

VOL. IV. No. 42.

THE MARINE OBSERVER.

JUNE 1927.

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WORK OF THE YEAR.

Note to Marine Observers.

THE past year will be remembered as most depressing to commerce, and though during the coal stoppage a number of tramps and old ships, laid up, were put into commission and made voyages bringing coal to Great Britain, shipping was disorganised during the General Strike and subjected to serious delays during the continuance of the coal dispute.

According to the annual report of the Chamber of Shipping of the United Kingdom, the effective carrying services rendered to and from Great Britain and Ireland diminished by no less than 11,000 million loaded ton miles in 1926; a tremendous loss of trade and employment to the merchant service.

After such a time it is significant that the Prime Minister should, in paying tribute to the merchant service at the annual banquet

of the Chamber of Shipping of the United Kingdom, take as his theme the mastery of the sea by British seamen.

Notwithstanding the difficulties which have confronted us, the British corps of voluntary marine observers have during the 12 months ended 31st March, 1927, worthily upheld the tradition which has been built up, with the Marine Division as a medium, during the past seventy years. For not only has the high standard which was reached last year—when we reported that the improvement in routine observation recorded in logs was without precedent—been maintained, but many more members of the corps of marine observers have taken the initiative, and by use of wireless telegraphy have themselves applied The Work as an aid to navigation.

The facts which follow speak more eloquently of your work at

sea than any other appreciation which could be given.

COLLECTION OF DATA.

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

Commencing from 1st April, 1926, the higher standard of classification, previously notified was used. Therefore about the best 40 logs in every 100, taking into consideration evidence of the practical application of meteorology to navigation, have been classed "Excellent"; and of 274 logs received the following classification has been allotted by this competitive standard.

Excellent	-	-	-	-	-	-	-	109
Very Good	-	-	-	-	-	-	-	164
Good	-	-	-	-	-	-	-	1
Not classed	-	-	-	-	-	-	-	0
Total	-	-	-	-	-	-	-	274

This is the first year since 1922, when "Not Classed" was first used to indicate inferior observation, that *all* logs received have contained observations in the standard form required, made with official instruments; and nil for "Not classed" therefore constitutes a further record to our corps.

There is a marked improvement in the record of wireless reports made to "All ships," and other evidence of the practical application of the work in the form of weather charts, additional remarks, etc. attached at the end of the logs.

The average number of merchant ships in the voluntary observing fleet detailed to keep meteorological logs has remained at 115, and the geographical distribution of observation has been very materially improved.

Arrangements have been made for the four H.M. Surveying Ships in Home Waters to be replaced on the list by ships on foreign stations; and it is intended to retain 10 places in all on the list for H.M. Ships to keep meteorological logs, in future.

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

Classification.	1926-1927.	1925-1926.	1924-1925.
Excellent - - -	439	416	393
Very Good - - -	1,623	1,641	1,721
Good - - -	33	32	75
Not classed - - -	0	2	0
Total received - -	2,095	2,091	2,189

During the year this form was revised and the provision for recording wireless weather reports made to "All ships" by those selected, with reliable mercurial barometers in their outfit, and the space provided for "Additional remarks" are being brought into more general use.

As the above table shows, the work of keeping these most useful forms is steadily maintained, and as we shall show later, ships detailed in the list to keep these forms are now also playing an important part in the development of the practical application of the work at sea for the general benefit of shipping and seamen; as well as assisting some of the meteorological services of British Dominions and Colonies overseas.

Ice Reports, Form 912.

The recording and returning of reports of ice seen in all parts of the world steadily improves. The improvement is perhaps most marked with ships using Southern Ocean tracks since the revision and publication of the quarterly Ice Chart of the Southern Hemisphere in the 1926 numbers of THE MARINE OBSERVER.

Like all other branches of the work a sustained effort is required and marine observers are asked not only to report ice seen, but to make "Nil" returns when no ice is seen when passing through regions within the charted ice limits in both northern and southern latitudes.

Report of Tropical Revolving Storms, Form 905.

These reports, welcomed from all ships, whether on our list or not, experiencing tropical revolving storms, are most useful in investigating hurricanes, typhoons and cyclones. A number have been received and members of the corps of marine observers are asked to bring to the notice of all captains and officers of ships navigating cyclone regions the desirability of sending in these reports, so that if possible the "Laws of Storms" may be improved.

North Atlantic Wireless Telegraphy Weather Report Registers, used with Instruments lent by the Meteorological Office, Ships' Coded Reports.

As shown by the comparative table below, the standard of these registers continues to improve.

Classification.	1926-1927.	1925-1926.	1924-1925.	1923-1924.
Excellent - -	212	157	162	155
Very Good - -	102	143	100	90
Good - - -	0	0	0	5
Not classed - -	0	0	2	0
Total received -	314	300	264	250

Cross-Channel Steamers' Telegraphic Reports.

Ten Packet Steamers on the Newhaven-Dieppe, Guernsey-Weymouth and Holyhead-Dublin services have made these reports of observations taken at mid-Channel.

During the year 674 reports have been received.

This work has been carried out in a highly satisfactory manner.

Sea Water Samples.

Twelve ships in the South American, West Indian, and North Atlantic trades have collected water samples, for which work the Director of the Fisheries Laboratory desires us to make acknowledgment on behalf of the Ministry of Agriculture and Fisheries. The Marine Biological Association of Plymouth and the Salt Union of Runcorn have also benefited by this work, which is arranged by the Port Meteorological Officer, Liverpool, to ensure that there shall not be duplication of effort.

The use made of the Data collected.

In "Work of the Year" in former years, and in "Marine Meteorology, History and Methods," published in Volume II, information was given of the process of data extraction and compilation, so that all members of the corps of marine observers might enter with knowledge whole-heartedly into the work, which is intended to provide mariners with charts and directions and in general provide humanity with improved knowledge of the atmosphere and the sea.

To mention one matter in which data provided has helped to serve the nation of this island Kingdom, so largely dependent on food from overseas, The Director of Food Investigation of the Department of Scientific and Industrial Research wished to ascertain what the humidity was along a certain route traversed by a ship having on board an experimental shipment of meat from Australia. The observations of the dry and wet bulb thermometers taken in regular observing ships along the route supplied him with the information.

With the advances made in the processes of chilling and freezing meat, dairy produce, fruit, and the skilled stowage of all forms of perishable cargo, a knowledge of meteorological conditions at loading ports, along the trade routes, and at discharging ports, is becoming more and more necessary.

Enquiries for the purpose of litigation in the courts of this country concerning claims brought for damaged cargo, all go to prove the economic value of your work to the shipowner, the underwriter, the merchant and the consumer.

The findings of several recent inquiries into the loss of ships, due to unexpected currents and to bad weather go to prove how indispensable the development of the work is to safety of life at sea. The results of the work are being steadily published in this Journal,

in the form of current charts, advice as to the application of wireless communication to foreknowledge of weather, statistics of fog, and the daily variations of the barometer (with instructions as to the use of normals, more especially in the tropics, for obtaining warnings of hurricanes); and there is no doubt that in future your work will play a most important part in furthering the development of the Empire's air communications. It has already been a means of assistance to those engaged in laying down projected air routes which were considered by the Imperial Conference in 1926.

Data Extraction, Compilation and Research.

During the year 78,180 sets of observations were extracted from logs and punched on HOLLERITH cards.

In addition to these complete sets of observations, 8,242 observations of set and drift of current, dating back to 1910, on the routes to the West Indies and Panama, were extracted.

The average rate of preparing and coding observations of 81 sets per man per day, including Sundays and holidays in the time expended, reached for the first time last year, has been maintained.

Sixty-two per cent of logs received, reaching the standard of "very good" or above, have been prepared for extraction; while observations of special interest and unusual phenomena in all logs and Forms 911 received during the year have been indexed.

MARSDEN CHART No. I shews the distribution and number of sets of observations extracted from logs during the past twelve months; and MARSDEN CHART No. II gives these particulars since April, 1920.

You will find the results of our researches throughout the numbers of this Journal.

Exchange of Data.

This year more marine meteorological data have been supplied to other services than ever before, within the knowledge of the oldest member of the Marine Division or as revealed in the Annual Reports; while the data that the British corps of voluntary marine observers have supplied have made it unnecessary for us to apply to foreign marine divisions for observations for such investigations and computations as we have been able to carry out, for compiling information for mariners.

Thus the great advantage of the British system, with the use of the HOLLERITH machine for international purposes, is manifested; in that the principle information contained in a meteorological log kept on board a British ship is made available to all maritime nations; and it is unnecessary for the officers of these ships to keep more than one record. Harm has been done to the progress of marine meteorology by systems which required that the same ship should keep a number of logs, registers, or records for different services.

By the British method all requirements of international marine meteorology may be met without duplication of work on board observing ships. The Hollerith method puts at the disposal of all marine divisions the data extracted from British marine meteorological logs, at the cost of sorting the cards and postage.

During the year the following data have been supplied to the services indicated.

To the Royal Dutch Meteorological Institute at De Bilt, 1,112 sets of observations for all months in the year 1925, in selected squares in the Atlantic, Indian and Pacific Oceans.

To the French National Meteorological Office at Paris, 536 sets of observations for the period 25th April to 10th May, 1924, in the North Atlantic and North Sea, between Latitude 20° and 55° N. Longitude 10° E. and 35° W.

To the Geophysical Institute at Bergen, 1,496 sets of observations in the North Atlantic north of Latitude 10° N., for the periods 28th September to 4th October, 1923, 7th to 13th October, 1923 and 18th to 26th October, 1923.

To the International Bureau of Vulcanology at Naples, copies of all reports of submarine earthquake phenomena received during the year ending March 31st, 1926.

To the Reseau Mondial, an international publication compiled by the Climatology Division:—

Monthly means of pressure and air temperature for Watling Island, West Indies, and Cape Pembroke, Falkland Islands, for the year 1922.

Monthly means of air and sea temperature for the area, Latitude 57°–62° N., Longitude 15°–20° W. for the year 1925.

Monthly means of pressure, air and sea temperature for the areas, Latitude 45°–50° N., Longitude 30°–35° W., and Latitude 48°–53° N., Longitude 15°–20° W. for the year 1924; and the same information for the area Latitude 50°–55° N. Longitude 25°–30° W. for 1923 and 1924.

To the International Upper Air Commission, 283 observations of wind and pressure at 8 a.m. on selected days in April, May and June, 1923, in all oceans south of the Equator.

The percentage frequency of sea and swell disturbance, computed from 6,153 observations taken in the years 1921 to 1925, along a projected seaplane route, was supplied for the purpose of British aviation.

Two hundred and thirty-seven sets of observations for 8 a.m. ships' time, for the week February 13th to 19th, 1925, between Longitude 25° W., and 100° E., were provided for the purpose of investigating the projected airship route to India.

To the Fishery Board for Scotland, 372 observations of the set and drift of current in the North Atlantic between Latitude 40° and 60° N., for the year 1925.

Many inquiries calling for information of conditions prevailing at sea, at the times of casualties, have been answered by providing extracts from meteorological logs and ships' meteorological reports, Forms 911, for the purpose of the law courts and other tribunals.

Wireless Telegraphy Coded Reports from North Atlantic Liners.

These reports have been of great value to the Forecast Service in connection with Gale Warnings, the "Weather Shipping" Bulletin, the forecasts issued through the press and the B.B.C., as well as for the purposes of aviation. Their national value was increased at the time of the general strike, when air transport of mails and other essential aerial communications made information of weather systems approaching from the westward, of vital importance.

During the last twelve months 4,714 weather reports were received from the 32 North Atlantic liners specially detailed in our list for this service.

Upon examination of the registers in the Marine Division, it was found that 1,254 reports were received within one hour of observation, 1,230 reports within two hours, 1,080 within four hours, while 1,150 were over four hours in transmission.

2,162 reports were sent by ships to the westward of Longitude 40° W., through Bar Harbour and other American coast stations direct to the United States Weather Bureau at Washington, D.C. A selection of these reports are re-transmitted from Washington through Paris to England, and are used with those received direct, for obtaining the distribution of pressure and weather right across the North Atlantic.

381 errors in transmission were corrected by the check system, the registers proving that the check had only failed in 14 cases.

Some of these ships have repeated the same observations in plain language standard form reports addressed to "All ships" so as to make the reports more easily available, direct, to all ships desiring observations synchronised with those of the nearest coast. R.M.S. *Cedric*, Captain V. W. HICKSON and R.M.S. *Lancastria*, Captain R. G. MALIN, are to be congratulated on being the pioneers of this extension of service, and upon their sustained and continuous effort.

Practical Application of the Work at Sea.

The provisions of the Meteorological Office authorise the loan of sets of tested instruments to the Captains of British merchant ships for the purpose of the collection of reliable observations of weather at sea. These observations are required to provide data for research, for compiling information required for navigation, for the general purposes of meteorology ashore, and for central forecasting.

The provisions of the Meteorological Office do not permit the loan of instruments to ships for their own exclusive purposes, but where instruments are lent for the first, it is intended that they should be used also for the second. And so it is that there are about 150 British merchant ships, with highly efficient official instruments on board, which may be used for the general advantage of shipping on the high seas.

In 1921, in "Weather Forecasting in the Eastern North Atlantic and Home Waters for Seamen," published when the principle of giving actual observations at British coast stations by W/T to

shipping was first adopted, it was stated—

“The greatest assistance which shipowners can give in furthering this aid to navigation is to provide their ships with good mercurial barometers.”

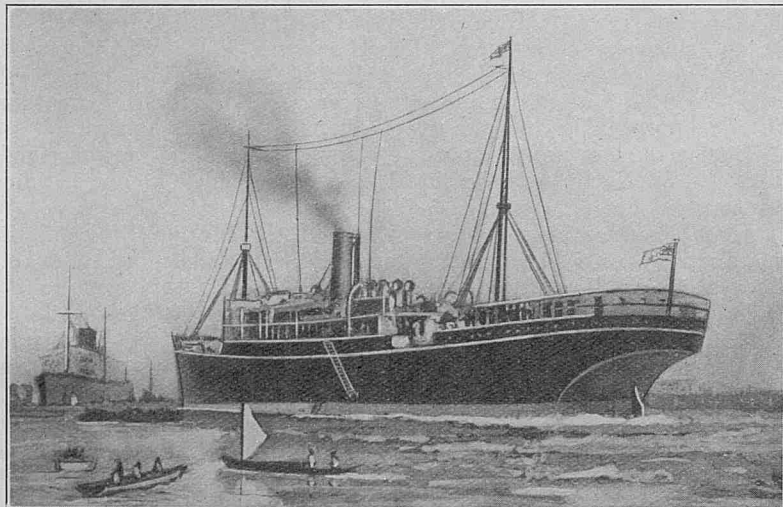
It would seem that many shipowners are now realising more truly the value, to those navigating their ships, of a reliable barometer; and there are now on our list just over one hundred ships with mercurial barometers in their outfits, which with the 150 ships with official instruments, make 250 ships in our total 500 which have on board a good mercurial barometer, and are invited to make routine reports to “All ships.”

The chapters on “Wireless and Weather an Aid to Navigation,” originally published in the 1924 numbers of this Journal, are being revised and re-published in this year's numbers.

The number of British observing ships regularly making weather reports to “All ships” along all the trade routes of the world, has more than doubled during the past twelve months, and is steadily growing, as shown by the weather reports logged as sent.

Of the many ships which are performing this very useful service, a few may be mentioned which have indeed set a fine example.

Of the ships equipped with official instruments, S.S. *Khyber*, Captains J. B. BROWNING, and C. HESTER, principal observer, Mr. C. W. ROCHE, Chief Officer, during two voyages to the Far East, has continued regularly broadcasting reports of observations, made at the correct times, daily to “All ships”; and when within range of certain stations these reports have been addressed to British Colonial observatories as well as to all ships. A weather chart has been made whenever sufficient synchronised data was available.



S.S. “Khyber” entering Harbour.

On her earlier voyage *Khyber* brought to the notice of the authorities at Hong Kong the utility to ships in the China Seas of weather observations at coast stations, if broadcast by wireless; and from July 1st, 1926, these observations have been so made.

On her last voyage she made good use of these reports. With them and those of other ships, the chart she made on September 29th, 1926, showed her that a typhoon could be passed, and so loss of time was avoided.

S.S. *Wangaratta*, Captain W. SCUTT, principal observer, Mr. S. R. MILLARD, Second Officer, on two voyages to Australia via Suez, has broadcast routine reports daily to “All ships” and to British Dominion weather offices when in touch; made weather charts, and made a special study of humidity.

S.S. *Cristales*, Captain J. M. ISAACSON, has continued to report to all ships regularly every day, and to make weather charts when sufficient synchronised observations were available. Also, this ship has provided a chart giving her position daily at observation time, with the names of all vessels in wireless touch (and so benefiting by her reported observations) on a voyage out to the West Indies and Home. A special study was made of currents in the Caribbean Sea.

Of ships not equipped with official instruments but having their own mercurial barometers and returning Form 911, S.S. *Auditor*, Captain W. T. OWEN, principal observer, Mr. T. E. STEEL, Third Officer, on two voyages to the East Indies regularly made reports

daily, and made weather charts; and in December last, when homeward bound in the Eastern Mediterranean, was so confident of the information given by a weather chart made on board, that she issued a gale warning to all ships in touch.

A gale was experienced by a number of ships to the southward of Crete on the following day.

S.S. *Kaisar-i-Hind*, Captain G. MANLEY, principal observer, Mr. A. H. COLE, Third Officer, has been absolutely persistent and consistent throughout the year in giving reliable and correctly timed observations to “All ships.”

S.S. *Malda*, Captain T. N. GRAY, principal observer, Mr. W. G. DONALD, Third Officer, has made reports to “All ships” with great regularity, and has supplied a chart giving her positions at observation time throughout her last outward passage, with the names of all the ships in wireless touch, who would benefit by her observations, and so giving valuable corroboration of the practicability of this system.

CHART III which gives the position of every regular observing ship at sea on June 1st, 1926, which has a mercurial barometer, with the wireless equipment, if compared with a similar chart accompanying “Work of the Year” last year for June 1st, 1925, will show the steady progress being made in the improvement of the distribution of ships invited to make these reports to “All ships.”

In filling vacancies in our list of 500 by giving preference to ships offering to observe which have mercurial barometers, and by accepting more engaged in Southern Ocean and Pacific trades, by gradual but steady process, the British organisation is more and more effectively covering all the main trade routes of the world; and the captains of all regular observing ships on our list, indicated by the letters M.L., M and W.T., who are not making daily routine reports of observations made at the same time as those of the nearest coast, are adjured to render this really most useful (even if not yet apparent) service to shipping and seamen.

There is no doubt that in the course of time, now that four equidistant observation times are recognised, not only will these be adopted in all parts of the world, but that recognised times for transmission will also follow; and it may not be too much to hope that the approximate number of ships invited to make reports may be controlled according to the tonnage of each country, for otherwise confusion and jamming will be difficult to avoid; and that more wireless stations will be told off to intercept these reports so that they may be more generally disseminated.

We cannot offer too much encouragement to the Captains, Officers and Wireless Operators of regular observing British ships, for out of this work will undoubtedly come great benefits to navigation, aerial navigation, agriculture and industry.

In Home Waters evidence of the value to shipping of the British “Weather Shipping” Bulletin has continued to come in, and during the year the appreciation of salvors was especially evident. The Committee of the Liverpool Underwriters’ Association made special mention of this in their annual report. Captain C. G. BONNER, V.C., D.S.C., contributed an article to THE MARINE OBSERVER giving his experience of the utility of weather intelligence in ships’ salvage.

During the salvage of S.S. *Valdura*, Captain J. ANDERSON, ashore near Waterford, on the coast of Ireland, Commander IVOR KAY, R.N.R., the Salvage Officer of the Liverpool Salvage Association, telegraphed a special request that the instruments lent to her captain for keeping a meteorological log (which were to be removed) should be retained on board. Weather charts were drawn daily by the observing officer, Mr. L. ROWLING, Third Officer, which gave first-hand information of the changes of weather which might be expected, and notwithstanding a difficult situation with bad holding ground, salvage was accomplished, the foreknowledge of probable weather gained each day being of assistance in deciding upon the course of the work of the salvors.

Acknowledgment and Awards.

Old Marine Observers and Marine Agents.

We are, as always, this year indebted to many master mariners and others resident at ports throughout the British Empire and especially to the Marine Agents for furthering the work and their great assistance to marine observers. In October last, Captain J. MCINTYRE, Harbour Master at Belfast, undertook an agency, there being one short in the number allowed, owing to the death of Captain M. H. CLARKE, who had been agent at Dublin from 1923.

Lieut.-Commander O. C. G. LEVESON-GOWER, R.N., became

marine agent at Hong Kong, on taking over the Admiralty Chart and Chronometer Dépôt, *vice* Lieut.-Commander C. R. H. HARVEY, R.N., in June, 1926.

Excellent Awards and Conclusion.

A list of commanders and principal observing officers to whom the Meteorological Committee have made awards for excellent work is appended.

The publications awarded will be forwarded as soon as the inscriptions have been made. The Director wishes to express his thanks to one and all who have contributed by their efforts to the work of the Meteorological Office; and as the nautical officer directly responsible for supervision of Voluntary Marine Observation, I would like to thank every member of our Corps for their great support to the Marine Division, and more especially for their work in the application of marine meteorology as an aid to seamanship and navigation.

At a banquet at the Mansion House given by the British Government in honour of the British Industries Fair, H.R.H. THE PRINCE OF WALES said—"We Britishers think we are very efficient, and we are at the head of the world in lots of things, but to keep in the van we must be conscious of that very valuable thing—the knowledge that we learn something new every day. To put it in three words, we must learn to adopt, to adapt and to improve."

Let these be our watchwords throughout 1927.

MARINE SUPERINTENDENT.

London.

April 1st, 1927.

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

Captain.	Principal Observing Officer.	Ship.
ADAMSON, B. W. - - -	{ CUMING, R. - GOLDSWORTHY, J. G. -	{ <i>Dorestshire.</i> <i>Yorkshire.</i> <i>Shropshire.</i>
BEADNELL, F. E., Capt. R.N.R.	ROBERTS, R. G. -	<i>Adriatic.</i>
BERRY, G. - - -	PETERS, J. W. -	<i>Celtic.</i>
*BROWN, F. G., Capt. R.N.R., R.D.	SIMPSON, L. T. -	<i>Carmania</i>
BURTON-DAVIES, J. -	POVER, F. - -	<i>Hurunui.</i>
BYERS, G. - - -	MCDONALD, W. -	<i>Kweiyang.</i>
*CAMERON, E. P., Commr. R.N.R., R.D.	CASTLE BARTLEY, J. F.	<i>Orsova.</i>
CAMPOS, V., O.B.E., Lieut.-Commr., R.N.R.	HEGARTY, L. J. -	{ <i>C. S. Colonia.</i> <i>C. S. Dominia.</i>
CARLTON, G. F., Commr., R.N.R.	ALLEN, W. E. -	<i>C. S. Colonia.</i>
CHARLES, Sir J. T. W., K.B.E., C.B., Commodore R.N.R., R.D.	CROASDAILE, J. L.	<i>Aquitania.</i>
CLIFTON-MOGG, W. P., Lieut.-Commr. R.N.R.	BAKER, E. T. -	<i>Pakeha.</i>
COTTELL, S. C. - - -	POST, C. F. - -	<i>Port Hunter.</i>
*CRAVEN, R. - - -	LANGFORD, G. G.	<i>Port Hobart.</i>
CRAWFORD, R. - - -	{ BRAY, J. V. - KIME, G. H. -	{ <i>Aorangi.</i>
DIGGLE, E. G., Capt. R.N.R., R.D.	TAYLOR, E. R. -	<i>Mauretania.</i>
DUNCAN, A. R. - - -	JENKINS, C. -	<i>Elysia.</i>
DURHAM, R. S. - - -	SLOAN, J. H. -	<i>Port Auckland.</i>
ENGLISH, G. L. - - -	SHARROCK, D. Y.	<i>Leicestershire.</i>
*ENRIGHT, W. J., Lieut.-Commr. R.N.R., R.D.	BLOYE, N. H. -	<i>Port Chalmers.</i>
*FORRESTER, W. T., O.B.E.	DUDGEON, F. -	<i>Camito.</i>
*FOSTER, W. L. - - -	POTTER, P. H. -	<i>Somersetshire.</i>
*FREER, A., Commr., R.N.R., R.D.	MANSEY, A. -	<i>Metagama.</i>

Captain.	Principal Observing Officer.	Ship.
GEARY HILL, S. A., D.S.O., Commr. R.N.	{ TORLESSE, J. Y. G. LANSDOWN, C. S. E.	{ <i>H.M.S. Endeavour.</i>
*GORDON, A. L. - - -	ROBERTSON, M. -	<i>Elpenor.</i>
*GRAY, T. N. - - -	DONALD, W. G. -	<i>Malda.</i>
*GRIFFITHS, C. A. - -	HAWKINS, P. -	<i>Somersetshire.</i>
GRIFFITHS, E., Lieut.-Commr. R.N.R.	ROBERTS, E. -	<i>Empress of France.</i>
*HAMILTON, G. - - -	McFADYEN, H. -	<i>Montcalm.</i>
HEMMING, F. A. - - -	{ BISHOP, F. - SAUL, G. O. -	{ <i>Rimutaka.</i>
HESTER, C., Commr. R.N.R., R.D.	{ CRONE, J. K. - ROCHE, C. W. -	{ <i>Peshawur.</i> <i>Khyber.</i>
HICKSON, V. W., Lieut.-Commr. R.N.R.	CROWLEY, E. A. A.	<i>Cedric.</i>
HIGGS, W. G. - - -	BOYS SMITH, H. G.	<i>Port Sydney.</i>
HOLME, A. - - -	DYER, A. E. -	<i>Homeric.</i>
*HOSSACK, W. H., Capt. R.N.R., R.D.	BOVEY, R. - -	<i>Caronia.</i>
HOWELL, T. - - -	MURRAY, C. J. -	<i>Belgenland.</i>
*HUDSON, H. T., Lieut.-Commr. R.N.R., R.D.	HYLAND, G. -	<i>Woodarra.</i>
*HUNTER, J. L. B. - -	{ CLEGG, D. H. - REES, R. G. -	{ <i>Rotorua.</i>
*ISAACSON, J. M. - -	{ BROWNE, S. - BAKER, D. M. -	{ <i>Cristales.</i>
*JACK, J. - - -	{ McDONALD, A. - MUNDAY, P. A. -	{ <i>Port Nicholson.</i>
JACKSON, A. L., Commr. R.N.	JENKINS, H. L. -	<i>H.M.S. Iroquois.</i>
JAMES, L. V., D.S.C. -	WINSOR, B. - -	<i>Ormonde.</i>
*KERSHAW, W. A. R. -	ROGERS, J. C. K.	<i>Mahana.</i>
KETTLEWELL, C. R. -	WILLIAMS, A. E. -	<i>Dorset.</i>
KNOWLES, C. H., D.S.O., Commr. R.N.	HUGHES, A. M. -	<i>H.M.S. Ormonde.</i>
LANDY, E. - - -	WATT, A. M. -	<i>Montrose.</i>
*LAW, E. F. B., Lieut.-Commr. R.N.	DEANE, D. W. -	<i>H.M.S. Flinders.</i>
LEA, W. H. - - -	{ GROVES, C. - BOYS SMITH, H. G.	{ <i>Port Sydney.</i>
*LESLIE, G., D.S.C., Lieut.-Commr. R.N.R. - -	{ JONES, E. G. - ROBERTSON, M. -	{ <i>Port Dunedin.</i> <i>Elpenor.</i>
LETTON, F. W. - - -	HAZELL, H. A. -	<i>City of Chester.</i>
MACKAY, A. S., Commr. R.N.R., R.D.	TODD, H. V. -	<i>Culebra.</i>
*MALIN, R. G., Lieut.-Commr. R.N.R.	CAMPBELL, R. B.	<i>Lancastria.</i>
*MANLEY, G. - - -	COLE, A. H. -	<i>Kaisar-i-Hind.</i>
MARSHALL, W., C.B., D.S.O., Capt. R.N.R., A.D.C., R.D.	DAY, H. J. C. -	<i>Olympic.</i>
*McCOMISH, A. B. - -	ISAAC, W. F. -	<i>Clan Mackinnon.</i>
McKELLAR, A. W., Capt. R.N.R., R.D.	GLASSBOROW, W. J.	<i>Ruapehu.</i>
*McLEAN, J. G. - - -	ISAAC, W. F. -	<i>Clan Mackinnon.</i>
METCALFE, G. R., Lieut.-Commr. R.N.R.	FITZGERALD, W. T.	<i>Majestic.</i>
MILNE, R. A., Commr. R.N.R., R.D.	{ WRIGHT, P. - EVANS, H. E. -	{ <i>Margha.</i>
*NEILL, G. A. - - -	{ WERREY EASTER-BROOKE, S. M. WIGHTMAN, H. V.	{ <i>Clan Malcolm.</i>
*NOTLEY, A. H., Commr. R.N.R., R.D.	SHEARER, J. -	<i>Melita.</i>
*OWEN, W. T. - - -	STEEL, T. E. -	<i>Auditor.</i>
OWENS, A. L., Commr. R.N.R., R.D.	ELLIOT, W. - -	<i>Oronsay.</i>
PARK, G. - - -	HART, T. E. -	<i>Risaldar.</i>
PROTHERO, W. - - -	MUNRO, J. C. -	<i>Scythia.</i>

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

Captain.	Principal Observing Officer.	Ship.	Captain.	Principal Observing Officer.	Ship.
RENAUT, F. A. - -	FENTON, E. W. -	<i>Port Caroline.</i>	SWAN, L. H. - - -	{RENOUF, W. W. BAYLY, L. M. R.}	<i>Port Victor.</i>
*RICHARDS, J. - -	GLEN, J. - -	<i>Astronomer.</i>	*TOWNSHEND, W. P., Capt. R.N.R., R.D.	WARD, F. - -	<i>Balranald.</i>
RILEY, J. E. - -	ANDERTON, H. -	<i>Manchester Hero.</i>	TURNBULL, J., C.B.E., Capt. R.N.R., R.D.	WILLIAMS, F. E. -	<i>Montnairn.</i>
*ROBERTS, T. V., Lieut.- Commr. R.N.R., R.D.	COX, H. S. - -	<i>Euripides.</i>	*UPTON, H. L., D.S.C., Lieut.-Commr. R.N.R., R.D.	FANE, N. L. H. -	<i>Westmoreland.</i>
ROBINSON, C. A. - -	LEAVETT, E. A. -	<i>Port Albany.</i>	WARNER, G. E., Capt. R.N.R., R.D.	FLETCHER, C. V. -	<i>Orbita.</i>
ROBINSON, F. W. - -	{WILKINSON, W. C. WOODHOUSE, S. J.}	<i>Orari.</i>	WEBSTER, G. S., Lieut.- Commr. R.N.R., R.D.	KNIGHT, H. S. -	<i>Montclare.</i>
*ROSS, J. - - -	ECKFORD, R. D. -	<i>Oriana.</i>	WHITE, E. R., Commr. R.N.R., R.D.	WILKINSON, H. R.	<i>Baltic.</i>
ROSTRON, Sir A. H., K.B.E., Capt. R.N.R., R.D.	MYLES, J. A. -	<i>Berengaria.</i>	*WILDING, H. G. - -	CRONE, J. K. -	<i>Peshawur.</i>
ROWE, J. P. - - -	SCOINS, H. F. -	<i>Maihar.</i>	*WILLIAMSON, J. M. -	STANLEY, W. -	<i>London Importer.</i>
*SCOTT, J. R. - - -	{MOCK, C. E. - HOWE, F. - -}	<i>Tyndareus.</i>	WILLIS, M. - - -	STUART, M. S. -	<i>Arracan.</i>
SCUTT, W. - - -	MILLARD, S. R. -	<i>Wangaratta.</i>	*WYATT, A G N, Lieut - Commr. R.N.	HUGHES, A M. -	<i>H.M.S. Ormonde.</i>
SHOWMAN, A. C. - -	{HAULTON, T. - COUSIN, A. P. -}	<i>Niagara.</i>	*YARDLEY, H. A., D.S.C.	BRISTOW, S. J. -	<i>Abu.</i>
*SMITH, R. G. - - -	SHAW, R. H. -	<i>Regina.</i>	... ..	LLOYD HARRY, R.	<i>Tanda.</i>
*SMITH, W. E., D.S.O., Capt R.N.R., R.D.	ROBBINS, S. -	<i>Orduna.</i>			
STRONG, H., Commr. R.N.R., R.D.	WILBRAHAM, F. O.	<i>Windsor Castle.</i>			

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

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.

CURRENTS ON THE WEST INDIES AND PANAMA ROUTES.

THE following are extracts from some of the replies received in answer to a circular letter requesting information of general experience of currents on the West Indies and Panama routes.

Captain R. K. Barrow, S.S. "Ingoma."

"Generally speaking; between England and the Azores, lack of observation has been and nearly always is, a great handicap to observing Currents.

"In my opinion, the wind and sea combined tend to increase the Currents to a very large extent; a Southerly wind setting up a Northerly current, &c.

"This will be found particularly noticeable with a fresh or strong Westerly wind, being in position North (true) 60 miles from Fayal (Azores) and steaming between that island and Flores bound South. The Current here in April and January may run to the Eastward well over a knot!

"Passing 60 miles North of Azores group to position in Latitude 26° N. Longitude 47° W., and 60 miles South of same group to position Latitude 22° N. Longitude 47° W., also passing each side of the Island San Miguel, the Currents observed have been and are too numerous to mention, and indeed seldom, if ever appear to be twice alike. After leaving Longitude 47° W. (bound South) one soon runs into the main Western going stream, which again, in my opinion is helped along by the prevailing E. and N.E. winds.

"Around the West India Islands, I have always found the main stream setting to the W., N.W., or S.W.

North end of Trinidad Island.

"Between Chupara point and Galera point and 4 to 5 miles off shore, I have invariably found a Northerly set up to 1 knot and this with the prevailing Easterly wind."

Captain J. D. Ramsay, S.S. "Dunrobin."

"I have not had a great deal of experience of the direct run from the Channel to the West Indies and Panama, but recently have had considerable experience of the various currents in the vicinity of the West Indies and Panama. I find that on the Eastward and Northern approaches to the various passages the general trend of the current is to the W.N.W. 0.5 knots, as shown in the Bahama current, and on approaching closer to the Islands the current trends more to the Westward at the rate of about 1 knot. On the northward of the islands we have never experienced any counter current, but when running from Martinique to Cuba have at times experienced South of the Island of Haiti an easterly set of about 1 knot with a considerable indraught between the Island of Alta Vela and Cape Dame Marie. On two occasions when bound through the Panama Canal and making the Eastern Entrance, i.e., Colon, we have experienced a considerable indraught to the Eastward of that port."

Captain F. J. Kearney, S.S. "Port Melbourne."

"My experience regarding currents on the Channel to Panama routes have invariably shown a Westerly set on approaching the Mona Passage, varying in amount according to the strength of the N.E. trades.

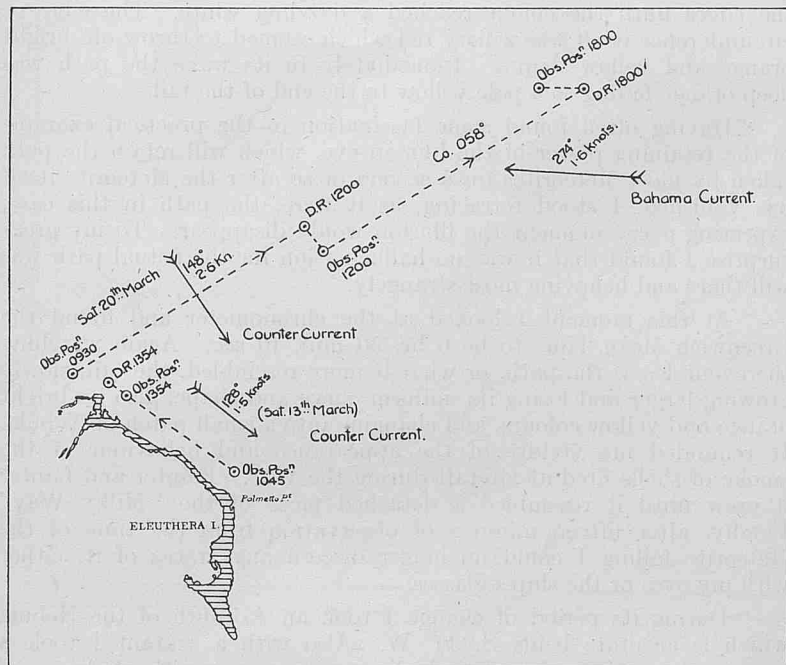
"Along the southern coasts of Santo Domingo and Porto Rico, in the vicinity of the Mona Passage, I have always experienced a strong Easterly set necessitating an allowance of 2° for several hours. Thence to Latitude 12° N. the set is W'ly increasing in amount until the allowance for this set has reached 5°. On approaching the coast of Central America the set is strong to the E.N.E. and Eastward, I have found it necessary to allow about 4° for set in this vicinity for 100 miles north of Colon."

OBSERVATION OF THE BAHAMA CURRENT.

THE following note from H.M.S. *Capetown*, Captain G. H. KNOWLES D.S.O., R.N., observer, Lieut.-Commander W. F. PREEDY, R.N. has been received from the Hydrographer of the Navy.

Note on Current off Eleuthera Island, Bahamas.

"It would appear, from observation on two dates one week apart, that a strong counter current exists off Abaco and Eleuthera Islands, setting approximately 128° to 148° at a speed of 1.5 knots to 2.6 knots, inside the usual Bahama current. It would seem, too, that this current may be about 50-60 miles broad. The accompanying tracing is intended to show how the above was deduced.



"On the 13th March, 1926, on passage to Nassau from Jamaica, difficulty was experienced in fixing the ship's position along the east coast of Eleuthera Island, but much was explained from the two fixes at 1045 and 1354 when it was discovered that a current, opposite in strength and direction to the Bahama current, was reducing the ship's speed. The wind was N.N.W. force 2. No sea.

"Again, on the 20th March, 1926, proceeding to Bermuda from Nassau, a similar set to the south-eastward was experienced.

At 0930 { obs. Latitude $25^{\circ} 39' N.$ } Course was set 058° , full speed
 { obs. Longitude $76^{\circ} 50' W.$ } (27.7 knots).

"This speed was maintained till 11.30.

"From 11.30 to 1200 the mean speed was 16.4 knots.

1200 D.R. Latitude $26^{\circ} 12' 1'' N.$, Longitude $75^{\circ} 49' 8'' W.$

1200 obs. " " $26^{\circ} 06' 8'' N.$, " " $75^{\circ} 46' 0'' W.$

"The observed position at 1200 was obtained from simultaneous observations of the sun and moon, approximately 90° apart.

"From 1200 the course was 058° , speed 11.4 knots.

1800 D.R. Latitude $26^{\circ} 43' 0'' N.$, Longitude $74^{\circ} 39' 2'' W.$

1800 obs. " " $26^{\circ} 43' 8'' N.$, " " $74^{\circ} 50' 5'' W.$

"The observed position at 1800 was obtained from observations of Rigel and Sirius.

"Wind. 18th March, 1926, N.E. force 2 } at Nassau, in open
 19th " " N.E. " 1-2 } anchorage.
 20th " " East " 2

"A small steamer stranded off the N.E. point of Eleuthera Island, seemed to bear testimony to the dangerous nature of this counter-current."

CURRENT.

West Coast of S. America.

THE following is an extract from the Meteorological Log of S.S. *Orcoma*. Commander R. H. DOMINY, C.B.E., R.N.R. Liverpool to West Coast of South America. Observer Mr. R. GRIFFITHS.

"22nd June 1926, 5 p.m. Sky becoming overcast towards sunset, Cirrus clouds from northward and at sunset Cirrus cloud in streaks

across sky from N.W. to S.E. Grey sky to southward and ugly appearance generally. Sky to westward flaming red. Visibility very good.

"Between Herradura Bay Latitude $28^{\circ} 3' S.$ and Chanaral Island a strong easterly set experienced, losing its strength after passing Chanaral to the Southward. Again further south a slight inshore set experienced."

NOTE.—It is worthy of remark that during the period that this current was felt the wind was from a north-easterly direction, in place of the normal southerly wind which is experienced on this coast.

CHANGE OF WIND WITH TIDE IN THE BRISTOL CHANNEL.

THE following is an extract from the Meteorological Log of H.M.S. *Flinders*, Lieutenant-Commander E. F. B. LAW, R.N., surveying Bristol Channel, observer, Sub-Lieutenant D. W. DEANE, R.N.

"Turn of tide always produces a change in wind force. It was very noticeable on the 21st-24th June, 1926, when the turn of tide from ebb to flood produced a much stronger wind from the West. As the tide approaches the next slack water, the wind eases considerably."

AURORA BOREALIS.

In the North Atlantic.

THE following is an extract from the Meteorological Log of S.S. *Port Sydney*, Captain W. H. LEA, Montreal to London, Observer Mr. H. G. B. SMITH, 3rd Officer:—

"Throughout the night of June 1st, 1926, there was a remarkable display of the Aurora Borealis. It commenced with the characteristic arch to the Northward from which radiated shoots of white light chiefly from its extremities. As the night progressed however, the lights became more and more extensive, and finally culminated by there being a bright white ring in the zenith towards which there leapt great tongues of white light from all points of the horizon, south as well as north. At the same time ripples of light forming rings right round the sky, starting at the horizon, rippled up at lightning speed to be finally lost in the stationary ring at the zenith. The sky during most of the display was, with exception of some thin Cirrus low on the horizon, quite cloudless, the stars being clearly visible through the tongues of light, not only undimmed, but apparently brighter than when the tongues covering them waving one way or the other, left them exposed. There was no show of colour anywhere other than white, and the whole sea was lit up as on a bright moonlight night. The air was noticeably wet at the time and the visibility very good.

"The position of the ship was approximately Latitude $48^{\circ} N.$, Longitude $46^{\circ} W.$ Course N. $73^{\circ} E.$ Speed 12 knots."

MIRAGE.

On the Trans North Atlantic Track.

THE following is an extract from the Meteorological Report of S.S. *Cameronia*, Captain R. W. SMART, New York to Glasgow, observer Mr. C. PATON, 3rd Officer:—

"On 22nd June, 1926, between Latitude $46^{\circ} 19' N.$, Longitude $53^{\circ} 10' W.$, and Latitude $48^{\circ} 17' N.$, Longitude $48^{\circ} 29' W.$, unusual visibility was experienced. Icebergs and passing vessels were observed extraordinarily distorted and at a great distance.

"Particular observation was made of a berg which appeared almost right ahead, at an altitude of three degrees, and having the shape of a single pillar. Berg was carefully watched and from the time it was first observed until it was abeam, a distance of 44 miles was run. Berg was then measured, while in Latitude $47^{\circ} 37' N.$, Longitude $49^{\circ} 57' W.$, and found to be 150 ft. high, 350 ft. long, conical in shape, and having a sharp pointed peak."

COLOURING OF CIRRUS CLOUDS AT SUNSET.

China Sea.

THE following is an extract from the Meteorological Log of H.M.S. *Iroquois*, Commander A. L. JACKSON, R.N., surveying China Sea, observers, Lieutenant-Commander D. H. FRYER, R.N., and Lieutenant H. L. JENKINS, R.N.

"Wednesday, 16th June, 1926, Latitude $9^{\circ} 50' N.$, Longitude $109^{\circ} 32' E.$ at sunset, curious rainbow colouring was observed in the Cirrus clouds near the sun. The upper air was very clear, though the visibility on the horizon was not more than 7.

"The accompanying sketch shows the arrangement of the clouds in relation to the sun. The Cirrus bands lay in a direction S.W.—N.E. a few detached Alto-Cumulus clouds were to be seen, and a heavy bank of Cumulus on the western horizon.

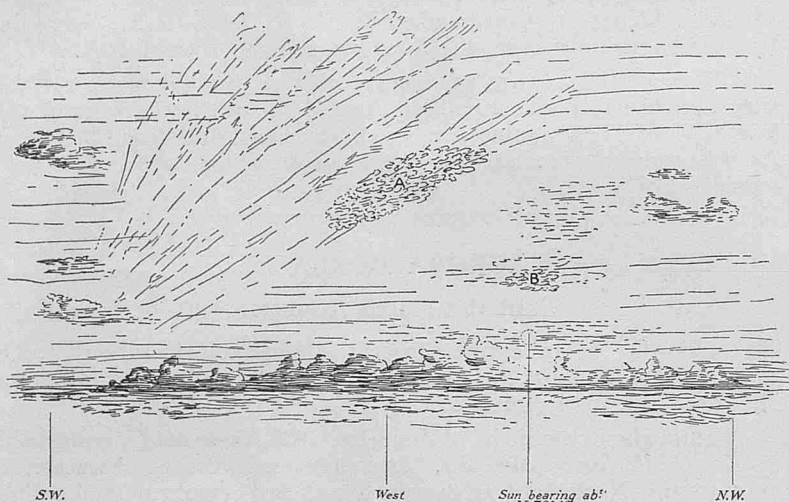


Diagram to accompany Report on colouring of Cirrus Clouds at Sunset. H.M.S. "Iroquois" 16th June 1926.

"The colouring was first observed when the altitude of the sun was about 8° . It extended over a range of altitude from 25° to within 5° of the sun. It soon attained a maximum brilliance and faded away gradually, finally disappearing when the sun set.

"The main colours observed were red, blue and green—very little yellow. Red appeared where the clouds seemed thickest and generally surrounded patches of blue and green.

"The Cirrus was very thin. It could not be seen after sunset.

"The colouring was confined to the areas A and B in the sketch.

"Barometer 1005 mbs. Wind WSW. force 6."

METEORITE.

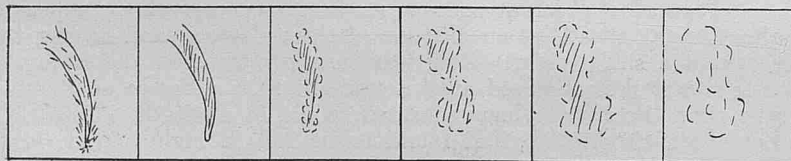
North Atlantic.

THE following report has been received from S.S. *Chancellor*, Captain R. RICHARDSON, Observing Officer, Mr. L. R. BULL:—

"On the morning of June 21st, 1926, I observed the peculiar behaviour of some Meteoric object and not having seen or heard of the like before, it seems to be as equally phenomenal as interesting.

Sketches of path of Meteor changing to Nebula.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
6	50	10	6	51	00	6	53	00	6	55	00	7	00	00	7	05	10



"At 3 hr. 19 min. Mean Time Ship on the above date, I was startled by the sudden lighting up of the sea and sky from somewhere

astern of the ship. Turning sharply round, I was in time to see an exceptionally bright Meteor just at the end of its flight through our atmosphere, as it is known to us. It was, at first sight, in no way different from any other such Meteorites I had seen, and it was by no means the brightest either and only occasioned ordinary interest in its passage and beautiful colours. From the elementary knowledge of Astronomy I have, I understand that colours are of little use in this Science without the conjunction of the Spectroscope. In case colour is of use I will endeavour to describe the colours of the Meteorite in question.

"Although my impression that the first great flash of light was green, the centre of the Meteorite was deep blue which faded towards the edges until the colour reached a dazzling white. The edge or circumference itself was a fiery red which seemed to throw off bright orange and yellow flames. Immediately in its wake the path was deep orange fading to a pale yellow to the end of the tail.

"Having often found some fascination in the practical example of the retaining power of the human eye, which will retain the path taken by most Meteorites for a second or so after the Meteorite itself has vanished, I stood retracing, as it were, the path in this case, expecting every moment the illusion would disappear. To my great surprise I found that it was no hallucination for the actual path was still there and behaving most strangely.

"At this moment I looked at the chronometer and found the Greenwich Mean Time to be 6 hr. 50 min. 10 sec. Again watching the event I saw the path, or what it more resembled, the tail, slowly growing larger and losing its uniform curve and shape, also its bright orange and yellow colours, and changing into a small patch of Nebula. It reminded me vividly of the appearance and behaviour of the smoke of shells fired at aircraft during the War. Fainter and fainter it grew until it resembled a detached piece of the 'Milky Way.' Finally, after fifteen minutes of observation from the time of the Meteorite falling I could no longer discern any traces of it, either with my eyes or the ship's glasses.

"During its period of change I took an Azimuth of the Nebula which is accurate being $S. 30^{\circ} W.$ Also with a sextant I took a very approximate altitude which gave me a zenith distance of $68^{\circ} 32' 00''$. The approximate position of the Nebula was close to, and to the south of, the constellation of 'Sagittarius,' and on a line drawn through 'Centaur α and β ' to the westward. It was noticeable that the curve of the path seemed almost parallel to the 'Milky Way.'

"DATA.—Observer's position. Latitude $22^{\circ} 38' 30'' N.$ Longitude $50^{\circ} 30' 00'' W.$

"Greenwich Mean Time at fall of Meteorite, June 21d. 6 hr. 50 min. 10 sec.

"Greenwich Mean Time at disappearance of Nebula, 21d. 7 hr. 05 min. 10 sec.

"Approximate Zenith Distance $68^{\circ} 28' 00''$.

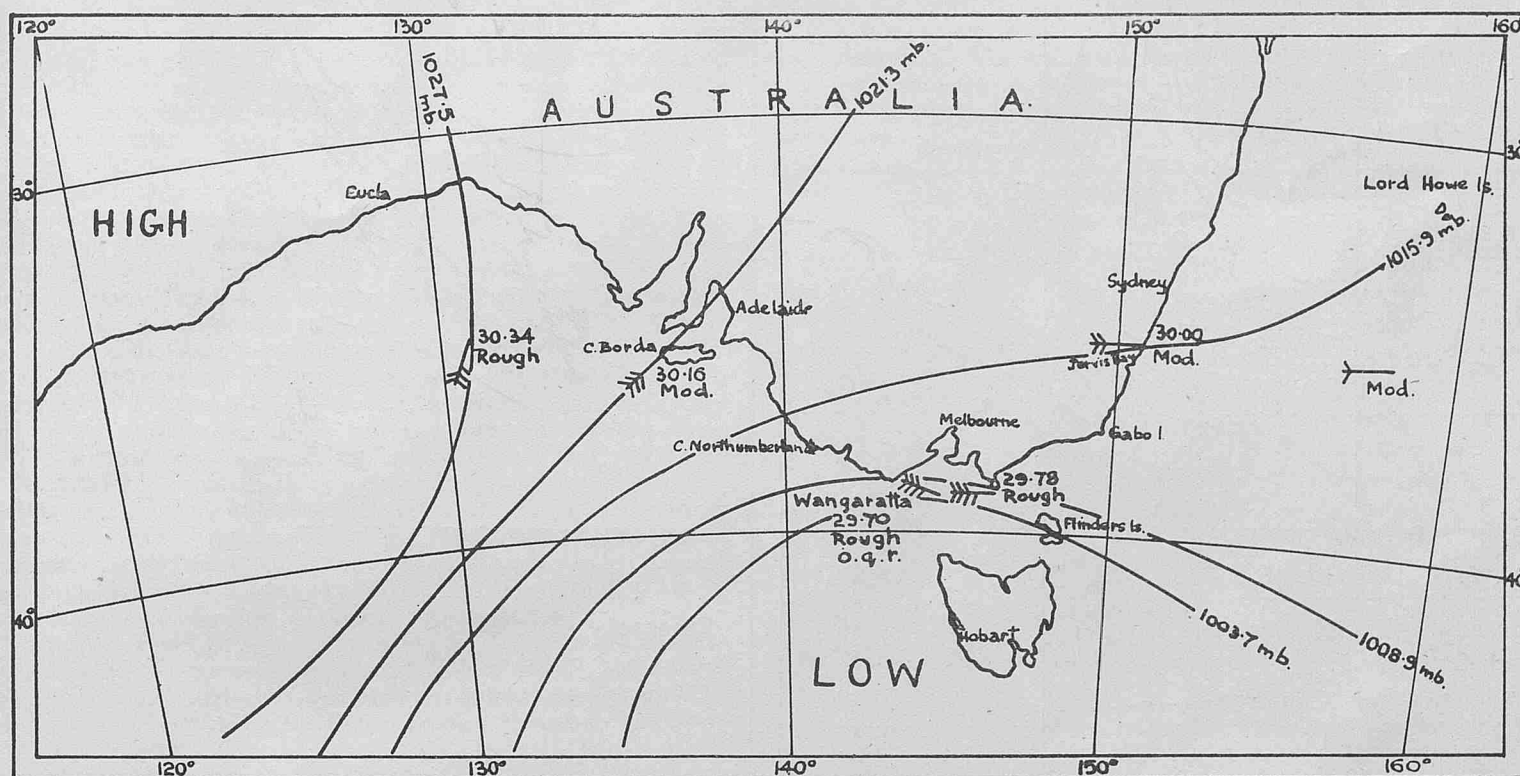
"True Azimuth $S. 30^{\circ} W.$

"WEATHER AT OBSERVATION.—Anticyclonic condition, calms, glassy sea, moderate northerly swell, Strato-Cumulus to Northward, horizon hazy. Thermometer 79° . Barometer $30.00''$ (aneroid)."

NOTE.—This is an interesting account of what was evidently a very fine meteor. It is always of value to note the colours, or sequence of colours, exhibited by an object of this character. While spectroscopic observation would tell us much about the chemical composition of a meteor it is almost impossible to carry out in practice owing to the unexpectedness of the phenomenon and its short duration. The retaining power of the human eye has been found to be about one-tenth of a second and cases when the trail of the meteor lasts as long as a second or two are those of real persistence of luminous matter in the upper air. In the present instance the trail, carried and distorted by the currents of the upper air, remained visible for 15 minutes. Such a duration is comparatively rare though a few much longer ones are on record. Thus a meteor fell in the early evening of February 22nd, 1909 and was widely observed over the Channel and Southern England. The trail of this meteor did not finally disappear until fully two hours afterwards.

COPY OF WEATHER CHART MADE AT SEA.

Copy of Weather Chart (one of a series) made on board S.S. "Wangaratta," Captain W. Scutt, by Mr. S. R. Millard, 2nd Officer. Friday, June 11th, 1926, 9 a.m. (Local). 10th, 2300 G.M.T.



"Forecast for Wangaratta: Weather should moderate, barometer rise slowly, wind back to S.W., decreasing slightly."

NOTE.—According to the Meteorological Log, S.S. Wangaratta experienced a shift of wind at 1.10 p.m. 11th June to S. by W., the barometer rose steadily during the day and the weather moderated.

MAKING SIMPLE WEATHER CHARTS AT SEA.

By Mr. C. H. WILLIAMS, 2ND OFFICER, UNION CASTLE LINE.

MAKING Weather Charts at sea is both useful and instructive and it is most interesting to see how one's forecasts of weather "Pan out."

Suitable Chartlets are supplied by the Meteorological Office, but if these are not available, small charts may easily be made on board by tracing from a general chart of suitable size.

I have generally found the Variation Chart to be about the scale needed, and the charts shown here were traced from the Variation Chart of the Atlantic.

Any old pieces of paper will, of course, do.

The groups of figures in the broadcasted weather bulletin should be deciphered, under their various places, by means of the New International Meteorological Code, pages 125-139 of the "Admiralty List of Wireless Signals, 1926."

Plot the data thus obtained on your chart in ink; the barometer in millibars, the wind direction and force by arrows in the usual way, (the number of feathers indicating the wind force) and the letters denoting the weather.

Also plot your own ship's position, corrected barometer reading, etc.; and other ships' reports if available.

Then, using BUYS BALLOTS law, mark lightly in pencil the rough positions of the Low and HIGH pressure areas. Having regard to these areas, and to the wind direction and force, (the stronger the wind, the closer the isobars will be as a rule) sketch in the isobars lightly in pencil.

This is the most interesting part of the game, in my opinion, and should be done carefully, using a soft pencil and rubbing out freely until one is satisfied with the result.

When finished, draw the isobars in plainly in ink. With the finished chart it is now possible to make a forecast of the weather ahead. In the example shown here the barometer tendencies rather indicate that the depression is "Filling up," which is supported by CHART NO. 2 made from the data of the P.M. bulletin of the same day.

The charts shown here are fairly simple ones, but some are most difficult. I don't think one should expect too much in the way of forecasts, but feel sure that the weather system shown by charts

point it continued until 4 a.m. on June 3rd, the barometer falling, when it backed to N.W. At noon on June 3rd the barometer was at its lowest, wind S.W., force 5.

This depression passed eastward between *Ashmore's* position and Cape Pembroke.

Captain R. H. WYNNE of S.S. *Banffshire* when reciprocating reports with the steamers *Boonah* and *Gilgai* and the Belgian sailing ship *L'Avenir*, between the Cape, and Australia, in April 1923, formed the conclusion that a heavy gale which they experienced near the 60th meridian east, covered an area of small width.

During the time of Captain SCOTT's first National Antarctic Expedition, 1901 to 1904, special daily observations were taken at noon G.M.T. by ships in the Southern Ocean; and a set of daily synoptic charts covering the whole of that part of the globe South of Latitude 30° S. was drawn in the Marine Division under Captain CAMPBELL HEPWORTH. Unfortunately the observations were so wide apart or few, that these charts are not sufficiently complete for generalising weather systems.

During Captain SCOTT's second expedition to the Antarctic, 1911, 1912, Dr. G. C. SIMPSON, who was physicist of the expedition during the first year, took observations in the Antarctic, which were continued throughout the expedition's stay. With his own observations, those of previous expeditions, Captain HEPWORTH's Charts, and other work done, Dr. SIMPSON came to the conclusion that, over the Southern Ocean there are cyclones and anti-cyclones which travel on the whole from west to east, and in all probability are in all parts of the ocean of a similar size to those shown on the Australian Daily Weather Reports, and their centres may pass anywhere between the Coast of Australia and the Coast of the Antarctic Continent.

If we reverse FIGURES 3 to 8 in Chapter II so that north is south and south is north, the cyclone, secondaries, V shaped depression, wedge, anti-cyclone, and col. of Northern Latitudes will resemble similar systems of Southern Latitudes, bearing in mind that BUYS BALLOT'S Law is reversed.

In the Southern Hemisphere if an observer faces the wind, low pressure will lie to his left and high pressure to his right.

Australian Weather Types.

FIGURES 22 to 30 are reproduced from "Types of Australian Weather" compiled in 1895 by Mr. H. A. HUNT of the Australian Weather Service, in continuation of work initiated by the Hon. RALPH ABERCROMBY, who first generalised the fundamental systems in Northern Latitudes.

According to Mr. HUNT, over Australia the anti-cyclone is the governing type. Weather systems generally travel East.

Rapid East Moving Winter Anti-cyclones.

In FIGURE 22 the weather chart for August 15th, 1893, there is an anti-cyclone over Western Australia. There is another anti-cyclone off the East Coast. These anti-cyclones are separated by a Λ -shaped depression centred south of Tasmania, a depression extending from the Tropics, and a "col" between them. They result in off-shore winds on the N.W. coast, southerly winds with rain from the Leeuwin to the head of the Australian Bight; westerly winds and rain on the coast of South Australia, and northerly winds on the Victorian and New South Wales Coasts, while on the coast of Queensland the wind is from east to south with rain.

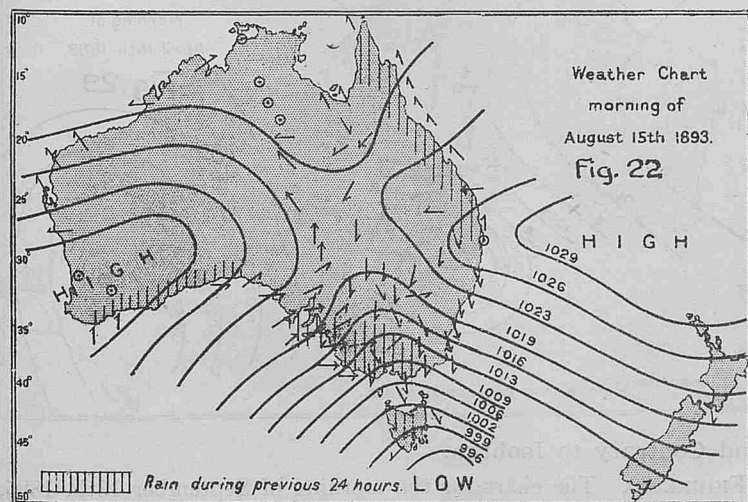


FIGURE 23, August 16th, 1893. The western anti-cyclone of yesterday has travelled rapidly east, and is now centred over the head of the Australian Bight. The eastern anti-cyclone is now N.E. of New Zealand, while the Λ depression is now centred S.W. of those Islands and the tropical low has merged into the anti-cyclone, leaving a kink in the isobars following the shape of the Gulf of Carpentaria.

The anti-cyclone now results in off-shore winds on the Coast of West Australia. The antarctic low is causing westerly winds and rain over Tasmania, on the coasts of Victoria and New South Wales; while the tropical secondary causes variable winds and some rain in Queensland.

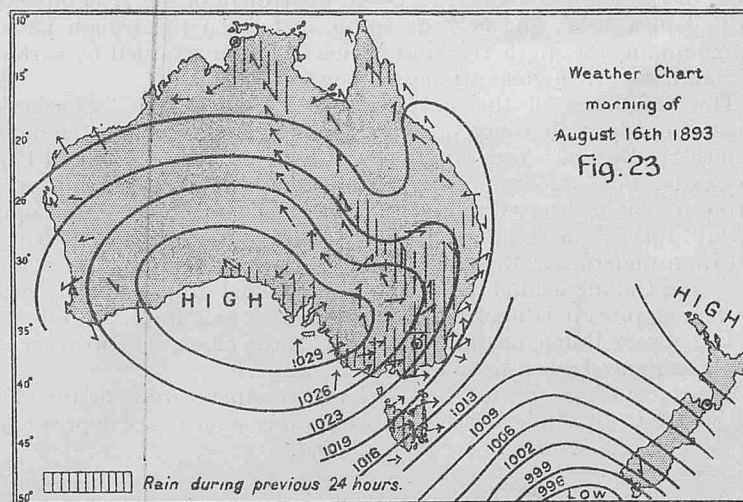
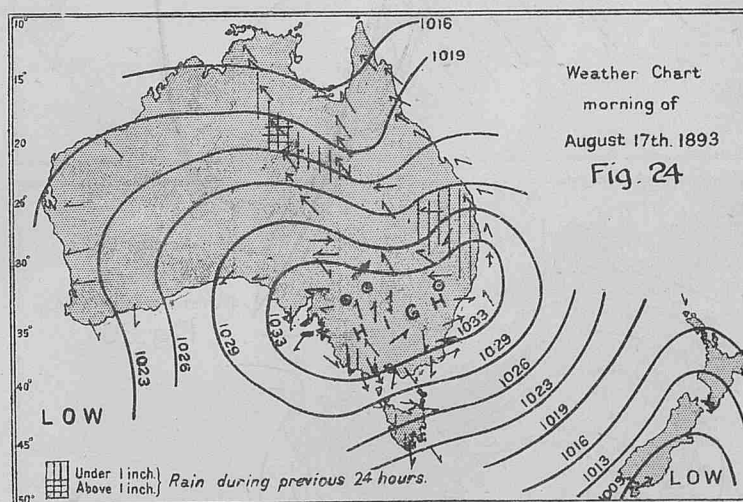


FIGURE 24, August 17th, 1893. The anti-cyclone has travelled further east; the tropical secondary has filled in somewhat, and has remained almost stationary while the Λ depression is now centred S.E. of New Zealand. The winds of the Australian Coast follow the isobars of the anti-cyclones anti-clockwise as would be expected; had there been observations available, no doubt the wind between Cape Howe and New Zealand would be from a westerly and south-westerly direction due to the Λ depression.

These three charts show the rapid easterly movement of winter anti-cyclones of settled weather; in this case the anti-cyclones having



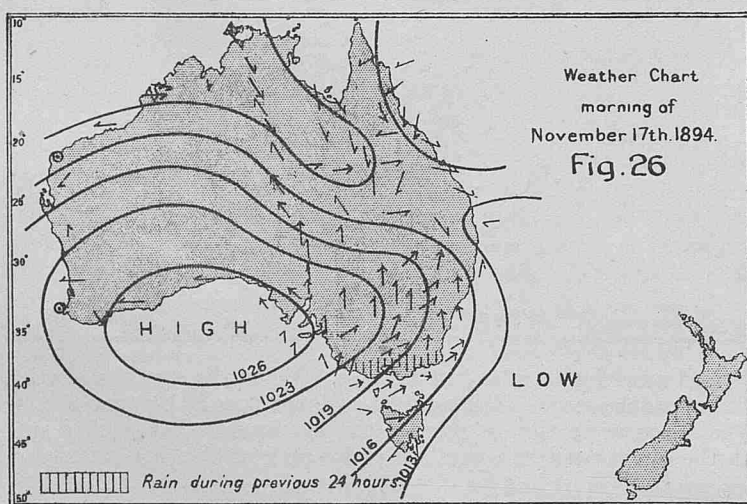
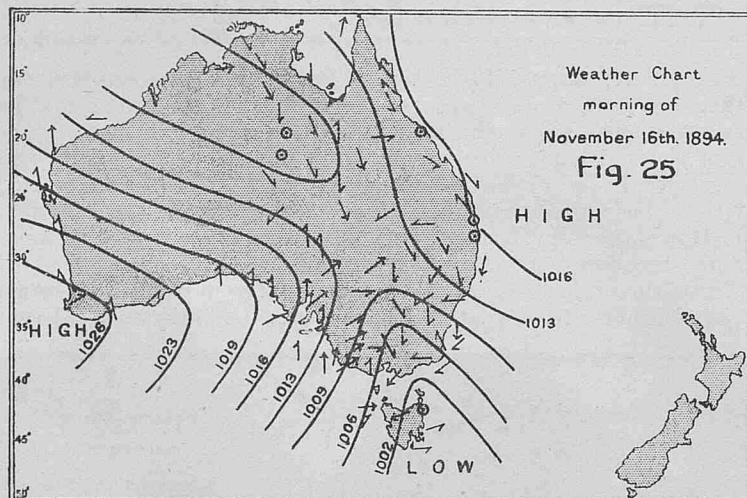
and a Δ depression was centred S.E. of Hobart.

There are cool southerly winds in front of the advancing anti-cyclone along the Southern Coasts; from Albany to Cape Otway these winds are of no great strength, probably due to the surface friction of the land. There are hot northerly winds, the "Brickfielder," over Northern Australia. By the morning of November 17th, 1894, the anti-cyclone had travelled east, and was centred over the Bight. Now in Victoria, New South Wales and Queensland, there is a range of mountains which follows the trend of the East coast from Cape Howe to Cape Byron, rising to 6,000 feet, and therefore right athwart the general easterly atmospheric drift.

As the pressure systems travel east, the trough of the Δ depression is tilted in a N.W. and S.E. direction, and when the trough passes the mountains the southerly wind, which has been retarded by surface friction, bursts with great strength along the coast.

The first burst of this cold wind is known as the "Southerly Buster," but the gale which often follows may last as long as ten days. "Southerly Busters" occur on the coast between Cape Howe and Port Macquarie, Port Jackson is thus right in their path. Ball-shaped Cirro-Cumulus or heavy Cumulus thunder clouds in the South are signs that a "Buster" is coming. As the squall approaches, a light fringe rises from underneath the cloud in front, curving over the top of the cloud, and trailing behind it. The northerly wind drops suddenly, and in a few minutes it is blowing from south with gale force. No doubt the East Coast Range has much to do with the changes of weather so often experienced when passing Gabo Island.

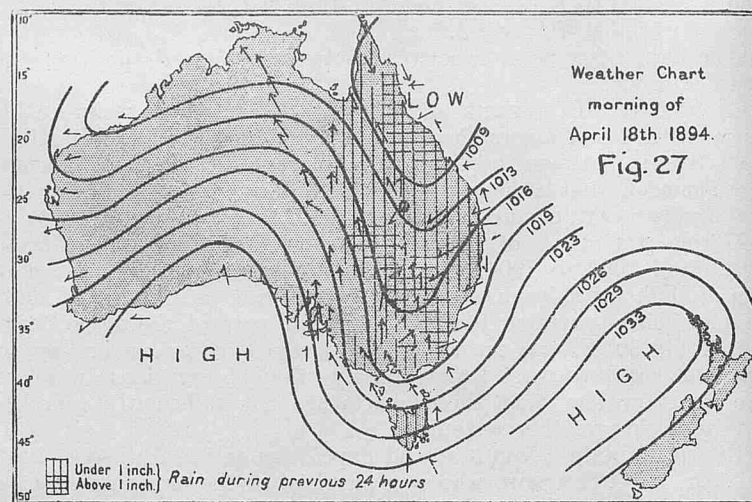
In a later Chapter when we deal with temperature a better idea may be obtained of indications from which developments of depressions causing increases of wind may be predicted.



Monsoonal Rain Storm.

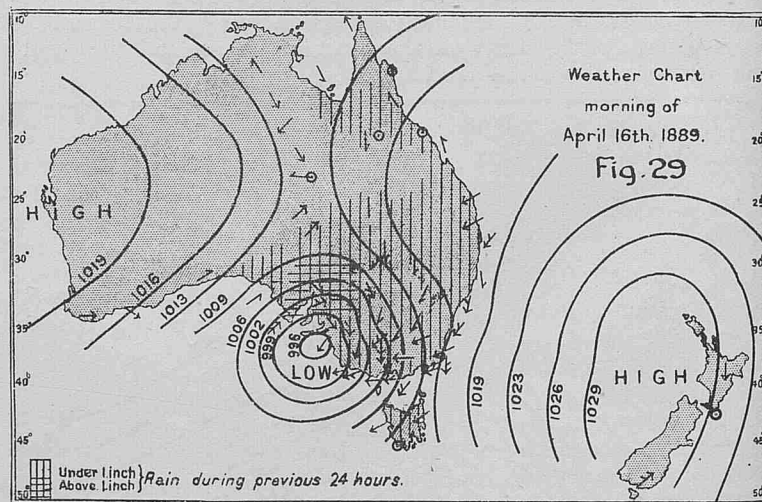
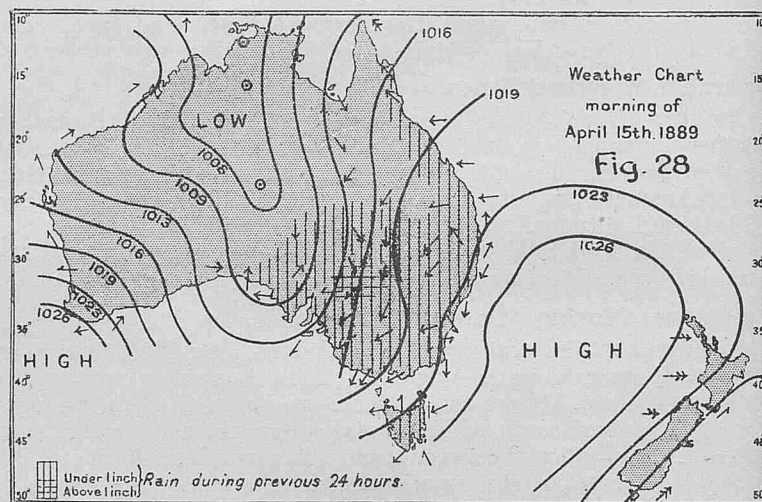
At all times of the year, but particularly in summer, if the tropical low forces itself far South, much rain and thunderstorms occur over the area it crosses. FIGURE 27—Chart for morning of April 18th, 1894.—The tropical low extends over the whole of Queensland, New South Wales and Victoria; to the East and West there are anti-cyclones, resulting in monsoonal rain in all the Eastern States, in Bass

Strait and on the Eastern seaboard.



Development of Cyclonic Storms in the South of Tropical Depressions.

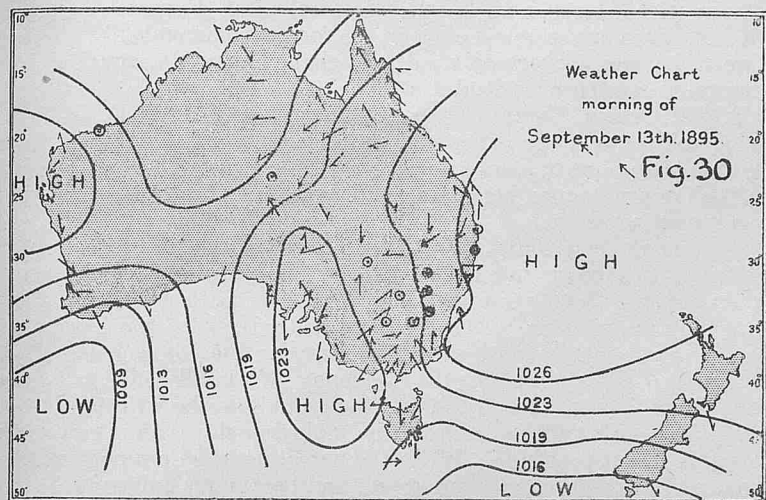
Sometimes, when the tropical depression extends across Australia into the Australian Bight, small cyclones develop in the South. This is illustrated by FIGURES 28 and 29. On the morning of April 15th, 1889, there was an anti-cyclone S.W. of Cape Leeuwin, and another over the Tasman Sea; these were separated by a tropical depression extending to the Bight. On the S.E. Coast of South Australia and on the South Coast of Victoria a strong easterly gale set in. On the morning of April 16th, 1889, a cyclone centred S.E. of Kangaroo Island had developed with steep barometer gradient and consequent winds of gale force and cyclonic circulation.



Wind Contrary to Isobars.

FIGURE 30. The chart for the morning of September 13th, 1895,

shows an anti-cyclone west of North-West Cape, a depression south of Cape Leeuwin; there is a large anti-cyclone east of Sydney, another "high" centred south of Adelaide, and a depression south-east of Tasmania. With this pressure distribution, if there were no disturbing factors, we should expect northerly winds on the coast of New South Wales, whereas it will be seen that the wind on the East Coast was actually southerly as far north as Sydney. No doubt the Mountain Range along this coast contributes to this. In a later chapter the effect of high mountains on wind will be dealt with.



Fog in the Bass Strait.

FIGURE 31. The Weather Chart for the morning of July 26th, 1910, shows an anti-cyclone to the West, a depression centred S.E. of King George's Sound; there is a kink in the isobar 1016 mb. indicating a shallow tropical low S.E. of the Gulf of Carpentaria; an anti-cyclone is centred over S.W. New South Wales, with another "high" over Tasmania; and there is a depression over the Tasman Sea, resulting in light E. to S.E. winds from the Tasman Sea bringing moisture to Bass Strait and the South Victorian Coast, where there is dense fog in the "col" between the two "highs."

There are other types of weather systems including cyclones from the N.W. and N.E. square-headed depressions and vertical straight isobars, all of which were dealt with by Mr. H. A. HUNT in "Types of Australian Weather," and have been summarised in "Climate and Weather of Australia," by H. A. HUNT, GRIFFITH TAYLOR and E. T. QUAYLE. The type of particular interest to the navigator working the Southern Coast of Australia is that which produces Westerly Gales; to illustrate this we have selected a gale which the writer has good reason to remember.

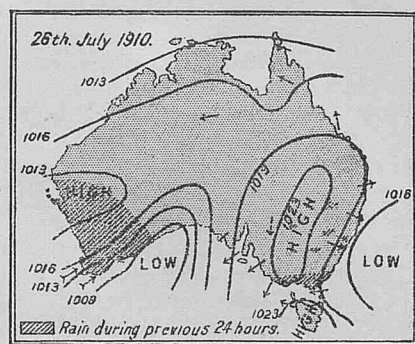


Fig. 31.

Antarctic Lows and S.W. Gales.

In his "Australian Meteorology," Mr. GRIFFITH TAYLOR writes:—

"Prediction of Storms. These may be divided into two groups, Gales and Hurricanes. The former arise when the gradient of the Low is very steep, and are common along the South and South-East Coasts when 'Antarctics' are numerous, i.e., in winter. They occur with similar charts in other seasons. In October, 1913, a well-developed Low occupied the Bight on the 13th, and moved normally to the east with intensifying gradients. On the 14th the gradient steepened greatly over the Bight, the isobars from 30.2 in. (1022.7 mb.) and 29.6 in. (1002.4 mb.) being closely packed together. The

forecast was as follows:—'Squally wind and rough seas East from Bight.' This was abundantly verified; for on the 15th a severe storm swept Bass Strait and the barometer fell to 29.2 in. (988.8 mb.) at Hobart: while the wind rose to 69 miles an hour at Melbourne. It is necessary to consider the aspect of the Coast in connection with Ocean warnings. Thus a S.W. wind has much less effect on the New South Wales Coast than on the Victorian Coast."

We took advantage in the *Omrah* of a lull after a violent squall and left Port Melbourne Pier at 3.16 p.m. on October 15th, 1913, with a fresh W.S.W. gale; proceeding down Port Phillip the squalls were very heavy, and in one of these the wireless aerial was carried away. This was repaired and sent aloft, only to be carried away a second time next morning.

Passing out between the Heads, the sea broke right across the entrance, the wind then being from west a fresh gale with frequent heavy squalls. Off Apollo Bay at midnight there was a whole gale from S.W. by W. with frequent violent squalls and a very high steep sea; a considerable reduction of speed was necessary. Off Cape Otway we felt the full force of the gale, ship rolling 40°, which was unusual for *Omrah*, a particularly steady ship. At 4 a.m. the ship had made little headway, it blew a whole gale from W.S.W. and at 6.47 a.m. the wind backed to S.W., sea increasing very high and steep; by 8 a.m. the wind had decreased to a fresh gale and backed to S.S.W.; we were then able to slightly increase speed and proceed on our course N. 80° W., but we could not get steam owing to the men not being able to keep their feet in the stokehold. That afternoon the wind and sea modulated and we were able to reach Adelaide next day in time to embark His Majesty's homeward mail, and sail as appointed.

Steamers scheduled to sail from Melbourne on October 15th, remained in harbour. On the morning of October 16th, S.S. *Geelong* bound east informed me by W/T that she had been hove to all night about 150 miles to the westward of Cape Otway.

FIGURES 32 and 33. The weather chart for the morning of October 15th, 1913, shows an anti-cyclone centred near Cape Leeuwin; the tropical low extends in a S. Easterly direction over Northern Australia; there is an anti-cyclone east of Townsville and a very deep Δ depression centred S.E. of Hobart; a "col" lies over central Queensland.

On the morning of October 16th, the anti-cyclone had travelled considerably east and was centred over the Bight and the Δ depression had moved east also.

The barometer at Hobart had, according to the chart risen 10 mb. since the morning of the 15th which, if we had not a chart before us, would be an indication that the depression, whose trough lay considerably east of Hobart, had travelled east, or was filling in.

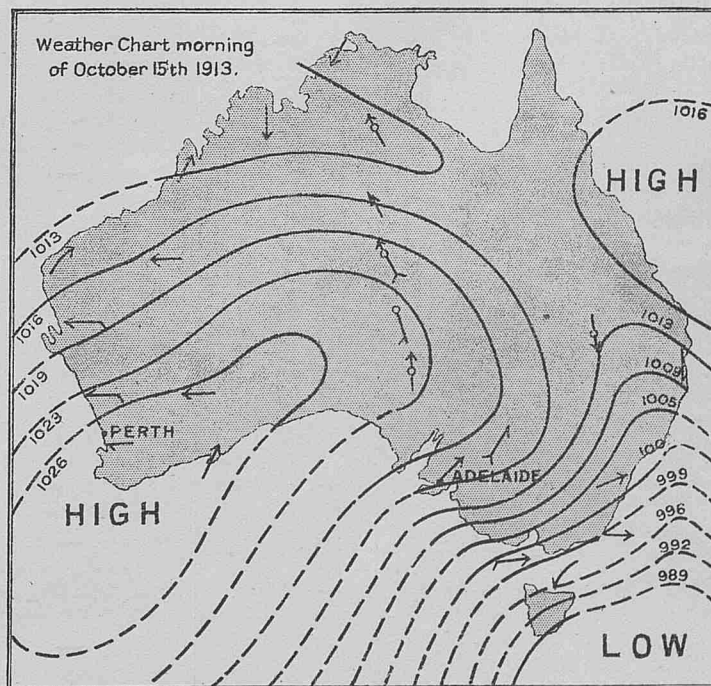


Fig. 32.

If we follow the run of the Isobars and consider the easterly movement of the depression it is easy to understand the shifts of wind we experienced in the *Omrah*.

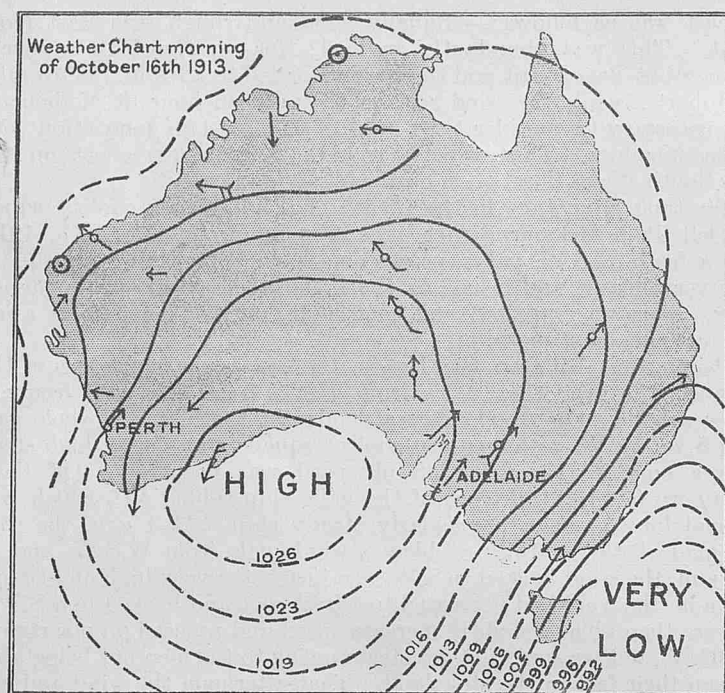


Fig. 33.

As so often happens the strongest winds were in rear of the depression, hence in the Southern hemisphere it often blows hardest with the first rise of the barometer and from the southward.

Making Weather Charts of Pressure, Wind and Weather.

Wireless weather reports have been received by ships in the Atlantic at a distance up to 2,400 miles from the Air Ministry sending station;

and reports from ships up to 1,660 miles distant from Devizes, the receiving station, have been received at the Meteorological Office, on continuous wave. In the ordinary progress of advance it may be fair to expect that before very long weather reports may be reciprocated at greater distances in many parts of the world. The following examples are based upon observations whose reciprocation would require an effective range of about 3,000 miles, in order that a wide scope of utility may be illustrated.

With observations taken from the Daily Weather Chart of Australia, Meteorological Logs and Ships' Meteorological Reports, recorded as if from the ships' wireless office in the form recommended in Chapter II we will make a chart as we did in that chapter, for practice will be useful in Southern Latitudes.

R.M.S. *Orsova*, Captain C. G. MATHESON, D.S.O., R.D., R.N.R., having telegraphed her expected time of arrival at Fremantle from Adelaide is anxious to keep it.

Much depends upon her maintaining schedule and to her a weather chart would be useful.

On a small scale Mercator CHART XXVII at the position of coast stations, with a protractor lay off wind arrows, each feather representing one of the Beaufort scale; the arrows fly with the wind, their heads indicate position. Abreast these stations, write the barometer in millibars or inches (both are given here for the convenience of all concerned). Unfortunately, the tendency of the barometer is not available; if it were, it and the weather would also be written abreast the stations. Plot the position of the reporting ships, and draw wind arrows, heads at positions. Write the name of the ship reporting, the barometer, weather, course and speed, and barometer tendency.

Next, pick out the lowest barometer reading plotted on the chart and facing the wind to the *left* with the soft pencil write LOW; also pick out the highest barometer on the chart and facing the wind to the *right*, write HIGH.

When this has been done, if there are well defined weather systems, it will be seen that the wind arrows give a general idea of how the wind is circulating at the surface.

Coast Weather Reports—Morning of July 11th, 1923.

Station.	Barometer tendency.	Weather.	Visibility.	Barometer.	Wind.	
					Direction.	Force.
Carnarvon - - -	—	—	—	1017 30·03	N.E.	2
Perth - - - -	—	—	—	1011 29·86	E.S.E.	1
Cape Leeuwin - - -	—	—	—	1010 29·83	N.W.	4
Albany - - - -	—	—	—	1010 29·83	N.N.W.	1
Port Eucla - - -	—	Rain	—	1016 30·00	N.N.E.	2
Cape Borda - - -	—	—	—	1022 30·18	N.	1
Cape Otway - - -	—	—	—	—	—	—
Hobart - - - -	—	—	—	1025 30·27	N.N.W.	2
Gabo I. - - - -	—	Rain	—	1023 30·21	S. by W.	5
Sydney - - - -	—	Rain	—	1020 30·12	W. by N.	2
Brisbane - - - -	—	—	—	1015 29·97	S.	2
The Bluff - - - -	—	—	—	1017 30·03	Calm	
Wellington - - -	—	—	—	1023 30·21	N.E.	1
Russell - - - -	—	—	—	1018 30·06	S.E.	5
Norfolk Island - -	—	—	—	1014 29·94	Calm	

Ships' Reports—Morning of July 11th, 1923.

Ship.	Lat.	Long.	Bar.	Wind.		Weather.	Course.	Speed.	Bar. Ten-dency.	Cur-rent.	From		To		Temp.		Swell.	Past Weather.
				Dir'n.	Force						Lat.	Long.	Lat.	Long.	Air.	Sea.		
<i>Orsova</i>	35° 19'S.	124° 42'E.	1011 29·86	N.N.W.	4	Blue sky	N.88°W.	15½	Falling slowly.									—
Bq. <i>Gathgarry</i> .	28° 23'S.	167° 28'E.	1012 29·89	E.N.E.	2	Overcast	S.70°W.	2	Steady									—
<i>Hauraki</i>	37° 58'S.	157° 40'E.	1017 30·03	E.S.E.	5	Some cloud.	S.75°W.	12	Rising slowly.									—
<i>Berrima</i>	42° 29'S.	94° 36'E.	989 29·21	W.S.W.	3	Cloudy	East	8	Rising									Gale at 8 p.m.
Ship <i>Monkbarns</i> .	38° 57'S.	132° 48'E.	1013 29·92	N.	7	Overcast with rain.	East	7½	Steady									—

In this case, it is evident that *Berrima* is in rear of a depression and that the winds reported at the Leeuwin, logged by *Orsova* herself, and reported by the Ship *Monkbarns*, conform to the circulation in the fore part of a cyclonic depression. We rough in the isobars hereabouts first, the wind giving us their trend, for it blows along the isobars, inclining towards the Low. Therefore, remember BUYS BALLOT'S Law, for it helps us greatly, especially at sea, away from the land and local causes. Ashore, or on the coast, the wind may not conform so nearly to this Law, as we have seen in FIGURE 30. The lowest barometer reported, at *Berrima's* position is 989 (29·21). For practical purposes at sea isobars drawn for every four mbs. (·12 of an inch) will be convenient, stepped from 1,000 mb. (29·53 in.).

Thus the lowest proved isobar of this stepping will be 992, but it is evident that there are actually isobars of lower value to the S.E. We therefore dot in the 988 (29·18 in.) isobar S.E. of *Berrima* on CHART XXVIII. As there are three barometers of not more than 1 mb. different from 1012 (29·89), well spaced along what appears to be the outskirts of this probably great cyclonic depression, we next draw the 1012 (29·89) isobar, from north of Perth where the wind direction is probably due to land breeze (ignoring BUYS BALLOT'S Law here), north-east of *Orsova* and west of Ship *Monkbarns*.

The 1008 isobar is drawn with barometers and winds at C. Leeuwin, Albany, S.S. *Orsova* and Ship *Monkbarns* as our guide. The 1004 (29·65), 1000 (29·53) and 996 (29·41) isobars are spaced in as dotted lines in the absence of observations over a considerable distance.

Next examining the region near the highest barometer at Hobart 1025 (30·27) it is seen that the wind at Cape Borda, Hobart and Gabo Island, all of which have high barometers, conforms to anti-cyclonic circulation. The 1024 (30·24) isobar is drawn southward passing east of Cape Borda, west of Hobart, whence it curves round to the northward and passes west of Gabo Island.

Having fixed the two main systems it will be well to examine other low and high barometers which obviously indicate the presence of other systems within the limits of our chart.

We find a LOW, north of Barque *Gathgarry's* position and a HIGH, east of New Zealand, and write these words in in pencil.

Returning to the Main High, the 1020 (30·12) isobar fits in, passing south-east to the west of Cape Borda and west of Hobart, then curves east and north passing through Sydney.

The 1016 (30·00) isobar is drawn from south of Carnarvon through Port Eucla, east of Ship *Monkbarns* and probably extends over the Tasman Sea in the direction shown by its dotted line, there probably being a LOW, south-west of the Bluff. The two eastern systems may now be conveniently dealt with. A 1012 (29·89) isobar is drawn through Barque *Gathgarry's* position trending S.W. and curving to the northward between Norfolk Island and Brisbane. A 1016 (30·00) isobar passes north of Russell, curves to pass close north of *Hauraki's* position and thence west of Brisbane.

A 1020 (30·12) isobar is drawn in from the eastward passing south of Russell, curves sharply south and passes west of Wellington, then turns south-east between the last station and the Bluff.

We have now roughed in all the isobars which can be drawn with the observations available, and using pencil and india-rubber, we improve them, making them close together where the wind is strong and wider apart where it is light, so that their spacing roughly shows the gradient.

These isobaric lines give us a general idea of pressure distribution, having been drawn through places estimated to have the same

barometric pressure.

The CHART XXVIII shows us that there is an anti-cyclone over Tasmania and Victoria, probably extending to the Northern Territory. A cyclonic depression is centred far S.W. of C. Leeuwin. There is an anti-cyclone east of New Zealand and a depression N.W. of Norfolk Island.

Orsova left Adelaide at 1.4 p.m. on July 9th. Until midnight she had moderate winds to light airs from S.W. with barometer nearly steady at 1028 (30·36); she was then in the anti-cyclone now far astern.

On July 10th the wind was northerly, barometer falling slowly as she crossed the isobars on the western side of the anti-cyclone.

She now (morning of July 11th) sees by CHART XXVIII that, with her own barometer falling slowly, that of Ship *Monkbarns*, steering east at 7½ knots, steady, and the rising barometer of *Berrima*, steaming east at 8 knots, that the LOW to the S.W. is travelling east. She may expect an increase of wind and that it will back to the westward.

According to her log, the wind increased to a strong breeze, and backed to W.N.W. at noon; at 4 p.m. it was W. by S., fresh, after which the wind veered to the northward and fell light, probably caused by a secondary, not shown on our chart through lack of observations, between Cape Leeuwin and *Berrima*, or it was of later development. From midnight until 4 a.m. on July 12th *Orsova's* barometer fell quickly.

On July 12th, the operation is repeated, CHART XXIX, and it is seen that another depression is overhauling *Berrima*; the strong N.W. wind at *Orsova's* position is probably caused by an extension or secondary north of yesterday's south-western LOW; with a slowly falling barometer, steaming N. 79° W., 15 knots nearly parallel to the isobars, after the quick fall in the night, this secondary depression is probably deep. She therefore may expect an increase of wind to gale force, and that after rounding the Leeuwin as she steams north the wind will back to the westward and moderate.

According to the log, the wind increased rapidly with violent rain squalls in the forenoon; at noon it had reached force 9; at 10.55 p.m., when C. Naturaliste was abeam, the wind had moderated to force 4, and was from west. *Orsova* arrived at Fremantle at 7.53 a.m. on July 13th and sailed again that evening, the wind remaining westerly, fresh to moderate.

Special Advantages for Sailing Ships.

To the sailing ship, the foreknowledge of wind to be experienced which is made possible by the use of long range wireless telegraphy and weather charts, would be invaluable, and we are lucky in having the observations of two of the very small fleet remaining afloat in 1923 with which to illustrate the method.

Supposing the Ship *Monkbarns*, Captain W. DAVIES, from Cape Town to Sydney, 32 days out on July 11th, 1923, had been able to make CHARTS XXVIII, XXIX, XXX and XXXI. On July 12th, she would have seen that the anti-cyclone which, according to the chart of the previous day, was centred near Bass Strait, was giving way (i.e., pressure reducing) and that the depression centred near the one hundredth meridian yesterday had probably moved east and developed the secondary now near Cape Leeuwin; also, that there was a secondary centred between her position and Cape Otway. *Monkbarns* steady barometer when steering E. ¾ N. at 7 knots is an indication that the secondary ahead of her is also moving east; the Antarctic Low is probably moving east. She may expect the wind

to veer and fall light, later coming from northward and increasing as the western secondary overhauls her.

At 8 a.m. on July 13th *Monkbarns* is distant 180 miles from Cape Otway, her point of landfall, whence she will shape a course to pass through Bass Strait. CHART XXX shows her that the depression near Norfolk Island has intensified and moved east; the anti-cyclone over Australia has further given way, and another anti-cyclone is approaching Australia from the westward and she is apparently in advance of a depression centred to the S.W.

All this points to the probability of the wind now N. by W., force 6, backing to the westward and remaining there for a time.

Monkbarns ended her observations on making Cape Otway, but the pressure distribution and coast reports in the vicinity of Bass Strait, given on CHART XXXI, indicate that the forecast made on July 13th was a good one, and she had a slant.

South Pacific.

Since the first edition was published the geographical distribution of the Observing Fleet has been much improved and we have on our list a much better proportion of ships in Pacific Trades. There are now Wireless Weather Signals made from Apia, Suva, Auckland, Sydney and Brisbane which contain a certain amount of reported observations at coast stations and though the range of some of these stations is small, ships may be able to receive sufficient reports for coast stations when at a considerable distance to the eastward or north eastward of New Zealand as has been proved by *Rimutaka*, Captain F. A. HEMMING, whose 2nd Officer, Mr. OSWALD M. WATTS, on November 21st, 1924, constructed the first Weather Chart made at sea in the South Pacific sent in to the Marine Division, see Volume II, page 158.

Though only the observations from the Australian daily weather report and Suva are available to us, ships observations make it possible to draw quite a useful chart.

It just happens that in July, 1925, S.S. *Rimutaka* was again in a position which serves our purpose admirably for an example. She was in Latitude 33° 10' S., Longitude 158° 34' W., at observation time on July 11th, Eastern Time, bound from Liverpool via Panama to Auckland. Now supposing that she had received the reports and made CHART XXXII; it indicates that she had just passed the trough of a depression and is now drawing away from the centre which is probably travelling East. There is another depression centred near Gabo Island (Cape Howe) while an extensive area of comparatively high pressure separates these depressions, in which to the westward of Cook Strait *Maunganui's* report indicates the existence of a third but very small depression shown by the sharp bend in the 1020 (30·12) isobar.

Rimutaka will expect improving weather with wind steady and then backing to south, when if the depression now to the west of Cook Strait moves east and develops, her wind will increase from the Southward and veer or back again according to which side of this small depression she passes through.

Actually *Rimutaka* experienced a South to S.S.W. wind up to gale force with squalls and heavy rain during the following morning watch. This small depression which *Maunganui* passed through during the early morning of July 11th developed and travelled rapidly East causing the gale experienced by *Rimutaka*.

Unfortunately the tendency of the barometer is not given for the shore stations but the ship barometer tendencies, with course and speed, afford useful information. Take that of *Aorangi* within the Tropics on a N.E. course steaming at 16 knots away from the HIGH; the barometer was actually rising slowly but if diurnal range is allowed for we should interpret a steady barometer for the purpose of gauging whether there was a change of pressure distribution in the vicinity. *Pakeha's* barometer tendency, falling slowly, in high latitude on a course towards the LOW indicates that she is overhauling the depression centred S.E. of *Rimutaka*, or that there is a secondary developing ahead of her. Those who navigate in Southern Waters will do well to study the significance of temperature observations and the development of depressions which will be dealt with in a later chapter, but it is first necessary to master the drawing and use of Weather Charts with pressure only so that we may have a thorough ground work on which to extend in all parts of the world.

South African Waters.

Since we commenced our endeavour to demonstrate the use of Weather Telegraphy and the construction of Weather Charts at sea,

attempts have been made to find suitable examples for illustrating the utility of the method in the region of the Cape, but sufficient observations from ships at sea and stations on the coast or ships in harbour at the same time have not been available.

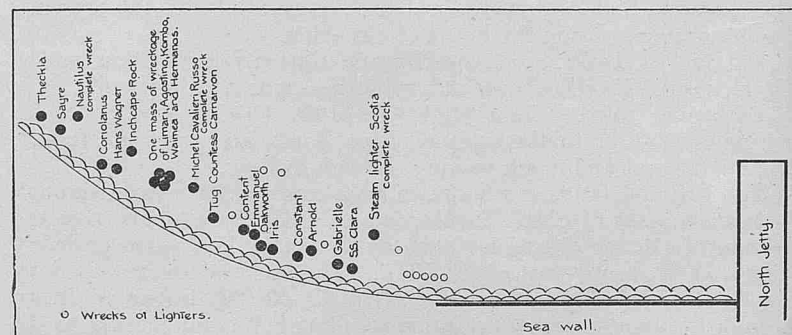
In 1925 information from Commanders of observing ships of the UNION CASTLE LINE was received that a system of routine Wireless Weather reports had been introduced for the Coasts of South Africa and a description of these was given in "Weather Signals" in the November 1926 Number.

Copies of the actual reports received in observing ships forwarded by Commanders with observations recorded in Meteorological Logs and Reports (Form 911) now provide sufficient data for making simple charts, one of which is produced, which may be of some assistance as a guide to those who wish to put into practice Wireless and Weather as an aid to Navigation in South African Waters. Though Weather on the South African coast has been a subject of study for many years and many have written upon it, including Captains CAMPBELL HEPWORTH and TOYNBEE, it does not appear to have been dealt with fully in synoptic meteorology. No daily weather maps or charts of types of weather such as Mr. HUNT's for Australia, are available, though we are told in a chapter on "Climate and Weather" by Mr. C. STEWART, in "Africa" of the Oxford Survey of the British Empire, that "The weather of South Africa, more particularly in the south, is largely due to a series of moving anticyclones passing from west to east with their associated A-shaped depressions and to secondaries.

In the absence of South African Weather Types those given for Australia may serve as a rough guide to Marine Observers, who are advised to refer to them for the same Latitudes in other parts of the Southern Hemisphere. Before Wireless Telegraphy made the synoptic method possible at sea and before Meteorological Services had been developed, when seamen were entirely dependent upon their own isolated observation for prediction of weather, it is probable that there was no coast in the World where weather changes were more significant and sudden and where we were better able to anticipate them. Notwithstanding this and the precautions of springs on cables, upper yards sent down and so forth, there were few places in the world where more ships were lost in consequence of weather.

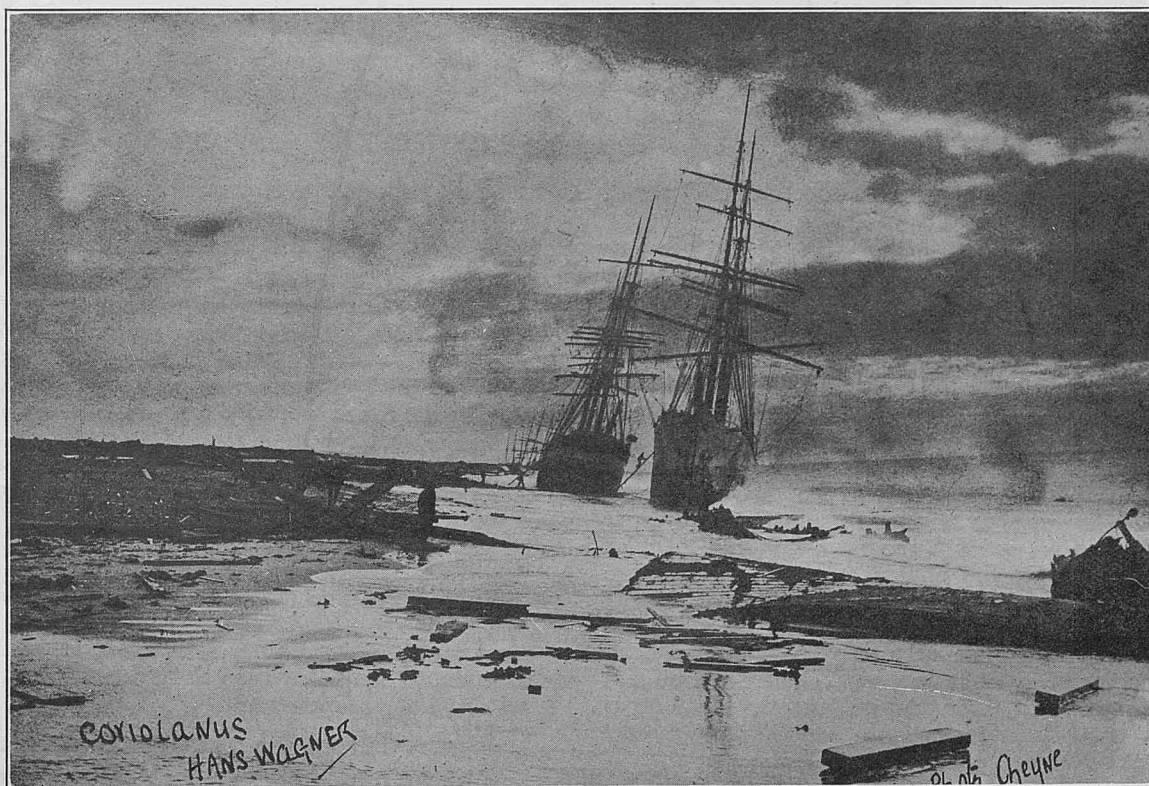
Algoa Bay was a veritable graveyard for sailing ships; as late as September 1st, 1902, no less than 17 sailing vessels, 2 steam tugs, and several lighters were driven ashore in a terrific S.E. gale, many of them literally piled up on top of each other, while others were broken to pieces or driven so high on the beach by the enormous seas that it was found impossible to repair and refloat them. In all, 63 lives were lost and an aggregate tonnage of about 12,500.

The ship in which the writer was serving at the time for the purpose of R.N.R. training, H.M.S. *Barracouta*, Commander SELBY ASH, R.N., arrived with the Cape Squadron a fortnight later, and the rough plan and photograph below will give some idea of the scene of destruction.



Rough plan of Algoa Bay showing positions of vessels stranded on the night of August 31st-September 1st, 1902.

During the same month we rode out another very heavy gale in Simon's Bay. On September 22nd, 1902, the barometer fell and the wind increased from N.N.E.; by 10 a.m. there was a whole gale from N. by E. (directions all magnetic). At noon the wind was storm force, N. by E., with terrific gusts off the mountains, occasional rain; 4 p.m. north, force 10; at 6.30 p.m. the wind veered to N.N.W. and dropped to force 3, and at 10 p.m. it veered (or to use the terms which have since been laid down for both north and south Latitudes *backed*, but I simply quote from my journal) to N.W. a moderate gale, after which the wind dropped and there was a perfect deluge of rain.



H.M.S. *Gibraltar*, flagship of Rear-Admiral MOORE, rode out this gale with both bowers and the sheet anchor.

The fine four-masted barque *Principality* dragged her anchors and, by a fine piece of seamanship on the part of the Mate who was in charge, did not go ashore. It happened this way; Simon's Bay lies in the N.W. corner of False Bay, which is surrounded by mountains except for a stretch of beach extending from the Cape Flats from Muizenberg to Gordon's Bay. It therefore affords a weather anchorage with winds from S.W. through west and north, and the mountains break the steady drive of the wind from those directions.

This mountain break wind is, however, the cause of terrific gusts, which are a great danger in the Bay, these gusts being more sudden and terrific than the squalls accompanying the gale out at sea to windward of these mountains.

Now, at 10 a.m. the wind shifted from N.N.E. to N. by E. and increased with terrific gusts; *Principality* started her anchors, and at 10.45 a.m. there was a tremendous squall with gusts which came down the Valley past Elsey Peak, a hill 990 feet high to the north of the anchorage. She commenced driving to leeward so fast that we thought she had parted her cables and that nothing could save her from going on to the rocks.

The mate promptly hoisted the fore topmast staysail with sheet to port, her head paid off to starboard, and soon afterwards her starboard anchor fouled the heavy moorings of H.M.S. *Penelope*, the depôt ship, cable was veered and *Principality* placed alongside of *Penelope* as neatly as if she were a twin-screw steamer assisted by tugs.

Captain CAMPBELL HEPWORTH, who served for a number of years in the steamers of the old UNION STEAMSHIP COMPANY, gave an account of the variations of Meteorological phenomena of the south and south-east Coasts of Africa, with the oscillations of the barometer associated therewith, in his "Notes on Maritime Meteorology" which describe admirably the seaman's method of anticipating weather changes before distant observations were available by Wireless Telegraphy; and Captain H. STRONG, of the UNION CASTLE LINE, who has had very long experience in South African Waters, remarked upon the infallibility of the barometer as a guide to forecasting wind on these coasts in his contribution to the first number of THE MARINE OBSERVER.

With this weight of testimony of the value of the barometer it would seem that, now weather reports from coast stations are available by Wireless Telegraphy, much more may be done by the seaman himself in the matter of weather prediction.

The following is to illustrate what may be done with a little trouble and the co-operation of other ships.

On May 17th, 1925, R.M.S. *Edinburgh Castle*, Commander H.

STRONG, R.N.R., was in Latitude $31^{\circ} 06' S.$, Longitude $15^{\circ} 27' E.$ at 0630 G.M.T. She made a weather report by wireless and received the Cape Town Radio weather message at 0835, but appears not to have received reports from any other ships. At this time there may have been other ships within W/T. range, but the only other steamer on our fleet list in the vicinity was S.S. *Clan Lamont*, Captain A. B. McCORNISH, distant some 450 miles to the northward and westward.

Let us, however, take the appropriate observations available and with them make WEATHER CHART No. XXXIII, carrying out exactly the same procedure and method advocated for Australian Waters.

This chart shows us that the South Atlantic High extends eastward nearly to the coast, and comparison with the South Atlantic chart for the month of May shows that *Edinburgh Castle's* barometer is normal. There is a depression south of East London, while the barometer at Walvis Bay and Port Nolloth indicate a shallow depression along that coast, while a small high separates this area of intermediate pressure from the main depression. Fine weather is general.

Now, *Edinburgh Castle* is within a day's steaming of Table Bay and she wishes to know most if she may expect the S.E. head wind to increase or decrease and if the visibility will remain very good, or if depressions will come from the S.W. and cause bad weather.

Now, with CHART No. XXXIII we can see the distribution of pressure with the wind circulation from the vicinity of East London to Walvis Bay, but we have very little to go upon to gauge how the systems are moving or altering; for this purpose we should be glad to know what the barometer had done at each of the coast stations during the last three hours, and the higher the latitude these are in, the more valuable will they be; as it is, we must depend very largely upon what *Edinburgh Castle's* barometer is doing. We should also like a report from a ship to the S.W. or from Tristan da Cunha; perhaps when *Discovery* is on her station she will supply that need.

Now with the isobars as they run and with the ship steaming S. $37^{\circ} E.$ 14 knots, and the barometer rising slowly (part of which rise is no doubt due to the diurnal range), the anticyclone is probably stationary or spreading towards the coast, so that it is probable that there will be very little change in the force of the wind and there is nothing to indicate the likelihood of decreased visibility.

With the barometer tendency at Port Nolloth and Cape Town we might get a very good idea of what change of gradient to expect along the coast, which gradient is, of course, directly associated with the "South-Easter." The tendency of the barometer at East London would give us some indication of how the depression was moving or altering.

(To be continued.)

CURRENTS ON THE TRACKS TO AND FROM THE WEST INDIES AND PANAMA.

PREPARED IN THE MARINE DIVISION BY C. S. DURST, SENIOR PROFESSIONAL ASSISTANT.

In the present series of charts we are dealing with (1) the currents beneath the great Atlantic Anticyclone, (2) the West-North-West stream current flowing along the shore of the West Indies, (3) the currents of the Caribbean Sea, and (4) the Gulf Stream between Florida and Long Island.

Owing to the comparatively few observations available it has been necessary to increase the areas for which current roses are drawn to as much as eight degrees of latitude and longitude in some places. And even so the navigator must take account of how many observations are used in the determination of an arrow, for one based on only a few observations is obviously more liable to differ from the true average than an arrow based on a larger number of observations. The disadvantages are obvious. In some places the areas are too large to reveal changes in the velocity of the stream currents, but by using both the resultant arrows and the roses the navigator will be able, even with these large areas, to obtain a better conception of the velocities he is likely to experience than if he had only single arrows to guide him as in the old charts. To form a true estimate it is essential that the navigator should have a very clear conception of what the arrows and roses represent.

The resultant arrows are obtained by taking the mean northing or southing and easting or westing of all currents experienced in the areas shown by pecked lines. An arrow therefore represents an approximation to the mean flow of surface water in a given area. It does not imply that the current will set in that direction and with that velocity on any single occasion because surface currents are very variable and are subject to influences which are at present very imperfectly known. But if the navigator has no other information to go on these arrows will give him an indication of the mean direction and velocity. The roses show him what velocities in each direction have been experienced and therefore what may be experienced again.

It will be seen that with currents of such variability as is shown on these charts, the previous experiences of an individual may not provide a definite criterion of what current to expect, and it is only when a very large number of observations have been amassed and grouped in some such way as is done on these charts, that the navigator has data on which to form an opinion. There are some grounds for believing that observations of the currents used in the construction of these charts are of a higher order of accuracy than those used in the old charts. Of recent years the observation of current has greatly improved, for reasons which are well known to Marine Observers. It is, therefore, not surprising that certain features seem to be appearing on the present series of charts which have been absent from previous ocean current charts, especially when those features are not unexpected from physical considerations. A reader who has followed what has been written on the Gulf Stream in THE MARINE OBSERVER, Volume III, No. 36, page 211, will see that there is a tendency for warm water to drift northward and eastward with the stream. This water being warmer and lighter than that lying to south-eastward of the stream will tend to produce a downward slope of the sea from the stream towards the south-east and a slight current will be produced such that it flows in an opposite direction to the stream. If the charts of mean current for the first two quarters of the year so far published are examined, a distinct westerly and southerly set will be found in the area which lies to the south-east of the Gulf Stream. This set is less conspicuous in the two current roses, given in the charts for the regions of latitude 26° to 32° N., longitude 70° to 76° W. and latitude 32° to 36° N., longitude 62° to 70° W., respectively, since these roses represent the conditions in a considerably larger area than that in which the slight counter-current is found. The westward and southward counter current, which flows on the average directly against the wind, does not appear on any previous chart based on observations prior to 1910, and it seems probable that it was not recognised before owing to leeway or slip of the propeller and other errors having been confused with the true current.

Caution as to use of the Charts in the neighbourhood of Gulf Stream.

The method of measuring the velocity of currents by differences between observed and dead reckoning position logged is not always suitable for the examination of surface drifts in those regions of the ocean where there is a very narrow stream current, with velocities varying rapidly from place to place. In such regions the set and drift found by this method would depend so much on the course steered, according to whether it was athwart the narrow stream or along it, that nothing more than a very general idea of the surface drift could be arrived at. For this reason the resultant arrows in the Gulf Stream between Latitude 24° N., and Latitude 28° N., are intended only to give a general idea of the velocities experienced and no current rose is drawn for that region because it would not give the navigator a good indication.

Lieut. J. E. PILLSBURY U.S.N., however, made a survey of the Gulf Stream in the years 1885 to 1889 and the following tables give the results of his measurements.

From the Tortugas to Havana.

Distance from Tortugas.	Mean Surface Velocity.
Nautical Miles.	Knots.
20	0.32
35	0.74
50	2.24
68	2.23
86	0.77

Eastward of Fowey Lighthouse.

Distance East of Fowey Lighthouse.	Mean velocity at depths of				
	3½ fathoms (surface).	15 fathoms.	30 fathoms.	65 fathoms.	130 fathoms.
Nautical Miles.	Knots.	Knots.	Knots.	Knots.	Knots.
8	2.66	2.35	2.25	1.59	0.63
11½	3.46	2.90	2.94	2.42	1.61
15	3.16	3.06	3.18	2.95	2.20
22	2.73	2.67	2.70	2.50	1.86
29	2.12	2.10	2.12	1.98	0.45
36	1.71	1.57	1.90	1.57	1.45

It must be recognised that these observations are means of a large number; on individual occasions the velocities differed widely from these values.

PILLSBURY estimated that the axis of the stream was situated (under average conditions) in the following positions:—

25 Nautical miles north of Havana.
11 " " east of Fowey Rocks.
19 " " east of Jupiter Inlet.

Reference should be made to "West Indies Pilot" Volume III, page 29, where the main results of PILLSBURY's investigations are given.

Discrimination must always be exercised in the near neighbourhood of the West Indian Islands and the Coast of South America, in both of which positions there appear to be inshore counter currents of no great width which cannot be sufficiently defined by the method of D.R. and observed positions.

The Currents beneath the great Atlantic Anticyclone.

As is known to every navigator, the velocities attained by currents in this region are slight; a velocity of a knot is quite the exception and the great majority of currents observed have less than half that speed. The motion of the water is in the main due to wind drift, which as has been explained in previous articles tends to set the

ship in the same direction as the wind, but at an angle of 45° to the right in the Northern hemisphere (to the left in the Southern).

There are some features however which attract attention, even though the drifts indicated are so slight.

In the neighbourhood of the Azores and to westward for some twenty degrees of longitude there is a tendency for the current to set to the southward (a feature which is not so clearly shown on the old charts). This southerly set is however corroborated, at least in the neighbourhood of the Azores, by a series of charts made by Drs. HELLAND-HANSEN and NANSEN. They have collected all the available data with regard to salinity and temperature in the Eastern North Atlantic at all depths. From these data they have computed the density of the water at a large number of points. Since the bottom water is *very* nearly still, it is possible by such a computation to obtain the horizontal pressure gradients at all points in the ocean and thus to obtain the current at any depth.

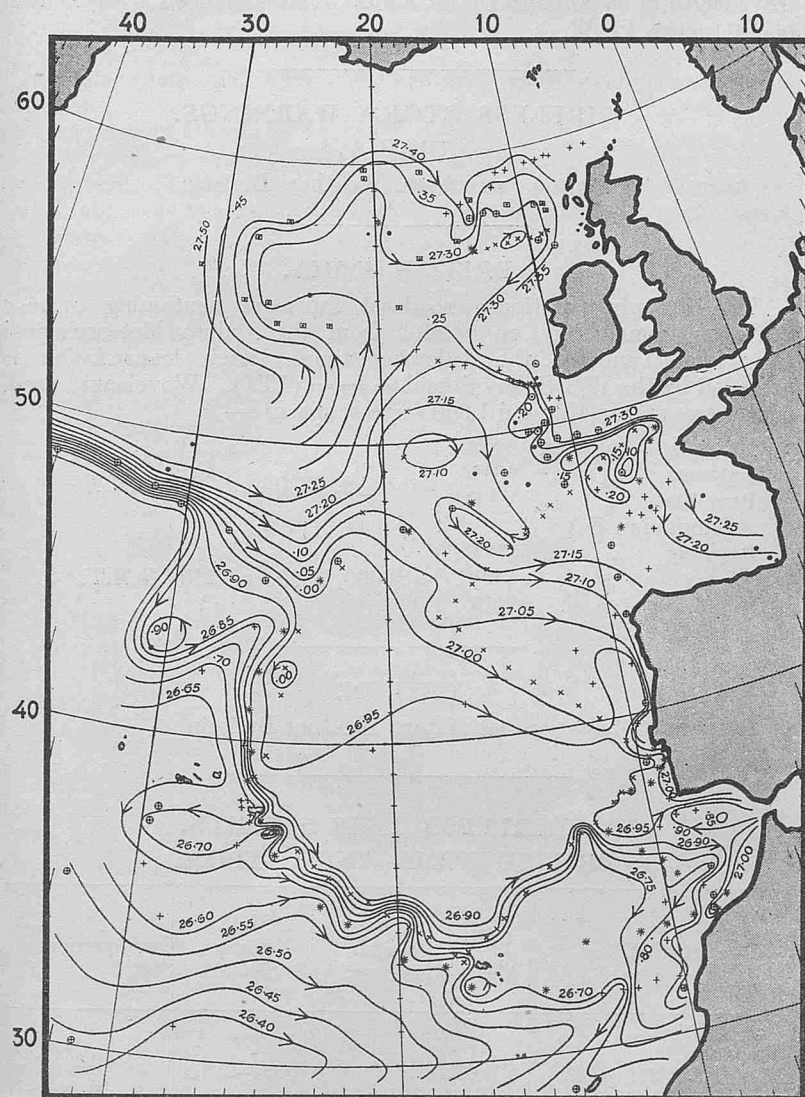


Fig. 1.—Showing lines of equal density at 55 fathoms.

(Reproduced from "The Eastern North Atlantic," by Drs. Helland Hansen and Nansen.)

The chart showing lines of equal density at 55 fathoms and the chart showing the subsurface flow of water are given in FIGURES 1 and 2. With regard to the latter the authors say that it may need

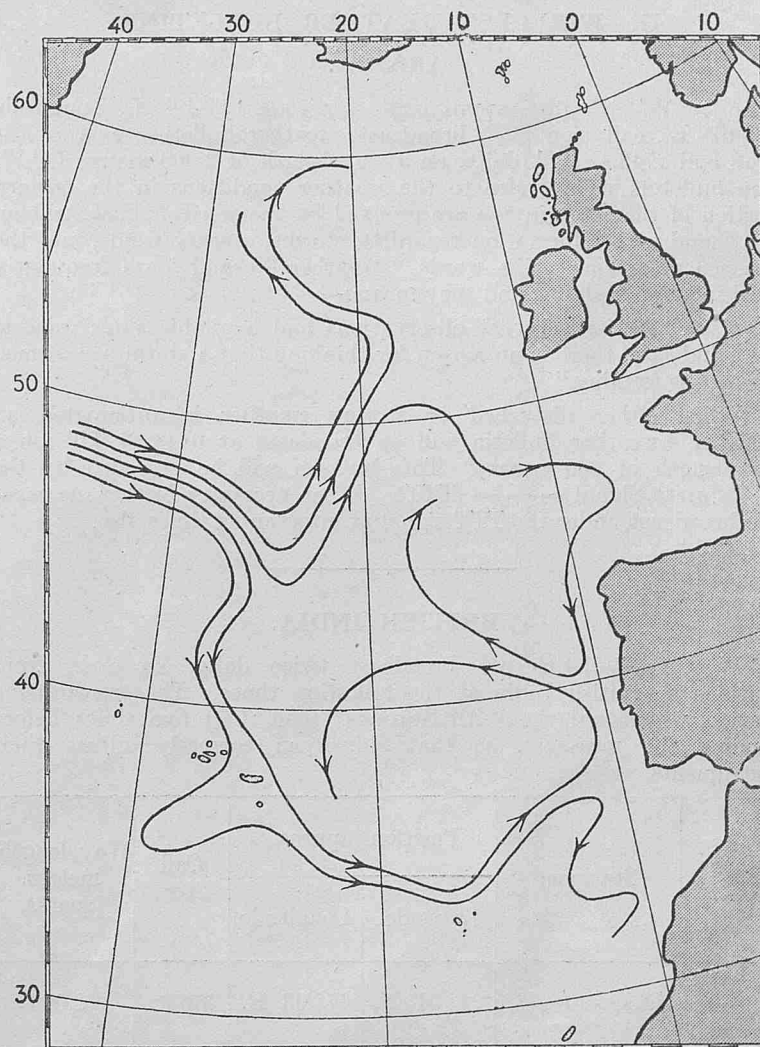


Fig. 2.—Showing the General Subsurface Circulation of the Eastern North Atlantic.

(Reproduced from "The Eastern North Atlantic," by Drs. Helland Hansen and Nansen.)

modification when further data become available, but it does give an idea of what the subsurface stream currents are. These stream currents will be of a very similar nature to those found at the surface and so it is most satisfactory to notice that the Southerly set near the Azores, which has been observed by the method of differences of D.R. and observed positions, is corroborated by such an entirely different method of computation. At the same time it must not be overlooked that the North-going stream shown in FIGURE 2 as flowing roughly along the 20th meridian between the parallels of 48° and 52° N., is not shown in the charts of ocean current which were published in the MARINE OBSERVER last year.

In connection with the currents dealt with in this article a circular letter was sent out to commanders of ships trading to the West Indies and Panama. Some extracts from the replies received are given in "The Marine Observer's Log."

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

WEATHER SIGNALS.

WIRELESS WEATHER SIGNALS.

II.—WIRELESS WEATHER BULLETINS.

ARABIA.

Aden W/T Station, approximate Latitude 12° 49' N., Longitude 45° 02' E., call sign BZF, broadcasts weather bulletins, *en clair*, at 0948 and 1748 G.M.T. daily, on a wavelength of 2,000 metres I.C.W. The bulletins which refer to the weather conditions in the eastern portion of the Arabian Sea are prefixed by the words "East Arabian Sea" and give information regarding storms, stormy winds, and the absence of storms. The words "Weather Normal" are frequently used in these bulletins and they mean:—

"As far as coast observations and available ships' reports indicate, there is no reason for thinking that a storm has formed or is forming."

When either disturbed or stormy weather is anticipated an "Extra" weather bulletin will be broadcast at 0148 G.M.T. on a wavelength of 600 metres. This bulletin will be preceded by the W/T Safety Signal — — — (TTT). When necessary further messages are broadcast under the TTT signal at intervening times also.

BRITISH INDIA.

Weather bulletins are broadcast twice daily, *en clair*, from stations in British India at the following times. The transmitting station will signal the "All Stations" call (CQ) five times before sending the messages, so that ships can correctly adjust their instruments.

Time G.M.T.	Stations.	Position (approx.)		Call Sign.	Wavelength, metres. (spark).
		Latitude.	Longitude.		
0830 and 1630	Karachi	24° 51' N.	67° 03' E.	VWK	1,000
0900 and 1700	Calcutta*	22° 34' N.	88° 20' E.	VWC	2,000
	Bombay	18° 57' N.	72° 54' E.	VWB	2,000
	Madras	12° 59' N.	80° 11' E.	VWM	1,000
	Rangoon	16° 46' N.	96° 12' E.	VTR	1,200

* After the time signal.

During disturbed or stormy weather "Extra" messages preceded by the W/T Safety Signal (TTT), will be broadcast, if necessary, on 600 metres (spark) at the following times:—

0030 G.M.T.; by Karachi, and Calcutta W/T Stations.

0100 G.M.T.; by Bombay, Madras, and Rangoon W/T Stations.

The foregoing messages are also supplemented when necessary by further messages under the TTT signal during stormy weather. (See W/T Storm Warnings.)

CEYLON.

Matara W/T Station, approximate Latitude 5° 59' N., Longitude 80° 32' E., call sign BZE, broadcasts weather bulletins, *en clair*, at 0948 and 1748 G.M.T. daily, on a wavelength of 2,000 metres I.C.W. These bulletins give information regarding weather conditions in the Bay of Bengal and Arabian Sea, being prefixed accordingly.

The word "Normal" is sometimes used in the bulletins and may be preceded by "Bay" or "Arabian Sea" according to which is referred to. It means:—

"As far as coast observations and available ships' reports indicate, there is no reason for thinking that a storm has formed or is forming."

When either disturbed or stormy weather is anticipated an "Extra" weather bulletin will be broadcast at 0148 G.M.T. on a wavelength

of 600 metres. This bulletin will be preceded by the W/T Safety Signal — — — (TTT).

When necessary further messages are broadcast under the TTT signal at intervening times also.

NOTE.—At the conclusion of the 0948 and 1748 G.M.T. weather bulletins Matara W/T station listens in on the 600-metre wave for 15 minutes and replies on 2,000 metres I.C.W., to ships wishing to transmit weather messages, and who are unable to communicate with Colombo W/T Station.

Colombo W/T Station, approximate Latitude 6° 55' N., Longitude 79° 53' E., call sign VPB, broadcasts brief reports, on the weather conditions near Ceylon after the time signals at 0600 G.M.T. on a wavelength of 2,300 metres C.W. and at 1700 G.M.T. on a wavelength of 600 metres I.C.W.

WIRELESS STORM WARNINGS.

ARABIA.

Aden W/T Station, see Aden Weather Bulletin.

BRITISH INDIA.

The following stations broadcast messages containing cyclone warnings immediately on receipt from the Indian Meteorological Department and at the following times. Each transmission is preceded by the W/T Safety Signal — — — (TTT). Wavelength used, 600 metres spark (Karachi 1,000 metres, spark):—

Karachi	call sign	VWK	} at 0430, 1230 and 2030 G.M.T.
Calcutta	" "	VWC	
Port Blair (Andaman Is.)	" "	VTP	
Bombay	" "	VWB	} at 0500, 1300 and 2100 G.M.T.
Madras	" "	VWM	
Rangoon	" "	VTR	

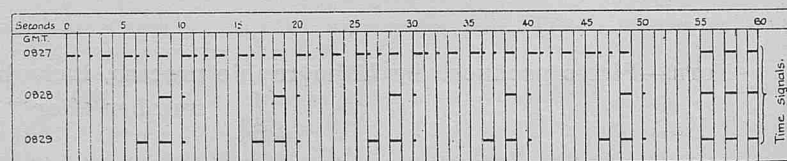
CEYLON.

Matara W/T Station, see Matara Weather Bulletin.

III.—WIRELESS TIME SIGNALS.

BRITISH INDIA AND CEYLON.

Station.	Call Sign.	Wave length, metres.	G.M.T. of Time Signal.	System.
Calcutta. Lat. 22° 33' 34" N. Long. 88° 20' 14" E.	VWC	2,000 spk.	0827-0830 1627-1630	} See FIGURE 1.
Colombo. Lat. 6° 55' 05" N. Long. 79° 52' 53" E.	VPB	2,300 C.W. 600 I.C.W.	0557-0600 1657-1700	



Note.—Calcutta.—(1) Preliminary signals sent two minutes before transmission of T.S. proper, the words "ordinary time

signals," and the signal "wait" (■ — ■ — ■); all these signals are sent by hand.

- (2) Signals automatically controlled from Alipore Observatory, Calcutta.
- (3) T.S. accurate to within 0.2 sec.
- (4) Should there be any inaccuracy, the T.S. is followed by the "erase" signal and the words "signal failed."

Colombo.—(1) Preliminary signals sent two minutes before transmission of T.S. proper, CQ de VPB (repeated 3 times) Time Signal Wait (■ — ■ — ■).

- (2) Actual time signals automatically controlled from Colombo Observatory (Lat. 6° 54' 18" N., Long. 79° 52' 18" E.), the remaining signals being sent by hand.

IV.—VISUAL STORM WARNINGS. BRITISH INDIA.

THE undermentioned storm signals known as general, general with additional daily signals, and brief systems have been adopted at the various ports of British India.

Port Officers are kept informed, by the Indian Meteorological Department, of the latest information concerning all disturbances, and application can be made to them for information to supplement the storm signals.

General System.

Distant Signals.

To indicate danger to vessels after they have left the harbour :

- I. Cautionary.**—There is a region of squally weather, in which a storm may be forming.

NOTE.—This signal will be hoisted at ports situated with reference to the disturbed weather such that a vessel leaving the port might run into danger during her voyage. It will also be hoisted at Arabian Sea ports when a disturbance is crossing the peninsula which may develop into a cyclone after entering the Arabian Sea.

- II. Warning.**—A storm has formed.

NOTE.—This signal will be hoisted when there is no immediate danger of the port itself being affected, but vessels leaving the port might run into the storm.

NOTE.—Night Signals { white light represented by
red light represented by

Local Signals.

To indicate that the port and vessels in it are threatened :

- III. Cautionary.**—The port is threatened by squally weather.

- IV. Warning.**—The port is threatened by a storm, but it does not appear that the danger is as yet sufficiently great to justify extreme measures of precaution.

The existence of a storm can often be determined before the direction of its movement can be fixed. In this case all those ports which the storm could possibly strike will be warned by this signal.

- V. Danger.**—The port will experience severe weather from a storm of slight or moderate intensity that is expected to cross the coast to the south of the port (or to the east in the case of Veraval, the Húgli ports, Diamond Island, Bassein, Rangoon, and the Andamans).

- VI. Danger.**—The port will experience severe weather from a storm of slight or moderate intensity that is expected to cross the coast to the north of the port (or to the west in the case of the Húgli ports, Chittagong, Rangoon, Moulmein, Karachi, and the Andamans).

- VII. Danger.**—The port will experience severe weather from a storm of slight or moderate intensity that is expected to cross over or near to the port.

- VIII. Great Danger.**—The port will experience severe weather from a storm of great intensity that is expected to cross the coast to the south of the port (or to the east in the case of Veraval, the Húgli ports, Diamond Island, Bassein, Rangoon, and the Andamans).

- IX. Great Danger.**—The port will experience severe weather from a storm of great intensity that is expected to cross the coast to the north of the port (or to the west in the case of the Húgli ports, Chittagong, Rangoon, Moulmein, Karachi, and the Andamans).

- X. Great Danger.**—The port will experience severe weather from a storm of great intensity that is expected to cross over or near to the port.

- XI. Failure of Communications.**—Communication with the Meteorological headquarters has broken down and the local officer considers that there is danger of bad weather.

General System with Additional Signals, Bay of Bengal.

It is possible to locate an area of squally weather or a storm in the Bay of Bengal with some degree of certainty, even though the disturbance may be far from the coast. At ports not threatened a "Section" signal for the area affected, as shown on the chartlet, is hoisted *under* the "distant cautionary" or "distant warning" signals (Signals I and II of the "general system") to indicate the position of the disturbance in the Bay.

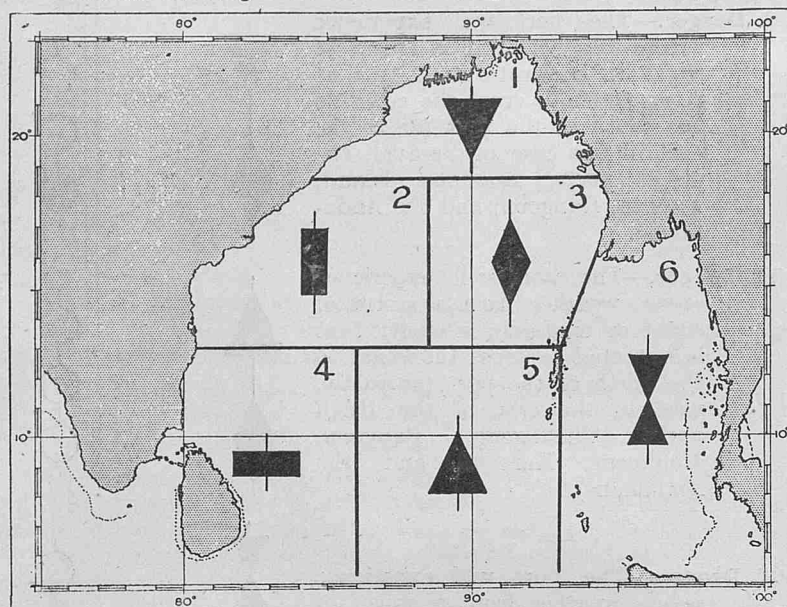
The Bay of Bengal is divided into six sections, *see* Chartlet, thus, if there is squally weather in Section 5 of the Bay the signal, a cylinder placed horizontally over a cone, point upwards, would be hoisted at the various ports.

Day.

Night.



Chartlet showing "section" storm signals, Bay of Bengal.



If a storm has formed in Section 2, the signal, two cylinders placed vertically one over the other, would be hoisted at all the ports which were not directly threatened. The ports threatened would hoist one or other of the local signals.

If the centre of the storm is near the boundary of a section, two locality signals will be given, the first indicating the section in which the centre is supposed to be, and the second the neighbouring section near to which it is. In the event of a storm centre being near to the angles where three sections meet, three locality signals will be hoisted. The first will give the section in which the storm is supposed to be, the second the nearest adjoining section, the third the remaining section.

If a port itself is threatened the appropriate "local" signal of the "general system" would be hoisted.

If no disturbance exists in the Bay of Bengal a *ball* will be hoisted.

This system is in force at the following ports:—

Negapatam, Porto Novo, Cuddalore, Madras, Cocanada, Sagar Island, Chittagong, Akyab, Bassein, Diamond Island, Elephant Point, Rangoon and Table Island.

The signals are not exhibited at the Sandheads, but information is available for passing vessels.

These signals are also exhibited at Sabang, Pulo Weh, off the north-west end of Sumatra; the data for the signals being received from the W/T station at Port Blair. Two balls, placed vertically, denote that the latest weather report has not been received, a request can be made for the last weather report received by means of flags, Morse signals, or W/T. Reply will be made free of charge by means of long distance signals or Morse signals; if the reply is made by W/T the charge will be made through Lloyd's agents at Sabang at the usual tariff.

Brief System.

In the brief system only the four following signals will be hoisted, but the Port officers will be kept informed of the progress of bad weather for the general information of shipping:—

Signal No. III. Cautionary	} Meaning the same as the day and night signals as in the General System.
Signal No. IV. Warning	
Signal No. VII. Danger	
Signal No. X. Great Danger	

Special Signals used on the Rivers of the Ganges Delta, and River Húgli.

These signals are the same as those mentioned in the "general system," but a more detailed signification of certain of the signals is as follows:—

Signal V. indicates that a storm of slight or moderate severity will probably cross the coast to the eastward of Sagar Island and westward of Chittagong. Vessels may proceed to sea if the height of the barometer, state of the sea, and weather, are such as to lead masters and pilots to infer that there is no danger. The wind at

the mouth of the Húgli will probably haul from north-east, through north, to north-west or west.

Signal VI. indicates that a storm of slight or moderate severity will probably cross the coast to the westward of Sagar Island and northward of False Point. The wind at the mouth of the Húgli will probably veer from north-east, through east, to south-east or south. As these easterly winds will raise a heavy swell and produce a strong westerly set in the channel at the Sandheads, it is advisable that none but fast steamers in light trim should put to sea, and those only if the weather appearances and state of the sea are not too unfavourable.

Signal VII. indicates the approach towards Sagar roads of a storm of slight or moderate intensity. It is advisable that no vessels, except fast vessels in light trim, should put to sea until the wind direction and force, the state of weather and sea, and the rise of the barometer indicate that the storm has either broken up or passed inland. It should be remembered that cyclonic storms of small extent in the Bay of Bengal sometimes blow with hurricane force, and raise a high sea near their centres.

Signal VIII. indicates that a storm of great intensity will cross the coast to the eastward of Sagar Island and westward of Chittagong. No sailing vessels, nor deep-laden, nor slow-steaming vessels should go to sea. The wind at the mouth of the Húgli will probably shift from north-east to north, north-west, etc.

Signal IX. indicates that a storm of great intensity will cross the coast to the westward of Sagar Island and northward of False Point. No vessel should go to sea, and masters and pilots of vessels outward bound should be guided by the appearance of the weather and height of the barometer in deciding whether it is advisable to proceed below Diamond Harbour or Mud Point. The wind at the mouth of the Húgli will probably veer from north-east, through east, to south-east or south.

Signal X. indicates the approach of a storm of great intensity towards the mouth of the Húgli, and Calcutta. No vessels should go to sea from Sagar Island, or proceed down from Diamond Harbour, and all vessels should be properly secured.

The above signals are exhibited at Barisal, Goalunda, Noakhali, Narayanganj, Chandpur, Khulna, Sagar Island, Mud Point, Diamond Harbour, Calcutta (Port Commissioner's Office), Kidderpur Docks (Clock Tower), Budge Budge (Assistant Harbour Master's House).

Instructions to hoist the signals are sent by telegram from the Meteorological Department, Calcutta.

Special Notices regarding Personnel.

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

Captain H. W. Broadbent, R.D., R.N.R.

After 28 years' service in command of H.M. School Ship *Conway*, Captain H. W. BROADBENT has recently retired.

Completing his two years' cadetship in the *Conway* in 1882 Captain BROADBENT served his apprenticeship in the sailing ships owned by GALBRAITH PEMBROKE AND COMPANY of London and later served as an officer in sail. Leaving sail for steam he rejoined the company of his apprenticeship, serving as Third, Second, and First Officer of their steamers employed in the Eastern Trade.

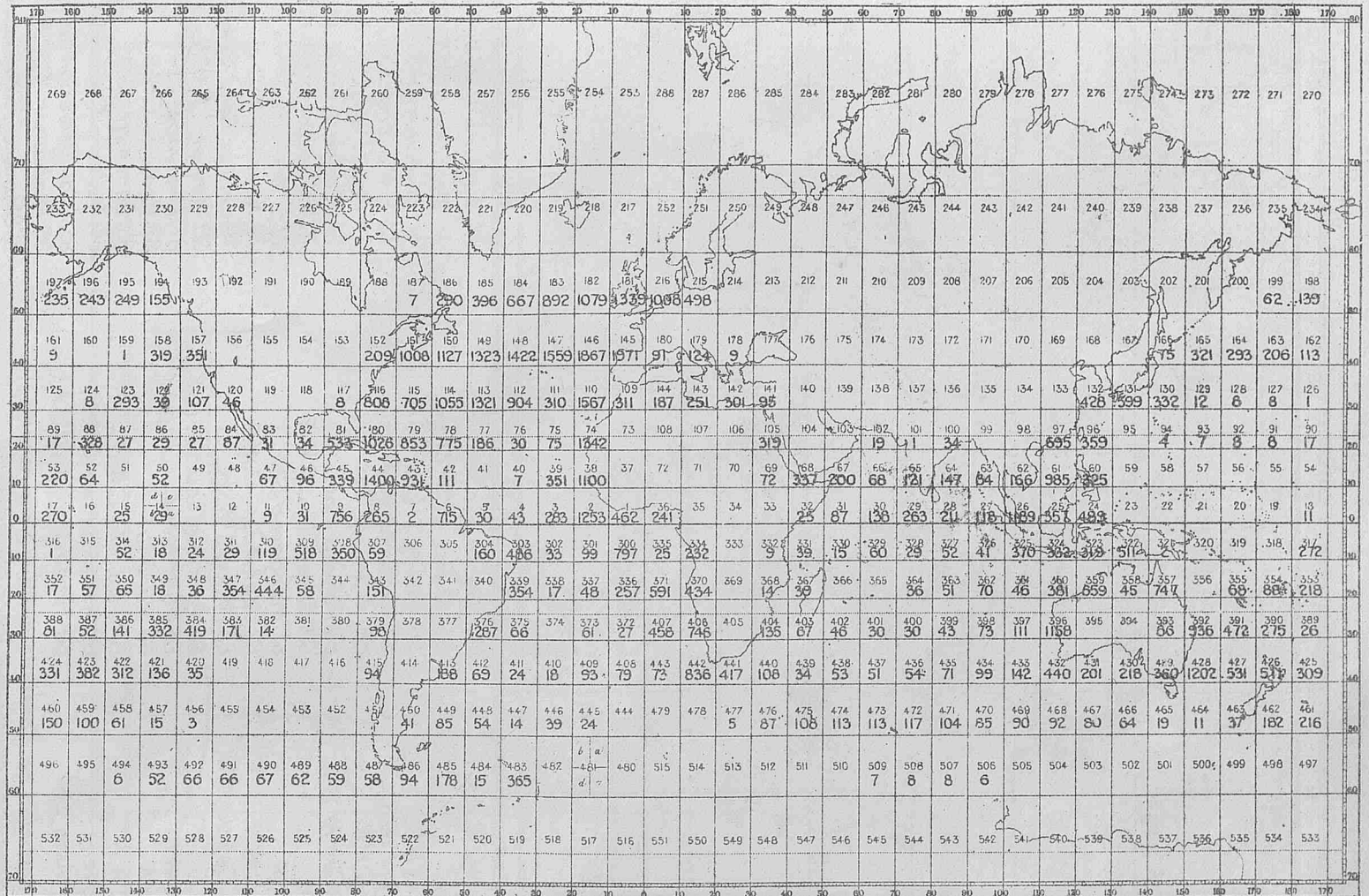
Obtaining his Master's certificate in 1891 Captain BROADBENT served in the BIBBY LINE until 1894 when he did his twelve months' training in the Royal Navy.

In 1895 he joined the Cunard Company and in 1898 was appointed Chief Officer of the *Conway*, obtaining command four years later in succession to the late Captain A. T. MILLER.

Captain BROADBENT took a keen interest in Marine Meteorology. The establishment of the Cadet Meteorological Log now kept in the Officers stationary training ships of the Mercantile Marine was the outcome of a suggestion made by him, and many members of the Corps of Marine Observers received their early training under his command. Marine Observers will join with the Marine Division and "Old Conways" in all parts of the world in wishing Captain BROADBENT long life and happiness in his well-earned retirement.

MARSDEN CHART I.

SHOWING NUMBER OF SETS OF OBSERVATIONS EXTRACTED BETWEEN APRIL 1st. 1926 & MARCH 31st. 1927.



MARSDEN CHART II.

SHOWING NUMBER OF SETS OF OBSERVATIONS EXTRACTED BETWEEN APRIL 1st. 1920 & MARCH 31st. 1927.

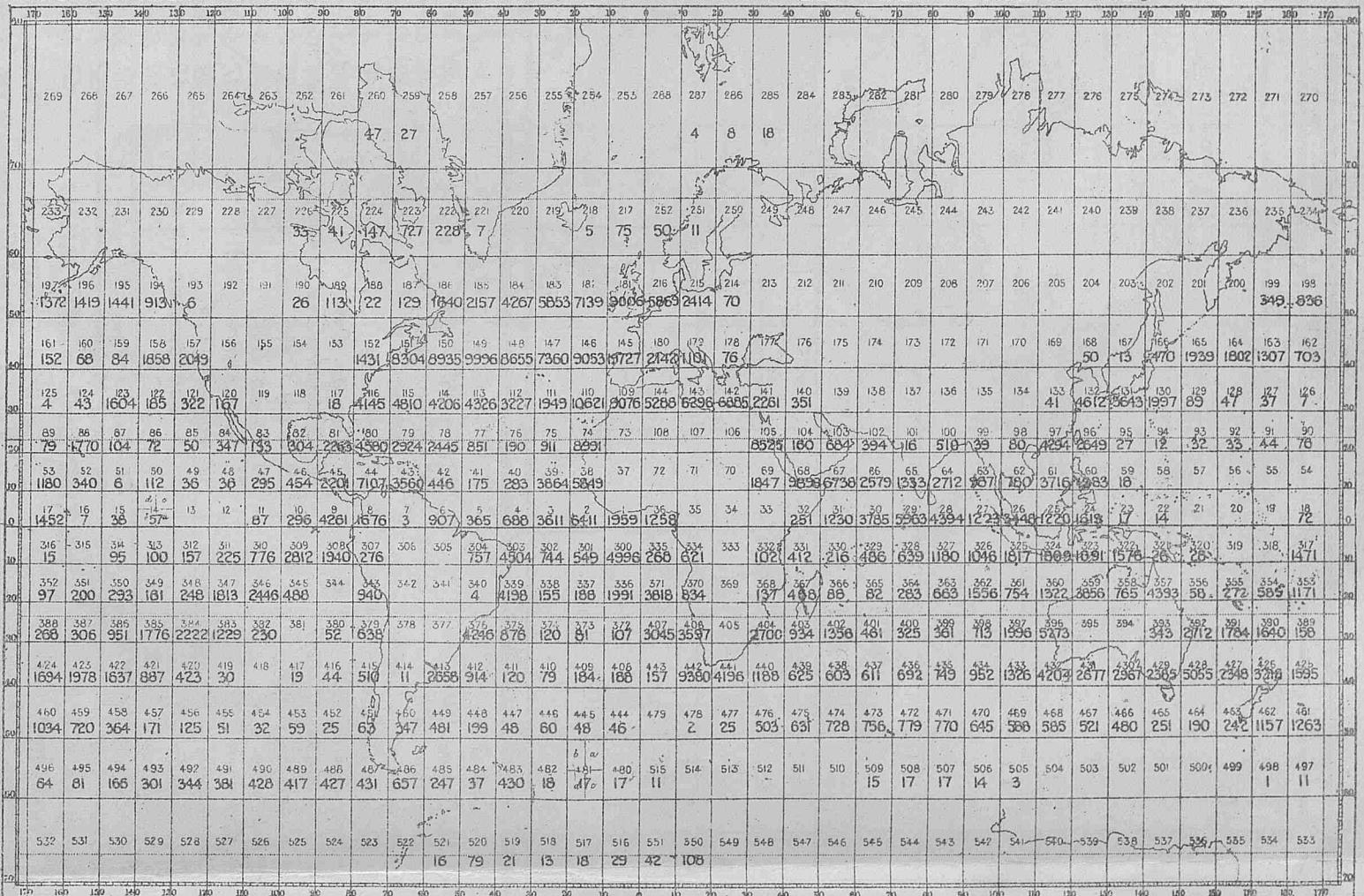
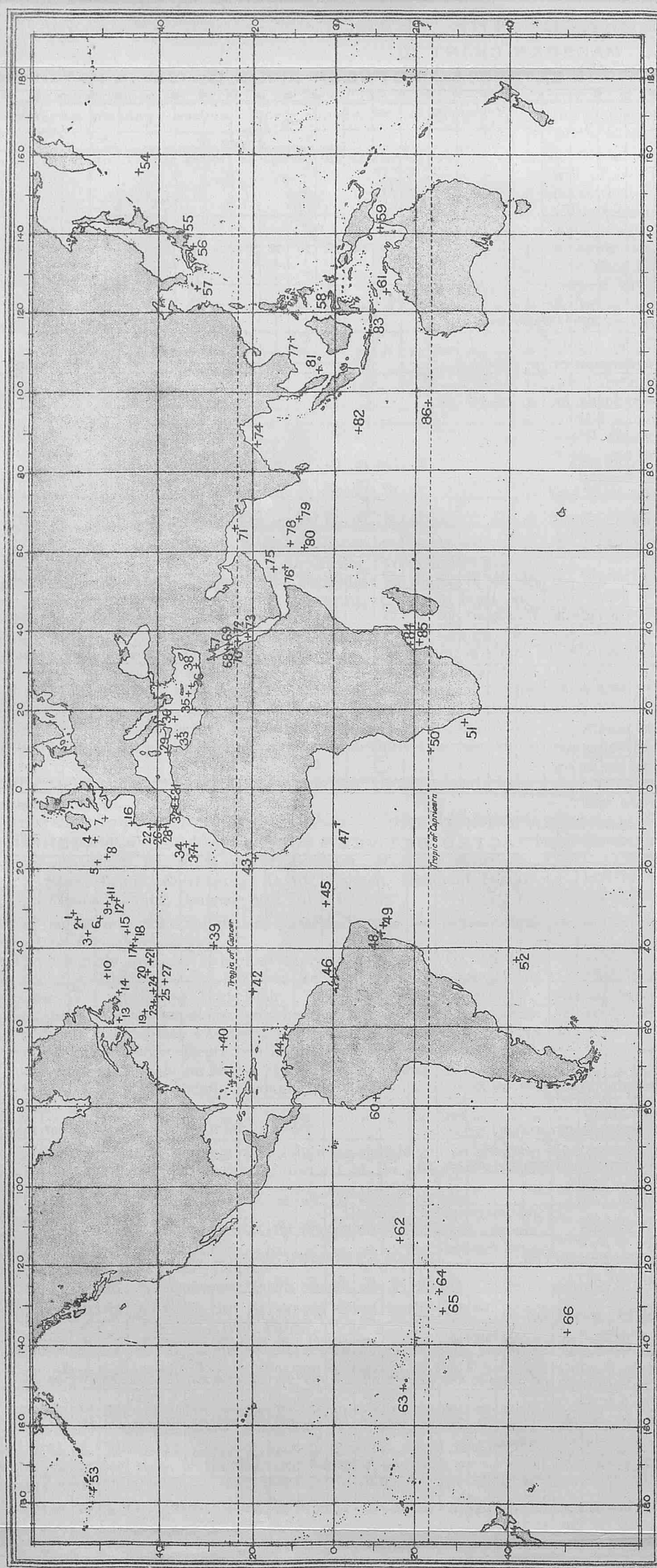


CHART OF THE WORLD SHOWING POSITION OF REGULAR OBSERVING SHIPS WITH MERCURIAL BAROMETERS AND THEIR WIRELESS INSTALLATION — JUNE 1ST 1926.



1. Regina C.W.
2. Montclare C.W.
3. Sachem C.W.R.
4. Port Caroline C.W.R.
5. Empress of Scotland C.W.
6. Empress of France C.W.
7. Port Victor C.W.R.
8. Marengo C.W.
9. Adriatic C.W.
10. Montrose C.W.
11. Carmania C.W.
12. Lapland C.W.
13. Bolingbroke C.W.R.
14. Port Sydney C.W.R.
15. Ohio C.W.
16. Nagoya C.W.R.
17. Mauretania C.W.
18. Olympic C.W.
19. City of Rangoon Spk.
20. Caronia C.W.
21. Cristales C.W.R.

22. Chindwin C.W.R.
23. Orduna C.W.
24. Belgenland C.W.
25. Baltic C.W.
26. Ormonde C.W.
27. Orcoma C.W.
28. Westmoreland C.W.R.
29. Orari C.W.R.
30. Orama C.W.
31. Dorsetshire C.W.R.
32. Morvada C.W.
33. British Advocate C.W.R.
34. Aba C.W.
35. Machanda C.W.R.
36. Clan Malcolm Spk.
37. Pakeha C.W.R.

38. Port Adelaide C.W.R.
39. Monkbarns
40. Culebra C.W.R.
41. Port Albany C.W.R.
42. Ariguani C.W.R.
43. Armadale Castle C.W.
44. Camito C.W.
45. Deseado C.W.
46. Norseman C.W.R.
47. Kenilworth Castle C.W.
48. Avon C.W.
49. Kaikoura C.W.R.
50. Borda C.W.R.
51. Berrima C.W.R.
52. R.R.S. Discovery
53. Empress of Asia Spk.

54. Tyndareus Spk.
55. Khyber C.W.R.
56. Titan Spk.
57. Empress of Russia Spk.
58. Arafura Spk.
59. Taiping Spk.
60. Essequibo C.W.R.
61. Kangaroo Spk.
62. Malakuta C.W.R.
63. Makura Spk.
64. Port Melbourne C.W.R.
65. Port Pirie C.W.R.
66. Hurunui
67. Kashmir C.W.R.
68. Astronomer C.W.R.
69. Ferndale Spk.

70. Nellore C.W.R.
71. Barpeta C.W.R.
72. Discoverer C.W.R.
73. H.M.S. Endeavour
74. Matheran C.W.R.
75. Kaiser-i-Hind C.W.
76. Leicestershire C.W.R.
77. H.M.S. Inguois
78. Actor C.W.R.
79. Jervis Bay Spk.
80. Maihar C.W.R.
81. Kweiyang Spk.
82. Ormuz C.W.R.
83. Centaur Spk.
84. Mulbera C.W.
85. Lady Denison Pender Spk.
86. Peshawur C.W.R.

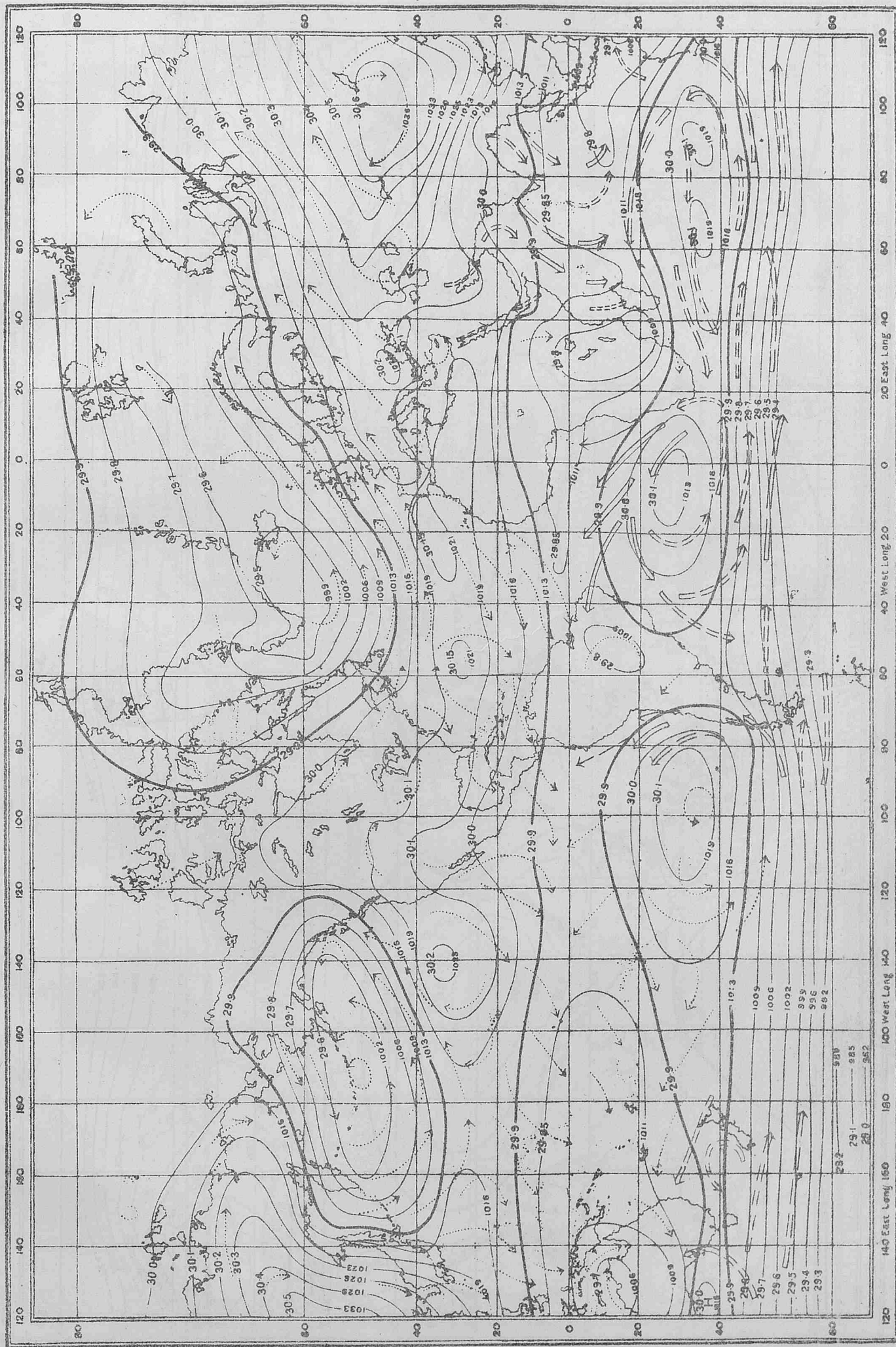
C.W. = Fitted for both transmission and reception on Continuous Wave (long range).
 C.W.R. = Fitted for reception on Continuous Wave (long range) and Spark transmission.
 Spk. = Fitted for both transmission and reception on Spark only.

"Work of the Year." Chart No. III.

86. Ships out of 250 unfavourable positions to report, with about 164 in port or narrow waters. This is typical and represents a fair average day.

PRESSURE AND WIND

JANUARY.



STEADINESS {
WIND { FORCE {
Light 1-3
Moderate 4-7
Strong 8 or above

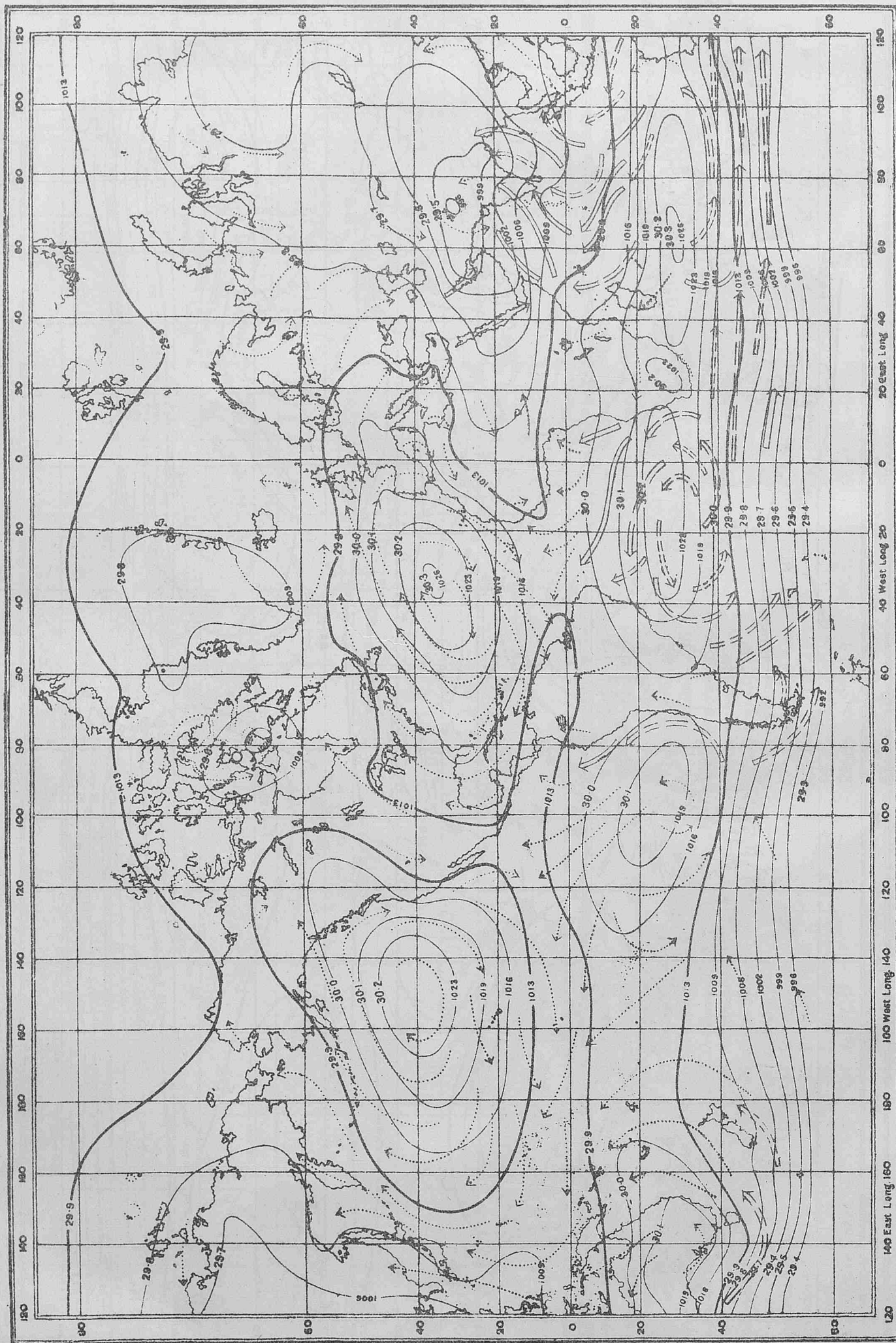
Frequency 50 to 75 %

Frequency above 75 %

Direction only

JULY.

PRESSURE AND WIND



WIND { STEADINESS {
FORCE {
Light 1-3
Moderate 4-7
Strong 8 or above

Frequency less than 50% of all observations
Frequency 50 to 75%
Frequency above 75%

Direction only

WEATHER CHART, MORNING OF JULY 11 TH, 1923.

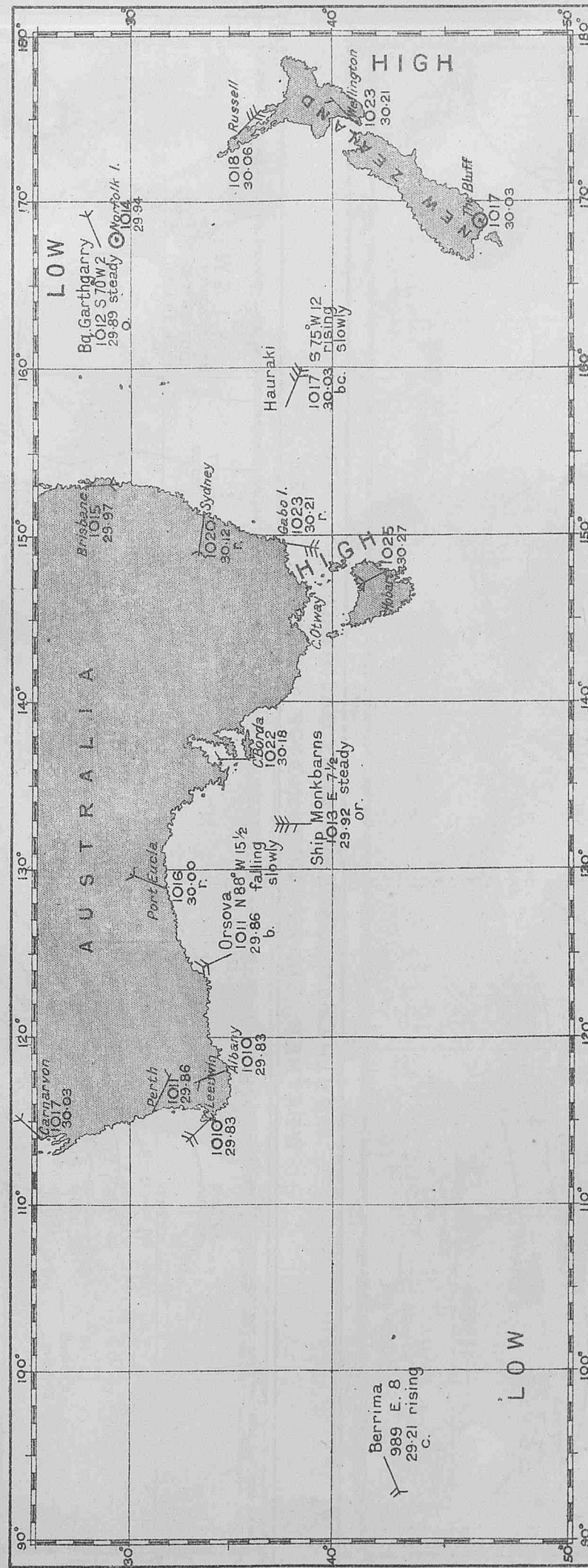


Chart XXVII —Wireless and Weather.

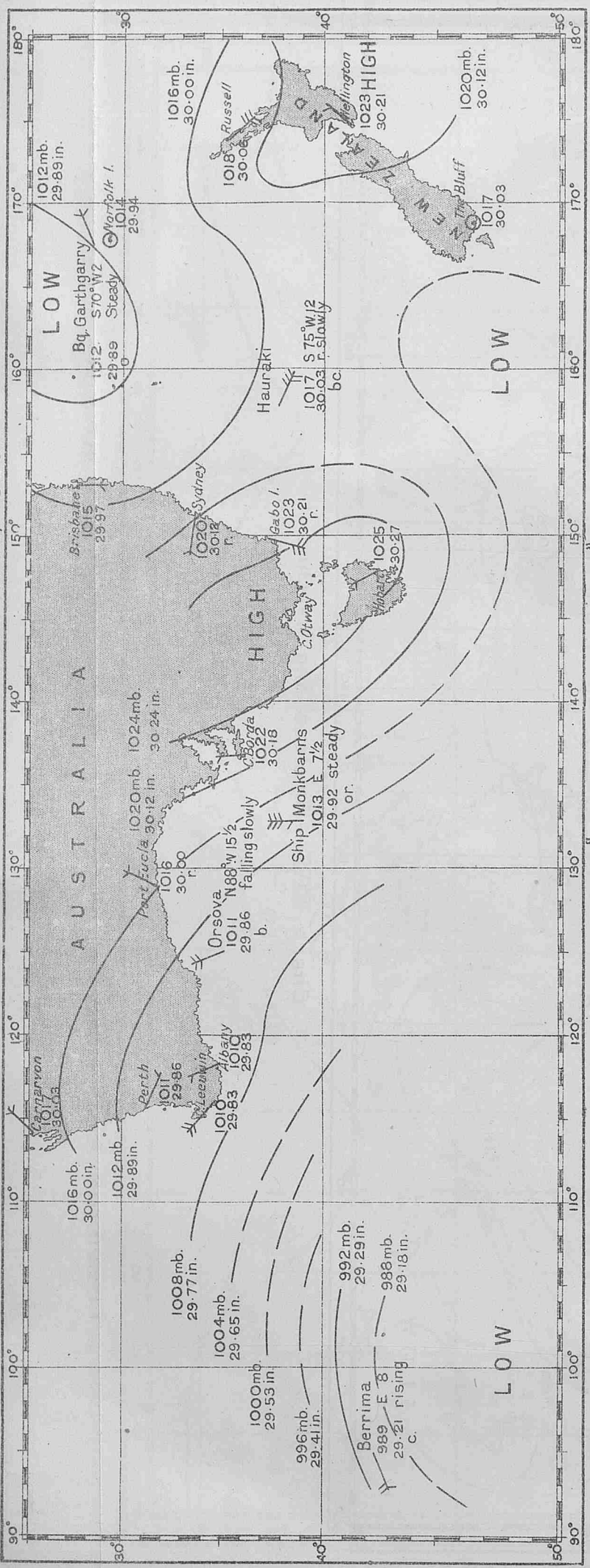


Chart XXVIII—"Wireless and Weather."

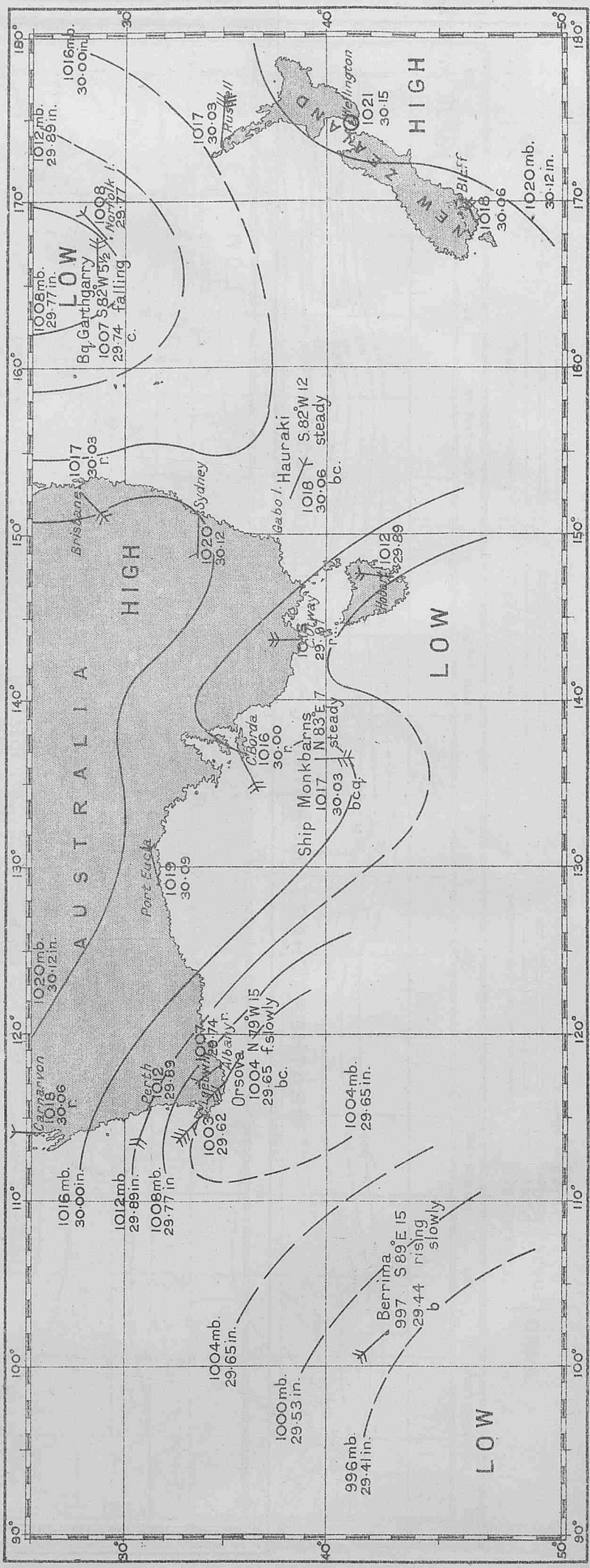


Chart XXIX—"Wireless and Weather."

WEATHER CHART, MORNING OF JULY 13 TH, 1923.

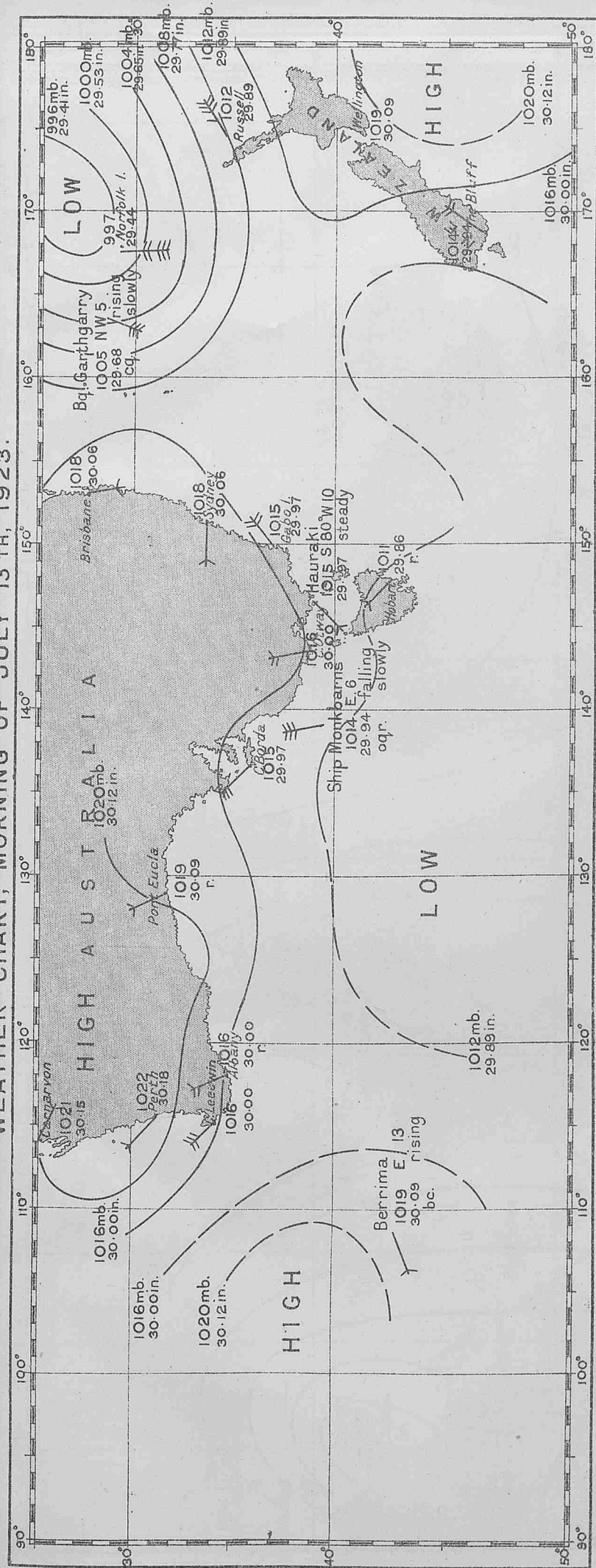


Chart XXX — "Wireless and Weather."

WEATHER CHART, MORNING OF JULY 14 TH, 1923.

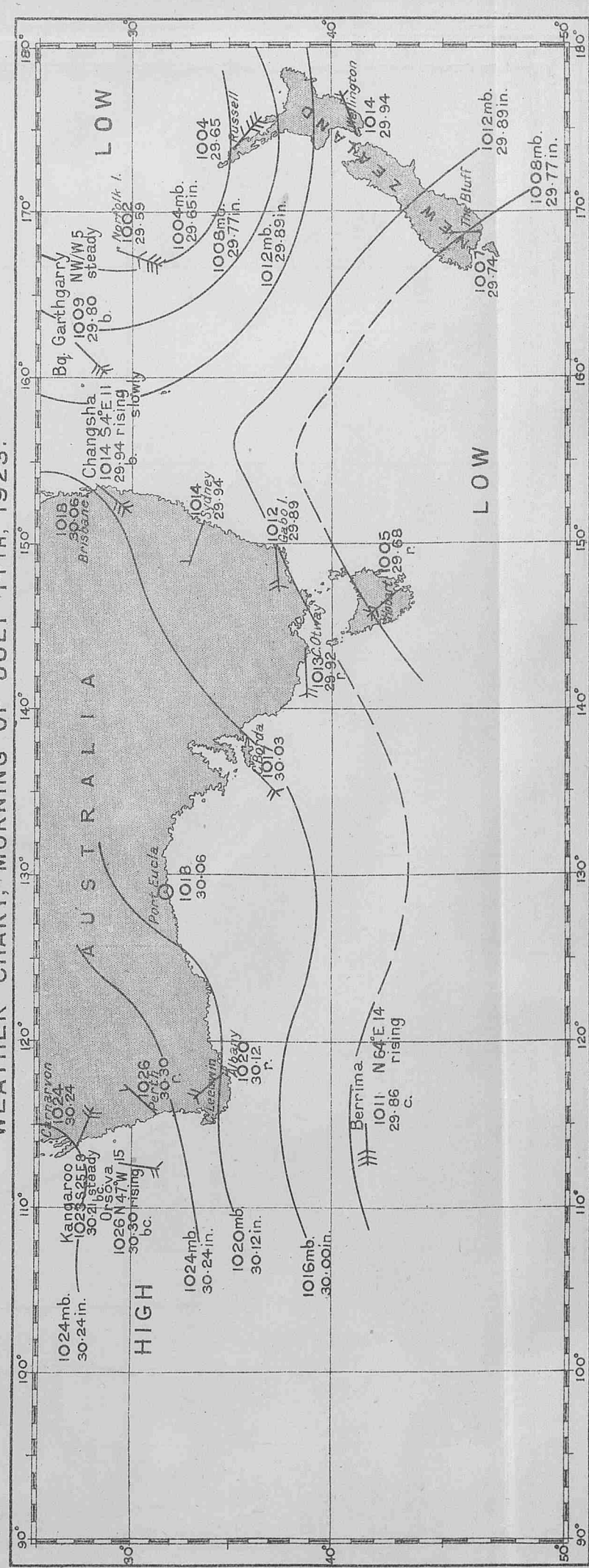
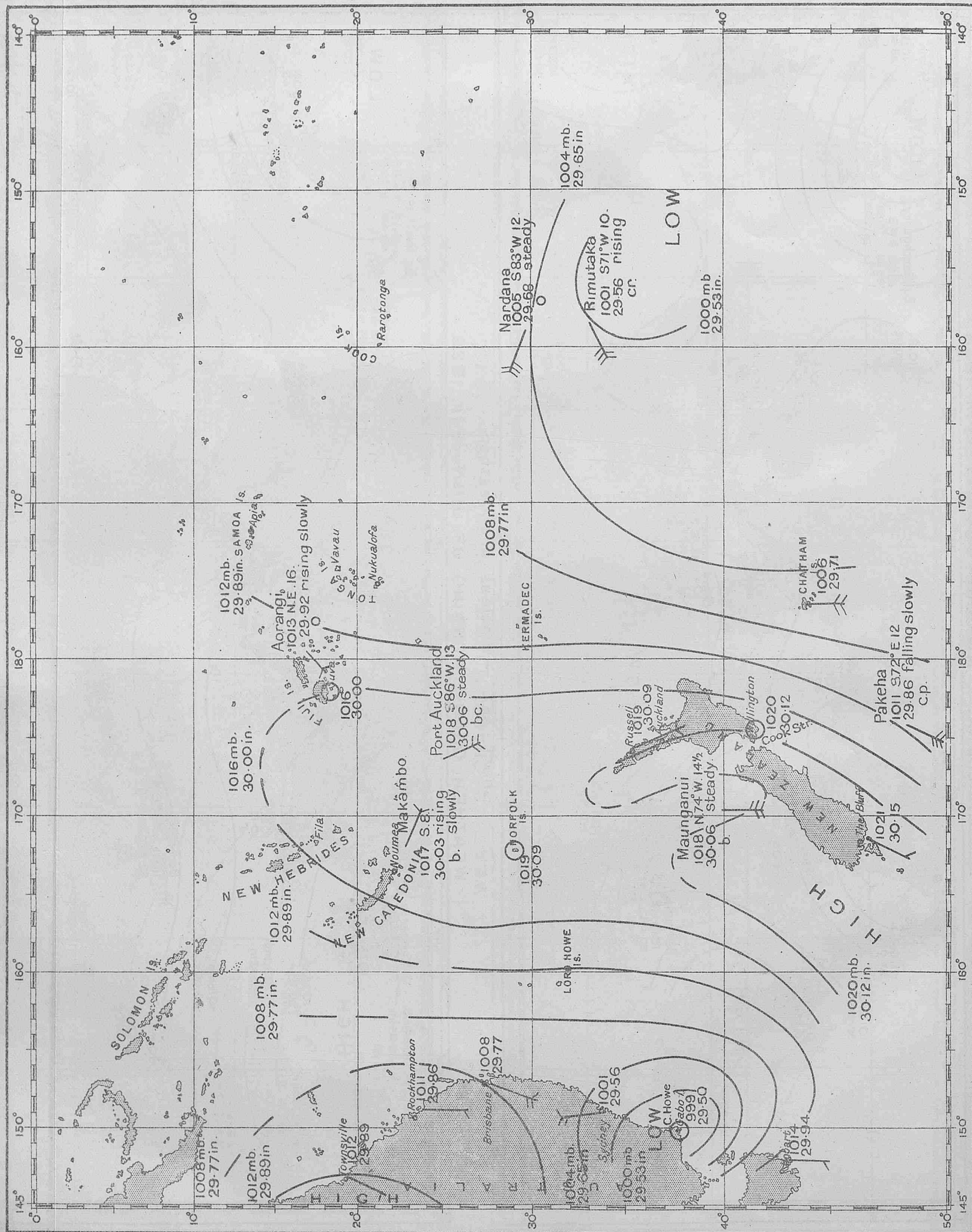
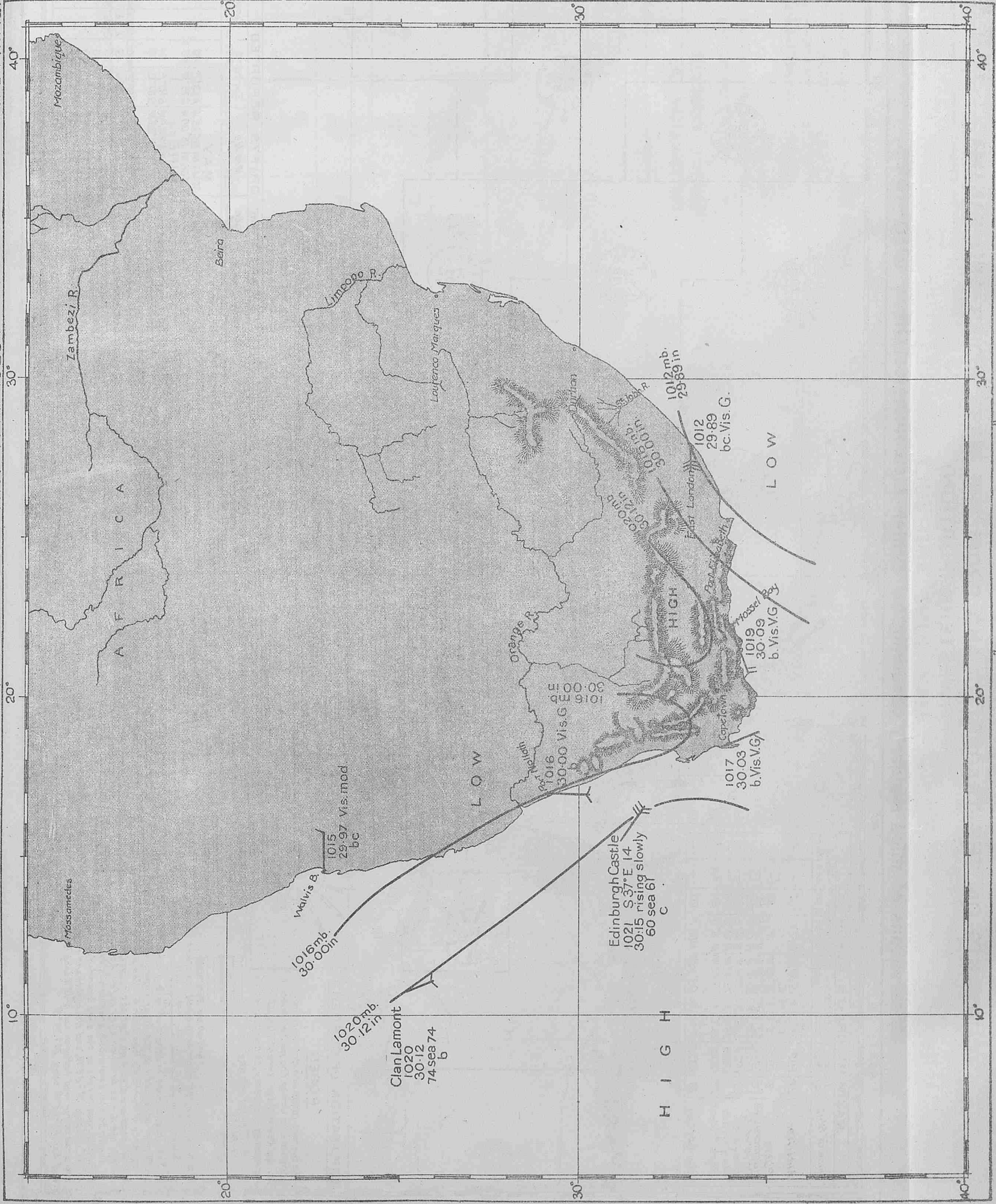


Chart XXXI — "Wireless and Weather."



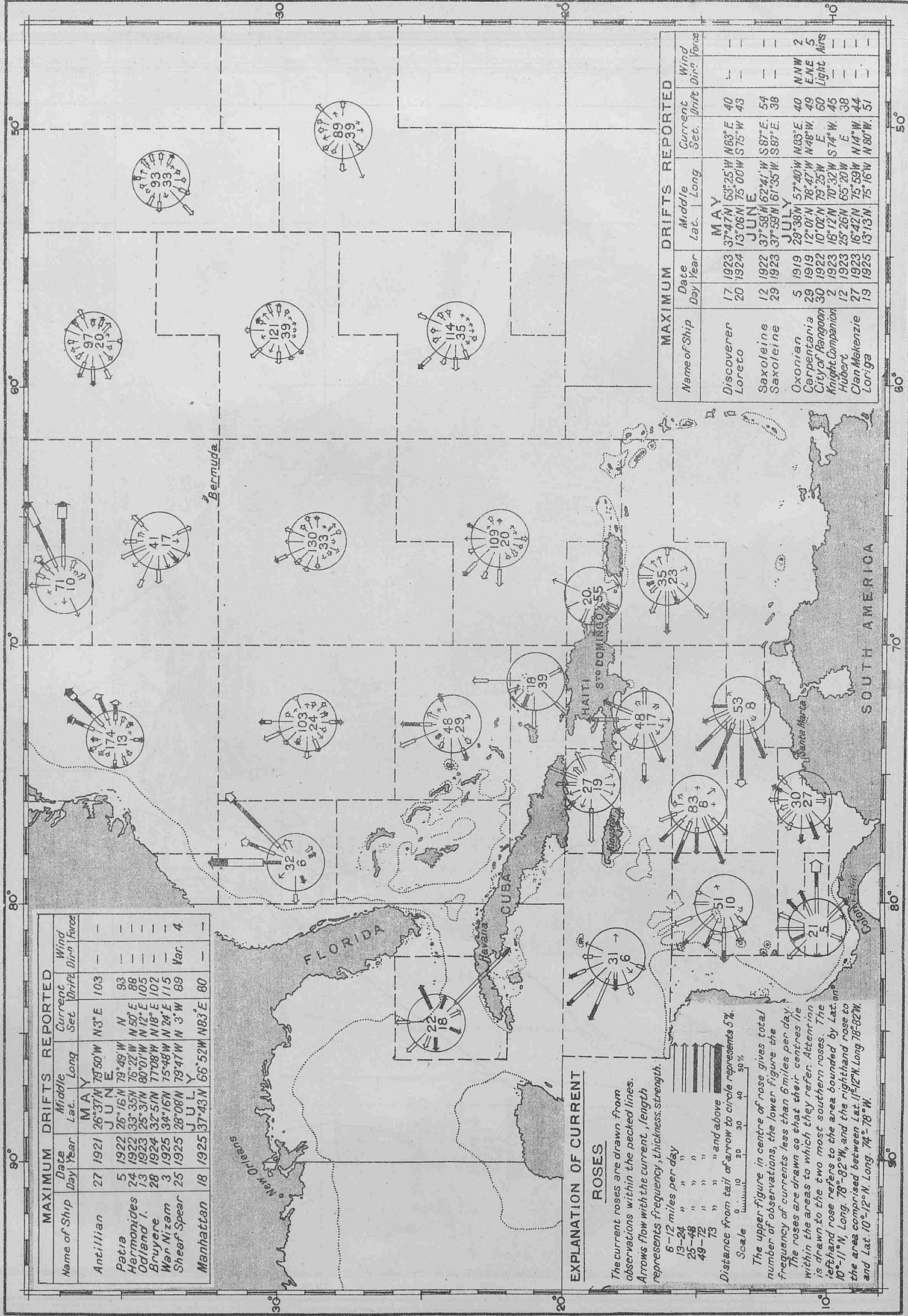


CURRENTS ON THE TRACKS TO AND FROM THE WEST INDIES AND PANAMA.

(WESTERN PORTION)

MAY, JUNE AND JULY.

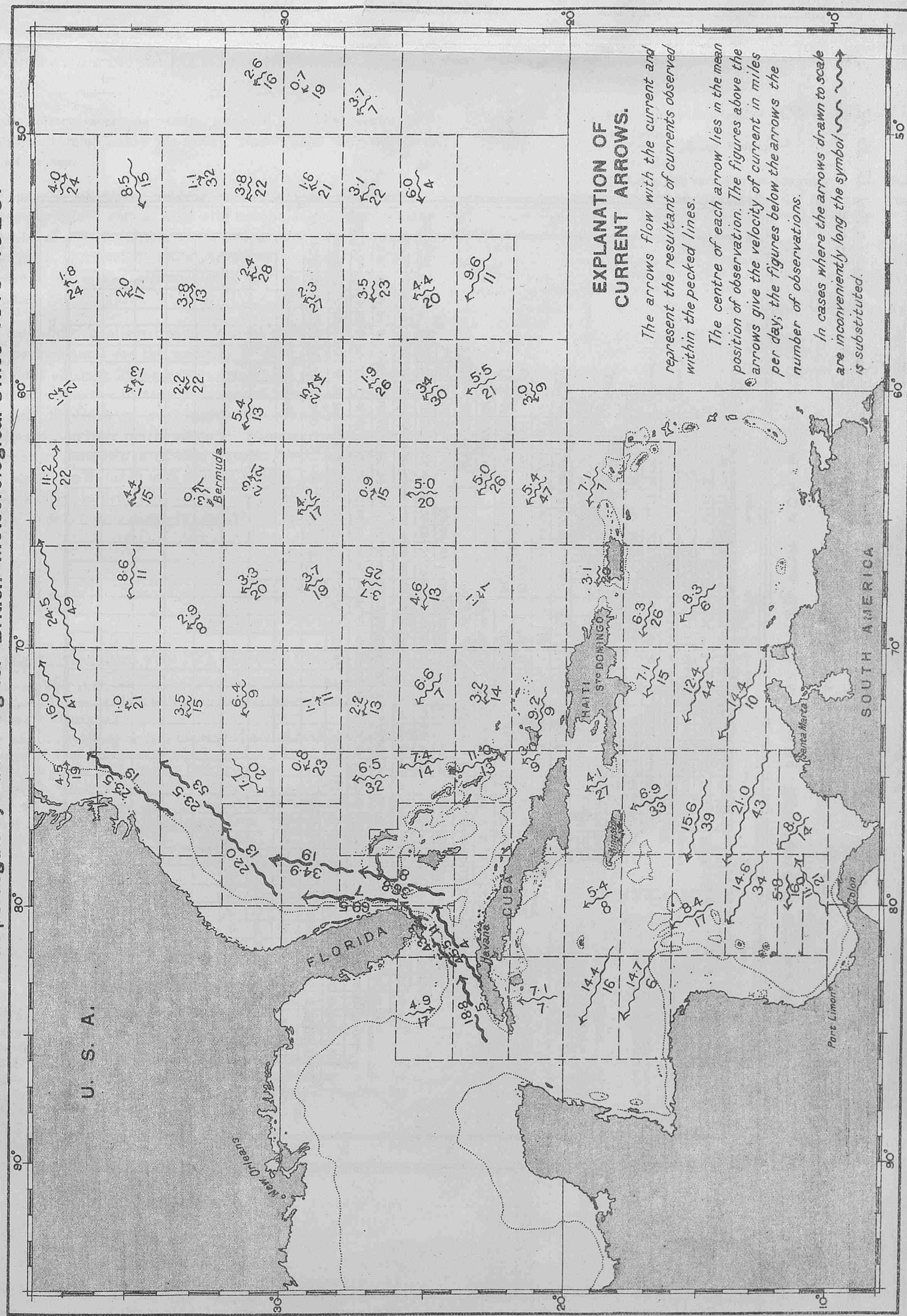
Observations of ships regularly observing for British Meteorological Office 1910-1925.



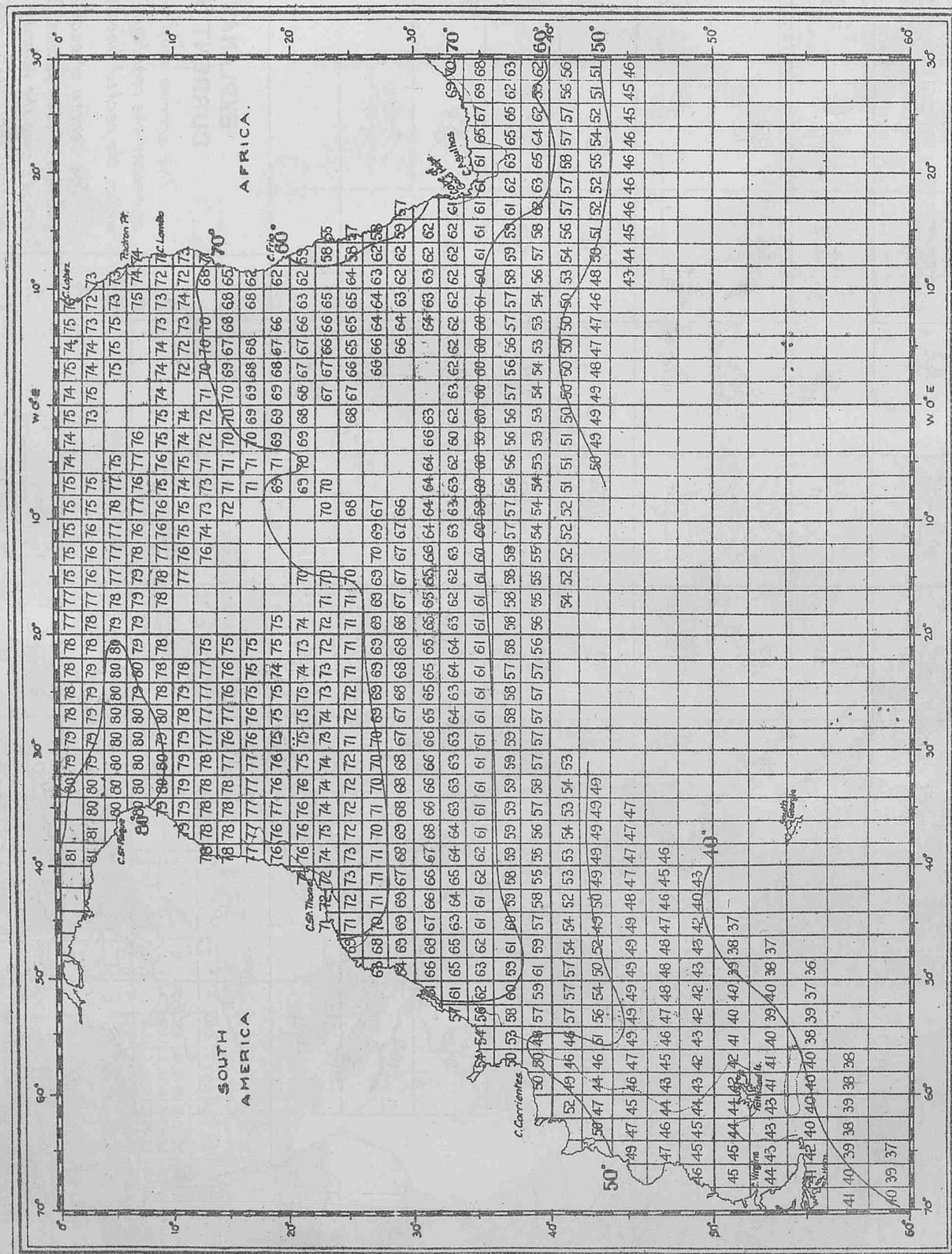
CURRENTS ON THE TRACKS TO AND FROM THE WEST INDIES AND PANAMA.
(WESTERN PORTION)

MAY, JUNE AND JULY.

Observations of ships regularly observing for British Meteorological Office 1910-1925.



MEAN SEA SURFACE TEMPERATURES FOR MONTH OF JUNE



Computed from observations of British ships during the years 1855 to 1899 except to the Southward and Eastward of Latitude 30° South and Longitude 10° East where the observations are for the years 1855 to 1878.

INFORMATION OF SQUALLS AND THUNDERSTORMS.

Marine observers are earnestly requested to make careful note and give full information of severe squalls and thunderstorms observed at sea.

The space provided for Additional Remarks in Meteorological Logs and Forms 911 may be used with advantage for these descriptions. Sketches in black and white and photographs, if attached, will be much appreciated, while careful note should be made of instrumental observations immediately before, during and after occurrence.

Not only will this information be of great interest to seamen, but it will be invaluable for the purposes of aerial navigation. Such disturbances observed at the surface may be the means of obtaining information of the terrific vertical as well as horizontal winds which occur aloft, of which it is of such vital importance that aerial navigators should have timely warning. Therefore great importance is attached to information of Line Squalls, Thunderstorms, Waterspouts, etc. being included with present or past weather in Wireless Weather Reports to C.Q., which should conform to the standard form given on page 17 of Volume IV, No. 37, of this Journal.

ILLUSTRATIONS FOR THE MARINE OBSERVER.

When making sketches, charts or plans, Marine Observers will give us great assistance if they will give consideration to reproduction in THE MARINE OBSERVER.

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

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

POSTAL ARRANGEMENTS.

THE MARINE OBSERVER is published, when circumstances permit, on the first Wednesday of the month previous to that to which the number refers.

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

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

Port of Call.....

Date of Homeward Departure.....

Postal Address.....

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

GULF OF ST. LAWRENCE ICE PATROL.

An Ice Patrol will be maintained in the Gulf of St. Lawrence from :—

Cape Ray to Bird Rocks,
Bird Rocks to vicinity of Heath Point,
Heath Point to Cape Ray,

from the opening of navigation in the spring until the route is clear of ice.

The radio call sign VCO has been allotted for the Ice Patrol Vessel. This is a special call and will be used by whatever vessel is engaged in the service.

A regular message embodying ice conditions from Cape Race to Quebec, and recommendations as to route to be followed, will be made up by the Ice Patrol every four hours, at 0100, 0500 etc., G.M.T., and kept on file for immediate transmission by radio to ships, upon request.

This information will also be broadcast four times daily by the ice patrol VCO as follows:—

- (a) At 0100 and 1900 G.M.T. on 600 metres (spark).
- (b) At 0130 and 1330 G.M.T. on 1,621 metres (I.C.W.).

The coast radio stations at North Sydney (VCO) and Grindstone (VCN) will copy this message and will be prepared to pass the same to ships requesting it. Cape Race (VCE) will also include a brief summary of the message in the regular ice broadcast at 0215 and 1415 G.M.T. daily.

Ships requiring the latest information on the Gulf Route should communicate directly with the Ice Patrol vessel VCO on 600 metres (spark).

The work of the patrol will be greatly facilitated if incoming ships will co-operate in supplying information regarding ice in their vicinity.

ICE REPORTS.

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

These forms are supplied with THE MARINE OBSERVER each month to regular observing ships in these Trades.

CONVERSION TABLE.

To Convert Inches into Millibars.

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

ICE CHART.

WESTERN NORTH ATLANTIC.

LETTERS OF TRANSATLANTIC TRACKS INDICATE

NOTE.—In case of necessity owing to extreme southerly drift of ice, operative dates will be fixed for Track A.

- ③ From 1st March to 31st August, inclusive.
- ① From 16th May to Opening of Belle Isle route, and to 30th November when not using the Belle Isle route.
- ② Westbound, on approaching Cape Race steer a course to pass 10 miles S. of Cape Race.
- ④ Eastbound, steer from position 25 miles S. of Cape Race.
- ⑤ From the opening of the Straits of Belle Isle to 14th November.

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

ROUTE NOTICES.

For latest information re Tracks see pages 78-9, Vol. IV. No. 40, of this Journal.

SYMBOLS USED ON THE CHART.

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

PHENOMENAL DRIFTS OF ICE.

Date.	Ship or Source of Report.	Position. Lat. Long.	Remarks.
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. Holtby...	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.	33°20'N. 49°16'W.	Berg, 10 ft. high.
" 16, 1924	S.S. West Irmo...	38°03'N. 63°20'W.	Growler.
" 25, 1926	S.S. Baxtergate...	30°20'N. 62°32'W.	Large piece, about 30 ft. long and 15 ft. wide, showing about 3 ft. above water.

Reports of Ice sighted between which have been received by the by the Symbols plotted in the indicating the day of the month.

LATEST ICE REPORT FROM CANADA.

The following cablegram dated 12th April, 1927, was received from the Superintendent, Canadian Signal Service, Quebec:—

"Montreal to Heath Point, Anticosti, no ice. Belle Isle Straits, heavy close-packed ice. Cape Ray, no ice. St. Pauls Island, heavy ice south, no ice to north. Money Point, heavy packed ice. Magdalen Islands, considerable open ice. Northumberland Strait and Gut of Canso, heavy open ice. Cape Race, two bergs about 15 miles south, no field ice. Government ice breaker reports good ice conditions on steamer track from Cape Ray to Heath Point. Saguenay River expected clear by twentieth instant."

Limit of Ice reported to the Meteorological Office June 1901-1926

April 1st and April 30th, 1927, Meteorological Office, are shown position reported, the figures

NOTICES.

MARINE METEOROLOGY.

Co-operation of Shipowners, Masters and Mates.

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

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

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

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

Vessels observing regularly for the Meteorological Office to which office instruments are not lent, keep Form 911, Ship's 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, but the log should be returned in all cases at least twice yearly.

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.

Ships on the List of Voluntary Observers to the Meteorological Office which have a mercurial barometer are indicated by the letters M.L., W.T. and M.

These are selected ships for reporting weather observations made at specified times by W/T to "All Ships," and they are invited to perform this service, which is for the benefit of all shipping fitted for W/T reception.

For sample weather report message see pages 15 and 17 of Vol. IV. No. 37.

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. A suitable cover may be obtained from H.M. Stationery Office, price 2s.

LATE PRESS.

DERELICTS AND FLOATING WRECKAGE.

Date.	Position.		Description.
	Latitude.	Longitude.	
BALTIC.			
6.4.27	N.E. by E. (Mag.) 1' of Schults Lt. Vsl.	Ground	Drifting wreck.
NORTH SEA.			
3.4.27	57°47' N.	6°45' E.	Heavy Spar, covered with seaweed and barnacles, projecting about 3 feet out of water, probably attached to submerged wreckage.
ENGLISH CHANNEL.			
1.4.27	50°55' N.	1°02' E.	Floating wreckage.
7.4.27	12 m. W. of Bo'lgne.		Dangerous wreckage.
15.4.27	49°16' N.	3°38' W.	Spar with tackle attached, 8 feet out of water, dangerous to navigation.
17.4.27	48°31' N.	5°11' W.	Floating wreckage, resembling hull of small schooner, dangerous to navigation.
MEDITERRANEAN.			
8.4.27	36°—' N.	4°—' W.	After part of vessel painted grey. No name visible.
10.4.27	35°57' N.	3°20' W.	Black and white vertical striped buoy adrift. Light not working.
18.4.27	36°24' N.	21°47' E.	(P Spar) projecting 2 feet above water, probably submerged wreck attached, dangerous to navigation.
NORTH ATLANTIC.			
2.4.27	31°—' N.	77°30' W.	Spar, about 60 feet long, covered with marine growth.
2.4.27	40°09' N.	52°51' W.	Vessels superstructure about 30 feet long.
3.4.27	43°17' N.	52°08' W.	Submerged craft drifting southward, two masts visible above water.
3.4.27	41°02' N.	46°20' W.	Gas buoy.
3.4.27	42°—' N.	63°55' W.	Two heavy logs, about 30 feet long, lashed together at one end.
4.4.27	39°44' N.	9°53' W.	Small derelict.
4.4.27	37°12' N.	74°30' W.	Spar buoy or end of mast projecting 12 feet out of water.
4.4.27	42°12' N.	67°17' W.	Obstruction showing about 6 feet out of water, attached to submerged wreckage.
6.4.27	41°32' N.	56°10' W.	Black cylindrical buoy with red lantern.
7.4.27	31°59' N.	59°37' W.	Derelict 2-masted schooner on beam ends, awash.
8.4.27	31°43' N.	71°16' W.	Timber, 50 feet long, 2 feet square.
9.4.27	41°50' N.	68°17' W.	Three-masted schooner on fire.
10.4.27	48°41' N.	19°00' W.	Red conical-shaped whistling buoy.
10.4.27	35°08' N.	75°19' W.	Partly submerged wreckage, apparently part of schooner's bow.
10.4.27	39°45' N.	47°59' W.	Derelict schooner <i>Annabel Cameron</i> .
11.4.27	37°51' N.	71°—' W.	Spar projecting about 6 feet out of water, apparently attached to submerged wreckage.
14.4.27	47°21' N.	7°06' W.	Red buoy marked T recently painted. Flagstaff red, flag white centre. Quick flashing light, irregular.
17.4.27	48°39' N.	7°29' W.	Large can-shaped red buoy, dangerous to navigation.
17.4.27	41°34' N.	9°33' W.	Small red buoy with lamp projecting 2 feet above water.
18.4.27	44°35' N.	8°18' W.	Large red conical buoy.
24.4.27	47°05' N.	20°32' W.	Heavy log 40 feet long, 4 feet diameter, covered with marine growth.
GULF OF MEXICO.			
3.4.27	26°33' N.	86°57' W.	Submerged tree trunk, 90-100 feet long with several branches showing from 8 to 10 feet out of water.
6.4.27	23°48' N.	84°47' W.	Broken spar about 2 feet in diameter projecting vertically about 4 feet out of water, apparently attached to submerged wreckage.
NORTH PACIFIC.			
1.4.27	43°52' N.	124°17' W.	Large log resembling capsized launch.
3.4.27	40°40' N.	124°32' W.	Partly submerged obstruction about 90 feet long, with two barrels about 30 feet apart and flag flying on 10 feet staff.
11.4.27	500 mls. N.W. of Honolulu.		Derelict, 170 feet long, submerged, mast and bridge amidship.

NAUTICAL OFFICERS AND AGENTS OF THE MARINE DIVISION OF THE METEOROLOGICAL OFFICE, AIR MINISTRY.

LONDON ...	...	Captain L. A. BROOKE SMITH, R.D., R.N.R., Marine Superintendent.
	...	Commander J. Hennessy, R.D., R.N.R., Senior Nautical Assistant.
	...	Room 319, Adastral House, Kingsway, W.C.2. (Telephone No.: Holborn 3434 Extension 421).
	...	Nearest station Temple, District Railway. Mr. W. T. GRIEVES, Visiting Officer for the Port of London.
LIVERPOOL ...	...	Lieut. Commander M. CRESSWELL, R.N.R., Port Meteorological Officer, Dock Office. (Telephone No.: Bank 3959).

Agents.

BELFAST ...	...	Captain J. MCINTYRE, Harbour Master, Harbour Office. (Telephone No.: Belfast 4090).
CARDIFF ...	...	Captain T. JOHNSTON, Technical College, Cathays Park.
GLYDE ...	...	Captain M. C. CORRANCE, Board of Trade Sur- veyor's Office, 73, Robertson Street, Glasgow.

Agents (contd.).

FREMANTLE, W. Australia.	...	Captain J. J. AIREY, Deputy Director of Naviga- tion, Dalgety's Buildings.
HONG KONG, China.	...	Lieut. Commander O. C. G. LEVESON-GOWER, R.N., Superintendent, Admiralty Chart and Chronometer Depot, H.M. Dockyard.
HULL ...	...	Captain Geo. B. STURDY, c/o Mr. W. HAKES, Commercial Road.
LEITH ...	...	Captains G. BLACK and C. G. BONNER, V.C., D.S.C., Leith Salvage and Towage Co., Ltd., 2, Commercial Street.
SOUTHAMPTON	...	Captain D. FORBES, Nautical Academy, 1, Albion Place.
SYDNEY, New South Wales.	...	Commander G. D. WILLIAMS, D.S.O., R.D., R.N.R., Deputy Director of Navigation, Customs House.
TYNE ...	...	Captain J. J. MCEWAN, Marine School, South Shields.
VANCOUVER, British Columbia.	...	Mr. T. S. H. SHEARMAN, Room 40, Post Office Building.

LIST OF VOLUNTARY OBSERVING SHIPS

i

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

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

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

Only in special cases will individual letters be sent.

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

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

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

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

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

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

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

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

No. = Keeps Ship's Meteorological Report Form 911 with ship's instruments. Letter M after No. indicates ship's barometer Mercurial; A. ship's barometer Aneroid.

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 13.4.27.	Date Received.
<i>Aba</i> ...	Hughes, J. ...	S. J. Bristowe, O. E. Jones, C. Spark.	M.L.	Elder Dempster	Met. Log. 13.10.26 to 12.3.27...	17.3.27.
<i>Abinsi</i> ...	Millson, H. E. ...	E. W. Bascombe ...	No. A.	"	Form 911 29.12.26 to 23.2.27...	3.3.27.
<i>Achilles</i> ...	Wilson, C. A. ...	"	M.L.	A. Holt	"	"
<i>Actor</i> ...	Haylett, E. ...	A. Frew, J. McKay, J. D. Greeves.	M.L.	Harrison	Met. Log. 29.8.26 to 4.12.26	10.1.27.
<i>Adda</i> ...	Toft, J. T. ...	"	No. M.	Elder Dempster	Form 911 27.10.26 to 3.12.26...	7.12.26.
<i>50 Adriatic</i> ...	Beadnell, F. E., Capt., R.N.R.	R. G. Roberts, O. V. Lucas ...	W.T.	White Star	W.T. Reg. 26.12.26 to 12.1.27...	14.2.27.
<i>Aeneas</i> ...	Wallace, W. K. ...	J. M. Anderson, J. Weir ...	No. A.	A. Holt	" 12.2.27 to 2.3.27	9.3.27.
<i>Agapenor</i> ...	Ramsay, J. ...	"	" A.	"	Form 911 18.10.26 to 6.11.26...	9.11.26.
<i>Aidan</i> ...	Pym, J. ...	J. Whayman ...	" A.	Booth	" 7.1.27 to 18.2.27	22.2.27.
<i>Alban</i> ...	Whayman, W. ...	"	" A.	"	" 12.12.26 to 4.3.27	11.3.27.
<i>Albania</i> ...	Gronow, S. ...	L. Harper ...	" A.	Cunard	" 13.2.27 to 24.2.27	14.3.27.
<i>Alipore</i> ...	Harrison, R., D.S.O., R.D., Captain, R.N.R.	D. A. C. Butler ...	" M.	P. and O.	" 11.12.26 to 23.12.26	3.2.27.
<i>Almanzora</i> ...	Wakeman, E. C. ...	J. C. Blake ...	" A.	R.M.S.P.	" 29.8.26 to 22.9.26	24.9.26.
<i>Albertic</i> ...	Parker, W. H., C.B.E., R.D., Capt. R.N.R.	"	No.	White Star	" 30.12.26 to 17.2.27...	7.3.27.
<i>Alondra</i> ...	Prendergast, J. J. ...	H. Peters ...	No. A.	Yeoward	"	"
<i>Ampelco</i> ...	Vandenkerckhove, A. ...	"	" A.	American Petroleum	Form 911 27.2.27 to 19.3.27	23.3.27.
<i>Andalucia</i> ...	Thomas, R. J. ...	"	" M.	Blue Star	" 18.2.27 to 2.3.27	4.4.27.
<i>Anchises</i> ...	Woodgett, R. J. ...	W. Anderson ...	" A.	A. Holt	"	"
<i>Andes</i> ...	Parker, W. H., C.B.E., R.D., R.N.R.	T. J. Horan ...	" M.	R.M.S.P. Co.	Form 911 29.1.27 to 15.3.27	21.3.27.
<i>Antiochus</i> ...	Dunlop, S. K. ...	R. W. Trethewey ...	" A.	A. Holt	" 29.1.27 to 8.3.27	12.4.27.
<i>Aorangi</i> ...	Crawford, R. ...	G. H. Kime, H. A. Titchfield, E. Anderson, C. Holdaway.	M.L.	Canadian-Australasian	Met. Log. 25.8.26 to 9.12.26	10.1.27.
<i>30 Aquitania</i> ...	Charles, Sir J. T. W., K.B.E., C.B., R.D., Commodore, R.N.R.	J. L. Croasdaile, J. Locke, D. MacLean.	W.T.	Cunard	W.T. Reg. 10.3.27 to 23.3.27	28.3.27.
<i>62 Arabic</i> ...	Harvey, H. ...	W. F. Jackman, J. M. Appleby, W. Jenkins.	"	White Star	" 8.3.27 to 25.3.27	28.3.27.
<i>Arafura</i> ...	Gordon, A. S. ...	G. C. Smith, R. Lloyd Harry, C. G. Knight, B. W. Dun.	M.L.	Eastern and Australian	Met. Log. 29.10.26 to 26.1.27...	25.3.27.
<i>Arawa</i> ...	Summers, W. G. ...	"	M.L.	Shaw, Savill and Albion	"	"
<i>Archimedes</i> ...	Downs, E. B. ...	J. M. Edgar ...	No. A.	Lamport & Holt	Form 911 22.3.26 to 9.6.26	16.7.26.
<i>Argyllshire</i> ...	Wallace, J. ...	"	" M.	Federal	" 5.2.27 to 23.2.27	4.4.27.
<i>Ariguani</i> ...	Scudamore, J. H. H., D.S.C., R.D., Commr., R.N.R.	S. A. Sapworth, G. McKee, W. E. Butcher, J. W. Kendall.	M.L.	Elders & Fyfes	Met. Log. 14.8.26 to 12.12.26	18.12.26.
<i>Armada Castle</i> ...	Millard, A. ...	A. B. Connor, G. D. Pinnick, L. May.	"	Union Castle	Met. Log. 17.4.26 to 10.10.26	30.10.26.
<i>Arracan</i> ...	Willis, M. ...	R. McInnes, G. B. Christie, C. C. Weir.	"	P. Henderson	" 22.5.26 to 3.12.26	4.4.27.
<i>Arundel</i> ...	Short, H. ...	Mr. Hill ...	C.C.	Southern Rly.	Telegraphic Report 29.3.27	29.3.27.
<i>Arundel Castle</i> ...	George, J., O.B.E. ...	C. S. Keen ...	No. A.	Union Castle	Form 911 14.1.27 to 6.3.27	8.3.27.
<i>Astronomer</i> ...	Richards, J. ...	A. Brown, J. Glen, — Thompson.	M.L.	Harrison	Met. Log. 15.8.26 to 25.12.26	1.1.27.
<i>Athenic</i> ...	Davies, E. ...	W. Hill ...	No. A.	White Star	Form 911 29.1.27 to 7.3.27	11.3.27.
<i>Atrous</i> ...	Salter, G. H. ...	F. A. Brown ...	" A.	A. Holt	" 2.1.27 to 30.1.27	7.3.27.
<i>Atsuta Maru</i> ...	Shibutani, S. ...	K. Murazumi ...	" A.	Nippon Yusen Kaisha	" 11.12.26 to 12.1.27...	19.1.27.
<i>Auditor</i> ...	Owen, W. T. ...	T. E. Steel ...	" M.	Harrison	" 16.2.27 to 6.3.27	29.3.27.
<i>Ausonia</i> ...	Stafford, W., D.S.C., R.D., Lt. Commr., R.N.R.	E. R. B. Freeman ...	" A.	Cunard	" 19.2.27 to 28.2.27	3.3.27.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 13.4.27.	Date Received.
<i>Avon</i> ...	Hannam, F. S. ...	E. S. Dunch ...	No. M.	R.M.S.P. ...	Form 911 10.11.26 to 20.1.27...	8.2.27.
<i>Balfour</i> ...	McQueen, D. S. ...	W. P. Phillips ...	" A.	Canadian Pacific ...	" 10.1.27 to 14.2.27 ...	18.2.27.
<i>Balranald</i> ...	Townshend, W. P., Commr., R.N.R.	F. Ward, E. Cowell, J. Davis, E. Alexander.	M.L.	P. & O. Branch ...	Met. Log. 2.7.26 to 7.11.26 ...	20.11.26.
51 <i>Baltic</i> ...	White, E. R., Commr. R.N.R.	D. K. Crawford, J. Law, H. R. Wilkinson.	W.T.	White Star ...	W.T. Reg. 21.3.27 to 10.4.27 ...	13.4.27.
<i>Bampton Castle</i> ...	Hutchings, A. H. ...	J. W. S. Brooks ...	No. A.	Union Castle ...	Form 911 24.1.27 to 12.3.27 ...	15.3.27.
<i>Banbury Castle</i> ...	Singelsen, E. A., D.S.C., R.D., Capt., R.N.R.	C. G. Cuthbertson ...	" A.	" ...	" 24.7.26 to 26.12.26 ...	10.1.27.
<i>Banffshire</i> ...	Wynne, R. H. ...	W. F. Lockhead ...	" A.	Turbull Martin ...	" 18.1.27 to 6.2.27 ...	28.2.27.
<i>Baradine</i> ...	Rollo, W. ...	" ...	M.L.	P. & O. Branch ...	" ...	" ...
<i>Baron Murray</i> ...	Edgar, J. B. ...	W. P. G. Arthur, H. Thompson	No. A.	Hogarth & Sons ...	Form 911 8.5.26 to 10.6.26 ...	21.9.26.
<i>Barpeta</i> ...	Strachan, J. ...	W. P. Page ...	" M.	British India ...	" 5.2.27 to 3.3.27 ...	29.3.27.
<i>Barrabool</i> ...	Rhodes, H. R. ...	F. S. Bowman ...	" M.	P. & O. Branch ...	" 29.1.27 to 10.2.27 ...	8.3.27.
<i>Baychimo</i> ...	Cornwall, S. A. ...	E. J. Hankin ...	" A.	Hudson's Bay Co. ...	" 17.10.26 to 1.12.26	8.12.26.
<i>Baymaud</i> ...	Foellmer, G. ...	" ...	" M.	" ...	" ...	" ...
59 <i>Belgenland</i> ...	Howell, T. ...	C. Murray, J. Cross	W.T.	Red Star ...	W.T. Reg. 4.10.26 to 23.10.26... Form 911 4.10.26 to 23.10.26...	26.10.26. 26.10.26.
<i>Beltana</i> ...	Allin, C. H. C. ...	D. H. Moulton ...	No. M.	P. & O. Branch ...	" ...	" ...
<i>Bentley</i> ...	Colp, J. H., D.S.C.	L. H. Smith ...	" A.	Ben Line ...	Form 911 26.2.27 to 14.3.27 ...	20.3.27.
<i>Bendigo</i> ...	Nicholl, R. N. C. ...	J. Young ...	" M.	P. & O. Branch ...	" 4.2.27 to 18.3.27 ...	24.3.27.
<i>Benefactor</i> ...	O'Connor, T. ...	A. Watson ...	" M.	Harrison ...	" ...	" ...
81 <i>Benengaria</i> ...	Rostron, Sir A. H., K.B.E., R.D., Capt., R.N.R.	W. C. A. Robson, E. W. Connell, S. A. T. Bullock.	W.T.	Cunard ...	W.T. Reg. 4.3.27 to 17.3.27 ...	22.3.27.
<i>Berrima</i> ...	Short, C. E. ...	T. Ferguson ...	No. M.	P. & O. Branch ...	Form 911 4.8.26 to 5.12.26 ...	7.12.26.
<i>Berwyn</i> ...	McCombie, G. ...	D. Dunn ...	" A.	Canadian Pacific ...	" 23.1.27 to 19.3.27 ...	24.3.27.
<i>Bintang</i> ...	Morzer Bruyns, M. F.	M. C. Altins ...	" M.	Nederland ...	" 26.2.27 to 25.3.27 ...	29.3.27.
<i>Bogota</i> ...	Barkley, E. ...	" ...	" A.	R.M.S.P. Co. ...	" 15.2.27 to 2.3.27 ...	22.3.27.
<i>Bolingbroke</i> ...	Dott, J. F. ...	C. A. Mott ...	M.L.	Canadian Pacific ...	Met. Log. 23.1.26 to 31.8.26 ...	8.9.26.
<i>Borda</i> ...	McQueen, D. ...	Murray, M. F.	" ...	" ...	" ...	" ...
<i>Bothwell</i> ...	Holland, R. ...	" ...	No. M.	P. & O. Branch ...	Form 911 1.1.27 to 23.1.27 ...	1.2.27.
<i>Brandon</i> ...	Rothwell, A. J. ...	" ...	" A.	Canadian Pacific ...	" 19.11.26 to 26.12.26	13.1.27.
<i>Brecon</i> ...	Sargent, A. H., R.D., Lt.-Commr., R.N.R.	T. Beck ...	" A.	" ...	" 25.7.26 to 25.8.26 ...	27.8.26.
<i>Brenda</i> ...	Prentice, W. ...	" ...	" A.	" ...	" 22.12.26 to 22.1.27	25.1.27.
<i>Brighton</i> ...	Lamont, A. ...	J. McMillan ...	" A.	Scottish Fishery Board ...	" 15.3.27 to 30.3.27 ...	4.4.27.
<i>British Advocate</i> ...	Hill, A. ...	Mr. Munton ...	C.C.	Southern Railway ...	Telegraphic Report 12.4.27 ...	12.4.27.
<i>British Soldier</i> ...	Taylor, R. J. ...	E. Williams ...	No. M.	British Tankers ...	Form 911 15.2.27 to 1.4.27 ...	8.4.27.
<i>Bronze</i> ...	Pratt, R. O. ...	H. J. Crangle ...	" A.	" ...	" 17.11.26 to 10.12.26	3.1.27.
<i>Browning</i> ...	Crapper, J. S. ...	W. Jones, C. E. Legg ...	" A.	Lampert & Holt ...	" 15.1.27 to 10.2.27 ...	15.2.27.
<i>Burma</i> ...	Connorton, W. A. ...	A. B. Murray ...	" A.	" ...	" 29.3.26 to 1.7.26 ...	5.7.26.
<i>Cambria C.S.</i> ...	Reid, R. B. ...	J. Henderson ...	" A.	Henderson ...	" 24.7.26 to 10.10.26...	29.10.26.
<i>Cambria</i> ...	Sherwood, C. A., D.S.C.	A. J. English, B. C. Farrow, C. F. St. John.	M.L.	Eastern Tel. Co. ...	Met. Log. 9.9.26 to 25.1.27 ...	23.2.27.
<i>Cameronia</i> ...	Telfer, J. E., O.B.E.	V. S. Phillips ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report 9.4.27 ...	9.4.27.
<i>Camilo</i> ...	Gemmell, W. ...	W. Black ...	No. A.	Anchor ...	Form 911 28.2.27 to 21.3.27 ...	29.3.27.
<i>Canadian Importer</i> ...	Forrester, W. T., O.B.E.	W. T. Broome, P. C. Congdon, F. Dudgeon.	M.L.	Elders & Fyffes ...	Met. Log. 20.11.26 to 21.3.27...	26.3.27.
<i>Canadian Inventor</i> ...	McCulloch ...	C. R. Randle ...	No. A.	Canadian Govt. Mercantile Marine.	Form 911 18.11.26 to 4.1.27 ...	10.1.27.
<i>Canadian Miller</i> ...	Boulton, F. W. ...	D. Grey ...	" A.	" ...	" 5.9.26 to 14.12.26 ...	21.2.27.
<i>Canadian Scottish</i> ...	McConehy, W. T. ...	C. E. Moore, H. Ruegg ...	" A.	" ...	" 14.3.26 to 23.6.26 ...	15.7.26.
<i>Canadian Skirmisher</i> ...	Wallace, C. ...	J. T. White, E. A. Mullock...	" A.	" ...	" 11.12.26 to 20.1.27	14.2.27.
<i>Canadian Winner</i> ...	Millar, W. H. ...	" ...	" A.	" ...	" 19.11.26 to 5.1.27 ...	11.1.27.
35 <i>Carmania</i> ...	Bisset, C. R. ...	R. Girling, J. Cochrane ...	" M.	Cunard ...	16.11.26 to 21.12.26	9.2.27.
<i>Carnarvon Castle</i> ...	Brown, F. G., R.D., Capt., R.N.R.	L. R. Simpson, W. M. Stewart, P. L. Williams.	W.T.	" ...	W.T. Reg. 20.3.27 to 10.4.27 ...	13.4.27.
<i>Carrara</i> ...	Hague, J. W., Commr. R.N.R.	S. Colbourne, H. A. Causton, G. Gorringe, H. Idles.	M.L.	Union Castle ...	Form 911 25.7.26 to 13.8.26 ...	20.8.26.
34 <i>Cironia</i> ...	Hossack, W. H., R.D., Capt., R.N.R.	M. Boston, H. G. Hayward...	W.T.	Cunard ...	Met. Log. 18.7.26 to 12.12.26...	21.12.26.
<i>Casanare</i> ...	Steidtmann, H. ...	" ...	No. A.	" ...	W.T. Reg. 7.3.27 to 26.3.27 ...	11.4.27.
<i>Cavina</i> ...	Riseley, A. D. ...	" ...	" A.	Elders & Fyffes ...	Form 911 7.3.27 to 26.3.27 ...	29.3.27.
52 <i>Cedric</i> ...	Hickson, V. W., Lt.-Commr., R.N.R.	E. A. A. Crowley, S. S. Fieldwood, J. J. Farrell.	W.T.	" ...	" 24.2.27 to 25.3.27 ...	31.3.27.
53 <i>Celtic</i> ...	Berry, G. ...	F. Pratt, A. Thompson, J. Peters.	"	White Star ...	W.T. Reg. 28.2.27 to 20.3.27 ...	24.3.27.
<i>Centaur</i> ...	Rose, A. F. ...	L. Johnstone ...	No. M.	" ...	Form 911 27.2.27 to 19.3.27 ...	23.3.27.
<i>Ceramic</i> ...	Roberts, J., C.B.E., D.S.O., R.D., Capt., R.N.R.	J. A. Bayer ...	" A.	A. Holt & Co. ...	W.T. Reg. 4.3.27 to 3.4.27 ...	6.4.27.
<i>Change</i> ...	Gambrill, F. C. ...	J. Thomas, D. D. Tyer, J. A. Allan, - Johnson.	M.L.	White Star ...	Form 911 22.12.26 to 2.2.27 ...	14.3.27.
<i>China</i> ...	Furlong, G. H. S., R.D., Capt., R.N.R.	M. K. Stone ...	No. M.	" ...	" 18.2.27 to 4.3.27 ...	4.4.27.
<i>Chindwara</i> ...	Brooks, E. G. ...	J. J. Smith ...	" M.	Yuill & Co... ...	Met. Log. 18.8.26 to 10.12.26...	27.1.27.
<i>Chindwin</i> ...	Esslemont, C. ...	W. D. Tulloch ...	" A.	P. & O. ...	Form 911 8.10.26 to 27.10.26...	15.11.26.
<i>City of Baroda</i> ...	McMillan, J. ...	A. Beaton, E. H. Routledge, H. C. Snow.	M.L.	British India ...	" 20.11.26 to 23.11.26	29.12.26.
<i>City of Benares</i> ...	Anderson, W. W. ...	C. G. Inglis ...	No. A.	Henderson ...	Met. Log. 22.7.26 to 2.1.27 ...	4.3.27.
<i>City of Brisbane</i> ...	Seaborne, F. O., D.S.C.	R. W. May ...	" A.	" ...	Form 911 14.12.26 to 9.1.27 ...	24.1.27.
<i>City of Canterbury</i> ...	Bremner, D. M. ...	W. F. Munro ...	" A.	" ...	" 29.10.26 to 11.12.26	20.12.26.
<i>City of Carlisle</i> ...	Mordue, J. A. ...	" ...	" A.	" ...	" 4.2.27 to 5.3.27 ...	23.3.27.
<i>City of Chester</i> ...	Letton, F. W. ...	H. Asher, W. Speakman, H. A. Hazell.	M.L.	" ...	" 22.10.26 to 21.1.27...	21.1.27.
<i>City of Edinburgh</i> ...	Wyper, J. ...	N. G. Fraser ...	No. M.	" ...	Met. Log. 21.9.26 to 5.2.27 ...	23.2.27.
<i>City of Hong Kong</i> ...	Walton, H. L., O.B.E., R.D., Commr., R.N.R.	S. J. Nash ...	" A.	" ...	Form 911 17.2.27 to 9.4.27 ...	13.4.27.
<i>City of London</i> ...	Parker, F. W., R.D., Commr., R.N.R.	K. M. Nicholson ...	" A.	" ...	" 7.11.26 to 9.12.26 ...	3.1.27.
<i>City of Rangoon</i> ...	Jones, P. ...	A. Gibb ...	M.L.	" ...	" 24.10.26 to 15.1.27...	20.1.27.
<i>City of Venice</i> ...	Lee, A. ...	W. Aitken ...	No. A.	" ...	Met. Log. 4.9.26 to 4.12.26 ...	15.12.26.
<i>City of Yokohama</i> ...	McDonald, W. D. ...	W. N. M. Faichney ...	" A.	" ...	Form 911 18.2.27 to 24.2.27 ...	11.3.27.
<i>Clan Alpine</i> ...	Lennox, W. J. ...	G. Short ...	" A.	" ...	" 16.11.26 to 1.1.27 ...	21.1.27.
<i>Clan Lamont</i> ...	Urquhart, P., D.S.C.	P. de Gruchy ...	" A.	Clan ...	" 27.1.27 to 21.3.27 ...	6.4.27.
					" 10.12.26 to 5.1.27 ...	13.1.27.

LIST OF VOLUNTARY OBSERVING SHIPS

iii

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 13.4.27.	Date Received.
<i>Clan Lindsay</i> ...	Worthington, J. H.	E. P. Smith ...	No. A.	Clan ...	Form 911 5.3.27 to 21.3.27 ...	31.3.27.
<i>Clan Macbeth</i> ...	Young, A. H., R.D., Lieut. - Commr. R.N.R.	J. M. Lorimer ...	" A.	" ...	" 16.1.27 to 9.2.27 ...	28.2.27.
<i>Clan Macfadyen</i> ...	Stenson, F. J., R.D., Capt., R.N.R.	H. M. Wavell ...	" A.	" ...	" 25.1.27 to 16.2.27 ...	14.3.27.
<i>Clan Macgillivray</i> ...	West, W. F. ...	J. H. Johnson ...	" A.	" ...	" 26.1.27 to 12.3.27 ...	22.3.27.
<i>Clan Macindoe</i> ...	Low, A. ...	" ...	" A.	" ...	" 11.2.27 to 30.3.27 ...	4.4.27.
<i>Clan Mackellar</i> ...	Smith, W. P. ...	J. K. Thomas ...	" A.	" ...	" 23.2.27 to 5.3.27 ...	29.3.27.
<i>Clan Macmillan</i> ...	McComish, A. B. ...	W. F. Isaac, S. Y. Strange, J. W. Innes.	M.L.	" ...	Met. Log. 21.8.26 to 27.11.26...	2.12.26.
<i>Clan Macphie</i> ...	Gourlay, J. B. ...	D. S. Rae, J. O. Woodall, J. J. Millar.	"	" ...	" 6.9.25 to 14.5.26 ...	24.6.26.
<i>Clan Macnaughton</i> ...	Simpson, A. W. ...	F. Cossar ...	No. A.	" ...	Form 911 21.2.27 to 14.3.27 ...	23.3.27.
<i>Clan Macnaghtart</i> ...	Mee, F. T. ...	F. B. Fairweather ...	" A.	" ...	" 24.10.26 to 25.11.26	3.12.26.
<i>Clan Macwhirter</i> ...	Waterhouse, J. ...	R. W. Roberts ...	M.L.	" ...	" 26.11.26 to 12.12.26	17.12.26.
<i>Clan Macwilliam</i> ...	Williamson, A. ...	T. B. Cranwill ...	No. A.	" ...	" 28.8.26 to 9.10.26 ...	30.10.26.
<i>Clan Malcolm</i> ...	Neill, G. A. ...	J. T. Bell, H. V. Wightman, A. R. McDonald.	M.L.	" ...	Met. Log. 23.9.26 to 3.3.27 ...	30.3.27.
<i>Clan Morrison</i> ...	Porterfield, W. M. ...	L. C. Higgins ...	No. A.	" ...	Form 911 4.10.26 to 4.1.27 ...	24.1.27.
<i>Clan Murdoch</i> ...	Miller, W. ...	H. F. M. Preston ...	" A.	" ...	" 30.1.27 to 10.3.27 ...	5.4.27.
<i>Clan Ranald</i> ...	Laird, C. ...	J. B. Templeman ...	" A.	" ...	" 14.2.27 to 22.2.27 ...	2.3.27.
<i>Clan Ross</i> ...	Smith, W. P. ...	D. B. Edgar ...	" A.	" ...	" 8.12.26 to 21.12.26...	13.1.27.
<i>Clan Sinclair</i> ...	George, L. S. ...	N. Macleod ...	" A.	" ...	" 24.1.27 to 10.2.27 ...	5.3.27.
<i>Clan Urquhart</i> ...	Baker, E. W. ...	E. A. Hewson ...	" A.	" ...	" 10.1.27 to 4.2.27 ...	28.2.27.
<i>Colonia C.S.</i> ...	Carlton, G. F., O.B.E., Commr., R.N.R.	W. E. Allen, W. F. Anderson, F. B. Bolingbroke.	M.L.	Telegraph Construction & Maintenance.	Met. Log. 4.12.26 to 25.2.27 ...	8.3.27.
<i>Colonian</i> ...	Gittins, R. P. ...	W. J. Wright ...	No. A.	Leyland ...	Form 911 27.2.27 to 27.3.27 ...	4.4.27.
<i>Comorin</i> ...	Borland, J. Mc. I., C.B., D.S.O., R.D., Capt., R.N.R.	C. L. Hayward ...	" M.	P. & O. ...	" 6.11.26 to 15.1.27 ...	7.2.27.
<i>Concordia</i> ...	Telfer, J. H. ...	T. Philip, J. McIntosh, S. R. McNie.	M.L.	Anchor Donaldson ...	Met. Log. 3.9.26 to 14.1.27 ...	24.1.27.
<i>Corinthia</i> ...	Hart, F. ...	E. Burt, J. Warltire, M. Ben- nett.	"	White Star ...	" 3.12.26 to 19.3.27 ...	11.4.27.
<i>Cornwall</i> ...	Haines, F. P. ...	H. S. White ...	No. A.	Federal ...	Form 911 26.1.27 to 28.2.27 ...	12.4.27.
<i>Craftsman</i> ...	Gibbings, W. ...	J. Williams ...	" A.	Harrison ...	" 23.12.26 to 10.3.27 ...	14.3.27.
<i>Crawford Castle</i> ...	Morgan, A. O., R.D., Commr., R.N.R.	J. E. R. Wilford ...	" A.	Union Castle ...	" 9.11.26 to 16.12.26...	29.12.26.
<i>Cristales</i> ...	Isaacson, J. M. ...	S. Browne, R. Southerland, D. M. Baker, J. M. Hamp- shire.	M.L.	Elders & Fyffes ...	Met. Log. 25.7.26 to 4.12.26 ...	14.12.26.
<i>Culebra</i> ...	Mackay, A. S., R.D., Commr., R.N.R.	P. Cooper, F. B. Collinson, J. W. Smith.	"	R.M.S.P. Co. ...	" 27.12.26 to 23.3.27...	12.4.27.
<i>Cumberland</i> ...	Deith, G. T. ...	J. D. Marks ...	No. A.	Federal ...	Form 911 7.8.26 to 8.1.27 ...	9.2.27.
<i>Cuthbert</i> ...	Lee, O. J. P. ...	C. C. Beal ...	" A.	Booth ...	" 20.10.26 to 3.11.26...	10.11.26.
<i>Cyclops</i> ...	Cosker, W. ...	J. R. C. Evans ...	" A.	A. Holt ...	" 19.1.27 to 11.3.27 ...	22.3.27.
<i>Dardanus</i> ...	Williams, D. T. ...	C. F. Morgan ...	" M.	" ...	" 9.12.26 to 14.2.27 ...	26.2.27.
<i>Darian</i> ...	Masters, W. ...	A. S. Holland ...	" A.	Leyland ...	" 3.3.27 to 23.3.27 ...	12.4.27.
<i>Darro</i> ...	Matthews, G. P. ...	W. Halder Campe... ..	" M.	R.M.S.P. Co. ...	" 8.1.27 to 4.3.27 ...	7.3.27.
<i>Demerara</i> ...	Willan, F. C. L. ...	J. R. Baty ...	" M.	" ...	" 24.12.26 to 19.2.27...	23.2.27.
<i>Demosthenes</i> ...	Orriss, F. A. ...	J. Cruickshank ...	" M.	Aberdeen ...	" 5.2.27 to 17.3.27 ...	23.3.27.
<i>Deseado</i> ...	Shillitoe, B., R.D., Commr., R.N.R.	L. D. Jennings ...	" M.	R.M.S.P. Co. ...	" 26.2.27 to 18.3.27 ...	29.3.27.
<i>Desna</i> ...	Green, J. ...	A. F. Walker ...	" M.	" ...	" 3.12.26 to 19.1.27 ...	31.1.27.
<i>Deucalion</i> ...	Findlay, J. ...	R. Wilson ...	" A.	A. Holt ...	" 3.3.27 to 9.4.27 ...	12.4.27.
<i>Dieppe</i> ...	Marmery, S. ...	Mr. Parsons ...	C.C.	Southern Railway ...	Telegraphic Report 14.1.27 ...	14.1.27.
<i>Dimboola</i> ...	Roy, C. M. ...	" ...	No. A.	Melbourne S.S. Co. ...	Form 911 21.1.27 to 15.2.27 ...	22.3.27.
<i>Discoverer</i> ...	Ling, J. T. ...	C. C. Heaton ...	" M.	Harrison ...	" 16.10.26 to 20.3.27...	23.3.27.
<i>Discovery, R.R.S.</i> ...	Stenhouse, J. R., D.S.O., D.S.C., O.B.E., R.D., Commr., R.N.R.	T. W. Goodchild ...	M.L.	Discovery Expedition	Met. Log. 8.5.26 to 11.7.26 ...	30.9.26.
<i>Domala, M.V.</i> ...	Kitson, A. G. ...	J. G. Wallace ...	No. M.	British India ...	Form 911 1.12.26 to 3.2.27 ...	16.3.27.
<i>Dominia, C.S.</i> ...	Campos, V., O.B.E., Lt.-Commr., R.N.R.	S. A. Garnham, C. Bullock, L. J. Hegarty, R. Johnson.	M.L.	Telegraph Construction and Maintenance.	Met. Log. 11.9.26 to 4.2.27 ...	25.2.27.
<i>Doric</i> ...	Bolton, S., D.S.C., R.D., R.N.R.	G. Kavanagh, J. A. Heenan, J. Clarke.	No.	White Star ...	Form 911 20.3.27 to 6.4.27 ...	12.4.27.
<i>Doric Star</i> ...	Thomas, R. T. ...	L. McDermott ...	No. A.	Blue Star ...	Form 911 22.11.26 to 20.12.26	10.1.27.
<i>Dorington Court</i> ...	Clarke, E. J. ...	E. W. Blomberg ...	" A.	Haldin & Co. ...	" 20.8.26 to 27.9.26 ...	4.10.26.
<i>Dromore Castle</i> ...	Vincent, E. S., R.D., Commr., R.N.R.	D. H. McDougall ...	" A.	Union Castle ...	" 10.12.26 to 3.4.27 ...	13.4.27.
<i>Dryden</i> ...	Major, T. W. ...	G. Major ...	" M.	Lampert & Holt ...	" 11.1.27 to 4.2.27 ...	16.2.27.
<i>Duendes</i> ...	Pape, E. R. ...	W. Billington ...	" M.	P.S.N. Co. ...	" 19.1.27 to 16.2.27 ...	21.2.27.
<i>Dunaff Head</i> ...	Butt, H. L., R.D., Commr., R.N.R.	F. S. Napier ...	" A.	Ulster S.S. Co. ...	" 4.12.26 to 13.1.27 ...	25.1.27.
<i>Dundrum Castle</i> ...	Weller, H. E. ...	" ...	" A.	Union Castle ...	" 27.1.27 to 24.2.27 ...	14.3.27.
<i>Dunrobin</i> ...	Ramsay, J. D. ...	C. H. Kendall ...	" A.	Glen & Co. ...	" 13.3.27 to 27.3.27 ...	12.4.27.
<i>Duquesa</i> ...	Ellis, F., D.S.C. ...	E. W. Denman ...	" M.	Furness Withy ...	" 8.1.27 to 3.3.27 ...	11.3.27.
<i>Edinburgh Castle</i> ...	Knight, A. ...	E. M. Betts ...	No. A.	Union Castle ...	" 1.12.26 to 20.3.27 ...	24.3.27.
<i>Egyptian Prince</i> ...	Ord, T. ...	" ...	"	Prince ...	" 13.1.27 to 7.3.27 ...	31.3.27.
<i>Elmina</i> ...	Williams, T. E. ...	E. Anders, C. G. S. Short, E. S. James.	M.L.	Elder Dempster ...	Met. Log. 3.11.26 to 21.3.27 ...	26.3.27.
<i>El Paraguay</i> ...	Smith, F. C. ...	G. Fletcher ...	No. M.	" ...	Form 911 2.1.27 to 27.2.27 ...	4.3.27.
<i>Elpenor</i> ...	Gordon, A. L. ...	M. Robertson, C. Kavanagh	M.L.	Houlder Bros. ...	Met. Log. 11.10.26 to 7.2.27 ...	10.2.27.
<i>Elysia</i> ...	Duncan, A. R. ...	A. Laidlaw, C. Jenkins, J. A. C. A. Leitch	"	A. Holt ...	" 15.10.26 to 26.12.26	10.1.27.
<i>Empress of Asia</i> ...	Lovegrove, A. V. R., D.S.O., R.D., Capt., R.N.R.	R. H. Foley, L. Johnston, L. C. Hogg, W. T. Miler.	"	Anchor ...	" 16.9.26 to 23.1.27 ...	2.3.27.
<i>Empress of Canada</i> ...	Robinson, S., C.B.E., R.D., Commr., R.N.R.	" ...	"	Canadian Pacific ...	" 1.10.26 to 12.2.27 ...	22.3.27.
<i>Empress of France</i> ...	Griffiths, E. ...	E. Roberts, W. Ewens, O. F. Pennington, W. Pickersgill.	"	" ...	" 1.5.26 to 3.11.26 ...	8.11.26.
<i>Empress of Russia</i> ...	Hosken, A. J. ...	J. H. Reid ...	"	" ...	" 19.8.26 to 29.11.26...	21.2.27.
<i>Empress of Scotland</i> ...	Latta, R. G. ... Stuart, R.N., V.C., D.S.O.	M. McLellan, W. Bacon, F. G. Hutchings.	"	" ...	" 15.5.26 to 13.10.26...	28.10.26.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 13.4.27.	Date Received.
<i>Endeavour</i> ...	Commr. S. A. Geary-Hill, D.S.O., R.N.	C. S. E. Lansdown ...	M.L.	His Majesty's Ship ...	Form 911 14.11.26 to 13.3.27...	28.3.27.
<i>Essequibo</i> ...	Kite, E. ...	... ..	No. M.	R.M.S.P. Co. ...	" 30.12.26 to 14.2.27 ...	28.2.27.
<i>Eumaeus</i> ...	Read, J. W. ...	J. L. Millar ...	" A.	A. Holt ...	" 19.2.27 to 5.3.27 ...	28.3.27.
<i>Euripides</i> ...	Collins, P. J., O.B.E.	H. S. Cox, K. D. Fisher, P. Longdon.	M.L.	Aberdeen ...	Met. Log. 18.7.26 to 22.11.26...	29.11.26.
<i>Euryades</i> ...	Stewart, J. R. ...	... ..	No. A.	A. Holt ...	Form 911 22.2.27 to 3.4.27 ...	6.4.27.
<i>Explorer</i> ...	Allan, J. ...	A. Stout ...	" A.	Scottish Fishery Board	" 2.3.27 to 28.3.27 ...	4.4.27.
<i>Ferdale</i> ...	Daniel, F. ...	D. Jones, E. F. Pember ...	" M.	Commonwealth Govt.	" 5.3.27 to 2.4.27 ...	7.4.27.
<i>Flandria</i> ...	Maars, L. ...	T. Doornbosch ...	" M.	Holland Lloyd ...	" 11.2.27 to 31.3.27 ...	4.4.27.
<i>Francisco</i> ...	Scales, H. ...	J. C. Nettleship ...	" A.	Ellerman Wilson ...	" 22.1.27 to 4.3.27 ...	17.3.27.
<i>Freya</i> ...	Angus W. ...	T. R. Ness ...	" A.	Scottish Fishery Board	" 1.3.27 to 31.3.27 ...	4.4.27.
<i>Gaika</i> ...	Whitfield, G. J. ...	... ..	" A.	Union Castle ...	" 30.11.26 to 21.12.26	29.12.26.
<i>Galtymore</i> ...	Southerland, E. ...	R. B. Gurner ...	" M.	Furness Withy ...	" 12.3.27 to 23.3.27 ...	29.3.27.
<i>Garret</i> ...	Visser, C. ...	C. J. Vandendoom ...	" M.	Rotterdam Lloyd ...	" 20.2.27 to 5.3.27 ...	29.3.27.
<i>Garth Castle</i> ...	Jackson, C. R. ...	W. S. J. Aldous ...	" A.	Union Castle ...	" 1.2.27 to 11.3.27 ...	15.3.27.
<i>Getria</i> ...	Veldkamp, G. J. ...	T. van der Mast ...	" M.	Holland Lloyd ...	" 19.2.27 to 10.3.27 ...	14.3.27.
<i>Geranium</i> ...	Bennett, H. T., D.S.O., Commr. R.A.N.	... ..	M.L.	His Majesty's Australian Ship	... ..	...
<i>Glenamoy, M.V.</i> ...	Homan, C. E. ...	R. H. Bishop ...	No. A.	Glen Line ...	Form 911 4.2.27 to 24.2.27 ...	4.4.27.
<i>Glenarriff</i> ...	Angier, J. ...	... ..	No.	" ...	" ...	"
<i>Glenluce</i> ...	Kennett, W. H. ...	J. Hall ...	No. A.	" ...	Form 911 7.2.27 to 19.2.27 ...	28.2.27.
<i>Glenishane</i> ...	Beer, E. ...	R. A. Dale ...	" A.	" ...	" 27.9.26 to 9.1.27 ...	13.1.27.
<i>Gloucestershire</i> ...	Robin, E. ...	... ..	" A.	Bibby ...	" 4.12.26 to 12.2.27 ...	17.2.27.
<i>Gorgon</i> ...	Hughes, J. W. ...	A. E. Bowit ...	M.L.	A. Holt & Co. ...	" 30.9.26 to 17.10.26...	22.11.26.
<i>Halesius</i> ...	... ..	... ..	No. A.	R. P. Houston ...	" ...	"
<i>Haliartius</i> ...	Marsh, L. V. ...	W. H. Upton ...	" A.	R. P. Houston ...	Form 911 19.12.26 to 31.1.27...	21.2.27.
<i>Harmonides</i> ...	Hughes, W. F. ...	S. S. Davidson ...	" A.	" ...	" 29.1.27 to 19.2.27 ...	17.3.27.
<i>Harmony, Auxy.</i> ...	Jackson, J. C. ...	A. W. Bush ...	" A.	Moravian Mission ...	" 25.12.26 to 6.1.27 ...	19.1.27.
<i>Hatarana</i> ...	Denne, G. H. A. ...	F. Wells, C. Parkes, W. T. Beedle, T. S. Barnes.	M.L.	British India ...	" 12.6.25 to 27.2.26 ...	29.3.26.
<i>Hatimura</i> ...	Lane, S. R., R.D., Capt., R.N.R.	... ..	No. M.	British India ...	" ...	"
<i>Hawaki, M.V.</i> ...	Frew, J. D. ...	... ..	M.L.	Union S.S. Co. N.Z. ...	Form 911 22.6.26 to 11.7.26 ...	20.9.26.
<i>Henry Holmes, C.S.</i> ...	Bicker Caarten, A. ...	M. A. Green ...	No. M.	W. I. & Panama Telegraph Co.	" 22.12.26 to 10.1.27...	15.2.27.
<i>Herald</i> ...	Silk, H. V., Lieut.-Commr., R.N.	D. G. V. Williams ...	M.L.	His Majesty's Ship ...	Met. Log. 4.9.26 to 30.11.26 ...	27.1.27.
<i>Herefordshire</i> ...	Mann, R. P. ...	H. R. Mackay ...	No. A.	Bibby ...	Form 911 21.8.26 to 29.1.27 ...	7.2.27.
<i>Herminius</i> ...	Roberts, T. V. ...	G. P. McCraith ...	" A.	Shaw, Savill & Albion	" 25.9.26 to 11.10.26...	22.11.26.
<i>Herschel</i> ...	Watson, W. W. ...	J. F. Maurey ...	" A.	Lampport & Holt ...	" 20.12.26 to 13.3.27 ...	22.3.27.
<i>Hertford</i> ...	Urquhart, D. ...	A. Robertson ...	" A.	Federal ...	" 1.2.27 to 21.2.27 ...	4.4.27.
<i>Hibernia</i> ...	Tanner, E. B., O.B.E.	R. Woodall ...	" C.	L.M. & S. Rly. ...	Telegraphic Report, 19.3.27 ...	19.3.27.
<i>Highland Glen</i> ...	Jones, T. J. ...	W. Jealous ...	No. A.	Nelson ...	Form 911 29.3.26 to 26.5.26 ...	31.5.26.
" <i>Heather</i> ...	Powell, G. A. ...	J. H. Fitton, J. Hardy ...	" A.	" ...	" 13.12.25 to 24.6.26 ...	14.7.26.
" <i>Laddie</i> ...	Alford, C. ...	E. F. Smart ...	" A.	" ...	" 23.11.26 to 14.1.27 ...	24.1.27.
" <i>Piper</i> ...	Collings, D. ...	J. S. Collins, S. E. Jackson W. T. Breen.	M.L.	" ...	Met. Log. 25.4.26 to 16.9.26 ...	23.9.26.
" <i>Pride</i> ...	Robinson, R. H. ...	... ..	No. A.	" ...	Form 911 21.2.27 to 14.3.27 ...	28.3.27.
" <i>Prince</i> ...	Brown, J. B. ...	S. A. Wheaton ...	" A.	Prince ...	" 23.2.27 to 28.2.27 ...	4.4.27.
" <i>Rover</i> ...	Ashby Graves, F. ...	C. C. Legg ...	" A.	Nelson ...	" 1.2.27 to 24.3.27 ...	4.4.27.
" <i>Warrior</i> ...	Robinson, R. H. ...	J. O. Simons ...	" M.	" ...	" 25.3.26 to 19.5.26 ...	26.5.26.
<i>Hildebrand</i> ...	Maddrell, J. ...	A. Allan ...	" A.	Booth ...	" 24.11.26 to 7.1.27 ...	25.1.27.
<i>Hobsons Bay</i> ...	Kydd, O. J. ...	R. Pearce, A. Badman, T. Morrison, H. Hendy.	M.L.	Commonwealth Govt.	Met. Log. 3.8.26 to 17.12.26 ...	23.12.26.
<i>Holbein</i> ...	Gough, W. A. ...	H. L. Rudd ...	No. A.	Lampport & Holt ...	Form 911 9.1.27 to 18.3.27 ...	23.3.27.
<i>54 Homeric</i> ...	Holme, A. ...	A. S. Dyer, H. G. Morgan, S. B. Morfee.	W.T.	White Star ...	W.T. Reg. 14.1.27 to 28.1.27 ...	8.2.27.
<i>Hororata</i> ...	Holland, E. ...	E. R. Kemp, F. Malcouironne	No. A.	New Zealand S.S. Co.	Form 911 1.9.26 to 3.1.27 ...	5.1.27.
<i>Hubert</i> ...	Evans, L. ...	S. G. Edwards ...	" A.	Booth ...	" 11.1.27 to 10.3.27 ...	4.4.27.
<i>Huntingdon</i> ...	Ashworth, W. ...	R. Cox ...	" A.	Federal ...	" 25.1.27 to 2.3.27 ...	5.3.27.
<i>Hurumui</i> ...	Burton Davies, J. ...	J. Oxnard, L. C. Hill, L. Cann, K. Goldsworthy.	M.L.	New Zealand S.S. Co.	Met. Log. 10.10.26 to 18.11.26	26.11.26.
<i>Ingoma</i> ...	Barrow, R. K. ...	C. R. Davenport ...	No. M.	Harrison ...	Form 911 19.2.27 to 3.4.27 ...	7.4.27.
<i>Iris, C.S.</i> ...	Hughes, H. R. ...	W. Oliver, D. Bruce, D. MacDonald, T. Vickers.	M.L.	Pacific Cable Board ...	Met. Log. 23.1.26 to 25.4.26 ...	5.10.26.
<i>Iroquois</i> ...	Jackson, A. L., Commr., R.N.	H. L. Jenkins ...	"	His Majesty's Ship ...	" 24.8.26 to 3.12.26 ...	15.2.27.
<i>Ixion</i> ...	Reed, G. C. ...	C. W. R. Murphy ...	No. A.	A. Holt ...	Form 911 29.11.26 to 9.1.27 ...	28.2.27.
<i>Javanese Prince</i> ...	Naylor, E. ...	W. Venn ...	" A.	Prince ...	" 21.12.26 to 6.1.27 ...	24.1.27.
<i>Jervis Bay</i> ...	Chaplin, W. R. ...	R. W. Laycock ...	" M.	Commonwealth Govt.	" 14.12.26 to 22.2.27...	7.3.37.
<i>John Pender, C.S.</i> ...	Smythe, T. W. ...	H. W. Milne ...	" A.	Eastern Tel. Co. ...	" 8.9.26 to 25.9.26 ...	25.10.26.
<i>Justin</i> ...	Lee, O. J. P. ...	R. C. Holmes ...	" A.	Booth ...	" 10.2.27 to 22.2.27 ...	4.4.27.
<i>Kaisar-i-Hind</i> ...	Manley, G. ...	A. H. Cole ...	" M.	P. & O. ...	" 19.2.27 to 10.3.27 ...	4.4.27.
<i>Kamo Maru</i> ...	Shiratori, S. ...	... ..	" A.	Nippon Yusen Kaisha	" 15.1.27 to 15.2.27 ...	6.4.27.
<i>Kangaroo</i> ...	Norris, H. C. ...	V. J. Denton, H. W. Norris, E. Hutchinson, H. Griffiths.	M.L.	State Service Australia	Met. Log. 25.7.26 to 13.11.26...	21.12.26.
<i>Karapara</i> ...	Miller, A. C. ...	J. W. Knight ...	No. M.	British India ...	Form 911 24.11.26 to 7.1.27 ...	24.1.27.
<i>Kashmir</i> ...	Stringer, R.H., O.B.E., R.D., Commr., R.N.R.	J. H. Anderson ...	" M.	P. & O. ...	" 28.1.27 to 27.2.27 ...	1.3.27.
<i>Kenilworth Castle</i> ...	Chave, Sir B., K.B.E.	... ..	M.L.	Union Castle ...	Met. Log. 8.8.26 to 30.1.27 ...	5.4.27.
<i>Kent</i> ...	Downton, M. M. ...	F. M. Knight ...	No. A.	New Zealand S.S. Co.	Form 911 28.7.26 to 31.8.26 ...	8.9.26.
<i>Khiva</i> ...	Cooper, C. P. ...	G. W. Wood ...	M.L.	P. & O. ...	Met. Log. 17.10.26 to 31.1.27 ...	3.2.27.
<i>Khyber</i> ...	Hester, C. W., R.D., Commr., R.N.R.	C. B. Roche, E. J. Parry, H. D. Case, G. S. B. Collard.	"	P. & O. ...	Form 911 27.8.26 to 8.12.26 ...	13.12.26.
<i>Kia Ora</i> ...	McIntosh, A. ...	E. A. Hickling, J. Laurensen	"	Shaw Savill & Albion	Met. Log. 21.6.26 to 15.12.26...	30.12.26.
<i>Knight Companion</i> ...	Cox, B. T. ...	... ..	No. M.	A. Holt ...	Form 911 3.3.27 to 15.3.27 ...	23.3.27.
<i>Koolinda, M. V.</i> ...	Buckeridge, G. ...	... ..	No.	State Service, Australia	" ...	"
<i>Kovno</i> ...	Dossor, W. A. ...	H. Redfern, A. Snowden, A. Hebblewhite.	M.L.	Ellerman Wilson ...	Met. Log. 12.6.26 to 26.11.26	27.11.26.
<i>Kwitying</i> ...	Byers, G. ...	W. McDonald, T. Hackett ...	"	China Nav. Co. ...	" 25.3.26 to 4.8.26 ...	27.9.26.
<i>Kyogle</i> ...	Coalstad, C. ...	E. W. Hughes, C. B. Odman	No. A.	Commonwealth Light-house Service.	Form 911 26.11.26 to 19.12.26	7.2.27.
<i>37 Laconia</i> ...	Britten, E. T. ...	T. Parry, J. Ashcroft, J. W. Caunce.	W.T.	Cunard ...	W.T. Reg. 17.1.27 to 22.1.27 ... Form 911. 16.1.27 to 23.1.27 ...	10.2.27. 9.2.27.

LIST OF VOLUNTARY OBSERVING SHIPS

v

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 13.4.27.	Date Received
<i>Lady Denison Pen- aer, C.S.</i>	West, G. W. ...	F. Lawrence ...	No. A.	Eastern Tel. Co. ...	Form 911 9.5.26 to 7.7.26 ...	7.8.26.
<i>Laguna</i> ...	Pattison, G. H. ...	...	" A.	Pacific S.N. Co. ...	Met. Log. 7.11.26 to 24.11.26...	14.12.26.
<i>Lahore</i> ...	Kirkwood, J. H. ...	...	" M.	P. & O. ...	27.11.26 to 31.12.26 ...	5.1.27.
<i>Lahunde</i> ...	Dawson, E. N. ...	W. G. Stevenson ...	" A.	Lampport & Holt ...	Form 911 21.11.26 to 12.3.27 ...	29.3.27.
<i>Lancashire</i> ...	Hamill, H. ...	A. E. Warburton ...	" A.	Bibby ...	1.1.27 to 13.3.27 ...	16.3.27.
<i>36 Lancastrius</i> ...	de Legh, P. ...	F. Holdsworth ...	" W.T.	Cunard ...	W.T. Reg. 7.11.26 to 27.11.26...	1.12.26.
	Malin, R. G., Lt.-Commr., R.N.R.	R. P. Campbell, L. R. Sharp, F. G. Russell	No. A	Pacific S.N. Co. ...	Form 911 18.1.27 to 23.2.27 ...	26.2.27.
<i>Lantaro, M.V.</i> ...	Barkley, E. ...	...	No. A	A. Holt ...	" 9.12.26 to 3.3.27 ...	11.3.27.
<i>Laomedon</i> ...	Beswick, W., D.S.C., Lt.-Commr., R.N.R.	A. Yarwood ...	" M.	Pacific S.N. Co. ...	" 26.1.27 to 11.3.27 ...	22.3.27.
<i>La Paz, M.V.</i> ...	Benson, C. W. ...	D. L. Jones ...	" A.	Lampport & Holt ...	18.11.26 to 31.3.27 ...	13.4.27.
<i>Laplace</i> ...	Shaw, W. ...	A. L. Murray, R. D. Cottam	" W.T.	Red Star ...	Met. Log. 1.1.26 to 8.5.26 ...	17.5.26.
<i>55 Lopland</i> ...	Knight, R. A. ...	E. Cornellie, J. C. Flett ...	M.L.	Bibby ...	W.T. Reg. 22.2.27 to 14.3.27 ...	22.3.27.
	Morehouse, W. M. ...	J. Cullen, W. A. Kent, D. Y. Sharrock, J. D. Archer.	No. A.	Lampport & Holt ...	Form 911 21.2.27 to 12.3.27 ...	4.4.27.
<i>Leicestershire</i> ...	English, G. L. ...	J. T. A. Thomson ...	" A.	Dowie, J., & Co. ...	" 18.11.26 to 5.12.26 ...	14.2.27.
<i>Leighton, M.V.</i> ...	Lindesay, J. M. ...	H. G. Letts ...	No. M.	Union Castle ...	Form 911 17.10.26 to 4.1.27 ...	2.2.27.
<i>Leitrim</i> ...	Morton Betts, W. ...	Buret, T. J. C. ...	" A.	Furness Withy ...	2.3.27 to 6.4.27 ...	12.4.27.
<i>Llandaff Castle</i> ...	Buret, T. J. C. ...	J. S. Williams, W. Stanley ...	No. A.	Ulster S.S. Co. ...	Form 911 1.2.27 to 16.2.27 ...	18.2.27.
<i>Loch Katrine</i> ...	Young, H. J., D.S.C.	L. G. Kirwan ...	" A.	Pacific S.N. Co. ...	" 8.1.27 to 25.1.27 ...	14.2.27.
<i>London Commerce</i> ...	Williamson, J. M. ...	R. W. Gill ...	" M.	" "	" 4.12.26 to 29.12.26 ...	31.12.26.
<i>Lord Antrim</i> ...	Jarvis, F. E. ...	E. Baxter ...	" M.	" "	" "	" "
<i>Loriga, M.V.</i> ...	Clapham, E. C. ...	...	" M.	" "	" "	" "
<i>Losada, M.V.</i> ...	Ross, J. ...	...	" M.	" "	" "	" "
<i>Macedonia</i> ...	Potter, H. W., R.D., Commr., R.N.R.	E. Lee ...	" M.	P. & O. ...	" 14.2.27 to 3.3.27 ...	12.4.27.
<i>Macharda</i> ...	Tyers, W. O. ...	D. M. Fulton ...	" M.	Brocklebank ...	" 3.3.27 to 4.4.27 ...	7.4.27.
<i>Mahana</i> ...	Kershaw, W. A. R. ...	F. M. Smith, H. C. Smith, J. C. K. Rogers.	" A.	Shaw, Savill & Albion	Met. Log. 15.4.26 to 10.8.26 ...	30.8.26.
<i>Maharaja</i> ...	Hinton, J. C. ...	H. A. Hartley ...	" M.	Asiatic S.N. Co. ...	Form 911 30.11.26 to 14.12.26	15.2.27.
<i>Mahia</i> ...	Williams, G. ...	R. Naef ...	No. A.	Shaw, Savill & Albion	" "	" "
<i>Maihar</i> ...	Rowe, J. P. ...	C. Shaw, H. T. Scoins, G. Henshaw.	M.L.	Brocklebank ...	Met. Log. 20.3.26 to 23.6.26 ...	15.7.26.
<i>Maimyo</i> ...	Scurr, T. W. ...	H. M. Drummond ...	No. A.	Burns Philp ...	Form 911 9.7.26 to 1.12.26 ...	6.12.26.
<i>Maiwara</i> ...	Brown, T. M. ...	W. T. Fitzgerald, A. H. Young, W. W. Pearson, J. Paine.	M.L.	White Star ...	W.T. Reg. 24.3.27 to 7.4.27 ...	11.4.27.
<i>58 Majestic</i> ...	Metcalfe, G. R. ...	W. T. Fitzgerald, A. H. Young, W. W. Pearson, J. Paine.	M.L.	Burns Philp ...	Met. Log. 26.6.26 to 6.10.26 ...	29.12.26.
<i>Makambo</i> ...	McLean, J. ...	F. C. Vogelmann, T. R. Lang, W. O. L. Wilding.	"	Canadian-Australasian	" 9.9.26 to 20.1.27 ...	7.2.27.
<i>Makura</i> ...	Brown, T. M. ...	O. C. Bray, W. J. Weber, L. P. Bourke.	"	Burns, Philp & Co. ...	" 6.7.26 to 15.12.26 ...	23.3.27.
<i>Malabar</i> ...	Davey, A. H. ...	J. H. Round ...	No. M.	Brocklebank ...	Form 911 8.9.26 to 22.9.26 ...	25.9.26.
<i>Malakuta</i> ...	Mawson, J. ...	R. Morris ...	" M.	" "	" 29.7.26 to 12.8.26 ...	28.9.26.
<i>Malancha</i> ...	Hillman, E. J. ...	J. H. Round ...	" M.	British India ...	" 20.1.27 to 24.2.27 ...	5.3.27.
<i>Malta</i> ...	Adamson, F. L. ...	R. Humble ...	" M.	P. & O. ...	Form 911 23.12.26 to 6.2.27 ...	17.2.27.
<i>Maloja</i> ...	Gray, T. N. ...	W. S. Donald, A. A. Parker...	" A.	Shaw, Savill & Albion	" 29.1.27 to 4.3.27 ...	11.3.27.
<i>Mamari</i> ...	Warner, S. C. ...	P. Campbell ...	" A.	Manchester Liners ...	" 13.1.27 to 25.1.27 ...	28.1.27.
<i>Manchester Brigade</i> ...	Falconer, H. ...	J. Shaw ...	" A.	" "	" "	" "
<i>Manchester Corporation</i> ...	Stott, C. H. ...	W. L. Lavers ...	" A.	" "	" "	" "
<i>Manchester Hero</i> ...	Everest, J. E. ...	J. H. Emmitt, H. Anderton, B. M. Brown.	M.L.	" "	Met. Log. 31.7.26 to 10.2.27 ...	9.3.27.
<i>Manchester Mer- chant.</i> ...	Riley, J. E. ...	E. W. Jeffries ...	No. A.	" "	Form 911 26.6.26 to 11.8.26 ...	20.8.26.
<i>Manchester Regiment</i> ...	Struss, F. D. ...	J. F. Fisher ...	" A.	" "	" 13.2.27 to 17.3.27 ...	24.3.27.
<i>Manchester Shipper</i> ...	Foale, J. R. ...	H. Swindells ...	M.L.	" "	Met. Log. 24.7.26 to 16.11.26...	29.11.26.
<i>Manipur</i> ...	Dormer, A. E. ...	R. Penston, K. Leadbetter ...	No. M.	Brocklebank ...	Form 911 6.1.27 to 4.2.27 ...	8.3.27.
<i>Mantua</i> ...	Cochran, G. N. ...	D. B. Leader ...	" M.	P. & O. ...	" 28.1.27 to 11.2.27 ...	6.4.27.
<i>Marburn</i> ...	Randell, G. G. ...	R. H. W. Jackson ...	" M.	Canadian Pacific ...	" 24.4.26 to 17.5.26 ...	20.5.26.
<i>Marella</i> ...	Stewart, A. ...	Mortimer, S. ...	M.L.	Burns Philp ...	Met. Log. 3.10.25 to 7.11.26 ...	5.4.27.
<i>Marengo</i> ...	Williams, J. C. R.D., Commr. R.N.R.	F. Barnard, H. Bryon, J. Ford	"	Elberman Wilson ...	" 14.1.27 to 21.2.27 ...	16.3.27.
<i>Margha</i> ...	Milne, R. A., R.D., Commr. R.N.R.	P. Wright, H. E. Evans, R. M. Wyatt, E. H. Rabey.	"	British India ...	" 24.10.26 to 21.1.27...	26.1.27.
<i>Marsina</i> ...	Rothery, S. ...	H. C. Tarrington ...	No. A.	Burns, Philp & Co. ...	Form 911 15.9.26 to 6.10.26 ...	15.11.26.
<i>Masirah</i> ...	Mallett, R. ...	A. E. Evans ...	" M.	Brocklebank ...	" 12.9.26 to 13.10.26...	16.11.26.
<i>Matakana</i> ...	Thurston, H. P. ...	J. Hart, J. Dickson, G. E. Lindsay.	M.L.	Shaw, Savill & Albion	Met. Log. 1.2.27 to 13.3.27 ...	18.3.27.
<i>Mataram</i> ...	Voy, W. ...	V. V. Edmonds ...	No. A.	Burns Philp & Co. ...	Form 911 26.12.26 to 20.1.27...	28.2.27.
<i>Mataroa</i> ...	Kershaw, W. A. R. ...	T. T. Oliver, J. J. Nicoll, J. C. K. Rogers.	M.L.	Shaw, Savill & Albion	Met. Log. 6.11.26 to 20.2.27 ...	9.3.27.
<i>Matheran</i> ...	Hanna, R. G. ...	H. H. Armstrong, H. Willing- ton, J. Richardson.	"	Brocklebank ...	Met. Log. 5.9.26 to 31.12.26 ...	5.1.27.
<i>Matiana</i> ...	Green, F. V. ...	R. M. Morrison ...	No. M.	British India ...	Form 911 27.2.27 to 17.3.27 ...	4.4.27.
<i>Maunganui</i> ...	Davey, A. H. ...	C. G. Eustace ...	" M.	Union S.S. Co. of N.Z. ...	" 4.6.26 to 9.7.26 ...	23.8.26.
<i>32 Maureunia</i> ...	Diggle, E. G., R.D., Capt., R.N.R.	E. R. Taylor, J. A. Quarrie, G. Duguid.	W.T.	Cunard ...	W.T. Reg. 10.2.27 to 25.2.27 ...	28.3.27.
<i>Media</i> ...	Mallett, R. ...	S. C. Cramb ...	No. A.	T. & J. Brocklebank...	Form 911 2.5.26 to 28.6.26 ...	7.7.26.
<i>Medic</i> ...	Jones, W. H. ...	W. Nicoll ...	" A.	White Star ...	" 18.12.26 to 7.1.27 ...	14.2.27.
<i>Megantic</i> ...	Trant, E. L., R.D., Commr. R.N.R.	H. A. Billiard, R. Conway, J. C. Boyce.	" A.	" "	W.T. Reg. 6.12.26 to 26.12.26...	29.12.26.
<i>22 Melita</i> ...	Notley, A. H. ...	J. Shearer, N. J. P. Roberts	W.T.	Canadian Pacific ...	" 19.2.27 to 9.3.27 ...	14.3.27.
<i>Memnon</i> ...	Melling, C. F. ...	L. S. Evans ...	No. A.	A. Holt ...	Form 911 5.11.26 to 19.12.26...	6.1.27.
<i>21 Metagama</i> ...	Freer, A. Commr., R.N.R.	R. Walker, J. H. Lewis ...	W.T.	Canadian Pacific ...	W.T. Reg. 4.3.27 to 22.3.27 ...	29.3.27.
<i>Middlesex</i> ...	Macrae, A. B. ...	...	No. M.	Federal ...	Form 911 14.2.27 to 27.2.27 ...	21.3.27.
<i>Minderoo</i> ...	Richardson, E. ...	B. J. Bennie, W. J. McPhedran, J. H. Oxtan.	" A.	West Australia Nav. Co.	Met. Log. 2.5.26 to 4.10.26 ...	1.12.26.
<i>Minna</i> ...	Mackenzie, G. G. ...	J. H. Hennessey ...	" A.	Scottish Fishery Board	Form 911 29.1.27 to 14.3.27 ...	17.3.27.
<i>23 Minnedosa</i> ...	Griffiths, J. N. ...	J. P. Dobson, G. Mowatt ...	W.T.	Canadian Pacific ...	W.T. Reg. 5.3.27 to 22.3.27 ...	28.3.27.
<i>Minnesota</i> ...	Pollard, W. F., D.S.O., Capt., R.N.R.	...	No. M.	H.M. Transport ...	Form 911 5.2.27 to 31.3.27 ...	12.4.27.
<i>Minnetonka</i> ...	Gates, T. F., C.B.E.	H. E. McCartney ...	" M.	Atlantic Transport ...	" 28.2.27 to 20.3.27 ...	23.3.27.
<i>Minnewaska</i> ...	Claret, F. H., C.B.E., Commr. R.N.R.	A. R. Stevens ...	" M.	" "	" 17.2.27 to 7.3.27 ...	14.3.27.
<i>Mirror, C.S.</i> ...	Gibson, L. ...	A. G. Watts ...	" M.	Eastern Tel. Co. ...	" 8.3.27 to 17.3.27 ...	8.4.27.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed Received up to 13.4.27.	Date Received.
Mississippi ...	Wylie, J. T. J. ...	C. H. Denton ...	No. A.	Atlantic Transport ...	Form 911 14.1.27 to 23.2.27 ...	1.3.27.
Moldavia ...	Burleigh, C. W., D.S.O., R.D., Capt., R.N.R.	R. H. Maskell ...	" M.	P. & O. ...	" 5.12.26 to 23.12.26...	19.1.27.
Mongolian Prince ...	Edwards, W. ...	V. E. Palmer ...	" A.	Prince ...	" 21.12.26 to 6.3.27 ...	17.3.27.
24 Montcalm ...	Hamilton, G. ...	H. McFadyen ...	" W.T.	Canadian Pacific ...	W.T. Reg. 27.2.27 to 18.3.27 ...	22.3.27.
25 Montclare ...	Webster, G. S., R.D., Lt.-Commr. R.N.R.	E. Shergold, A. Mansey, R. W. Jackson.	" W.T.	" ...	" 13.3.27 to 1.4.27 ...	5.4.27.
Montferland ...	Van Noppen, C. D.	W. Slooten ...	No. M.	Holland Lloyd ...	Form 911 16.10.26 to 4.11.26...	9.11.26.
27 Montclair ...	Turnbull, J., A.d.C., C.B.E., R.D., Capt., R.N.R.	F. E. Williams, L. Ham- mersley, N. A. Goater, J. Roche.	" W.T.	Canadian Pacific ...	" 5.8.26 to 6.11.26 ...	17.11.26.
26 Montrose ...	Landy, E. ...	A. Watt, F. Hutchings ...	"	" ...	" 23.1.27 to 11.2.27 ...	16.2.27.
20 Montroyal ...	Griffiths, E., Lieut.- Commr., R.N.R.	R. Antrobus ...	"	" ...	" 20.2.27 to 10.3.27 ...	14.3.27.
Moresby ...	Edgell, J. A., O.B.E., Capt., R.N.	W. H. Martin ...	M.L.	His Majesty's Australian Ship.	Form 911 17.7.26 to 22.7.26 ...	11.4.27.
Morvada ...	Mills, T. L., O.B.E., R.D., Commr., R.N.R.	A. J. Norris ...	No. M.	British India ...	Met. Log. 31.8.26 to 14.12.26	24.1.27.
Mulbera ...	Steadman, W. R. ...	E. H. Spriggs ...	" M.	" ...	Form 911 7.11.26 to 27.1.27 ...	1.2.27.
Nagara ...	Foster, E. ...	E. Hewitt ...	" M.	R.M.S.P. Co. ...	" 9.12.26 to 23.12.26...	3.1.27.
Nagoya ...	Davis, H. C., D.S.C., R.D., Commr., R.N.R.	L. Porter, T. A. Sargeant ...	" M.	P. & O. ...	" 3.10.26 to 19.12.26...	29.12.26.
Naldera ...	Coldwell, G. J. ...	W. F. Laughland ...	" M.	" ...	" ...	" ...
Nellore... ..	Hignett, A. H., R.D., Lt. - Commr., R.N.R.	S. H. Baldwin ...	" M.	" ...	Form 911 21.7.26 to 9.1.27 ...	31.1.27
Nerbudda ...	Williams, B. N. ...	J. W. B. Archibald ...	" M.	British India ...	" 27.2.27 to 18.3.27 ...	12.4.27.
Nestor ...	Houghton, G. K. ...	D. W. Stroud, O. C. Williams, N. Anderson.	M.L.	A. Holt ...	Met. Log. 15.8.26 to 18.12.26...	29.12.26.
Newby Hall ...	Butler, J. ...	E. M. Robertson, A. W. Wise, R. Y. Smith.	"	Ellerman ...	" 26.11.26 to 6.3.27 ...	28.3.27.
Newfoundland ...	Westgarth, W. A., D.S.C.	R. F. Handley, E. Sainty, S. Moore.	"	Furness Withy ...	" 19.8.26 to 3.12.26 ...	14.12.26.
Niagara ...	Showman, A. C. ...	A. P. Cousin, D. McKenzie, T. Haulton, J. M. Hood.	"	Canadian-Australian...	" 22.9.26 to 3.1.27 ...	5.4.27.
Ningchow ...	Christie, W. ...	" ...	No. A.	A. Holt ...	Form 911 13.10.26 to 30.12.26	10.1.27.
Norfolk ...	Mead, G. F. ...	J. W. Pring ...	" A.	Federal ...	" 13.1.27 to 24.1.27 ..	7.2.27.
Norna ...	Wright, J. W. ...	T. Mather ...	" A.	Scottish Fishery Board	" 2.3.27 to 25.3.27 ...	29.3.27.
Norseman, C.S. ...	Barter, H. O., R.N., Commr., R.N.R.	R. W. Greenfield ...	" M.	Western Tel. Co. ...	" 10.3.27 to 17.3.27 ...	4.4.27.
Northwestern Miller	Nuttall, E. L. ...	" ...	" A.	Furness Withy ...	" 20.11.26 to 23.12.26	29.12.26.
Nova Scotia ...	Furneaux, S. ...	W. P. Paterson ...	" A.	" ...	" 8.9.26 to 4.10.26 ...	18.10.26.
Noushera ...	Rowe, S. N. ...	T. E. C. Earl ...	" M.	British India ...	" ...	" ...
Nubian ...	Watmough, T. M. ...	" ...	" A.	Leyland ...	Form 911 28.2.27 to 14.3.27 ...	22.3.27.
Oaklands Grange...	St. Clair, C., D.S.C.	E. J. Longheed, G. T. Hurst	" A.	Houlder Bros. ...	" 14.1.27 to 11.2.27 ...	17.2.27.
57 Olympic ...	Marshall, W., C.B., D.S.O., A.-d.-C., R.D., Capt., R.N.R.	A. Fisher, H. J. C. Day, A. E. Weller.	" W.T.	White Star ...	W.T. Reg. 17.3.27 to 31.3.27 ...	4.4.27.
Orama... ..	Shelford, W. S., Lieut. - Commr., R.N.R.	T. Fox Russell, C. K. Blake, H. Tanner.	M.L.	Orient ...	Form 911 17.3.27 to 1.4.27 ...	6.4.27.
Oranian ...	Hoskins, W. ...	W. Lawton ...	No. A.	Leyland ...	Form 911 11.9.26 to 13.11.26...	26.11.26.
Orbita ...	" ...	" ...	No.	R.M.S.P. Co. ...	" ...	" ...
Orcoma ...	Dominy, R. H., C.B.E., Commr., R.N.R.	T. Naylor, G. Gerety, T. Mit- chell.	M.L.	Pacific S.N. Co. ...	Met. Log. 18.11.26 to 4.2.27 ...	22.2.27.
Orduna... ..	Daniel, T. ...	E. Hicks ...	No. M.	R.M.S.P. Co. ...	Form 911 13.1.27 to 22.3.27 ...	28.3.27.
Orestes ...	Hanney, T. W. ...	F. T. Berry ...	No. A.	A. Holt ...	" 14.2.27 to 17.3.27 ...	28.3.27.
Orita ...	Splatt, W. A. ...	C. C. N. Gibson, D. W. Hutch- inson, G. R. Bubb, J. L. Jones.	M.L.	Pacific S.N. Co. ...	Met. Log. 22.6.26 to 29.11.26...	20.12.26.
Ormonde ...	Wyatt, A. G. N., Lieut. Commr., R.N.	A. M. Hughes ...	"	His Majesty's Ship ...	" 7.9.26 to 17.11.26 ...	1.12.26.
Ormonde ...	James, L.V., D.S.C.	" ...	No. M.	Orient ...	" ...	" ...
Oronsay ...	Owens, A. L., R.D., Lt.-Commr., R.N.R.	J. C. K. Dowding, E. Hatch, R. Galpin, R. S. Hawker.	M.L.	" ...	Met. Log. 11.9.26 to 19.1.27 ...	24.1.27.
Oroya ...	Duncan, E. E. ...	G. Lewis ...	No. M.	Pacific S.N. Co. ...	Form 911 28.10.26 to 4.1.27 ...	10.1.27.
Orsova ...	Cameron, E. P., R.D., Commr., R.N.R.	L. E. Fordham, L. J. Vesty, W. Elliott, J. F. Castle- Bartley.	M.L.	Orient ...	Met. Log. 12.12.26 to 16.3.27...	26.3.27.
Ortega ...	Barkley, E. ...	G. M. Rice ...	No. M.	Pacific S.N. Co. ...	Form 911 29.9.26 to 15.11.26...	24.11.26.
Orvieto... ..	Thorne, G. G., R.D., Commr., R.N.R.	I. E. G. Goldsworthy, G. L. Carter, J. L. Skilling, T. L. Shurrock.	M.L.	Orient ...	Met. Log. 25.12.26 to 31.3.27...	4.4.27.
Osterley ...	Hayes, I. J. ...	S. Burnnand ...	No. A.	" ...	Form 911 1.11.26 to 3.2.27 ...	8.2.27.
Otaki ...	McNish, R. ...	C. R. Brown ...	" A.	New Zealand S.S. Co. ...	" 24.12.26 to 7.2.27 ...	10.2.27.
Otira ...	Wood, C. ...	D. N. MacGregor ...	" M.	Shaw, Savill & Albion	" 15.12.26 to 29.1.27...	2.2.27.
Otranto ...	Staunton, H. G., C.B.E., R.D.	S. Myers ...	" M.	Orient ...	" 22.11.26 to 22.12.26	31.12.26.
Oxfordshire ...	Crumplin, W. E. ...	T. W. Coyne ...	" A.	Bibby Bros. ...	" 18.12.26 to 24.2.27...	3.3.27.
Pacific Shipper, M.V.	Newman, G. W. A.	G. Davis ...	" A.	Furness Withy ...	" 22.2.27 to 25.3.27 ...	29.3.27.
Pacuare ...	Lister, W. B. ...	A. Sandham ...	" A.	Elders & Fyffes ...	" 15.2.27 to 20.3.27 ...	23.3.27.
Pakeha ...	W. P. Clifton Mogg	E. T. Baker, R. E. Nicholson, A. J. Tillot.	M.L.	Shaw, Savill & Albion	Met. Log. 27.5.26 to 12.10.26...	18.10.26.
Pareora ...	Evans, J. O. ...	N. Turner ...	No. A.	Hain S.S. Co. ...	Form 911 25.10.26 to 7.11.26	9.11.26.
Paris ...	Cook, C. L. ...	Mr. Biles... ..	C.C.	Southern Ry. ...	Telegraphic Report. 15.10.26 ...	15.10.26.
Patia ...	Makepeace, S. ...	J. Kinsley ...	No. A.	Elders & Fyffes ...	Form 911 27.12.26 to 28.1.27...	14.2.27.
Patrician ...	Pugh, R. H. ...	H. W. Stanley ...	" M.	Harrison ...	" 11.6.26 to 28.9.26 ...	23.11.26.
Patrol, C.S. ...	Welsh, T. K. ...	J. S. Browne ...	No.	Eastern Extension (A. & C.) Telegraph Co. P. & O. ...	Met. Log. 18.10.26 to 15.11.26	9.2.27.
Peshawur ...	Wilding, H. G. ...	J. C. Mellonie, J. K. Crone, R. G. Wood.	M.L.	" ...	" 30.10.26 to 6.3.27 ...	18.3.27.
Piako ...	Kettlewell, C. R. ...	" ...	"	New Zealand S.S. Co. ...	" ...	" ...
Polycarp ...	Evans, T. G. ...	C. W. Smethurst ...	No. A.	Booth ...	Form 911 30.1.27 to 13.2.27 ...	26.2.27.

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Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed, Received up to 13.4.27.	Date Received.
Port Adelaide ...	Hayter, S. W. ...	R. W. Linklater, E. N. Rogers, L. Porter.	M.L.	Commonwealth & Dominion,	Met. Log. 14.8.26 to 18.12.26 ..	29.12.26.
Port Albany ...	Robinson, C. A. ...	E. A. Leavett, W. Eastoe, J. Thom.	"	" " "	" 1.5.26 to 9.11.26 ...	17.11.26.
" Auckland ...	Durham, R. S. ...	G. L. Hazlewood, C. F. Post, J. H. Sloan, H. E. Braine.	No. A.	" " "	" 18.9.26 to 22.1.27 ...	7.2.27.
" Bowen ...	Gilling, W. ...	W. R. Johnston ...	No. A.	" " "	Form 911 8.2.27 to 20.3.27 ...	28.3.27.
" Caroline ...	Williams, R. ...	"	M.L.	" " "	Met. Log. 31.5.26 to 21.12.26 ...	8.1.27.
" Darwin ...	Sawbridge, I. R. ...	E. T. N. Lawrey ...	No. A.	" " "	Form 911 23.10.26 to 4.12.26..	13.12.26.
" Denison ...	Ferris, J. ...	"	M.L.	" " "	Met. Log. 4.12.26 to 2.3.27 ...	5.4.27.
" Dunedin ...	Lea, W. H. ...	E. G. Jones, R. Needham, H. M. Post, E. Wheeler.	No.	" " "	"	"
" Fremantle ...	Kearney, F. J. ...	F. W. Elgar, G. Lovegrove, E. Luker.	M.L.	" " "	Met. Log. 30.10.26 to 11.12.26	15.12.26.
" Hacking ...	Hoad, A. C. ...	C. Hersee, L. Copeland, G. G. Langford, C. L. Webb.	"	" " "	" 12.9.26 to 5.1.27 ...	13.1.27.
" Hobart ...	Craven, R. ...	A. Cooper, R. Forrest, J. T. Weldin.	"	" " "	" 1.6.26 to 2.11.26 ...	23.11.26.
" Hunter ...	Cottell, S. C. ...	D. G. H. Bradley, B. M. Fenton, L. H. B. Bloye.	"	" " "	" 26.10.26 to 3.3.27 ...	23.3.27.
" Melbourne ...	Brown, A. H. ...	E. Craven, A. R. Martin ...	No. A.	" " "	Form 911 22.11.26 to 19.12.26	5.3.27.
" Napier ...	Jones, C. N. ...	J. L. Lewis, G. L. H. Dean	M.L.	" " "	Met. Log. 10.9.26 to 3.1.27 ...	19.1.27.
" Nicholson ...	Jack, J. ...	P. A. Munday, C. Jolly.	"	" " "	" 6.11.26 to 8.3.27 ...	24.3.27.
" Pirie ...	Kippins, T. ...	"	"	" " "	" 25.9.26 to 19.2.27 ...	28.2.27.
" Sydney ...	Higgs, W. G. ...	H. G. Boys Smith...	"	" " "	" 16.7.26 to 20.11.26..	1.12.26.
" Victor ...	Swan, L. H. ...	L. M. R. Bayly, W. J. Watson, A. Brown.	No. A.	" " "	Form 911 14.10.26 to 2.2.27 ...	11.2.27.
" Wellington ...	Farmer, F. ...	P. H. Pedrick ...	" A.	Pacific Mail S.S. Co.,	" 4.10.26 to 30.11.26..	10.1.27.
President Jackson	Griffith, J. ...	"	" A.	Admiral Oriental Line	" 1.1.27 to 23.2.27 ...	12.4.27.
President Jefferson	Nichols, F. R. ...	C. H. Moen ...	" A.	Dollar ...	" 5.9.26 to 2.11.26 ...	22.11.26.
President Wilson	Nelson, H. ...	A. M. Quinlan ...	" A.	South African Naval Service.	" 1.2.27 to 28.2.27 ...	29.3.27.
Protea, H.M.S.A.S.	Woodhouse, A. F. B., Lt.-Commr., R.N.	"	M.L.	"	"	"
Pyrhus ...	Elford, W. J. ...	"	No. A.	A. Holt ...	" 18.2.27 to 4.3.27 ...	4.4.27.
Ranpura ...	King, A. M., D.S.C.	G. Randall ...	" M.	P. & O. ...	" 12.3.27 to 30.3.27 ...	4.4.27.
Regina ...	Smith, R. G. ...	F. W. Laws, R. H. Shaw, C. Cochrane.	No.	White Star-Dominion	W.T. Reg. 6.3.27 to 27.3.27 ...	30.3.27.
Reindeer ...	Langdon, C. ...	"	C.C.	G.W. Railway	Form 911 6.3.27 to 27.3.27 ...	29.3.27.
Remuera ...	Cameron, J. J. ...	P. McCullum, P. Shakespeare	No. A.	New Zealand S.S. Co.	Telegraphic Report 12.2.27	12.2.27.
Revenazon ...	Jack, D. A. ...	L. C. Bach, C. B. Stamp ...	No.	Elders & Pyffes	Form 911 13.3.26 to 19.4.26 ...	27.7.26.
Rhodesian Transport.	Fowler, W. H. ...	"	No. A.	Houlder Bros. ...	" 8.1.27 to 4.4.27 ...	6.4.27.
Rimutaka ...	Henning, F. A. ...	H. A. Fryer, D. E. Hughes, G. O. Saul, H. Vernon	M.L.	New Zealand S.S. Co.	" 16.9.26 to 30.12.26..	4.2.27.
Risaldar ...	Park, G. ...	T. E. Hart, C. B. Miller, W. H. J. Llewellyn.	No.	Asiatic S.N. Co. ...	" 10.4.26 to 16.9.26 ...	19.10.26.
Rotorua ...	Hunter, J. B. ...	E. Lawrence, R. G. Rees, H. Cockerill.	M.L.	N.Z.S. Co. ...	" 18.11.26 to 4.3.27 ...	10.3.27.
Royal Fusilier ...	Dawson, J. ...	J. Fraser ...	No. A.	London & Edinburgh S.S. Co.	Form 911 30.1.27 to 6.3.27 ...	14.3.27.
Royal Transport... Ruapehu ...	Dove, J. ... McKellar, A. W., R.D., Capt., R.N.R.	R. W. Wass ... H. M. Selmer, W. J. Glassborow, H. C. Russell.	" A. M.L.	Houlder Bros. ... New Zealand S.S. Co.	" 24.1.26 to 24.7.26 ... Met. Log. 26.8.26 to 26.12.26..	6.8.26. 30.12.26.
Sachem ...	Murphy, J. W. ...	E. C. Free ...	No. M	Furness Withy	Form 911 26.1.27 to 4.3.27 ...	7.3.27.
St. Albans ...	{ Smith, G. L. ... Diamond, S. L.	{ J. M. Heddlie, F. O. Colvin, R. S. Millington.	M.L.	Eastern and Australian	Met. Log. 7.9.26 to 29.12.26 ...	26.2.27.
St. Helier ...	Mulhal, W. ...	C. Bell ...	C.C.	G.W. Railway	Telegraphic Report 4.11.26 ...	4.11.26.
St. Julien ...	Langdon, C. H. ...	C. Joy ...	"	"	" 12.4.27 ...	12.4.27.
St. Andrew ...	Bearpark, E. W. ...	J. G. Feint ...	No. A.	Rankin Gilmour	Form 911 2.1.27 to 17.2.27 ...	11.3.27.
Salaga ...	Sola, P., D.S.O.	C. V. Evans ...	" A.	Elder Dempster	" 18.12.26 to 28.2.27..	4.3.27.
38 Samaria ...	McNeill, S. G. S., R.D., Capt., R.N.R.	C. S. Williams, W. B. Tanner, A. B. Fastig.	W.T.	Cunard	" 23.1.27 to 18.2.27 ...	4.4.27.
Saxon ...	Owen, S. H. ...	E. G. Broodbank ...	No. A.	Union Castle	W.T. Reg. 23.1.27 to 14.2.27 ...	1.3.27.
Scindia ...	Matthews, W. ...	R. S. Paton ...	" A.	Anchor ...	Form 911 27.8.26 to 18.10.26..	29.10.26.
Scholar... ..	Egerton, J. J. ...	W. A. Pemberton ...	" M.	Harrison ...	" 18.12.26 to 2.4.27 ...	12.4.27.
Scotia ...	Prichard, S.D., M.B.E.	O. W. L. Jones ...	C.C.	L.M. & S. Rly	" 19.12.26 to 2.2.27 ...	9.2.27.
Scottish Bard	McDonnell, S. ...	J. W. Lilley ...	No. A.	Tankers Ltd.	Telegraphic Report 13.4.27 ...	13.4.27.
33 Seythia ...	Prothero, W. ...	G. Overton, J. C. Munro, P. G. Britten.	W.T.	Cunard ...	Form 911 22.11.26 to 3.12.26	3.1.27.
Sheaf Lance	Earl, C. ...	"	No.	W. A. Souther ...	W.T. Reg. 10.1.27 to 2.2.27 ...	3.3.27.
Sheaf Mount	Groves, C. V. ...	W. Thomson ...	No. A.	"	Form 911 26.1.27 to 19.2.27 ...	3.3.27.
Sheaf Spear ...	Whitfield, G. A., O.B.E.	S. J. Dring, T. B. Fishley ...	M.L.	"	Form 911 2.2.27 to 9.2.27 ...	2.3.27.
Shropshire, M.V.	Adamson, B. W. ...	W. L. Whiteside, R. Cumings, W. H. Brittain, J. E. Goldsworthy.	"	Bibby ...	Met. Log. 14.10.26 to 13.2.27..	1.3.27.
Socrates ...	Taylor, F. C. ...	W. E. Jordan ...	No. A.	Lampport & Holt ...	Met. Log. 6.11.26 to 15.1.27 ...	18.1.27.
Soekaboemi	Z. W. Flach ...	J. Watson ...	" M.	Rotterdam Lloyd ...	Form 911 22.12.26 to 14.3.27..	28.3.27.
Somme ...	Miles, F. R., Commr. R.D., R.N.R.	D. Fraser, J. G. F. Betson ...	" A.	R.M.S.P. Co. ...	" 11.9.26 to 5.1.27 ...	2.2.27.
Spero ...	Montgomery, H. ...	T. E. Fea, D. Millward ...	M.L.	Ellerman Wilson ...	" 1.5.26 to 23.7.26 ...	13.8.26.
Stockwell ...	Thowless, E. ...	W. Gibson ...	No. A.	Brocklebank ...	Met. Log. 17.6.26 to 18.12.26..	24.12.26.
Surrey ...	Lamb, C. B. ...	S. C. Bradley ...	" A.	Federal ...	Form 911 26.9.26 to 1.1.27 ...	21.1.27.
Suwa Maru	Gotoh, M. ...	"	" A.	Nippon Yusen Kaisha	"	"
Syltafield...	Biddick, E. ...	E. Holmes ...	" A.	Hunting & Son ...	Form 911 22.1.27 to 20.2.27 ...	11.3.27.
Tainui ...	Elford, H. C. ...	P. S. Horwood ...	" A.	Shaw, Savill & Albion	" 2.3.27 to 2.4.27 ...	6.4.27.
Tairoa...	Summers, W. G. ...	S. A. Bannister ...	" A.	"	" 15.12.26 to 20.1.27..	24.1.27.
Tahiti	{ Aldwell, B. M. ... Crawford, R.	{ D. A. Menlove ...	" A.	Union S.S. Co. of N.Z.	" 30.3.26 to 12.5.26 ...	17.5.26.
Taiping	Frame, A. M. ...	"	M.L.	Yuill & Co. ...	" 3.12.26 to 7.2.27 ...	23.3.27.
Talhybuis	Davie, J. ...	"	No. A.	A. Holt ...	Met. Log. 17.9.26 to 8.1.27 ...	15.3.27.
Tamara	Hartman, W. H. ...	T. A. Smith ...	" M.	Shaw, Savill & Albion	Form 911 18.12.26 to 12.1.27..	1.2.27.
Tanda ...	Pilcher, E. ...	J. W. Kavanagh, B. Dun, C. Stratford H. E. Nuzum.	" M.	E. & A. S.S. Co.	Form 911 27.8.26 to 3.12.26 ...	7.1.27.
Tambora ...	Huisman, N. ...	H. Van Manen ...	" M.	Rotterdam Lloyd ...	" 29.8.26 to 14.10.26..	30.10.26.
Teiresias ...	Wilkinson, W. H. ...	W. Stanger ...	" A.	A. Holt & Co. ...	" 3.1.27 to 13.3.27 ...	17.3.27.
Tekoa ...	Barnett, H. ...	P. H. Chalwin ...	" M.	New Zealand S.S. Co.	" 6.2.27 to 17.3.27 ...	21.3.27.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 13.4.27.	Date Received.
<i>Telamon</i> ...	Clark, D. ...	F. Wardrobe ...	No. A.	A. Holt ...	Form 911 19.2.27 to 7.3.27 ...	29.3.27.
<i>Teucer</i> ...	Hodgson, R. N. ...	D. T. Thorne ...	" A.	" ...	" 24.2.27 to 13.3.27 ...	13.4.27.
<i>Themistocles</i> ...	Jermyn, W. M. ...	H. C. Howe ...	" M.	Aberdeen ...	" 13.2.27 to 4.3.27 ...	29.3.27.
<i>Theseus</i> ...	Jones, E. ...	W. A. Fyffe ...	" A.	A. Holt ...	" 30.1.27 to 21.2.27 ...	14.3.27.
<i>Titan</i> ...	Wilkinson, T. G. ...	D. MacTavish, G. W. Best, C. G. Bailey.	M.L.	" ...	Met. Log. 27.8.26 to 12.2.27 ...	23.2.27.
<i>Tongariro</i> ...	White Parsons, V.C.	J. J. Youngs ...	No. M.	New Zealand S.S. Co.	Form 911 8.1.27 to 15.2.27 ...	21.2.27.
<i>Transylvania</i> ...	Bone, D. W. ...	P. Middleton ...	" A.	Anchor ...	" 29.1.27 to 2.3.27 ...	12.4.27.
<i>Traveller</i> ...	Worthington, B. ...	" ...	" M.	T. & J. Harrison ...	" 23.12.26 to 8.1.27 ...	17.1.27.
<i>Trematon</i> ...	Evans, B. ...	R. Gregory, J. Toms, J. Bell.	M.L.	Hain S.S. Co.	" ...	" ...
<i>Turakina</i> ...	Hamilton, E. S. ...	A. N. Marshall, G. S. Shepherd	No. M.	New Zealand S.S. Co.	Form 911 27.9.26 to 5.1.27 ...	28.1.27.
<i>Tuscana</i> ...	Smart, R. W. ...	J. Hamilton ...	" A.	Anchor ...	" 29.1.27 to 20.2.27 ...	24.2.27.
<i>Tyndareus</i> ...	Scott, J. R. ...	A. G. Phillips, F. Howe, A. R. McDavid.	M.L.	A. Holt ...	Met. Log. 1.7.26 to 22.11.26 ...	10.1.27.
<i>Ulimaroa</i> ...	Wylie, W. J. ...	" ...	No. M.	Huddart Parker, Ltd.	Form 911 4.2.27 to 28.2.27 ...	12.4.27.
<i>Ulysses</i> ...	McHutchon, W. ...	E. C. Radford ...	" A.	A. Holt ...	" 18.12.26 to 30.1.27 ...	3.2.27.
<i>Umvolsi</i> ...	Barnes, E. W. ...	R. L. B. Ryde ...	" A.	Bullard King ...	" 23.1.27 to 4.2.27 ...	14.2.27.
<i>Valencia</i> ...	Inch, F. ...	G. Meggitt ...	" M.	Cunard ...	" 12.1.27 to 10.4.27 ...	13.4.27.
<i>Vardulia</i> ...	Fear, E. T. C. ...	L. D. W. Rand ...	" A.	" ...	" 30.1.27 to 13.3.27 ...	4.4.27.
<i>Verbania</i> ...	Pooley, T. S. M. ...	A. F. Watts ...	" A.	" ...	" 23.5.26 to 3.8.26 ...	13.12.26.
<i>Vigilant</i> ...	Simpson, E. S. S. ...	M. Jamieson ...	" A.	Scottish Fishery Board	" 3.3.27 to 28.3.27 ...	4.4.27.
<i>Waiotapu</i> ...	Norton, A. ...	S. A. Smith ...	" M.	Canadian-Australasian	" 28.12.26 to 20.2.27 ...	20.3.27.
<i>Wairuna</i> ...	Whyborn, H. S. ...	R. Howie, G. H. George, A. W. Rabbitts.	M.L.	Union S.S. Co. of N.Z.	Met. Log. 19.6.26 to 25.9.26 ...	29.12.26.
<i>Walmer Castle</i> ...	Chave, Sir B., K.B.E.	H. A. Deller ...	No. A.	Union Castle ...	Form 911 7.5.26 to 23.5.26 ...	7.6.26.
<i>Wangaratta</i> ...	Scutt, W. ...	T. W. Worthingham, S. R. Millard, K. M. Morrison, A. G. Brooks.	M.L.	British India ...	Met. Log. 18.9.26 to 1.2.27 ...	7.2.27.
<i>Warfield</i> ...	Steel, R. ...	C. M. Quick ...	No. A.	" ...	Form 911 11.2.27 to 4.3.27 ...	11.3.27.
<i>War Nizam</i> ...	Moncrieff, T. ...	J. Row ...	" A.	British Tankers ...	" 24.2.27 to 2.4.27 ...	13.4.27.
<i>Welshman</i> ...	Rollerson, W. ...	J. Mendus ...	" M.	White Star-Dominion	" 22.10.26 to 14.11.26 ...	26.11.26.
<i>William Scoresby</i> ...	Mercer, G. M., D.S.C.	A. Irving, M. C. Lester ...	M.L.	Falkland Islands Government.	Met. Log. 5.7.26 to 23.12.26 ...	4.4.27.
<i>R.S.S.</i>	Lt.-Commr., R.N.R.	" ...	"	Union Castle ...	" 1.6.26 to 20.9.26 ...	2.10.26.
<i>Windsor Castle</i> ...	Strong, H., R.D., Commr., R.N.R.	F. Wilbraham, C. L. Lovegrove, J. Montgomery, F. Norfolk.	"	" ...	" ...	" ...
<i>Winifredian</i> ...	Harrocks, W. ...	" ...	No. M.	Leyland ...	Form 911 14.2.27 to 19.3.27 ...	29.3.27.
<i>Wonganella</i> ...	Suffern, H. ...	G. F. Phillips ...	"	W. Crossby & Sons ...	" 18.11.26 to 4.12.26 ...	10.1.27.
<i>Woodarra</i> ...	Hudson, H. T. ...	L. D. Graham, G. Hyland, H. Goater, J. Wallace.	M.L.	British India ...	Met. Log. 20.3.26 to 8.9.26 ...	15.9.26.
<i>Yorkshire</i> ...	Millson, G. E. ...	W. M. C. Higginson ...	No. A.	Bit-by ...	Form 911 15.1.27 to 26.3.27 ...	4.4.27.
<i>Conway H.M.S.</i>	Broadbent, H. W., R.D. Capt., R.N.R.	The Senior Cadets...	Cadets' M.L.	" ...	Cadets' Met. Log. 23.1.27 to 2.4.27 ...	4.4.27.
<i>Pangbourne Nautical College.</i>	Tracy, A. F. G., Commr., R.N.	" ...	"	" ...	Cadets' Met. Log. 16.1.27 to 26.3.27 ...	30.3.27.
<i>Worcester, H.M.S.</i>	Sayer, M. B., O.B.E., R.D., Capt., R.N.R.	" ...	"	" ...	Cadets' Met. Log. 24.9.26 to 15.12.26 ...	17.12.26.
<i>Abaco</i> ...	" ...	The Keepers ...	Lighthouse Register.	" ...	Lighthouse Register 1.1.26 to 30.6.26 ...	26.10.26.
<i>Cay Lobos</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.26 to 30.6.26 ...	26.10.26.
<i>Double Headed Shot</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.26 to 30.6.26 ...	26.10.26.
<i>Inagua</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.1.26 to 30.6.26 ...	26.10.26.
<i>Sombrero</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.7.26 to 31.12.26 ...	1.2.27.
<i>Watling Island</i> ...	" ...	" ...	"	" ...	Lighthouse Register 17.1.26 to 20.7.26 ...	19.11.26.
<i>Cape Pembroke (Falkland Is.).</i>	" ...	" ...	"	" ...	Lighthouse Register 1.7.26 to 31.12.26 ...	24.2.27.

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 31.3.27.	Date Received.
<i>Darro</i> ...	Matthews, G. P. ...	W. Halder-Campe ...	R.M.S.P. Co. ...	Water Samples ...	10.3.27.
<i>Desado</i> ...	Shillitoe, B. ...	F. F. Wheeler ...	" ...	" ...	13.1.27.
<i>Hillsbrand</i> ...	Maddrell, J. ...	A. Allan ...	Booth ...	" ...	14.1.27.
<i>Manzanara</i> ...	Edwards H. ...	W. E. A. Duff ...	Elders & Fyffes ...	" ...	3.1.27.
<i>Reventazon</i> ...	Jack, D. A. ...	L. C. Bach ...	" ...	" ...	21.2.27.

June, M.O., 1927.