART XXI.A.

TYPHOONS IN THE FAR EAST DURING 26 YEARS.



JUNE. — Single chart : 34 tracks; a little more than one case every year.

The tropical storms have not much increased in numbers, but the translation of their movement towards the N.W. is asserting itself more and more. The Philippines are crossed freely, Hainan and the Gulf of Tongking receive more numerous visits, but the more interesting feature for us is that the coast of China is no more invulnerable; the typhoons may strike Kwangtung and even two instances give the warning that they can rise up to Foochow, and pay a visit, after recurving inland, to the mouth of the Yang-tze kiang.

The recurving of the trajectories takes place, with a fair degree of regularity, in the neighbourhood of the Ballintang and the Bashi Channels, about the 20th parallel, in the great curve of islands formed by the Meiaco-Simas, Formosa and northern Luzon. Thence the tracks are seen to start towards the N.E., in great numbers, to sweep over the Loochoos, Kiushu and Nippon: a few ones begin even to cross the Sea of Japan.

[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].

NOTICE.

REPORTS ON TROPICAL CYCLONES, HURRICANES AND TYPHOONS.

The Commanders and officers of ships, who do not keep full Meteorological logs, will render great assistance, if, when they experience these disturbances, they will record and send in a report in the following form. Printed copies of these forms can be supplied on request.

It will be of great assistance, if, in all cases in the vicinity of cyclones, observers will note the period and length of swell.

Form 905.

REPORT ON CYCLONE EXPERIENCED BY S.S. _____

Captain _____

Owners _____ from _____ to _____

This Form is intended for ships in or near tropical cyclones or hurricanes who do not keep meteorological logs. When completed please return to the Director, Meteorological Office, Air Ministry, Adastral House, Kingsway, London, W.C.2. (Observations are desired even if the ship may be up to 600 miles from the disturbance.)

Date. 192...	Time of Observation.	Position.		Distance.	Barometer Uncorrected. Height above sea.....ft.	Attd. Ther- mometer.	Wind.		Weather by Beaufort Notation.	Sea.		Clouds.			Remarks.
		Lat.	Long.				True Direction.	Force by Beaufort Scale.		True Direction.	Amount Character- istic.	Upper, and direction from which they move.	Lower, and direction from which they move.	Amount 0-10.	
	4 a.m.														
	8 a.m.														
	Noon.														
	4 p.m.														
	8 p.m.														
	Midt.														

Copies of W/I. weather messages received or sent, from or to other ships or the shore, are specially desired.

It is specially desired that it should be stated if the Barometer is Mercurial or Aneroid.

The accompanying blue postcard should be completed in accordance with instructions thereon in order that the error of the barometer may be known. If the position by observation at noon is given when obtained, and by D.R. at noon when sights are not obtained, so long as the courses (True) and distances between each set of weather observations are given with time, it will enable the computers to ascertain the position of the ship when each set of observations is recorded, which is very important. Hourly observations are desirable near the storm centre.

Please state at each Noon how much ship's time differs from G.M.T.; also state if ship's time is used.

If in addition to the observations required by the above form a narrative of the experiences in cyclones is given it will be greatly appreciated. This report will give great assistance in investigating cyclones.

Address to which acknowledgment may be sent _____

ICE CHART.

WESTERN NORTH ATLANTIC.

LETTERS OF TRANSATLANTIC TRACKS INDICATE

- (A) Westbound. From 1st April to 30th June, inclusive.
Eastbound. From 25th March to 7th July, inclusive.
- (F) From 16th May to Opening of Belle Isle route.
Westbound, on approaching Cape Race steer a course to pass 10-miles S. of Cape Race.
Eastbound, steer from position 25 miles S. of Cape Race.
- (G) From opening of Belle Isle route to 14th November.

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

ROUTE NOTICES.

For latest information re Tracks see pages 15-18, "Supplementary Summary of Board of Trade Notices to Mariners," 20th November, 1924, and pages 35-36, March, 1925, "Marine Observer."

SYMBOLS USED ON THE CHART.

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

PHENOMENAL DRIFTS OF ICE.

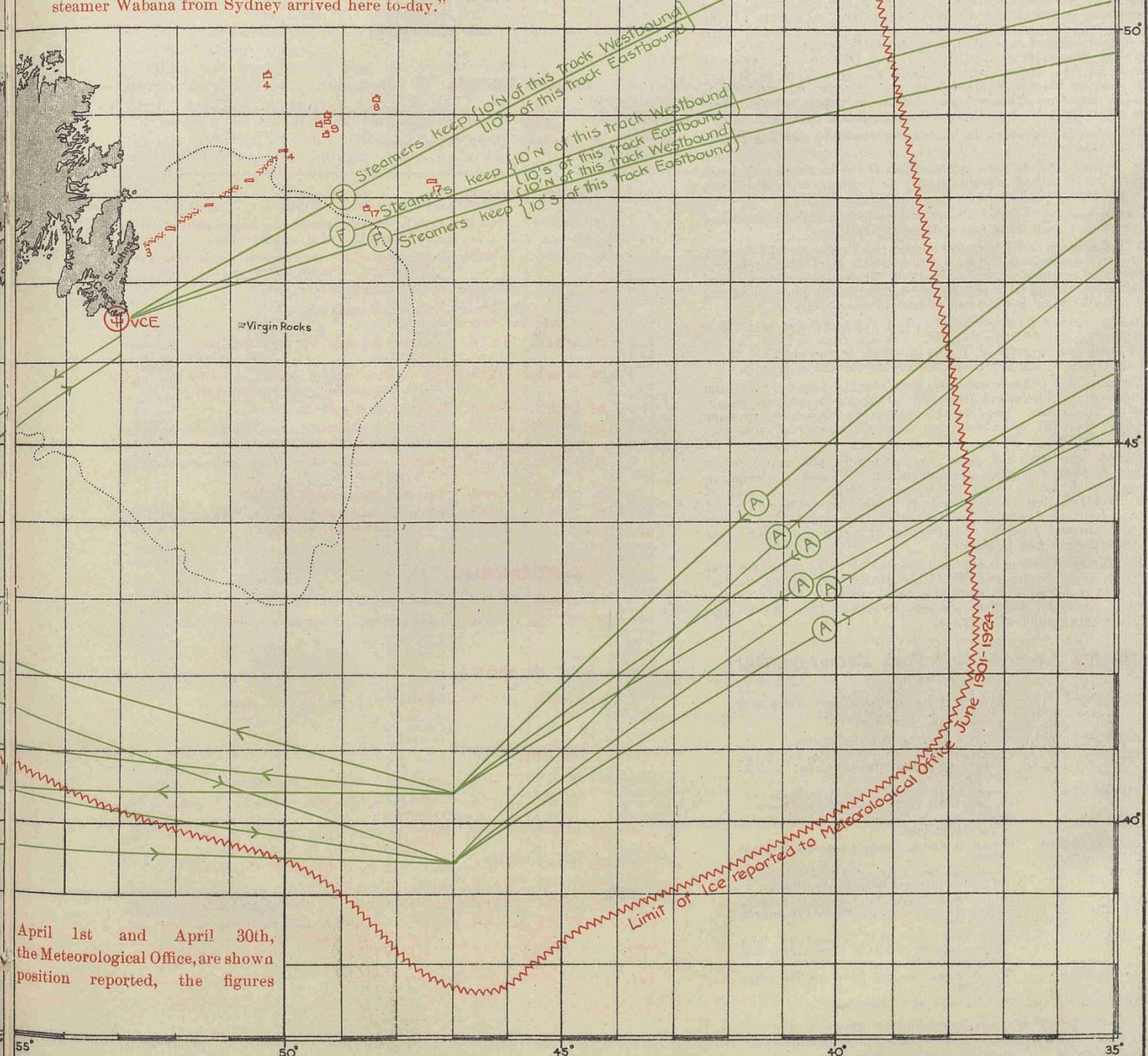
Date.	Ship or Source of Report.	Position.	Remarks.
		Lat. Long.	
June 25, 1886	Brig Blanch...	48°40'N. 15°22'W.	Large berg.
" 5, 1907	S.S. Kingswell...	32°37'N. 64°25'W.	Several bergs.
" - 1907	Bark Silverstream...	80 miles W. of Fastnet.	Berg.
" 11, 1912	S.S. Valetta ...	37°30'N. 74°24'W.	3 pieces of ice.
" 7, 1913	S.S. Holby ...	39°35'N. 64°50'W.	Berg, 10 ft. high.
" 27, 1915	S.S. Stella ...	36°28'N. 57°45'W.	Small piece.
" 30, 1921	U.S. Navy Dept. via Lloyds List.	33°20'N. 49°18'W.	Berg, 10 ft. high.
" 16, 1924	S.S. West Irma, via U.S. Hydro. Office.	38°03'N. 63°20'W.	Growler.

Reports of Ice sighted between April 1st and April 30th, 1925, which have been received by the Meteorological Office, are shown by the Symbols plotted in the indicating the day of the month.

LATEST ICE REPORT FROM CANADA.

The following cablegram, dated 13th, April 1925, was received from the Superintendent, Canadian Signal Service, Quebec:

"Montreal to Gaspé no ice, Anticosti, Magdalen Island, Cabot Strait heavy open ice, Northumberland Strait, Gut Canso no ice in sight, Belle Isle Strait heavy close packed ice distant, steamer Wabana from Sydney arrived here to-day."



April 1st and April 30th, the Meteorological Office, are shown by the Symbols plotted in the position reported, the figures

MARINE METEOROLOGY.**Co-operation of Shipowners, Masters and Mates.**

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

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

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

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

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

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

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

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

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

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

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

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

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

Masters who wish to assist in developing the rapid interchange of Meteorological information and Weather Forecasting at sea can do so by using the standard form, not in code, of W/T Weather Report suggested in "Weather Signals," given in this Journal, January, 1925 Number (see pages 11 and 12). For this purpose a mecurial barometer of which the index error has been ascertained is essential.

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

Marine Agencies and Port Meteorological Officers.

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

LATE PRESS.**DERELICTS AND FLOATING WRECKAGE.**

Date.	Position.		Description.
	Latitude.	Longitude.	
NORTH SEA.			
2.4.25	58°21'N.	3°25'E.	Capsized wooden vessel about 45 ft. long projecting 5 ft.
3.4.25	57°27'N.	9°31'E.	Pieces of floating wreckage apparently from a wooden vessel.
6.4.25	20 m. W.N.W. of West Hinder Lt. V.		Submerged obstruction.
13.4.25	51°15'N.	1°28'E.	Obstruction.
ENGLISH CHANNEL.			
12.4.25	5 m. S.E. of Dungeness.		Two lifeboats and wreckage, dangerous to navigation.
12.4.25	50°52'N.	1°05'E.	Wreckage.
NORTH ATLANTIC.			
1.4.25	50°33'N.	5°16'W.	Floating obstacle painted grey, large shackle on head, projecting about 6 ft. above surface.
1.4.25	41°34'N.	51°58'W.	Large buoy with superstructure and lantern about 12 ft. high. It had a very large round base.
2.4.25	33°43'N.	78°00'W.	Heavy timber floating upright.
2.4.25	16 m. S. from American Shoal.		Waterlogged small boat.
2.4.25	18°33'N.	74°41'W.	Very large stump of tree projecting about 8 ft. out of water.
3.4.25	49°44'N.	6°12'W.	Spar standing upright and supported by two large balls, burning lamp and flag attached.
4.4.25	46°23'N.	7°46'W.	Red conical buoy adrift.
5.4.25	38°18'N.	61°23'W.	Broken mast about 60 ft. long and 2 ft. in diameter, with pin rail attached.
8.4.25	29°33'N.	48°26'W.	Piece of wreckage about 20 ft. long and showing 3 ft. out of water.
11.4.25	65°20'N.	7°49'E.	Telegraph buoy marked 03 adrift.
12.4.25	34°24'N.	74°25'W.	Stump of a mast with fife rail attached and apparently fast to submerged wreckage.
MEDITERRANEAN.			
9.4.25	38°16'N.	13°17'E.	Floating wooden hull 70 ft. long.
24.4.25	42°51'N.	5°44'E.	Drifting buoy surmounted with flag W.
GULF OF MEXICO.			
9.4.25	29°20'N.	92°58'W.	Log about 20 ft. long and 4ft. diameter.
NORTH PACIFIC.			
1.4.25	34°56'N.	131°20'W.	Log about 30 ft. long, 2 ft. diameter.
1.4.25	28°55'N.	138°50'W.	Large submerged tree trunk 30 ft. long, 3 ft. diameter.
3.4.25	52°36'N.	167°55'W.	Large log about 35 ft. long, 2½ ft. diameter, roots projecting about 3 ft. out of water.
6.4.25	45°54'N.	124°48'W.	Dangerous, partly submerged obstruction.
7.4.25	29°54'N.	170°52'W.	Derelict fishing boat.
7.4.25	35°14'N.	156°42'W.	Spar about 30 ft. long covered with marine growth.
8.4.25	35°44'N.	121°35'W.	Partly submerged derelict about 200 ft. long with figure 14 painted on bow and stern.

LIST OF VOLUNTARY OBSERVING SHIPS.

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

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

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

Only in special cases will individual letters be sent.

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

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

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

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

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

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

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

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

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

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

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

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 17.4.25.	Date Received.
<i>Aba</i> ...	Hughes, J. ...	G. Pugh Williams ...	M.L.	Elder Dempster ...	Form 911 11.12.24 to 15.1.25 ...	21.1.25.
<i>Abinsi</i> ...	Wright, J. B. ...	W. Borrows ...	No.	Elder Dempster ...	" 18.2.25 to 28.3.25 ...	14.4.25.
<i>Actor</i> ...	Haylett, E. ...	W. Rennie ...	"	Harrison ...	" 22.8.24 to 6.9.24 ...	7.10.24.
<i>Adda</i> ...	Toft, J. T. ...	J. E. Wood, E. H. Gatward ...	"	Elder Dempster ...	" 12.6.24 to 18.7.24 ...	21.7.24.
50 <i>Adriatic</i> ...	Beadnell, F. E., Commr., R.N.R.	J. Collins, R. Hawkins, A. C. I. Anson, L. G. A. Farmer,	W.T.	White Star ...	W.T. Reg. 10.11.24 to 29.11.24 ...	4.12.24.
<i>Agapenor</i> ...	Ramsay, J. ...	J. P. Makepeace ...	No.	A. Holt ...	Form 911 14.2.25 to 6.3.25 ...	13.3.25.
<i>Alban</i> ...	Torrible, R. H. ...	G. E. Freeman ...	"	Booth ...	" 8.1.25 to 2.2.25 ...	23.3.25.
<i>Albania</i> ...	Gronow, S. ...	E. W. Connell ...	"	Cunard ...	" 20.3.25 to 31.3.25 ...	8.4.25.
<i>Algerian Prince</i> ...	Shaw, D. C. ...	G. Potts ...	"	Prince ...	" 4.12.24 to 17.3.25 ...	1.4.25.
<i>Alipore</i> ...	Gordon, L. M., R.D., Commr., R.N.R.	F. R. W. Page ...	"	P. and O. ...	" 17.3.25 to 31.3.25 ...	6.4.25.
<i>Almanzora</i> ...	Mackenzie G. A. ...	A. P. Portsmouth ...	"	R.M.S.P. ...	" 15.2.25 to 3.3.25 ...	23.3.25.
<i>Alondra</i> ...	J. J. Prendergast ...	J. B. Corlett ...	"	Yeoward ...	" 6.2.25 to 23.3.25 ...	26.3.25.
<i>Ampetco</i> ...	Verstichelen, A. ...	E. Smet ...	"	American Petroleum ...	" 28.2.25 to 23.3.25 ...	27.3.25.
<i>Anglia</i> ...	Sorge, P. ...	W. H. Hughes ...	C.C.	L.M. & S. Rly. ...	" 31.1.25 to 1.3.25 ...	3.4.25.
<i>Antiochus</i> ...	Wilkinson, H. ...	A. C. D. Howes ...	No.	A. Holt ...	Telegraphic Report 11.4.24 ...	11.4.24.
<i>Aorangi</i> ...	Crawford, R. ...	R. B. Denniston ...	M.L.	Canadian-Australasian ...	Form 911 4.3.25 to 29.3.25 ...	16.4.25.
<i>Appam</i> ...	Yardley, H. A. ...	B. Holt, J. Doyle, P. Marriott ...	M.L.	Elder Dempster ...	Met. Log. 9.7.24 to 21.12.24 ...	29.12.24.
30 <i>Aquitania</i> ...	Charles, Sir J. T., W. K.B.E., C.B., R.D., Commodore, R.N.R.	J. L. Croasdaile, P. O. Davis, J. Locke.	W.T.	Cunard ...	W.T. Reg. 5.3.25 to 19.3.25 ...	23.3.25.
<i>Arafura</i> ...	Gordon, A. S. ...	R. Lloyd Harry ...	No.	Eastern and Australian Union Castle ...	" 29.3.25 to 13.4.25 ...	16.4.25.
<i>Armadales Castle</i> ...	Millard, L. A. ...	M. M. Tomkins ...	M.L.	P. Henderson ...	Form 911 17.8.24 to 18.10.24 ...	15.12.24.
<i>Arracan</i> ...	Willis, M. ...	McInnes, M. S. Stuart, A. McCullum, R. Morrison.	M.L.	Met. Log. 27.9.24 to 7.2.25 ...	" 2.1.25 to 18.1.25 ...	10.2.25.
<i>Arundel</i> ...	Short, H. ...	Mr. Hill ...	C.C.	Southern Rly. ...	Met. Log. 27.9.24 to 7.2.25 ...	25.2.25.
<i>Arundel Castle</i> ...	Hague, J. W., Commr., R.N.R.	G. Blaklock, C. Williams, F. Granger.	M.L.	Union Castle ...	Telegraphic Report 1.2.25 ...	1.2.25.
<i>Assyria</i> ...	Erskine, R. ...	R. L. A. Hamilton ...	No.	Anchor ...	Met. Log. 12.9.24 to 4.1.25 ...	12.1.25.
<i>Astronomer</i> ...	Booth, W. M. ...	L. Harriman, H. Thomas, E. Shatton.	M.L.	Harrison ...	Form 911 24.1.25 to 25.2.25 ...	26.3.25.
<i>Athenic</i> ...	Davies, E. ...	W. Hill ...	No.	White Star ...	Met. Log. 11.1.24 to 8.2.25 ...	18.2.25.
<i>Atsuta Maru</i> ...	Furuhashi, M. ...	S. Mizoguchi ...	"	Nippon Yusen Kaisha ...	Form 911 14.3.25 to 28.3.25 ...	15.4.25.
<i>Auditor</i> ...	Owen, W. F. ...	T. E. Steel ...	"	Harrison ...	" 3.1.25 to 2.2.25 ...	9.3.25.
<i>Auldmuir</i> ...	Ramsay, J. D. ...	J. A. S. Adams ...	"	Glen & Co. ...	" 11.3.25 to 24.3.25 ...	15.4.25.
<i>Ausonia</i> ...	Gibbons, G., R.D., Commr., R.N.R.	A. T. Hamer ...	"	Cunard ...	" 11.10.24 to 27.10.24 ...	11.11.24.
<i>Avon</i> ...	Matthews, J. E. P.	...	No.	R.M.S.P. ...	" 21.2.25 to 16.3.25 ...	20.3.25.
51 <i>Baltic</i> ...	A. Holme ...	E. A. A. Crowley, J. Law, F. Patchett.	W.T.	White Star ...	Form 911 ...	...
<i>Bambra</i> ...	Wyles, W. S. ...	G. Buckeridge, H. W. Norris, W. Walters, V. Denton, G. Simpson.	M.L.	State Service, Australia ...	W.T. Reg. 23.3.25 to 11.4.25 ...	16.4.25.
<i>Bampton Castle</i> ...	Swiney, W. A. ...	A. E. Benn, D. Campbell, S. E. Aldam.	"	Union Castle ...	Form 911 22.2.25 to 11.4.25 ...	15.4.25.
<i>Banbury Castle</i> ...	...	C. G. Page ...	No.	Turnbull Martin ...	Met. Log. 12.11.24 to 28.2.25 ...	16.4.25.
<i>Banffshire</i> ...	Wynne, R. H. ...	J. M. Bowie ...	"	Commonwealth Govt. ...	" 28.11.24 to 25.2.25 ...	17.3.25.
<i>Barambah</i> ...	Daniel, F. ...	T. Swann ...	"	Hogarth & Sons ...	Form 911 20.2.25 to 27.3.25 ...	6.4.25.
<i>Baron Cawdor</i> ...	Baillie, T. ...	A. Campbell ...	"	British India ...	" 29.11.24 to 18.12.24 ...	9.3.25.
<i>Barpeta</i> ...	Beedle, T. S. ...	W. G. E. Rawlingson ...	"	His Majesty's Ship ...	" 15.8.24 to 28.8.24 ...	16.10.24.
<i>Beaufort</i> ...	Rice, W. V., D.S.O., D.S.C., Commr., R.N.	H. M. S. Forbes ...	M.L.	Met. Log. 28.7.24 to 3.11.24 ...	" 4.2.25 to 7.3.25 ...	30.3.25.
59 <i>Belgenland</i> ...	Bradshaw, J. ...	C. J. Murray, J. M. Appleby, H. H. Grace.	W.T.	Red Star ...	" 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 ...	W.T. Reg. 26.9.24 to 16.10.24 ...	20.10.24.
<i>Bengloe</i> ...	McCorquodale, A. ...	G. M. Duff ...	"	Ben Line ...	Form 911 26.9.24 to 15.10.24 ...	20.10.24.
31 <i>Berengaria</i> ...	Irvine, W. R. D., R.D. Capt., R.N.R.	R. F. Bovey, C. H. Morris, J. A. Myles.	W.T.	Cunard ...	" 6.3.25 to 16.3.25 ...	2.4.25.
					W.T. Reg. 25.11.24 to 13.12.24 ...	20.12.24.
					Form 911 15.3.25 to 30.3.25 ...	2.4.25.
					Form 911 28.1.25 to 13.2.25 ...	16.2.25.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 17.4.25.	Date Received.
<i>Bernini</i> ...	Evans, W. ...	H. J. Rudd ...	No.	Lampport & Holt ...	Form 911 21.11.24 to 31.1.25...	16.2.25.
<i>Berrima</i> ...	Townshend, W. P. ...	H. C. Shinn ...	No.	P. & O. Branch ...	" 28.10.24 to 11.11.24 ...	15.12.24.
<i>Bogota</i> ...	Dunn, R. E., O.B.E. ...	T. R. Thomas ...	No.	R.M.S.P. Co. ...	" 11.2.25 to 11.3.25 ...	14.4.25.
<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. ...	S. W. Keay ...	No.	P. & O. Branch ...	Form 911 4.9.24 to 15.1.25 ...	6.2.25.
<i>Bothwell</i> ...	Hamilton, G. ...	W. J. P. Roberts, G. B. Marriott ...	No.	Canadian Pacific ...	" 23.1.25 to 27.2.25 ...	2.3.25.
<i>Brandon</i> ...	Mc. Combie, G. F. G. ...	J. Mackenzie, H. C. Waters, ...	M.L.	" "	" 22.12.24 to 24.1.25 ...	30.1.25.
<i>Brecon</i> ...	J. Newman ...	T. J. Webster, D. Durin, ...	M.L.	" "	Met. Log. 2.12.24 to 24.2.25 ...	4.3.25.
<i>Brenda</i> ...	Murdoch, R. G. ...	N. B. Goater, T. Golby. ...	No.	Scottish Fishery Board ...	Form 911 1.3.25 to 31.3.25 ...	3.4.25.
<i>Brighton</i> ...	Hill, A. ...	F. R. Ness ...	C.C.	Southern Railway ...	Telegraphic Report 16.4.25 ...	16.4.25.
<i>British Advocate</i> ...	Taylor, R. J. ...	Mr. Munton ...	No.	British Tankers ...	" "	" "
<i>British Engineer</i> ...	T. W. Joures ...	E. L. Miller ...	No.	" "	Form 911 2.12.24 to 1.1.25 ...	16.2.25.
<i>Browning</i> ...	Connorton, C. A. ...	W. E. Johnston ...	"	Lampport & Holt ...	" 17.11.25 to 6.2.25 ...	23.2.25.
<i>Bruyere</i> ...	Denson, W. ...	C. E. Legg ...	"	" "	" 27.2.25 to 21.3.25 ...	14.4.25.
<i>Cambria C.S.</i> ...	Wightman, H. G. E., D.S.C. ...	E. N. L. Staples ...	M.L.	Eastern Tel. Co. ...	Met. Log. 8.7.24 to 5.10.24 ...	27.1.25.
<i>Cambria</i> ...	...	V. S. Phillips ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report 14.3.25 ...	14.3.25.
<i>Camito</i> ...	Scudamore, J. H. H., D. S. C., R. D., Commr., R.N.R. ...	D. A. Jack, R. M. Cossantine, S. Borrie, S. Ray. ...	M.L.	Elders & Fyffes ...	Met. Log. 8.7.24 to 13.12.24 ...	19.12.24.
<i>Canada</i> ...	Jones, T. ...	F. W. Laws ...	No.	White Star-Dominion ...	Form 911 29.11.24 to 20.12.24 ...	30.12.24.
<i>Canadian Importer</i> ...	...	K. Macleod ...	"	Canadian Govt. Mercantile Marine. ...	Form 911 ...	...
<i>Canadian Raider</i> ...	Dixon, C. G. ...	H. W. Mosher ...	"	Canadian Govt. Merchant Marine. ...	Form 911 28.12.24 to 10.1.25 ...	13.3.25.
<i>Canadian Scottish</i> ...	Forson, A. ...	S. Fieldhouse ...	"	" " " ...	" 8.1.25 to 24.1.25 ...	9.2.25.
<i>Canadian Skirmisher</i> ...	Millar, W. H. ...	C. W. Crofts ...	"	" " " ...	Form 911 21.1.25 to 1.3.25 ...	3.3.25.
<i>Canadian Winner</i> ...	Hocking, N. P. ...	R. D. Ranns ...	"	" " " ...	" 2.2.25 to 5.3.25 ...	30.3.25.
<i>Carlow Castle</i> ...	Whitfield, G. J. ...	L. H. Stevens ...	"	Union Castle ...	" 21.8.24 to 3.1.25 ...	6.1.25.
<i>35 Carmania</i> ...	McNeil, S. G. S., R.D., Capt., R.N.R. ...	S. Schofield, W. M. Stewart, T. A. O. Ellis. ...	W.T.	Cunard ...	W.T. Reg. 16.3.25 to 4.4.25 ...	7.4.25.
<i>34 Caronia</i> ...	Hossack, W. H., R.D., Capt., R.N.R. ...	J. A. Quarrie, E. R. Taylor, P. Clarke. ...	W.T.	Cunard ...	Form 911 14.3.25 to 4.4.25 ...	6.4.25.
<i>Cassandra</i> ...	Mitchell, W. E. ...	G. M. Sime ...	No.	Anchor Donaldson ...	Form 911 8.10.24 to 16.12.24 ...	18.12.24.
<i>52 Cedric</i> ...	Hickson, V. W. ...	A. E. Weller, G. T. Kavanagh, W. A. Calway. ...	W.T.	White Star ...	W.T. Reg. 16.3.25 to 4.4.25 ...	8.4.25.
<i>53 Celtic</i> ...	Berry, G. ...	R. S. Walker, D. W. Chamberlain, R. H. Shaw. ...	W.T.	" " " ...	W.T. Reg. 2.3.25 to 21.3.25 ...	26.3.25.
<i>Centaur</i> ...	Rose, A. F. ...	L. Johnstone ...	No.	A. Holt & Co. ...	Form 911 2.12.24 to 23.1.25 ...	20.2.25.
<i>Ceramic</i> ...	Summers, F. F. ...	E. E. Burt ...	"	White Star ...	Form 911 12.11.24 to 16.12.24 ...	29.12.24.
<i>Changsha</i> ...	Gambrill, F. C. ...	A. M. Frame, F. G. Stratford, H. Lishman, L. A. Baillie, W. Bailley. ...	M.L.	Yuill & Co. ...	Met. Log. 25.4.24. to 2.10.24... ..	10.3.25.
<i>China</i> ...	King, A., D.S.C. ...	E. Cox Walker ...	No.	P. & O. ...	Form 911 9.4.24 to 20.5.24 ...	26.5.24.
<i>Chindwara</i> ...	Brisley, P. L. ...	A. G. Earl ...	"	British India ...	" 15.12.24 to 22.2.25 ...	23.3.25.
<i>Chindwin</i> ...	Esslemont, C. ...	J. Summers, W. Wilson, J. G. Walker. ...	M.L.	P. Henderson ...	Met. Log. 28.12.24 to 12.3.25 ...	27.3.25.
<i>Chinhua</i> ...	Byers, G. ...	Messrs. Stringer, Taylor, W. E. Chapman, L. V. Rowe. ...	"	China Nav. Co. ...	" 10.7.24 to 15.11.24... ..	3.2.25.
<i>City of Alexandria</i> ...	Bedford, G. B. ...	T. Telleson ...	No.	Ellerman ...	Form 911 9.2.25 to 16.2.25 ...	25.2.25.
<i>City of Baroda</i> ...	Houghton, W. ...	A. D. Henderson ...	M.L.	" " " ...	Met. Log. 29.10.23 to 29.9.24... ..	6.11.24.
<i>City of Batavia</i> ...	Sproule, A. ...	S. J. Nash ...	No.	" " " ...	Form 911 27.12.24 to 25.1.25 ...	9.3.25.
<i>City of Benares</i> ...	Nancollas, H. E. ...	A. A. Fullerton ...	"	" " " ...	" 6.12.24 to 17.12.24 ...	26.1.25.
<i>City of Brisbane</i> ...	McArthur, J. ...	W. E. Fletcher ...	"	" " " ...	" 29.12.24 to 28.1.25 ...	2.2.25.
<i>City of Canterbury</i> ...	Seaborne, F. O. ...	A. M. Hamilton ...	"	" " " ...	" 8.9.24 to 9.11.24 ...	14.11.24.
<i>City of Chester</i> ...	Macdonald, K., O.B.E. ...	F. C. Wilson ...	M.L.	" " " ...	Met. Log. 29.4.24 to 27.10.24... ..	18.11.24.
<i>City of Edinburgh</i> ...	Teague, R. E. ...	E. V. Henday ...	No.	" " " ...	Form 911 31.8.24 to 30.9.24 ...	16.10.24.
<i>City of London</i> ...	Spencer, H. ...	J. L. Mumford ...	"	" " " ...	" 11.2.25 to 23.2.25 ...	3.3.25.
<i>City of Marseilles</i> ...	Martin, D. ...	W. J. Nixon ...	"	" " " ...	" 5.12.24 to 28.12.24... ..	6.1.25.
<i>City of Rangoon</i> ...	Brown, G. ...	W. Ibbotson, S. L. Hoare, C. A. Dexter. ...	M.L.	" " " ...	Met. Log. 25.4.23 to 9.8.23 ...	16.8.23.
<i>City of Valencia</i> ...	Williams, T. L. ...	T. A. Dexter. ...	"	" " " ...	" "	" "
<i>City of Yokohama</i> ...	Williamson, W. A., R.D., Lieut.-Commr. R.N.R. ...	C. C. Duncan ...	No.	" " " ...	Form 911 14.11.24 to 4.2.25 ...	20.2.25.
<i>Clan Cumming</i> ...	McDonald, W. D. ...	R. Moloney ...	"	" " " ...	" 11.1.25 to 18.2.25 ...	6.4.25.
<i>Clan Lindsay</i> ...	McLean, J. G. ...	S. M. Werrey Easterbrook ...	"	Clan ...	" 25.12.24 to 29.1.25 ...	9.3.25.
<i>Clan Macbeth</i> ...	Worthington, C. D. ...	G. K. Johnson ...	"	" " " ...	Form 911 8.10.24 to 13.11.24... ..	19.11.24.
<i>Clan Macgillivray</i> ...	Young, A. H., R.D., Lieut.-Commr., R.N.R. ...	T. Lund ...	"	" " " ...	" 27.2.25 to 26.3.25 ...	2.4.25.
<i>Clan Macindoe</i> ...	West, W. F. ...	P. G. de Gruchy ...	"	" " " ...	" 19.2.25 to 6.3.25 ...	30.3.25.
<i>Clan Mackellar</i> ...	Miller, W. ...	F. G. Darnborough ...	"	" " " ...	" 24.9.24 to 27.11.24... ..	3.12.24.
<i>Clan Mackenzie</i> ...	Scotland, A. ...	A. V. Howard ...	"	" " " ...	" 25.2.25 to 9.3.25 ...	14.4.25.
<i>Clan Mackinnon</i> ...	Young, G. ...	W. G. Arthur, F. B. Fairweather. ...	"	" " " ...	" 7.11.24 to 21.11.24... ..	12.12.24.
<i>Clan Macphee</i> ...	Mackie, R. W. ...	W. S. Holden, T. V. Wilson, C. Jones. ...	M.L.	" " " ...	Met. Log. 6.9.24 to 15.12.24 ...	22.1.25.
<i>Clan Maclaggart</i> ...	Gourlay, J. B. ...	W. D. E. Campbell, F. Buckley, E. C. Carter. ...	M.L.	" " " ...	Met. Log. 13.6.24 to 26.12.24... ..	2.3.25.
<i>Clan Maclaurin</i> ...	Gray, J. N. ...	T. Walls ...	No.	" " " ...	Form 911 11.1.25 to 8.2.25 ...	14.3.25.
<i>Clan Malcolm</i> ...	Phillips, G. P. ...	L. S. Murrin ...	"	" " " ...	" 24.2.25 to 18.3.25 ...	14.4.25.
<i>Clan Morrison</i> ...	Higgins, C. J. ...	T. G. Young, R. F. Buckley ...	M.L.	" " " ...	Met. Log. 6.10.24 to 30.3.25 ...	6.4.25.
<i>Clan Murdoch</i> ...	Porterfield, W. M. ...	G. Morren ...	No.	" " " ...	Form 911 1.4.25 to 6.4.25 ...	16.4.25.
<i>Clan Randall</i> ...	Pagan, J. C. ...	C. W. Thomas ...	"	" " " ...	" 10.1.25 to 5.2.25 ...	2.3.25.
<i>Clan Ross</i> ...	Openshaw, L. G. ...	W. H. D. Stephen ...	"	" " " ...	" 8.2.25 to 28.3.25 ...	3.4.25.
<i>Clan Stclair</i> ...	Jones, R. C. ...	G. Short ...	"	" " " ...	" 24.1.25 to 11.2.25 ...	23.3.25.
<i>Clan Stuart</i> ...	Nell, G. A. ...	F. B. Parker ...	"	" " " ...	" 21.12.24 to 31.1.25 ...	5.2.25.
<i>Clan Urquhart</i> ...	Stenson, F. J., R.D., Commr. R.N.R. ...	R. Silk ...	"	" " " ...	" 30.1.25 to 25.2.25 ...	17.3.25.
<i>Colonia, C.S.</i> ...	Gibb, A. F. W. ...	R. H. Law ...	"	" " " ...	" 23.1.25 to 1.3.25 ...	3.3.25.
<i>Colonial</i> ...	Campos, V., O.B.E., Lt.-Commr., R.N.R. ...	S. A. Garnham, A. S. Muir, J. M. Matthews, W. Sangwine. ...	M.L.	Telegraph Construction & Maintenance. ...	Met. Log. 4.10.24 to 21.1.25 ...	30.1.25.
<i>Colombian</i> ...	Barrow, R. K. ...	D. Wolstenholme ...	No.	Harrison ...	Form 911 3.1.25 to 2.4.25 ...	15.4.25.
<i>Columbia</i> ...	Gittins, R. P. ...	W. R. Vaughan ...	"	Leyland ...	" 16.1.25 to 12.2.25 ...	20.2.25.
	Gemmell, W. ...	J. K. Macmillan ...	"	Anchor ...	" 8.3.25 to 29.3.25 ...	2.4.25.

LIST OF VOLUNTARY OBSERVING SHIPS

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 17.4.25.	Date Received.
<i>Concordia</i> ...	Lawson, P. ...	...	M.L.	Anchor Donaldson ...	Met. Log. ...	...
<i>Comino</i> ...	Nuttall, E. L. ...	A. McVicar ...	No.	Furness Withy ...	Form 911 9.9.24 to 14.10.24 ...	22.10.24.
<i>Cooce</i> ...	Festa, M. ...	C. Keen ...	"	Commonwealth Govt. ...	" 9.8.24 to 29.8.24 ...	7.10.24.
<i>Corinthic</i> ...	Hart, F. ...	F. Kean, W. Fitzgerald, F. G. Rogers, ...	M.L.	White Star ...	Met. Log. 28.11.24 to 17.3.25 ...	26.3.25.
<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> ...	Haines, F. P. ...	Mr. Maltby, Mr. Ray ...	"	Dowie, J., & Co. ...	" 4.1.25 to 26.1.25 ...	23.3.25.
<i>Crawford Castle</i> ...	Morgan, A. O., R.D., Commr. R.N.R.	G. Montgomery ...	"	Union Castle ...	" 10.3.25 to 26.3.25 ...	8.4.25.
<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. ...	K. S. Monro, J. Watson ...	No.	Booth ...	Form 911 10.3.25 to 30.3.25 ...	1.4.25.
<i>Cyclops</i> ...	Cosker, W. ...	R. W. Ellis ...	"	A. Holt ...	" 5.12.24 to 27.2.25 ...	3.3.25.
<i>Dardanus</i> ...	Shaw, A. T. ...	...	No.	A. Holt ...	" 22.1.25 to 7.2.25 ...	23.3.25.
<i>Darian</i> ...	Masters, W. ...	A. S. Holland ...	"	Leyland ...	" 22.2.25 to 3.4.25 ...	6.4.25.
<i>Darro</i> ...	Smith, W. E., D.S.O., R.D., Capt., R.N.R.	W. H. Fowler ...	"	R.M.S.P. Co. ...	" 7.2.25 to 5.4.25 ...	17.4.25.
<i>Daytonian</i> ...	Walker, C. J., D.S.C.	W. T. Godwin ...	"	Leyland ...	" 1.2.25 to 4.3.25 ...	13.3.25.
<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> ...	Willan, F. C. L. ...	E. Hewitt ...	"	R.M.S.P. Co. ...	" 15.2.25 to 7.3.25 ...	23.3.25.
<i>Demosthenes</i> ...	Williams, W. J. ...	R. A. Alcock ...	"	Aberdeen ...	" 31.1.25 to 19.2.25 ...	10.3.25.
<i>Deseado</i> ...	Wakeman, E. C. ...	S. G. Dawson ...	"	R.M.S.P. Co. ...	" 21.11.24 to 10.1.25 ...	16.1.25.
<i>Desna</i> ...	Shillitoe, B., R.D., Commr. R.N.R.	A. Hambly ...	"	"	" 27.12.24 to 21.2.25 ...	3.3.25.
<i>Deucalion</i> ...	Findlay, J. ...	P. W. Savery, F. W. Duffy ...	"	A. Holt ...	" 14.2.25 to 2.3.25 ...	23.3.25.
<i>Devon</i> ...	Gardner, H. W. ...	A. Bell ...	"	New Zealand S.S. Co. ...	" 20.12.23 to 11.5.24 ...	4.6.24.
<i>Dieppe</i> ...	Marmery, S. ...	Mr. Parsons ...	C.C.	Southern Railway ...	Telegraphic Report 17.4.25 ...	17.4.25.
<i>Digby</i> ...	Westgarth, W. A., D.S.C.	J. Pascoe, J. W. Murphy, W. P. Paterson.	M.L.	Furness Withy ...	Met. Log. 17.4.24 to 9.11.24 ...	26.11.24.
<i>Dimboola</i> ...	Chambers, F. W., D.S.C.	...	"	"	"	"
<i>Discoverer</i> ...	Roy, C. M. ...	F. L. Heppell ...	No.	Melbourne S.S. Co. ...	Form 911 31.1.25 to 11.2.25 ...	23.3.25.
<i>Dogra</i> ...	Ling, J. T. ...	J. Richardson ...	"	Harrison ...	" 30.11.24 to 9.3.25 ...	11.3.25.
<i>Domala, M.V.</i> ...	Hartock, L. ...	E. C. Akers ...	"	Asiatic S.N. Co. ...	" 27.12.24 to 12.1.25 ...	2.2.25.
<i>Doric</i> ...	Buswell, W. ...	C. E. Merchant ...	"	British India ...	" 1.2.25 to 11.2.25 ...	2.3.25.
<i>Doric Star</i> ...	S. Bolton ...	S. Fieldwood, T. F. Pratt, O. V. Lucas.	"	White Star ...	W.T. Reg. 9.2.25 to 1.3.25 ...	5.3.25.
<i>Dorington Court</i> ...	Thomas, R. T. ...	T. Williams ...	"	Blue Star ...	Form 911 28.2.25 to 11.3.25 ...	23.3.25.
<i>Dorsel</i> ...	Isaacs, W. A. ...	E. V. Quickenden ...	"	Haldin & Co. ...	" 17.8.24 to 8.9.24 ...	18.9.24.
<i>Dromore Castle</i> ...	H. S. White, H. Neagle, J. S. Bloomfield, L. Cann.	S. S. Smith ...	M.L.	New Zealand S.S. Co. ...	Met. Log. 3.4.24 to 6.10.24 ...	10.10.24.
<i>Dryden</i> ...	Vincent, E. S., R.D., Commr. R.N.R.	...	No.	Union Castle ...	Form 911 17.2.25 to 4.3.25 ...	23.3.25.
<i>Dundrum Castle</i> ...	Knight, R. A. ...	G. D. Oldfield ...	"	Lampart & Holt ...	" 28.9.24 to 7.12.24 ...	6.1.25.
<i>Duendes</i> ...	Kershaw, H. J. ...	R. May ...	"	Union Castle ...	" 7.2.25 to 7.3.25 ...	30.3.25.
<i>Duffield</i> ...	Pape, E. R. ...	D. P. Morgan ...	"	Pacific S.N. Co. ...	" 22.11.24 to 24.12.24 ...	29.12.24.
<i>Duquesa</i> ...	King, A. ...	T. S. Robertson ...	"	Hunting & Sons ...	" 10.11.24 to 9.12.24 ...	16.12.24.
<i>Durenda</i> ...	Ellis, F. ...	C. P. Lane, W. Thornton ...	"	Furness Withy ...	Form 911 18.1.25 to 21.3.25 ...	26.3.25.
<i>Edinburgh Castle</i> ...	Wilson, W. ...	W. H. Creese ...	"	British India ...	" 6.10.24 to 12.11.24 ...	15.12.24.
<i>Eemland</i> ...	Strong, H., R.D., Commr. R.N.R.	...	M.L.	Union Castle ...	Met. Log. 11.4.24 to 12.10.24 ...	27.10.24.
<i>El Cordobes</i> ...	Van Noppen, C. D.	J. G. Sander ...	No.	Holland Lloyd ...	Form 911 27.11.24 to 4.2.25 ...	10.3.25.
<i>Elmina</i> ...	Noton, F. G. ...	J. W. Ekins ...	"	British & Argentine S.N. Co. ...	" 2.2.25 to 24.2.25 ...	23.3.25.
<i>El Paraguayo</i> ...	Millson, H. E. ...	R. Wilkinson, C. Cryer, R. Griffiths.	M.L.	Elder Dempster ...	Met. Log. 10.10.24 to 21.2.25 ...	11.3.25.
<i>Elpenor</i> ...	Ellis, F., D.S.C. ...	W. E. Williams ...	No.	Houlder Bros. ...	Form 911 8.11.24 to 8.1.25 ...	16.1.25.
<i>Empress of Asia</i> ...	T. W. Hannay ...	P. E. Wright, W. T. Pennington.	M.L.	A. Holt ...	Met. Log. 3.11.24 to 18.2.25 ...	23.2.25.
<i>Empress of Australia</i> ...	Douglas, L. D., R.D., Lt. - Commr., R.N.R.	G. H. Blyth, A. M. Barff, D. Smith, L. Johnston ...	M.L.	Canadian Pacific ...	Met. Log. 25.9.24 to 26.1.25 ...	3.3.25.
<i>Empress of Canada</i> ...	Halley, A. J. ...	C. Critchley, R. A. Leicester, A. B. Smith	M.L.	" " ...	" 24.4.24 to 28.10.24 ...	24.11.24.
<i>Empress of France</i> ...	Robinson, S., C.B.E., R.D., Commr., R.N.R.	W. S. Halliday, L. C. Barry ..	M.L.	" " ...	Met. Log. 19.6.24 to 13.11.24 ...	29.12.24.
<i>Empress of Russia</i> ...	Griffiths, E. ...	O. Pennington, E. Roberts, A. W. Patrick.	M.L.	" " ...	" 7.6.24 to 11.11.24 ...	18.11.24.
<i>Empress of Scotland</i> ...	Hosken, A. J. ...	— Reid ...	M.L.	" " ...	" 28.8.24 to 8.12.24 ...	26.1.25.
<i>Endeavour</i> ...	Gillies, J., C.B.E. ...	B. Grant, S. C. Fox, D. Loram, L. W. Akerman, W. J. Phillips.	M.L.	" " ...	Met. Log. 26.4.24 to 29.10.24 ...	11.12.24.
<i>Essequibo</i> ...	Commr. S. A. Geary-Hill, D.S.O., R.N.	M. L. Harrison, E. V. B. Baker, E. H. B. Baker.	M.L.	His Majesty's Ship ...	Met. Log. 2.10.24 to 29.1.25 ...	3.3.25.
<i>Eumaeus</i> ...	Duncan, E. E. ...	L. W. Hanson ...	No.	R.M.S.P. Co. ...	Form 911 6.11.24 to 23.12.24 ...	5.1.25.
<i>Euripides</i> ...	Read, J. W. ...	E. R. Pritchard, M. B. Glasier	"	A. Holt ...	" 18.2.25 to 4.3.25 ...	4.4.25.
<i>Eurybates</i> ...	Collins, P. J., O.B.E.	H. S. Cox, G. R. Fisher, F. Fuller.	M.L.	Aberdeen ...	Met. Log. 10.10.24 to 2.2.25 ...	9.2.25.
<i>Explorer</i> ...	Lloyd, R. ...	J. J. Goldsmith ...	No.	A. Holt ...	Form 911 5.3.25 to 17.3.25 ...	19.3.25.
<i>Fitzroy</i> ...	Lamont, A. ...	Scientific Staff ...	M.L.	Scottish Fishery Board	Met. Log. 20.6.24 to 27.9.24 ...	24.10.24.
<i>Flandria</i> ...	Silk, H. V., Lt.-Commr. R.N.	C. W. Sabine ...	M.L.	His Majesty's Ship ...	" 24.7.24 to 31.10.24 ...	11.11.24.
<i>Frankenfels</i> ...	Veldkamp, G. J. ...	T. Doornbosch ...	No.	Holland Lloyd ...	Form 911 20.2.25 to 11.4.25 ...	14.4.25.
<i>Freienfels</i> ...	Henderson, D. A., Lt.-Commr., R.N.	K. F. Boxall ...	M.L.	His Majesty's Ship ...	Met. Log. 26.7.24 to 30.10.24 ...	18.11.24.
<i>Freya</i> ...	Wilkins, J., O.B.E.	C. Leonard ...	No.	Ellerman Wilson ...	Form 911 16.1.25 to 23.2.25 ...	3.3.25.
<i>Gallie</i> ...	Cartmer, G. E., O.B.E.	L. M. Burfitt, J. H. A. Mackie, J. Garmory.	M.L.	India Office Shipping	Met. Log. 1.11.24 to 5.2.25 ...	14.2.25.
<i>Gallymore</i> ...	Cleugh, J. W. ...	C. H. Porter, V. R. Watkins, H. Wilson.	"	" " " ...	" 7.9.24 to 7.12.24 ...	17.12.24.
<i>Garret</i> ...	Angus, W. ...	J. H. Hennessey ...	No.	Scottish Fishery Board	Form 911 11.3.25 to 26.3.25 ...	30.3.25.
<i>Gascoyne</i> ...	Summers, F. F., R.D., Commr. R.N.R.	W. G. O. Jones ...	"	White Star ...	Met. Log. 3.8.24 to 9.12.24 ...	12.12.24.
<i>Garret</i> ...	Ledsome, J. S. ...	N. Goubrough ...	"	Furness Withy ...	Form 911 5.3.25 to 15.3.25 ...	18.3.25.
<i>Gascoyne</i> ...	Visser, C. W. ...	F. Weeda ...	"	Rotterdam Lloyd ...	" 19.11.24 to 6.1.25 ...	12.1.25.
<i>Gascoyne</i> ...	Mills, A. ...	P. G. Collins ...	"	Dalgety & Co. ...	" 21.10.24 to 1.2.25 ...	9.3.25.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log Register, or Report Contributed. Received up to 17.4.25.	Date Received.
<i>Gelria</i> ...	Kolkman, J. M. ...	F. J. de Visser ...	No.	Holland Lloyd ...	Form 911 6.2.25 to 20.3.25 ...	30.3.25.
<i>Glenamoy</i> , M.V. ...	Angier, J. ...	R. H. Bishop ...	"	Glen Line ...	" 21.3.25 to 24.3.25 ...	17.4.25.
<i>Glenapp</i> , M.V. ...	Griffith, J. E. ...	F. Poate ...	"	" ...	" 17.12.24 to 28.12.24 ...	8.1.25.
<i>Glenluce</i> , M.V. ...	Barkley, E. ...	J. D. Richards ...	"	" ...	" 22.2.25 to 24.3.25 ...	30.3.25.
<i>Glocestershire</i> ...	Roberts, W. E. ...	R. A. Dale ...	"	" ...	" 27.2.25 to 11.3.25 ...	19.3.25.
<i>Gorgon</i> ...	Robin, E. ...	T. E. Field ...	"	Bibby ...	" 3.1.25 to 13.3.25 ...	16.3.25.
<i>Gourko</i> ...	Hughes, J. W. ...	W. E. Crompton ...	"	A. Holt & Co. ...	" 28.12.24 to 19.2.25 ...	30.3.25.
	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 15.2.25 to 10.3.25 ...	14.4.25.
<i>Harmonides</i> ...	Hughes, W. J. ...	D. L. Roberts ...	"	" ...	" 11.1.25 to 4.2.25 ...	12.3.25.
<i>Harmony</i> , Auxy. ...	Jackson, J. C. ...	A. W. Bush ...	"	Moravian Mission ...	" 4.12.24 to 20.12.24 ...	6.1.25.
<i>Hatirana</i> ...	Mardon, T. T. ...	J. L. Durkee, F. Wells, E. B. Heath, E. C. McGuinness.	M.L.	British India ...	" 12.9.23 to 26.3.24 ...	22.4.24.
<i>Hauraki</i> , M.V. ...	Frew, J. D. ...	E. A. Buckingham ...	No.	Union S.S. Co., N.Z. ...	" 10.11.24 to 1.12.24 ...	12.1.25.
<i>Henry Holmes</i> , C.S. ...	Bicker Caarten, A. ...	E. S. C. Hale ...	"	W. I. & Panama Telegraph Co. ...	" 28.1.25 to 16.2.25 ...	16.3.25.
<i>Herald</i> ...	Harvey, J. R., O.B.E., Commr., R.N. ...	W. C. Jenks ...	M.L.	His Majesty's Ship ...	Met. Log. 4.10.24 to 31.1.25 ...	7.4.25.
<i>Herefordshire</i> ...	Stanley, W. ...	R. C. Leitch, G. Whitworth, P. S. Cooper, H. G. Walton	"	Bibby ...	" 13.9.24 to 26.2.25 ...	23.3.25.
<i>Herschel</i> ...	Carey, W. J. ...	A. N. Blundell ...	No.	Lampart & Holt ...	Form 911 2.2.25 to 7.4.25 ...	14.4.25.
<i>Hibernia</i> ...	Tanner ...	R. Woodall ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report. 16.4.25 ...	16.4.25.
<i>Highland Enterprise</i> ...	Pond, R. H. ...	D. R. S. Webster ...	No.	Nelson ...	Form 911 29.3.24 to 12.6.24 ...	8.7.24.
<i>Glen</i> ...	Jones, T. J. ...	C. M. Best ...	"	" ...	" 14.12.24 to 2.1.25 ...	16.1.25.
<i>Heather</i> ...	Powell, G. A. ...	" ...	M.L.	" ...	" ...	" ...
<i>Laddie</i> ...	Alford, C. ...	G. L. Goodman ...	No.	" ...	Form 911 16.9.24 to 8.11.24 ...	22.12.24.
<i>Piper</i> ...	Collings, D. ...	A. S. Jones, J. S. Collins, G. E. Leech.	M.L.	" ...	Met. Log. 21.7.24 to 8.12.24 ...	17.12.24.
<i>Pride</i> ...	Robinson, R. H. ...	H. McKinnon, F. Falconer, R. R. Soanes, G. E. Leech.	"	" ...	" 25.9.24 to 17.2.25 ...	3.3.25.
<i>Rover</i> ...	Ashby Graves, F. ...	F. W. Harvey, H. Thomas, F. Abbott.	"	" ...	" 15.1.25 to 19.3.25 ...	1.4.25.
<i>Warrior</i> ...	Davis, G. O. ...	G. I. Evans ...	No.	" ...	Form 911 22.12.24 to 8.2.25 ...	17.2.25.
<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. 2.12.24 to 12.3.25 ...	8.4.25.
<i>Holbein</i> ...	Gough, W. A. ...	G. P. Kitto, D. B. Woods ...	No.	Lampart & Holt ...	Form 911 8.12.24 to 27.12.24 ...	16.2.25.
<i>54 Homeric</i> ...	Roberts, J., C.B.E., D.S.O., R.D., Capt. R.N.R. ...	H. Clark, H. Yates, A. Griffiths.	W.T.	White Star ...	W.T. Reg. 26.3.25 to 10.4.25 ...	16.4.25.
<i>Honorius</i> ...	Samuels, C. ...	J. E. Martin, W. G. Iddes ...	No.	R. P. Houston ...	Form 911 5.1.25 to 2.2.25 ...	9.2.25.
<i>Hororata</i> ...	Haines, F. P. ...	" ...	"	New Zealand S.S. Co. ...	" ...	" ...
<i>Huancho</i> ...	Redyard, A. ...	A. G. Litherland ...	"	Pacific S.N. Co. ...	" 15.7.24 to 5.8.24 ...	15.8.24.
<i>Hubert</i> ...	Jones, W. C. H. ...	S. G. Edwards ...	"	Booth ...	" 7.12.24 to 21.2.25 ...	24.2.25.
<i>Hurumui</i> ...	Burton Davies, J. ...	P. McCallum, C. D. Watt, L. A. Beale.	M.L.	New Zealand S.S. Co. ...	Met. Log. 29.3.24 to 24.10.24 ...	29.10.24.
<i>Iber</i> ...	Langdon, C. ...	" ...	C.C.	G.W. Railway ...	Telegraphic Report. 19.3.25 ...	19.3.25.
<i>Ikala</i> ...	Meetham, J. T. ...	E. Lightfoot ...	No.	J. H. Welsford & Co. ...	Form 911 8.11.24 to 24.11.24 ...	15.12.24.
<i>Intaba</i> ...	Gibbins, W. A. ...	" ...	"	Harrison ...	" 7.2.25 to 26.3.25 ...	1.4.25.
<i>Intombi</i> ...	Sawyer, E. I. ...	J. Richardson ...	"	" ...	" 3.8.24 to 19.10.24 ...	22.10.24.
<i>Iroquois</i> ...	Tinson, C. W., O.B.E., Commr., R.N. ...	G. A. R. J. Leslie, R. H. Lucy, G. A. Gould.	M.L.	His Majesty's Ship ...	Met. Log. 15.7.24 to 7.11.24 ...	3.2.25.
<i>Ixion</i> ...	Carnon, C. G. ...	A. R. Cook ...	No.	A. Holt ...	Form 911 3.12.24 to 12.2.25 ...	4.3.25.
<i>John Pender</i> , C.S. ...	Smythe, T. W., O.B.E. ...	B. C. Farrow ...	No.	Eastern Tel. Co. ...	" 5.12.24 to 13.12.24 ...	18.12.24.
<i>Junin</i> ...	Benson, O. W. ...	A. Beharrel ...	"	Pacific S.N. Co. ...	" 28.2.25 to 16.3.25 ...	4.4.25.
<i>Kaikoura</i> ...	Downton, M. ...	H. E. Reilly, F. T. Bisley, G. T. Webb, F. Vesington.	M.L.	New Zealand S.S. Co. ...	Met. Log. 15.7.24 to 19.12.24 ...	29.12.24.
<i>Kaisar-i-Hind</i> ...	Manley, G. ...	J. O. Ablewhite ...	No.	P. & O. ...	Form 911 10.1.25 to 4.3.25 ...	17.3.25.
<i>Kamo Maru</i> ...	Okano, Y. ...	F. Takaku ...	"	Nippon Yusen Kaisha ...	" 2.3.25 to 2.4.25 ...	14.4.25.
<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>Kashmir</i> ...	Stringer, R. H., O.B.E., R.D., Commr., R.N.R. ...	F. Hopkins ...	"	P. & O. ...	" 24.8.24 to 8.9.24 ...	18.11.24.
<i>Kellett</i> ...	Haselfoot, F. E. B., D.S.O., Commr., R.N. ...	E. H. B. Baker, R. A. Stephens	M.L.	His Majesty's Ship ...	Met. Log. 30.7.24 to 15.10.24 ...	20.10.24.
<i>Kenilworth Castle</i> ...	Millard, L. A. ...	A. E. Denn, W. M. Tonkins ...	M.L.	Union Castle ...	" 16.5.24 to 25.1.25 ...	6.2.25.
<i>Khiva</i> ...	George J., O.B.E. ...	— May.	"	" ...	" ...	" ...
<i>Khyber</i> ...	Randall, H. W. R.D., Capt., R.N.R. ...	L. Fraser, K. H. Cummins, G. K. Fox.	M.L.	P. & O. ...	" 24.10.24 to 31.1.25 ...	5.2.25.
<i>Kia Ora</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>Kildonan Castle</i> ...	McIntosh, A. ...	J. C. Kelly Rogers ...	"	Shaw Savill & Albion ...	" 25.12.24 to 31.1.25 ...	5.2.25.
<i>Kenderdijk</i> ...	Wilford, T.H. ...	R. S. W. Harris, N. P. Curtoys ...	"	Union Castle ...	" 19.12.24 to 12.4.25 ...	14.4.25.
<i>Kiyo Maru</i> ...	Jochems, A. B. ...	A. Stenger ...	"	Holland America ...	" 27.3.24 to 3.5.24 ...	8.5.24.
<i>Knight Companion</i> ...	Gotoh, M. ...	R. Nakane ...	"	Nippon Yusen Kaisha ...	" 11.2.25 to 7.3.25 ...	13.3.25.
<i>Kovno</i> ...	Beale, H. E. ...	J. Pobjoy ...	"	A. Holt ...	" 7.2.25 to 5.3.25 ...	6.4.25.
<i>Kyogle</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>Lady Denison Pender</i> , C.S. ...	Coalstad, C. ...	C. B. Odman, E. W. Hughes	No.	Commonwealth Light-house Service. Eastern Tel. Co. ...	Form 911 13.11.24 to 13.12.24 ...	19.1.25.
<i>Laguna</i> ...	West, G. W. ...	F. Lawrence ...	"	" ...	" 4.12.24 to 31.12.24 ...	24.2.25.
<i>Lalande</i> ...	Mander, F. ...	F. W. Parker ...	"	Pacific S.N. Co. ...	" 22.3.24 to 14.4.24 ...	28.4.24.
<i>Lancashire</i> ...	Bambra, W. A. ...	H. Phillips ...	"	Lampart & Holt ...	" 8.3.25 to 29.3.25 ...	15.4.25.
<i>Laomedon</i> ...	Beckett, F. W. ...	W. M. S. Higginson ...	"	Bibby ...	" 31.1.25 to 10.4.25 ...	17.4.25.
<i>La Paz</i> , M.V. ...	Smith, A. H. ...	A. J. Barclay ...	"	A. Holt ...	" 19.11.24 to 23.12.24 ...	5.1.25.
<i>Laplace</i> ...	Ross, J. ...	A. Lyall ...	"	Pacific S.N. Co. ...	" 20.1.25 to 10.2.25 ...	25.2.25.
<i>55 Lapland</i> ...	Davies, G. W. ...	W. Boyde, R. B. Langley ...	W.T.	Lampart & Holt ...	Form 911 13.12.24 to 30.3.25 ...	3.4.25.
	Howell, T. ...	W.N. Jenkins ...	"	Red Star ...	W.T. Reg. 2.1.25 to 20.1.25 ...	30.1.25.
<i>Lassell</i> , M.V. ...	Hickman, V. T. ...	H. G. Cuthill ...	No.	Lampart & Holt ...	Form 911 23.2.25 to 16.3.25 ...	23.3.25.
<i>Leicestershire</i> ...	English, G. L. ...	W. Whiteside, P. H. Potter, D. Sharrock, W. H. Muirhead.	M.L.	Bibby ...	Met. Log. 3.11.24 to 28.11.24 ...	19.12.24.
<i>Leitrim</i> ...	Robertson, A. ...	E. F. C. Higgins ...	No.	Dowie, J., & Co. ...	Form 911 20.12.24 to 16.1.25 ...	3.3.25.
<i>Ling Nam</i> ...	Waterson, W. H. V. ...	" ...	"	Chunghua Nav. Co. ...	" 27.10.23 to 12.1.24 ...	22.4.24.
<i>Llanstephan Castle</i> ...	Owen, S. H. ...	J. B. M. Reynolds ...	"	Union Castle ...	" 20.9.24 to 25.11.24 ...	29.11.24.
<i>Loch Katrine</i> ...	Matthews, G. P. ...	C. Noakes ...	"	R.M.S.P. Co. ...	" 9.11.24 to 6.2.25 ...	13.3.25.

LIST OF VOLUNTARY OBSERVING SHIPS

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 17. 4. 25.	Date Received.
<i>London Commerce</i>	Young, H. J., D.S.C.	P. G. Leverett ...	No.	Furness Withy	Form 911 31.1.25 to 4.3.25 ...	17.3.25.
<i>Loreto M.V.</i>	Barkley, E.	F. Binnion ...	"	Pacific S.N. Co.	" 18.5.24 to 7.6.24 ...	12.6.24.
<i>Losada M.V.</i>	Meldrum, G. W.	A. H. Turner ...	"	" "	" 16.12.24 to 22.3.25...	26.3.25.
<i>Macedonia</i>	Potter, H. W., R.D., Commr., R.N.R.	E. R. Bodley ...	No.	P. & O.	" 28.2.25 to 20.3.25 ...	14.4.25.
<i>Macharda</i>	Cochran, G.	W. Moore ...	"	Brocklebank	" 6.9.24 to 24.11.24 ...	5.12.24.
<i>Mahana</i>	Kershaw, W. A. R.	F. Gilroy ...	"	Shaw Savill & Albion	" 21.12.24 to 2.2.25 ...	9.2.25.
<i>Maharaja</i>	Perry, C. R.	C. B. Miller ...	"	Asiatic S.N. Co.	" 15.2.25 to 20.3.25 ...	14.4.25.
<i>Maihar</i>	Rowe, J. P.	C. Shaw L. Robertson, R. G. Widdon.	M.L.	Brocklebank	Met. Log. 26.1.24 to 26.5.24 ...	23.6.24.
<i>Maimyo</i>	Richardson, T.	P. Yates ...	No.	"	Form 911 12.12.24 to 15.1.25...	19.1.25.
<i>Maive</i>	Seymour, H.	S. C. Skinner ...	"	Atlantic Transport	" 23.2.25 to 5.4.25 ...	14.4.25.
<i>58 Majestic</i>	Haves, 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. 10.12.24 to 22.12.24	29.12.24.
<i>Makambo</i>	Brown, T. M.	F. C. Ree, H. Mann, D. G. Irvine, D. Wilson, J. Abbot, K. Thompson.	M.L.	Burns Philp	Met. Log. 13.2.24 to 28.8.24 ...	2.12.24.
<i>Makura</i>	Mawson, J.	J. D. Lundie, G. H. Kime, N. Archibald, A. R. Noble.	M.L.	Canadian-Australasian	" 23.10.24 to 6.3.25 ...	30.3.25.
<i>Malancha</i>	Whitham, F.	A. Hill ...	No.	Brocklebank	Form 911 14.11.24 to 29.1.25...	2.2.25.
<i>Malda</i>	Gray, T. N.	W. E. Murphy ...	"	British India	" 16.1.25 to 20.2.25 ...	24.2.25.
<i>Manchester Corporation.</i>	Everest, J. E.	W. L. Lavers ...	"	Manchester Liners	" 21.3.25 to 30.3.25 ...	16.4.25.
<i>Manchester Mariner.</i>	Riley, J. E.	C. E. Stocker, J. F. Fisher, Dormer, A. E.	M.L.	" "	Met. Log. 23.3.24 to 25.11.24...	5.12.24.
<i>Manchester Merchant.</i>	Barclay, J.	R. A. Walker ...	No.	" "	Form 911 15.3.25 to 24.3.25 ...	6.4.25.
<i>Mandasor</i>	Kershaw, R. W.	W. Baxter ...	"	Brocklebank	" 29.12.24 to 9.3.25 ...	18.3.25.
<i>Manhattan</i>	Hutchison, J. G.	R. Day ...	"	Atlantic Transport	" 10.11.24 to 18.12.24 ...	22.12.24.
<i>Manipur</i>	Scurr, T. W.	G. W. Barker ...	"	Brocklebank	" 12.10.24 to 1.1.25 ...	3.1.25.
<i>Manistee</i>	Isaacson, J. M.	S. Browne, J. Blower, F. R. Inch.	M.L.	Elders & Fyfes	Met. Log. 26.7.24 to 7.12.24 ...	16.12.24.
<i>Manzanares</i>	Henderson, J. N.	H. B. Lees ...	No.	"	"	"
<i>Marella</i>	Mortimer, S.	T. W. Burdis, D. Pemberton, K. L. Thompson, W. McBride, A. M. Hill.	M.L.	Burns Philp	Form 911 24.11.23 to 17.4.24...	2.12.24.
<i>Marengo</i>	Bean, A.	L. T. Hale, F. Elgin, J. E. Stott, W. G. Pearce, E. Wood.	"	Ellerman Wilson	" 12.9.24 to 21.2.25 ...	25.2.25.
<i>Margha</i>	Milne, A. R., R.D., Commr., R.N.R.	J. Strachan, P. Wright, H. E. Evans.	"	British India	" 25.10.24 to 4.1.25 ...	21.1.25.
<i>Marglen</i>	Griffiths, J. N.	E. Bastley ...	No.	Canadian Pacific	" 19.2.25 to 9.4.25 ...	14.4.25.
<i>27 Marloch</i>	Notley, A. H.	H. W. G. Coughlan, E. V. Glennie.	W.T.	" "	W.T. Reg. 21.2.25 to 15.3.25 ...	18.3.25.
<i>Maryland</i>	Hutt, F. C.	A. C. Clay ...	No.	Atlantic Transport	Form 911 9.11.24 to 23.11.24 ...	5.12.24.
<i>Masrah</i>	Thowless, E.	R. C. Baker ...	"	Brocklebank	" 16.1.25 to 18.2.25 ...	24.2.25.
<i>Massilia</i>	Henderson, J. L.	E. Richardson ...	"	Brocklebank	" 4.4.24 to 25.4.24 ...	26.5.24.
<i>Matakana</i>	Bosdet, V. J.	A. Chrystal, D. N. Mac- Gregor.	"	Anchor	" 12.9.24 to 20.9.24 ...	22.9.24.
<i>Mataran</i>	Williams, D. J.	E. H. Doughty ...	"	Shaw, Savill & Albion	" 5.7.24 to 25.11.24 ...	10.12.24.
<i>Matheran</i>	Columbine, F. F.	J. A. Embley, J. Robertson, S. C. Cramb.	M.L.	Burns Philp & Co.	Form 911 6.1.25 to 3.2.25 ...	23.3.25.
<i>Mathura</i>	Hanna, R. G.	H. H. Armstrong ...	No.	Brocklebank	Met. Log. 18.11.24 to 16.2.25...	23.2.25.
<i>Matiana</i>	Langlands, D. H.	B. Paul ...	"	British India	Form 911 27.1.25 to 27.2.25 ...	16.3.25.
<i>Maunganui</i>	Worrall, L. C. H.	D. M. Todd ...	"	Union S.S. Co. of N.Z.	" 28.2.25 to 19.3.25 ...	14.4.25.
<i>32 Mauretania</i>	Rostron, A. H., C.B.E., R.D., A.-d.-C., Capt., R.N.R.	F. A. York, R. Allen, A. Mac- kellar.	W.T.	Cunard	W.T. Reg. 8.2.25 to 19.2.25 ...	20.3.25.
<i>Media</i>	Mangan ...	"	No.	T. & J. Brocklebank...	" 22.3.25 to 6.4.25 ...	9.4.25.
<i>56 Megantic</i>	White, E. R., R.D., Commr., R.N.R.	A. H. Young, J. A. Heenan, R. Conway.	W.T.	White Star	W.T. Reg. 12.1.25 to 9.4.25 ...	16.4.25.
<i>22 Melita</i>	Clews, A. H.	W. E. Bacon, C. C. Muckle- stone, J. McLennan.	W.T.	Canadian Pacific	Form 911 8.3.25 to 26.3.25 ...	30.3.25.
<i>Mennon</i>	Salter, G. H.	E. D. Potts ...	No.	A. Holt	" 3.10.24 to 19.10.24...	21.10.24.
<i>Menominee</i>	Pollard, W. F.	C. F. Hicks ...	"	Atlantic Transport	" 14.2.25 to 19.3.25 ...	23.3.25.
<i>Mercian</i>	Gardner, J.	R. Hughes ...	"	Leyland	" 19.1.25 to 2.3.25 ...	6.3.25.
<i>21 Metagama</i>	Henderson, W.	W. F. Reid, F. McLeroy, A. M. Watt.	W.T.	Canadian Pacific	W.T. Reg. 8.3.25 to 27.3.25 ...	30.3.25.
<i>Miami</i>	Maxwell Brown, W. E.	G. McKee ...	No.	Elders & Fyfes	Form 911 16.12.24 to 20.1.25...	26.1.25.
<i>Michigan</i>	Tribe, A. E.	L. A. Williams ...	"	Atlantic Transport	" 11.6.24 to 20.6.24 ...	25.6.24.
<i>Minderoo</i>	Richardson, E.	B. J. Bennie, W. J. McPhedron, J. H. Oxtou.	M.L.	West Australia Nav. Co.	Met. Log. 13.6.24 to 26.11.24...	4.3.25.
<i>Minna</i>	Mackenzie, G. G.	D. Rattray ...	No.	Scottish Fishery Board	Form 911 10.2.25 to 8.4.25 ...	14.4.25.
<i>23 Minnedosa</i>	Notley, A.	— Carter, — Soame, — Mac- kenzie.	W.T.	Canadian Pacific	W.T. Reg. 5.1.25 to 22.1.25 ...	26.1.25.
<i>Minnetonka</i>	Gates, T. F.	H. E. McCartney ...	No.	Atlantic Transport	Form 911 6.9.24 to 24.9.24 ...	26.9.24.
<i>Minnewaska</i>	Claret, F.	W. S. Mackie ...	"	"	" 16.2.25 to 7.3.25 ...	10.3.25.
<i>Mirror, C.S.</i>	Gibson, L.	C. E. F. St. John ...	"	"	" 2.3.25 to 21.3.25 ...	26.3.25.
<i>Mississippi, M.V.</i>	Wylie, J. T. J.	H. K. Cockerill ...	"	Eastern Tel. Co.	" 19.11.24 to 17.1.25 ...	19.2.25.
<i>Moena</i>	Morzer Bruyns, M. F.	G. H. Vander Roest ...	"	Atlantic Transport	" 12.2.25 to 19.3.25 ...	24.3.25.
<i>Moldavia</i>	Burleigh, C. W., D.S.O., Capt., R.N.R.	D. C. S. Cook ...	"	Nederland	" 18.12.24 to 6.2.25 ...	10.2.25.
<i>Mongolian Prince</i>	Durrant, G. D.	P. F. Owens ...	"	P. & O.	" 21.11.24 to 25.2.25 ...	2.3.25.
<i>Monkbarns, Ship</i>	Davies, W.	R. Baise, J. Williams ...	"	Prince	" 22.2.25 to 11.4.25 ...	15.4.25.
<i>24 Montcalm</i>	Sibbons, H.	H. McFadyen ...	W.T.	J. Stewart & Co.	" 10.10.24 to 26.11.24 ...	5.2.25.
<i>25 Montclare</i>	Webster, G. S., R.D., Commr., R.N.R.	R. Fegan, W. Phillips, H. S. Knight.	"	Canadian Pacific	W.T. Reg. 15.3.25 to 2.4.25 ...	6.4.25.
<i>Montlaurier</i>	Henderson, W.	F. E. Williams ...	No.	"	Form 911 1.3.25 to 20.3.25 ...	24.3.25.
<i>Montoro</i>	"	"	"	"	W.T. Reg. 26.1.25 to 12.2.25 ...	17.2.25.
<i>26 Montrose</i>	Landy, E.	"	W.T.	Burns, Philp & Co.	Form 911 ...	"
<i>20 Montroyal</i>	Latta, R. G.	T. Beck, A. Mansey, C. Clarke.	W.T.	Canadian Pacific	W.T. Reg. 8.3.25 to 27.3.25 ...	1.4.25.
		F. E. Williams ...	"	"	Form 911 6.3.25 to 28.3.25 ...	1.4.25.
			"	"	" 11.7.24 to 31.7.24 ...	5.8.24.
			"	"	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 17.4.25.	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. 13.9.24 to 15.3.25 ...	9.4.25.
<i>Mulbera</i> ...	Steadman, W. R. ...	E. Holland, H. W. Norris ...	No.	British India ...	Form 911 30.3.25 to 8.4.25 ...	16.4.25.
<i>Nagara</i> ...	Purvis, A. ...	H. V. Todd ...	"	R.M.S.P. Co. ...	" 13.12.24 to 12.2.25...	16.2.25.
<i>Nagoya...</i>	Cherry, W. G. W. ...	P. Haworth ...	"	P. & O. ...	" 15.3.25 to 26.3.25 ...	4.4.25.
<i>Nardana</i> ...	Moth, F. L. ...	S. C. T. Smith ...	"	British India ...	" 17.11.24 to 28.12.24	11.2.25.
<i>Nariva...</i>	Buret, T. J. C. ...	B. Y. Vickers, J. S. Scott, R. H. East.	M.L.	R.M.S.P. Co. ...	Met. Log. 25.1.25 to 25.3.25 ...	2.4.25.
<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>Navasota</i> ...	Willan, F. G. L., R.D., Commr., R.N.R.	W. A. Delap ...	No.	R.M.S.P. Co. ...	Form 911 23.6.24 to 20.8.24 ...	28.8.24.
<i>Nebraska</i> ...	Collins, A. R. D., O.B.E., R.D., Lt.-Commr., R.N.R.	A. F. Walker ...	"	R.M.S.P. Co. ...	" 15.3.24 to 21.4.24 ...	5.5.24.
<i>Nellore...</i>	Murray, F. S., R.D., Lt. - Commr., R.N.R.	G. E. Owen ...	"	P. & O. ...	" 5.12.24 to 5.2.25 ...	13.2.25.
<i>Nestor</i> ...	Owen, R. D., O.B.E.	W. H. Newby, C. J. Beasley, F. J. Silva.	M.L.	A. Holt ...	" 12.10.24 to 12.2.25...	20.2.25.
<i>Nevasa...</i>	Swanson, C. J. ...	D. Lorrie ...	No.	British India ...	" 13.10.24 to 30.12.24	6.1.25.
<i>Newby Hall</i> ...	Kendall, J. W. ...	A. Martin ...	M.L.	Ellerman ...	Met. Log. 12.9.24 to 10.1.25 ...	27.1.25.
<i>Niagara</i> ...	Rolls J. T. ...	R. B. Denniston, T. A. Macpherson, J. V. Bray, J. Dawson.	M.L.	Canadian-Australian...	" 19.7.24 to 13.11.24...	8.12.24.
<i>Ningchow</i> ...	Wilson, C. A. ...	R. A. Hannay ...	No.	A. Holt ...	Form 911 14.10.24 to 8.1.25 ...	16.1.25.
<i>Nore</i> ...	Parker, J. W. ...	R. W. Mackie, C. B. Roche, R. H. Turner, G. Haughey.	M.L.	P. & O. ...	Met. Log. 6.11.24 to 24.1.25 ...	29.1.25.
<i>Norman</i> ...	Morton Betts W. ...	D. A. Hodgson ...	No.	Union Castle	Form 911 1.12.24 to 20.12.24...	19.1.25.
<i>Norna</i> ...	Wright, J. ...	T. Mather ...	"	Scottish Fishery Board	" 1.3.25 to 28.3.25 ...	2.4.25.
<i>Norseman, C.S.</i> ...	W. Douglas ...	" ...	M.L.	Western Tel. Co. ...	Met. Log. 16.8.24 to 30.1.25 ...	3.3.25.
<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 ...	"	" ...	" 21.12.24 to 2.1.25 ...	6.1.25.
<i>Nyanza</i> ...	Carpendale, F. W. J.	G. D. Brown, C. H. Hand, S. Ferguson.	M.L.	P. & O. ...	Met. Log. 20.10.24 to 4.1.25 ...	9.1.25.
<i>Oaklands Grange...</i>	Routledge, R. ...	E. A. Insley ...	No.	Houlder Bros.	Form 911 18.10.24 to 2.2.25 ...	19.2.25.
<i>42 Ohio</i> ...	Nicholson, M. S., R.D., Capt., R.N.R.	R. W. Morford, P. M. Burrell, H. F. Woodroffe.	W.T.	R.M.S.P. Co. ...	W.T. Reg. 1.2.25 to 3.4.25 ...	7.4.25.
<i>Olympia</i> ...	A. R. Duncan ...	D. R. Urquhart, G. Lynas, C. Mortimer.	M.L.	Anchor ...	Form 911 28.3.25 to 4.4.25 ...	7.4.25.
<i>57 Olympic</i> ...	Marshall, W., D.S.O., R.D., Capt., R.N.R.	J. C. M. Boyce, H. J. C. Day, C. J. Wartire, L. Thompson.	W.T.	White Star ...	W.T. Reg. 27.2.25 to 12.3.25 ...	16.3.25.
<i>Orama...</i>	Staunton, H. G., C.B.E., R.D., Commr., R.N.R.	L. J. Vesty, F. Butler, M. C. Lester, J. S. Metcalf.	M.L.	Orient ...	Form 911 20.3.25 to 2.4.25 ...	6.4.25.
<i>Oranian</i> ...	Hoskins, W. ...	D. Hewett ...	No.	Leyland ...	Met. Log. 16.11.24 to 18.2.25...	20.2.25.
<i>Orari</i> ...	Robinson, F. W. ...	R. Newman, T. Breen, F. Longheed, C. Wilkinson, H. Farrant.	M.L.	New Zealand S.S. Co.	Form 911 4.9.24 to 17.11.24 ...	24.11.24.
<i>40 Orbita</i> ...	Parker, W. H., C.B.E., R.D., Capt. R.N.R.	C. Frankom ...	W.T.	R.M.S.P. Co. ...	Met. Log. 9.8.24 to 20.1.25 ...	27.1.25.
<i>Orcoma</i> ...	Dominy, R. H., C.B.E., Commr. R.N.R.	G. B. Wardale, L. Jones, W. Billington.	M.L.	Pacific S.N. Co. ...	Form 911 14.2.25 to 11.3.25 ...	16.3.25.
<i>41 Orduna</i> ...	Warner, G. E., R.D., Commr., R.N.R.	R. W. Sumpton, J. Vivian, H. D. Hooper, G. F. Russell.	W.T.	R.M.S.P. Co. ...	Met. Log. 20.11.24 to 4.2.25 ...	9.2.25.
<i>Oriana...</i>	{ Daniel, T. ... }	" ...	M.L.	Pacific S.N. Co. ...	W.T. Reg. 1.3.25 to 27.3.25 ...	3.4.25.
<i>Orita</i> ...	{ Kite, E. ... }	" ...	M.L.	" ...	Form 911 28.2.25 to 27.3.25 ...	2.4.25.
<i>Ormonde</i> ...	Splatt, W. A. ...	J. G. Harvey, T. R. Scott, D. W. Hutchinson, C. P. D. Dean.	M.L.	" ...	Met. Log. 15.2.24 to 24.10.24 ...	8.11.24.
<i>Ormonde</i> ...	Knowles, C. H., D.S.O., Commr., R.N.	A. M. Hughes ...	M.L.	His Majesty's Ship ...	Met. Log. 19.9.24 to 6.12.24 ...	19.12.24.
<i>Ormonde</i> ...	Shelford, W. S., Lt.-Commr., R.N.R.	N. A. Whinfield, W. A. Wickham, A. H. Dyer.	M.L.	Orient ...	Met. Log. 8.11.24 to 6.12.24 ...	31.12.24.
<i>Ormuz</i> ...	James L. V., D.S.C.	C. Fox, J. C. K. Dowding, H. MacLean, L. A. Keeble, F. S. Shurrock.	M.L.	" ...	Met. Log. 4.1.25 to 7.4.25 ...	15.4.25.
<i>Oroya</i> ...	Pearce, A. ...	S. Lewis ...	No.	Pacific S.N. Co. ...	Met. Log. 19.10.24 to 22.1.25...	28.1.25.
<i>Orsova</i> ...	Matheson, C. G., D.S.O., R.D., Commr., R.N.R.	M. J. Sarson, A. J. Croft Cohen, C. V. Dodgson, P. P. Murphy, L. E. Fordham.	M.L.	Orient ...	Form 911 27.1.25 to 6.4.25 ...	16.4.25.
<i>Ortega</i> ...	Pleignier, H. S. ...	C. Leatherbarrow ...	No.	Pacific S.N. Co. ...	Met. Log. 12.10.24 to 13.1.25...	19.1.25.
<i>Orvieto...</i>	Simner, G. L., R.D., Commr., R.N.R.	M. Petit Daun, G. E. Martin	M.L.	Orient ...	Form 911 9.12.24 to 16.2.25 ...	25.2.25.
<i>Osterley</i> ...	Cameron, E. P. ...	F. G. Goodman, E. Hatch, J. C. Jackson, H. Tanner.	M.L.	" ...	Met. Log. 9.11.24 to 10.2.25 ...	14.2.25.
<i>Othello</i> ...	Pearson, Z. C. ...	J. W. Botheroyd ...	No.	Ellerman Wilson ...	" 17.8.24 to 19.11.24...	28.11.24.
<i>Otira</i> ...	Elford, H. E. ...	J. H. Fuller ...	"	Shaw, Savill & Albion	Form 911 27.1.25 to 17.3.25 ...	19.3.25.
<i>Ovid</i> ...	Groom, A. C. B. ...	" ...	"	Shakespeare Shipping Co.	" 10.1.25 to 28.1.25 ...	6.4.25.
<i>Oxfordshire</i> ...	Crumplin, W. E. ...	F. C. Brooks ...	"	Bibby Bros.	" 7.2.25 to 2.3.25 ...	30.3.25.
<i>Pacific Shipper, M.V.</i>	Newman, G. W. A.	R. S. Smith ...	"	Furness Withy ...	" 26.2.25 to 27.3.25 ...	2.4.25.
<i>Pakeha</i> ...	W. P. Clifton Mogg	R. K. Vandervard, E. T. Baker	M.L.	Shaw, Savill & Albion	" 25.12.24 to 12.1.25...	14.4.25.
<i>Paparoa</i> ...	Ashworth, F. ...	C. J. Brewer ...	No.	New Zealand S.S. Co.	Met. Log. 7.11.24 to 27.3.25 ...	30.3.25.
<i>Pareora</i> ...	Evans, J. O. ...	R. F. Hillings ...	"	Hain S.S. Co. ...	Form 911 13.3.25 to 23.3.25 ...	30.3.25.
<i>Paris</i> ...	Cook, C. L. ...	Mr. Biles ...	C.C.	Southern Rly. ...	" 31.12.24 to 6.2.25 ...	21.2.25.
<i>Patia</i> ...	Bostock, R. J. ...	W. McLwaine ...	No.	Elders & Fyffes ...	Telegraphic Report. 19.2.24	19.2.24.
<i>Patrol, C.S.</i>	Welsh, T. K. ...	W. H. S. Clark, H. F. P. Albrecht, W. G. MacBryde, A. T. Morrell.	M.L.	Eastern Extension (A. & C.) Telegraph Co.	Form 911 17.1.25 to 4.2.25 ...	2.3.25.
<i>Persic</i> ...	Davies, E. ...	H. Williams ...	No.	White Star ...	Met. Log. 1.10.24 to 12.1.25 ...	16.4.25.
<i>Peshawar</i> ...	Hester, C. W., R.D., Commr., R.N.R.	D. G. Baillie, E. J. R. North, J. R. Alleyne.	M.L.	P. & O. ...	Form 911 19.10.24 to 1.12.24...	3.12.24.
<i>Pharos</i> ...	Ewing, T. N. ...	D. Tullock, A. McLachlan ...	No.	Northern Lighthouse Board.	Met. Log. 24.7.24 to 4.12.24 ...	10.12.24.
<i>Philadelphum</i> ...	Baker, J. A. ...	W. Lawton ...	No.	Leyland ...	" 17.8.24 to 19.11.24...	28.11.24.
<i>Polyphemus</i> ...	Hatfield, J. ...	R. E. Wilkes ...	"	A. Holt ...	Form 911 2.10.24 to 20.11.24...	26.11.24.
<i>Poona</i> ...	Cherry, W. G. W. ...	F. B. W. Page ...	"	P. & O. ...	" 1.2.25 to 23.2.25 ...	25.2.25.
					" 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 17.4.25.	Date Received.
<i>Port Adelaide</i> ...	Hayter, S. W. ...	... ..	M.L.	Commonwealth & Dominion.	... ..	...
„ <i>Albany</i> ...	Robinson, C. A. ...	A. Jenkyns, A. G. Newbury, G. Lovegrove.	M.L.	„ „ „	Met. Log. 15.11.24 to 1.4.25...	9.4.25.
„ <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. ...	H. Smith, T. Copeland, E. Fenton, C. Chamberlin.	M.L.	„ „ „	„ 16.8.24 to 17.12.24...	22.12.24.
„ <i>Curtis</i> ...	Van den Bergh, C. ...	W. H. Miles ...	No.	„ „ „	Form 911 10.11.24 to 21.11.24	6.12.24.
„ <i>Darwin</i> ...	Brown, A. H. ...	E. T. N. Lawrey, E. W. R. Young.	„	„ „ „	„ 13.1.25 to 7.2.25 ...	23.3.25.
„ <i>Denison</i> ...	Ferris, J. ...	... ..	„	„ „ „	... ..	... ..
„ <i>Hacking</i> ...	Williams, R. ...	Rowland Hill ...	„	„ „ „	„ 3.11.24 to 17.12.24...	26.1.25.
„ <i>Hunter</i> ...	Cottell, S. C. ...	A. Cooper, C. F. Post, J. T. Weldin.	M.L.	„ „ „	Met. Log. 18.10.24 to 2.3.25 ...	9.3.25.
„ <i>Melbourne</i> ...	Kearney, F. J. ...	D. G. H. Bradley, J. A. Fairbairn, A. G. Starkey.	M.L.	„ „ „	„ 10.11.24 to 3.4.25 ...	8.4.25.
„ <i>Nicholson</i> ...	Hoad, A. C. ...	E. A. Leavett, C. R. Townshend, G. G. Langford.	M.L.	„ „ „	„ 12.3.24 to 14.8.24 ...	9.9.24.
„ <i>Pirie</i> ...	Higgs, W. G. ...	H. C. Jeffery, W. G. Jones, J. T. Nicholson, E. G. L. Jones.	M.L.	„ „ „	„ 9.8.24 to 13.12.24...	19.12.24.
„ <i>Sydney</i> ...	Lea, W. H. ...	A. W. Sams, C. Groves, A. M. Stanton, G. Freeman-Pannett.	M.L.	„ „ „	„ 13.6.24 to 15.11.24...	18.11.24.
„ <i>Victor</i> ...	Swan, L. H. ...	E. G. Fullick, R. T. R. Tomsett, W. Pickup.	M.L.	„ „ „	„ 4.10.24 to 9.2.25 ...	14.2.25.
<i>President Jackson Protea</i> , H.M.S.A.S.	Griffith, J. ...	E. E. Henry ...	No.	Pacific S.S. Co. ...	Form 911 4.1.25 to 24.1.25 ...	4.3.25.
	Woodhouse, A. F. B., Lt.-Commr., R.N.	F. J. S. Scott-Stokes ...	„	South African Naval Service.	„ 11.2.25 to 28.2.25 ...	23.3.25.
<i>Pyrrhus</i> ...	Elford, W. J. ...	W. Owen ...	No.	A. Holt ...	„ 16.2.25 to 26.2.25 ...	26.3.25.
<i>Regina</i> ...	Smith, R. G. ...	A. Hulme, N. E. Banks, W. Daman.	M.L.	White Star-Dominion {	W.T. Reg. 25.1.25 to 15.2.25 ...	23.2.25.
					Form 911 25.1.25 to 14.2.25 ...	19.2.25.
<i>Reindeer Rhodesian Transport.</i>	Mulhall, W. ...	... ..	C.C.	G.W. Railway ...	Telegraphic Report. 16.4.25 ...	16.4.25.
	Fowler, W. H. ...	W. Heritage ...	No.	Houlder Bros. ...	Form 911 4.11.24 to 27.2.25 ...	14.3.25.
<i>Rialto</i> ...	Mordue, J. A. ...	... ..	„	Ellerman Bucknall ...	„ 17.2.25 to 25.3.25 ...	4.4.25.
<i>Rimutaka</i> ...	Hemming, F. A. ...	H. Horwood, R. S. Cox, O. M. Watts.	M.L.	New Zealand S.S. Co.	Met. Log. 12.10.24 to 1.4.25 ...	6.4.25.
<i>Risaldar</i> ...	Park, G. ...	H. Gibson, N. W. Heard, T. E. Ward.	„	Asiatic S.N. Co. ...	„ 8.3.24 to 13.10.24...	18.11.24.
<i>Romney</i> ...	Syms, G. ...	W. H. Underhill ...	No.	Lampert & Holt ...	Form 911 24.12.24 to 5.2.25 ...	6.3.25.
<i>Rotorua</i> ...	Winter, - ...	... ..	„	N.Z.S. Co. ...	„ ...	... ..
<i>Royal Fusilier</i> ...	Dawson, J. ...	J. Fraser ...	„	London & Edinburgh S.S. Co.	„ 11.3.25 to 1.4.25 ...	6.4.25.
<i>Royal Transport... Ruapehu</i> ...	Dove, J. ...	R. Martin ...	„	Houlder Bros. ...	„ 11.1.25 to 8.2.25 ...	10.3.25.
	McKellar, A. W., R.D., Capt., R.N.R.	P. J. Connolly, T. N. Bennett, F. Cooke.	M.L.	New Zealand S.S. Co.	Met. Log. 25.10.24 to 14.3.25 ...	23.3.25.
<i>Sachem</i> ...	Westgarth, W. A. ...	C. Waldron, E. Sainty ...	M.L.	Furness Withy ...	Form 911 2.11.24 to 14.12.24...	15.12.24.
<i>St. Albans</i> ...	Picher, E. ...	W. McIntyre ...	No.	Eastern and Australian Scientific Expeditionary Research Assocn.	„ 10.9.24 to 18.11.24...	19.1.25.
<i>St. George</i> ...	Blair, D., O.B.E., R.D., Commr., R.N.R.	G. H. Blair, R. A. Edwards	M.L.	„	Met. Log. 1.5.24 to 10.12.24 ...	1.4.25.
<i>St. Patrick</i> ...	Bearpark, E. W. ...	J. Hill ...	No.	Rankin Gilmour ...	Form 911 2.1.25 to 26.1.25 ...	27.2.25.
<i>Salaga</i> ...	Sola, P., D.S.O. ...	F. A. Elston ...	„	Elder Dempster ...	„ 31.1.25 to 13.2.25 ...	2.3.25.
<i>Samaria</i> ...	Horsburgh, G., O.B.E.	R. P. Cambell ...	„	Cunard ...	„ 25.1.25 to 15.2.25 ...	21.2.25.
<i>Sandown Castle</i> ...	Jackson, C. R. ...	E. H. de Heaume ...	„	Union Castle ...	„ 20.11.24 to 19.12.24	16.1.25.
10 <i>Saturnia</i> ...	Mitchell, W. ...	D. Macqueen ...	W.T.	Anchor Donaldson ...	W.T. Reg. 15.3.25 to 5.4.25 ...	17.4.25.
					Form 911 15.3.25 to 7.4.25 ...	16.4.25.
<i>Saxoleine</i> ...	Biddick, F. ...	R. Atkinson, B. Johnsen ...	No.	Hunting & Son ...	„ 20.2.25 to 12.4.25 ...	16.4.25.
<i>Saxon</i> ...	Stanley, W. F., R.D., Commr., R.N.R.	R. S. W. Harris ...	„	Union Castle ...	„ 8.8.24 to 29.9.24 ...	1.10.24.
<i>Saxonia</i> ...	Jones, R. D. ...	H. A. D. Waterhouse ...	„	Cunard ...	„ 7.9.24 to 7.10.24 ...	16.10.24.
<i>Scholar</i> ...	McCullum, J. ...	A. L. Cresswell ...	„	Harrison ...	„ 1.1.25 to 3.3.25 ...	20.3.25.
<i>Scientist</i> ...	Hansen, W. A. ...	D. G. Russell ...	„	„	„ 21.5.24 to 9.8.24 ...	12.8.24.
<i>Scotia</i> ...	Smart, R. W. ...	H. D. Campsie ...	„	Anchor ...	„ 4.10.24 to 17.12.24...	29.12.24.
<i>Scottish Bard</i> ...	Telfer ...	O. W. L. Jones ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report 4.4.25 ...	4.4.25.
<i>Scottish Borderer</i> ...	McDonnell, S. ...	S. W. Watts ...	No.	„	Form 911 8.3.25 to 27.3.25 ...	15.4.25.
<i>Scottish Strath</i> ...	Thompson, F. ...	G. F. Widger ...	„	„	„ 12.6.24 to 13.7.24 ...	21.7.24.
33 <i>Scythia</i> ...	French, A. F. ...	W. Black ...	„	„	„ 9.11.24 to 14.12.24...	3.1.25.
	Prothero, W. ...	T. Parry, G. Overton, W. B. Tannet.	W.T.	Cunard ...	W.T. Reg. 12.1.25 to 18.1.25 ...	10.2.25.
					Form 911 11.1.25 to 7.2.25 ...	16.2.25.
<i>Sheafdart</i> ...	... ..	T. B. Griffiths ...	No.	Kaitani Mining Administration.	„ ...	... ..
<i>Sheaf Mount</i> ...	Groves, C. V. ...	C. A. Goold ...	„	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. 17.7.24 to 13.11.24...	1.1.25.
<i>Sicilia</i> ...	Davis, H. C., D.S.C., R.D., Commr., R.N.R.	R. Rowe ...	No.	P. & O. ...	Form 911 9.12.24 to 28.12.24...	23.2.25.
<i>Socrates</i> ...	James, F. R. ...	E. R. Hartley ...	„	Lampert & Holt ...	„ 5.2.25 to 24.2.25 ...	23.3.25.
<i>Soekaboemi</i> ...	Lap, J. ...	W. N. de Wijn ...	„	Rotterdam Lloyd ...	„ 26.1.25 to 26.2.25 ...	23.3.25.
<i>Somerset</i> ...	Barnett, H. ...	J. J. Youngs ...	No.	N.Z.S. Co. ...	Form 911 6.1.25 to 23.1.25 ...	23.3.25.
<i>Somersetshire</i> ...	Adamson, B. W. ...	P. Hawkins, J. Cullen, M. Simmons.	M.L.	Bibby ...	Met. Log. 9.11.24 to 11.2.25 ...	6.3.25.
<i>Somme</i> ...	Spriddell, F. G. ...	K. W. Simpton, H. Chamberlian, V. Hill, C. C. Prosser.	M.L.	R.M.S.P. Co. ...	Met. Log. 16.2.24 to 29.9.24 ...	18.11.24.
	Miles, F. R., Commr., R.N.R.	... ..			
<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> ...	Richardson, R. ...	D. Fraser, J. G. F. Betson ...	No.	„	Form 911 26.1.25 to 9.4.25 ...	16.4.25.
<i>Spero</i> ...	French, H. E. ...	E. A. Gould, G. Mussared, R. Higginbottom, J. Ruthertford.	M.L.	Ellerman Wilson ...	Met. Log. 23.2.24 to 9.8.24 ...	19.8.24.
<i>Stephan</i> , C.S. ...	Carlton, G. F., O.B.E., Commr., R.N.R.	S. G. Elcoate, F. B. Bolingbroke, W. E. Allen, T. J. Horan.	M.L.	Telegraph Construction & Maintenance	„ 25.7.24 to 13.10.24...	17.10.24.
<i>Stuart Prince</i> ...	Litchfield, E. ...	G. B. Taylor, W. R. Holt ...	No.	Prince ...	Form 911 24.2.25 to 10.3.25 ...	16.3.25.
<i>Surrey</i> ...	Field, H. E. B. ...	C. P. Jackson, C. H. Landfield.	M.L.	Federal ...	Met. Log. 2.11.24 to 28.3.25 ...	14.4.25.
<i>Sussex</i> ...	Upton, E. C. S. ...	W. A. Ewington ...	No.	„	Form 911 28.10.24 to 13.11.24	15.12.24.
<i>Tainui</i> ...	Hartman, W. H. ...	P. S. Horwood ...	„	Shaw, Savill & Albion	„ 13.12.24 to 23.1.25...	23.1.25.
<i>Tairoa</i> ...	Summers, W. G. ...	S. A. Bannister ...	„	„	„ 2.9.24 to 7.2.25 ...	23.3.25.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 17.4.25.	Date Received.
<i>Tahiti</i> ...	...	...	No	Union S.S. Co. of N.Z.	Form 911 ...	...
<i>Taiyuan</i> ...	Hamilton, H. E. ...	T. M. Young, W. Bailey, ...	M.L.	Yuill & Co. ...	Met. Log. 11.7.24 to 15.12.24...	10.2.25.
<i>Talthybius</i> ...	Thomas, R. D. ...	A. M. Frame. ...	...	...	...	...
<i>Tanda</i> ...	Duggan, C. ...	P. Elder ...	No.	A. Holt ...	Form 911 21.2.25 to 5.3.25 ...	23.3.25.
<i>Tambora</i> ...	Pilcher, E. ...	...	M.L.	E. & A. S.S. Co. ...	Form 911 ...	...
<i>Teiresias</i> ...	Ruhaak, H. G. ...	H. Van Manen ...	No.	Rotterdam Lloyd ...	" 23.10.24 to 10.12.24	22.12.24.
<i>Teucer</i> ...	Holden, W. R. F. ...	R. S. Young ...	"	A. Holt ...	" 8.1.25 to 23.1.25 ...	2.2.25.
<i>Themistocles</i> ...	Hodgson, R. N. ...	G. Lancaster ...	"	" ...	" 30.1.25 to 9.3.25 ...	8.4.25.
<i>Theseus</i> ...	Jernyn, W. M. ...	W. F. Sargent ...	"	Aberdeen ...	" 4.1.25 to 11.2.25 ...	24.3.25.
<i>Titan</i> ...	Batt, A. E. ...	J. T. Fettes ...	"	A. Holt ...	" 4.2.25 to 23.2.25 ...	23.3.25.
<i>Tolmie</i> , S.F.Bqtne.	Wilkinson, T. G. ...	G. Gow, L. Horton, S. C. Timmouth.	M.L.	" ...	Met. Log. 6.6.24 to 12.10.24 ...	11.12.24.
<i>Tottori Maru</i> ...	Stewart, J. C. ...	E. F. Collins ...	No.	B. C. Mills, Tug and Barge Co.	Form 911 1.11.24 to 24.12.24...	2.3.25.
<i>Traveller</i> ...	Matsukura, B. ...	S. Ibori ...	"	Nippon Yusen Kaisha	" 7.9.24 to 13.10.24 ...	20.10.24.
<i>Trematon</i> ...	Worthington, B. ...	A. Robertson ...	M.L.	Harrison ...	" 19.6.24 to 18.7.24 ...	22.7.24.
<i>Tuscania</i> ...	Hicks, F. H. ...	J. Christopher, D. Thomas, F. J. Webb, S. Smith, C. Mayberry.	"	" ...	Met. Log. 31.3.23 to 24.9.24 ...	14.10.24.
<i>Tyndareus</i> ...	Evans, B. ...	...	...	...	...	...
<i>Ulimaroa</i> ...	Bone, D. W. ...	J. W. Cherry ...	No.	Anchor ...	Form 911 4.3.25 to 12.3.25 ...	17.4.25.
<i>Ulysses</i> ...	Adcock, F. ...	D. L. Hoare ...	"	A. Holt ...	" 17.5.24 to 22.8.24 ...	10.9.24.
<i>Umtali</i> ...	Wyllie, W. J. ...	J. Gilbertson ...	"	Huddart Parker, Ltd.	" 17.10.24 to 23.11.24	19.1.25.
<i>Valacia</i> ...	McHutcheon, W. ...	T. R. Phillips ...	"	A. Holt ...	" 10.1.25 to 27.1.25 ...	6.4.25.
<i>Valdura</i> ...	Barnes, E. W. ...	W. H. Foster ...	"	Bullard King ...	" 8.12.24 to 8.4.25 ...	16.4.25.
<i>Vardulia</i> ...	Doyle, M. ...	N. Grayson ...	M.L.	Cunard ...	Met. Log. 15.2.25 to 26.2.25 ...	2.3.25.
<i>Vasconia</i> ...	Mitchell, A. ...	H. J. Maughan, J. Anderson, A. M. S. Well.	"	Gow Harrison ...	" 19.6.24 to 20.11.24...	8.12.24.
<i>Vellavia</i> ...	Murchie, P. A., R.D., Commr., R.N.R.	J. E. Deans ...	No.	Cunard ...	Form 911 8.2.25 to 20.2.25 ...	27.2.25.
<i>Ventura de Lar-rinaga</i> ...	Inch F. ...	E. Gleave ...	"	" ...	" 7.1.25 to 21.1.25 ...	16.2.25.
<i>Verbania</i> ...	Fear, E. T. C. ...	J. E. Deans ...	"	" ...	" 26.3.25 to 6.4.25 ...	14.4.25.
<i>Verentia</i> ...	Keay, W. S. ...	H. J. Kay ...	"	Larrinaga ...	" 2.10.24 to 4.11.24 ...	25.11.24.
<i>Vigilant</i> ...	Hatcher, W. H., R.D., Commr., R.N.R.	J. G. Wiseman ...	"	Cunard ...	" 17.2.25 to 22.3.25 ...	24.3.25.
<i>Walmer Castle</i> ...	Edkin, E. ...	A. F. Watts ...	"	" ...	" 13.2.25 to 26.3.25 ...	1.4.25.
<i>Wangaratta</i> ...	Simpson, E. S. S. ...	J. Hunter ...	No.	Scottish Fishery Board	Form 911 7.3.25 to 30.3.25 ...	2.4.25.
<i>Warfeld</i> ...	Davey, A. ...	B. S. Cave ...	No.	Canadian-Australasian	Form 911 2.10.24 to 22.10.24...	9.12.24.
<i>War Nizam</i> ...	Stanley, W. P., R.D., Commr., R.N.R.	C. Ayles ...	"	Union Castle ...	" 2.1.25 to 23.2.25 ...	24.2.25.
<i>Welshman</i> ...	Scutt W. ...	T. W. Wordingham, W. C. Cripps, K. M. Morrison.	M.L.	British India ...	Met. Log. 30.6.24 to 26.11.24...	1.12.24.
<i>Winifredian</i> ...	Steel, R. ...	E. V. Wilkinson ...	No.	" ...	Form 911 18.11.24 to 12.1.25...	16.1.25.
<i>Woodarra</i> ...	Putt, R. O. ...	D. Beaumont ...	"	British Tankers ...	" 10.2.25 to 23.2.25 ...	17.3.25.
<i>Yorkshire</i> ...	Rollerson, W. ...	W. A. Fletcher ...	"	White Star-Dominion	" 29.1.25 to 26.2.25 ...	6.3.25.
<i>Zealand</i> ...	Harrocks W. ...	W. E. Boyle ...	"	Leyland ...	" 14.12.24 to 19.1.25...	2.2.25.
<i>Conway H.M.S.</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>Pangbourne Nautical College.</i>	Millson, G. C. ...	E. Jones ...	No.	Bibby ...	Form 911 8.11.24 to 15.1.25 ...	19.1.25.
<i>Worcester, H.M.S.</i>	Thomas, A. J. ...	J. Cross ...	No.	Red Star ...	Form 911 13.2.25 to 6.3.25 ...	9.3.25.
<i>Abaco</i> ...	Broadbent, H. W., R.D. Capt., R.N.R.	The Senior Cadets...	Cadets' M.L.	...	Cadets' Met. Log. 25.1.25 to 4.4.25	9.4.25.
<i>Cay Lobos</i> ...	Tracy, A. F. G., Commr., R.N.	" ...	"	...	Cadets' Met. Log. 18.1.25 to 2.4.25	7.4.25.
<i>Double Headed Shot</i> ...	Sayer M. B., O.B.E., R.D., Capt., R.N.R.	" ...	"	...	Cadets' Met. Log. 26.9.24 to 17.12.24	19.12.24.
<i>Inagua</i> ...	...	The Keepers ...	Lighthouse Register.	...	Lighthouse Register 7.7.24 to 14.1.25	9.3.25.
<i>Sombrero</i> ...	...	" ...	"	...	Lighthouse Register 1.7.24 to 31.12.24	9.3.25.
<i>Watling Island</i> ...	...	" ...	"	...	Lighthouse Register 1.7.24 to 31.12.24	9.3.25.
<i>Cape Pembroke (Falkland Is.)</i>	...	" ...	"	...	Lighthouse Register 11.7.24 to 18.1.25	9.3.25.
	...	" ...	"	...	Lighthouse Register 1.7.24 to 31.12.24	10.2.25.
	...	" ...	"	...	Lighthouse Register 1.7.24 to 30.12.24	9.3.25.
	...	" ...	"	...	Lighthouse Register 1.7.24 to 31.12.24	4.3.25.

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

Name of Vessel.	Captain.	Observing Officer.	Line.	Last Case of Water Samples, Reports, etc., Received up to 31.3.25.	Date Received.
<i>Denis</i> ...	Harris, F. C. P. ...	Mr. Heyburn ...	Booth ...	Water Samples ...	24.2.25.
<i>Hildebrand</i> ...	Maddrell, J. ...	R. S. Hulme Goodier ...	" ...	" ...	13.1.25.
<i>Manzanaras</i> ...	Henderson, J. N. ...	H. E. Lees ...	Elders & Fyffes ...	" ...	...
<i>Miami</i> ...	Makepeace, S. ...	H. H. Dunning ...	" ...	" ...	...