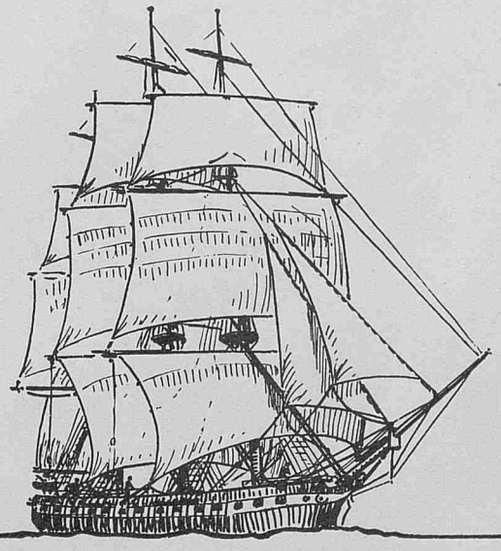

VOL. XIII, No. 122. THE MARINE OBSERVER. APRIL 1936.

TABLE OF PRINCIPAL CONTENTS

The passing of King George V on the night of January 20th, 1936, is profoundly mourned by the whole of the sea services.

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King George V

"After he had served his own generation by the will of God, he fell on sleep, and was laid unto his fathers."

THE CURRENT MATTER OF GREATEST INTEREST.

We are now engaged, and shall be for the next two years, in charting the currents of the South Pacific. It is of the utmost importance that all who navigate or have navigated that ocean should be aware of this.

The Hydrographer of the Navy is kindly calling the attention of His Majesty's Ships, using the South Pacific, to the desirability during the next two years of their communicating knowledge derived from experience of the peculiarities of currents, seasonal variations, width of the main streams, particularly those off a coast, and inshore currents, and counter-currents.

The Port Meteorological Officers at Liverpool and London, and the Merchant Navy Agents at Sydney, N.S.W., are also calling the attention of the masters of merchant ships navigating the South Pacific to the desirability of their communicating similar knowledge to the Marine Division.

Since 1923 during the re-charting of the Atlantic and Indian Oceans, and the preliminary investigation of the currents observed by ships traversing the South Pacific from Panama to Australasia, a number of masters of ships and others of great experience have sent in information which has been of the greatest value.

For instance, when we were charting the currents of the South Atlantic in 1923, the late Captain L. R. MILLARD, of R.M.S. *Kenilworth Castle*, drew attention to a double maximum in the seasonal strength of the Equatorial and Guinea Currents, which subsequent computation of all observations available proved to be the fact. Captain MILLARD, by making known his discovery, made in long experience in running to the Cape, showed us a matter which might otherwise have been overlooked; and which now is established for a number of main currents in other parts of the oceans.

His interest and action in sending in his experience and views has influenced the whole of our work in investigating the currents.

Then as to seamen ashore in different parts of the world, who are in close touch with shipping, and how they can assist us.

The case of Captain R. G. SARGEANT, Port Captain of Mombasa, is perhaps the most useful illustration. After reading my notes entitled "A matter of great interest to the Merchant Navy" in the March 1931 number, Captain SARGEANT consulted the masters of ships calling at Mombasa. With the information they afforded him, his own experience in navigating these waters, and from wireless communication with a ship broken down and drifting in the East African Coast Current, he indicated the probable best distance off the land to navigate against or with the current, published in the September 1931 MARINE OBSERVER; with the result that investigation was made by computed observations in the Marine Division, and the average strength of the currents at varying distances from the land established to be in general agreement with Captain SARGEANT'S deductions.

Less is known at present of the currents of the Pacific Ocean than either those of the Indian or Atlantic Oceans.

During the present year, charts of the currents of the South Pacific south of Latitude 34° S. are being published in THE MARINE OBSERVER, and information regarding these currents is being summarized in this number and the October 1936 number.

It is mainly regarding the more northerly parts of the South Pacific that navigators of experience in that ocean are now urged to consider.

Those who have navigated these waters continuously may be able greatly to assist us. For instance, in 1925, the British Consul at Callao, Peru, sent in a report to the Foreign Office, extracts from which were published in the February 1926 number of THE MARINE OBSERVER, in which he told of severe rains, hitherto unknown at Callao, which were attributed to the influence of a strong warm southerly current, known as "Corriente del Nino," which had been experienced by ships where they would expect to find the Humboldt Current running in the opposite direction.

British Consuls and others suitably situated, may be able to provide information, which when combined with the observations of set and drift of current sent in by observing ships, may throw more light upon this influence of current upon climate.

On the west coast of South Africa, the effect of the cold Benguela Current, which runs off that coast as far north as the mouth of the Congo, intensifies the aridity of the coast; and the fogs and the sooopwa, S.S.W. wind so called by the Hottentots, are well known phenomena.

The masters of ships navigating the waters on the east coast of Australia will greatly assist, by either consulting Captain N. G. ROSKRUGE, or Captain G. B. MERCER, and pointing out to them the peculiarities of the East Australian Coast Current; or if there are those who after long experience prefer to send in remarks upon the strength of the current at different distances from the land, and any other variations, with a view to publication in the Marine Observer's Log, we shall be delighted to receive them.

In the more central parts of the South Pacific, and particularly among the islands, especially remote from the more frequented trade routes, more observations of set and drift of current logged since the year 1910 are desired. All British ships who can provide such observations, which have not already been returned, are asked to communicate as soon as possible with the Port Meteorological Officers whose addresses will be found on the back of the ice chart in this number, sending copies to them, or lending their logs.

In the central parts of the South Pacific and near the Equator, those who have knowledge of the currents and their peculiarities, and seasonal variations, are asked to communicate direct, or through Captain N. G. ROSKRUGE, at the Customs House, Sydney, N.S.W.

It may seem to many that, so long as observations of the set and drift of ships attributed to current, are regularly and constantly returned to the Marine Division of the Meteorological Office, that with its capacity for investigation and all the scientific advice at its disposal, and with the support of the Hydrographic Department of the Admiralty, it is not necessary to seek the advice and views of seamen; but the fact is that their experience has played the greater part in unravelling the mysteries of ocean currents.

After over a quarter of a century spent almost continuously at sea, and 16 years in the Meteorological Office in the supervision of the work, ashore and afloat, I am convinced that it is mainly through the knowledge acquired by seamen in the course of their every day duties at sea, combined with continuous charting in the Marine Division that we have been able to accomplish most in the revision and extension of the published information of currents.

Therefore the British corps of voluntary marine observers, and all concerned, should be encouraged, and are asked to sustain their efforts in maintaining constant observation of the currents in all oceans.

SAFETY OF LIFE AT SEA.

In the January number as usual, we published those Articles of the International Convention for Safety of Life at Sea which are the law governing our work, and gave the working arrangements for carrying out the routine of the work at sea so far as weather telegraphy goes.

We also published a comparison of the severity of the weather in the North Atlantic, in which sea and swell are such factors, during the last five winters, and a short account of the weather at the time that *Blairgowrie* foundered in February last year, compiled from observations returned by regular observing ships.

As the Marine Division is called upon to provide information at the time of maritime disasters, for the purpose of Board of Trade enquiries, or for litigation in the Admiralty and other Courts, it is most desirable that we should have an understanding of what is involved; that is to say, not only the study of weather, but its effects upon ships, their working, and their crews.

Therefore we devoted as much time as we could to being present as ordinary spectator in Court when Lord Merrivale, with his assessors, investigated the cause of the loss of a number of ships in the winter of 1934–35.

Though in all these cases, as the findings indicated, weather contributed greatly, there were other causes as well.

Now, though weather telegraphy and weather forecasting are a means by which the mariner may be warned to prepare for heavy weather which is coming, why is it that such stress is laid in Article 35 upon the collection of meteorological data, for examination, and dissemination.

Of course, collection includes that by means of wireless communication; but apart from central weather forecasting, collection, examination, and dissemination here also mean the obtaining of and providing to all concerned, information of conditions at sea whereby the construction, equipment, manning, and loading of ships may be regulated so as to ensure a proper margin for safety.

The collection of routine observations by means of the meteorological log kept in a necessarily limited number of British ships has proceeded since 1855. A great deal of meteorological information over the oceans has been collected; and in "Work of the Year" ending 31st March, 1935, in the July, 1935, number, we give information of the present state of the work on the climatic survey of the oceans.

It is hoped that before long we may be able to add to this statement.

Meanwhile, while the lessons which should be learned from these disasters are fresh in the minds of the merchant navy, it should be stressed, that experience is the safest, surest and best foundation upon which to work.

Now as well as routine observations, what we call in the meteorological log "additional remarks" are valuable. Additional remarks, particularly if they give a clear, accurate, and enlightening account of actual experiences in emergencies or when hazard has been avoided, may be invaluable for the purpose of regulations.

It may be that the reticence, of which we seamen have rather prided ourselves, has been part of the cause; but it is a fact that the shore community is still woefully ignorant of the conditions which govern the working of shipping at sea.

The Marine Division of the Meteorological Office is the agency by which His Britannic Majesty's Government collects and disseminates information of weather, climate, currents, and ice; and THE MARINE OBSERVER is the chief organ of its dissemination.

The officers of the merchant navy are asked, as well as carrying out the specified routine voluntary meteorological work, to send in careful, authentic accounts of their experiences, which are often great in overcoming the hazards of the sea, with a view to publication in THE MARINE OBSERVER, so that the information may be readily available to all concerned.

OBSERVATION AND WEATHER FORECASTING AND SOME OF THEIR BEARINGS ON THE SEA SERVICE.

The improvement in observing atmospheric pressure at sea since the Great War is very great, and it has taken place so steadily and surely that it is probably not realized by many of those in the merchant navy who have made it.

Even after wireless telegraphy had made information of distant barometeric observation possible at sea, how many of us in those good old days before the War really knew how to put on a chart the lines along which there was equal atmospheric pressure?

Yet to forecast or estimate the strength and direction of the winds which we are approaching or which are approaching us, it is essential to know the position and trend of the different isobars.

The isobar is the key to weather forecasting.

The barometer is like any other tool, implement, or instrument; it only becomes efficient if properly understood, cared for, and worked by those who use it.

The realization that weather forecasting was not only possible by a specially privileged and situated few in observatories ashore, and the growing successful endeavours of officers at sea which followed this realization, have been the impelling force which has brought about the great improvement in barometric observation.

It was our privilege in 1921 to explain to a Committee of the Chamber of Shipping of the United Kingdom some of the advantages which might accrue to navigation by the more general use of reliable barometers and thermometers at sea.

This Committee was composed of four very eminent and experienced seamen, whose names guaranteed the wisdom of their recommendations,—Captain Sir BENJAMIN CHAVE, then Marine Superintendent of the Union Castle Line, Captain E. A. VEALE, then Secretary of the Orient Line, Captain R. J. NOAL, Marine Superintendent of the Shaw Savill Line, and Captain T. S. ANGUS, Nautical Inspector, P. & O. Line.

Their report to the President of the Chamber of Shipping contained the following :—"Your Committee recommends that new steamers be equipped with good class mercurial barometers with scales according to the modern practice in addition to the inch scale, and also good thermometers such as those which we understand are in use in the P. & O. Company."

Many more British ships now carry reliable barometers in their outfit, and as the knowledge of the value of weather forecasting on board ship is proved to shipowners, by those who navigate their ships, no doubt the absence of a good mercurial barometer in the ship's outfit will become a rare occurrence.

As the officers of the merchant navy develop the dual capacity of navigating ships and piloting aircraft, the necessity for reliable information of atmospheric pressure at the sea surface for safe aerial navigation will be another incentive.

The air pilot obtains his height by an altimeter, in much the same way as a surveyor obtains the altitude of a mountain. The measurement of height being dependent upon the difference of atmospheric pressure from that at the sea surface, so that if the air pilot has not recent information of the atmospheric pressure at sea level in his vicinity, which he can only obtain through observation on board ships, his altimeter may register a height much in error, and so cause disaster.

That the observation of the temperature of the air and the sea surface has not been so generally improved in the merchant navy seems evident; for whether or not shipowners have followed the advice of the Committee of the Chamber of Shipping above quoted regarding thermometers to the same extent as the barometer, the thermometers of many ships appear to be so inaccurate as to render temperature observation unreliable.

As experienced seamen have thought for many many years, changes of weather are due in the first place to changes of temperature, hence :

> "To forecast the different kinds of weather, that is whether to expect fog or clear weather, wet or fine weather, it is necessary to know something of the temperature of the air and of the sea."

Of recent years Professor J. BJERKNES of Norway has done much to clarify how to interpret the part which temperature plays in the development, continuance, and dying out of cyclonic storms.

As to fog, well it is not too much to say that temperature of the sea and the air are the keys to forecasting it; but all this is dealt with in a "Handbook of Weather Currents and Ice, for Seamen" as simply and as clearly as we can.

Unless a ship has accurate and reliable thermometers, it is better that she should not report temperature. For this and other reasons, in the little pamphlet, M.O. 329, "Decode for Wireless Weather Messages from Ships" (in which notes for the guidance of masters of British ships are given), a form of coded message which omits sea temperature is given; and stress is laid upon the desirability of reporting the set and drift of current observed or ice seen.

The late Captain HENRY TOYNBEE used to say: "a blank space is preferable to a doubtful observation." Nowadays it is not too much to say that when a ship only has thermometers which are known to be erroneous, it may be worse than folly to report such observed temperature by wireless telegraphy.

All British "A" Selected Ships are equipped with thermometers certificated by the N.P.L., or in the old phraseology of the sea, the Kew Certificate.

Now "A" Selected Ships make their reports on 2100 metres, and they have a range of about 1500 miles, and there are British "A" Selected Ships working on all the main trade routes of the oceans,

so that not only are temperature observations available in fair number for forecasting at sea, but in port their thermometers afford a means whereby through the courtesy of the captain, ships may compare their own thermometers, and so ascertain their accuracy.

The instruments lent to British shipping by the Meteorological Office are distributed as far as possible so as to be of the greatest assistance to the whole merchant navy, and to the Meteorological services in all parts of the world.

At the present time, of 358 observing ships in the fleet list, 192 have on board Meteorological Office barometers, Kew pattern, while 148 use their own mercurial barometers which, after careful comparison and examination by the Port Meteorological Officers and Merchant Navy Agents, have been reported upon as suitable for carrying out the functions of Selected Ship.

All "A" Selected Ships, which at present number 109, are equipped as before stated, with Meteorological Office thermometers, and these are used in either Portable or Modified screens. The majority of "A" Selected Ships have Meteorological Office barographs, and a large number use their own barographs.

All Meteorological log-keeping ships, of which at present there are 40, are entirely equipped with Meteorological Office instruments. These ships are engaged in the work necessary for the completion of the survey of the climates of the oceans, for which data are being collected especially from the Pacific and certain less traversed regions of the North Atlantic, the Arctic and Antarctic.

Also thermometers and screens are lent to 18 cross-Channel steamers for reporting in home waters.

The Meteorological Office instruments lent to observing ships are provided for a two-fold purpose, namely :

(1) To ensure the accuracy of data collected for the purpose of research and for weather forecasting, ashore and afloat.

(2) To provide patterns which may be copied, with advantage to all concerned, for general use at sea in merchant ships.

Now from time to time it has been suggested that more instruments should be lent to merchant ships. Indiscriminate lending of instruments at the cost of the public funds is neither in the interest of the merchant navy nor the nation. The cost of maintaining instruments on loan to a great many ships is not only the initial cost of the instruments themselves, and the cost of the retest, overhaul, and repair, but also a proportion of the cost of maintaining Port Meteorological Offices and Agencies.

To materially increase Meteorological Office equipment afloat in British merchant ships and to maintain efficiency would not be possible with the existing establishment of personnel at the ports.

Those who make these suggestions can scarcely realize the amount of work done by the Port Meteorological Officers and Merchant Navy Agents and the Instruments Division, let alone that of the Marine Division, placing instruments on board ships, transferring them to other ships, withdrawing them, and so on.

Many officers in the merchant navy have had some experience at one time or another of the work involved in Government Departmental storekeeping. That experience should be sufficient to indicate how much more convenient and effective to the merchant navy good ships' instruments may be.

There is little doubt that weather forecasting at sea by means of weather charts is growing. Many ships do this work. Most of their officers appear to be too modest or to dislike any limelight whatever; but recently we have received some striking evidence of good work done, which we intend to publish in the appropriate numbers of THE MARINE OBSERVER.

The Royal Navy, realizing the value of good weather forecasting to the fleet, has given great encouragement to its officers; and we have seen work done by naval officers which has enhanced their value to their service.

It is only right that those officers of the merchant navy who specially excel as weather forecasters should receive the credit they deserve; and therefore commanders are asked to send in occasionally with a view to publication a few samples of weather charts made by their officers at sea, together with the forecasts made therefrom, with remarks as to the advantages gained to the navigation of the ship.

It will greatly assist if the few sample weather charts sent in are carefully drawn with *black* ink, preferably Indian ink.

Not only may the development of the skill of weather forecasting, which comes natural to many seamen, tend to improve navigation, and thereby enhance the value and prestige of the officers, but the improvement in observation and communication which will result, will tend also to enhance the efficiency and the value of the State meteorological services ashore.

It is often claimed that the great improvement in safety of life at sea which has taken place is due to invention and science.

That of course is true, but invention and science in themselves could not have brought this about unless used with good seamanship.

It is this development of weather forecasting in ships at sea as a branch of seamanship which we wish to encourage.

MARINE SUPERINTENDENT.

London.
January 18th, 1936.

April, May and June.

It is hoped that these pages will be filled each quarter with a selection of the contributions of Mariners in manuscript, or remarks from the Logs and Records of regular Marine Observers.
Responsibility for statements rests with the Contributor.

ICE SIGHTED EXCEPTIONALLY FAR SOUTH.

North Pacific.

THE following report of ice has been received from M.V. *King Neptune*, Captain R. EVANS.

April 11th 1935 in Latitude 38° 20′ N., Longitude 155° 39′ E. passed a piece of ice about 40 feet long and 4 feet in height. The shape was roughly as shown in sketch.

NOTE :—As far as our information goes this position is the farthest south that ice has been reported in this Longitude.

SHARKS.

Peruvian Waters.

THE following is an extract from the Meteorological Record of S.S. *Orduna*. Captain A. RIDYARD. Valparaiso to Balboa via Ports. Observer. Mr. R. D. ECKFORD, 3rd Officer.

27th June 1935 about Noon A.T.S. off the coast of Peru. From a position 4 miles west of Talara we steamed northward for some 30 miles passing several hundreds of hammer-head sharks each 3 to 5 ft. (approx.). The sea was literally alive with them so that at any time from any position on deck without moving, several could be seen.

Although a fresh breeze was blowing the bright sunlight rendered them perfectly clear for observation as they lazily swam about with their dorsals awash.

The occurrence of such multitudes of sharks is by no means uncommon between C. Blanco and Malpelo Point on the south side of the Guayaquil estuary, but never have I seen such large numbers south or west of C. Blanco.

First seen in Latitude 4° 33′ S., Longitude 81° 24′ W. Last seen in Latitude 4° 06′ S., Longitude 81° 17′ W.

Wind S. by W. 5. Cloudless. Air 73° F. Sea 75° F.

EARTHQUAKE TREMOR.

At Yokohama.

THE following is an extract from the Meteorological Log of M.V. *Alynbank*. Captain. D. GILLIES. At Yokohama. Observer. Mr. G. LINFIELD, 3rd Officer.

15th June 1935 whilst in dry dock at Yokohama, vessel experienced an earthquake tremor at 6.15 a.m. lasting about 10 seconds and of sufficient intensity to shake vessel very distinctly against the dry dock supports.

PHOSPHORESCENCE.

South Atlantic Ocean.

THE following is an extract from the Meteorological Record of M.V. *Durham*. Captain. H. L. UPTON, D.S.C., R.D., R.N.R., Liverpool to Las Palmas. Observer. Mr. W. J. V. BRANCH, 3rd Officer.

April 8th 1935 10 to 12 p.m. A.T.S. passed through very extensive and very brilliant phosphorescent waters. At first it was noticeable only as the waves broke, but later, large and very intense patches of milky fluid were encountered. As mentioned in the MARINE OBSERVER'S HANDBOOK these patches did definitely assert a calming effect upon the sea surface. They could be compared to the effect that would be produced by light oils on the water. It was difficult to estimate the exact size of these patches but they were roughly circular in shape and of about 2 miles in diameter. Between them the water showed only normal phosphorescence. Some of this "milky fluid" caught in a bucket revealed nothing abnormal and it is possible the source of this light may be some distance beneath the surface. The horizon appeared to vanish altogether, being replaced by a broad band of pale light reaching, approximately, 10° up from the true horizon. An important feature was the fact that all sense of judging visibility and distances was destroyed. Air Temperature 79° F. Sea Temperature at frequent intervals 81° F.

Position of ship, Latitude 7° S., Longitude 10° W.

Bay of Bengal.

THE following is an extract from the Meteorological Record of S.S. *City of Evansville*, Captain D. O. EVANS. Calcutta to U.S.A. via Suez. Observer, Mr. A. G. DANIELS, 3rd Officer.

June 27, 1935, at 9.30 p.m. strange phosphorescent effects were seen. Previously the sea had presented the usual appearance, though flecked with phosphorescence. At 9.0 p.m. seven bright lights were

sighted ahead—distant probably 4 to 5 miles—each of these in turn lasted roughly 3 seconds and was eclipsed at 9.30 p.m. The first of these bright phosphorescent lights appeared—close alongside the ship—under the starboard bow, as a circular patch 100 ft. in diameter and as the ship passed over this patch it was as though a large ball, roughly 6 feet in diameter, of intensely bright light was travelling at speed from the depths to the surface. Arrived at the surface, the ball of intense light split up into small pieces which travelled to the outer edges of the circle—the whole being suffused with bright light. The phenomenon lasted between 2 and 3 seconds and was repeated five times close alongside the ship—steaming 11 knots—until 9.40 p.m. Several of these were seen in the distance also, but not after this time, when the sea resumed its normally phosphorescent appearance.

Position of ship, Latitude 10° 19′ N., Longitude 83° 27′ E.

CURRENT RIPS.

North Atlantic.

THE following is an extract from the Meteorological Log of S.S. *Aidan*, Captain C. SAXTON. Norfolk Va. to Para. Observer Lieutenant J. WHAYMAN, R.N.R., 2nd Officer.

May 26th, 1935, at 1500 A.T.S., passed through exceptionally long belt of current ripples. These ripples ran in long straight lines W.N.W. —E.S.E. Each ripple was about a cable in width and they were most regular in their uniformity. On crossing them, they could be seen to the limit of vision, in long straight " strips " like clean-cut " roads." The whole belt was about 3 miles wide, for at 15.15, vessel cleared them and the sea became normal.

These ripples are generally encountered on crossing the Brazilian Current, but not in such long pronounced straight " strips." The vessel was at the time being set well to the W.N.W., having, since noon, experienced 7 miles westerly drift and 2 miles northerly drift.

Position of ship, Latitude 3° 01′ N., Longitude 47° 22′ W.

DISCOLOURED WATER.

South African Waters.

THE following is an extract from the Meteorological Record of S.S. *Ceramic*, Captain H. C. ELFORD, Durban to Cape Town. Observer Mr. G. F. CRESSWELL, 3rd Officer.

On April 20th, 1935, from 1010 to 1125 G.M.T. and from Latitude 35° 51′ S., Longitude 21° 53′ E. to Latitude 35° 54′ S., Longitude 21° 32′ E. vessel passed through an area, extending on either side for a considerable distance, of discoloured water, varying from a dark red to bright orange. The dark red was more or less evenly distributed, but the bright orange was only in streaks of about 10 to 15 feet broad, extending in a north and south direction, as far as the eye could see. The bright orange appeared to be floating on the surface, while the dark red substance went to a considerable depth. Sea smooth and cloudless sky.

FOG AND SQUALL.

China Sea.

THE following is an extract from the Meteorological Record of M.V. *Glengarry*, Captain J. ANGIER. Tsingtao to Manila. Observer, Mr. W. B. WHYTE, 2nd Officer.

On 10th May, 1935, at 1241 Standard Time 120° E. (0441 G.M.T.), while sailing in a dense fog, with E.S.E. wind 2, and slight sea, the fog suddenly changed into heavy torrential rain which lasted 20 minutes, when the weather became fine and clear with passing showers. This rain was the outcome of a very large, black and heavy line squall, stretching from horizon to horizon and probably 5 or 6 miles wide. The weather remained clear with occasional showers until 2148 Standard Time when once more the ship was enveloped in dense fog.

Position of ship at the time of rain, Latitude 28° 46′ N., Longitude 122° 49′ E.

ABNORMAL REFRACTION.

English Channel.

THE following is an extract from the Meteorological Record of S.S. *Paris*. Captain C. G. G. MUNTON. Dieppe to Newhaven. Observer, Mr. E. W. SMITH, 2nd Officer.

June 21st, 1935, after dense fog there was extraordinary visibility and mirage effect.

10.28 p.m. left Newhaven. Calm, dense fog, slight W'ly swell. Visibility 30 yds. Barometer 30·04 in. steady. Clear overhead.

10.55 p.m. ran suddenly into clear weather. Wind S.E., force 2. Beachy Head Light visible 4½ miles. Royal Sovereign visible 11 miles.

11.02 p.m. Cape Antifer visible S.15° W. (Mag.), distant 57 miles.

11.10 p.m. Royal Sovereign L.V. abeam. Dungeness Light House and Hastings lights, visible. Beachy Head Light then obscured, but top of cliff and Signal Station distinctly visible. The lights on Hastings promenade were so clear as to be countable—the distance off was 18 miles.

11.12 p.m. Cap D'Ailly Light visible bearing S. 22° E. (Mag.), distant 40 miles.

When abeam of Royal Sovereign, that light appeared to be close to and in the water, while Hastings lights appeared to be high above the horizon.

In all cases the lights themselves were visible, not just the beam.

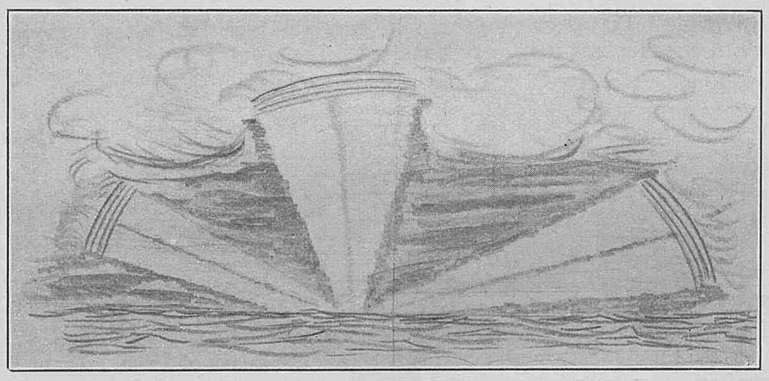
In nearly thirty years' experience in the Channel, I cannot remember such extraordinary refraction.

CREPUSCULAR RAYS AND RAINBOW.

North Atlantic.

THE following is an extract from the Meteorological Record of S.S. *Ceramic*. Captain H. C. ELFORD. Cape Town to London. Observer, Mr. G. L. ROE, 4th Officer.

April 29th, 1935, 6.03 p.m. A.T.S. sunset, clouds Stratus, A.-St., Cu., A.-Cu., 8/10ths, weather showery (Doldrums). Air temperature 80°, water temperature 85°, rays of light radiating from a point directly opposite to the setting sun. Outer edge of rays bounded by a rainbow having a radius of 38°. Appeared a few minutes before sunset and faded as the sun set and disappeared completely a few minutes afterwards. Position of ship, Latitude 3° 27′ N., Longitude 11° 04′ W.



GREEN FLASH AT SUNSET.

South Pacific Ocean.

THE following is an extract from the Meteorological Record of S.S. *Mataroa*. Captain A. MCINTOSH. Southampton to Auckland, N.Z., *via* Panama. Observer, Mr. E. B. MACFARREN 3rd Officer.

April 12th, 1935, 1800 Z.T.S. (Sunset), when 2′ of sun's upper limb remained visible, it turned a very pale green, and almost immediately a brilliant fairly dark green, and as it dipped the flash was very distinct; at 1950 Venus, when about 2½° above horizon, was observed undergoing a remarkable succession of changes of colour, red, orange, and green being very distinct and in that order; this continued for 5 minutes, when clouds passed over. The horizon was very well-defined; on each occasion small scattered Ci.-Cu. were in the vicinity, at sunset,

the side limbs being obscured by same. Wind, East 3; Barometer 1011 mb.; Air 78°, Sea 78°, Wet Bulb 71½°.

The following night although sea calmer, no clouds, and horizon as clear, no ray was observed.

Position of ship, Latitude 14° S., Longitude 109° W. (approx.).

ZODIACAL LIGHT.

South Indian Ocean.

THE following is an extract from the Meteorological Record of S.S. *Mongolia*. Captain H. R. RHODES. Fremantle to Colombo. Observer, Mr. E. J. SPURLING, 3rd Officer.

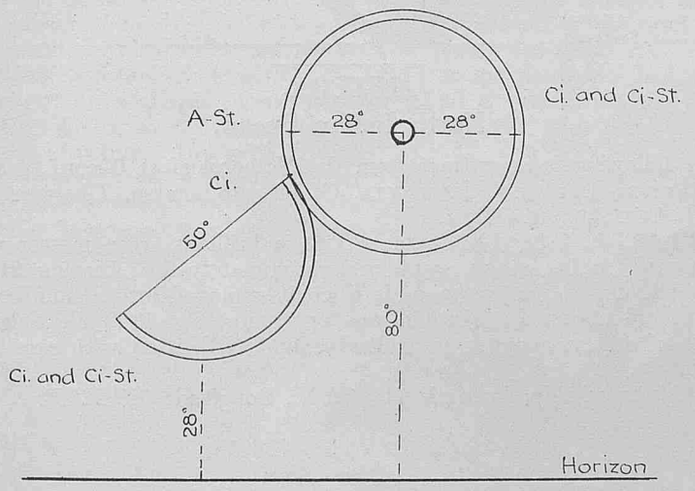
The Zodiacal Light was observed on five occasions during the run from Fremantle to Colombo.

On June 1st, 1935, it appeared exceptionally brilliant; at 0330 A.T.S. the Light was first observed as a small cone on the eastern horizon, it steadily rose with the stars and increased in size till the Light was merged into the sunrise. At 0430 A.T.S. it would have been possible to take stellar observations on that part of the horizon where it appeared, the brilliancy of the Light at that time might be compared to that given by the full moon a few seconds before appearing over the horizon. The apex of the cone was situated in the vicinity of the constellation of Pegasus. The Light was lost to view at 0515 A.T.S., the sun rose at 0620 A.T.S. Ship's position at 0600 A.T.S. was Latitude 11° 47′ S., Longitude 95° 58′ E.

SOLAR HALOS.

North Indian Ocean.

THE following is an extract from the Meteorological Record of S.S. *Harmonides*. Captain F. R. ELWELL. Allepey to Tuticorin. Observer, Mr. G. SARGEANT, 3rd Officer.



May 17th, 1935, at 0630 G.M.T. a double solar halo was observed, the radius of the main halo was 28° and the sun's altitude at the time 80°, the colours of the spectrum being very distinct, the upper clouds at the time being Ci. and Ci.-St., with a thin veil of A.-St. Joining the main halo on its western side and in the form of a semi-circle was a second, only the white colour being visible, the angular distance between the outer segment of the semi-circle and the main halo being 50° and the lower limb 28° above the horizon.

This phenomenon only lasted a few minutes, the halo being merged into the clouds very shortly after being observed. Position of ship, Latitude 8° 47′ N., Longitude 76° 34′ E.

North Pacific Ocean.

THE following is an extract from the Meteorological Record of M.V. *Tantalus*. Captain W. T. BIRCH. Yokohama to Victoria, B.C. Observer Mr. N. P. SMITH, 3rd Officer.

May 18th, 1935 at 11.30 a.m. a halo formed round the sun with a radius of 22°. Conditions were exceptionally favourable, for the green and blue of the spectrum were well-defined at the halo's outer edge as well as the red, orange and yellow of the inner edge. It remained at the same intensity until 12.15 a.m. when further observation was impossible owing to the sun becoming clouded over. No additional halos, arcs of halos or mock suns were visible.

Wind E. by S. force 4. Moderate sea. Slight W.S.W. swell.

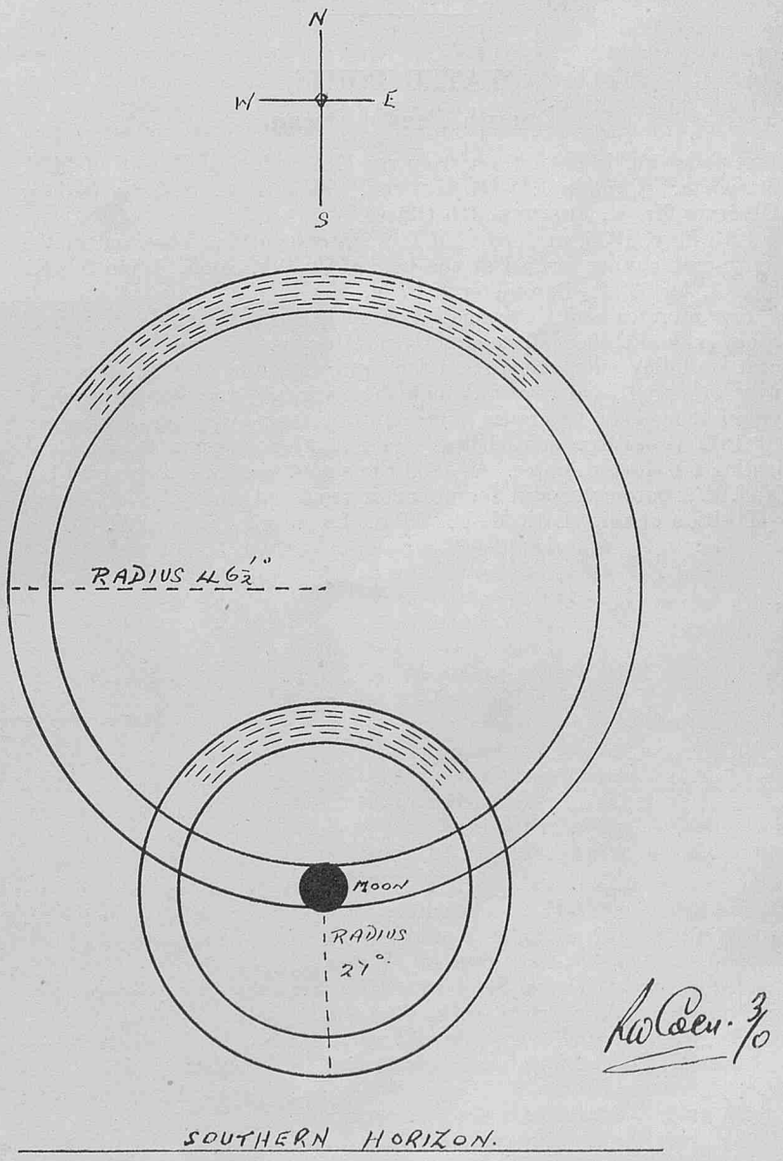
Position of ship at noon, Latitude 50° 13′ N., Longitude 154° 14′ W.

LUNAR HALOS.

North Atlantic Ocean.

THE following is an extract from the Meteorological Record of S.S. *Westmoreland*. Captain E. R. KEMP. Newport News to Colon. Observer Mr. R. W. COEN, 3rd Officer.

April 17th, 1935, at 10.30 p.m. A.T.S. (0330 G.M.T. 18th), two lunar halos were observed at their brightest, having been first observed at 0230 G.M.T. and gradually becoming more distinct and bright, until at 0330 G.M.T. the primary halo had formed with a radius of 27° and the secondary halo with its centre directly overhead and with a radius of 46½°. The southern limb of the secondary passed exactly over the moon and the northern limbs of both halos were very much brighter than the rest. They remained as at 0330 for a period of about 20 minutes, then gradually became fainter until at 0410 only the indistinct form of the primary halo remained and at 0430 G.M.T. no part of either halo was visible. The moon was bearing S. 17° E. (T.), altitude 42° 22′. The sky was covered with a thin layer of Cirro-Stratus clouds and 2/10 of Cumulus clouds were also visible. Wind



at 0330 was W.N.W. force 4, Air temperature 64°, Sea 65°, Barometer 29.94 in.

Position of ship, Latitude 34° 04′ N., Longitude 75° 12′ W., Course 178°.

NOTE. The larger halo observed was the horizontal circle or mock moon ring, which, as it was centred at the zenith, is parallel to the horizon.

DOUBLE LUNAR CORONA.

South African Waters.

THE following is an extract from the Meteorological Record of M.V. *Durham*. Captain H. L. UPTON, D.S.C., R.D., R.N.R. Las Palmas to Auckland, N.Z. Observer Mr. A. W. MARSHALL, 2nd Officer.

19th April, 1935, 2000 A.T.S. observed very brilliant double lunar corona. At time of observation, moon, nearly full, was plainly visible through soft A.-Cu. The first corona was distinguishable by the brown-red ring and the aureole. The second, or outer, was very much more brilliant and showed quite distinctly, brown-red, yellow or yellowish green, and violet, the latter colour being particularly vivid. The phenomenon lasted for less than half a minute, owing to the moon clearing the cloud patch and no sextant angles could be taken but the angle subtended between the moon and the further edge of the outer corona could not have been greater than 4-5°.

Position of ship, Latitude 39° 00′ S., Longitude 29° 00′ E.

WATERSPOUTS.

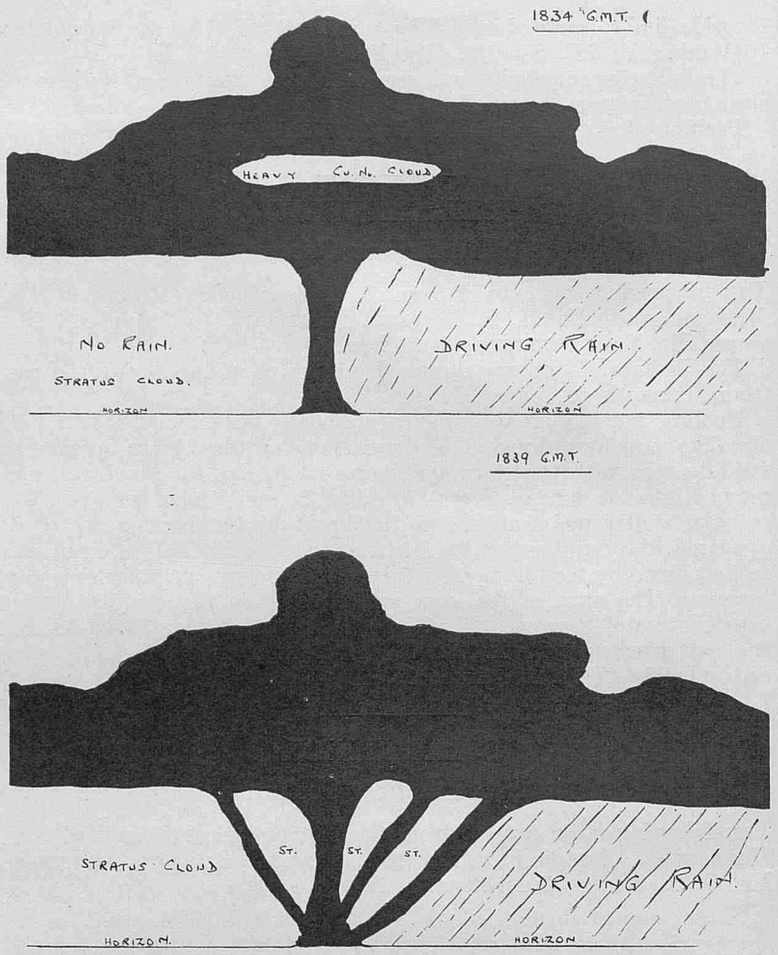
South Pacific Ocean.

THE following is an extract from the Meteorological Record of M.V. *Rangitata*. Captain J. N. B. HUNTER. Wellington. N.Z. to Balboa. Observer Mr. H. FORSTER, 4th Officer.

12th May, 1935, at 1834 G.M.T. a waterspout was observed in the south-east having formed at the base of Cu.-Nb. cloud. Wind S.S.E., force 4, Air 53° F., Barometer 29.97 in.

Five minutes later three small spouts had formed around the original spout (vide sketches) all apparently meeting in a common base. Heavy rain gradually encroached from the southward and at 1842 all spouts were obscured from view although there was no precipitation at ship, vessel being some two miles (approx.) from the edge of the rain storm. At 1847 vessel experienced heavy rain squall with wind at gale force lasting for three minutes. At 1850 the squall had passed away to the N.N.W.; barometer and thermometer remained steady.

Position of ship, Latitude 40° 08′ S., Longitude 167° 26′ W.



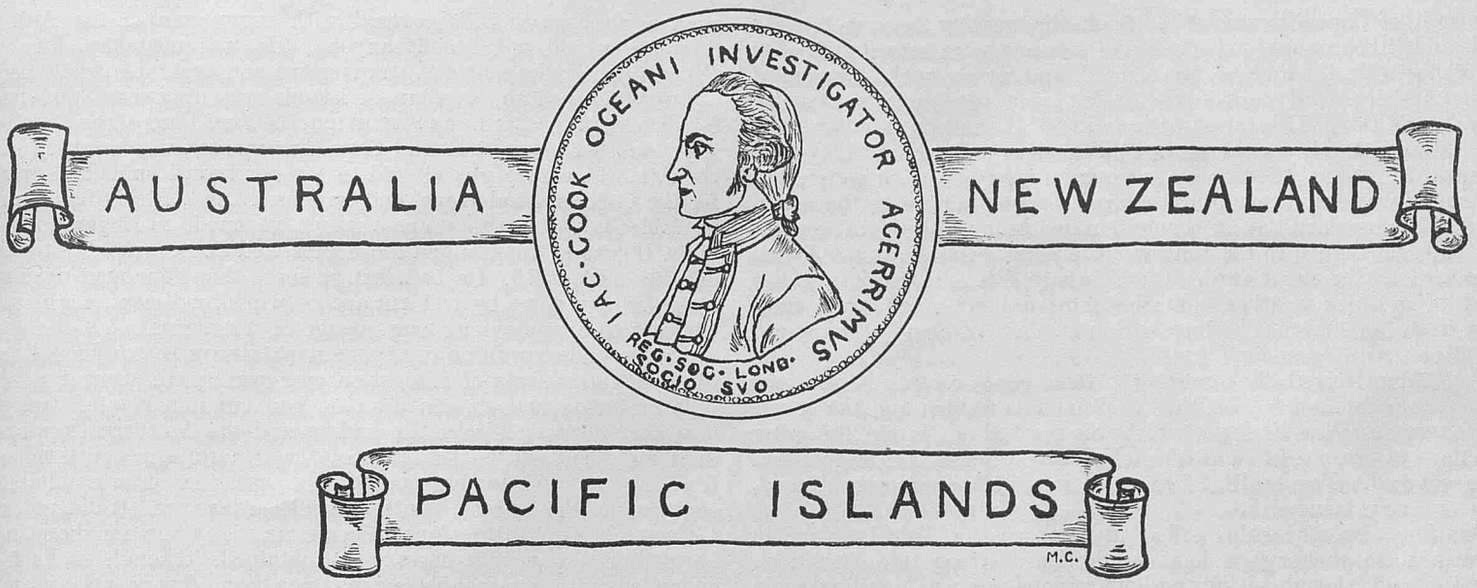
METEOR.

North Indian Ocean.

THE following is an extract from the Meteorological Record of S.S. *Contractor*. Captain D. L. WHYTE. Colombo to London. Observer Mr. A. L. COTTIER, 3rd Officer.

April 25th, 1935, 10.45 p.m. A.T.S., a brilliant green meteor was observed, falling at an angle of approximately 45°, bearing 215°; its flight lasted for two seconds when it exploded into a number of small red stars. Its altitude was approximately 30°. Weather at time of observation was part cloudy, light N.E. wind with excellent visibility.

Position of ship, Latitude 11° 48′ N., Longitude 52° 22′ E.



CAPTAIN JAMES COOK.

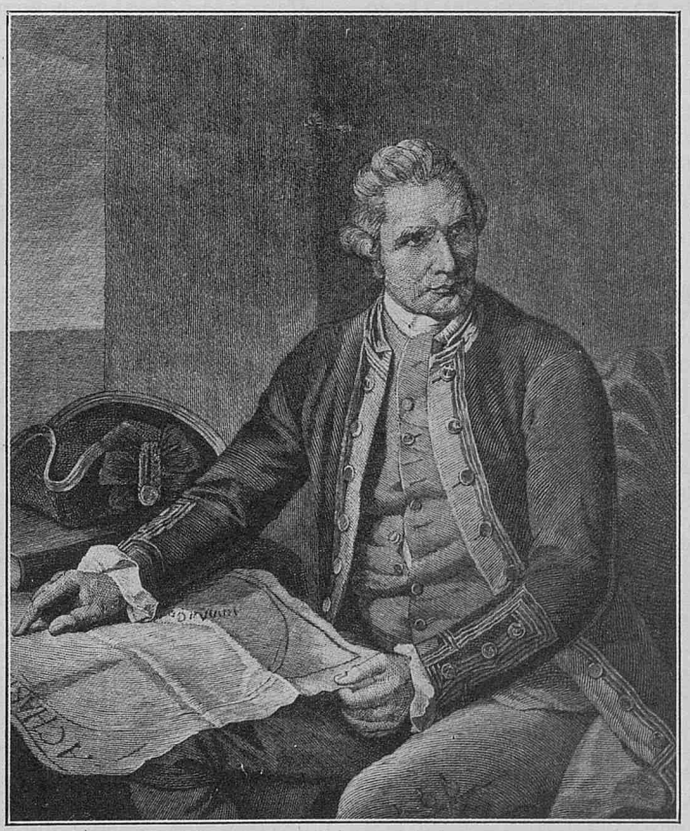
1728–1779.

(*Continued from page 14, January 1936 number*)

For the first few months after his arrival home Cook was hard at work turning over to the Admiralty his vast collection of journals, notes, sailing directions, charts and observations, compiled during the voyage. He had given to his country Australia and New Zealand—nothing less—but the supreme importance of these discoveries and possessions was never properly appreciated during his lifetime. He was rewarded for this eminent service by promotion to the rank of Commander. Meanwhile the controversy about the great southern continent had broken out afresh, as Cook's recent discoveries had not disproved its existence. Cook had not found it because he had not searched for it, so said those, and they were many, who believed in "Terra Australis Incognita," that "El dorado," which might contain riches greater even than those of the Spanish American Colonies. What a prize for the nation who should find it !

It was largely due to the Earl of Sandwich, First Lord of the Admiralty, that it was decided to despatch an expedition to settle the controversy, and incidentally to discover and annex any other lands or islands for the British Crown.

Cook was nominated to command the expedition, and as the hazards of the Great Barrier Reef had convinced him of the desirability of a consort, it was decided to send two ships, again Whitby-built merchant vessels. *Resolution* of 462 tons and *Adventure* of 336 tons. Commander Tobias Furneaux was appointed to *Adventure* and many of Cook's old officers and men volunteered for the new expedition, 193 men in all. Profiting by the experience of the former voyage, Cook took every possible form of anti-scorbutics. This seems to be the first occasion in the history of nautical discovery in which careful preparations were made for combating scurvy, which dreadful disease regularly carried off a considerable proportion of the crews embarked for long voyages.



Captain Cook.

Cook's orders were long and complicated—briefly, he was to sail South in search of Bouvet's "Cape Circumcision," supposed to be some 1,200 miles south of the Cape of Good Hope. If found he was to survey it and explore it, if not found he was to stand to the southward as far as practicable then steer east and circumnavigate the World, keeping as far south as he could. He was given permission to proceed northward at any time to refit and revictual his ships and recuperate his men. If *Resolution* was lost the voyage was to be continued in *Adventure*.

Before Cook sailed on his second voyage he found time to write a paper for the Royal Society, entitled "An account of the Flowing of the Tides in the South Sea, as observed on board His Majesty's Bark, the Endeavour." This paper, as well as one on the Scientific Results of the voyage was published in their Philosophical Transactions.

It is of interest to mention the equipment of navigational instruments supplied for Cook's second expedition :—

An astronomical Quadrant.
Two Hadley's sextants.
Four chronometers.
An azimuth compass.
A pair of globes.
A theodolite with a level and chain.
A wind gauge.
A dipping needle.
A marine barometer.
Two portable barometers.
Six thermometers.
An apparatus for testing the temperature of the sea water at different depths.

Wales and Bayley, two astronomers, were appointed by the board of Longitude, one to each ship, and of Wales in *Resolution* Cook mentions with great appreciation.

The ships finally sailed from Plymouth on July 13th, 1772, bound for the Cape of Good Hope, which was reached *via* Madeira on October 30th, and on November 22nd, they sailed

in search of Cape Circumcision. Soon the weather became bitterly cold, and " Fearnought " jackets and trousers were served out. On December 10th, the first ice was sighted, and for six weeks they sailed among icebergs and pack-ice, with fog, rain, sleet and snow. By New Year's Day, 1773, the ships were in 60° S., and on January 16th the Antarctic Circle was crossed. Still no signs of land, and they were hemmed in by ice. Cook was anxious in regard to fresh water, but ice melted was found to supply the need. A position far to the southward of the reported Cape Circumcision had been reached, the weather was bad and the ice to the southward impassable, so Cook was forced to return to the northward. On February 8th, *Adventure* was lost sight of in thick weather, and the ships did not meet again until May 18th, in Queen Charlotte's Sound, New Zealand, the agreed rendezvous.

Resolution steered first northerly then south-easterly, then east along the parallel of 60° South. No land was sighted and the course was altered for New Zealand, which was reached on March 26th, after 117 days at sea out of sight of land, during which 2,600 leagues had been covered. The health of the men in *Resolution* remained good, only one man being sick.

On June 7th, the ships sailed in company for Tahiti, where in coming to an anchor in a light wind with a strong tide, *Resolution* struck a reef, though luckily without serious damage. Sailing again on September 1st, a cruise was made among the other islands of the group, in all of which Cook met many old friends among the natives, and was able to obtain fresh supplies in plenty. At Huahine, *Adventure* ran ashore but got off without great damage; she seems to have been an unlucky consort as on the passage down to New Zealand she again lost company and was seen no more during the voyage. She reached England finally, long before *Resolution*.

Cook again arrived at New Zealand on November 3rd, and refitted *Resolution* at Queen Charlotte's Sound, a good supply of wild celery, scurvy grass and vegetables from seeds planted during their previous visit was obtained. Leaving orders behind in a bottle in case *Adventure* came in, Cook sailed again on November 25th for his second voyage into the Antarctic. When clear of the land he steered to the south-eastward and worked up and down across the South Pacific. He penetrated to 67° 31′ S., and working through the bergs and heavy floes he reached, on January 30th, 1774, a position in Lat. 71° 10′ S. Long. 106° 54′ W., a record that was not beaten until 60 years later.

Further progress south was impossible, as the Great Ice Barrier barred the way, and satisfied that there was no land in this Ocean within the Antarctic Circle, except possibly so far south as to be practically inaccessible, Cook turned north once more, as his men were suffering from fever brought on by the cold and wet.

There was still plenty of unexplored space in the great Pacific, so Cook turned away to the northward, then from February 6th to 12th, 1774, very heavy weather was experienced, which carried away several sails. Soon afterwards Cook himself was severely ill from what he describes as " a bilious colic." The loathsome salt meat, and biscuit little better than mouldy dust, together with the cold and exposure must have told upon even his iron constitution. A dog was killed and made into soup, and writes Cook " I received nourishment and strength from food which would have made most people in Europe sick." To the great joy of everybody on board the Captain soon recovered, whether or not from the effect of this fresh meat cannot be said!

Cook searched for Juan Fernandes in its reported position but without success, he reached Easter Island on March 12th, then proceeded to examine the Marquesas and Friendly Islands, in each case determining their positions and describing them in detail. After a stay at Tahiti to refit and rest his crews, he cruised among the Society and Friendly Islands, a month being spent surveying the New Hebrides, as Cook renamed the " Grandes Cyclades " of Bougainville. Next followed the entirely new discoveries of New Caledonia, Norfolk Island and the Isle of Pines. After surveying all these a return was made on October 18th 1774 to Queen Charlotte's Sound, New Zealand.

Then followed yet another examination of the far Southern Pacific, which was crossed from West to East through the whole of its extent from South Australia to Tierra del Fuego. Cape Horn was passed on December 29th, and on New Year's Day, 1775, they visited Staten Island. Proceeding again on January 3rd, still in search of the southern continent, the island of South Georgia was discovered, named and formally taken possession of, though Cook was of the opinion that such a place, with hills covered with snow even in the Antarctic Summer, would not benefit anyone. He was mistaken, for South Georgia is now the centre of an extensive and profitable whale fishery.

On January 30th, a group of islands was discovered and named Sandwich Land, after Lord Sandwich, the First Lord of the Admiralty. After another attempt to find Cape Circumcision on the other side of the Atlantic, course was altered to the northward on February 23rd, for the Cape of Good Hope, and on March 22nd, *Resolution* anchored in Table Bay. From the Cape a return was made to England, by way of St. Helena, Ascension and the Azores, and Cook arrived at Spithead on July 30th, 1775. He had lost no more than four men during the entire voyage, three by accident and only one by disease, a remarkable contrast to any previous long voyage of discovery.

This second expedition of Cook's must always be considered as one of the greatest feats of navigation ever performed. During a period of three years and sixteen days he had circumnavigated the globe near the Antarctic Circle. He had crossed the Southern Ocean in all directions, had skirted the edge of the Antarctic ice until he could force his way no further south. The question of any inhabitable continent in the extreme South was settled for ever. It did not exist.

Cook sums up " It doth not become me to say how far the principal objects of our voyage have been obtained. Though it hath not abounded with remarkable events, nor been diversified by sudden transitions of fortune, though my relation of it has been more employed in tracing our course by sea than in recording our observations on shore, this, perhaps, is a circumstance from which the curious reader may infer that the purposes for which we were sent into the Southern Hemisphere were diligently and effectually pursued. Had we found out a continent there we might have been better enabled to gratify curiosity; but we hope our not having found it, after all our persevering researches, will leave less room for future speculations about unknown worlds remaining to be explored."

Cook was now forty-eight years of age, and he had certainly achieved more than any living person; had probably added more to geographical knowledge than any man since Columbus. He had established and confirmed the outlines of the Southern portions of the globe substantially as they are known to-day. He was now at home again for the last time, and being graciously received by the King, was promoted to Post-Captain and appointed by the Admiralty to be one of the Captains of Greenwich Hospital, which provided him for life with a house and an income of £200 a year and allowances.

He was also elected a Fellow of the Royal Society in February 1776, and awarded the Copley Gold Medal for his paper on the preservation of the health of the crew on long voyages. In addition he contributed a paper on the actions of the tides along the east coast of New Holland.

But in that snug retreat at Greenwich Hospital with his wife and children, Cook could not rest, the habit of incessant work was too deep-seated to be thrown off, and when a further expedition was being planned and he was consulted as to a leader, he replied by offering to go yet a third time. Captain Cook would have been appointed to the command without the least hesitation, but for a natural feeling that, at his age, he had done enough and should now be left to repose.

He was invited to dine with Lord Sandwich, together with his old patrons and friends, Sir Hugh Palliser and Mr. Stephens, Secretary of the Admiralty. During dinner the conversation turned upon a projected expedition for the discovery of a North-west Passage, with a view to shortening the route to the Far East, and fired once more by the enthusiasm of the navigator Cook sprang to his feet and offered to take the command, which offer was immediately accepted.

Resolution was again chosen for the voyage, and with her *Discovery*, a smaller vessel, also Whitby built, of about 300 tons, Captain Charles Clerke in command. As previously, many of those who had served on the previous voyages came forward as volunteers. Plenty of warm clothing was taken, together with articles of " trade," for bartering with the natives, also a present of some cattle from King George to the natives of Tahiti.

By Act of Parliament a reward of £20,000 was now offered to the fortunate ship's company who discovered a North West Passage, and owing to the previous succession of failures to get through from the Atlantic to the Pacific, it was decided for Cook to make an attempt in the reverse direction. He was to proceed to the Cape of Good Hope, then search for some islands south of Mauritius, previously seen by the Frenchmen, Marion du Fresne and Crozet. Thence he was to proceed to New Zealand and afterwards to Tahiti. From there he was to sail up the Pacific to the coast of Drake's " New Albion " (British

Columbia), and sailing northward was to explore any inlets that seemed likely to lead to communication with the Atlantic.

Resolution sailed from Plymouth on July 12th, 1776, and arrived at the Cape on October 18th, being joined the following month by *Discovery*, which had been delayed in starting. On November 30th, the ships sailed away to the eastward, carrying much live-stock for Tahiti.

Islands were sighted which Cook named Prince Edward's and Marion Islands and gave the name of Crozet Islands to another group farther east. Kerguelen was reached on Christmas Eve and good anchorage found in "Christmas Harbour," and the island was surveyed. During the run eastward much bad weather and fog was encountered; *Resolution* lost her mizzen-topmast and the cold weather proved fatal to several of the sheep and goats.

On January 26th, 1777 the ships anchored in Adventure Bay, Van Diemen's Land (Tasmania) and necessary repairs were carried out. This was the first time that Cook had been on the coast of Van Diemen's Land and he did not discover that it was an island, but concluded that it was part of New Holland.

New Zealand was next visited, then until the end of the year the ships cruised among the South Pacific Islands, the live stock, horses, cows, sheep, turkeys, geese, ducks and peacocks being landed at Tahiti, much to everyone's relief. How this menagerie was found room for in the confined space on the decks of small crowded ships and how they were kept alive on a passage with much bad weather, it is impossible to imagine.

On December 23rd the ships crossed the Equator sailing northward, and on the 25th discovered "Christmas Island," whence a supply of turtle and fish was obtained. The Sandwich Islands (Hawaii) were next found, being also named after the First Lord of the Admiralty. On March 7th, 1778, the coast of North America near Vancouver Island was sighted, and an almost continuous survey of the coast up to Behring Straits (previously discovered and named by Vitus Behring the Danish navigator). On this coast Cook discovered and named many capes, islands and inlets. He found to the south-east of the Alaska Peninsula what seemed to promise a passage to the Artic Seas, and penetrated without success into an inlet now known as Cook's River.

He finally sailed on north of Behring Straits as far as 70° 41′ N. where no further advance could be made as the ships were barred by an unbroken barrier of ice, rising 12 feet above water and stretching as far as could be seen. Cook named the farthest point visible on the American shore, Icy Cape (extreme north-west of Alaska).

Turning back, Cook cruised for some time on the coasts of Alaska and Siberia. Here he met some Russian traders, to one of them Cook entrusted a letter and chart to be forwarded *via* Siberia to the Admiralty. These were safely delivered in London the following year.

So the search for a North-West Passage had failed, but extensive surveys had been carried out over some 1,200 leagues of coast, and again the whole coast of British Columbia and Alaska became in due course another British possession. This really belongs to a later story, as it was George Vancouver, a midshipman under Cook upon his second and third voyages, who, eleven years later sailed in command of *Discovery* and finally added these lands to our Empire.

On October 26th, 1779, the ships sailed southward and discovered Maui, another island of the Sandwich Group. Here Cook obtained a quantity of sugar cane which he ordered to be utilised for brewing beer, intending it for use instead of rum with a view to saving the latter for use in colder climates. But the men would have none of it, and as Cook writes "every innovation whatever, tho' ever so much to their advantages, is sure to meet with the highest disapprobation from seamen." It would seem, therefore, that the eighteenth century sailor, not unlike his twentieth century brother, was suspiciously conservative in his likes and dislikes!

Hawaii, the principal island of the Sandwich Group was reached on November 30th, and after some time spent in surveying, the ships anchored in Karakakooa Bay. The natives were very friendly but as usual expert at thieving, in fact it appears that all the natives of the Pacific with whom Cook came in contact had no respect whatever for the property of other persons. The removing of numerous small articles, such as the rudder of a boat and the lids of boilers must have caused great annoyance.

Resolution and *Discovery* left on February 4th, 1779, the King presenting a herd of pigs and quantities of vegetables to Cook. Soon afterwards in a heavy gale *Resolution's* foremast was so badly sprung that it was necessary to unstep it for immediate repair, and a return was made to Karakakooa Bay on February 11th.

The natives did not welcome the return of the ships, possibly due to some superstitious idea, but the mast was got ashore and repairs proceeded with. On the afternoon of the 13th, the natives commenced to be distinctly hostile, and a watering party was attacked. Many thefts took place and canoes with stolen property on board were chased by ship's boats, the crews of which were stoned and roughly handled.

Next morning *Discovery's* six-oared cutter was missing, and Cook determined to teach the natives a lesson. He landed with a party of armed marines, proceeded to the village and saw the King. Just at this time news arrived that a Chief had been killed by some of the sailors on the other side of the bay. Matters became immediately serious, the natives donning their war-mats and menacing Cook's party, which retreated to their boats. Stones began to fly and the marines were attacked, so that fire was opened by them and the boats' crews. In the struggle which ensued Cook was clubbed from behind, at the very instant when he was ordering his men to cease fire.

Thus, due to petty thieving, terminating in a fight, in the midst of a brilliant career perished James Cook; and at sunset on February 21st, 1779, with the booming of minute guns and the colours at half-mast; his remains were reverently committed to the deep.

It is unnecessary here to describe the remainder of the voyage and the further ineffectual attempts to discover the North-West Passage, before in October, 1779, the ships started homewards by way of Japan, Macao, the Straits of Sunda and the Cape of Good Hope. *Resolution* and *Discovery*, under the command of Lieutenants Gore and King respectively (Captain Clerke having died on 22nd August, 1780) finally arrived in England on October 4th, 1780, having been absent four years, two months, and twenty-two days.

This account would hardly be complete without some mention of the tragedy of Cook's children. He had six, of whom three boys grew up to manhood, the two elder entering the Navy. In the same week as the news of her husband's death reached the unhappy widow, her second son Nathaniel went down on board H.M.S. *Thunderer* in a hurricane off Jamaica, in October 1780. The youngest son, Hugh, died in December 1793, whilst at Christ's College, Cambridge, and only five weeks later Commander James Cook, her eldest son, who had only just received his promotion and appointment to command the sloop *Spitfire* was drowned, when going off his ship at Portsmouth.

Mrs. Cook lived to be ninety-three years of age, she received a pension, and became a wealthy woman with her share in the profits of her husband's books. She is described as a handsome and venerable lady, who entertained the highest respect for her husband's memory, measuring everything by his standard of honour and morality.

Outside the Mall entrance to the Admiralty stands one of the many statues of Captain James Cook. Distinguished honours have since been heaped upon his memory, but for his great services he received only a very inadequate share of official reward. The greater part of his journals, logs and sailing directions are now in the Australian Commonwealth National Library, but the log of the First Voyage and the gold medal conferred on the Captain by the Royal Society are in the British Museum. A manuscript "Directions for Sailing" in Cook's handwriting, and his hanger and telescope are preserved in the museum of the Royal United Service Institution in Whitehall, while in the Painted Hall at Greenwich is his portrait in naval uniform painted by Nathaniel Dance, R.A.

As a Commander, Navigator, Observer, Surveyor and practical Physician his merits were equally great. Cook's record is truly wonderful and compared with his achievements the voyages of other navigators fade into insignificance. Of our famous Seamen he was the greatest Empire Builder of them all.

Together with a commanding personal presence sagacity, decision and perseverance, he won the affection of all those who served under him.

As Seamen we may well be proud of his undying memory.

THE OBSERVATION OF WIND FORCE AT SEA.

By Captain L. A. Brooke Smith, R.N.R.

Skill in correctly estimating the force of the wind has been acquired by seamen by experience through the centuries.

When Admiral Beaufort drew up his Scale, there was a wind gauge in the ship herself, since she was propelled by the wind in her sails.

The international deep sea criteria, 1874, are Admiral Beaufort's criteria, modified, upon the recommendation of Captain Henry Toynbee, by the International Marine Meteorological Commission of that time; and to seamen who served in sailing ships are still a reminder, for who does not remember the appearance of the sea when the royals could just be carried " full and by " ?

This knowledge has been passed on to the younger seamen of the present day, though often they may not realize it; for the instinct, or call it what you will, by which modern seamen gauge the force of the wind is mainly from the appearance of the sea surface.

From time to time, officers of both the Royal and Merchant Navies have advocated the substitution of the criteria given in the Marine Observer's Handbook; but as no proved satisfactory substitute was put forward, it has been considered wise not to change the present Beaufort Wind Scale.

It has seemed to me that to try and define exactly all the senses which make up the sailor's means of estimating wind force at sea, under all the varying conditions experienced, might undermine the good perception which undoubtedly exists.

When we heard early last year that the Scale of visible effects of wind force on the sea given below, proposed by Germany, was to be considered for internationalization at a meeting of the International Marine Meteorological Commission in Holland in the summer, it became necessary to have recent first hand information derived from observation in the British merchant navy.

Accordingly, this Scale was handed to the Commanders of as many regular British observing ships as was possible in the time available, together with a form for noting comparative observations, by Captain Sir Benjamin Chave and Commanders Cresswell and Williams.

Some very useful observations and enlightening comments were received by the end of May from 36 British ships.

The information received was not conclusive, but it was sufficient to indicate that further observation, study, and investigation were necessary before a satisfactory scale of visible effects could be agreed to by the British delegate at the meeting.

The International Marine Meteorological Commission were very appreciative of the German Scale, but unanimously agreed that it required further study.

Now this Scale, I learned from Captain Luensee, my opposite number in Germany, was originally drawn up by Captain Peter Petersen, a German sailing-ship master from his own observation in sailing ships. When it is studied, it will be obvious to all who have experience in steam, motor, and sailing vessels, that the conditions in a steamer or a motor vessel often lessen the means of detecting sounds.

Observation from the coast, or in moored vessels, cannot settle this question, since the depth of water plays its part.

It would prejudice further comparison if now more were said or the observations and comments already received from the Captains of observing ships were published; but I can assure them that their efforts are very much appreciated.

I have written this as a personal note, because of my conversation with Captain Luensee.* The scales of weather and wind were originally drawn up by Admiral Beaufort, and the Scale of Sea and Swell was, of more recent years, drawn up by Admiral Douglas.

* A week after this note was written we received the sad news of Captain Luensee's death. *See* notices of personnel.

The fact that these Scales were the outcome of sea experience, drawn up and sponsored by the seamen whose names they bear, has been a recommendation to seamen, and has contributed in no small degree to their success and continued use.

The Petersen Scale is submitted to British seamen for a fair trial, and for such improvement as they are able to suggest.

Accompanying this number, there will be copies of a form for observation, which was used by the 36 observing ships who carried out the trial last spring; and Commanders are asked to have observations made and recorded under different conditions, and to return these forms completed, together with their own general comments, in due course.

Published for examination by observation by British Seamen.

German Scale proposed for Internationalization. Visible effects of wind-force on the sea.

Beaufort Scale No.	
0	Sea like a mirror — smooth.
1	Small wavelets with the appearance of scales are formed but without foam crests.
2	The waves are short and more pronounced; their crests begin to break; the foam is not white but of glassy appearance.
3	
4	The waves become longer; many white horses are formed; the breaking sea produces a short, continuous rustling sound.
5	The waves take a more pronounced long form; white foam crests are formed everywhere; the sea breaks with considerable noise which sounds like a perpetual murmur.
6	Larger waves begin to form; the white foam crests are more extensive; the sea breaks with a duller, rolling noise.
7	The sea heaps up and the white foam from the breaking waves begins to be blown in streaks along the direction of the wind; the noise of the breaking sea is audible at a greater distance.
8	The height of the waves and their crests increases visibly; the foam is blown in dense streaks along the direction of the wind; the sea begins to " roll."
9	
10	High waves develop with long overhanging crests; the resulting foam, in great patches, is blown in dense white streaks along the direction of the wind. The whole surface of the sea takes on a white appearance. The rolling of the sea becomes heavy and shock-like.
11	The waves become so high that ships within sight drop so low in the wave troughs that for a time they are lost to view. The rolling of the sea becomes tumultuous. The sea is covered with white streaky foam lying along the wind direction; the wind blows the edges of the wave crests to froth. Owing to the violence of the wind, the air is so filled with foam and spray that distant objects can no longer be seen.
12	

THE GREEN FLASH AT SUNRISE AND SUNSET.

Prepared in the Marine Division by E. W. Barlow, B.Sc.

The phenomenon of the green flash observed at sunrise and sunset is an interesting one, partly on account of the vivid colour presented and partly on account of its elusive nature, whereby there is no certainty of seeing it even when atmospheric conditions appear favourable for its appearance. Thus it happens that many ships' officers have seen it frequently, while others who may have been at sea for many years have never seen it at all. It is also a subject of considerable interest to many passengers on liners proceeding on their usual routes or on cruises. Not infrequently someone on the ship knows something about the phenomenon or has seen it, with the result that "green flash parties" may be formed towards the hour of sunset to watch for it. The green flash has been introduced into fiction, the best-known example being "Le Rayon Vert" by M. Jules Verne, in which this meteorological phenomenon forms the theme on which the story is based.

Another name for the green flash is the green ray; both are used, but the former is preferable as it will be shown in the present article that other phenomena occur at sunrise and sunset to which the name of green ray is more appropriate.

The time to look for the green flash is when all but a small segment of the sun has set below the horizon. The approximate size of this segment is shown in Figure 1, but it may not be exactly the same on

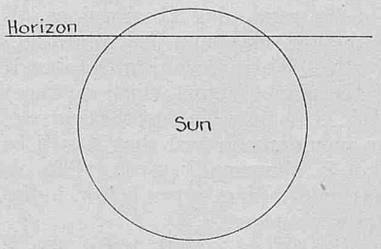


Figure 1—Approximate stage of Sunset after which the Green Flash may be seen.

all occasions. The remaining segment of the sun then turns a vivid emerald or bluish-green and almost at the same instant dips below the horizon and vanishes. This is the phenomenon of the green flash, part of the sun itself changing colour just as it finally sets. The duration of the green coloration is 2 to 3 seconds at the most. Care must be taken that the eye is not dazzled by looking at the bright sun when this is still wholly or mainly above the horizon. The green flash varies considerably in brilliancy; when it is bright it is easily seen by the unaided eye but it is more impressive when viewed through binoculars or a small telescope.

If instrumental aid be used it will be seen that the green colour begins at the two points of the segment of the sun, as described in the following quotation from an observation by Dr. A. A. Rambaut, F.R.S. This observation was made by him and several of his fellow-passengers on S.S. *Durham Castle* on her voyage from South Africa on September 27th, 1905, when the sun was seen to set behind the range of hills which terminate in Cape Guardafui. "When the visible portion of the disk was reduced to a very narrow elongated segment I could distinctly see that the tips of the segment first became green, whilst the central portion still remained a brilliant yellow or orange. As the segment became more attenuated, the green patches spread rapidly from each end, until, meeting in the middle, they merged into each other and the whole narrow segment appeared of a vivid green or bluish tint. This lasted for a very short time. . . . . After that date the phenomenon became one of frequent, almost daily, occurrence as we passed northwards through the Red Sea, and was observed by many passengers on board the *Durham Castle*. It was seen both with and without glasses, but to enable one to follow the gradual extension and meeting of the green tips some little optical aid seems necessary." The reverse process is seen at sunrise, as is shown by the description written by Captain A. Carpenter, R.N., who observed the green flash at sunrise on the sea horizon on 21 mornings in 1911 to 1912, from a height of 700 feet above the sea at Taormina in Sicily. "In clear weather the phenomenon seen through moderate binoculars consisted of a sudden appearance of a blue-green knob, which spread rapidly right and left into a whale-backed line full of rippling light, but not at all dazzling. This lasted from $1\frac{1}{2}$ to $2\frac{1}{2}$ seconds. Then the centre of the arc turned into a dazzling white or gold, the green lingered for an instant at the ends of the arc and the phenomenon was over, a notch being cut out of the ocean at the same time by irradiation."

Six observations of the green flash at sunset have been published in The Marine Observer. On November 8th, 1928, in the North Atlantic Ocean, S.S. *Cumberland* reported that "Sun set at 5.33 p.m. with a peculiar green tint as upper segment dipped," the visibility being excellent, referring to it also as a "brilliant greenish tint" (Volume VJ, 1929, November, page 243). S.S. *City of Palermo*, in South African waters on January 29th, 1930, "observed vivid green flash immediately sun disappeared below horizon, period 2 seconds, visibility being exceptionally good." (Volume VIII, 1931, January, page 7). On May 28th, 1930, in the eastern Mediterranean, H.M.S. *Endeavour* observed that at "6.40 p.m. (sunset), the upper limb of the sun turned a vivid green colour about 3 seconds before it dipped. The green light persisted for half a second after the upper limb had dipped. This green flash was very much brighter than any of the ones previously observed from the ship, either in the Mediterranean or the Red Sea, and was visible not only through binoculars, but to the naked eye . . . . visibility good." (Volume VIII, 1931, May, page 101). On June 23rd, 1930, the green flash was again seen by H.M.S. *Endeavour* in the Mediterranean (Volume VIII, 1931, June, page 126). The same ship also recorded a more unusual observation at Haifa. "On May 8th, 1930, 6.30 p.m., as the upper limb of the sun dipped, for a period of 2-3 seconds it turned a pale cobalt blue, the colour appearing at the edges and moving towards the centre as the upper limb disappeared." (Volume VIII, 1931, May, page 101). In the present number an observation by S.S. *Mataroa* will be found. On April 12th, 1935 in the South Indian Ocean the upper limb of the setting sun "turned a very pale green and almost immediately a brilliant fairly dark green."

Colour of the Green Flash.—This is generally described as bluish green or as a very vivid or emerald green. The intensity of the colour, when well seen, is much greater than that of the green band in the rainbow. Sometimes it appears as green changing to blue. Mr. C. F. Whitmell, who was a well-known writer on astronomical and other subjects, once saw the flash change from green to blue, which colour was followed by a faint wisp of violet, the next colour in order in the solar spectrum. Such an observation is extremely rare and must have occurred in most exceptional atmospheric conditions. Two persons observing the green flash on the same occasion may describe the colour differently. Thus Dr. Rambaut quotes an observation made at sunrise on September 29th 1905, on the voyage mentioned above. He described the colour as a brilliant green while Professor Miers, standing beside him, called it blue.

Conditions for seeing the Green Flash.—The green flash is equally well seen at sunrise and at sunset but the majority of observations have been made at sunset since few people, with the exception of seamen, have the opportunity of observing the sunrise over a suitable horizon. Furthermore, even if the sunrise is being looked for, for example at sea, the difficulty arises that the exact point at which the sun will appear is not known and hence the transient phenomenon of the green flash may be missed while the eye is being turned in the right direction.

The unbroken sea horizon is ideal for making observations of the green flash. At one time it was thought that the phenomenon could not be seen elsewhere but it is now known that it can be equally well seen over a suitable land horizon. We have quoted Dr. Rambaut's observation at sunset behind the hills of Guardafui. On June 22nd, 1926, Mr. J. E. Clark, the well-known amateur meteorologist, saw the green flash as the sun set behind a ridge of the North Downs at Purley on an evening of unusual visibility. The remaining segment of the sun "visibly narrowed towards the vanishing point, became yellower for a brief instant before turning to an almost dazzling emerald green, which seemed to emit rays downwards in a semi-circle from the last fraction of the sun's disc. Not only was its brilliance greater than it has been my fortune to see it before, even at sea on the tropics, but, instead of being an instantaneous phenomenon, it lasted

at least two seconds . . . " The author saw a splendid example of the green flash on September 20th, 1922, at Wadhurst, Sussex, the sun setting behind a ridge forming part of Ashdown Forest, distant about 8 miles. The phenomenon was observed through a small telescope and there were several isolated trees, very small on account of the distance, projected upon the diminishing segment of the sun. Suddenly each tree was outlined in green light, the sun retaining its normal colour, golden only slightly tinged with red. After a perceptible interval of time the whole segment turned a brilliant emerald green and almost immediately disappeared below the horizon. A suitable land horizon is one which is hard-edged, such as a distant bare ridge or hill-top, preferably of not too high an altitude above the true horizon. A tree-covered horizon, even if two or three miles distant, is unsuitable. The green flash has occasionally been seen when the sun sets behind a hard-edged cloud, at some little distance above the horizon.

As the extracts given above show, an essential condition for seeing the green flash well is that visibility must be excellent. The most favourable conditions are when absorption of light due to dust or mist is at a minimum. There is always sufficient absorption to make the sun of a yellowish colour near the horizon, but the redder and the less luminous the sun is near the horizon, the less the chance of seeing the green flash. It has however, been well seen when the sun was orange in colour or even orange-red, if it remains sufficiently bright. Under exceptionally good conditions, the colour is more likely to be blue, or to turn to blue before the sun finally disappears, and as we have seen above a trace of violet may even be seen.

Explanation of the Green Flash.—In the article on " Deceptions of Vision Due to Atmospheric Conditions at Sea " which was published in MARINE OBSERVER, Volume XII, 1935, January, page 14, the general effects of refraction, the distortion and other deceptions of vision produced, were explained. There is one other effect of refraction at low altitudes which must be considered in order to explain the green flash. The various colours of which white light is composed are refracted unequally, the blue and violet light being most refracted and the red light least refracted. Thus in an astronomical telescope the image of a star near the horizon is drawn out into a short spectrum, coloured blue or bluish-green above and red below; a smaller instrument will not show it. The disc of a planet such as Jupiter, similarly observed, will show colour fringes even at an altitude of 15° or more above the horizon. Mr. WHITMELL many times observed the sun at low altitudes with a telescope magnifying 100 diameters and always saw a bluish-green fringe at the upper limb and an orange-red one at the lower limb. In other words the atmosphere acts like a prism. The green, blue and violet rays, being the most refracted, are the last ones to be seen as the upper limb of the sun sets. This will be made clear by FIGURE 2. The setting sun is actually a

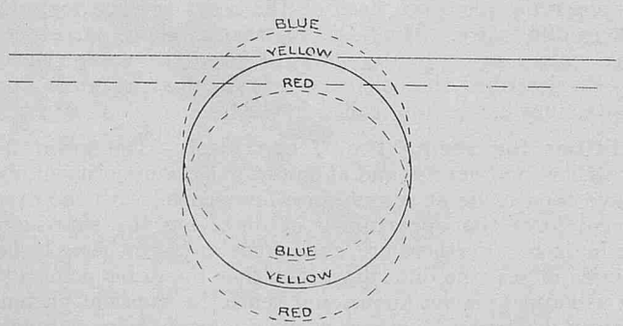


Figure 2.—Explanation of the Green Flash.

number of differently coloured images superimposed upon one another but not quite in coincidence, so that the bulk of the sun's disc retains its normal colour. In the figure, to avoid confusion, only the blue, yellow and red images are shown and the separation between them is exaggerated. The unbroken horizon line is drawn to represent the instant when the yellow light has completely disappeared, leaving only the upper fringe of green and blue which forms the green flash. The dotted horizon line represents an earlier moment when there is still a yellow segment of the sun's disc left, edged with green or blue at each side. This is in accordance with the fact stated above that the green flash begins at the tips of the segment.

According to the diagram the green flash should always end as a blue flash, remembering that the green is between the yellow and the blue. The blue light however is less bright than the green and being of shorter wave-length also suffers atmospheric absorption in greater degree, so that it is only in exceptional atmosphere conditions that the flash appears or ends as blue. What has been said about the blue applies still more forcibly to the violet and indigo light which in the diagram would be above the blue, but, as stated above, a trace of violet coloration has been seen.

That this theory of the green flash is the correct one is proved by the fact that the red flash at the lower limb of the sun has also been seen. In 1906 Mr. WHITMELL wrote—" The sun was sinking behind a low horizontal narrow bank of cloud, between which and the horizon was a strip of clear sky. Just as the top of the sun disappeared behind the upper edge of the cloud, I saw a green flash, and just as the base of the sun appeared below the lower edge of the cloud, I saw a red flash." The same observer also saw both green and red flashes as the sun successively disappeared behind and emerged from horizontal bars, with openings between, in a chapel belfry.

The only point about the phenomenon which is not explained is that it is so often not seen even when the conditions appear to be perfectly favourable. Sometimes it is frequently observed in the course of a single voyage; on the other hand many ships' officers have never seen it at all, although they have often looked for it. Captain A. CARPENTER, R.N., observed every sunrise over a sea horizon, except four, from December 15th, 1911 to March 14th, 1912, from a height of 700 feet above the sea at Taormina, Sicily. Of the 91 mornings, 45 were rainy or cloudy and 25 others were misty or hazy, so that the sun rose a dull red or otherwise diminished in brilliancy. The green flash was seen on each of the remaining 21 mornings. Even on the same evening the phenomenon may not be repeated. Admiral J. P. MACLEAR, in the North Atlantic Ocean, in October 1898 saw the green flash at sunset, but the planet Venus which set shortly afterwards did not show a green flash. It is possible that the degree of refraction affects the visibility of the phenomenon and that it will be more frequently seen when refraction is abnormally great. The observations of the green flash at the setting of Venus, given below, indicate that refraction was abnormal on these occasions.

The Green Ray at the Setting of Planets and Stars.—The green ray has been observed at the setting of the planets Venus and Jupiter, but there appears to be no record of it in the case of the moon. Four observations at the setting of Venus have been published in THE MARINE OBSERVER. On January 24th, 1929, in the North Atlantic Ocean, S.S. *Culebra* recorded as follows :—" Observed Venus setting. When at an altitude of about 10 minutes the planet appeared greatly enlarged and of a bright red colour, on the instant of her dipping the red changed quickly to a brilliant green." (Volume VII, 1930, January, page 8). On September 3rd, 1930, in the South Pacific Ocean, S.S. *Wairuna* reported that—"At an altitude of 0° 45′, Venus, instead of showing bright white, alternated white and red, and when viewed through binoculars, it was seen that only the lower half of the planet was affected. As the altitude decreased, the frequency of the alterations increased, and for a few seconds before it disappeared it split into two bodies, the upper of which was white and the lower red. Then both merged into one and showed green for an instant before dipping below the horizon." (Volume VIII, 1931, September, page 188). A very interesting observation was made by S.S. *Nestor* in the South Indian Ocean and is published in Volume VIII, 1931, October, page 209. When about 3° above horizon the planet's upper limb was seen to be reddish and this prompted its observation through glasses. When about its own diameter above the horizon the whole planet was red and was joined to the horizon by a ray of red light. As the lower limb reached the horizon the planet turned white. As it dipped it suddenly turned bright green, with short green rays slanting obliquely upward, and then disappeared. On March 26th, 1935, in the North Indian Ocean, S.S. *Alipore* observed Venus setting in exceptionally clear atmosphere. " Watching with a pair of prismatic binoculars . . . it appeared very much magnified by refraction and was flickering from orange to deep red. As it set a remarkably distinct ' Green Flash ' appeared." (Volume XIII, 1936, January, page 8). In the current number, S.S. *Mataroa*, after observing the green flash at sunset as described above, saw Venus when about $2\frac{1}{2}$° above the horizon undergoing changes of colour, red, orange and green being very distinct, but clouds prevented the actual setting being observed.

It is probable that the green flash at the setting of a bright star on a night of great transparency could be seen, if binoculars or a telescope were used. In July 1880 Admiral J. P. MACLEAR watched

α Eridani changing its colour to brilliant red and green alternately as it neared the horizon.

Other Phenomena at Sunrise and Sunset.—Sometimes traces only of the green flash are observed, the sun's upper limb turning a greyish-green or whitish green as it disappears. This, which may be seen over both land and sea horizons, is not visible except with binoculars or other aid.

In The Marine Observer, Volume II, 1925, May, page 73, Captain Sir David Wilson Barker, Kt., R.N.R., describes an appearance of the peeling off of green vapour from the sun. He wrote : " As the sun gradually sank to the horizon, it changed gradually in colour from brilliant orange to deep red. A slight haze was on the hitherto clear sky; through a low power telescope irregularities appeared on the sun's outline : (1) on the sides, about one-quarter from the top, bulges appeared; (2) and seemed to peel off, at the final separation from the sun's orb; (3) the vapour took a beautiful emerald green colour and then vanished. This process was repeated several times before the sun quite disappeared, the green colouring lessening in effect and there was no ' green ray.' "

A phenomenon of sunset, quite distinct from the green flash, but probably also produced by refraction, has been recorded in The Marine Observer. As the sun finally disappears, or immediately after sunset, a ray of green light shoots up into the sky. On June 25th, 1927, in the north-west Pacific Ocean, S.S. *Talthybius* reported that : " Immediately after sunset a vivid emerald green flash was observed from the horizon point of sunset to an altitude of about 80° in a southerly direction. The sky immediately above the horizon was covered with A.-St. clouds to an altitude of about 5°. The remainder of the sky was covered with Cu.-Nb./St.-Cu. clouds." (Volume V, 1928, June, page 115.) The following extract from the meteorological log of H.M.S. *Enterprise* was published in Volume VII, 1930, May, page 103 :—" In Ceylon at the end of April and beginning of May—just before the break of the S.W. Monsoon—at sunset, which is always very brilliant, as the sun finally disappears under the horizon, a great column of green light appears to shoot up into the heavens and then gradually disappears." Mr. C. Mickie Smith, writing from the Observatory at Kodaikanal, South India, on May 15th, 1906, stated that he had seen there, on two or three occasions, the whole sky filled at sunset with what seemed to be a green mist, which produced the most lurid effects. These phenomena are quite distinct from the ordinary clear greenish colour of part of the cloudless sky in the west, which is often observed after sunset.

Historical.—The green flash does not appear to have been observed until the last quarter of the nineteenth century. As far as is known the first account of it was published in Nature in 1882. In the days of the sailing ship, observations of amplitude were commonly made at sunset, but as these were taken at the time when the sun's disc was bisected by the horizon the setting of the upper limb would not have been specially observed.

CURRENTS IN THE SOUTH PACIFIC OCEAN, SOUTH OF LATITUDE 34° S., DURING THE SOUTHERN SUMMER.

Prepared in the Marine Division by E. W. Barlow, B.Sc.

During the southern summer, November to April, the mean drifts are weak over the whole of the area for which observations are available. In only a few isolated regions are they as much as 14 to 16 miles per day, and in none of these does the number of observations exceed four.

The Southern Ocean Drift.—When the currents of the Southern Indian Ocean were investigated (Marine Observer, Vol. X, 1933, October, page 132), it was found that the mean easterly set, between Latitudes 38° S. and 50° S., Longitudes 120° E. to 140° E., is very weak during February to October and is replaced by a weak westerly set in November to January. In other words, the flow of the Southern Ocean Drift, south of Australia, is very weak. From the charts of the South Pacific Ocean, for November to April, it will be seen that this weakness continues across the whole of this ocean; in fact, it may be said that the Southern Ocean Drift is hardly discernible in the regions for which observations are available. It will be seen from the roses for the middle and eastern charts (Longitude 176° W. to Cape Horn) that the currents are variable, but that northerly currents are frequent and in some areas predominate over all other directions. Northerly currents were also found in the South Indian Ocean, but only in limited areas in the western part.

Other Currents.—The southern part of the East Australian Current, between Latitudes 34° S. and 38° S., Australian Coast to Longitude 152° E., is shown on the charts. The current here is variable, with many reverse sets, but a south-south-westerly flow down the coast predominates, with mean drifts of 5 to 8 miles per day. Between the Australian coast and the North Island of New Zealand, the currents are variable. Off the west and south coasts of Tasmania the current sets mainly between N.N.E. and E.N.E. during February to April. Off the east coast of this island the currents set between W. and S.W. in November to January and mainly N. and between E. and S. in February to April.

Greatest Drifts.—The strongest current in the whole area during the period 1910 to 1935 was that recorded by S.S. *Strathaird* on March 6th, 1935, at the rate of 75 miles per day, S.16° W., in the mid-position Latitude 35° 30′ S. Longitude 150° 25′ E. This was observed only over a period of four hours, by land fixes. In the western part of the Ocean (Longitudes 140° E. to 176° W.) occasional currents of about 2 knots have been observed.

In the middle part (Longitudes 176° W. to 124° W.) no currents exceeding 38 miles per day were observed during the period 1910 to 1935. In the eastern part (Longitudes 124° W. to 70° W.) the greatest drifts observed were weaker still, the strongest being that recorded by S.S. *Orduna* on February 5th, 1928, S.13° W., at the rate of 36 miles per day, in the mid-position Latitude 47° 46′ S., Longitude 76° 11′ W.

SUMMARY OF ICE CONDITIONS WESTERN NORTH ATLANTIC 1935.

Prepared in the Marine Division by Commander J. Hennessy, R.D., R.N.R.

The following monthly summary of ice conditions in the Western North Atlantic during the 1935 season is compiled from ice reports returned from those ships of the Voluntary Observing Fleet traversing the Trans-North Atlantic routes, from bulletins issued by the International Ice Patrol Service, and from other sources.

January :—The only ice reported during the month was a few scattered bergs off the south-west coast of Greenland in the vicinity of Latitude 60° N. Longitude 50° W. on the 6th and 21st.

February :—During the first half of the month extensive fields of brash and slob ice were encountered on and to the eastward of the Grand Banks, north of the Virgin Rocks. During the second half of the month heavier fields of ice were encountered within the same area. On the 18th two bergs were sighted in Latitude 48° 16′ N. Longitude 48° 00′ W. and on the 28th a large berg was reported in Latitude 48° 12′ N. Longitude 49° 20′ W. Scattered fields of slob ice were reported during the first half of the month on the Misaine and Banquereau Banks, north of Sable Island between the 57th and 61st meridians.

In the Davis Straits extensive patches of sludge and pancake ice were reported on the 19th and 20th of the month between Latitudes 62° and 64° North and Longitudes 51° and 54° West.

March :—The United States Coast Guard cutters *Mendota* and *Pontchartrain* were detailed to carry out ice patrol duties throughout the season. The *Mendote* sailed from Boston to commence the service on the 9th.

At intervals throughout the month field ice was reported on and in the vicinity of the Grand Banks also on the Misaine Bank to the north and east of Sable Island. Some of the fields were extensive and of a heavy nature.

Numerous bergs and growlers were reported during the month between the 44th and 49th parallels and the 41st and 50th meridians. Owing to the southerly drift of ice menacing track " C," vessels were instructed to change to track " B," on the 16th of the month.

The southernmost ice reported during the month was a patch of light field ice observed on the 13th in Latitude 43° 52′ N. Longitude 49° 34′ W. The southernmost bergs were reported on the 12th and 21st in Latitude 44° 22′ N. Longitude 48° 30′ W. and Latitude 44° 23′ N. Longitude 45° 20′ W., respectively.

April :—Ice conditions off the south and southwest coast of Greenland reported by the Danish Meteorological Institute were as follow :—" On April 11th between Cape Farewell and Arsuk navigation was unimpeded by storis, 20 bergs observed between Cape Farewell and Arsuk." On the 19th, " 50 bergs observed between the same points." On April 23rd, " Ice edge 30 miles off shore in Julianehaab Bay, no ice off Cape Farewell." On the 25th, " Off Nanortalik, storis very open, northern edge extending to Nunarssuit, very few bergs between Cape Farewell and Nanortalik."

On the 15th the opening of navigation within the Gulf of St. Lawrence was marked by the arrival at Montreal of the Finnish steamer *Marisa Thorden*.

On the 20th ice conditions within the Gulf and River St. Lawrence were reported as follows :—" Montreal to Cape des Rosiers no ice. Twenty miles eastward to thirty-five miles south of Heath Point, Anticosti and Magdalen Islands, heavy close packed ice everywhere. Gaspe Bay and Saguenay River both solid ice."

Over the Misaine and Banquereau Banks north of the 43rd parallel and west of the 57th meridian patches of Gulf ice were reported throughout the month. On and in the vicinity of the Grand Banks and especially down the eastern side of the Banks numerous bergs and growlers together with some extensive and heavy fields of ice were observed drifting south, throughout the month.

On April 27th, S. S. *Cochrane* sighted a small berg in Latitude 28° 44′ N. Longitude 48° 42′ W., a phenomenal position in which to observe ice, but other than this the southernmost ice reported during the month were two bergs observed on the 28th in Latitude 41° 58′ N. Longitude 49° 11′ W. and Latitude 41° 56′ N. Longitude 49° 03′ W. respectively.

May :—On May 1st the Danish Meteorological Institute reported ice conditions off the south-west coast of Greenland as follows :—" The northern edge of the ice extends to Arsuk. Off Arsuk open coastal water extends for over 18 miles off shore. The western edge of the ice is 30 miles off shore. Edge consists of open ice unimpeding navigation."

The Gulf of St. Lawrence was practically clear of ice throughout the month other than in the vicinity of the north and east coasts of Breton Island where heavy closed packed ice was reported during the greater part of the month.

Heavy close packed ice with numerous bergs and growlers were reported throughout the month in Belle Isle Strait.

Outside the Cabot Strait entrance to the Gulf of St. Lawrence, on the Misaine and Banquereau Banks, patches of Gulf ice were met with up to the 18th of the month.

On and in the vicinity of the Grand Banks no field ice was reported after the first week of the month but all ships crossing this area reported numerous bergs and growlers throughout the month especially when between the east coast of Newfoundland and the 45th meridian and the 45th and 48th parallels. On the 14th of the month owing to the southernmost drift of ice, vessels were instructed to operate on the Extra Southern Track " A." A phenomenal drift of ice was reported by the British M.V. *Lochmonar* who, on the 15th sighted a growler approximately 90 feet long, and 25 feet wide, with its highest point showing about 3 feet above water, in Latitude 33° 43′ N. Longitude 48° 47′ W.

Other than the above phenomenal position, the southernmost ice reported during the month were two bergs observed on the 6th in Latitude 41° 19′ N., Longitude 47° 48′ W.

June :—On the 25th June the Danish Meteorological Institute reported ice conditions off the southwest coast of Greenland as follows :—"About 100 bergs observed between Cape Farewell and Nanarssuit, No storis." Off the south coast of Greenland British vessels reported on the 28th and 29th : Storis extending to 75 miles off Cape Farewell and many bergs and growlers between Latitude 58° 38′ N., Longitude 42° 12′ W. and Latitude 58° 40′ N., Longitude 45° 47′ W.

On the 21st June the Canadian Signal Service reported numerous bergs and growlers within the Strait of Belle Isle, and heavy loose ice off Belle Isle and Battle Harbour.

On June 20th the S.S. *Pengreep* in attempting to make Belle Isle steamed along the outer edge of an impenetrable field of ice from Latitude 50° 45′ N., Longitude 54° 08′ W. to Latitude 52° 15′ N., Longitude 54° 20′ W. and from this position observed the field ice to extend northward and westward as far as the eye could see.

On and in the vicinity of the Grand Banks the ice reported during the month was confined chiefly to that region north of Latitude 45° N., only a few bergs drifting down the eastern edge of the Banks being observed south of that parallel. For this reason vessels were instructed to revert to Track " B," on June 3rd.

The southernmost ice reported during the month was a berg observed on the 30th in Latitude 41° 29′ N., Longitude 49° 30′ W.

July :—The Danish Meteorological Institute reported on the 5th, " Ice edge 20 miles off Cape Farewell, edge consists of compact ice. Bergs met with in Longitude 42° W."

Between July 2nd and 14th British vessels navigating the Davis Straits south of Latitude 63° N. and east of Longitude 59° W., observed extensive ice fields and many bergs and growlers.

Between the 17th and 30th the S.S. *Nascopie* when navigating off the east coast of Labrador encountered heavy ice fields and observed numerous bergs and growlers from Latitude 52° N., Longitude 55° 34′ W. to Latitude 62° 02′ N., Longitude 69° 47′ W.

Ships bound to and from the Gulf of St. Lawrence commenced navigating the Belle Isle Strait during the first week of the month.

On July 7th the Canadian Signal Service reported ice conditions within the Straits as follows, " Many bergs and growlers from Greenly Island to Belle Isle the majority of which being in the northern part of the Straits. From Latitude 51° 33′ N., Longitude 56° 15′ W.

extending north westward to the Labrador coast and in a north easterly direction heavy scattered ice with numerous bergs and growlers. The Newfoundland coast clear of all ice from 3 to 4 miles off throughout the Strait." Ships navigating Belle Isle Straits reported ice conditions as severe both within the Straits and eastward on the tracks to the 51st meridian.

On and in the vicinity of the Grand Banks a few reports of bergs observed south of the Tail which is in Latitude 43° 00′ N., were received during the first week of the month, but during the rest of the month reports received referred to ice observed north of Virgin Rocks between the 49th meridian and the Newfoundland coast.

The southernmost ice reported during the month was a berg observed on the 2nd in Latitude 41° 00′ N., Longitude 49° 00′ W.

The southern tracks being free of ice, the International Ice Patrol was discontinued for the season on July 9th when the U.S.C.G. cutter *General Greene* sailed for northern waters to observe ice conditions and carry out oceanographic research.

August :—On August 9th the Danish Meteorological Institute reported " Free of ice 10 mile off Cape Farewell. Bergs met with in Latitude 59° N., Julianehaab Bay free of ice."

On the 17th the U.S.C.G. cutter *General Greene* reported 187 bergs, observed within a radius of 10 miles from Latitude 59° 38′ N., Longitude 44° 55′ W. and on the 19th hundreds of bergs extending as far as could be seen to the north eastward and north westward of Cape Farewell. On the 18th when off the Labrador coast between Watchman Island and Round Hill Island the American schooner *Morrissey* sighted hundreds of bergs and many pieces of ice and growlers. Most of the bergs were situated to the northward of White Bear Islands.

On the northern routes to and from Belle Isle numerous bergs were reported throughout the month, both within the straits and eastward on both sides of the tracks to the 49th meridian.

Only three reports were received during the month of ice observed on and in the vicinity of the Grand Banks. Two of these reports referred to bergs and growlers sighted on the 6th and 19th in Latitude 48° 35′ N., Longitude 49° 00′ W. and Latitude 48° 00′ N., Longitude 52° 24′ W., respectively. The other report referred to growlers sighted on the 10th in Latitude 43° 07′ N., Longitude 50° 09′ W. which was the southernmost ice reported during the month.

September :—On September 5th the Danish Meteorological Institute reported :—" Free of ice 50 miles off Cape Farewell, Icebergs met with in Latitude 59° N." On the 14th " Free of ice 40 miles off Cape Farewell, Julianehaab Bay free of ice."

Between the 23rd and 25th the S.S. *Nascopie* observed only a few bergs when steaming down the Labrador coast between the 60th and 55th parallels.

Throughout the month ships passing through Belle Isle Straits reported a few bergs between Belle Isle and Point Amour. On the tracks eastward of Belle Isle to the 51st meridian bergs were met with during the first three weeks of the month. No ice was reported on or in the vicinity of the Grand Banks during the month.

October :—On October 25th the Danish Meteorological Institute reported " Free of ice 40 miles off Cape Farewell, Julianehaab Bay free of ice. Belt of icebergs and growlers in Latitude 59° 18′ N. Longitude 42° 45′ W."

Only a few reports of bergs observed within Belle Isle Strait and on the tracks eastward of the Straits were received during the month.

No ice was observed on or in the vicinity of the Grand Banks during the month.

November :—The only ice reported during the month was a few bergs reported between the 15th and 18th on the tracks between Belle Isle and the 51st meridian.

December:—The port of Montreal was closed for the season on December 9th. On December 20th the Canadian Signal Service reported the following ice conditions within the River and Gulf of St. Lawrence—" Montreal to about Condres Island light open ice everywhere. Eastward to Cape Ray and Belle Isle no ice in sight. Bergs sighted off Belle Isle on the 16th." Two large bergs were reported on the 4th in Lat. 48° 18′ N. Long. 48° 35′ W.

CHART A. shows the monthly limits within which reports of ice have been received by the Meteorological Office during the year 1935, also the monthly limits reached by ice over the period 1901–1935.

Particulars of ice observed in phenomenal positions in the North Atlantic, of which the Meteorological Office have records, are given in the following table, and the positions of same are plotted on Chart B.

Phenomenal positions of ice.

No.	Date.	Source of Report.	Position of ice. Latitude N.	Position of ice. Longitude W.	Remarks.
1	14.1.1836	H.M.S. *Cove* ...	60° 55′	5° 50′	Two bergs.
2	9.1.1913	S.S. *Oriflamme* ...	48° 37′	34° 42′	Berg 40 ft. high, 400 ft. long.
3	27.1.1916	S.S. *Rio Verde* ...	33° 34′	70° 32′	Hummock 2 ft. high, 30 ft.in circumference.
4	3.2.1922	S.S. *Weehawken* ...	41° 42′	58° 59′	Ice (sustained bow damage).
5	24.3.1913	S.S. *Floride* ...	46° 21′	34° 05′	Berg 60 ft. high, 200 ft. long.
6	20.3.1915	S.S. *Wanaby* ...	36° 55′	48° 32′	Piece; supposed portion of a berg, 5 ft. high, 60 ft. long.
7	21.3.1920	U.S. Hyd.,Bulletin	38° 02′	40° 38′	3 ft. high, 30 ft. long.
8	21.3.1921	S.S. *Hollandia* ...	37° 50′	47° 23′	Berg.
9	6.4.1909	S.S. *Trafalgar* ...	35° 54′	31° 47′	Two pieces 18 ins. in diameter.
10	11.4.1914	S.S. *Erodiade* ...	32° 55′	62° 11′	Apparently river ice about the size of a lifeboat.
11	24.4.1916	S.S. *Communipaw*	49° 05′	36° 48′	4 ft. high, 50 ft. wide, and 100 ft. long.
12	4.4.1921	S.S. *Hollandia* ...	43° 35′	35° 57′	Large berg.
13	16.4.1926	Trawler *Orizaba* ...	61° 03′	10° 30′	Floating ice about 40 ft. long, and 3 ft. high.
14	7.4.1930	S.S. *La Crescenta*	42° 24′	34° 22′	Small berg about 20 ft. in diameter.
15	27.4.1935	S.S. *Cochrane* ...	28° 44′	48° 42′	Small berg.
16	20.5.1907	S.S. *Lord Lansdowne.*	31° 00′	38° 00′	Two small pieces 6 ft. by 6 ft. and 12 ft. by 4 ft. out of water.
17	6.5.1908	S.S. *Oceano* ...	150–20 Nort Berm	0 miles h of uda.	Pieces.
18	27.5.1909	S.S. *Reventazon* ...	32° 28′	44° 10′	60 ft. long, 10 ft. high.
19	15.5.1911	S.S. *Camillo* ...	10 mile of Nan Shoal	s East tucket Lt.-V.	Small berg.
20	11.5.1914	S.S. *Indradeo* ...	42° 18′	62° 43′	Large slabs of field ice and growlers 100–150 ft. long, 5 ft. out of water.
21	17.5.1915	S.S. *Pola*	38° 16′	61° 50′	Some field ice.
22	15.5.1920	U.S. Hyd.,Bulletin	45° 11′	36° 42′	Berg.
23	27.5.1930	S.S. *Valperga* ...	40° 37′	37° 50′	Iceberg about 16 ft.high. with growlers.
24	15.5.1935	M.V. *Lochmonar* ...	33°43½′	48° 47′	Growler, 90 ft. by 25 ft. by 3 ft.
25	25.6.1886	Brig. *Blanch* ...	48° 40′	15° 22′	Large berg.
26	5.6.1907	S.S. *Kingswell* ...	32° 37′	64° 25′	Several bergs.
27	–.6.1907	Bque. *Silverstream*	80 mile of Fa	s West stnet.	Berg.
28	11.6.1912	S.S. *Valetta* ...	37° 30′	74° 24′	Three pieces of ice.
29	7.6.1913	S.S. *Holtby* ...	39° 35′	64° 50′	Berg 10 ft. high.
30	27.6.1915	S.S. *Stella* ...	36° 28′	57° 45′	Small piece.
31	30.6.1921	U.S. Navy Dept.	33° 20′	49° 16′	Berg 10 ft. high.
32	16.6.1924	S.S. *West Irmo* ...	38° 03′	63° 20′	Growler.
33	25.6.1926	S.S. *Baxtergate* ...	30° 20′	62° 32′	Large piece about 30 ft. long and 15 ft. wide, showing about 3 ft. above water.
34	2.6.1934	M.V. *Beaulieu* ...	30° 50′	45° 06′	Small berg, 20 ft. by 8 ft. by 3 ft. above water.
35	–.7.1890	S.S. *Slavonia* ...	48° 53′	24° 11′	Last remnants of berg.
36	–.7.1902	Two reports by fishermen.	56° 30′ (appx.).	6° 30′	40-50 ft. long, 15 ft. wide, 2 ft. 6 ins. out of water.
37	31.7.1909	S.S. *Shimosa* ...	36° 59′	30° 01′	25 ft. long, 3 to 8 ft. wide.
38	10.7.1913	S.S. *Lothian* ...	37° 27′	36° 48′	Piece, 6 ft. high, 50 ft. in circumference.
39	18.7.1916	U.S. Hyd.,Bulletin	32° 09′	54° 26′	Piece of berg, 3 or 4 ft. out of water.
40	23.7.1916	S.S. *San Giorgio* ...	42° 09′	63° 24′	Berg 60 ft. long.
41	23.7.1918	U.S. Hyd.,Bulletin	44° 25′	35° 01′	Large berg.
42	18.7.1921	,, ,,	44° 30′	39° 26′	Small berg about 15 ft. square.
43	21.7.1921	,, ,,	39° 09′	40° 39′	Berg.
44	31.7.1921	,, ,,	37° 37′	27° 29′	Berg.
45	10.7.1926	S.S. *Chelatros* ...	42° 42′	36° 45′	Two pieces of ice.
46	16.7.1933	S.S. *Rein*	52° 32′	22° 00′	Small piece of ice about 25 ft. long, 12 ft. wide.

No.	Date.	Source of Report.	Position of ice. Latitude N.	Position of ice. Longitude W.	Remarks.
47	12.8.1903	S.S. *Saxon Prince*	37° 52′	71° 30′	Piece, 3 ft. high, 40 ft long.
48	7.8.1908	S.S. *Caronia* ...	50° 31′	18° 55′	Two pieces, 10 ft. square and 15 ft. square.
49	2.8.1909	S.S. *Shimosa* ...	37° 16′	42° 06′	Piece, 18 ft. by 5 ft., 2 ft. out of water.
50	14.8.1912	S.S. *Ulstermore* ...	43° 55′	39° 16′	Piece.
51	27.8.1912	S.S. *Lux*	42° 30′	15° 26′	50 ft. square, 4 ft. out of water.
52	10.8.1915	S.S. *St. Louis* ...	41° 02′	48° 00′	Berg.
53	16.8.1915	S.S. *St. Leonards*	41° 09′	56° 43′	Berg.
54	21.8.1915	S.S. *Strathgarry* ...	40° 46′	68° 20′	Growler.
55	–.8.1915	,, ,,	39° 00′	46° 20′	Piece, 20 ft. long, 4 ft. high.
56	29.8.1920	U.S. Hyd.,Bulletin	40° 30′	47° 52′	Berg.
57	2.9.1883	Bque. *Olivette* ...	35° 40′	30° 00′	Lump of ice.
58	–.9.1895	S.S. *Gulf of Taranto*	36° 35′	71° 36′	Two bergs 30 ft. high, 300–400 ft. long, and much field ice over two miles area.
59	19.9.1906	S.S. *Lord Lansdowne.*	54° 20′	22° 00′	Small berg 20 ft. by 6 ft.
60	10.9.1908	S.S. *Deutschland* ...	45° 28′	27° 18′	Two small bergs and one large.
61	6.9.1920	U.S. Hyd.,Bulletin	47° 10′	38° 04′	Bergs.
62	2.9.1922	S.S. *Hallgjerd* ...	50° 00′	40° 05′	Berg.
63	15.9.1922	S.S. *Empress of Britain.*	52° 52′	40° 12′	Large berg.
64	3.9.1923	S.S. *Djambi* ...	40° 10′	31° 36′	Piece of ice about 30 ft. long, 1½ft. out of water.
65	15.10.1883	S.S. *Elenora* ...	37° 00′	18° 00′	Piece of ice.
66	8.10.1912	S.S. *Putney Bridge*	35° 15′	44° 50′	Small berg 35 ft. long, 6 ft. high.
67	27.10.1916	S.S. *Montreal* ...	51° 17′	41° 17′	Small berg.
68	2.10.1918	U.S. Hyd.,Bulletin	50° 10′	40° 50′	Large berg.
69	19.10.1920	,, ,,	45° 22′	40° 09′	Berg.
70	19.10.1920	,, ,,	45° 24′	40° 07′	Berg.
71	17.10.1921	S.S. *Mount Vernon*	48° 23′	42° 19′	Berg about 70 ft. high, 400 ft. long.
72	6.10.1922	S.S. *Christian Krogh.*	50° 43′	40° 42′	Berg 60 ft. high.
73	7.10.1923	S.S. *Eastern Dawn*	40° 46′	65° 54′	Large growler about 100 ft. square.
74	23.10.1927	Trawler, *Grecian Empire.*	30 miles E.S.E. of the Outer Skerries, Shetland Islands.		Piece of ice 100 ft. long, 6 ft. above water.
75	3.10.1934	S.S. *Rhexenor* ...	36° 53′	29° 13′	Growler, approx. 20 ft. by 4 ft.
76	4.10.1934	S.S. *Imperial Valley.*	36° 16′	29° 26′	Growler, approx. 15 ft. by 3 ft.
77	7.11.1922	Cape Race, W/T Station.	47° 38′	40° 04′	Berg and growlers.
78	–.12.1903	S.S. *Lord Antrim*	42° 00′	55° 00′	Ice.
79	22.12.1915	S.S. *Carolyn* ...	42° 53′	57° 39′	Large berg.
80	16.12.1920	S.S. *Oriana* ...	43° 53′	44° 39′	Berg.
81	16.12.1927	S.S. *Ascania* ...	47° 52′ (approximate).	40° 50′	Four large bergs.

North Atlantic Tracks.

The suggestion that all ships engaged in the Trans-North Atlantic trade should follow separate routes when eastbound to those used when westbound, was first made by Commander F. M. Maury, U.S.N., in 1855, but it was not until 1875 that his suggestion was adopted. The Cunard Company then laid down specified routes which all their ships were ordered to follow.

On the recommendation of the United States Hydrographic Office these routes were amended in 1891, and seven years later the Trans-North Atlantic Conference was formed consisting of the principal International Shipping Companies engaged in the Trans-North Atlantic trade. The conference, working in conjunction with the United States Coast Guard, revise the tracks from time to time in accordance with Article 39 of the International Convention for the Safety of Life at Sea, 1929.

The tracks are shown on Admiralty Route Chart which is published in two sections.

Chart No. 2058 b showing lane routes south of Ireland and English Channel.

Chart No. 2058 c showing lane routes north of Ireland.

The section of the routes running through the ice region in operation for the month is shown on the ice chart published with each quarterly number and monthly supplement of The Marine Observer.

The particulars of the routes which were last revised in March, 1931, are as follows :—

United States.

Track " A " (Extra Southern).

Westbound.

Will only be brought into operation when necessity arises.

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

Eastbound.

Will only be brought into operation when necessity arises.

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

Track " B " (Southern).

Westbound.

From April 11th to June 30th (both days inclusive). Except when ice conditions necessitate the use of " A " Track.

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

Eastbound.

From April 11th to June 30th (both days inclusive). Except when ice conditions necessitate the use of " A " Track.

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

Track " C " (Northern).

Westbound.

From July 1st to April 10th (both days inclusive). Except when ice conditions necessitate the use of B track.

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

Eastbound.

From July 1st to April 10th (both days inclusive). Except when ice conditions necessitate the use of " B " Track.

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

General Instructions.

Vessels bound to or from United States ports **calling at Halifax** have the option of following either the Canadian or United States Seasonal Tracks to or from that port, passing 40 miles South of Sable Island Westbound and 60 miles South of Sable Island Eastbound when proceeding on U.S. Tracks and Canadian Track " D." When proceeding on Canadian Tracks " E " or " F " via Halifax, ships pass North of Sable Island both Westbound and Eastbound.

(Note.—General Instructions Canadian Tracks for vessels bound to or from the North of Ireland.)

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

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

The date on which Tracks change is to apply to the meridian of the Fastnet for Westbound steamers and the meridian of 70° 00′ West for Eastbound vessels.

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

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

Canada.

Track "D."

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

Westbound.

Steer from Fastnet, Inishtrahull, or Bishop Rock on Great Circle course **to cross the meridian of 50° West in Latitude 43° North,** thence to Halifax or other Port, passing not less than 40 miles south of Sable Island.

Eastbound.

Steer from Halifax or other port to pass 60 miles south of Sable Island **to cross the meridian of 50° West in Latitude 42° North,** thence on the Great Circle course to Fastnet, Inishtrahull, or Bishop Rock.

Track "E."

From 11th April to 15th May or until the Cape Race Route clear of ice, and December 1st to February 14th.

Westbound.

Steer from Fastnet, Inishtrahull, or Bishop Rock on the Great Circle course **to the meridian of 50° West in 45° 55′ North,** thence to Halifax or the Gulf of St. Lawrence.

(Note :—The Donaldson Line reserve the right to cross Longitude 45° West in Latitude 45° North on this track.)

Eastbound.

Steer from Halifax or the Gulf of St. Lawrence **to cross the meridian of 50° West in Latitude 45° 25′ North** thence on the Great Circle course to the Fastnet, Inishtrahull or Bishop Rock.

Track "F."

From 16th May to the opening of Belle Isle Route and to November 30th when not using the Belle Isle route.

Westbound.

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

Eastbound.

Steer from Halifax or the Gulf of St. Lawrence to a position 25 miles South of Cape Race thence on a course 10 miles south of the Great Circle track until approaching Fastnet, Inishtrahull, or Bishop Rock.

Track "G."

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

Westbound.

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

Eastbound.

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

General Instructions.

Vessels bound to or from U.S. ports **from or to the north of Ireland** have the option of following either the U.S. or the Canadian Seasonal Tracks D, E and F, remaining on track F during the operative dates of Track G.

On tracks "E" and "F" vessels passing 40 miles south of Sable Island westbound thence to position south of Nantucket and Eastbound from position 40° 10′ North in 70° 00′ West to position 60 miles south of Sable Island.

On track "D" westbound proceeding by rhumb line from position 43° 00′ North in 50° 00′ West to position south of Nantucket and eastbound from position 40° 10′ North in 70° 00′ West to position 42° 00′ North in 50° 00′ West.

Commanders on encountering ice have permission to deviate from these tracks and after the end of October to leave the Belle Isle for the more southerly route at their discretion according to weather conditions. Should vessels on Track "C" bound to or from United States be deviated to Track "B" on account of ice, Canadian vessels will remain on Track "D" for the period prescribed but will have the above option of deviating as necessary in the vicinity of ice areas.

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

SOUTHERN ICE REPORTS.

During the year 1935.

April.

Year.	Day.	Position. Latitude.	Position. Longitude.	Description.	Remarks.	Name of Ship reporting.
1935	28	56° 34′ S.	110° 50′ W.	Berg	Estimated dimensions 200 feet high 400 feet long	S.S. *Port Bowen.*
	15	53° 18′ S.	103° 32′ W.	Berg	One mile long, about 800 feet maximum height	S.S. *Port Victor.*

May.

No reports.

June.

No reports.

Reports of Ice previous to April, May and June, 1935, will be found in the Marine Observer, Volume XII, No. 118, p. 74.

WIRELESS WEATHER SIGNALS.

I.—SHIPS' WIRELESS WEATHER SIGNALS.

A full description of the world-wide system of voluntary "Selected Ships" routine weather reports with instructions was given on pp. 28–39 of the January number of this volume of THE MARINE OBSERVER.

The list which follows contains the latest information of stations to which "A Selected Ships" should report in accordance with those instructions, and stations detailed to intercept or receive reports from "B Selected Ships" also in accordance with those instructions.

To decode these reports, and for information of the system of communication of "Selected Ships", all concerned are referred to the PAMPHLET, M.O. 329, concerning which special notice to the masters of British ships will be found on p. 31, paragraphs (27) and (34) of the January 1936 number of THE MARINE OBSERVER.

WIRELESS STATIONS DETAILED TO RECEIVE ROUTINE CODED WEATHER REPORTS FROM "A SELECTED SHIPS."

Request for Information.

THE ATTENTION OF METEOROLOGICAL SERVICES IS DIRECTED TO THE INVITATION GIVEN ON PAGE 28 OF VOL. XIII NO. 121, JANUARY 1936 MARINE OBSERVER.

Ocean.	Station.	Position.	Call Sign.	Frequency and Wave Length.		Area and limits covered by Station.	Telegraphic address of Meteorological Centre.	Information required—Limit of Groups.	Notes.
				For Station to call up "Selected Ships."	For "Selected Ships" to report to Station.				
North Atlantic and North Sea.	Portishead.	Lat. 51° 28′ 41″ N. Long. 2° 47′ 30″ W.	GKU.	149 kc/s. (2013 metres).	143 kc/s. (2100 metres).	North Sea and Eastern North Atlantic East of Longitude 40° W. but not within 300 miles of station. (*see* Chart of the World.)	Weather London.	Weather only, up to seven groups, preferably No. 3 Supplementary Groups.	Control system. "Selected Ships" chosen to report in given order notified by station daily at 2300, 0330, and 1030 G.M.T. Roll call thus—Weather London—call sign of chosen "Selected Ships" to report through GKU at schedule times on 2100 m.
North Atlantic.	Horta, Azores.	Lat. 38° 32′ N. Long. 28° 38′ W.	CTG.	125 kc/s. (2400 metres).	125 kc/s (2400 metres).	Those "A" Selected Ships not in the Roll Call for reporting to Weather London through Portishead, in the Eastern North Atlantic, east of Long. 40°W. should report to this station.	Radio Horta.	Weather only, up to seven groups, preferably No. 3 Supplementary Groups.	"A" Selected Ships in the Eastern North Atlantic not on the roll call made through Portishead (described in these notes for Portishead) should report to Horta in accordance with schedule given in the instructions for British "A" Selected Ships.
	Chatham Mass.	Lat. 41° 43′ N. Long. 70° 47′ W.	WCC.						
	Sayville N.Y.	Lat. 40° 45′ N. Long. 73° 06′ W.	WSL.						
	Thomaston.	Lat. 44° 01′ N. Long. 69° 13′ W.	WAG.		142·9kc/s. (2098 metres).	North Atlantic West of Longitude 40° W.	Observer Washington	Weather only. First four groups of observations taken at 0000 and 1200 G.M.T. only required.	No control. All British "A Selected Ships" within area to address their 0000 and 1200 G.M.T. observations to Observer Washington and their 1800 G.M.T. observations to CQ in accordance with schedule.
	Jupiter.	Lat. 26° 42′ N. Long. 80° 02′ W.	WMR.						
	Palm Beach.	Lat. 26° 42′ N. Long. 80° 02′ W.	WOE.						
South Atlantic.	Slangkop (Cape Town)	Lat. 34° 08′ 46″ S. Long. 18° 19′ 18″E.	ZSC	—	143 kc/s. (2100 metres).	South Atlantic Westward of 25° E. and within a range of about 2,000 miles of station.	Met.	Weather only. Four universal groups and first group of No. 6 Supplementary groups.	No Control. Only 0600 G.M.T. observation required. All British "A Selected Ships" within area should report, commencing at 0618 G.M.T.
Mediterranean.									
Red Sea and Indian Ocean.									

WIRELESS STATIONS DETAILED TO RECEIVE ROUTINE CODED WEATHER REPORTS FROM "A SELECTED SHIPS."

(Continued.)

Ocean.	Station.	Position.	Call Sign.	Frequency and Wave Length.		Area and limits covered by Station.	Telegraphic address of Meteorological Centre.	Information required—Limit of Groups.	Notes.
				For Station to call up "Selected Ships."	For "Selected Ships" to report to Station.				
Indian Ocean.	Jacobs (Durban).	Lat. 29° 55′ 40″ S. Long. 30° 58′ 50″E.	ZSD	—	143 kc/s. (2100 metres).	Indian Ocean S. of 20° S. and Eastward of 25° E. and within a range of about 2,000 miles of station.	Met.	Weather only. Four universal groups and first group of No. 6 Supplementary groups.	No control. Only 0600 G.M.T. observations required. All British "A Selected Ships" within area should report, commencing at 0618 G.M.T.
	Bombay.	Lat. 19° 04′ 55″ N. Long. 72° 49′ 54″E.	VWB	—	143 kc/s. (2100 metres).	Arabian Sea N. of line C. Comorin to Ras Fartak.	Weather.	Weather only. No. 6 Supplementary groups.	All British "A Selected Ships" are requested, when convenient, to report 0000 G.M.T. observations commencing at 0018 G.M.T. in addition to schedule times.
	Madras.	Lat. 12° 59′ 17″ N. Long. 80° 10′ 56″E.	VWM	—	143 kc/s. (2100 metres).	Bay of Bengal N. of line C. Comorin to Achin Head.	Weather.	Weather only. No. 6 Supplementary groups.	All British "A Selected Ships" are requested, when convenient, to report 1200 G.M.T. observations commencing at 1218 G.M.T. in addition to schedule times.
	Colombo.	Lat. 6° 55′ 14″ N. Long. 79° 52′ 46″E.	VPB	130 kc/s. (2300 metres).	143 kc/s. (2100 metres).	Indian Ocean South of a line Ras Fartak, C. Comorin and Achin Head, and within a range of about 1500 miles.	Weather.	Weather only. No. 6 Supplementary groups preferred.	No control—all British "A Selected Ships" within area should report in accordance with Schedule.
	Mombasa.	Lat. 4° 03′ 11″ S. Long. 39° 39′ 49″E.	VPQ	—	125 kc/s. (2400 metres).	From Ras Hafun to Lat. 20° S. when westward of the Colombo area.	Weather Nairobi.	Weather only. No. 6 Supplementary groups.	No control—all British "A Selected Ships" within area should report 0600 G.M.T. observations.
	Perth.	Lat. 32° 01′ 51″ S. Long. 115° 49′ 31″E.	VIP	125 kc/s. (2400 metres).	143 kc/s. (2100 metres).	Indian Ocean and Southern Ocean between Long. 90° and 135° E.; but not within 100 miles of the coast.	Weather.	Weather only. No. 6 Supplementary groups.	No control—all British "A Selected Ships" within area should report in accordance with Schedule. Reports not required for observation times not starred on Chart, p. 30, of the January 1936 number.
North Pacific and China Sea.	Cape d'Aguilar, Hong Kong.	Lat. 22° 12′ 39″ N. Long. 114° 15′ 11″E.	VPS	8330kc/s. (36 metres) or 500 kc/s. (600 metres).	143kc/s.* (2100 metres).	China Sea and North Pacific to about 1,500 miles from station.	Royal Observatory.	Weather only, preferably No. 6 Supplementary Groups.	No control—all British "A Selected Ships" within area should report in accordance with Schedule. *Alternatively see particulars on p. 65 and use wave length and times for "B Selected Ships."
South Pacific.	Sydney.	Lat. 33° 46′ 00″ S. Long. 151° 03′ 09″E.	VIS	125 kc/s. (2400 metres).	143 kc/s. (2100 metres).	S. Pacific Coral and Tasman Seas and Southern Ocean between Long. 135° and 160° E.; but not within 100 miles of the coast.	Weather.	Weather only. No. 6 Supplementary groups.	No control—all British "A Selected Ships" within area should report in accordance with Schedule. Reports not required for observation times not starred on Chart, p. 30, of the January 1936 number.
	New Zealand.	—	—	—	—	—	Weather Wellington.	Weather only, four universal groups.	The Meteorological Office, Wellington, will be glad to receive routine reports from British Selected Ships within range of New Zealand W/T Stations through the normal commercial channels.

WIRELESS STATIONS DETAILED TO INTERCEPT ROUTINE CODED WEATHER REPORTS FROM "B SELECTED SHIPS."

In cases where routine weather reports made to CQ might not be received by the appropriate station within range, indicated in this list, they should be made to that station by call sign, but so that they may be readily intercepted by all ships. 600 m. is used throughout.

Ocean.	Station.	Position.	Call Sign.	Telegraphic address of Meteorological Centre desiring information.	Information desired.	Notes.
North Atlantic.						
South Atlantic.	Salinas	Lat. 0° 37′ 00″ S. Long. 47° 23′ 00″ W.	PPL	Meteoro Rio.	Weather only, including supplementary groups.	
	S. Luiz	Lat. 2° 31′ 28″ S. Long. 44° 16′ 30″ W.	PXM			
	Fortaleza	Lat. 3° 42′ 49″ S. Long. 38° 30′ 56″ W.	PPC			
	Natal	Lat. 5° 46′ 30″ S. Long. 35° 16′ 20″ W.	PXN			
	Olinda	Lat. 8° 00′ 55″ S. Long. 34° 50′ 40″ W.	PPO			
	Amaralina	Lat. 13° 00′ 50″ S. Long. 38° 28′ 27″ W.	PPA			
	Abrolhos	Lat. 17° 57′ 35″ S. Long. 38° 42′ 00″ W.	PXH			
	Victoria	Lat. 20° 18′ 52″ S. Long. 40° 19′ 06″ W.	PPT			
	Rio	Lat. 22° 59′ 19″ S. Long. 43° 11′ 26″ W.	PPR			
	Santos	Lat. 23° 59′ 22″ S. Long. 46° 18′ 18″ W.	PPS			
	Floriano-polis	Lat. 27° 35′ 22″ S. Long. 48° 34′ 17″ W.	PPF			
	Juncçao	Lat. 32° 03′ 22″ S. Long. 52° 08′ 13″ W.	PPJ			
Mediterranean						
Red Sea and Indian Ocean						
Indian Ocean.	Jacobs (Durban).	Lat. 29° 55′ 40″ S. Long. 30° 58′ 50″ E.	ZSD	Met.	Weather only, 4 universal groups and first group of No. 6 Supplementary groups.	
	Algoa Bay (Port Elizabeth).	Lat. 33° 57′ 16″ S. Long. 25° 35′ 30″ E.	ZSQ	Met.	Weather only, 4 universal groups and first group of No. 6 Supplementary groups.	
	Calcutta.	Lat. 22° 33′ 31″ N. Long. 88° 20′ 16″ E.	VWC	Weather.	Weather only up to 6 groups, No. 6 Supplementary Groups preferred.	
	Rangoon.	Lat. 16° 45′ 57″ N. Long. 96° 11′ 51″ E.	VTR			
	Madras.	Lat. 12° 59′ 17″ N. Long. 80° 10′ 56″ E.	VWM			
	Bombay.	Lat. 19° 04′ 55″ N. Long. 72° 49′ 54″ E.	VWB			
	Karachi.	Lat. 24° 51′ 05″ N. Long. 67° 02′ 32″ E.	VWK			
	Matara.	Lat. 6° 01′ 07″ N. Long. 80° 35′ 39″ E.	GZP			
	Mombasa.	Lat. 4° 03′ 11″ S. Long. 39° 39′ 49″ E.	VPQ	Weather Nairobi.		
	Dar-es-Salaam.	Lat. 6° 50′ 38″ S. Long. 39° 17′ 24″ E.	ZBZ	Weather Nairobi.		
	Mauritius.	Lat. 20° 23′ 41″ S. Long. 57° 35′ 25″ E.	VRS	Observatory Mauritius.	Weather 4 universal groups and first of No. 6 Supplementary Groups.	
	Geraldton.	Lat. 28° 47′ 15″ S. Long. 114° 36′ 24″ E.	VIN	Weather.	Weather only, including No. 6 Supplementary Groups.	
	Esperance.	Lat. 33° 52′ 40″ S. Long. 121° 53′ 34″ E.	VIE			

WIRELESS STATIONS DETAILED TO INTERCEPT ROUTINE CODED WEATHER REPORTS FROM "B SELECTED SHIPS."

(*Continued.*)

In cases where routine weather reports made to CQ might not be received by the appropriate station within range, indicated in this list, they should be made to that station by call sign, but so that they may be readily intercepted by all ships. 600 m. is used throughout.

Ocean.	Station.	Position.	Call Sign.	Telegraphic address of Meteorological Centre desiring information.	Information desired.	Notes.
North Pacific and China Sea.	Cape d'Aguilar, Hong Kong.	Lat. 22° 12′ 39″ N. Long. 114° 15′ 11″ E.	**VPS.**	Royal Observatory.	Weather only, preferably No. 6 Supplementary Groups.	
South Pacific.	Auckland.	Lat. 36° 50′ 37″ S. Long. 174° 46′ 08″ E.	**ZLD.**	Weather Wellington.	Weather only, four universal groups.	The Meteorological Office, Wellington, will be glad to receive routine reports from British Selected Ships within range of New Zealand W/T Stations through the normal commercial channels.
	Wellington.	Lat. 41° 16′ 26″ S. Long. 174° 45′ 55″ E.	**ZLW.**			
	Awarua.	Lat. 46° 30′ 47″ S. Long. 168° 22′ 24″ E.	**ZLB.**			
	Chatham Island.	Lat. 43° 57′ 28″ S. Long. 176° 34′ 25″ W.	**ZLC.**			
	Rarotonga.	Lat. 21° 11′ 52″ S. Long. 159° 48′ 52″ W.	**ZKR.**			
	Apia.	Lat. 13° 50′ 17″ S. Long. 171° 49′ 42″ W.	**ZMA.**			
	Thursday I.	Lat. 10° 35′ 14″ S. Long. 142° 12′ 43″ E.	**VII**	Weather.	Weather only, including No. 6 Supplementary Groups.	
	Townsville.	Lat. 19° 16′ 09″ S. Long. 146° 49′ 47″ E.	**VIT**			
	Brisbane.	Lat. 27° 25′ 34″ S. Long. 153° 07′ 19″ E.	**VIB**			
	Melbourne.	Lat. 37° 46′ 56″ S. Long. 144° 52′ 09″ E.	**VIM**			
	Adelaide.	Lat. 34° 51′ 14″ S. Long. 138° 31′ 55″ E.	**VIA**			

II.—WIRELESS WEATHER SIGNALS.

Bulletins.

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

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

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

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

BRITISH ISLES.

Development of Weather Bulletins to aid Navigation.

The first weather bulletin for the British coasts broadcast to aid navigation was a message giving a forecast issued by the Admiralty at the end of the Great War.

In 1921 the principle of broadcasting weather reports of observations made at coast stations was first adopted by the Meteorological Office in a message made through Poldhu W.T. station in Cornwall, entitled the " Western Seaboard " Message, which gave reports from five coast observing stations in code, and a forecast for the western coasts of the British Isles. A pamphlet was published entitled " Weather Forecasting in the Eastern North Atlantic and Home Waters for Seamen " which explained simply the modern methods of weather forecasting by the use of weather charts, and how to draw isobars.

After obtaining the views of many of the masters, mates and skippers of every type of vessel navigating the eastern North Atlantic, North Sea, and waters adjacent to the British Isles, the British Weather Shipping Bulletin was adopted and brought into use on 1st January, 1924.

At the International Conference on Safety of Life at Sea in 1929, this British Weather Shipping Bulletin was cited by foreign shipmasters as giving the weather information from the shore most desirable to aid navigation.

The station reports in the British Weather Shipping Bulletin, together with routine weather reports received or intercepted direct from Selected Ships, or with the reports broadcast in the Weather Shipping Bulletin of Germany or Sweden, afford the desirable information for constructing weather charts on board ships navigating these waters.

After the British Weather Shipping Bulletin had been in use for seven years, exhaustive enquiry was made, and the views and experience of a great many masters, mates, skippers, and others, in all types of vessels was again obtained, with the result that but for the addition of a Northern Area and modification of Districts therein, the Bulletin remained practically unaltered.

From time to time, the officers in some larger merchant ships have advocated a more elaborate synoptic message; but so far as information goes the British Weather Shipping Bulletin, taken in conjunction with the W/T. and R./T. Gale Warnings, continues to meet the needs of the majority of shipping, and more particularly smaller vessels whose need of weather intelligence from the shore to promote safety of life at sea is greater.

In September, 1935, the Admiralty adopted a Fleet Synoptic Message for the Home Station, which is compiled daily at the Meteorological Office, London, and made through the Admiralty W/T. stations at Cleethorpes and Gibraltar.

This message may be used with advantage by liners in the Eastern North Atlantic; and full particulars were given in Admiralty Notice to Mariners No. 1374, published on 17th August, 1935, and which will be incorporated in the Admiralty List of W/T Signals.

Throughout these pages, in the April, July and October numbers of THE MARINE OBSERVER for each maritime country, in geographical order where established, Weather Shipping Bulletins founded on the same principles as the British Weather Shipping Bulletin will be given; and where not available, such Bulletins as are the most appropriate for shipping.

Only the International Ships' Wireless Weather Telegraphy Code is given in THE MARINE OBSERVER.

Those who desire information of the more elaborate bulletins and synoptic messages which are issued for the use of meteorologists in their specialized work, and for aiding aerial navigation and so forth, are referred to the " Admiralty List of W/T. Signals " which contains the most complete information of all W/T signals.

In short " Weather Signals " in THE MARINE OBSERVER is an endeavour to provide concise information of the signals which are generally most practical for the purposes of the merchant navy.

" WEATHER SHIPPING " BULLETIN.

C.W.

W/T Station, **Rugby.** Latitude 52° 21′ 59″ N. Longitude 1° 11′ 12″ W. Call Sign **G.B.R.**

Wavelength 18,740 metres C.W. (16 kc/s.).

Times of transmission 0910 G.M.T. and 2133 G.M.T.

The message issued at 0910 G.M.T. contains 0700 G.M.T. observations. The message issued at 2133 G.M.T. contains 1800 G.M.T. observations.

During the time of S.O.S. lookout, from 0915 to 0918 G.M.T. there will be a pause in the transmission of the signal.

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

Part I is a brief general statement which will generally provide information of the atmospheric pressure systems which influence the weather in the region dealt with by this Bulletin.

Part II is a weather report in code giving actual observations at ten British coast stations and two foreign stations.

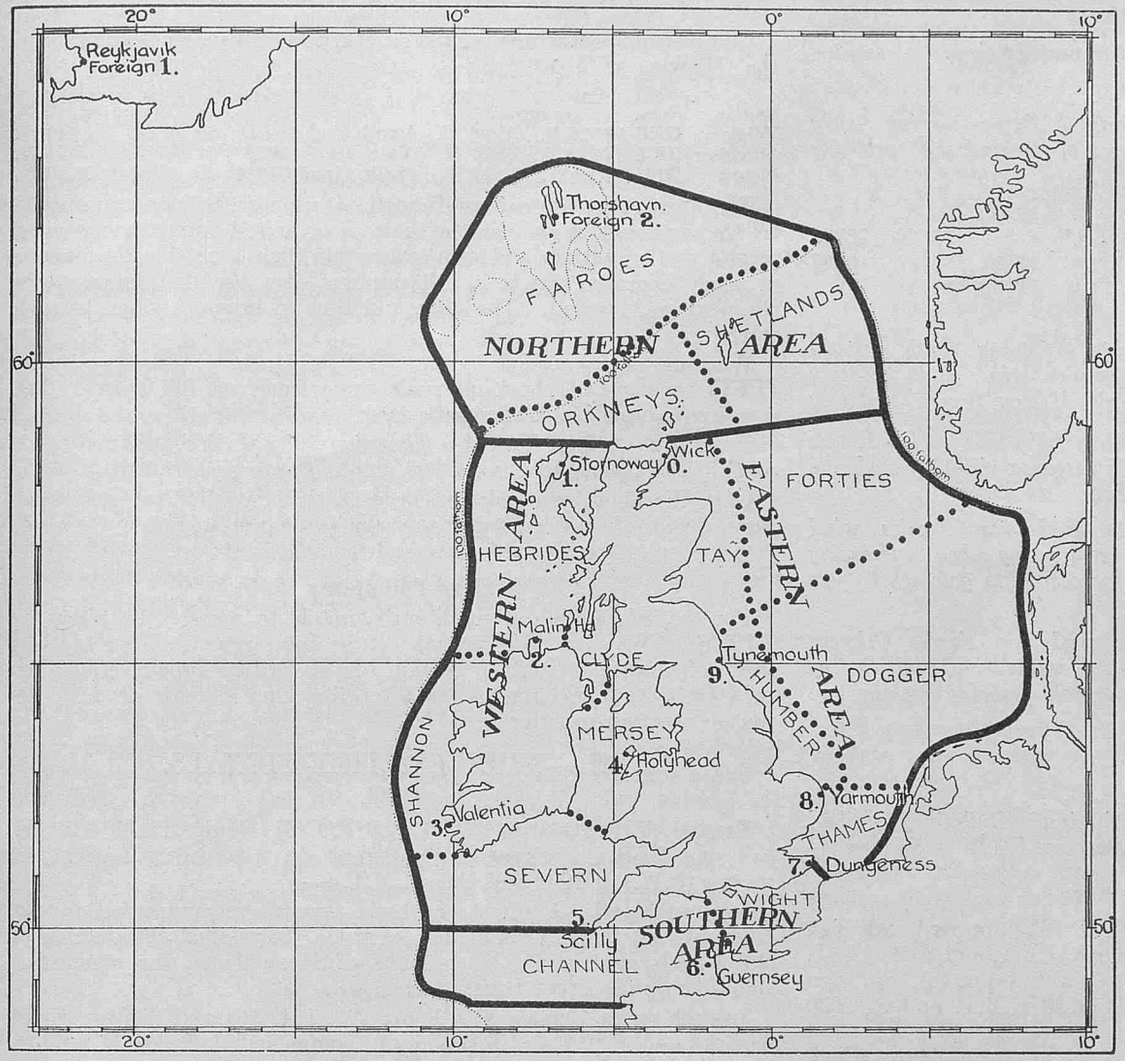
For full information for decoding see next page, also the Pamphlet, M.O. 329, " DECODE FOR USE WITH THE INTERNATIONAL CODE FOR WIRELESS WEATHER MESSAGES FROM SHIPS (Third Edition)," obtainable from H.M. Stationery Office, price 6d.

Parts III, IV, V and VI are forecasts of wind and visibility for the 12 hours following the time of shore observations for the areas shown upon the Chart on p. 67.

Part VII commencing " Outlook " is a brief general statement of weather expected after the period of the forecasts.

NOTE.—In order to avoid ambiguity between the words Ireland and Iceland the latter word is always repeated whenever it occurs in Part I.

Chart Showing Stations, Forecast Areas and Districts.



WESTERN AREA.

The sea and coasts eastward of the 100 fathom line from the latitude of Cape Wrath to Scilly.

DISTRICTS.

HEBRIDES—That part of Western which lies N. and W. of Bloody Foreland, Rathlin I. and Islay.
SHANNON—West coast of Ireland from Bloody Foreland to the Fastnet.
SEVERN—South coast of Ireland Bristol Channel and approaches.
MERSEY—The Irish Sea and approaches.
CLYDE — The North Channel and approaches to Clyde.

SOUTHERN AREA.

The English Channel from S. Foreland to the 100 fathom line.

DISTRICTS.

CHANNEL—West of St. Albans.
WIGHT—East of St. Albans.

EASTERN AREA.

The North Sea southward of line Duncansby Head to Utsire, to the Straits of Dover.

DISTRICTS.

THAMES — Thames estuary and its approaches.
HUMBER—East coast from Haisborough to Longstone.
TAY—East coast of Scotland, including Moray Firth.
FORTIES—Eastward to 100 fathom line and N. of Longstone to Naze.
DOGGER—Eastward to coast of Denmark and S. of line Longstone to Naze.

NORTHERN AREA.

Northward of latitude of Cape Wrath and of line Duncansby Head to Utsire, to the bank of soundings north of the Faroes in the west, and to north east extremity of the 100 fathom line in the east. Westward of the 100 fathom line to Bill Baileys Bank.

DISTRICTS.

ORKNEYS—Orkneys and north-westward to the 100 fathom line.
SHETLANDS — Shetlands and eastward to the 100 fathom line.
FAROES—That part of the Northern Area to the northward of the 100 fathom line.

Explanation of Chart.

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

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

These areas are sub-divided into districts, named after islands, rivers or banks within them, so that they may be readily memorised.

For instance the district in the neighbourhood of the Long Forties is termed " Forties."

The boundaries of these districts should only be taken as an approximate indication of their extent.

These districts are for the purpose of giving information of different weather within an area, without unduly lengthening the wording of a message. When similar weather is expected all over an area, these district names will not be used.

DESCRIPTION OF STATION REPORTS GIVEN IN PART II OF THE BULLETIN AND INSTRUCTIONS FOR DECODING.

These reports only contain an identifying number of the stations from which they originate, and just those elements which are most essential for the purpose of the mariner, viz., the true direction of the wind, and its force, the barometer and how it has recently changed, the visibility to seaward, and the weather.

The observations are made at fixed times, viz., 0700 G.M.T. and 1800 G.M.T.

Instructions for Decoding.

These reports are made by means of the code tables of the International Code for wireless weather messages from ships, in five figure groups which are paired, each pair of groups giving a complete report for a station.

To decode these stations' reports the tables given in M.O. 329 are required (Decode for use with the International Code for Wireless Weather Messages from Ships (Third Edition), obtainable from H.M. Stationery Office, price 6d.).

The Key Letters of the International Ships Wireless Weather Telegraphy Code are fully described on page 36 of the January, 1936, number and in M.O. 329.

The following is a brief description of the Key Letters used for the station reports in this bulletin.

First Group of Pair :—I_NABBV meaning :—

I_N = Station. British stations from 1 to 9 and 0, and foreign stations 1 and 2, prefixed by the word " foreign " (*see* Chartlet), also page 27 of M.O. 329 (Third Edition).
A = Barometric tendency.
BB = Barometric pressure.
V = Visibility. Caution is necessary in the use of these visibility reports owing to the conditions of view to seaward at some stations.

Second Group of Pair is arranged, in accordance with International agreement, similar to the third group of Selected Ships' reports, *i.e.*—D D F w w
meaning :—

DD = Wind Direction. F = Wind force. w w = Weather.

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

Sample Message.

(28th December, 1930.)

Call Sign :—*CQ CQ CQ GBR GBR GBR (repeated twice).*

Weather Shipping.

General Statement.—Deep depression north of Faroes moving slowly northeast stop Intense depression north-west of Ireland will probably move east-north-east.

Station Reports,

10877 20301 28856 09360 30868 20402 47935 17760 57996
18902 66117 16401 75127 20602 85106 18502 96977 16360
00898 18601 Foreign 12847 08102 22726 22660

Forecast.

Western Area. Hebrides wind moderate to strong south easterly or variable visibility moderate to good Shannon wind south westerly veering fresh to strong visibility good Clyde Mersey Severn southerly gale visibility moderate to good.

Southern Area. Southerly gale whole gale at times visibility moderate to good.

Eastern Area. Visibility moderate to good stop Forties wind southwest strong to gale backing and moderating then increasing remainder Eastern Area wind southerly increasing to gale whole gale in places.

Northern Area. Visibility moderate to good stop Faroes Orkneys wind southwest to west strong to gale then moderating and veering northwest Shetlands wind southwest strong to gale probably backing and moderating then increasing.

Outlook strong winds or gales.

I.C.W.

Certain portions of the " Weather Shipping " Bulletin described above are broadcast by coast W/T stations on I.C.W. as follows :—

For the Western Area.

Valentia. Lat. 51° 56′ N., Long. 10° 21′ W. (approx.), call sign **GCK,** wavelength 600 metres I.C.W. At 0948 G.M.T. and 2048 G.M.T.

Seaforth. Lat. 53° 28′ N., Long. 3° 01′ W. (approx.), call sign **GLV,** wavelength 600 metres I.C.W. At 0930 G.M.T. and at 2030 G.M.T.

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

For the Southern Area.

Niton. Lat. 50° 35′ N., Long. 1° 17′ W. (approx.), call sign **GNI,** wavelength 600 metres I.C.W. At 0930 G.M.T. and at 2030 G.M.T.

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

For the Eastern Area.

Cullercoats. Lat. 55° 02′ N., Long. 1° 26′ W. (approx.), call sign **GCC,** wavelength 600 metres I.C.W. At 0948 G.M.T. and at 2048 G.M.T.

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

Wireless Telephony (R/T).

For the information of small craft unable to receive the foregoing W/T signals, appropriate messages are broadcast by word of mouth, R/T from certain stations of the British Broadcasting Corporation.

During the forenoon, Parts I, III, IV, V, VI and VII of the British Weather Shipping Bulletin.

During the evening a forecast of weather for the regions near the coasts of the British Isles.

Details as to stations, wavelength and times are given in the " Radio Times " and the daily press.

WIRELESS GALE WARNINGS.

I.C.W.

Gale warnings are broadcast on a wave of 600 m. (500 kc/s), from the following W/T stations :—

Station.	*Call Sign.*	Lat. (approx.)	Long.	*Station.*	*Call Sign.*	Lat. (approx.)	Long.
Wick	**GKR**	58° 26′N.	3° 06′W.	**Lands End**	**GLD**	50° 07′N.	5° 40′W.
Humber	**GKZ**	53° 20′N.	0° 17′E.	**Valentia**	**GCK**	51° 56′N.	10° 21′W.
Niton	**GNI**	50° 35′N.	1° 17′W.	**Malin Head**	**GMH**	55° 22′N.	7° 20′W.

The warnings are broadcast from the station or stations appropriate to the area within which the gale is expected immediately upon receipt at the station, and also, when this time is outside the periods of single operator watch, at 18 minutes past the first hour within the next such period. The date and time of origin is given in each warning.

Warnings are preceded by the W/T safety signal — — — **(TTT)** repeated at short intervals three times on full power. The warning is broadcast one minute later.

Example—" *Gale Warning Thursday* 1230 *G.M.T. Easterly Gale south of line Spurn head to Galway and in Dogger district.*"

Gale Warnings will only be broadcast when winds of gale force (force 8 of the Beaufort Scale) or above are expected; when a " whole gale " (force 10 or above) is expected this will be stated.

Wireless Telephony (R/T).

For the information of small craft unable to receive the foregoing **TTT** Gale Warning W/T signals, these messages are broadcast by word of mouth, R/T, from certain of the British Broadcasting Corporation's stations immediately after the Time Signals or with the routine weather messages.

III.—WIRELESS TIME SIGNALS.

C.W.

Rugby W/T Station, Lat. 52° 21′ 59″ N., Long. 1° 11′ 12″ W. call sign **GBR,** broadcasts Time Signals on a wavelength of 18,740 metres (C.W.) at 1000 and 1800 G.M.T. :—

System Used.—Modified rhythmic type as recommended by the International Time Commission of 1925, consisting of a series of 306 signals emitted in 300 seconds of Mean Time, the concluding signal being the exact hour.

In each series, Signals Nos. 1, 62, 123, 184, 245 and 306 are single dashes (—) of 0·4 sec. duration and commence at the exact minute. Each dash is followed by 60 dots (.) of 0·1 sec. duration.

The commencement of successive signals, whether dot or dash, are equally spaced at intervals of 60/61 parts of one second of Mean Time, *i.e.* :—

G.M.T. h.	m.	s.	Signal.
9 or 17	55	00	1st signal a dash (—) followed by 60 dots (. . . . etc.).
,,	56	00	62nd do. do. do.
,,	57	00	123rd do. do. do.
,,	58	00	184th do. do. do.
,,	59	00	245th do. do. do.
10 or 18	00	00	306th signal, a dash (—).

This type of time signal will enable chronometer comparisons of extreme accuracy to be obtained, the method employed being to count the number of intervals from the first dash (—) until coincidence occurs between one of the rhythmic signals and the beat of the chronometer. (There being two such coincidences, $29\frac{1}{2}$ or $30\frac{1}{2}$ seconds apart, every minute.)

It is not necessary actually to count the signals.

Write down :—

(1) The chronometer time of the tick (whole or half second) immediately preceding the *first* dash.

(2) The chronometer times of coincidences (seconds only need be written down).

The difference between these (the " Elapse Time ") increased by 0·5 sec. when it is not a whole number, gives the Rhythmic " Interval Number " from which the corresponding correction can be obtained.

NOTE.—An article entitled " Greenwich Time " describing how these signals are made, of great interest to navigators, will be found on pp. 159-167, Vol. V, No. 56.

SPECIAL SERVICE BY PAYMENT.

Additional Wireless Telegraphic and Land Line Services which are performed for shipping, with charges.

The following list indicates the information which may be obtained on request, at any time, night or day.

Weather Forecasts.

Special weather forecasts can be made at the Meteorological Office for a period of 24 hours for areas within the region contained between the parallels of 70° N. and 35° N. and between the meridians of 12° W. and the coast of the Continent of Europe.

Procedure for Ships at Sea.—Request weather forecast through the nearest coast W/T station in Great Britain or Ireland, specifying required date and area, and giving ship's name.

Charge.—7s. 6d.

Procedure for Shipowners and Masters of Ships in port about to sail.—Telephone to Meteorological Office (Telephone No. Holborn 3434, Extension 174) or send **reply paid** telegram to Weather, Phone, London (allowing 10 to 20 words as necessary for reply), requesting weather forecast and specifying date and area for which required, and address to which to be sent.

Charges—None, if the information is required immediately and the reply paid telegram covers the telegraphic charges.

If the information is required for a specified day in advance, or for a number of days, a registration fee of 6d. per week (minimum fee 6d.) in addition to cost of telegrams. In this case application for the forecasts may be made by letter.

Procedure for Salvage Officers and others requiring warning of gales or winds from specified directions, or particular kinds of weather.—Write to the Meteorological Office, London, stating the position or locality and the warnings required, with the period.

Charge.—2s. 6d. for each message, plus telegraphic charges.

NOTE.—For Home waters the Areas and Districts used in the British "Weather Shipping" Bulletin may be used with advantage to indicate the localities for which forecasts are required.

Weather Reports.

Information of the actual local weather conditions prevailing at any of the following stations may be obtained :—

Aberdeen.	Hoylake.	Prawle Point.
*Bangor, Co. Down.	Inchkeith.	Southend.
Barry Island.	Kildonan.	Spurn Head.
Beachy Head.	Lizard.	†St. Ann's Head.
*Broughness.	Mersey Hb.	St. Catherines Point.
Cape Wrath.	*Mumbles.	*Stornoway.
†Dover Pier.	Needles.	*Torr Head.
Dunnet Head.	*Rame Head.	†Tynemouth.
*Holyhead.	†Portpatrick.	†Wick.

* These stations cannot give information about barometric pressure.

† Reports from these stations include information as to the state of the sea.

Procedure for Ships at Sea.—Request through nearest W/T coast station in Great Britain or Ireland, specifying the name of the station for which observed weather conditions are required.

Charge.—7s. 6d.

GERMANY.

II.—WEATHER SHIPPING BULLETIN.

North Sea.

I.C.W.

Norddeich W/T station approximate Latitude 53° 36′ N., Longitude 7° 09′ E.

Call sign—**DAN.**

Wavelength—677 m. I.C.W.

Times of Transmission—1020 and 2130 G.M.T.

The message issued at 1020 is based on 0700 G.M.T. observations. The message issued at 2130 is based on 1800 G.M.T. observations.

The messages are preceded by the words "Seewetter Nordsee" and consist of two parts.

Part I is a weather report in code giving actual observations at the stations hereunder.

Station No.	*German Station.*	*Position.*	*Station No.*	*Foreign Station.*	*Position.*
0	Borkum Riff Lt.-V.	53° 46′ N., 6° 04′ E.	0	Helder ...	52° 58′ N., 4° 45′ E.
1	Heligoland ...	54° 11′ N., 7° 54′ E.	1	Hanstholm ...	57° 05′ N., 8° 35′ E.
2	Elbe Lt.-V. No. 1 ...	54° 01′ N., 8° 13′ E.	2	Krakenes ...	62° 02′ N., 4° 59′ E.
3	Amrum Bank Lt.-V.	54° 33′ N., 7° 53′ E.	3	Aberdeen ...	57° 10′ N., 2° 06′ W.

The foreign stations' observations are preceded by the word "Ausland" (Foreign). The Key and Code used is exactly the same as that used for the British "Weather Shipping" Bulletin see page 67.

Part II contains a brief statement of weather conditions followed by a forecast for the following 24 hours in German, covering the whole sea area off East and North Frisian coasts including Ostfriesland (between Borkum Riff Lt.-V., Elbe entrance and Heligoland) and Nordfriesland (Elbe entrance northward to Ellenbogen, Sylt).

Western, Middle and Eastern Baltic.

I.C.W.

Rügen W/T Station, approximate Latitude 54° 35′ N., Longitude 13° 37′ E.

Call sign—**DAS.**

Wavelength—636 m. I.C.W.

Times of transmission—1030 and 2150 G.M.T.

The message issued at 1030 G.M.T. is based on 0700 G.M.T. observations. The message issued at 2150 G.M.T. is based on 1800 G.M.T. observations.

The messages are preceded by the words "Seewetter Rügen" and consist of two parts.

Part I is a weather report in code giving actual observations at the stations hereunder.

Station No.	*German Station.*	*Position.*	*Station No.*	*Foreign Station.*	*Position.*
4	Bulk	54° 27′ N., 10° 12′ E.	4	Skagen ...	57° 44′ N., 10° 38′ E.
5	Fehmarnbelt Lt.-V.	54° 36′ N., 11° 09′ E.	5	Copenhagen ...	55° 42′ N., 12° 37′ E.
6	Aldergrund Lt.-V.	54° 50′ N., 14° 22′ E.	6	Visby	57° 39′ N., 18° 18′ E.
7	Arkona	54° 41′ N., 13° 26′ E.	7	Memel	55° 42′ N., 21° 10′ E.
8	Leba	54° 46′ N., 17° 33′ E.			
9	Brusterort... ...	54° 58′ N., 19° 59′ E.			

The foreign stations' observations are preceded by the word "Ausland" (Foreign).

Key and Code as above.

Part II contains a brief statement of weather conditions followed by a forecast for the following 24 hours in German.

WIRELESS GALE WARNINGS.

I.C.W.

Gale Warnings are broadcast in German, preceded by the word "Funksturm," giving the nature of the atmospheric distribution with direction and force of wind for the regions specified by the stations indicated below.

W/T Station	Call Sign.	Position. Latitude N.	Position. Longitude E.	Wavelength.	Time of Transmission.	Region.
Norddeich	**DAN**	53°36′	7°09′	600 m. I.C.W. 677 m. I.C.W.	On receipt 0520, 1020* 1630, 2130*	North Sea.
Rügen	**DAS**	54°35′	13°37′	600 m. I.C.W. 636 m. I.C.W.	On receipt 0530, 1030* 1650, 2150*	Baltic — Flensburgh to Memel.

* After Weather Bulletin.

IV.—WIRELESS ICE WARNINGS.

C.W. and I.C.W.

Norddeich W/T Station, call sign **DAN,** broadcasts, when necessary, except Sundays, information of ice conditions along the German coasts in the North Sea and Baltic in a local code.

The message is transmitted at 0950 G.M.T. on a wavelength of 2400m. C.W.

Rügen W/T Station, call sign **DAS,** broadcasts ice warnings similar to above at 1030 G.M.T. on a wavelength of 636 m. I.C.W.

SWEDEN.

II.—WEATHER SHIPPING BULLETIN.

North Sea and Baltic.

C.W.

Karlsborg W/T Station, approximate Latitude 58° 29′ N., Longitude 14° 29′ E.

Call sign—**SAV.**

Wavelength—6000 m. C.W.

Times of transmission—1050 and 2230 G.M.T.

The message issued at 1050 is based on 0700 G.M.T. observations.

The message issued at 2230 is based on 1800 G.M.T. observations.

The messages are preceded by the words " Weather Report " and consist of five parts.

Part I is a weather report in code giving actual observations at the stations hereunder :—

List of Observation Stations.

Index Number.	*Station.*	*Position (approx.)* *Latitude N.*	*Longitude E.*
1	Kalmar	56°39′	16°22′
2	Bjurö klubb	64°28′	21°34′
3	Holmögadd	63°35′	20°45′
4	Bremö	62°13′	17°44′
5	Örskär	60°31′	18°22′
6	Sandhamn	59°17′	18°55′
7	Visby	57°39′	18°18′
8	Skanör	55°24′	12°49′
9	Kullen	56°18′	12°27′
0	Vinga	57°38′	11°36′
1	Hammershus	55°19′	14°47′
2	Hanstholm	57°07′	8°36′
3	Utsira	59°18′	4°53′
4	Kråkenes	62°02′	4°59′

The key and code used is exactly the same as that used for the British " Weather Shipping " Bulletin, see page 67.

Part II, en clair (English).

A statement of weather conditions in N. and N.W. Europe and adjacent seas.

Part III, en clair (English).

Weather forecasts for 12 hours for the following areas :—

1 Eastern part of the North Sea (E. of Longitude 5° E.).
2 Sweden, West Coast (Skagerrak, Kattegat and the Sound).
3 Baltic (Southern Baltic; South Skane, Bleking and Öland; Northern Baltic; East Gotland, Svealand and Gotland).
4 Gulf of Bothnia (Bothnia Sea; Bothnia Bay).

Part IV, en clair (English).

Gale warnings for areas 2, 3 and 4 (above), particulars as follows.

WIRELESS GALE WARNINGS.

Baltic.

C.W.

Karlsborg W/T station broadcasts warnings, *en clair*, English, of gales for the areas given in Part III of the Weather Shipping Bulletin.

The warnings commence with the words " Gale Warnings " and are valid for the ensuing 24 hours. They form Part IV of the weather bulletins broadcast by **Karlsborg W/T** at 1050 and 2230 G.M.T., previously explained.

IV.—WIRELESS ICE WARNINGS.

Swedish Ice Breaker.

C.W., I.C.W. and R/T.

The Swedish Government ice breakers broadcast information in **English** on a wavelength of 600 metres, giving their position, proposed area for ice breaking and rendering assistance during the ensuing 12 hours. Important local information for mariners will also be broadcast.

The messages are broadcast daily, during the time the vessels are employed on ice-breaking service.

The message will be repeated by wireless telephony on a wavelength of 600 metres R/T, in Swedish and English immediately after the transmission on I.C.W. The repetition will be preceded by the words " Fran svenska statens isbrytarfartyg " (from the Swedish State ice breaking vessel).

Ice breaker " Ymer," call sign **SBPN**, at 0800 and 1045 G.M.T. on weekdays and 1210 G.M.T. on Sundays and holidays.

Ice breaker " Atle," call sign **SBLN,** at 0815 and 1100 G.M.T. on weekdays and 1225 G.M.T. on Sundays and holidays.

NORWAY.

II.—WIRELESS GALE WARNINGS.

I.C.W. and R/T.

The following stations broadcast gale warnings for the coast of Norway.

Station.	Call Sign.	Position. Latitude N.	Position. Longitude E.	Wavelength.	Times of transmission G.M.T.	Region.
Flekkeroy	**LGY**	58°04′	8°00′	600m. C.W.	1025, 1620, 2120	S. of Kristiansand.
Utsira ...	**LGK**	59°18′	4°55′	600m. I.C.W. 600m. R/T	1200, 1600 1800, 2100	Lindesnes to Hellisöy Lt. Ho.
Ålesund ...	**LGA**	62°28′	6°10′	600m. I.C.W.	1150 and on receipt	Sonefjord to Rörvik.
Röst ... (1st Dec. to 30th Apr.)	**LGR**	67°30′	12°05′	600m. R/T	1200, 2030 (Sundays 2030)	Lofoten, Helgeland, Salten.
Tromsöy ...	**LMT**	69°39′	18°58′	1100m. C.W. 1100m. R/T	1025, 1145, 1545, 2015	Northern Norway, Rorvik to Grense Jakobselva.

DENMARK.

IV.—WIRELESS ICE WARNINGS.

Danish Waterways.

I.C.W.

The following W/T stations broadcast a summary of ice conditions in Danish waterways, *en clair* (English). Wavelength 600 metres, I.C.W.

Blaavand W/T station, approximate Latitude 55° 33′ N., Longitude 8° 05′ E., call sign **OXB,** at 0100 and 1300 G.M.T.

Copenhagen W/T station, approximate Latitude 55° 41′ N., Longitude 12° 37′ E., call sign **OXA,** at 1100 and 2300 G.M.T.

LATVIA.

IV.—WIRELESS ICE WARNINGS.

Wireless Telephony (R/T).

The broadcasting station at Riga, Latitude 56° 57′ N., Longitude 24° 02′ E., call sign **YLZ,** broadcasts in winter on a wavelength of 514·6 metres R/T, ice reports at 0650, 1035 and 2000 G.M.T. The reports contain information concerning ice and navigation conditions for the Latvian coast. They are broadcast in the Latvian, ENGLISH and German languages.

ESTONIA.

IV.—WIRELESS ICE WARNINGS.

C.W.

Tallinn W/T Station, approximate Latitude 58° 56′ N., Longitude 23° 32′ E., call sign **ESA,** broadcasts, on the first appearance of ice, information of ice conditions in Estonian waters in a local code.

The message is transmitted at 0940 G.M.T. on a wavelength of 3508m. C.W.

FINLAND.

II.—WIRELESS GALE WARNINGS.

I.C.W. and R/T.

The following stations broadcast Gale Warnings when necessary *en clair*, in **English,** at the times and wavelengths given below, the message commencing with the International Safety Signal "TTT Gale Warning."

Station.	Call Sign.	Position. Latitude N.	Position. Longitude E.	Wavelength.	Times of Transmission G.M.T.
Viipuri (Viborg)	OHP	60°43′	28°45′	600m. I.C.W.	1230 and 2030
				750m. R/T	1235 and 2035
Hanko (Hangö)	OHD	59°50′	22°56′	600m. I.C.W.	1210 and 1755
	OFK	,,	,,	750m. R/T	1205 and 1750
Vaasa	OHX	63°07′	21°37′	600m. I.C.W.	1225 and 1800
				750m. R/T	1220 and 1755

Example of message—"TTT Gale Warning. Southwest gale expected up to about next morning between Aland and Helsinki."

IV.—WIRELESS ICE WARNINGS.

C.W.

Helsinki-Helsingfors W/T Station, approximate Latitude 60° 09′ N., Longitude 25° 02′ E., call sign **OHA,** broadcasts, when necessary, information of ice conditions for the coasts of Finland in a local code.

The messages are transmitted at 1030 and 1410 G.M.T. on a wavelength of 3750m. C.W.

HOLLAND.

II.—WIRELESS GALE WARNINGS.

North Sea.

I.C.W.

Scheveningen W/T Station, Latitude 52° 06′ N., Longitude 4° 16′ E. (approx.), call sign **PCH,** makes gale warnings on receipt and following the end of the next compulsory 3 minutes' silent period, both in Dutch and English, and also at 1230 and 2030 G.M.T. Wavelength used is 600 metres (I.C.W.).

The warning commences with the letters "**KNMI,**" and is transmitted first slowly and then repeated quickly.

IV.—WIRELESS ICE WARNINGS.

I.C.W.

Scheveningen W/T Station, call sign **PCH,** broadcasts, when necessary, information of ice conditions in certain Dutch harbours and approaches, daily as follows:—

At 1230 and 2030 G.M.T. after the Storm Warning (if issued). Wavelength 600 metres (I.C.W.).

The ice report is broadcast in a local code and will contain the ice conditions for the following harbours:—

Delfzijl (Ems).	Helder (Zuider Zee).
Harlingen (Zuider Zee).	Rotterdam (Waterway).
Amsterdam (North Sea Canal).	Dordrecht (North).
Zaandam (Voorzaan).	Dordrecht (Mallegat).

The report commences with the words "Ijsbericht, Ice report."

The broadcast of the ice reports will begin when navigation is closed to small steamers and seagoing motor vessels at any of the harbours mentioned in the list, and will cease when navigation is re-opened.

FRANCE.

II.—WIRELESS GALE WARNINGS.

The following W/T stations broadcast gale warnings concerning the areas "Manche." "Bretagne," "Océan," and "Gascogne":—

Cherbourg-Rouges Terres ... Approximate Latitude 49° 37′ N., Longitude 1° 36′ W., call sign **FUC.**

Brest-Mengam ... Approximate Latitude 48° 21′ N., Longitude 4° 35′ W., call sign **FUE.**

Lorient-Pen-Mané Approximate Latitude 47° 44′ N., Longitude 3° 21′ W., call sign **FUN.**

Rochefort-Soubise Approximate Latitude 45° 56′ N., Longitude 0° 59′ W., call sign **FES.**

The following W/T stations broadcast storm warnings concerning the areas "Roussillon," "Provence," "Rhône," and "Corse":—

Toulon-Mourillon Approximate Latitude 43° 07′ N., Longitude 5° 55′ E., call sign **FUT.**

Ajaccio-Aspretto Approximate Latitude 41° 56′ N., Longitude 8° 46′ E., call sign **FUI.**

The W/T stations transmit the warning on the 600 metre wavelength as soon as it is received. The International Safety Signal **— — — (TTT)** is first sent out, followed by D.E. and station call sign. This transmission commences towards the end of one of the international three-minute silent periods and the nature of the warning is sent immediately after the end of the silent period. The message is repeated after several minutes.

When the time of sending falls outside a single operator watch on board ship the message is repeated at the commencement of the succeeding watch.

C.W.

Eiffel Tower W/T Station, approximate Latitude 48° 51′ N., Longitude 2° 18′ E., call sign **FLE,** broadcasts wireless gale warnings on a wavelength of 7,200 m. C.W.

The warnings are broadcast if the forecasts indicate that the wind force is likely to exceed 7 on the Beaufort scale.

The signals refer to the following French coastal areas :—
Manche, Bretagne, Océan, Gascogne, Roussillon, Rhône, Provence, Corse.

The limits of the areas mentioned above are as follows :—

" Manche "	...	Belgian frontier to and including Carteret.
" Bretagne "	...	From and including Cherbourg to estuary of Loire.
" Océan "	...	From and including Lorient to the Gironde.
" Gascogne "	...	From and including Ile de Ré to Spanish frontier.
" Roussillon "	...	From Spanish frontier to and including Cette.
" Rhône "	...	From and including Cette to Camarat.
" Provence "	...	From and including Camarat to Italian frontier.
" Corse " ...	...	All the coasts of Corsica.

Form of Message.

The warnings are sent *en clair* in French, and are valid for 24 hours from the time indicated in the message.

They commence with the name of the day of the week, the time from which the validity of the warning is reckoned, the name of area threatened followed by the word "Tempête" and the probable direction from which the gale may be expected.

Example.
" *Jeudi* 15 *heures Manche tempête, Nord-Ouest* (*N.W.*)."

Explanation.

From Tuesday until 1500 to-morrow a gale (Force 7 or over Beaufort) and from a direction between North and West will threaten all parts of the coast between the Belgian frontier and Carteret.

PORTUGAL.

II.—WIRELESS WEATHER BULLETINS.

Containing meteorological conditions at Madeira and Azores I.C.W. and R/T.

Monsanto W/T Station, approximate Latitude 38° 44′ N., Longitude 9° 11′ W., call sign **CTV,** broadcasts a meteorological report *en clair*, in Portuguese and English at 1130 and 2300 G.M.T. on a wavelength of 1000 metres (I.C.W.) and at 1155 and 2325 G.M.T. on a wavelength of 800 metres (R/T), giving :—

Observations of wind and swell, also a forecast for the next 24 hours of wind and swell for the coast of Portugal. The coast is divided as follows :—

Zona Norte...	From River Minho to Cape Mondego.
Zona Centro	From Cape Mondego to Cape St. Vincent.
Zona Sul ...	Cape of Algarve (southern coast).

The messages are based upon observations of 0700 or 1800 G.M.T.

MOROCCO.

II.—WIRELESS GALE WARNINGS.

Spark.

Casablanca—Médiounah W/T Station, approximate Latitude 33° 27′ N., Longitude 7° 31′ W., call sign **CNM,** broadcasts gale warnings at 1530 G.M.T. on 600 m. spark. They are broadcast *en clair* in French and repeated at the commencement of the following watch for single operators. The area affected is given in the message.

The message is preceded by the International Safety Signal **(TTT)** — — —

AZORES.

II.—WIRELESS WEATHER BULLETIN.

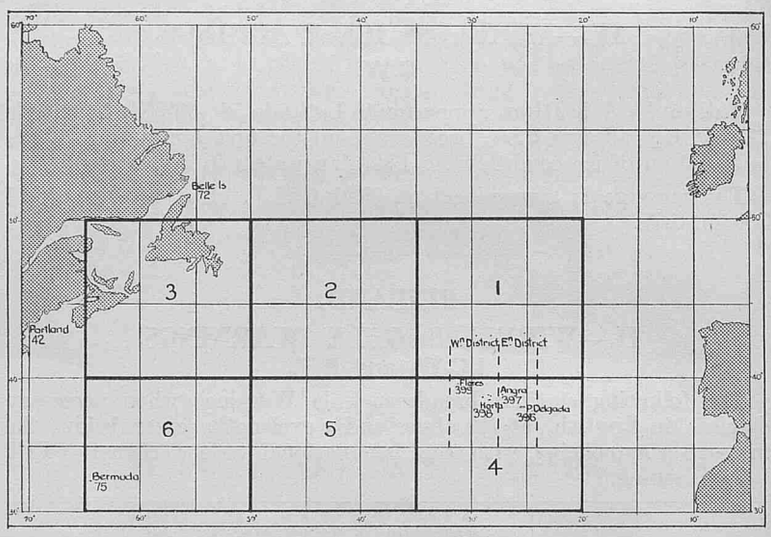
C.W. and Spark.

Horta W/T Station, Latitude 38° 32′ N., Longitude 28° 38′ W. (approx.), call signs :—

CTH, Wavelength 770 m. spark. Time of transmission 2000 G.M.T.
CTG, Wavelength 2400 m. C.W. Time of transmission 2030 G.M.T.

This weather bulletin is sent *en clair* in Portuguese and repeated in English, the time of observation upon which the forecasts are based being stated in the message.

The zones referred to are indicated in the chart below.



PERSONNEL.

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

PROMOTIONS AND AWARDS.

Captain Leonard Gillilan Garbett was promoted on January 1st, 1936, from Commander to the acting rank of Captain on the retired list of the Royal Navy.

Trained in H.M.S. *Worcester*, he served his apprenticeship in the beautiful composite clipper ship *Torrens*, after which he was for a time an officer in the service of the British India Steam Navigation Company. LEONARD GARBETT soon saw when he joined as a junior Royal Naval Reserve Officer for training in His Majesty's Fleet that his preference for service was with the Royal Navy and was so fortunate in his desire as to be transferred to that service.

He soon became a skilled hydrographic surveyor and most of his time in the Royal Navy was spent in that branch.

During the Great War he saw active service on the East Coast of Africa in Monitors and at the time of the Armistice was in command of H.M.S. *Mersey*.

His last command was H.M. Surveying Ship *Merlin* on the China station.

When the Meteorological Office took over the Meteorological Section which had been formed at the Admiralty to meet the requirements of the fleet during the Great War, it was considered if the Marine Division should take on the combined work of both the Royal Navy and the Merchant Service. It was evident to those who had experience of both services, that with the developments which seemed inevitable, following the many inventions and discoveries which had been made under the stress of War, that the work would best harmonize and flourish if there were separate divisions at the Meteorological Office, each under officers of their own service.

In 1921 he was selected for the new post of Superintendent of the Naval Service Division at the Meteorological Office and placed on the retired list with the rank of Commander.

He has shown an understanding not only of the needs of his own service but also for the aspirations of the Merchant Navy and the Marine Division which has earned our gratitude, and the corps of voluntary Marine Observers will join with us in congratulating our sister service upon this recognition of the work of the Naval Division with H.M. Fleet under Captain GARBETT. L.A.B.S.

Lieutenant Leonard Charles Hill, R.N.R., has been made an officer of the Civil Division of the Order of the British Empire by HIS MAJESTY THE KING.

In January 1936, the Royal Research Ship *Discovery II*, Captain L. C. HILL, rescued the American airman Mr. LINCOLN ELLSWORTH and his British companion Mr. H. HOLLICK KENYON from a rather uncomfortable situation at the Bay of Whales in the Ross Sea in about Latitude 79° South.

It can be safely said that all seamen regard this piece of seamanship as a "good show," for we can perhaps appreciate better than most landsmen the difficulty and strain of taking a ship through some 400 miles of pack ice, and of getting out again safely and without damage. This, in a steel ship, must have given her captain many anxious moments.

HILL has had considerable experience of ice navigation, and the success of the venture is due to his good seamanship and to the ready co-operation of 'all hands,' afloat and ashore.

When it was known that the Antarctic flyers needed help, the Discovery Committee in London took immediate action, and wirelessed orders to the ship, which was on Oceanic Research work in the Southern Ocean, to proceed at once to Melbourne for extra fuel and gear. The Committee had also to decide on the best route for the ship to take, and the latest date on which she must be clear of the ice.

The Australian and New Zealand Governments gave prompt assistance by lending aeroplanes, sledges, etc.; together with air pilots and the experienced Antarctic navigator Captain J. KING DAVIS, whose advice must have been helpful to Captain HILL.

Discovery II's route South was roughly along the 180th meridian, and light pack was encountered in Latitude 66° 38′ South on 7th January. She was held up by heavy pack on the 11th January in Latitude 71° 37′ S. and here the great usefulness of aircraft in this sort of work was evident. An aeroplane flew off and was able to spot better ice conditions about 40 miles away.

On the 14th January the ship cleared the pack in Latitude 73° 30′ S., and reached open water in the Ross Sea.

By the 16th the two airmen, who after landing through shortage of fuel had sledged in to Admiral BYRD's old hut at the Bay of Whales, had been found and were safe on board *Discovery II*.

The ship returned to New Zealand, having made a very smart passage in both directions.

The whole Merchant Navy will wish to join us in congratulating Captain HILL on his fine work, and on the honour conferred on him by the KING. C.H.W.

Captain G. S. Kennedy has been appointed Marine Superintendent of the Orient Line in place of the late Sir WALTER DE M. BAYNHAM.

Captain KENNEDY commenced his sea career in 1904 and served his apprenticeship in the sailing ships of Messrs. T. Dunlop and Sons, of Glasgow.

On obtaining his second mate's certificate in 1909 he transferred to steam and obtained experience in ships of various companies until passing for Master in 1912 when he joined the Orient Line as a fifth officer.

When serving as a Chief Officer in 1920 he was appointed Assistant Marine Superintendent of the Orient Line, but sailed for a voyage in command of the *Orvieto* in 1929 and of the *Orford* in 1932. J.H.

Commander George Davies Williams, D.S.O., R.D., R.N.R., for many years Deputy Director of Navigation and Lighthouses in the Australian Federal Service, for New South Wales, has been appointed Vice-President of the new Maritime Services Board of New South Wales, formed to administer the work of harbours and navigation.

Captain WILLIAMS went to sea in 1896. He was chief mate of the White Star Line training ship *Mersey* from 1908 to 1911, during which time he was commissioned as a Sub-Lieutenant in the Royal Naval Reserve.

In 1911–1914 he commanded the Victorian training ship *John Murray*.

During the War, he served as Lieutenant R.N.R. in H.M.A.S. *Australia* and *Sydney*. He was First Lieutenant in H.M.S. *Patia* and *Hindustan*. He took part in the Zeebrugge raid on St. George's Day, 1918. He commanded H.M.S. *Marquerite* and *Tuberose* in the Mediterranean.

We first met him during the Armistice, when for a short time he relieved the command of H.M.S. *Heroic*, after which he commanded the mine-sweeping Division in the Aegean and Black Sea, for which service he was awarded the Distinguished Service Order.

In 1922, Captain WILLIAMS was appointed Sub-Agent to the Meteorological Office at Sydney and Merchant Navy Agent in 1926, since when he has done most valuable work in the conduct of the British voluntary meteorological service in the Pacific.

We congratulate Captain WILLIAMS upon his appointment, which unfortunately for us means his retirement from the Agency at Sydney, and wish him continued success. L.A.B.S.

RETIREMENTS.

Captain J. J. Airey, for many years Deputy Director of Navigation and Lighthouses in the Australian Federal Service, for West Australia, retired at the end of January.

Captain AIREY went to sea in 1885 as an apprentice, serving in the Barques *Penshaw* and *Beatrix* in the west coast South America trade.

Later he was an officer in S.S. *Saladin* running between Fremantle and Singapore. In 1896, he joined the Survey Service on the coast of West Australia, for years commanding the Government steamers *Victoria* and *Penguin*, engaged in attendance upon the Lighthouses and upon surveys.

For a time he was harbour master of King George's Sound.

In 1915, when control of the coastal lights of Australia was taken over by the Commonwealth Government, Captain AIREY was appointed District Lighthouse Officer for Western Australia and the Northern Territory. In 1921, he was appointed Deputy Director of Navigation and Lighthouses for Western Australia.

In 1922, when Merchant Navy Agencies were established in Australia, Captain AIREY was appointed Sub-Agent to the Meteorological Office at Fremantle, with the Divisional Meteorologist.

Dual control of these Agencies being unsatisfactory, Captain AIREY was appointed Agent in 1926, and continued until 1932, when the Agency at Fremantle was closed.

During this time, his conduct of the voluntary service of meteorology resulted in the completion of the collection of data for charting for climate the region off the N.W. Coasts of Australia, and the East Indian Archipelago, a region which, up to then, had been neglected. L.A.B.S.

Captain Frederick W. Beckett, commander of the M.V. *Worcestershire*, has retired from the sea after 46 years' service.

Captain BECKETT commenced his sea career in 1889 as an apprentice in the Barque *River Ganges*. He remained in sail for eleven years, his last ship being the Barque *Rothesay Bay*, in which he served as second mate, mate, and master.

On transferring to steam, Captain BECKETT joined the Bibby Line in 1901 as fourth officer and served in the various grades until 1912 when he was appointed to command. In 1915 he was granted a commission in the Royal Naval Reserve and served in the 10th Cruiser Squadron until 1918, when he returned to the Bibby Line and was appointed to command the *Herefordshire*. Since then he has commanded several of the Bibby Line ships, including the *Lancashire*, *Dorsetshire*, *Cheshire*, and *Worcestershire*. At the time of his retirement Captain BECKETT was Commodore of the Bibby Line fleet. J.H.

Captain W. Morton Betts, commander of the R.M.S. *Warwick Castle* and Commodore of the Union Castle fleet, has recently retired, thus bringing to a close a sea career of nearly 50 years.

After some years' service in sailing ships, Captain MORTON BETTS, on obtaining his master's certificate, joined the Union Steamship Company as a fourth officer in 1891. Rising through the different grades he was promoted to command in 1915 and appointed to the *Gordon Castle*.

Since then Captain MORTON BETTS has commanded several ships of the Union Castle fleet, including the *Cluny Castle*, *Norman*, *Edinburgh Castle*, *Llandaff Castle*, *Windsor Castle*, *Walmer Castle*, *Arundel Castle*, *Carnarvon Castle*, *Winchester Castle*, and *Warwick Castle*. J.H.

Captain J. F. Spring Brown, of R.M.M.V. *Aorangi*, retired at the end of last year to live in Sydney.

He went to sea in 1888 as an apprentice in the Ship *Queen of Scots*, later was appointed Third Officer of S.S. *Tyrian*, to be delivered in Australia to Messrs. Howard Smith and Company, with whom he remained for some years in their Australian coastal service.

In January, 1900, he joined the service of the Union S.S. Company of New Zealand, as Third Officer, and gained his first command in 1910, S.S. *Wainui*.

During the Great War, when in command of S.S. *Mokoia* and *Wallochra*, he transported troops from Australia and New Zealand to Egypt, from England to Archangel, and after the War, refugees from the Baltic ports.

Since 1920, Captain SPRING BROWN has commanded *Makura*, *Marama*, *Maunganui*, *Tahiti*, *Sussex*, and *Niagara*. In February, 1931, he was appointed Commodore in the Union Company's fleet, and given command of the new *Aorangi*.

Captain SPRING BROWN has been a member of the corps of observers since 1923, and the voluntary work done by the ships under his command has been valuable, particularly in the example it has set in this much needed work in the Pacific Ocean. J.H.

OBITUARY.

With deep regret we record the following :—

Captain C. H. C. Allin died at Folkestone on 2nd February.

Captain ALLIN had only recently retired from active service in command of R.M.S. *Moldavia*, after 38 years with the P. & O. Steam Navigation Co., and 45 years at sea.

Trained in square rigged sailing ships, he joined the P. & O. Company's S.S. *Socotra* as fifth officer in 1897. He was appointed to his first command in 1923, S.S. *Beltana*. Later he commanded *Baradine* and *Moldavia*.

He was buried at sea from Dover on 5th February. J.H.

Captain Sir Walter de Mouchet Baynham, K.B.E., R.N.R., Marine-Superintendent of the Orient Line, died at his home at Sidcup, Kent, on 5th February, after a short illness, at the age of 59 years.

WALTER BAYNHAM was an old shipmate, whose death is a personal blow, as well as a great loss to the Service.

The son of the Rev. J. F. BAYNHAM, born and educated at Dover, WALTER BAYNHAM went to sea as a midshipman in Devitt and Moore's ship *Hesperus* in 1890. Before he had completed his time in the *Hesperus* he was appointed fourth mate of that ship.

He first went into steam with Messrs. John Hall, Junr., in August, 1895, and served for a time in the steamers of the China Mutual Navigation Company.

In November, 1897, he returned to sail and was Second Mate of his old firm's ship *Harbinger ;* the *Hesperus* and *Harbinger* being training ships of the LORD BRASSEY and DEVITT and MOORE'S scheme, which produced many fine officers, and was the forerunner of the present Pangbourne Nautical College.

Sir THOMAS DEVITT was a manager of the Orient Steam Navigation, and many officers trained in his ships found their way into the Orient Company.

In October, 1898, WALTER BAYNHAM was so lucky as to be appointed fourth officer of S.S. *Lusitania* of the Orient Steam Navigation Co., and he was probably one of the last officers to join that Company with a mate's certificate, a master's or extra master's certificate being later the invariable rule.

He was fourth, and then third officer of the old *Austral ;* second of the *Orient* where we first met in 1903, and he was promoted Chief Officer in 1908, and appointed to *Ormuz*.

On 22nd March, 1911, just 12½ years after joining the Company's service, he was appointed to command *Ophir*. Later he commanded *Orontes*, *Orvieto*, *Omrah*, and *Otranto*.

Soon after the outbreak of war, H.M.S. *Otranto* was commissioned as an armed cruiser, a Captain of the Royal Navy being in command. WALTER BAYNHAM, who had long been a fully trained permanent officer of the Royal Naval Reserve, was appointed Acting Commander R.N.R. and navigating officer.

Otranto was in Admiral CRADDOCK'S squadron, and formed line of battle when they met VON SPEE'S squadron off Coronel. She was ordered by the flagship to withdraw.

In November, 1917, Captain BAYNHAM was released by the Admiralty and appointed by his owners to command the *Ormonde*, which ship was engaged in trooping; and did much service with the troop transport convoy in the Mediterranean.

BAYNHAM, from my earliest association with him, was deeply interested in the business side of our profession, and foreseeing the possibilities after the war, he spent much of his leisure at this time in studying the economic problems of shipping, including the supply and markets of oil fuel.

The late Captain TUKE retired in 1920, and BAYNHAM was appointed to succeed him as Marine-Superintendent.

He had been a Younger Brother of Trinity House since 1913.

Called upon during Trinity week, 1919, to respond to a toast on behalf of the Younger Brethren of Trinity House, WALTER BAYNHAM, with characteristic incisiveness, pointed to the service of the merchant navy during the war, and the comparative small number of honours which had been bestowed upon it.

In 1920 no one was more surprised than WALTER BAYNHAM himself when he was told that his name was to be included in a list designed to do honour to the whole merchant navy, in recognition of its service to the British Empire in 1914–1918; and he was created a Knight of the Order of the British Empire.

In February, 1923, a meeting of a few master mariners took place at the Institute of Marine Engineers near the Tower of London. Sir WALTER BAYNHAM was one of those present; and this meeting ultimately proved to be the inception of what is now the Honourable Company of Master Mariners.

A few years later, pending the election of the first Court, a preliminary management of seven was appointed. It was the general wish that Sir WALTER BAYNHAM should be one of these, but owing to the pressure of his duties, he was unable to undertake this work, which by right was his.

Sir WALTER BAYNHAM took a leading part in the administration of the Honourable Company once it was formed; and with the exception of one year when he was absent in Australia, he has been a Mariner Warden, and in 1933–1934 Prime Warden.

His study of business and financial matters during his time at sea proved of great value, and he was appointed Trustee of the Honourable Company's funds, with His Grace the DUKE OF MONTROSE, and Sir PHILLIP H. DEVITT, a son of his old employer.

He was a member of the corps of voluntary marine observers from 1900 to 1919, and has in recent years given such encouragement to this voluntary service as his very full life permitted.

Sir WALTER BAYNHAM, as Marine Superintendent of the Orient Line, had a very responsible part in the maintenance of the efficiency of the Orient fleet and the high state of morale of its personnel, for which the Orient Company is famous.

As a Trustee and a Warden of the Honourable Company of Master Mariners, he took a large share in the creation of a central body of the Merchant Navy, to encourage and maintain a high and honourable standard of practical proficiency and professional conduct, and to advise on matters affecting it.

The British Merchant Navy has lost a true friend. L.A.B.S.

Admiral of the Fleet Earl Beatty, P.C., G.C.B., O.M., G.C.V.O., D.S.O., D.C.L. (Oxon), LL.D., died at his London house on March 10th, at the age of 65.

LORD BEATTY had been suffering from ill-health for some time.

On the occasion of LORD JELLICOE'S funeral in November last he left a sick bed in order to pay tribute to his old Chief, and again on January 28th, when suffering from a heavy cold, his determination to take his place in KING GEORGE'S funeral procession subjected him to severe physical strain.

The son of Captain D. L. BEATTY of the 4th Hussars, LORD BEATTY was born on January 17th, 1871, at Nantwich, in Cheshire.

Entering the Royal Navy as a cadet in 1884 he was advanced to midshipman two years later, made sub-lieutenant in 1890 and promoted to lieutenant in 1892.

In 1896 BEATTY was appointed as second-in-command of a naval brigade for service in a Nile flotilla co-operating with the Egyptian Army. When his commanding officer was wounded at Hafiz, BEATTY took his place and gained the D.S.O.

He was next appointed to command a Torpedo-boat Destroyer, but two years later was again serving on the Nile in the Sudan Expedition. He was present at the battles of Atbara and Khartoum, when he was mentioned in despatches, awarded the 4th class of the Medjidieh and promoted to commander, being then only 27 with six years' seniority as lieutenant.

BEATTY was next appointed to the *Barfleur* on the China station, and again saw active service ashore, being landed with the Naval Brigade during the Boxer Rebellion. At the defence of Tientsin he continued to lead his men, although badly wounded, in an attempt to capture two Chinese guns, which were causing much havoc. He was mentioned in despatches, and promoted to Captain after only two years as a commander.

Kept on the unemployed list for some time on account of his wounds, BEATTY remained ashore until 1902, when he was appointed to command the cruiser *Juno*. He subsequently commanded the cruisers *Diana* and *Suffolk* and was in command of the battleship *Queen* when he reached the top of the Captain's list.

Having completed less time in command than that required by regulations, owing to disability caused by the wounds he received in China, LORD FISHER, who was then First Sea Lord, obtained an Order in Council for his promotion, and BEATTY was made Rear Admiral on January 1st, 1910, at the very early age of 39.

After serving for some time as Naval Secretary to the First Lord, BEATTY was appointed to command the Battle Cruiser Squadron of the Home Fleet and hoisted his Flag on board the *Lion* on March 1st, 1913. In command of this squadron he fought the actions of Heligoland Bight and Dogger Bank, and it was he who, with his Battle Cruiser Fleet, brought the enemy to action and held them against great odds, until the arrival of the Battleships at Jutland.

In November, 1916, Admiral JELLICOE was called to the Admiralty as First Sea Lord, and BEATTY, who had been promoted to Vice-Admiral on August 9th, 1915, was appointed Commander-in-Chief of the Grand Fleet in his stead. On November 21st, 1918, he took his whole Fleet to sea to meet the ships of the surrendering German Navy and escorted them into Rosyth.

He was promoted to Admiral on January 1st, 1919, and remained in command of the Grand Fleet until it was dispersed on April 8th, 1919, having been promoted a few days earlier to Admiral of the Fleet.

For his war services Admiral BEATTY received an Earldom. He took the titles of Earl BEATTY of the North Sea and of Brooksby and Viscount Borodale of Wexford.

On November 1st, 1919, he was appointed First Sea Lord and remained at the Admiralty in this position for nearly eight years. During this time he worked assiduously to improve conditions of service and open up avenues of promotion in the Royal Navy.

In 1932 LORD BEATTY became President of the Coastal Trade Development Council and he had since been active in efforts to further the interests and welfare of the Merchant Navy.

With the passing of LORD BEATTY the country loses one of her most illustrious seamen, whose cool judgment and courageous leadership inspired all those who were privileged to serve under his command.

He was laid to rest on March 16th, in the crypt of St. Paul's, near to the tombs of NELSON, and his old chief, JELLICOE.

The Merchant Navy mourns with the Royal Navy in the loss of this great leader. J.H.

Mr. J. Dulson, Chief Officer of the S.S. *Clan Macphee*, died recently after an accident which took place when on passage from London to South Africa. J.H.

Lieutenant Commander George Stuart Hanmer Hutchison, R.N.R., of the Cunard White Star Line, died recently.

Lieutenant Commander HUTCHISON was taken ill while undergoing training at the Royal Naval Barracks, Devonport, and was taken to the Royal Naval Hospital, Plymouth, where he died.

In accordance with his own wish he was buried at sea off Plymouth, with full naval honours. J.H.

Commander Wesson Cecil Herbert Jones, R.D., R.N.R., commander of the Booth liner *Clement*, died recently.

Captain JONES commenced his sea career in 1893 as an apprentice in the ship *Forrest Hall*, and later served as an officer in the same company's ship *Dovenby Hall*.

On obtaining his master's certificate he transferred to steam, serving in the Allan Line and in steamers of Messrs. T. B. Roydens fleet before joining the Booth Line in 1907 as a junior officer.

Captain JONES was promoted to his first command, the *Benedict*, in 1920, since when he has commanded several units of the company's fleet, including the *Hubert*, *Pancras*, *Stephen*, *Hilary*, and *Clement*. J.H.

Kapitan Siegfried Luensee, Oberregierungsrat and Director of Nautical Group I of the Deutsche Seewarte, that is, Marine Superintendent of the German Meteorological Office, died on the 11th January at the age of 57, after a long and painful illness.

Captain LUENSEE went to sea at the age of fifteen, and from 1894 to 1901 served before the mast in sailing ships of different nations.

After attending the Navigation School in Hamburg and obtaining his mate's certificate in 1902, he served in the Imperial Navy.

In 1904 he joined the service of the Hamburg Amerika Line, obtaining his master's certificate in 1906.

During the early part of the War he was Commander of Patrols and Convoys. Later he joined the Naval Airship Division as navigating officer, and took part in several raids on England, for which he was awarded the Iron Cross.

In a conversation last summer at Utrecht in which we compared notes of experiences in the Great War, when he was obviously suffering from the complaint which ultimately caused his death, he told me that he had injured his leg when his airship came down, which he was thankful ended his service in a branch which never appealed to him as did his own of the sea.

After the War, Captain LUENSEE was employed ashore in an advisory capacity in connection with the Mercantile Marine, and he commenced to write upon nautical subjects, becoming Chairman of the Association of Ex-Officers of the Hamburg-Amerika Line.

In 1920 he joined the German Meteorological Office as a nautical assistant, and succeeded Captain SCHUBART as Marine Superintendent in 1932.

We first met him in 1929, when he accompanied the German delegation at the International Conference on Safety of Life at Sea in London; and we soon saw, as with other nautical representatives at Conferences dealing with marine meteorology, that the views of seamen of different nations were generally much in accord.

At the International Meteorological Conference at Copenhagen, Captain LUENSEE was one of very few seamen upon the delegations of the different nations, and he was appointed Secretary of the International Commisssion for Marine Meteorology.

When this Commission last met last summer at De Bilt, near Utrecht, Captain LUENSEE put forward the Scale of visible effects of the wind upon the sea surface, which was originated by Captain P. PETERSEN and which is now being tested in the British merchant navy.

Captain LUENSEE'S death is a great loss to the cause of international seamanlike practice in the study and application of marine meteorology and all akin to it, which concerns the shipping and seamen of all nations.

It was plain to see at the meetings last year that his wide experience of the sea and the air, ships and seamen, his all round ability, generous nature, and the esteem with which he was held by all who knew him, would tell towards securing that practical and scientific harmony which is necessary to fulfil the services contracted for by maritime nations in the Convention for Safety of Life at Sea.

We have lost one of all too few seamen administrators in the international marine meteorological service. L.A.B.S.

Commander J. H. H. Scudamore, D.S.C., R.D., R.N.R., in command of the S.S. *Ariguani*, died at sea in December, 1935, on passage from Avonmouth to Kingston, Jamaica.

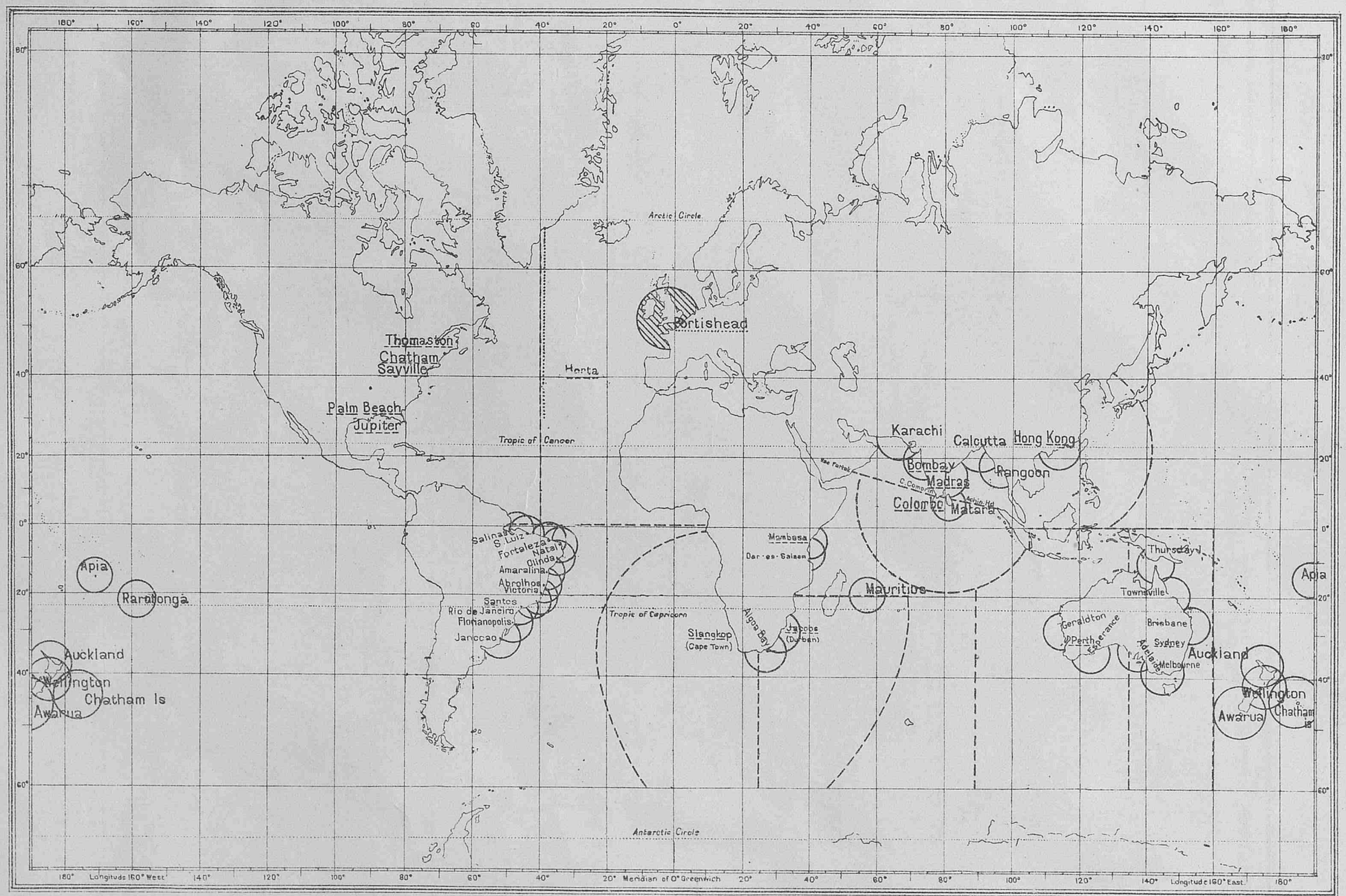
Captain SCUDAMORE was first appointed to command in Messrs. Elders and Fyffes fleet in 1905 when he was appointed to the *Appomattox*. Since then he has commanded the *Chickahominy*, *Manistee*, *Miami*, *Pacuare*, *Zent*, *Chirripo*, *Barranca*, *Manzanares*, *Tortuguero*, *Aracataca*, *Camito*, and *Ariguani*.

Captain SCUDAMORE was one of our oldest active marine observers having, with the exception of two years during the war, regularly made returns to the Meteorological Office since 1905. J.H.

SHIPS' WIRELESS WEATHER SIGNALS.

CHART OF THE WORLD.

Stations for Reception of Routine Wireless Weather Reports from "Selected Ships."



The dotted line indicates the area in which British "A Selected Ships" report under control to Portishead

A pecked line indicates the reporting area round stations in other countries to which British "A Selected Ships" should report. The names of such stations being underlined with a pecked line

The small shaded areas round stations detailed to receive reports from "A Selected Ships" indicate where these ships should not report on account of congest on

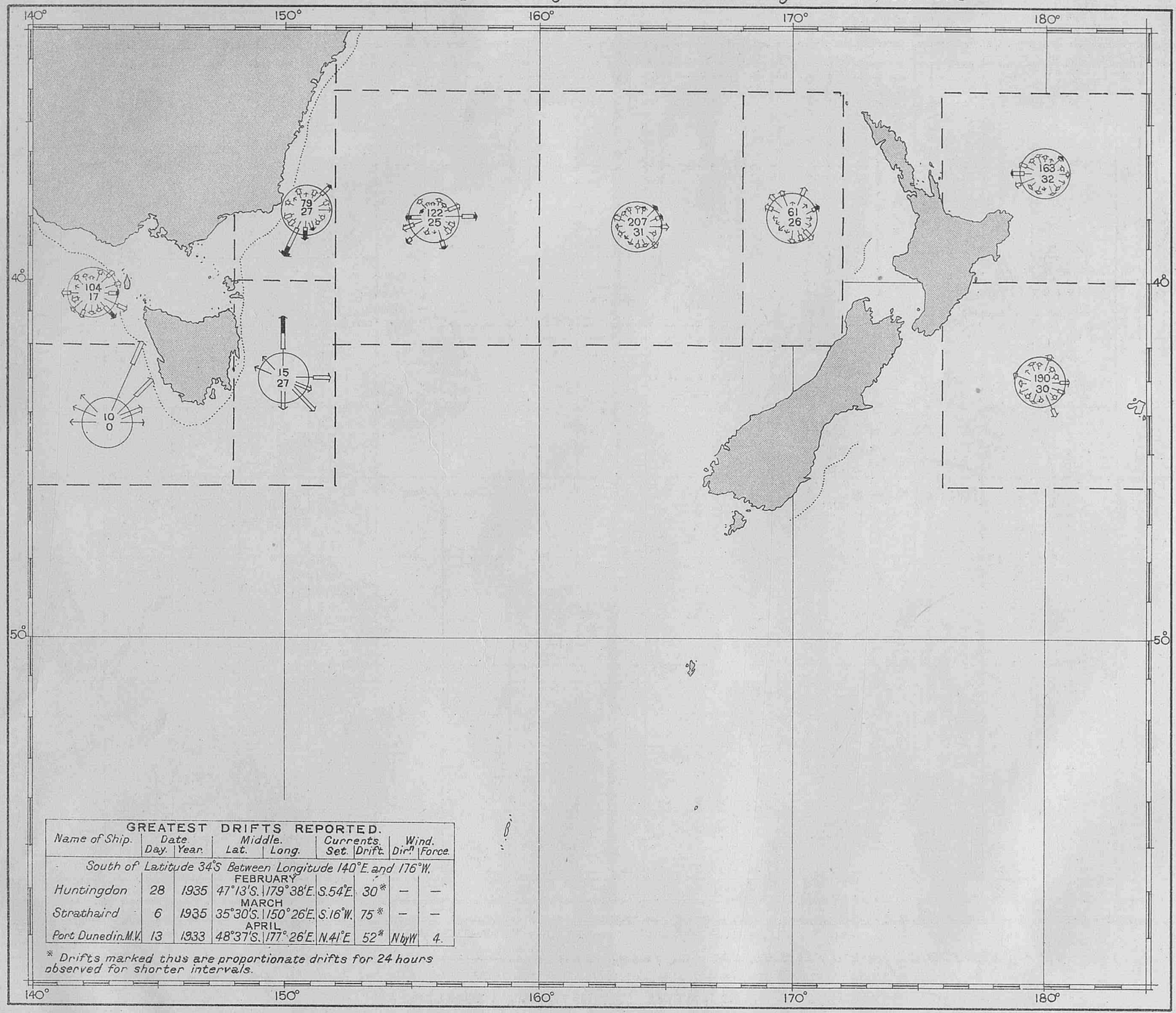
The full circles indicate the areas round islands and coast stations which are detailed to intercept "B Selected Ships" reports made to CQ on 600 metres

CURRENTS IN THE SOUTHERN PORTION OF THE SOUTH PACIFIC.

(Western)

FEBRUARY MARCH and APRIL.

Observations of ships regularly observing for the British Meteorological Office, 1910-1935.



GREATEST DRIFTS REPORTED.

Name of Ship.	Date Day.	Year.	Middle. Lat.	Long.	Currents. Set.	Drift.	Wind. Dir^n	Force.
South of Latitude 34°S Between Longitude 140°E. and 176°W.								
			FEBRUARY					
Huntingdon	28	1935	47°13'S.	179°38'E.	S.54°E.	30*	—	—
			MARCH					
Strathaird	6	1935	35°30'S.	150°26'E.	S.16°W.	75*	—	—
			APRIL					
Port Dunedin. M.V.	13	1933	48°37'S.	177°26'E.	N.41°E.	52*	N by W	4.

* Drifts marked thus are proportionate drifts for 24 hours observed for shorter intervals.

EXPLANATION OF CURRENT ROSES.

The current roses are drawn from observations within the pecked lines. Arrows flow with the current, length represents frequency, thickness strength;— 6-12 miles per day, ——→, 13-24 miles per day ⟹, 25-48 " " " ", ⟹, 49-72 " " " ⟹, 73 miles per day and above ⟹.

Distance from tail of arrow to circle represents 5%. Scale 0 1p 2p 3p 4p 50%.

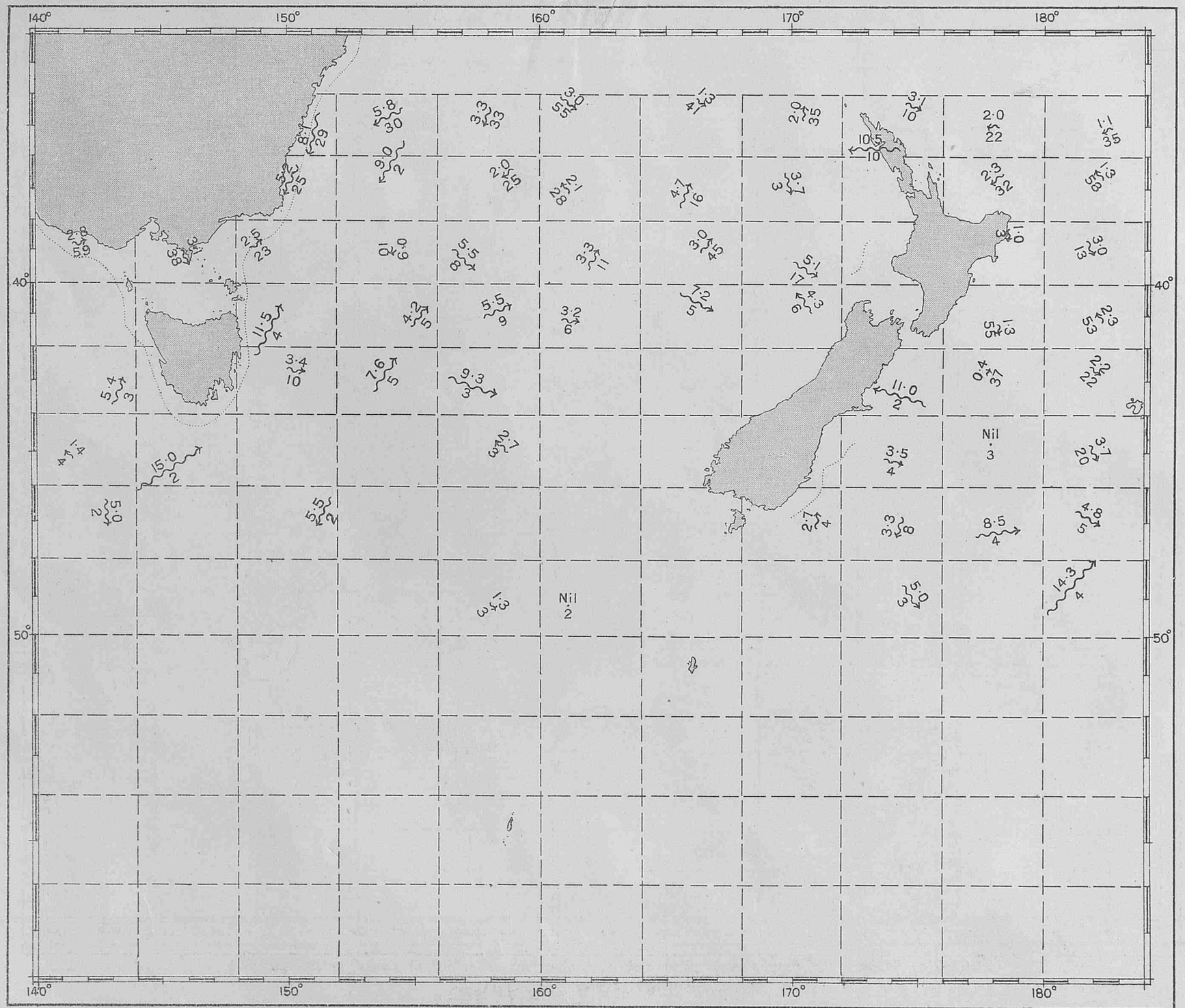
The upper figure in centre of rose gives total number of observations, the lower figure the percentage frequency of currents less than 6 miles per day.

CURRENTS IN THE SOUTHERN PORTION OF THE SOUTH PACIFIC.

(Western)

FEBRUARY MARCH and APRIL.

Observations of ships regularly observing for the British Meteorological Office, 1910-1935.



EXPLANATION OF CURRENT ARROWS.

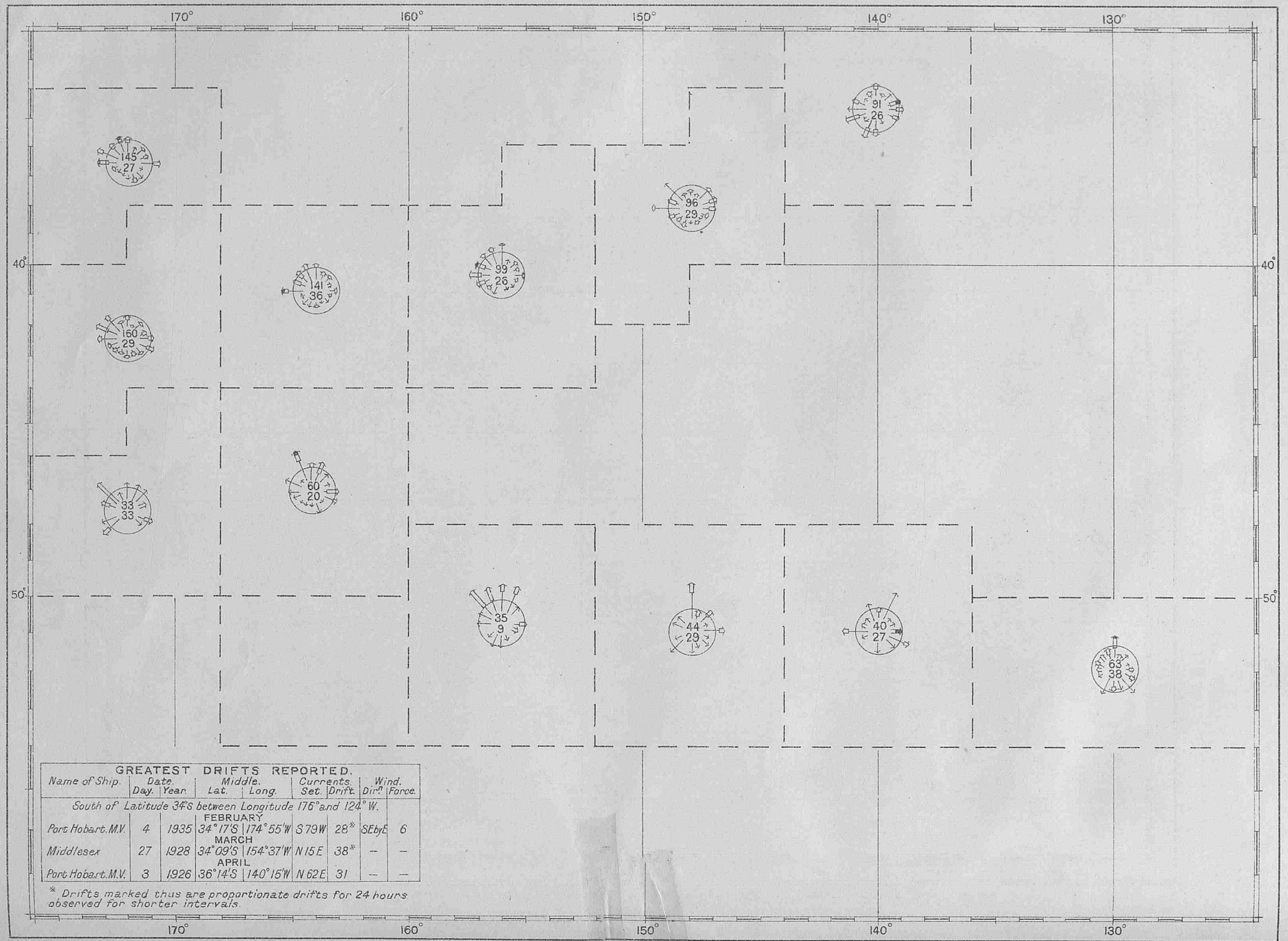
The arrows flow with the current and represent the resultant of currents observed within the pecked lines. The centre of each arrow lies in the mean position of observation. The figures above the arrows give the velocity of current in miles per day; the figures below the arrows the number of observations.

CURRENTS IN THE SOUTHERN PORTION OF THE SOUTH PACIFIC.

(Middle)

FEBRUARY MARCH and APRIL.

Observations of ships regularly observing for the British Meteorological Office, 1910-1935.



GREATEST DRIFTS REPORTED.

Name of Ship.	Date. Day.	Year.	Middle. Lat.	Long.	Currents. Set.	Drift.	Wind. Dir.n	Force.
South of Latitude 34°S between Longitude 176° and 124° W.								
			FEBRUARY					
Port Hobart M.V.	4	1935	34°17'S	174°55'W	S 79 W	28*	SEbyE	6
			MARCH					
Middlesex	27	1928	34°09'S	154°37'W	N 15 E	38*	—	—
			APRIL					
Port Hobart M.V.	3	1926	36°14'S	140°15'W	N 62 E	31	—	—

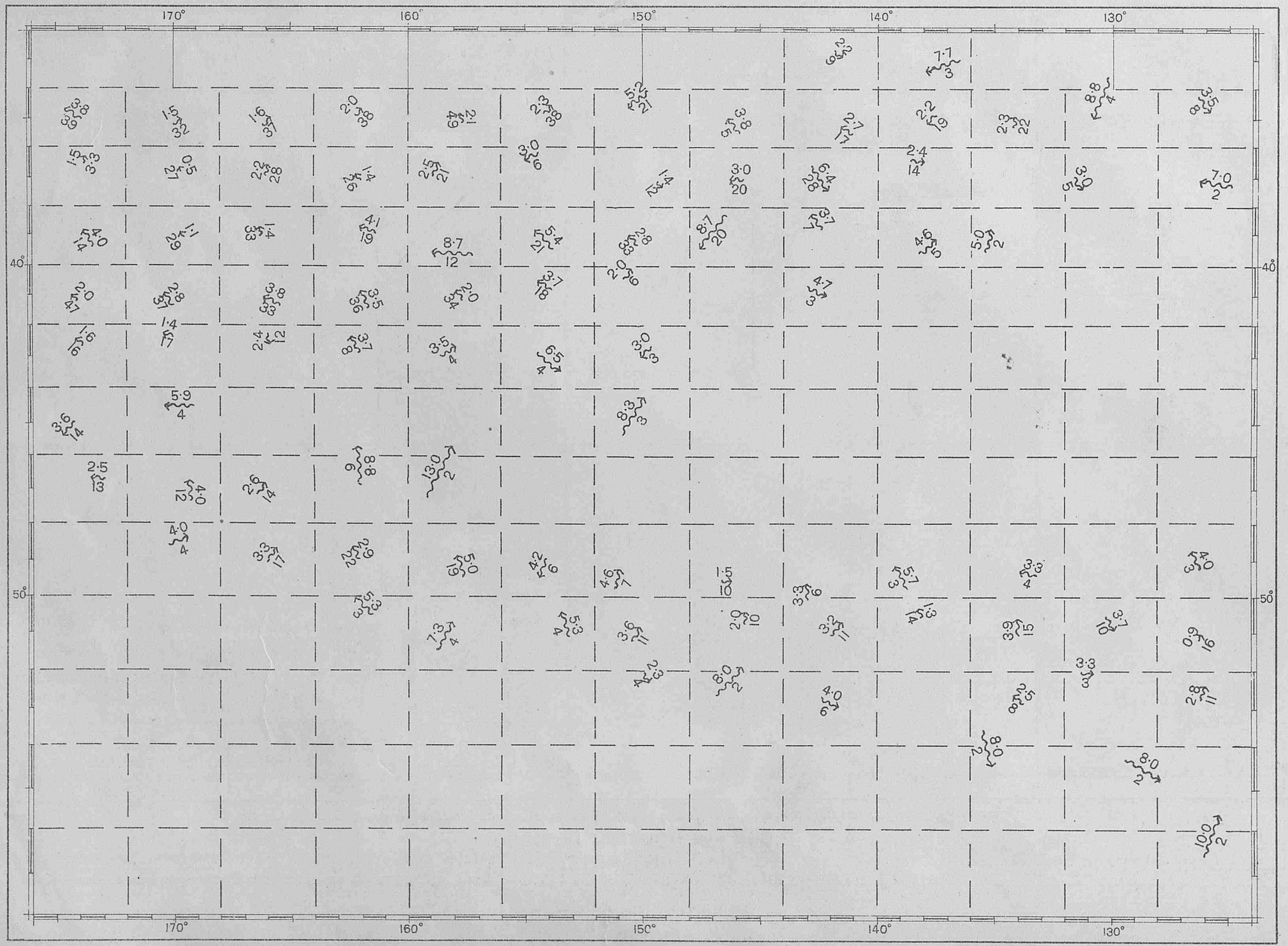
* Drifts marked thus are proportionate drifts for 24 hours observed for shorter intervals.

CURRENTS IN THE SOUTHERN PORTION OF THE SOUTH PACIFIC.

(Middle)

FEBRUARY MARCH and APRIL.

Observations of ships regularly observing for the British Meteorological Office, 1910-1935.



Currents in the Southern Portion of the South Pacific.

(Eastern)

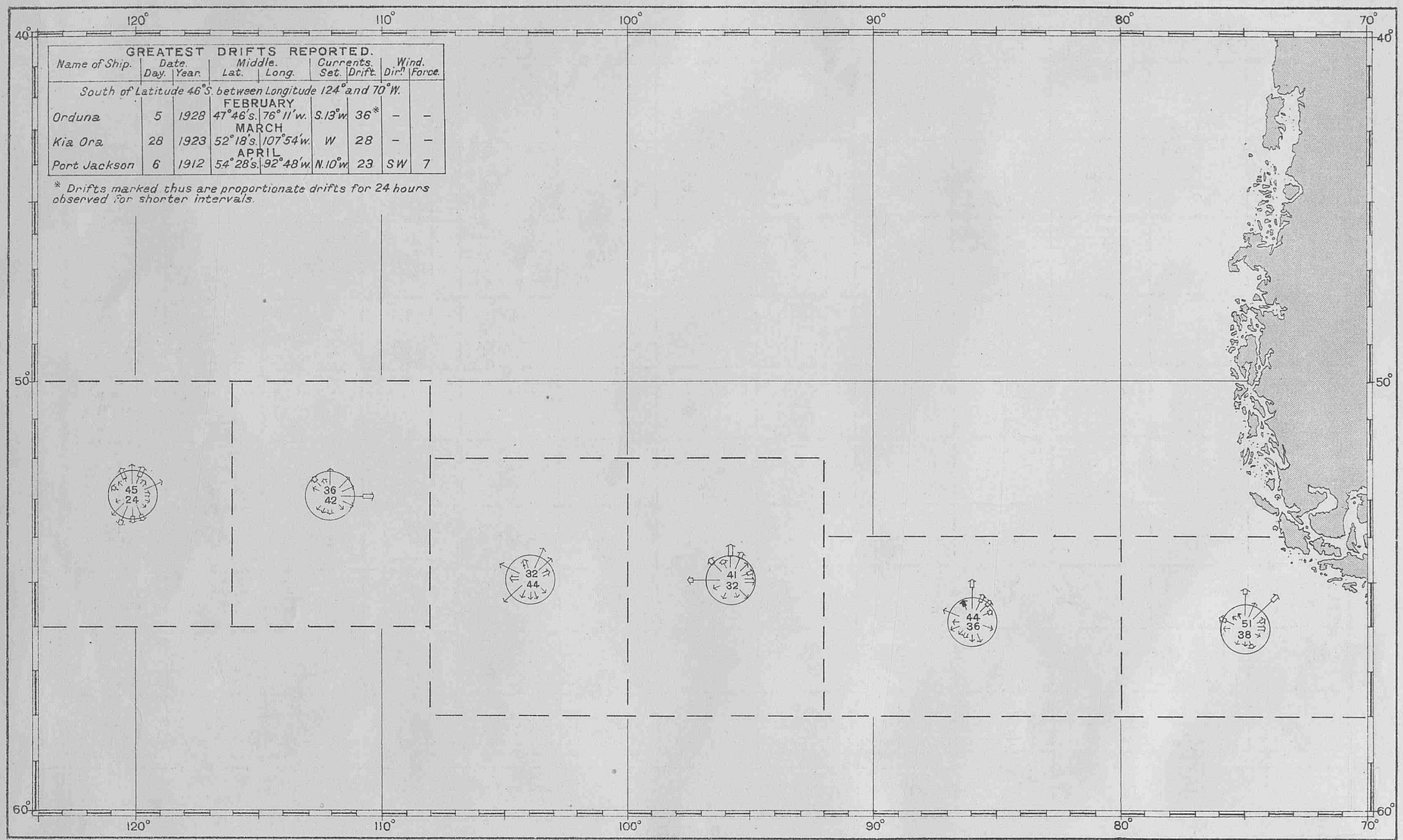
FEBRUARY MARCH and APRIL.

Observations of ships regularly observing for the British Meteorological Office, 1910-1935.

GREATEST DRIFTS REPORTED.

Name of Ship.	Date. Day.	Date. Year.	Middle. Lat.	Middle. Long.	Currents. Set.	Currents. Drift.	Wind. Dirn.	Wind. Force.
South of Latitude 46°S. between Longitude 124° and 70°W.								
			FEBRUARY					
Orduna	5	1928	47°46's.	76°11'w.	S.13°w	36*	–	–
			MARCH					
Kia Ora	28	1923	52°18's.	107°54'w.	W	28	–	–
			APRIL					
Port Jackson	6	1912	54°28's.	92°48'w.	N.10°w	23	SW	7

* Drifts marked thus are proportionate drifts for 24 hours observed for shorter intervals.

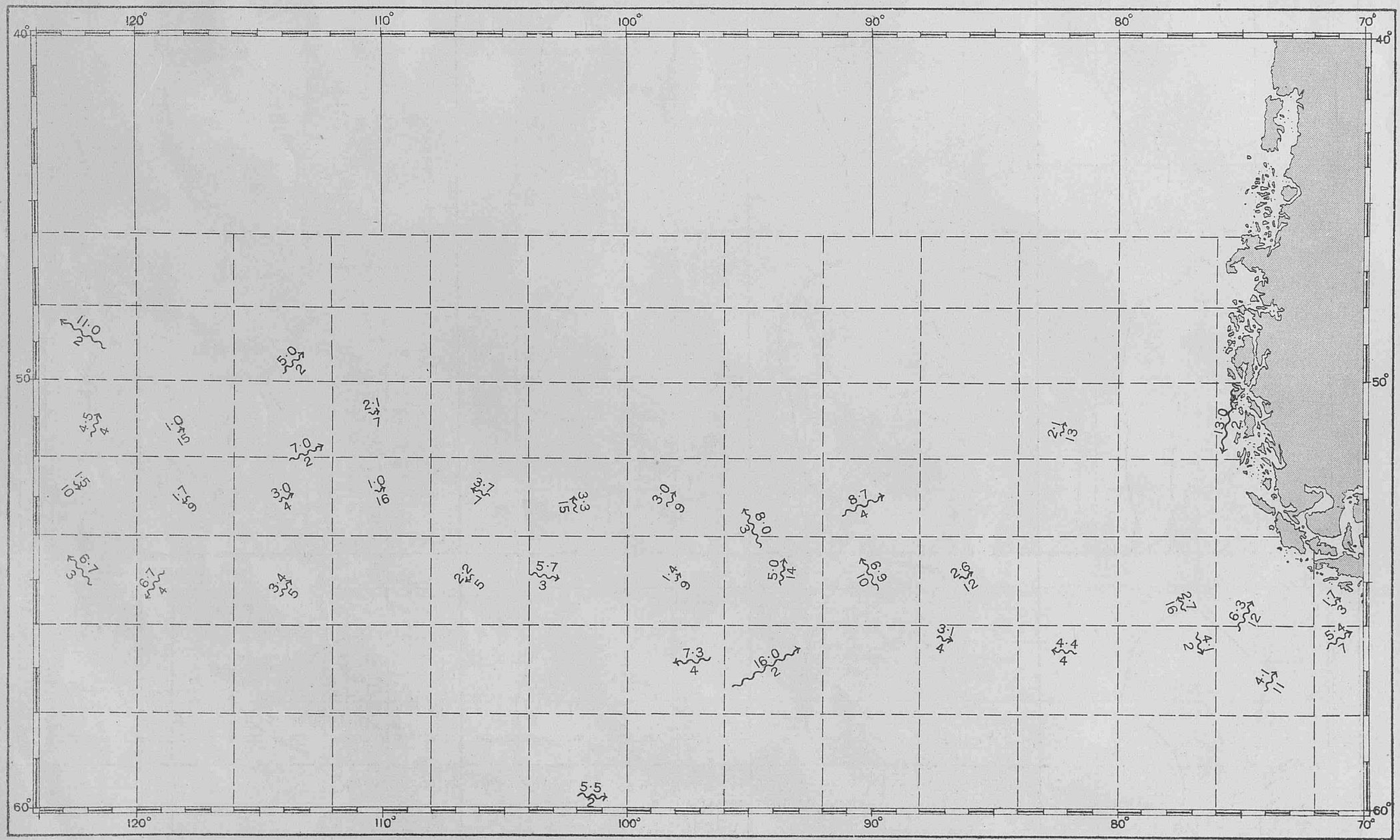


Currents in the Southern Portion of the South Pacific.

(Eastern)

FEBRUARY MARCH and APRIL.

Observations of ships regularly observing for the British Meteorological Office, 1910-1935.



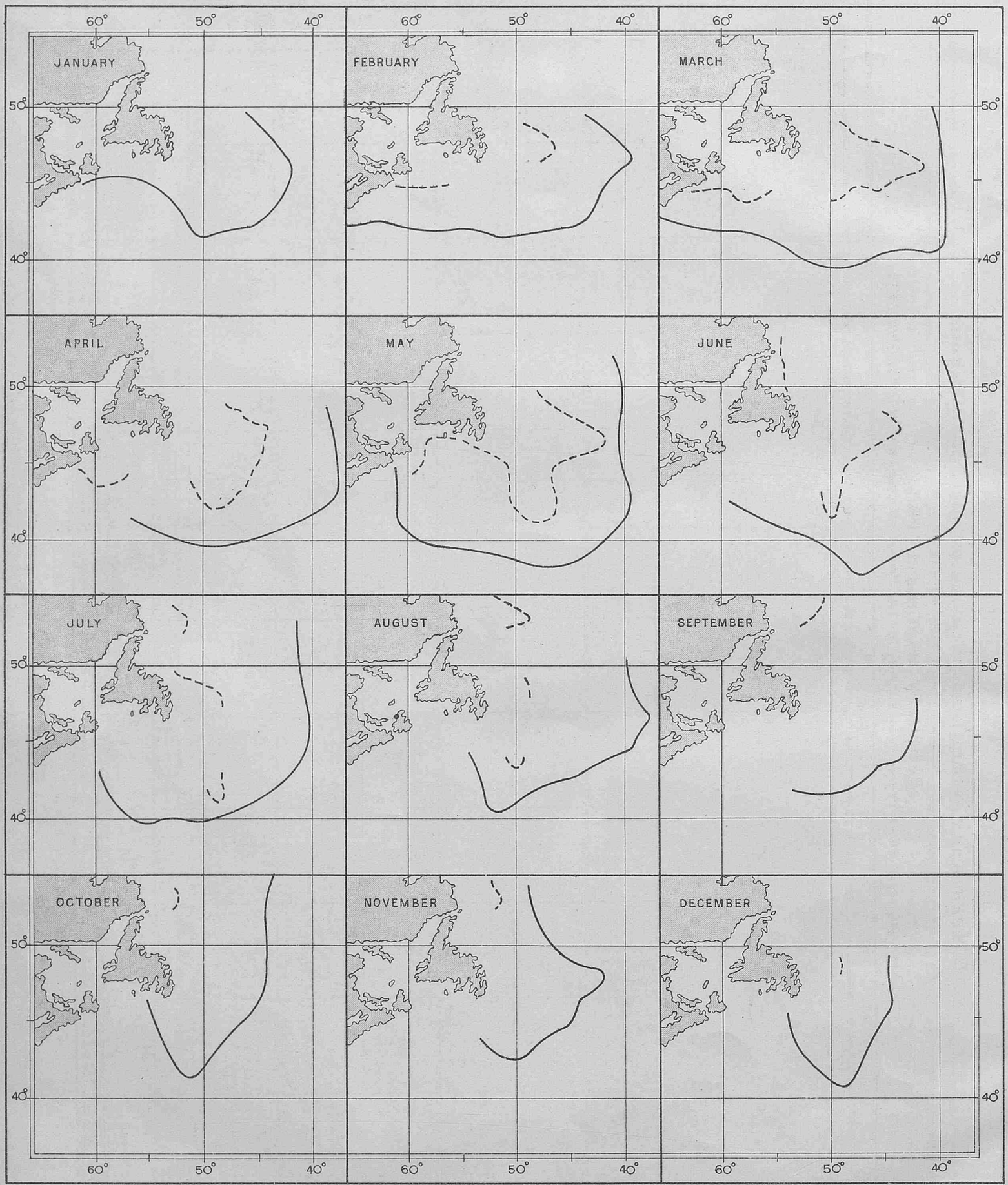


CHART A

LIMITS OF ICE, WESTERN NORTH ATLANTIC.

Limit from 1901 to 1935 shown thus ————————

Limit for 1935 shown thus - - - - - - - - - - - -

Phenomenal Positions of Ice.

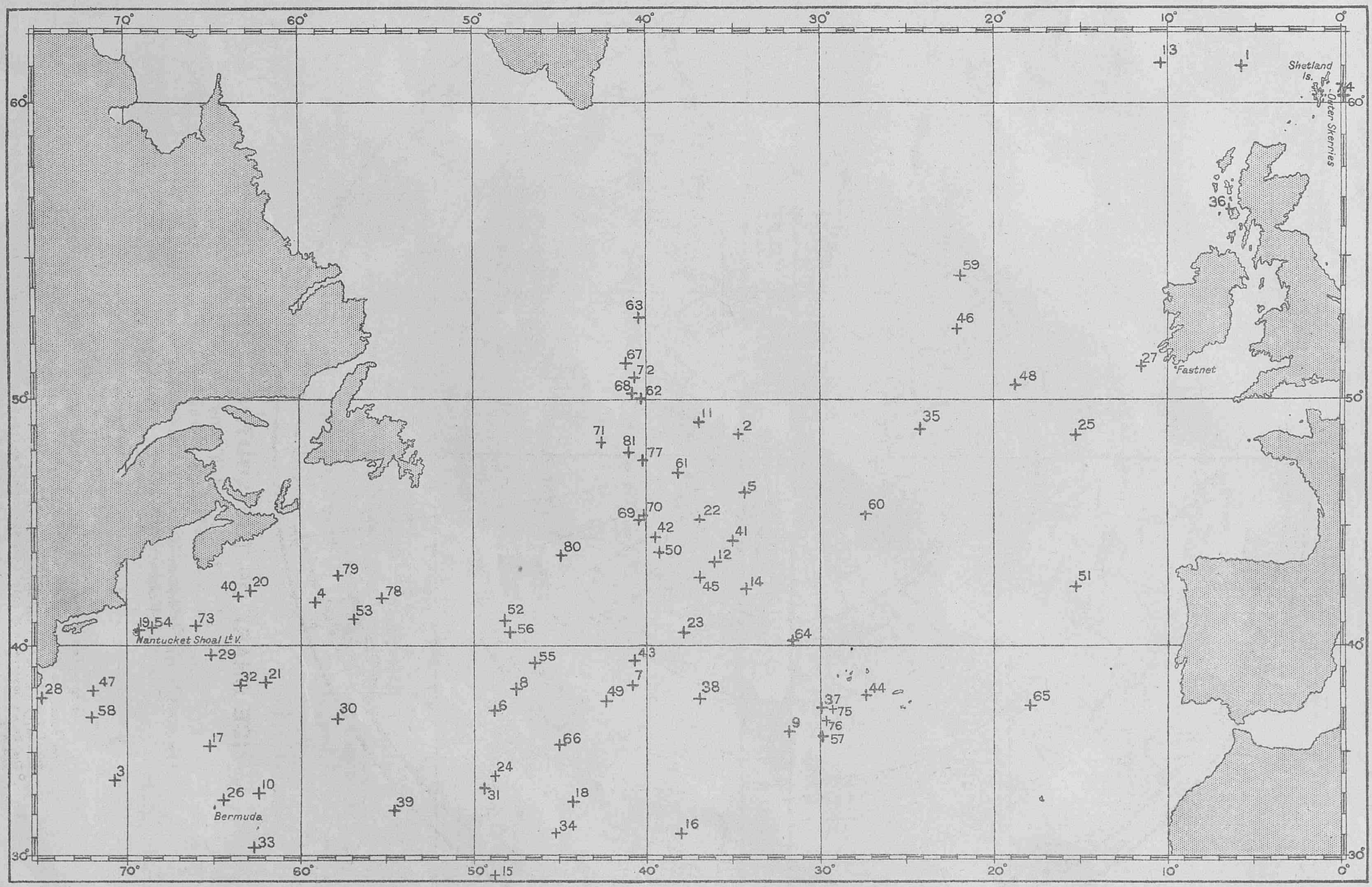
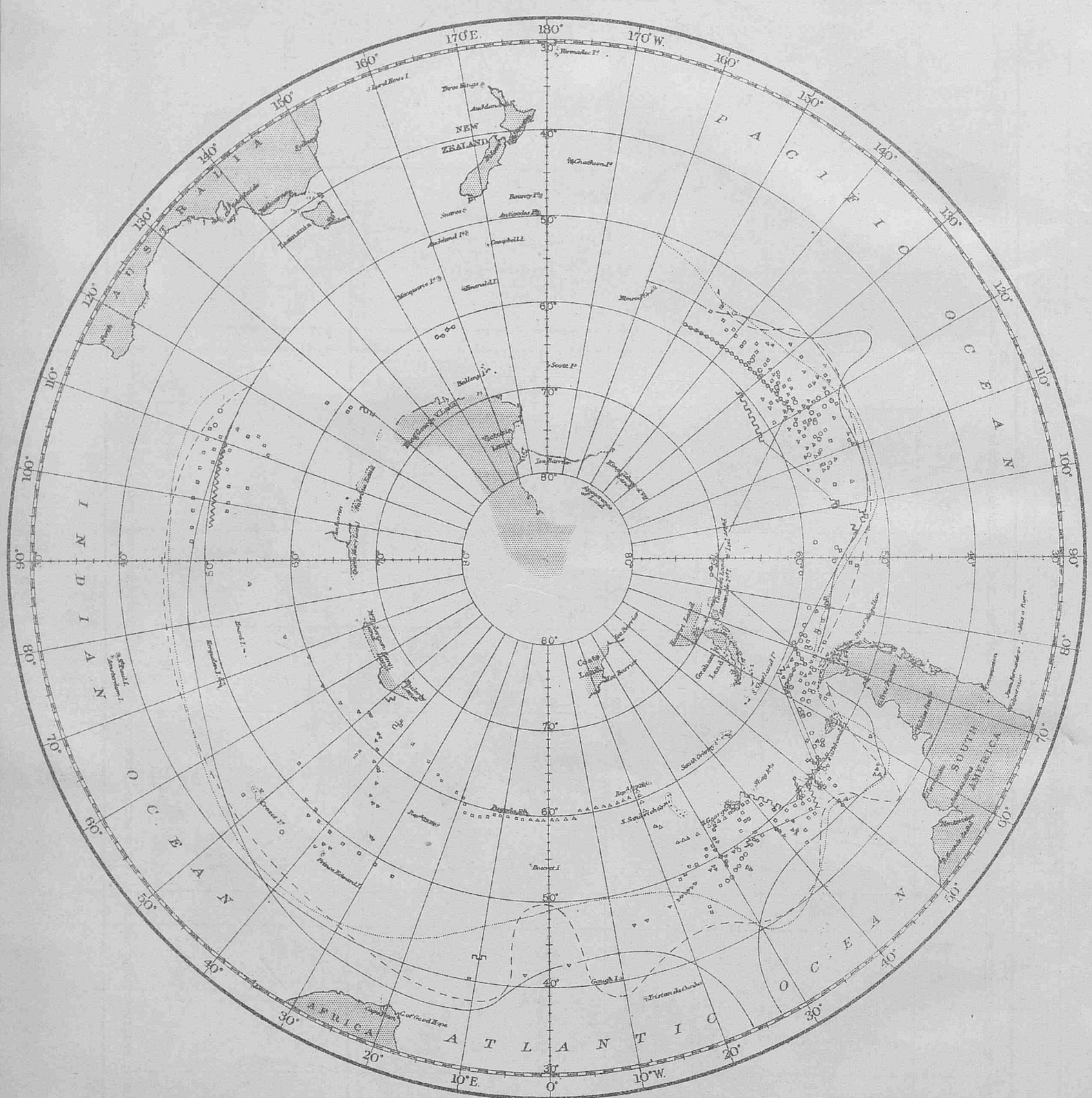


Chart B.



ICE CHART OF THE SOUTHERN HEMISPHERE,

APRIL MAY and JUNE.

EXPLANATION.

The symbols used to distinguish the ice of each of the three months are as follows:–

	Bergs, 1902–1935.	*Position of northernmost pack ice actually observed 1885–1935.*	*Extreme limit of all ice, 1772–1935.*
April	△	~~~~~~~~~~~~	————
May	□	⊓⊓⊓⊓⊓⊓⊓⊓⊓⊓⊓⊓	— — — — — — — —
June	○	○–○–○–○–○–○–○–○	.....

Note — The symbols for pack ice are joined by hair line where desirable.

The coast line of the Antarctic continent as shown on this chart is not completely corrected to accord with the latest survey information. It is intended in a later volume of The Marine Observer, after the Admiralty Ice chart of the Southern Hemisphere No 1241 has been revised, to again publish this chart in The Marine Observer with coast lines as complete as possible and to bring the ice information up to date annually.

Stationery Office Press Kingsway W.C.2

P3.482/3033 W6.17 A. D.22 Gp.908 1225. 3/36.