

Pending Approval



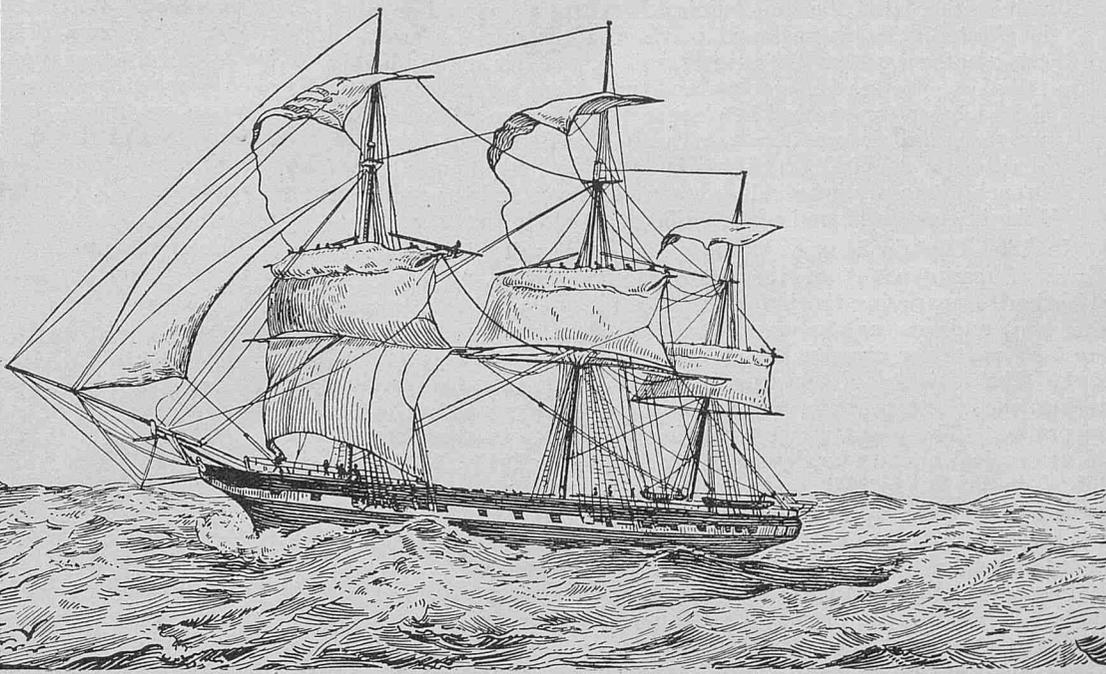
The Marine Observer

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

Vol. I., 1924.

Published by the Authority of
the Meteorological Committee,
Air Ministry, London.





VOL. I. No. 1.

THE MARINE OBSERVER.

JANUARY 1924.

FOREWORD.

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

THERE is no doubt that since the war there has been a marked increase in the interest taken by mariners in meteorological matters. This is partly due to the fact that wireless telegraphy has made it possible to extend to the sea the method of drawing charts of existing weather conditions (synoptic charts) on which modern forecasting depends; it is also partly due to a general quickening of interest in all scientific matters which the seaman, no less than the landsman, has experienced during recent years.

The Meteorological Office has tried to meet the new conditions by making better use of the backs of the Monthly Meteorological Charts for supplying information and instruction to mariners, but it has been clear for some time that this method is far from satisfactory. The space on the backs of the charts is not sufficient and the face of the charts has already become so overburdened with information that their usefulness is much impaired.

Early in 1921 Captain BROOKE SMITH, the Marine Superintendent, suggested the bold step of discontinuing the issue of the monthly charts and publishing in place of them a magazine devoted to marine meteorology and written chiefly for the benefit of marine observers who co-operate with the Meteorological Office. There were not a few difficulties in the way, but the evidence given by Captain BROOKE SMITH that he would receive the active support of the corps of voluntary observers and that there was a real demand for such a magazine carried the day, and now I have before me the manuscript of the first number of the MARINE OBSERVER.

In launching this new venture two thoughts are uppermost in my mind. First, I cannot help but think, with the deepest feelings of gratitude, of all the unselfish work of a whole army of marine observers, many passed away and many still with us; work which has extended our knowledge of winds, weather and currents into the uttermost parts of the sea. The taking of the observations at the correct time in all kinds of weather and often in difficult and dangerous conditions, the drudgery of compiling the "fair" registers, and the constant care of the instruments, have all been done in the faith that the observations would lead to a knowledge of the laws of the atmosphere which would prove of use and comfort to future generations of sailors. And this brings me to my second thought: the desire of the Meteorological Office to extract this knowledge from the data provided and to hand it back to the seaman in a form which he can understand and suitable for use in daily life at sea. The

gratitude I must ask the observer to accept on my assurance, but the MARINE OBSERVER will, I hope, be a tangible proof that the Meteorological Office is doing its share in this common undertaking.

The MARINE OBSERVER is a magazine for seamen, edited by a seaman, and will be largely written by seamen. I have every confidence that the British seaman can be relied upon to make it a success.

October, 1923.

DIRECTOR.

THE MARINE OBSERVER. AIMS AND OBJECTS.

It has been said that shipping and seamen since the advent of steam have lost interest in Meteorology. Post-war experience emphatically disproves such a contention; dealt with on seamanlike lines the Corps of Voluntary Marine Observers generally are unsurpassed as sea observers and are very efficient in practical application of the work too.

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

Its pages provide the Meteorological Office with a means of acknowledging the voluntary labours of observers and of making some return. The custom of providing Observers, in return for their trouble, with charts constructed from observations which they had themselves made, was first introduced by Commander M. F. MAURY of the United States Navy and the National Observatory at Washington; and it was he who first built up a corps of Voluntary Marine Observers, consisting of a thousand navigators all imbued with zeal for this unselfish service, and laid the foundation for international co-operation. This practice of providing observers with charts as a return was followed by Admiral FITZROY on the establishment of the service in Britain. A Committee was appointed to consider certain questions relating to the Meteorological Department of the Board of Trade after FITZROY's death in 1866, and the report which was presented to Parliament embodies the conclusion "that knowledge which is obtained through the medium of the observation of sailors and what is capable of being utilised for their benefit, should be so utilized as soon as possible, and that they should feel a confidence that it is so utilised."

The Committee further stated that :

"We feel moreover that we should be doing great injustice to ourselves if we were to allow it to be supposed that we undervalue either what the late Admiral FITZROY attempted or what he effected. To his zeal and perseverance is due the credit of establishing a system of Storm Warnings, which is already highly prized by the sea-faring class and if a more scientific method should hereafter succeed in placing the practice of foretelling weather on a clear and certain basis, it will not be forgotten that it was Admiral FITZROY who gave the first impulse to this branch of inquiry, who induced men of science and the public to take interest in it, and who sacrificed his life in the cause."

In 1867 Captain HENRY TOYNBEE of Blackwall Line fame, as Marine Superintendent of the Meteorological Office, directed his attention to answering the inquiry frequently made by Commanders who kept registers, as the logs were then termed, as to which was the best route for crossing the equator each month. He reported that "The registers of one month abound with bitter complaints against the Westerly route, while those of another month are full of its praise." The result was the publication of Charts and Remarks of Meteorological Data for Square 3 (Latitude 0° to 10° N., Longitude 20° W. to 30° W.) in 1873, and Charts and Remarks of Meteorological Data for the Nine 10° squares (Latitude 20° N. to 10° S., Longitude 10° W. to 40° W.) in 1876. In 1870 presentations for Excellent logs were first made.

Besides organising a corps of observers on all ocean routes of the Globe, TOYNBEE paid special attention to the Meteorology of the North Atlantic, and our present knowledge of the Weather Systems which traverse that ocean and affect the weather of the British Isles is largely due to the activity of Marine Observers under his supervision. This work resulted in the publication of Synchronous Charts of the North Atlantic and adjacent Continents in 1886.

In April, 1901, the Monthly Pilot Charts of the North Atlantic were first published, Captain CAMPBELL HEPWORTH of R.M.S. *Aorangi* having then been Marine Superintendent for two years. The monthly publication of the Meteorological Charts of the Indian Ocean and Red Sea began five years later. These charts have been added to considerably until the information has become too complex for easy reference, and the backs, which have been used in much the same way as we intend the MARINE OBSERVER to be used, afford insufficient space.

The monthly charts contain much useful permanent information in the shape of normals and frequencies, but there is no reason why these should be periodically published. A limited number have, therefore, been printed in which all information of a non-permanent nature has been omitted, thus rendering the charts clearer. One set of these normal and frequency charts of the North Atlantic and Indian Seas will be issued on request to the Commander of any ship on the list of regular observers making written application for them, with the understanding that they will be preserved. They may also be purchased through the Admiralty Chart Agents.

The new system of Data Extraction by means of the Hollerith Electrical Sorting and Tabulating machine, together with an improved system of indexing phenomena, is meanwhile steadily building up prepared data which will be the means of revising and extending the charts and improving our knowledge of Meteorology generally.

Our post-war experience seems to prove the soundness of TOYNBEE'S practice of endeavouring to answer the inquiries of Marine Observers. Such a course has the double effect of stimulating the work of observation at sea and encouraging fruitful research in the Office, for when results are so obtained they are gratifying alike to Marine Observers and to the Marine Division, and of general profit to the nation. It is this spirit of ready co-operation which the MARINE OBSERVER will seek to promote.

The most persistent questions received from Marine Observers in recent years relate to the application of weather prediction at sea by means of Wireless Weather Reports, the variation of ocean currents, tropical cyclone navigation, and the best track across the Arabian Sea during the S.W. monsoon season. We hope to continue our researches and to attempt to answer such questions through the medium of the MARINE OBSERVER.

Wireless Telegraphy has provided the Mariner with an aid to navigation and weather prediction which is revolutionizing both at sea. We are passing through a period of transition in methods, and it is well to note that no attempt is made to force suggested new methods until those at sea indicate that these are desired.

We have inherited a great fund of knowledge from the observation and researches of our predecessors afloat and ashore, and the time is ripe for applying this knowledge with the aid of the communication now possible by Wireless Telegraphy.

With the advent of the MARINE OBSERVER let us redouble our efforts, remembering that accurate observation and systematic record, in fine weather as well as foul, are the backbone of the work.

We have many inspiring examples of observational record, including that of HIS MAJESTY THE KING; for it is surely appropriate to recall that a Meteorological Log was kept in H.M.S. *Thrush* when, as Captain H.R.H. PRINCE GEORGE, His Majesty commanded that ship.

Marine Division,

MARINE SUPERINTENDENT.

Meteorological Office, London,

September, 1923.

BIOGRAPHICAL NOTES OF SOME LEADERS OF MARINE METEOROLOGY.

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

1. ADMIRAL SIR FRANCIS BEAUFORT, K.C.B.

THE systematic recording of weather observations at sea and the organisation of a service whereby these observations were collected and utilised for the benefit of the observing officers was inaugurated by Commander MAURY of the American Navy about the middle of the nineteenth century. Meteorological phenomena had, of course, been the subject of theoretical speculation and discussion from the time of the earliest philosophers, but previous to MAURY, the names of two men, whose work was of an essentially practical nature, and which stand out more particularly to seamen are Admiral SIR FRANCIS BEAUFORT and HENRY PIDDINGTON.

SIR FRANCIS BEAUFORT was born in 1774 at Collon in Ireland, and commenced his sea career under Captain LESTOCK WILSON of the East India Company in 1787. Two years later he was shipwrecked while carrying out survey work in Macclesfield Strait in the *Vansittart* and only succeeded in reaching England after suffering considerable hardship.

On his return to England he found active preparations for war against the French being made and he joined the frigate *Aquilon*, in which he took part in the action off Brest in 1794.

He then served in the *Phaeton* until 1800, when he was badly wounded in an encounter with the Spanish off Malaga. He won promotion to Commander, however, as a result.

Being disabled for a time from active service BEAUFORT spent the next two years assisting to establish a line of signal stations across Ireland.

He was appointed to the *Woolwich* in 1805, and it was while in this ship that he introduced the scale for estimating the force of the wind at sea which bears his name and which remains still in use at sea.

While in command of the *Woolwich*, too, he carried out in 1807 a hasty survey of the vicinity of Monte Video, although principally his work at this time consisted of convoying merchantmen.

BEAUFORT was promoted Captain in 1810 and in 1811 he was sent to carry out a survey of the southern shores of Asia Minor, a work he carried out remarkably well until 1812, when he was almost fatally wounded in an encounter with natives. After many months of suffering in hospital at Malta he eventually arrived in England and came ashore on half pay.

He published an account of his survey, and for the next seventeen years spent his time doing useful work on the Councils of various scientific societies and public bodies, until in 1829 he was appointed to the post for which he was so well fitted, namely, Hydrographer to the Navy.

In this capacity he re-organised the Hydrographic Department with the result of an improved service of charts and a general advancement of naval scientific knowledge.

It is interesting to note that it was BEAUFORT who commented on the splendid survey work carried out by Captain FITZROY, who himself afterwards became an outstanding figure in marine meteorology. He was appointed a Knight Commander of the Bath, and in 1845 was made retired Rear Admiral with permission to retain his post as Hydrographer, a post he brilliantly filled until over 80 years of age, retiring in 1855.

He died two years later on 17th December, 1857.

Acknowledgment is made to :

Proceedings of Royal Society, Vol. IX, 1858.

(To be continued.)



Rear-Admiral Sir Francis Beaufort, K.C.B., F.R.S., Corr. Mem. Inst. France,
Hydrographer to the Navy from 1829 to 1855.

From the original portrait presented to Greenwich Hospital by the subscribers to the Beaufort Testimonial.

(Copied from a photograph in the Hydrographer's Room at the Admiralty, by A. J. Tabor.)

CURRENTS.

NOTE BY MARINE SUPERINTENDENT.

EVERY navigator of experience has somewhere at the back of his memory a vivid recollection of a bad course made and possibly stranding averted.

Though the course set was carefully steered and the deviation frequently checked by azimuth of heavenly bodies, he has probably doubted the difference between Observed and Dead Reckoning positions and has, therefore, discarded this for giving a fair representation of current.

Comparisons of currents logged by observing ships of recent years passing through approximately the same water within a few hours of each other prove that fair reliance may be placed upon this method of observation. The question, therefore, occurs, are not many erratic courses largely due to varying currents? Experience with modern navigational methods and instruments of high accuracy seem to indicate that this is so. A set of observations made by the Cable ship *Stephan* recently published may be cited as an example.

The old current charts give the general average monthly or quarterly trend of ocean currents, but they do not show variations. The accompanying charts are incomplete in that they only show the average set and drift and varying currents experienced along the line traversed by ships steaming to and from the Cape. If they are used in conjunction with the old current charts their value will be increased, for the navigator may then obtain a more general idea of whence the water comes and whither it flows.

The articles which have appeared upon the Monthly Charts during the last two years have dealt with observations in various ways and in varying areas on several main ocean routes—in fact, the work has necessarily been rather patchy.

Several recent Courts of Enquiry have remarked upon the need for more and improved published information of currents. Many Marine Observers have indicated the need for revision of the current charts. This will take years.

It is now hoped that year by year as the observations are systematically prepared where they are sufficiently plentiful, along the main trade routes, they may be charted in the *MARINE OBSERVER*; and that ultimately this work will provide the necessary information for the revision of the current charts and sailing directions.

Many observations will be required and Marine Observers can do much to help if they will systematically log the set and drift whenever observations are considered reliable.

Further, all ships can assist by making similar records in the ship's log, for, as in the past, when general revision is made, it may be necessary to apply to shipowners for information from the logs of their ships which do not regularly co-operate with the Meteorological Office.

Charts for the remaining quarters will be completed and published in a later number, and when this is done our remarks upon them may be fuller. It is earnestly hoped that Commanders will meanwhile send in their views and experiences, for these will greatly increase the value of the worked-up observations.

Although this work deals with currents only upon the Cape Route, Marine Observers on all ocean routes may do well to study them, and having done so to compare the currents with those of the corresponding belts of the oceans they navigate; for by comparison and enquiry observation may be improved and currents better investigated.

CURRENTS ON DIRECT CAPE BLANCO—TABLE BAY TRACK.

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

THE current charts of the track between Cape Blanco and Table Bay are constructed for the quarters February to April, and May to July. They have been constructed from observations made during the years 1910–1914 and 1920–1922. It is considered that these observations, made with more reliable means of obtaining position and account, are superior to those on which the monthly current charts hitherto published are based, and it will be noticeable that the maximum drifts indicated on the old charts are invariably considerably larger than the maximum drifts given in the tables accompanying the new charts. Even when allowance has been made for the greater number of years over which the observations of the old charts were made, it cannot be doubted that the currents reported on them were often in excess of the true drift.

That this is so, is exceedingly unfortunate, for in many parts of the ocean which were once frequented it is now impossible to get regular observations owing to the revolution in tracks which steam has made. Instead of the method of charting by areas on which the old current charts are based, we are forced to adopt tracks. In the charts now published the track has been divided into sections by the parallels of latitude. Resultant arrows have been calculated for each interval of two degrees of latitude—except between the equator and latitude 6° N., where one degree intervals have been used to define better the line of demarcation between Equatorial and Guinea current. Current roses have been drawn in general for intervals of 5° of latitude, though where the currents have been found to vary considerably with change of latitude smaller intervals have been used. The parallels are indicated by a mark upon the latitude scale of the chart.

The resultant arrows give a picture of the general flow of the water over the track, the roses show the frequency of the currents actually experienced. In order that the roses should not clash with the resultant arrows, it has been necessary to displace them slightly to the left, but it must be clearly understood that the roses refer to the track running through the centres of the resultant arrows.

Sets towards Land, North of Cape Verde.

The current in the neighbourhood of Cape Verde runs to Southward and Westward, and throughout the greater part of the year is fairly constantly off shore. Instances, however, are not uncommon during the Northern Summer and Autumn months when ships have been set in by current.

An example was quoted on the back of the Monthly Meteorological Chart of the North Atlantic Ocean for July, 1923, in which S.S. *Port Sydney*, Captain W. H. LEA, London to Melbourne, was set in on June 23rd, 1922, when a remark was made in the meteorological log that there was no doubt that the ship experienced a very strong set to E.N.E. during the day, as when Cape Verde was sighted, it was found to be right ahead, or bearing S. true.

The data used in preparing the current charts given here were examined between the parallels of 15° and 18° N., month by month, and a diagram constructed to show the variation in frequency of currents of more than $\frac{1}{4}$ knot recorded between N.E. by N. and S.E. by S. This is given as **Figure 1**.

The month of greatest frequency is found to be July. The season of Easterly sets extends from June to November, though there is a marked falling-off in October and November. June, however, has quite a high frequency.

In July, August and September, the region of Doldrums lies in its most Northerly position and usually extends over Cape Verde, and throughout the months when these easterly sets occur there is a certain percentage of onshore winds found northward of Cape Verde. It is probable that the variability of the wind in direction during the months July to September is a very considerable factor in causing these Easterly sets.

The current is dependent not only on the wind blowing at the time, but before. For this reason it is not possible to relate the current on any occasion absolutely definitely to the wind. It was found,

however, that during the four months June to September, when the wind was from N.W. by W. or Westerly, on roughly one in every three occasions ships recorded a set of more than $\frac{1}{4}$ knot running to Eastward (*i.e.* between N.E. by N. and S.E. by S.).

When the wind was from N.W. or N.W. by N., an easterly set was found on about one in every four occasions. When the wind was from N.N.W. Northerly or North Easterly, it was only experienced on one in every eight occasions.

In making this computation the generalised direction of the wind was used. On some occasions the wind was too unsteady to assign any general direction to it for the day. Combining these with occasions of light variable airs, it was found that with variable winds Easterly sets were reported on one in every three occasions.

Some Examples of the Set towards Land.

On July 23rd–24th, 1910, S.S. *Suffolk*, Captain P. DAVIES, Liverpool to Adelaide, experienced a strong set towards the land between Latitude $19^{\circ} 32' N.$, Longitude $17^{\circ} 47' W.$, and Latitude $14^{\circ} 25' N.$, Longitude $17^{\circ} 39' W.$ So strong was the current that the ship was set right into Yof Bay. On the following day (25th) S.S. *Clan Macfadyen*, Captain G. YOUNG, Durban to Las Palmas, found a set and drift of S. $50^{\circ} E.$ 6 miles in the 24 hours between Latitude $13^{\circ} 31' N.$, Longitude $17^{\circ} 51' W.$ and Latitude $16^{\circ} 49' N.$, Longitude $17^{\circ} 44' W.$

S.S. *Suffolk* lost the N.E. trades at noon on the 23rd in Latitude $19^{\circ} N.$, from which point she had light variable winds.

Chartlets B and C show the pressure distribution and wind as far as can be drawn with the few observations available, also the current experienced plotted by an arrow with centre in the middle position of runs.

On July 27th and 28th 1913, S.S. *Ionic*, Captain C. E. STARCK, and S.S. *Palma*, Captain H. W. A. CLARK, found easterly sets north of Cape Verde.

Chartlets D, E and F give the weather conditions for July 27th, 28th and 29th at 8 a.m.

Chartlet A gives the normal pressure distribution for July.

On July 26th, 1920, R.M.S. *Kinfauns Castle*, Captain D. H. HOSKINS, Cape Town to Southampton, experienced a set and drift of N. $62^{\circ} E.$ 4 miles in $6\frac{1}{4}$ hours from abeam of Cape Verde to Noon (Latitude $16^{\circ} 24' N.$, Longitude $17^{\circ} 36' W.$).

On the 25th S.S. *Persic*, Captain J. KEARNEY, Liverpool to Cape Town, had passed Cape Verde and found the current S. $15^{\circ} W.$ 4 miles in the 24 hours between Latitude $20^{\circ} 35' N.$, Longitude $18^{\circ} 02' W.$ and Latitude $15^{\circ} 10' N.$, Longitude $18^{\circ} 26' W.$

The wind on these two days was very variable in the neighbourhood of Cape Verde. What there was came from seaward. W.N.W. force 2 was experienced by *Persic* from Latitude $14^{\circ} N.$ to $17^{\circ} N.$, and *Kinfauns Castle* reported a light onshore breeze off Cape Verde

On September 8th–9th, 1921, R.M.S. *Edinburgh Castle*, Captain J. W. HAGUE, Southampton to Cape Town, found a current of S. $50^{\circ} E.$ 14 miles in 24 hours between Latitude $19^{\circ} 25' N.$, Longitude $17^{\circ} 42' W.$ and Latitude $12^{\circ} 51' N.$, Longitude $17^{\circ} 37' W.$

In this case the wind was nearly steady from N.W. by N. force 4 throughout the 24 hours.

On September 9th–10th, 1910, S.S. *Volga*, Captain D. B. MARSHALL, Port Natal to Las Palmas, was set S. $56^{\circ} E.$ 15 miles in 24 hours between Latitude $14^{\circ} 06' N.$, Longitude $19^{\circ} 17' W.$ and Latitude $17^{\circ} 18' N.$, Longitude $18^{\circ} 37' W.$ The wind was south-westerly, force 3, off Cape Verde, and backed to E.S.E. at noon as she steamed north.

On August 6th, 1910, S.S. *Durham Castle*, Captain T. CHOPE, found a set of S. $59^{\circ} E.$ $14\frac{1}{2}$ miles in 15 hours between Cape Verde and

Latitude $17^{\circ} 50' N.$, Longitude $17^{\circ} 32' W.$ The wind was variable off Cape Verde and then north westerly.

On September 19th, 1899, S.S. *Umbilo*, Captain M. GRUTER, London to Port Natal, the present Marine Superintendent of the Meteorological Office being 3rd mate and Officer of the Watch, made Cape Verde light on the Starboard bow, and the following is an extract from a private journal:

“Wind variable. 10.45 p.m. Cape Verde light abeam distant $4\frac{1}{2}$ miles. From noon to midnight very strong easterly current.”

Unfortunately at this time there appears to have been no ship keeping a meteorological log in the vicinity with which to compare this observation.

The Guinea and Equatorial Currents.

The Guinea Current, according to the Africa Pilot, Part I., is generally considered as running eastward along the African Coast from about Cape Roxo to the Bight of Biafra.

During Winter and Spring the eastward moving waters do not generally extend much beyond 20° or $25^{\circ} W.$ Longitude, but in Summer and Autumn, when the region of Doldrums moves northward, a wedge of easterly current stretches westward as the Counter Equatorial Current.

A few degrees north of the equator there is a sharp line of demarcation between the east-flowing Guinea and the west-flowing Equatorial currents.

The average position of the boundary between the Equatorial and the Guinea Currents on the Cape Blanco—Table Bay Track is well defined when the resultant arrows are examined. Examined month by month, in February it lies on the average between Latitude $1^{\circ} 30'$ and $2^{\circ} 00' N.$, in July between Latitude $3^{\circ} 30'$ and $4^{\circ} 00' N.$, as is shown on **Figure 2**. In October, however, the position of boundary is not so easy to locate, but it seems that the Guinea Current in this month extends South to the Equator. In every year of those on which the charts are based easterly sets are recorded between the Equator and latitude $2^{\circ} N.$, and South of the Equator they have been reported on a fairly large number of occasions. In 1911 S.S. *Marere*, Captain T. B. LINKLATER, London to Melbourne, reported one as large as S. $62^{\circ} E.$ 15 miles per day in Latitude $3^{\circ} 35' S.$, Longitude $5^{\circ} 27' W.$

On October 4th, 1922, S.S. *Port Victor*, Captain J. JACKS, London to Melbourne, gives the following note in the meteorological log: “By virtue of the ship’s position and substantial decrease in temperature of the sea the Equatorial Current was expected and allowance made. Instead a strong easterly set was experienced.” The noon position of the ship at the time of this note was Latitude $2^{\circ} 23' S.$, Longitude $7^{\circ} 03' W.$, and the current found was S. $82^{\circ} E.$, 15 miles per day since the position, Latitude $1^{\circ} 22' N.$, Longitude $10^{\circ} 18' W.$

So striking an interruption of the curve shown in **Figure 2** is most unexpected, but it is supported by the curve given as **Figure 3**, which shows the seasonal variation of the position of strongest Guinea Current on the track.

In further confirmation also the old Monthly current charts of the Atlantic Ocean show that the Equatorial Current in October follows a different course to that which it does in neighbouring months.

The matter is still being investigated, and it is hoped that it may be possible to throw some light on so interesting a fact in a later number.

On each chart is given a table showing the maximum drifts reported in the equatorial and Guinea currents for each month.

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

THE MARINE OBSERVER'S LOG.

It is hoped that these pages will be filled each month with a selection of the contributions of Mariners in manuscript or remarks from the Logs and Reports of regular Marine Observers.

Responsibility for statements rests with the contributor.

WEATHER AND CURRENTS IN SOUTH AFRICAN WATERS.

Commander H. STRONG, R.D., R.N.R., R.M.S., *Armada Castle*, makes the following remarks, based on his experiences of weather and currents, &c., on the South African Coast.

Current.

"HAVING made a careful study of the 'Admiralty Sailing Directions' relating to these coasts, I have found that for general purposes they are very accurate, but, as everyone knows, while perhaps weather has been reduced to what amounts to an exact science, sea currents are so infinitely variable that one is always meeting with surprises; so that what follows is always subject to my realisation, from experience, that even the most regular recognised currents are constantly altering their strength, direction and locality.

Commencing my remarks from Walfisch Bay, on the West Coast of South Africa, I have found that the current invariably flows to the North'ard. It is a cold current originating in high Southern latitudes, and I believe I am correct in saying that it strikes the Cape Peninsula at some point between Cape Point and Table Bay. I base this remark on what I believe to be an unerring fact that the water in False Bay is warm all the year round, whereas the water in Table Bay, and about five miles south of it, is cold all the year round.

As I have already said, this current flows to the North'ard at a varying rate, and undoubtedly there is an inset into, and in the vicinity of, Table Bay, which appears to take place from Table Bay to Paternoster Point to the North'ard of it. It is, therefore, infinitely dangerous for vessels to approach that Coast without the utmost caution and giving it a very wide berth, especially as this current sometimes flows to the South'ard.

It may be said, that from Cape Agulhas the current, which is generally warm, curves to the North'ard and flows into False Bay; being a portion, at least, of the warm current which normally flows down the East Coast of Africa from the Mozambique Channel.

We may now shift the point of view to the East African Coast, and I think it is substantially correct to say that North, say, of Mozambique the currents are subject to monsoon influence, whereas South of it, it is fairly constantly flowing to the South'ard, is of a warm temperature, and decreasing in strength the further South it flows towards Cape Agulhas, being subject to changes in direction of wind. Generally speaking, it can be said that Easterly winds increase its strength, Westerly winds having a contrary effect. I have frequently found that when I expected a strong current, or none at all, the contrary has been the case, but whereas from Delagoa Bay down to Algoa Bay one generally experiences a Sou'westerly current of from 2 to $\frac{1}{2}$ knot, from Algoa Bay to Cape Agulhas the current is less strong, and frequently none at all.

As to the question of insets on this Coast, I do not think they are so strong as mentioned on the West coast, but undoubtedly they do sometimes exist, and are, therefore, to be guarded against.

The effect of current on the sea is very pronounced in Sou'westerly gales, especially between Delagoa Bay and Algoa Bay, and in that part in particular between Durban and the Western vicinity of East London, and notoriously, of course, a very confused sea results in the vicinity of Cape Agulhas.

Weather.

A curious phenomenon exists on the East Coast of South Africa, in that, taking a point midway between Natal and East London, and

running a line at right angles to the coast inland, South of it rain occurs in the winter, whereas North of it the Summer is the rainy season; the result being that foggy, misty, and hazy weather are most frequently encountered in the winter South of that line, and in the summer North of it.

Climate.

South of that line, the Winter rains make the climate less pleasant than the Summer season, whereas North of that line, the Summer climate is excessively warm and moist, and the Winter season is delightfully cool and dry.

Winds.

I do not believe that there is any part of the world in which South East and North West winds play such a monotonous part as they do in South Africa. Nor do any winds in any other part of the world, known to me, show less moderation. Possibly this is an advantage to the interior, and the fact that the interior rises by three plateaux to a considerable height is possibly the direct cause. Certainly, were it not for the frequent strength of the South East winds, the interior would get little or no rain, whereas on the coast it is the North West winds, in particular, that bring the rain.

I have found the barometer an infallible guide to forecasting wind. Given a normal barometer, its rise foretells a South East wind, which in accordance with the rate and the height of the rise, the strength, and probable duration of the coming South East wind may be estimated. The glass having reached its maximum rise, a South East air will be noticed, and as and while the glass falls, the South East wind develops its strength, and continues to blow until the barometer has reached its normal height, when, in ninety cases out of every one hundred, it will fall, and the contrary of the case already mentioned takes place.

In the winter North West gales prevail at Table Bay, and frequently rise to great strength, and knock up a tremendous sea which beats with great fury on all that part of the coast, and it is then that the Mariner has to guard against the effect of wind on current in making Table Bay, or any part of that Western Coast. Whereas on the Eastern Coast, the North West wind is off shore, and if it blows with great strength, it may be expected to decrease the strength of the current, which will flow with increased strength thereafter.

In the Summer months, especially towards the end thereof, South East winds prevail, producing on Table Mountain the curious phenomenon of the 'Table Cloth,' and in bygone years it was known as the 'Cape Doctor,' inasmuch as, in less scientific sanitary conditions, it blew away unhealthy gases.

On the Eastern coast, it is the wind that causes Mariners most anxiety, as it frequently blows with great strength, and knocks up a high sea, severely testing the ground tackle when at anchor in the roadsteads, and when at sea increasing the strength of the current, and in proportion to the amount of Southing in the wind, bringing about an inset.

Fogs.

Speaking with twelve months experience, between August 1914 and August 1915, of the South West African Coast, I entirely concur with the remarks upon fogs on that Coast in the 'Admiralty Sailing Directions.' For eight months out of that twelve, I found long-lasting and heavy fogs very prevalent from Port Nolloth to Walfisch Bay, especially so in the case of Walfisch Bay, and its vicinity.

The fogs round Table Bay, and sometimes on the Eastern Coast, appear to me to be exceptional in that they are frequently very dense, yielding much moisture, even with quite a fresh wind blowing."

SHAMAL.

An account of a Shamal experienced by H.M.S. *Crocus*, Lieut.-Comdr. H. T. BAILLIE-GROHMAN, O.B.E., D.S.O., R.N., between the 17th and 19th January, 1923, on the western side of the Musandam Peninsula; Persian Gulf.

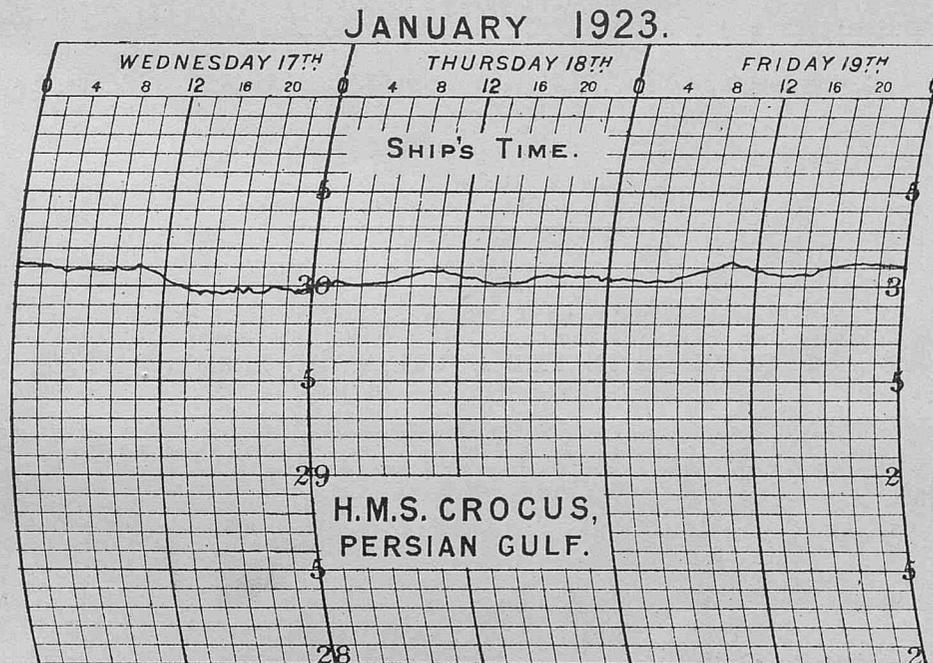
"SHIP left Sharja (25° 22' N., 55° 24' E.) on the morning of the 17th January and cruised North Eastward to Bakha (26° 09' N., 56° 08' E.). At noon the weather conditions were normal and there was no indication of bad weather; wind S.S.E. force 1; Sky b.c. Sea 1; Barometer 30.06" (Barograph chart for this period is attached). By 1600 the sky was completely overcast and there were heavy and threatening rain clouds to the W.S.W. and Northward: the wind veered to N.W. force 2. At 2000 the clouds had cleared and the entry in the log was: Wind W.S.W. force 1; Sky b.c.: Barometer 30.00." Dry bulb 75°: wet 72°: the temperature at this time was 6° above the average for the previous week. The air was oppressive and enervating. At 2200 the wind freshened from the S.W. by W. to force 2, and the darkness became intense: the sky was completely overcast and vivid flashes of lightning occurred on all quarters.

At 2230 the force of the wind was logged as 4, and at 2315 a very violent squall (force 7-8) passed over, accompanied by heavy rain. The sea rose rapidly. By 2245 the wind eased to force 5 and the rain stopped. Ship weighed and proceeded to sea at 0000. Another squall, lasting about 30 minutes, passed over at 0040 on the 18th followed, after a lull of 40 minutes, by a third squall. The force of the wind during these last two squalls was 10 and the rain torrential, sea 6. At 0200 the wind started to ease gradually, at the same time veering.

By 0600 the wind was W. by N. force 2. At 0630 it became misty, visibility to the South Eastward two to three miles, to the Northward five miles: the ship now being about 25 miles W.S.W. of the Quoin Lighthouse, steering East. At 0800 the wind freshened from the W.S.W. and by 0900 it blew with force 6 from this direction; visibility to the East and South at this time being reduced to one mile, and to the North three miles. At 1030 the fog began to lift and by 1045 the visibility was extreme; the wind, meanwhile, remaining at S.W. by W. force 6. At 1230 ship anchored off Khasab (26° 12' N., 56° 15' E.). A good lee was found here, but it is estimated that the Shamal continued with force 4 to 6 for the next 24 hours. A few detached clouds were seen at intervals, particularly at sunset, otherwise the sky was clear. Ship weighed at 1030 on the 19th January, and by 1130, when clear of the land, the wind was S.W. by W. force 4 and veering. By 1230 it was W.N.W. force 2, and by 1300 calm.

The barometer readings throughout the period were only such as might have been expected under normal weather conditions.

During the squalls the lightning was so heavy that it leaped across the gap between the upper end of the deck insulator and the edge of the spray shield in the W/T office, a distance of 12 inches or more. There was comparatively little thunder."



HUMIDITY AT BERMUDA.

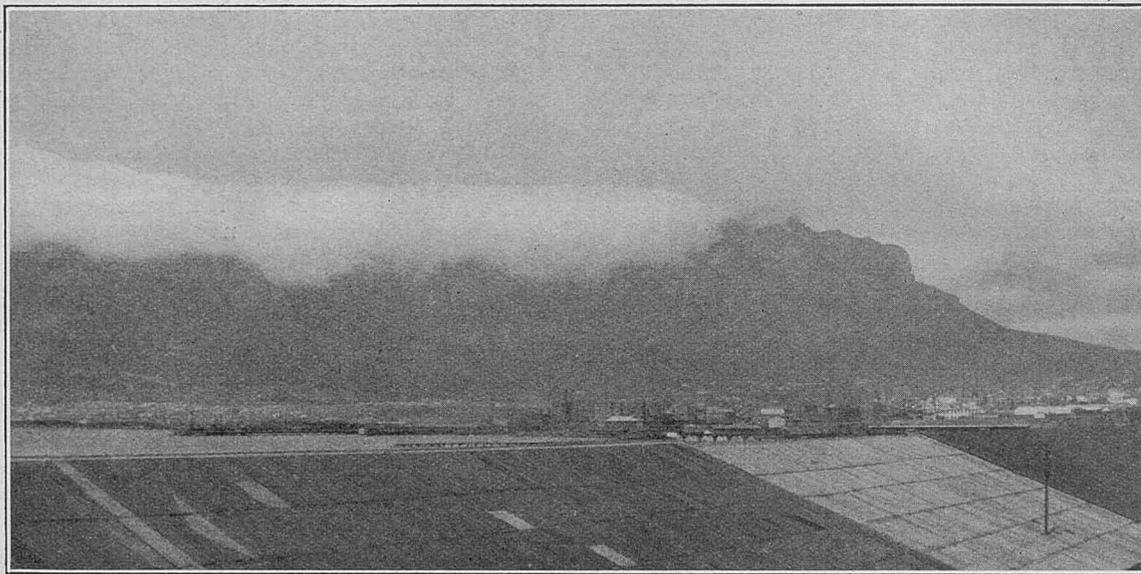
The following extract is taken from the Meteorological Log for the period, 17th August to 10th December, 1922, of H.M.S. *Mutine*, Captain H. P. DOUGLAS, C.M.G., R.N., stationed at Bermuda.

"ATTENTION is called to the extraordinary differences at Bermuda in the humidity of the atmosphere under the same weather conditions. It has often been noticed that with the wind in the S. to S.W., with barometer readings the same and the same type of weather chart (compiled on board from Washington W/T reports), one may get at Bermuda either the wet and dry bulb practically reading the same, causing the usual feeling of lassitude and depression, or a difference of some degrees with the consequent feeling of comparative exhilaration.

"This phenomenon has been noticed by many people that visit

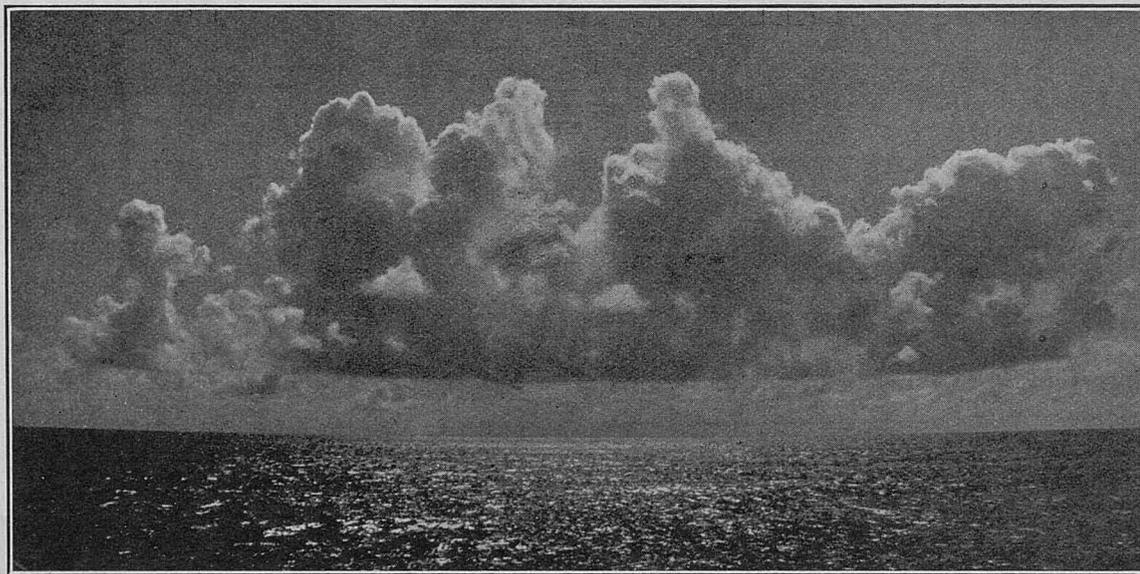
Bermuda, but I have not yet been able to assign a reason for it, although I put forward the suggestion that this difference in humidity may be caused by the Gulf Stream. Captains of vessels running frequently between New York and Bermuda have emphasised to me the fact that they can in no way rely as to where they may enter or leave the Stream, and that its breadth fluctuates considerably, and it does not appear unreasonable to me to assume that if the S. limit of this body of warm water was nearer to Bermuda, it might cause moister air than if the limit was further North."

TABLE-CLOTH SPREAD ON TABLE MOUNTAIN.



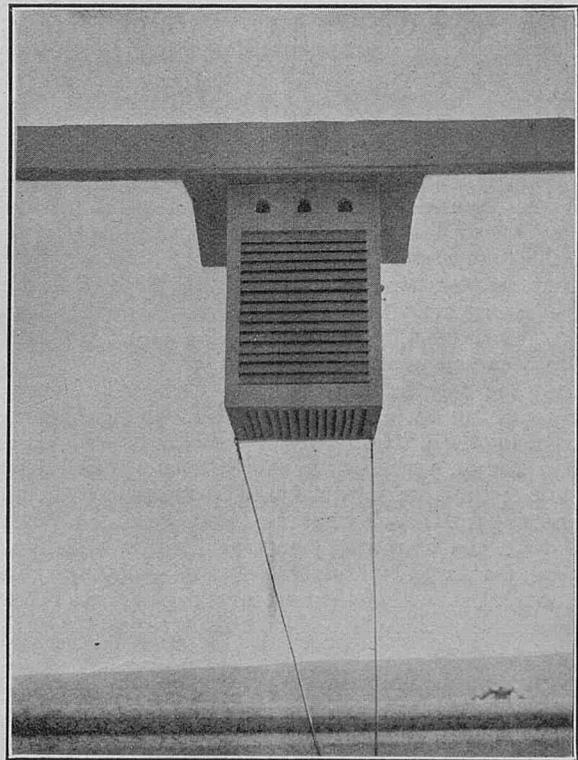
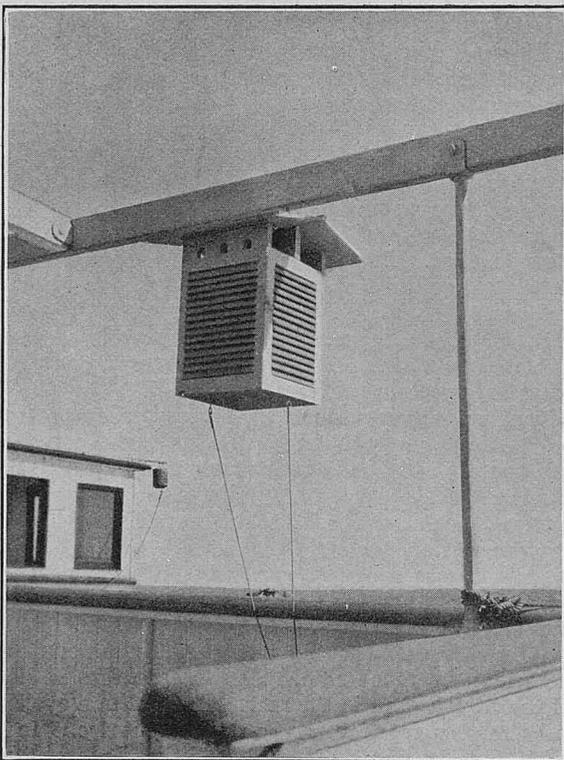
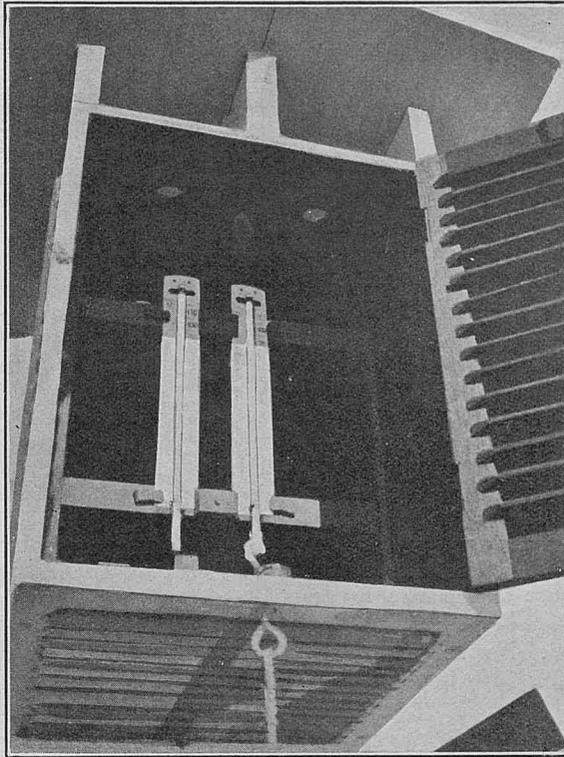
Photographed by Mr. C. H. WILLIAMS, 2nd Officer, Union Castle Line.

CUMULUS IN THE SOUTH EAST TRADE.



Photograph taken in Latitude 11° S., Longitude 0° W., by Mr. C. F. Post, 4th Officer, S.S. *Port Stephens*, Captain W. G. HIGGS.

EXPERIMENTAL TEMPERATURE OBSERVATION IN STEAM SHIPS.



Photographs of an experimental portable thermometer screen, made and used on board S.S. *Euripides*,
Captain P. J. COLLINS, O.B.E.

WIRELESS AND WEATHER. AN AID TO NAVIGATION.

By L. A. BROOKE SMITH, MARINE SUPERINTENDENT, METEOROLOGICAL OFFICE.

Foreword.

THE following chapters are intended to replace and extend "Weather Forecasting in the Eastern North Atlantic and Home Waters for Seamen" and the articles which have appeared upon this subject on the Monthly Charts since May, 1920.

Particulars and descriptions of Weather Reports, Signals and Codes useful to shipping will be given separately, in as concise a form as possible, under Weather Signals, as they become available, for all parts of the world, if possible in geographical order.

Since the establishment in June, 1921, of the coded Wireless Weather Report, broadcast for shipping through Poldhu, then Clifden and latterly Valencia and Malin Head or Land's End and Malin Head, there has been much evidence that suitably conducted wireless weather reporting can be made of great value to the Mariner.

This message gave actual observations of barometer pressure, wind direction and force, visibility and barometer tendency taken at 0700 and 1800 Civil G.M.T. at Blacksod, Stornoway, Holyhead, Scilly and Dungeness, Coast Telegraphic Weather Reporting Stations, so that the Mariner was given some idea of the conditions upon which the Meteorological Office based its forecast for the Western Coasts which was issued in plain language at the same time. It gave ships near and at a distance a means for comparing barometric pressure which has led to a better understanding of the functions of the barometer as a means of measuring the pressure of the atmosphere and formed a basis from which to extend weather charting at sea.

The period is one of transition in method. Formerly, without distant communication, the Mariner was forced to rely upon his own

isolated observations to predict weather, which, in ships proceeding at speed, was extremely difficult and uncertain. Wireless telegraphy has given him a means of communication whereby he may obtain information of existing weather conditions not only along his route, but at positions within range in all directions where there happen to be other reporting ships or stations. With such information and his knowledge gained by long experience the Mariner may obtain a better idea of what conditions he may expect. If he will plot the information and construct a weather chart he will have a graphic representation of the general conditions over a considerable area with detailed information at a number of points at the time of observation. From such a chart, with a knowledge of meteorology, he will generally be able to forecast the weather to be expected along his route for a day or even longer.

It is our aim to give suitable guidance to Mariners for the making of such charts and forecasts by a simple and quick process.

It will first be necessary to give a brief description of the Fundamental Weather systems as determined from charts for Extra Tropical Latitudes; though the Marine Observer's Handbook will remain the standard guide to the use of instruments and observation we shall give some brief notes upon special precautions which are necessary for instrumental observation in wireless weather work; then show how charts and forecasts may be made at sea from Wireless Weather Reports, and using the observations of Marine Observers give experiences and suggestions for the application of the method in all seas from which sufficient synchronised observations are available.

CHAPTER I.

WEATHER SYSTEMS OF TEMPERATE NORTHERN LATITUDES.

By charting atmospheric pressure at sea level, temperature, wind and weather conditions, continuously for many years, meteorologists have discovered that different types of pressure systems usually produce certain kinds of weather, and in 1883 the Hon. RALPH ABERCROMBY made the following important *generalisations*, and laid down the seven fundamental shapes of isobars:—

(a) That in general the configuration of the isobars takes one of seven well-defined forms.

(b) That independent of the shape of the isobars, the wind always takes a definite direction relative to the trend of these lines, and the position of the nearest area of low pressure. (There are occasional exceptions to this rule when the land interferes, marked examples have been found on the coasts of Australia.)

(c) That the velocity of the wind is always nearly proportional to the closeness of the isobars.

(d) That the weather—that is to say the kind of cloud, rain, fog, &c.—at any moment depends on the shape and not the closeness of the isobars, some shapes being associated with good and others with bad weather.

(e) That the regions thus mapped out by the isobars were constantly shifting their position, so that changes of weather were caused by the drifting past of these areas of good or bad weather, just as on a small scale rain falls as a squall drives by. The motion of these areas was found to follow certain laws, so that forecasting weather changes in advance became a possibility.

(f) That in the temperate zones sometimes, and habitually in the tropics, rain fell without any appreciable change in the isobars, though the wind conformed more regularly to the general law of these lines; this class of rainfall is called "non-isobaric rain."

It is important always to remember "Buys' Ballots Law," viz.:—

In the Northern Hemisphere face the wind and the barometer will be lower on your right than on your left.

In the Southern Hemisphere face the wind and the barometer will be lower on your left than on your right.

The wind is sometimes parallel to the isobars but more often it inclines towards the nearest low pressure.

The Fundamental Shapes of Isobars.

These are illustrated by weather charts taken from the daily weather report of N.W. Europe, in which the land has been intentionally omitted; it must therefore be remembered that some of the winds

are influenced by the land and may not in all cases conform to the rules of free air over the ocean, though generally they are similar.

1. **The Cyclone.**—An area of low pressure bounded by circular or oval isobars. **Fig. 1.**

2. **The Secondary cyclone**, or shortly "secondary," a small circular depression, subsidiary to the foregoing. **Figs. 1 and 5.**

3. **The V-shaped Depression.**—An area of low pressure bounded by V-shaped isobars, something like a secondary but differing from it in many important particulars. **Fig. 2.**

4. **The Anti-cyclone.**—An area of high pressure, bounded by circular or oval isobars. **Fig. 3.**

5. **Wedge-shaped Isobars.**—An area of high pressure bounded by isobars converging to a point like a wedge. **Fig. 4.**

6. **Straight Isobars.**—A barometric slope, across which the isobars lie in straight lines. **Fig. 5.**

7. **The Col or neck of low pressure** lying between two adjacent anti-cyclones. **Fig. 6.**

Cyclones, V's and secondaries usually move in an easterly direction in the temperate zones, but they sometimes travel to the westward, which makes forecasting extremely difficult.

Anti-cyclones are sometimes stationary for long periods; they may be called the feeders of cyclones and affect their course and movement.

Cyclones.—Closed isobars, usually circular or elliptical in shape, with low pressure at the centre. The wind blows round and towards the centre anti-clockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.

The path of a cyclone is the path taken by its centre. The trough is a line drawn through the centre, usually at right angles to the path. At places before the trough the barometer is falling, and in rear of the trough it is rising. Near the trough the wind may shift suddenly and there may be much rain. The temperature is always higher in front of the trough than in the rear. In front of a cyclone the weather is usually muggy, particularly on the right front in the Northern Hemisphere and in the left in the Southern Hemisphere. In rear the weather is usually cool and exhilarating. **Fig. 1** shows the wind circulation. **Fig. 7** illustrates the cyclone prognostics.

In extra tropical cyclones there is seldom calm at the centre, and the barometric gradient is not necessarily steepest near the centre, so that the strongest winds may sometimes be experienced at some distance from the centre. Cyclones vary in intensity; when deep they cause gales, but when shallow may only cause moderate winds; they may bring much rain or none at all.

If we imagine the conditions of the cyclone in **Fig. 1** with its isobars, wind arrows, and weather, and the prognostics in **Fig. 7** to be embodied in one system, and that we are a stationary observer in its path, we shall get an idea of the sequence of events that will pass over us in a cyclone travelling in an east-north-easterly direction, which will be valuable when by making a weather chart from W/T reports we find that one of these systems is approaching.

In a ship under way at sea it will be necessary to consider not only the movement of the system but the course and speed of the ship with relation to it.

Secondary Depression.—A bend in the isobars usually on the equatorial side of cyclones.

Secondaries usually travel in the same direction as, and sometimes faster than, the main cyclone; they may have their own wind circulation or cause an alteration in the direction and force of the winds in their neighbourhood in the main cyclone.

They usually produce rain and sometimes much wind caused by the crowding together of the isobars on the equatorial side of the main cyclone. Secondaries are often associated with thunderstorms.

Their conditions are very variable, and so make forecasting difficult.

V-shaped Depression.—Named thus from the shape of the isobars enclosing an area of low pressure.

The V points in an equatorial direction. The wind blows along the isobars and towards the trough which passes through the points of the V's formed by the isobars. Forward of the trough there is much cloud and rain; as the trough passes there is a sudden shift of wind, often accompanied by heavy squalls. When the trough passes, the weather clears. Westward of V's the weather is usually very clear.

Anti-cyclone.—A high pressure system. The atmospheric pressure is highest near the centre enclosed by isobars, usually more or less circular or oval and widely separated. These systems often cover a large area in which the air is comparatively calm and cool near the centre, while at the outskirts the wind blows round the centre in the opposite direction to that of a cyclone and inclining out from it.

Fig. 8 shows the general prognostics for summer and winter anti-cyclones in the region of the British Isles.

The changes of weather at places in anti-cyclones are often caused more by diurnal variations than by the movement of the system as in cyclones.

Wedge.—Just as an anti-cyclone is of opposite characteristics to a cyclone, so is a wedge the converse of a V.

Wedge-shaped isobars enclosing an area of high pressure, usually extending from an anti-cyclone polewards between two depressions.

In front of the wedge there is often a region of very fine weather with northerly winds in northern latitudes and southerly winds in southern latitudes. Along the centre line of the wedge there is calm; in rear of this line the winds are from an equatorial and westerly direction and there is often rain.

The wedge usually moves eastward between two depressions; hence the saying, "It cleared too quickly to last."

Straight Isobars.—Occasionally isobars are straight over a large area. Usually the low pressure lies on the polar sides of the straight isobars, and the high pressure on the equatorial side, therefore the winds are westerly. In areas of straight isobars there may be great diversity of weather, from overcast or cloudy skies with some rain towards the low, and blue sky towards the high. Straight isobars are not persistent in extra tropical latitudes, and the area they occupy is usually soon traversed by a depression.

Col.—A col is a region of comparatively low pressure, separating two anti-cyclones much like a kloof or ravine between two mountains.

In the middle of a col there is little or no barometric gradient; in it there are calms and light airs. Round the anti-cyclones which it separates the wind follows the usual laws of isobars.

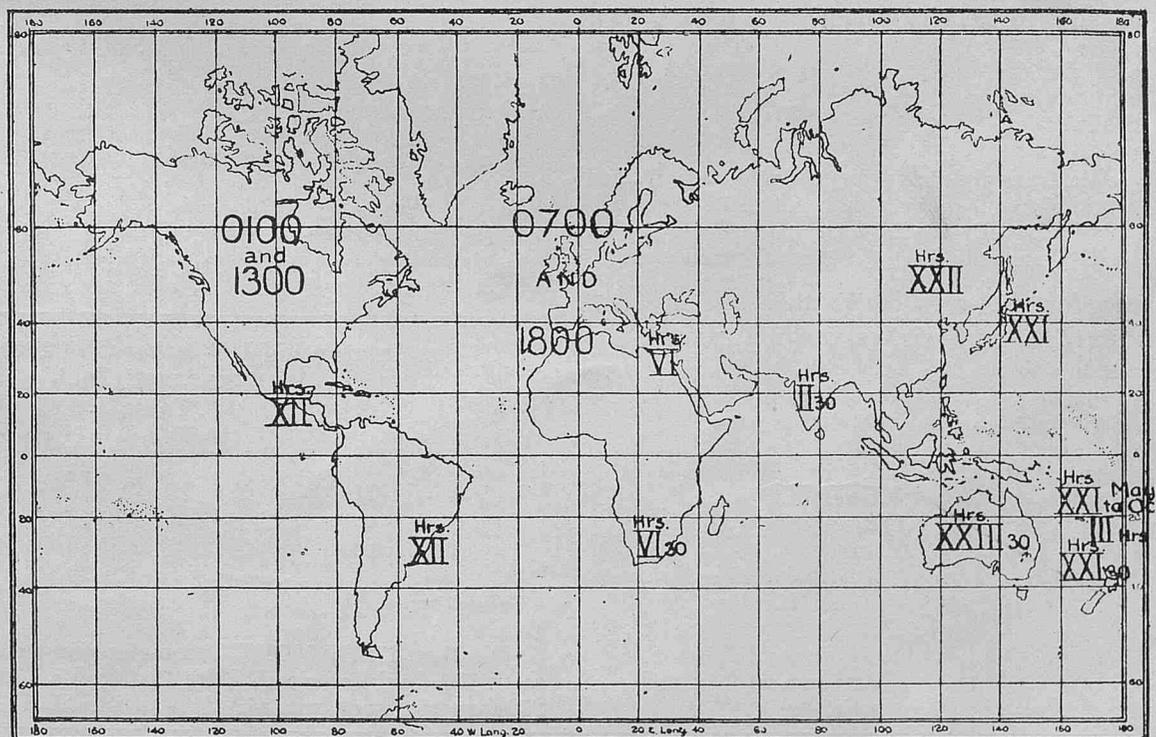
The col gives conditions for cloud, fog, or thunder storms.

Anti-cyclones being usually more or less stationary, the col may be considered a place of weakness through which depressions may pass. It is an area of unsettled weather without much wind.

The foregoing is a general description of the seven fundamental shapes of isobars which may be found in ever-varying complexity. These isobars being lines of equal pressure may be likened to the contour lines of sea soundings found on navigating charts. They represent lines of equal atmospheric pressure weighing down upon the earth, and if we think of the atmosphere as a great envelope of air which is suffering constant local changes of weight covering the earth, and in which the earth rotates, we shall see that these isobars are simply a graphic means of showing the distribution of pressure at any moment over an area of the surface of the globe. The wind is the flow of air from high towards low pressure influenced in direction by the rotary motion of the earth.

(To be continued.)

Chart showing Greenwich Civil Times of Shore Observations. (See p. 12.)



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

WEATHER SIGNALS.

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

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

I. SHIPS' WIRELESS WEATHER SIGNALS.

A LIMITED number of North Atlantic liners make reports to the British Meteorological Office in a Provisional International Code. The decode has not yet been published so that these signals are at present not available for ships other than those making these reports.

Weather Reports between ships at sea are of two kinds :—

- (1) Those which give information of conditions experienced during a passage or part of a passage with conditions prevailing at the time the message was drafted, no attempt being made to synchronise with other observations.
- (2) Those which are based upon observations made at arranged times so that they provide synchronised data.

The latter are essential for the system which is explained in "Wireless and Weather, an Aid to Navigation."

Until an organised plan has been established, in order that synchronised data may be available over ocean areas, observations made for the purpose of Wireless Weather Reports should be taken at the same time as those of the nearest land weather service. These times are given upon the Chart of the World, shewn on p. 11.

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

Wireless Weather Reports should always contain

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

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

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

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

For this purpose the following notation and scales are recommended

The Beaufort Notation of Weather.

LETTERS TO INDICATE THE STATE OF THE WEATHER.

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

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

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

The Beaufort Scale of Wind Force.

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

The International Weather Telegraphy Barometer Tendency Table.

Table I.

0	Barometer steady. (The barometer has not fallen or risen more than 1/4 millibar in 3 hours).
1	Do. rising slowly. (The barometer has risen 1 to 1 1/2 mb. (.03-.04 in.) in last 3 hours).
2	Do. rising. Do. do. 2 to 3 1/2 (.06-.10 in.) do.
3	Do. rising quickly. Do. do. 4 to 6 (.12-.18 in.) do.
4	Do. rising very rapidly. Do. do. over 6 (.18 in.) do.
5	Do. falling slowly. Do. fallen 1 to 1 1/2 (.03-.04 in.) do.
6	Do. falling. Do. do. 2 to 3 1/2 (.06-.10 in.) do.
7	Do. falling quickly. Do. do. 4 to 6 (.12-.18 in.) do.
8	Do. falling very rapidly. Do. do. over 6 (.18 in.) do.

Example :—

To CQ.

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

† These letters are only intended to refer to the amount of cloud. They are regarded as the equivalents of the following cloud amounts, scale 0-10; b=0-3; bc=4-6; c=7 and 8; o=9 and 10. It is well to bear in mind that w=dew, but d=drizzling rain, and e=wet air without rain; p=passing showers of rain, and q=squalls, but s=snow.

II. WIRELESS WEATHER SIGNALS.

Bulletins.

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

A *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 forecast applies are included in the message.

GREAT BRITAIN AND IRELAND.

WIRELESS WEATHER BULLETINS.

To come into force January 1st, 1924.

W/T Station, Air Ministry. Latitude 51° 27' 50" N.

Longitude 0° 01' 35" E.

Call sign G.F.A.

Wave length 4,100 metres, C.W.

Times of transmission 0900 G.M.T.* and 2000 G.M.T.

The message issued at 0900 G.M.T. is based upon 0700 G.M.T. observations. The message issued at 2000 G.M.T. is based upon 1800 G.M.T. observations.

During the time of S.O.S. lookout, from 0915 to 0918, and 2015 to 2018, there will be a pause in the transmission of these weather signals.

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

Part I. is a general inference of weather conditions over N.W. Europe and the adjacent seas.

Part II. is a report in code giving actual observations, with station number, of Barometer tendency, weather, visibility, Barometric Pressure, Direction and Force of Wind, at the ten stations shown upon the accompanying chartlet, p. 14, numbered from 1 to 10 (the initial 1 being omitted in the case of Station 10).

Parts III., IV. and V. are forecasts of wind and visibility for the 12 hours following the time of observations for the areas shown upon the chartlet.

Part VI. commencing "outlook" is a general statement as to expectation of weather after the period of the forecasts, when it can be made.

Explanation of Chartlet.

The numbers before 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 Mariners 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. 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.

DESCRIPTION OF CODE

AND

INSTRUCTIONS FOR DECODING PART II.

The code is arranged in five figure groups which are paired. Each pair of groups refers to one station, and contains an odd and an even group.

Odd Groups. The 1st Figure indicates the station to which the pair of groups refers.

The 2nd Figure gives the Barometer tendency, Table I.

* All times are G.M.T. Civil, i.e., reckoned from midnight, 00 to 23 hours.

The 3rd and 4th Figures give the weather, Table II.

The 5th Figure gives the visibility, Table III. Caution is necessary in the use of these visibility reports owing to the conditions of view to seaward at some stations.

Even Groups. The 1st and 2nd Figures indicate the last two whole figures of the corrected barometer reading in millibars.* To convert to inches, see conversion table published monthly on back of ice chart; this will also be included in *Chapter II.* of "Wireless and Weather an Aid to Navigation."

The 3rd and 4th Figures give the True Direction of the Wind, Table IV.

The 5th Figure gives the force of the wind by Beaufort scale. All forces 9 and above, as 9.

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

It will be of assistance in memorising the code if the following initial letters of the various elements are committed to memory.

I K ww v BB DD F.

Thus I=Station BB=Barometer Pressure.
K=Barometer tendency DD=Wind Direction
ww=Weather F=Wind Force.
v=Visibility.

Though at first decoding may be tedious a little practice will show that this can be done with ease and rapidity.

Sample Message.

Call sign :—CQ CQ CQ V GFA GFA GFA (repeated twice).

Weather Shipping.

Inference A deep depression over the North Channel which is moving East North East will cause strong winds or gales in all districts with much rain at first. Improving weather will spread across the country in its rear.

Station	17535	99041	2155—	93283	34117	12266
Reports	46356	97208	55167	13267	65417	19185
	77124	15206	87526	14186	97275	99206
	0856—	00146				

Forecasts Western Area Districts Mersey Severn Shannon westerly gale veering and moderating visibility becoming good Districts Clyde Hebrides strong northerly winds moderating visibility moderate full stop Southern area strong westerly to north westerly winds District Wight visibility poor District Channel visibility becoming good full stop Eastern Area Districts Dogger Humber Thames southwesterly gales visibility poor Districts Tay Forties southerly winds strong to Gale backing visibility poor districts Shetlands fresh easterly winds visibility moderate full stop Outlook Eastern area northerly gales western area temporary improvement.

Though these reports are intended for the use of ships at sea, they will be found useful to shipping and seamen at the ports, if intercepted by local wireless receiving stations and passed to Mercantile Marine Offices and Harbour Masters.

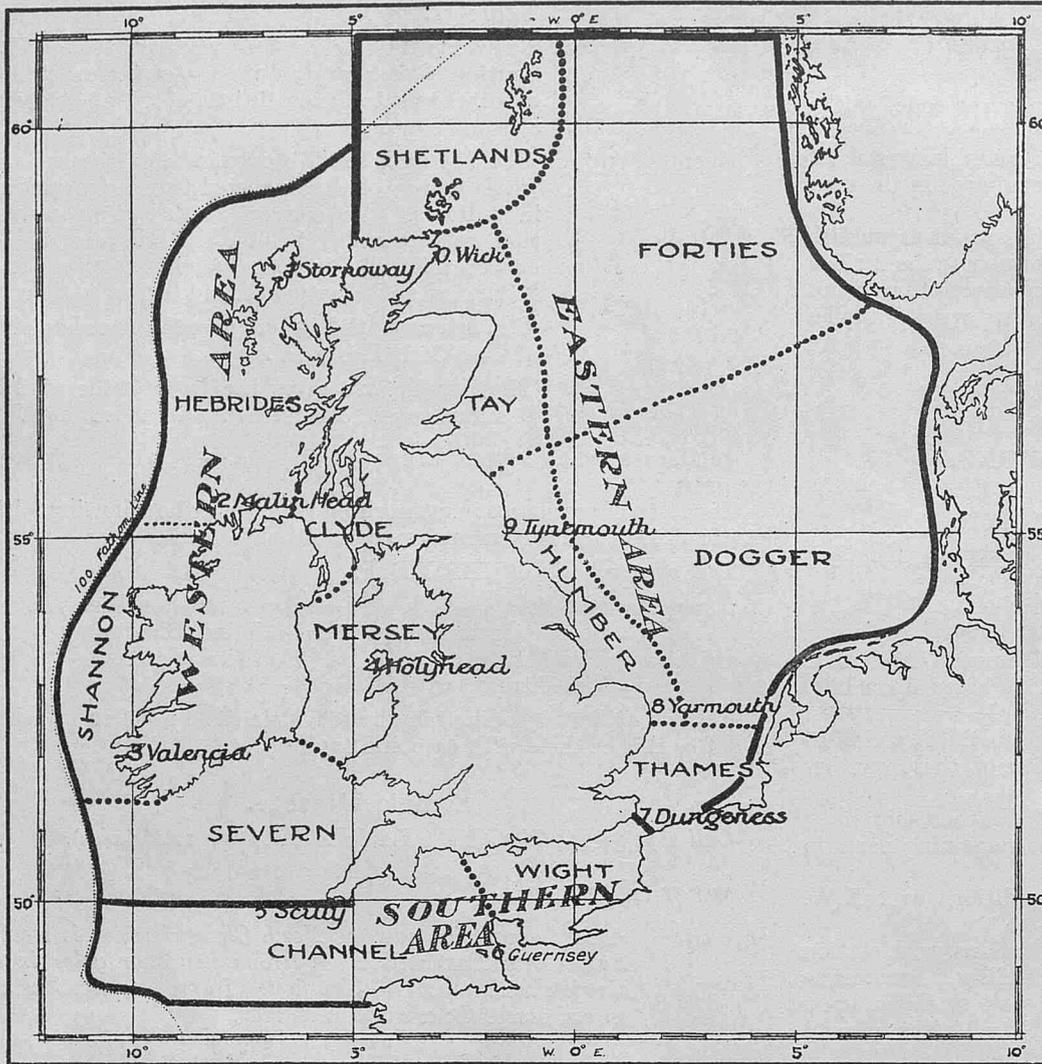
Table I.

International Weather Telegraphy Barometer Tendency Table.

0	Barometer steady.	(The barometer has not fallen or risen more than ¼ millibar in 3 hours)
1	Do. rising slowly.	(The barometer has risen 1 to 1½ mb. (.03-.04 in.) in last 3 hours)
2	Do. rising.	Do. do. 2 to 3½ (.06-.10 in.) do.
3	Do. rising quickly.	Do. do. 4 to 6 (.12-.18 in.) do.
4	Do. rising very rapidly.	Do. do. over 6 (.18 in.) do.
5	Do. falling slowly.	Do. fallen 1 to 1½ (.03-.04 in.) do.
6	Do. falling.	Do. do. 2 to 3½ (.06-.10 in.) do.
7	Do. falling quickly.	Do. do. 4 to 6 (.12-.18 in.) do.
8	Do. falling very rapidly.	Do. do. over 6 (.18 in.) do.

* It will be seen that the coded figures may represent two values of barometric pressure, but this only takes place with a very low or very high barometer, so that Mariners will be able to decide which value is intended.

CHARTLET SHOWING STATIONS, FORECAST AREAS AND DISTRICTS.



WESTERN AREA.

The sea and coasts eastward of the hundred fathom line from 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 Dover to the 100 fathom line.

DISTRICTS.

- CHANNEL.—West of Portland.
- WIGHT.—East of Portland.

EASTERN AREA.

The North Sea south of Lat. 61° N., and east of Long. 5° W. to the north and to the Straits of Dover in the south.

DISTRICTS.

- THAMES.—Thames Estuary and its approaches.
- HUMBER.—East coasts from Yarmouth to Tweed.
- TAY.—East coast of Scotland, including Moray Firth.
- SHETLANDS.—Orkneys and Shetlands.
- FORTIES.—Eastward to Norway and N. of line Tweed to Naze.
- DOGGER.—Eastward to coast of Denmark and S. of line Tweed to Naze.

Table II.

International Weather Telegraphy Present Weather Scale.

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

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

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

Code Figures.

00		Cloud has decreased.
01		No apparent change.
02		Cloud has increased.
03	Blue sky	Precipitation within sight.
04	or some	With solar or lunar halo.
05	cloud	After fog or mist or dust storm.
06	(Cloud	After rain or drizzle.
07	0-5)	After snow, sleet or hail.
08		With or after thunder and lightning in
09		After thunderstorm. [neighbourhood.
10		Cloud has decreased.
11		No apparent change.
12		Cloud has increased.
13	Cloudy or	Precipitation within sight.
14	overcast	With solar or lunar halo.
15	(Cloud	After fog or mist or dust storm.
16	6-10)	After rain or drizzle.
17		After snow, sleet, or hail.
18		With or after thunder and lightning in
19		After thunderstorm. [neighbourhood.

Code figures.

20		But clear in zenith	} Just begun.
21		And apparently overcast	
22		But clear in zenith	} Intermittent.
23		And apparently overcast	
24	} Fog or mist	But clear in zenith	} For some time:
25		And apparently overcast		} Has become thinner.
26		But clear in zenith	} For some time.
27		And apparently overcast		} For some time: Has
28		But clear in zenith	} become thicker.
29		And apparently overcast	
30		Slight with rain.	
31		" hail or rain and hail.	
32		" sleet.	
33		" snow.	
34	} Passing showers	Heavy with rain has become better.	
35		" rain.	
36		" rain has become worse.	
37		" hail or rain and hail.	
38		" sleet.	
39		" snow.	
40		Slight occasional.	
41		" continuous.	
42		" but has increased.	
43		Moderate but has decreased.	
44	} Drizzle	" occasional.	
45		" continuous.	
46		" but has increased.	
47		Thick but has decreased.	
48		" occasional.	
49		" continuous.	
50		Slight occasional.	
51	} Rain	" continuous.	
52		" but has increased.	
53		Moderate but has decreased.	

Code figures.

Table II.—continued.

54	Rain	Moderate occasional.	
55		„ continuous.	
56		„ but has increased.	
57		Heavy but has decreased.	
58		„ occasional.	
59		„ continuous.	
60	Snow or snow and hail	Slight occasional.	
61		„ continuous.	
62		„ but has increased.	
63		Moderate but has decreased.	
64		„ occasional.	
65		„ continuous.	
66	„ but has increased.		
67	Heavy but has decreased.		
67	„ occasional.		
69	„ continuous.		
70	Sleet or rain and snow	Slight occasional.	
71		„ continuous.	
72		„ but has increased.	
73		Moderate but has decreased.	
74		„ occasional.	
75		„ continuous.	
76	„ but has increased.		
77	Heavy but has decreased.		
78	„ occasional.		
79	„ continuous.		
80	Hail or rain and hail	Slight occasional.	
81		„ continuous.	
82		„ but has increased.	
83		Moderate but has decreased.	
84		„ occasional.	
85		„ continuous.	
86	„ but has increased.		
87	Heavy but has decreased.		
88	„ occasional.		
89	„ continuous.		
90	Thunderstorm (or Line squall)	Slight thunderstorm without hail.	
91		„ „ with hail.	
92		Moderate thunderstorm without hail.	
93		„ „ with hail.	
94		Heavy thunderstorm without hail	} without gale.
95		„ „ with hail	
96		„ „ without hail	} with gale.
97		„ „ with hail	
98		Line squall without hail.	
99	„ „ with hail.		

21	S.W. by W.	27	N.W. by W.
22	W.S.W.	28	N.W.
23	W. by S.	29	N.W. by N.
24	W.	30	N.N.W.
25	W. by N.	31	N. by W.
26	W.N.W.	32	N.

The Wireless Weather Bulletin for the Western Sea Board and stations issued on spark, 600 metres, through Malin Head and Land's End W/T. stations will be continued as heretofore for the present, except that at an early date the Land's End transmission will be transferred to Valencia, G.C.K., Lat. 51° 56' N., Long. 10° 21' W. (approx.).

GREAT BRITAIN AND IRELAND.

Wireless Storm Warnings.

These messages are broadcasted in plain language and refer to the area which lies within about 150 miles of the station sending out the message.

The signals are made on 600 m. wave length (spark) preceded by the **International safely signal TTT**. They are repeated three times at intervals of ten minutes. Should the signal be sent during the period when one operator ships do not keep watch they are repeated at the commencement of the next single operator watch.

Stations making these signals.

Station.	Call Sign	Latitude (approx.)	Longitude (approx.)
Niton (Isle of Wight)	- GNI	50° 35' N.	1° 17' W.
Land's End - - -	- GLD	50° 07' N.	5° 40' W.
Fishguard - - -	- GRL	52° 01' N.	4° 59' W.
Seaforth (Liverpool)	- GLV	53° 28' N.	3° 01' W.
Wick - - - - -	- GKR	58° 26' N.	3° 06' W.
Cullercoats - - -	- GCC	55° 02' N.	1° 26' W.
Valencia (Ireland)	- GCK	51° 56' N.	10° 21' W.
Malin Head (Ireland)	- GMH	55° 22' N.	7° 20' W.

Examples :—

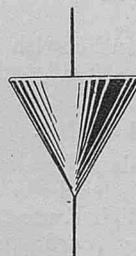
Gale N.W. to North force 8 to 9 anticipated Eastern Coast Dungeness to Wick.

GREAT BRITAIN AND IRELAND.

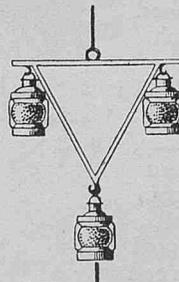
III. Visual Storm Warnings.

SOUTH CONE.

By Day.



By Night.

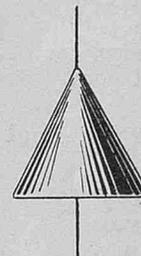


Hoisted for Gales

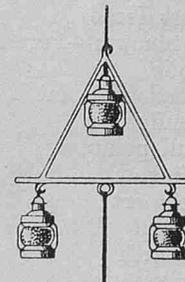
from S.E., veering to S.W., W., or N.W.
 „ S.W., veering to W. or N.W.
 „ W., veering to N.W.
 And also from E., veering to S. or S.W.

NORTH CONE.

By Day.



By Night.



Hoisted for Gales

from S.E., E., or N.E., backing to N.
 „ N.W., veering to N., N.E., or E.
 „ N., veering to N.E. or E.
 „ N.E., veering to E.

Table III.

International Weather Telegraphy Visibility Table.

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

Table IV.

Two Figure Compass Table.

International Weather Telegraphy Wind Direction Table.

01	N. by E.	11	S.E. by E.
02	N.N.E.	12	S.E.
03	N.E. by N.	13	S.E. by S.
04	N.E.	14	S.S.E.
05	N.E. by E.	15	S. by E.
06	E.N.E.	16	S.
07	E. by N.	17	S. by W.
08	E.	18	S.S.W.
09	E. by S.	19	S.W. by S.
10	E.S.E.	20	S.W.

When one of these signals is hoisted it indicates that a telegram has been received from the Meteorological Office by the station exhibiting the signal, that a gale is expected in the vicinity of the station.

At present only those stations marked † in the list show the night signal.

The stations are as follows :—

England, East Coast.

Berwick-upon-Tweed	Boston
Blyth	King's Lynn
Tynemouth	Sheringham
North Shields	Cromer
Souter Point	Yarmouth
Sunderland	Gorleston
Seaham	Lowestoft
Hartlepool	Southwold
Middlesbrough	Orfordness
Redcar	Ipswich
Whitby	Gunfleet
Filey	Shoeburyness
Flamborough Head	Greenhithe (H.M.S. Worcester)
Bridlington	Chatham
Spurn Head	Sheerness
Hull	†Southend
Goole	Tilbury
Grimsby	Rotherhithe

England, South Coast.

Ramsgate	Weymouth
Deal	Portland
Dover	Jersey
Sandgate	Exmouth
Dungeness	Torquay
Rye	Berry head
Eastbourne	Prawle point
Beachy head	Salcombe
†Newhaven	Plymouth
Brighton	Devonport
Littlehampton	Rame head
Portsmouth	Looe
Southampton	Fowey
Cowes	Mevagissey
Ryde	St. Anthony
St. Catherine point	Lizard
Needles	Porthleven
Poole	Newlyn
Swanage	Tol Peden Penwith
Anvil point	St. Agnes (Scilly isles)

England, West Coast, and Wales.

Sennen	Caldy island
Godrevy	St. Ann's head
St. Ives	Smalls lighthouse
Newquay	Newquay (Cardigan)
Trevose head	Carnarvon
Padstow	South Stack
Port Isaac	Holyhead
Lynmouth—Foreland	Amlwch
Bude	Hoylake
Hartland point	Formby Light Vessel
Lundy Isle	Bar Light Vessel
Bull point	New Brighton
Ilfracombe	Runcorn
Newport (Mon.)	Liverpool
Cardiff	Preston
Penarth	Blackpool
Nells point	Fleetwood
Barry dock	Heysham
Nash	Morecambe
Briton ferry	Barrow
Swansea	Walney island
Mumbles	Douglas (Isle of Man)
Rhos-sili	Ayre point (Isle of Man)
Burry port	Ramsey (Isle of Man)
Tenby	

Scotland, West Coast.

Stranraer	Mull of Cantyre
Mull of Galloway	Rinns of Islay
Corsewall point	Rudha Mhail
Ballantrae	Glas island
Ardrossan	Stornoway
Greenock	Ru Stoer
Campbeltown	

Scotland, North and East Coasts, with Orkneys and Shetlands.

Cape Wrath	Port Knockie
Lerwick	Portsoy
Sumburgh head	Banff
Fair Isle	Fraserburgh
Noup head	Peterhead
Kirkwall	Aberdeen
Stromness (Orkney Isles)	Nairn
Cantick head	Girdleness
Dunnet head	Scurdyness
Wick	St. Andrews
Tarbetness	Methil
Cromarty	Rosyth
Burghead	Grangemouth
Lossiemouth	Dunbar
Buckie	St. Abbs head

Ireland, North and East Coasts.

Rathmullen	Belfast
Malin head	Kingstown
Portrush	

Ireland, South Coast.

Queenstown	Galley head
Cork	

Ireland, West Coast.

Nil.

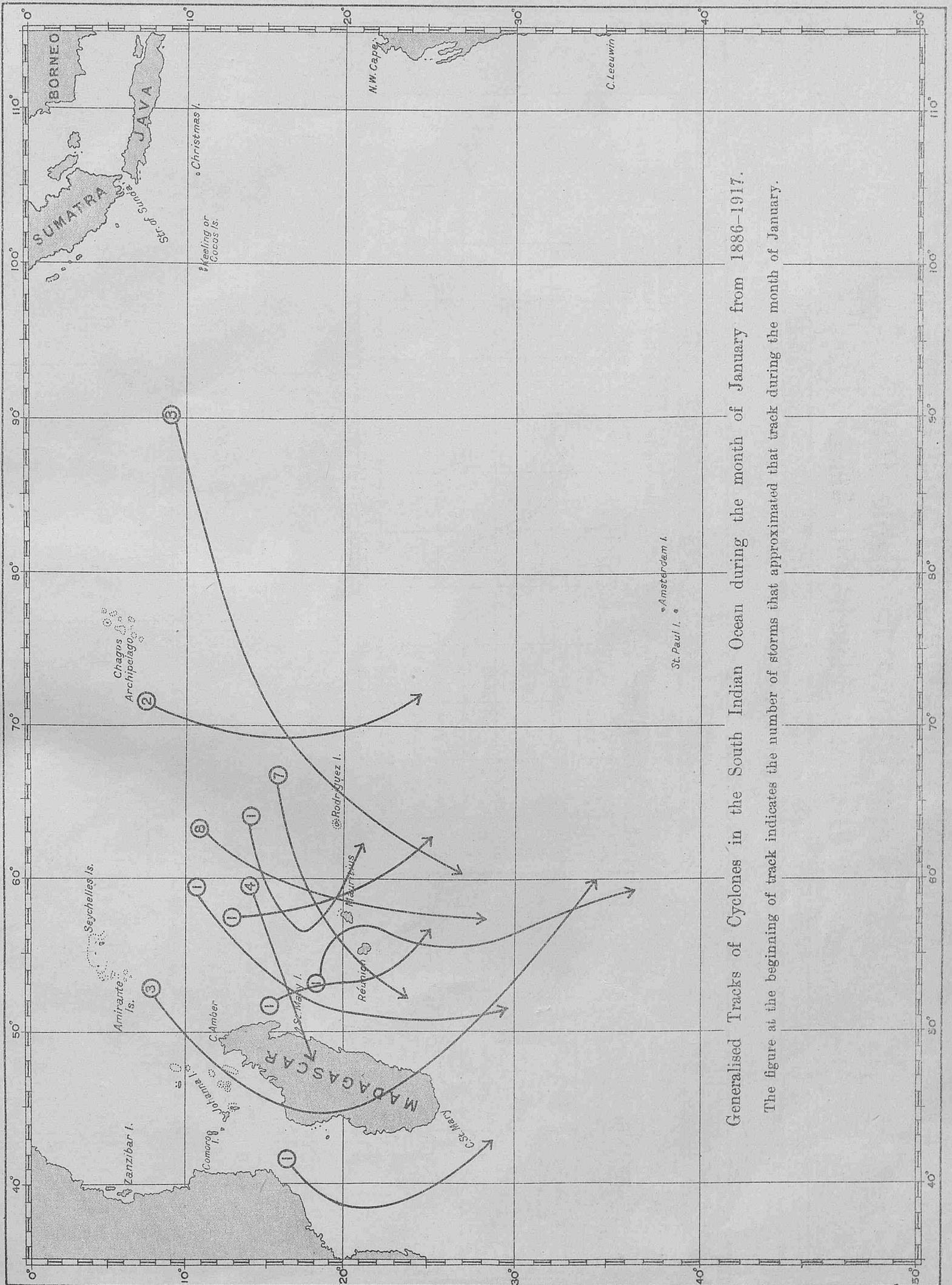
Special Notices regarding Personnel.

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

Captain **Hugh F. David, R.D., R.N.R.**

The recent announcement of the retirement, due to ill-health, of Captain DAVID from the command of R.M.S. *Olympic* is noted with regret. He has been a keen and active Marine Observer to the Meteorological Office since 1905, having contributed many Meteorological Logs and Wireless Telegraphy Weather Report registers, and obtained an excellent award this year.

Marine Observers will join with the Marine Division in wishing Captain DAVID a speedy recovery and success in the shore position he is to occupy.



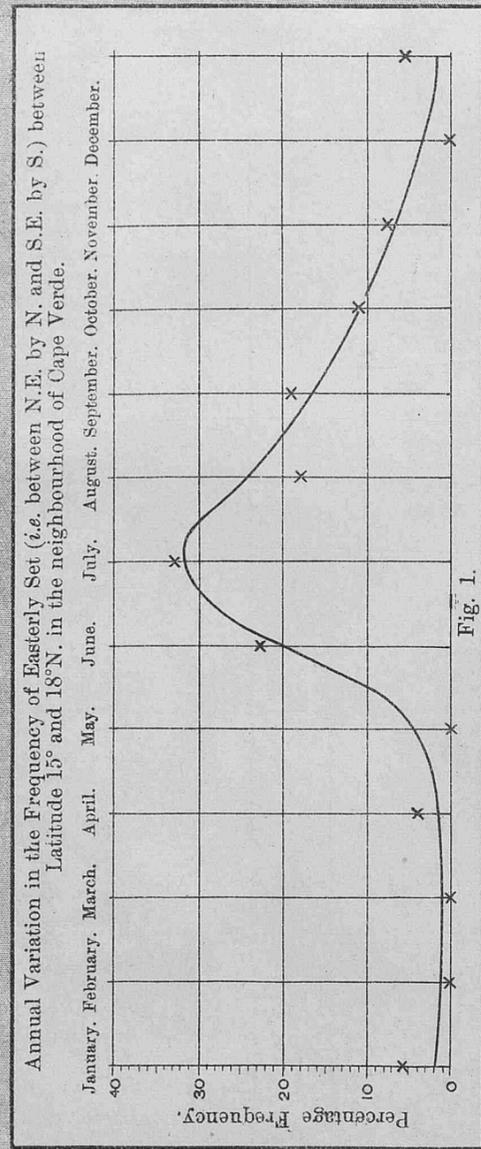
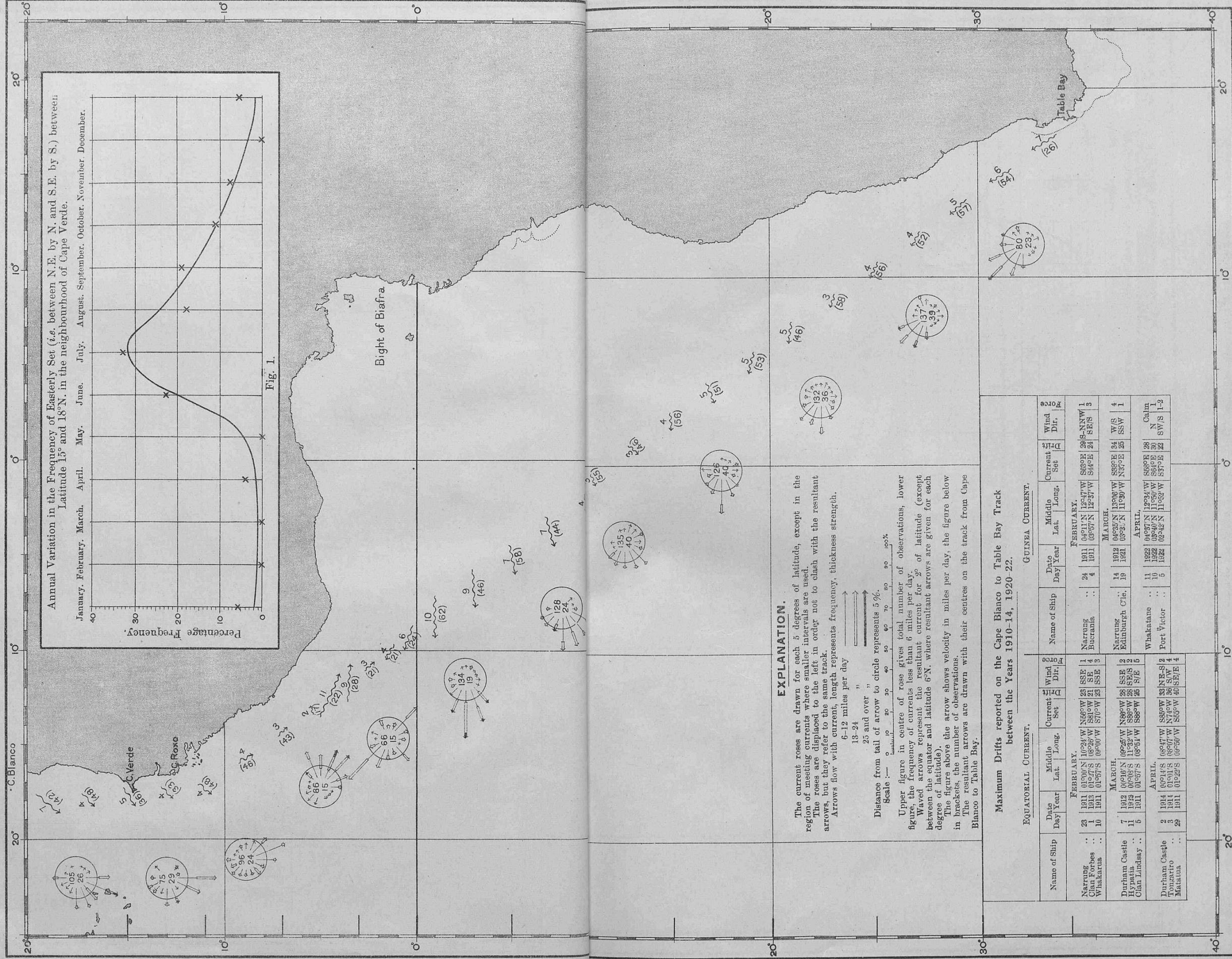
Generalised Tracks of Cyclones in the South Indian Ocean during the month of January from 1886-1917.

The figure at the beginning of track indicates the number of storms that approximated that track during the month of January.

CURRENTS ON DIRECT CAPE ROUTE. Cape Blanco to Table Bay.

FEBRUARY, MARCH AND APRIL.

Observations of Ships Regularly Observing for the Meteorological Office.
1910 to 1914 and 1920 to 1922.



EXPLANATION.
The current roses are drawn for each 5 degrees of latitude, except in the region of meeting currents where smaller intervals are used.
The roses are displaced to the left in order not to clash with the resultant arrows, but they refer to the same track.
Arrows flow with current, length represents frequency, thickness strength.
6-12 miles per day
13-24
25 and over
Distance from tail of arrow to circle represents 5%.
Scale: — 0 10 20 30 40 50 60 70 80 90 100%
Upper figure in centre of rose gives total number of observations, lower figure, the frequency of currents less than 6 miles per day.
Waved arrows represent the resultant current for 2° of latitude (except between the equator and latitude 6°N. where resultant arrows are given for each degree of latitude).
The figures above the arrow shows velocity in miles per day, the figure below in brackets, the number of observations.
The resultant arrows are drawn with their centres on the track from Cape Blanco to Table Bay.

EQUATORIAL CURRENT.				GUINEA CURRENT.					
Name of Ship	Date Day Year	Middle Lat. Long.	Current Set	Wind Dir.	Name of Ship	Date Day Year	Middle Lat. Long.	Current Set	Wind Dir.
Narung Cape Verde Whakarua	23	1911 01°00'N 10°24'W	N56°W 23	SSE	Narung Bucania	24	1911 04°11'N 12°47'W	S63°E 38	S-NNW 1
	1	1913 01°27'S 08°28'W	S81°W 21	SE		4	1911 03°07'N 12°37'W	S44°E 24	SE/S 3
	10	1911 01°57'S 09°00'W	S70°W 23	SSE		14	1912 04°05'N 11°06'W	S83°E 34	W/S 4
Durham Castle Hyndia Cian Lindsay	7	1912 00°25'W 08°25'W	N86°W 28	SSE	Narung Edinburgh Cie.	19	1921 03°01'N 11°30'W	N37°E 25	SSW 1
	11	1923 00°08'S 11°32'W	S86°W 28	SE/S 2		11	1922 04°07'N 12°34'W	S88°E 28	Calm
	6	1911 01°57'S 08°51'W	S88°W 26	S/E 5		10	1922 03°40'N 11°50'W	S64°E 30	N 1
Durham Castle Tonarito Matana	2	1914 00°14'S 08°07'W	S85°W 33	NE-S	Port Victor	5	1922 02°42'N 11°02'W	S73°E 22	SW/S 1-2
	3	1914 01°01'S 07°40'W	N74°W 36	S/W 4		6	1922 02°42'N 11°02'W	S73°E 22	SW/S 1-2
23	1911 01°22'S 09°50'W	S55°W 40	SE/E 4						

CURRENTS ON DIRECT CAPE ROUTE. Cape Blanco to Table Bay.

MAY, JUNE, AND JULY.

Observations of Ships Regularly Observing for the Meteorological Office.
1910 to 1914 and 1920 to 1922.

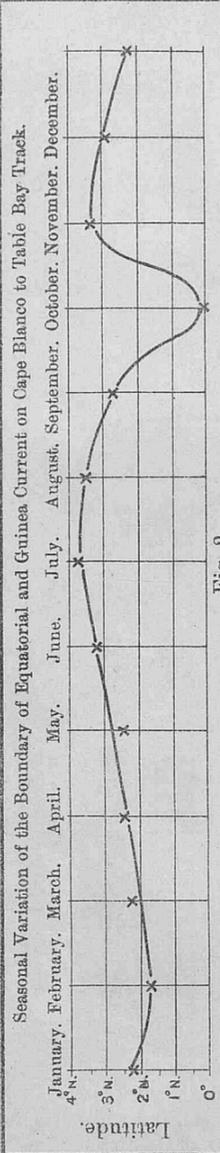
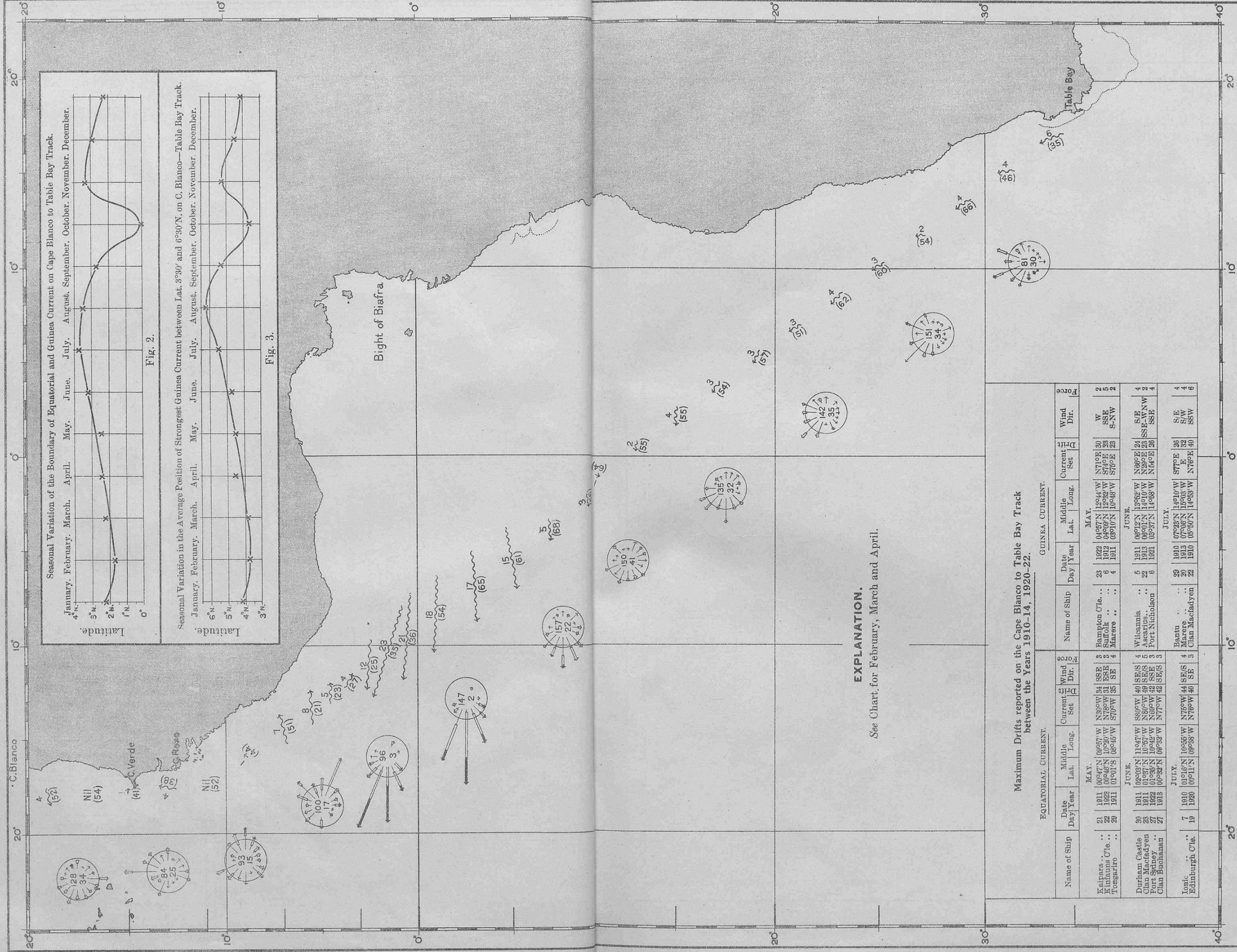


Fig. 2.

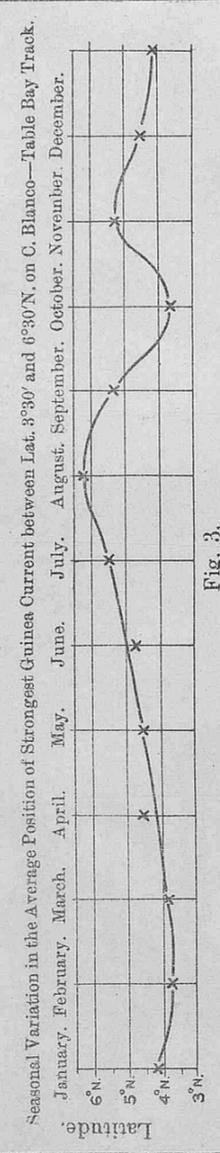


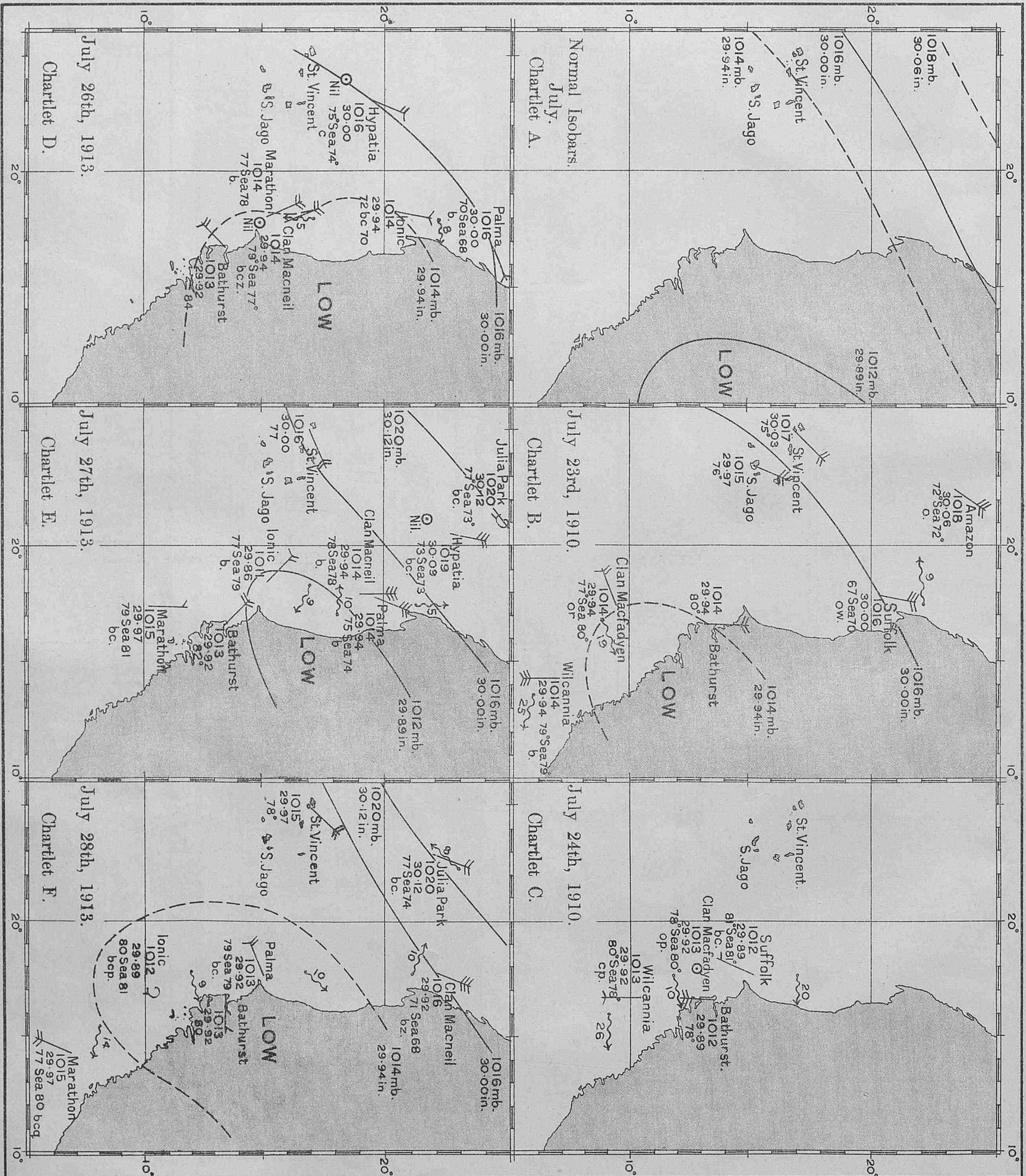
Fig. 3.

EXPLANATION.
See Chart for February, March and April.

Maximum Drifts reported on the Cape Blanco to Table Bay Track between the Years 1910-14, 1920-22.

EQUATORIAL CURRENT.				GUINEA CURRENT.						
Name of Ship	Date Day Year	Middle Lat. Long.	Current Set	Wind Dir.	Name of Ship	Date Day Year	Middle Lat. Long.	Current Set	Wind Dir.	Force
Kaipara. K. K. Tongariro	21	1911 09°47'N 10°57'W	N86°W 34	SSE	Bampton C'te. Suffolk Marere	23	1922 04°57'N 19°44'W	N71°E 30	W	2
	22	1922 09°45'N 10°20'W	N78°W 31	ESE		24	1912 04°08'N 19°32'W	S74°E 23	SSE	5
	29	1911 01°01'S 08°45'W	S70°W 35	SE		25	1911 03°10'N 10°48'W	S75°E 23	S-NW	2
Durham Castle Clan Macfadayen Port Sydney Clan Buchanan	30	1911 02°39'N 11°47'W	S86°W 40	SE/S	Wilcannia. Ascarius. Port Nicholson	5	1911 09°12'N 19°52'W	N68°E 24	S/E	4
	23	1911 01°37'N 10°57'W	N80°W 49	SE/S		6	1913 08°01'N 14°10'W	N30°E 23	SSE-WNW	2
	27	1922 01°35'N 10°42'W	N69°W 42	SE		26	1921 03°37'N 11°58'W	N54°E 26	SSE	4
	27	1913 00°32'N 08°32'W	N77°W 42	SE/S	3					
Ionic Edinburgh C'te.	7	1910 01°01'N 10°55'W	N75°W 44	SE/S	Bantu Marere Clan Macfadayen	23	1910 07°23'N 14°10'W	S77°E 26	S/E	4
	19	1920 00°11'N 09°38'W	N76°W 40	SE		22	1913 07°06'N 15°03'W	E 32	S/W	4
						1910 05°50'N 14°53'W	N76°E 40	SSW	6	

CURRENTS ON DIRECT CAPE BLANCO-TABLE BAY TRACK.



The wavyed arrows show the current experienced, the figures indicating the velocity in miles per day.

THE FUNDAMENTAL SHAPES OF ISOBARS.

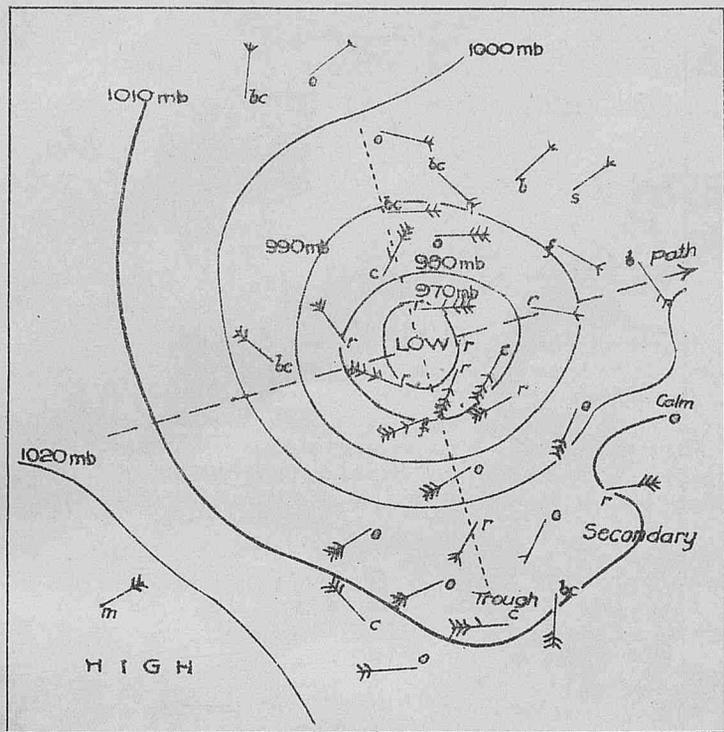


Fig. 1.—“Wireless and Weather”—Cyclone and Secondary.

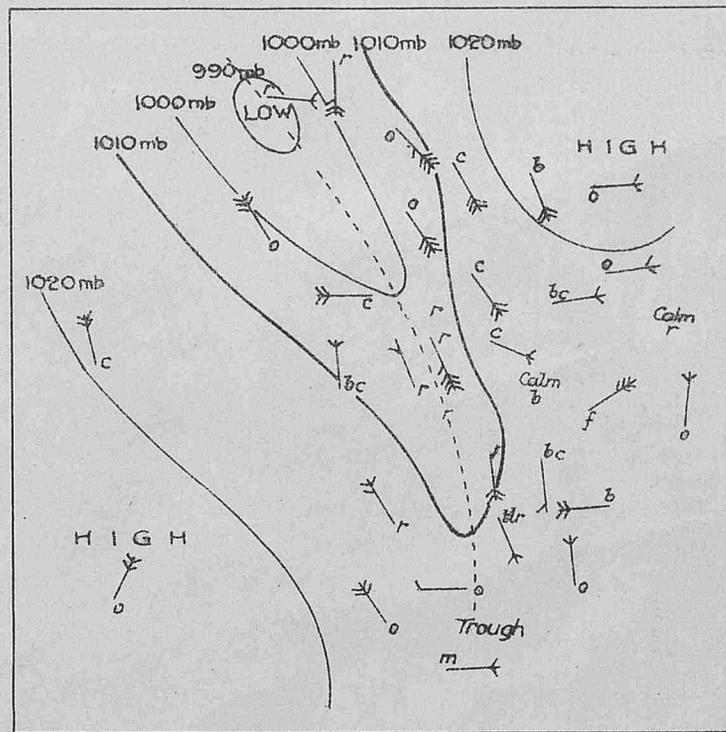


Fig. 2.—“Wireless and Weather”—V-shaped depression.

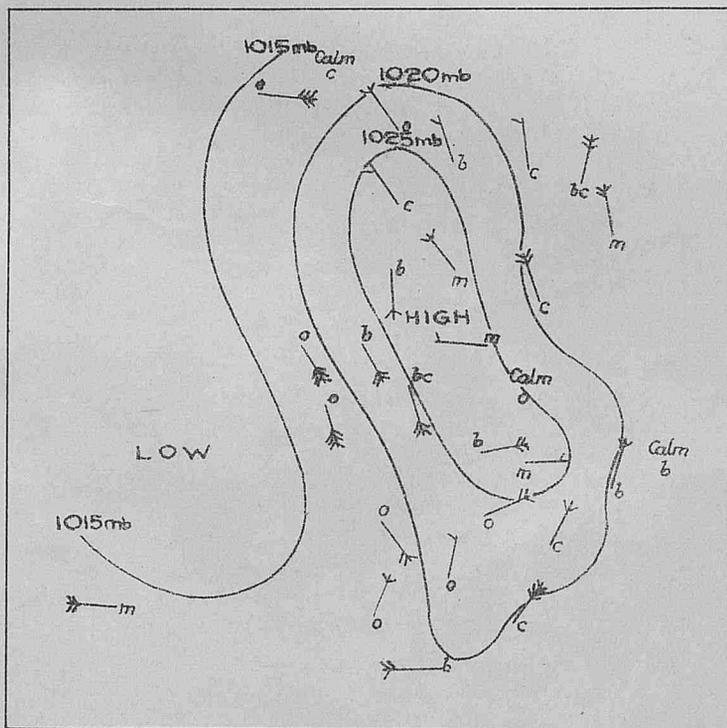


Fig. 3.—“Wireless and Weather”—Anticyclone.

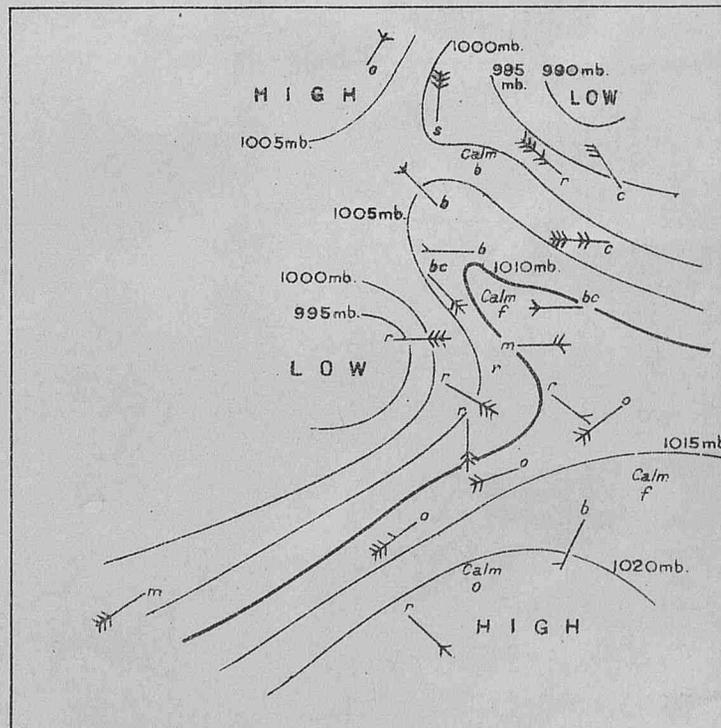


Fig. 4.—“Wireless and Weather”—Wedge.

THE FUNDAMENTAL SHAPES OF ISOBARS.

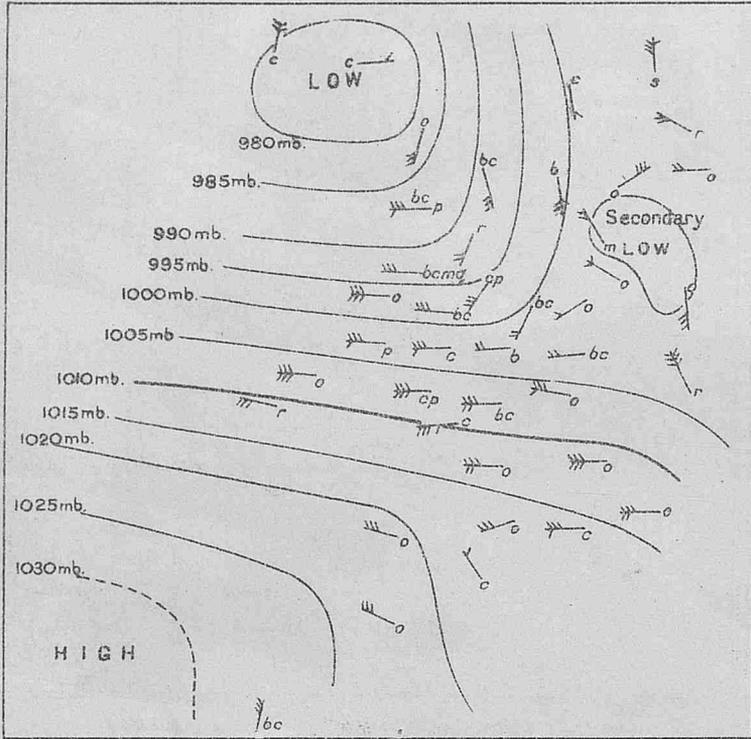


Fig. 5.—“Wireless and Weather”—Straight isobars between Cyclone and Anticyclone.

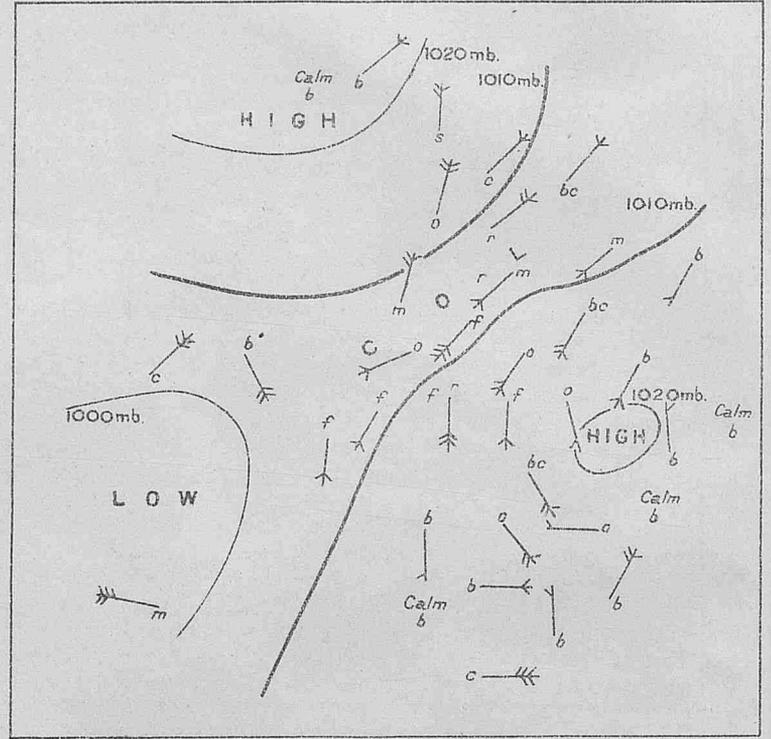


Fig. 6.—“Wireless and Weather”—Col.

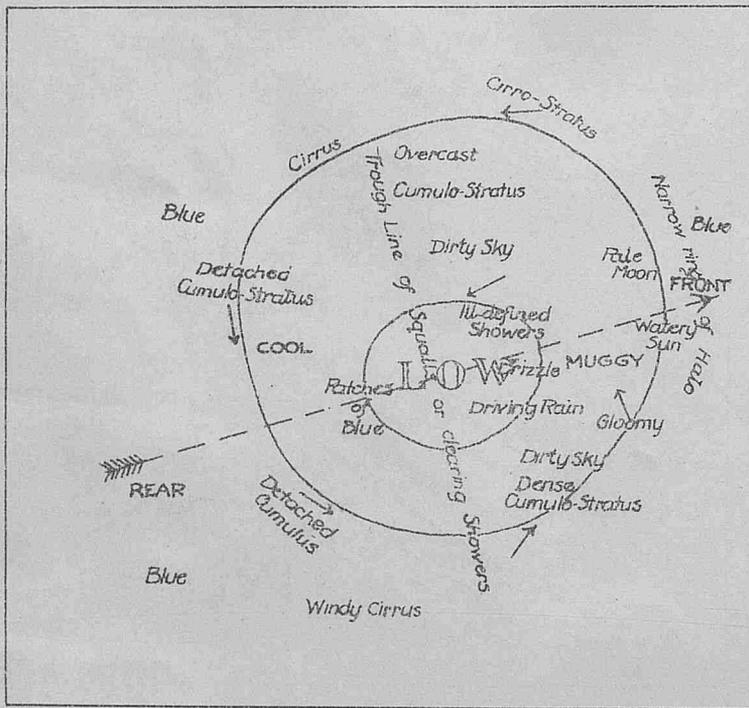


Fig. 7.—“Wireless and Weather”—Cyclone Prognostics.

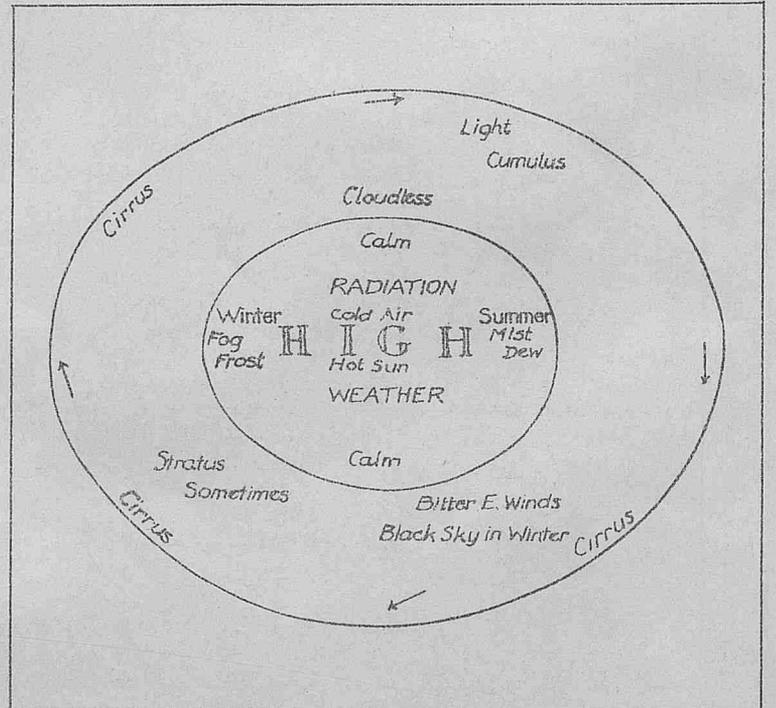


Fig. 8.—“Wireless and Weather”—Anticyclone Prognostics.

IMPORTANT.

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

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

Photographs, sketches and weather charts will be most welcome.

CURRENT OBSERVATION.

It is very desirable that good current data should be recorded. Spaces are provided for current experienced throughout the day and for current determined at shorter intervals in Meteorological Logs, while Form 911 (late 121) provides for either or both.

Generally the difference between the *Dead Reckoning Position* at noon, reckoned from previous noon, and the *observed position* has been accepted as attributable to a single current for the whole 24 hours.

It is necessary to make careful distinction between *Dead Reckoning Position* and *Estimated Position*, the former being the position as reckoned from the last fix by courses steered and distances run, corrected for all known errors and disturbances *except* current. When a fix cannot be obtained, an estimation for current (when one is known generally to exist) is sometimes applied to the D.R.; the result may then be conveniently termed the *Estimated Position*.

If this estimated position is given in the Meteorological Log or Form 911 (late 121), it should be clearly stated, otherwise it may be misleading.

Currents of varying velocity and direction may be experienced along the track made in 24 hours; therefore, when reliable fixes such as by Stellar observations at twilight are obtained, the current should be determined for the intervals, and all should be checked with the noon to noon result. Each of these currents determined at shorter intervals than 24 hours should be entered in the Meteorological Log in the appropriate column, and the time and latitude and longitude of each observation position should be given in the latitude and longitude columns. The times given on Form 911 (late 121) indicate the interval. The period of short interval currents should usually not be less than, say, six hours. The best interval is probably from twilight to twilight.

It is desirable that whenever possible two methods of ascertaining the distance run through the water should be used, as recent investigation goes to show that with one means of measuring the speed the inclination has been to credit the ship. When possible it is recommended that both patent log and revolutions should be used.

For working out the set and drift of current the position *from* as well as the position to must always be *fixes*. Some observers have used an *estimated position from*, which makes the set and drift false. The same remarks apply to course allowances for set; the latter are naturally necessary to make an *estimated course*.

Invitation to Marine Observers.

The Marine Superintendent will be pleased to see Captains of observing ships, who may be in London, between 10 a.m. and 4 p.m., at Room 319, Adastral House, Kingsway, W.C.2. Telephone No. :—Regent 8000. Extension 421. Telegrams, "Marine Superintendent, Weather, London."

(Nearest station—Temple, District Railway.)

DERELICTS AND LATE PRESS.

Date.	Position.		Description.
	Latitude.	Longitude.	
NORTH SEA.			
18.11.23	12 mls. W. by S. from Terschelling Lt.-Vsl.		Mast of sunken vessel projecting out of water.
18.11.23	9 mls. N. $\frac{1}{2}$ ° E. (mag.) from Longstone Lt.		Submerged wreckage probably floating under water.
21.11.23	54°44'N. 4°15'E.		Submerged wreckage.
ENGLISH CHANNEL.			
1.11.23	50°37'N. 6°10'W.		Floating spherical buoy with horns.
2.11.23	50°35'N. 5°20'W.		Submerged wreckage.
2.11.23	50°42'N. 0°28'E.		Submerged obstruction.
16.11.23	10 mls. W. by S. from Portland Bill.		Unknown object.
BALTIC SEA.			
15.11.23	57°19'N. 19°00'E.		Wreck bottom up.
15.11.23	57°00'N. 18°00'E.		Wreck.
NORTH ATLANTIC OCEAN.			
2.11.23	21°54'N. 74°11'W.		Log about 20 ft. long, 3 ft. in diameter.
3.11.23	48°30'N. 27°13'W.		Large number of 10 ft. deals, part of vessel's deck cargo.
3.11.23	38°56'N. 70°18'W.		Large spar painted red and black.
3.11.23	37°31'N. 72°08'W.		Spar about 12 ins. in diameter, projecting 5 ft. out of water.
3.11.23	42°00'N. 52°30'W.		Wreck of derelict schooner <i>Governor Parr</i> , mast gone and apparently waterlogged. (Note :—This schooner was abandoned on October 3, 1923, in Lat. 42°49'N., Long. 55°56'W.)
3.11.23	46°50'N. 47°22'W.		Floating wreckage.
4.11.23	44°40'N. 20°07'W.		Large red conical buoy.
4.11.23	23°30'N. 74°20'W.		Spar about 40 ft. long apparently attached to submerged wreckage.
4.11.23	38°36'N. 74°50'W.		Floating wreckage.
4.11.23	16 mls. N.E. from C. Charles.		Two pieces of wreckage.
4.11.23	40°12'N. 69°49'W.		Large can buoy.
4.11.23	42°47'N. 65°27'W.		Whistle buoy, functioning.
5.11.23	42°21'N. 53°00'W.		Reported position of derelict schooner <i>Governor Parr</i> (see N. Atlantic Ocean, 3.11.23, above).
5.11.23	37°59'N. 72°54'W.		Red spar standing upright.
5.11.23	22°34'N. 74°33'W.		Large spar apparently attached to submerged wreckage, projecting 16 ft. out of water, drifting 288° at 0.6 kt.
5.11.23	35°21'N. 75°17'W.		Wreckage.
6.11.23	31°23'N. 80°20'W.		Cross-trees and broken top mast, projecting 8 ft. out of water, apparently attached to submerged wreckage.
6.11.23	36°59'N. 75°43'W.		Raft of heavy timbers.
7.11.23	19°05'N. 75°18'W.		Floating tree projecting 15 ft. out of water.
8.11.23	42°32'N. 48°45'W.		Red flat topped mooring buoy.
8.11.23	33°01'N. 78°16'W.		Spar projecting 8 ft. out of water.
8.11.23	39°45'N. 74°01'W.		Stump of old spar buoy projecting 1 ft. out of water.
9.11.23	42°58'N. 50°06'W.		Spar about 25 ft. long.
9.11.23	30°59'N. 11°06'W.		Derelict s.s. <i>Merche</i> , decks awash, dangerous to navigation.
10.11.23	42°57'N. 51°27'W.		Spar floating upright.
12.11.23	46°18'N. 57°45'W.		Derelict Barque <i>Pelican</i> adrift, dangerous to navigation.
12.11.23	34°48'N. 35°51'W.		Red conical buoy, floating light.
23.11.23	40°58'N. 57°45'W.		Waterlogged vessel, bottom up, about 150 ft. long, and showing about 3 feet above water.
24.11.23	37°02'N. 9°08'W.		Schooner, probably <i>Little Princess</i> , abandoned and on fire, dangerous to navigation.
24.11.23	42°56'N. 51°18'W.		Derelict schooner.
24.11.23	48°31'N. 9°04'W.		Buoy with black and white vertical stripes, "451" on sides.
GULF OF MEXICO.			
9.11.23	28°30'N. 95°06'W.		Numerous pieces of driftwood about 25 ft. long.
PACIFIC OCEAN.			
1.11.23	47°44'N. 124°50'W.		Large log.
4.11.23	48°10'N. 125°08'W.		Large log.
6.11.23	47°48'N. 124°51'W.		Several logs about 30 ft. long and 2½ ft. in diameter.

NOTICE.

On and after the 10th December, 1923, the Wireless Weather Bulletin for the Western Seaboard, issued on 600 metres (spark) through Malin Head and Land's End W/T stations, will be issued through Malin Head as heretofore, but the Land's End transmission will be transferred to Valencia W/T Station, call sign G.C.K. (51°56'N., 10°21'W.).

ICE CHART.

WESTERN NORTH ATLANTIC.

NUMBERS OF TRANSATLANTIC TRACKS INDICATE

- ⑦ ③ ⑨ From 15th November to 14th February, inclusive.
- ⑩ ⑪ From 1st September to 31st January, inclusive.

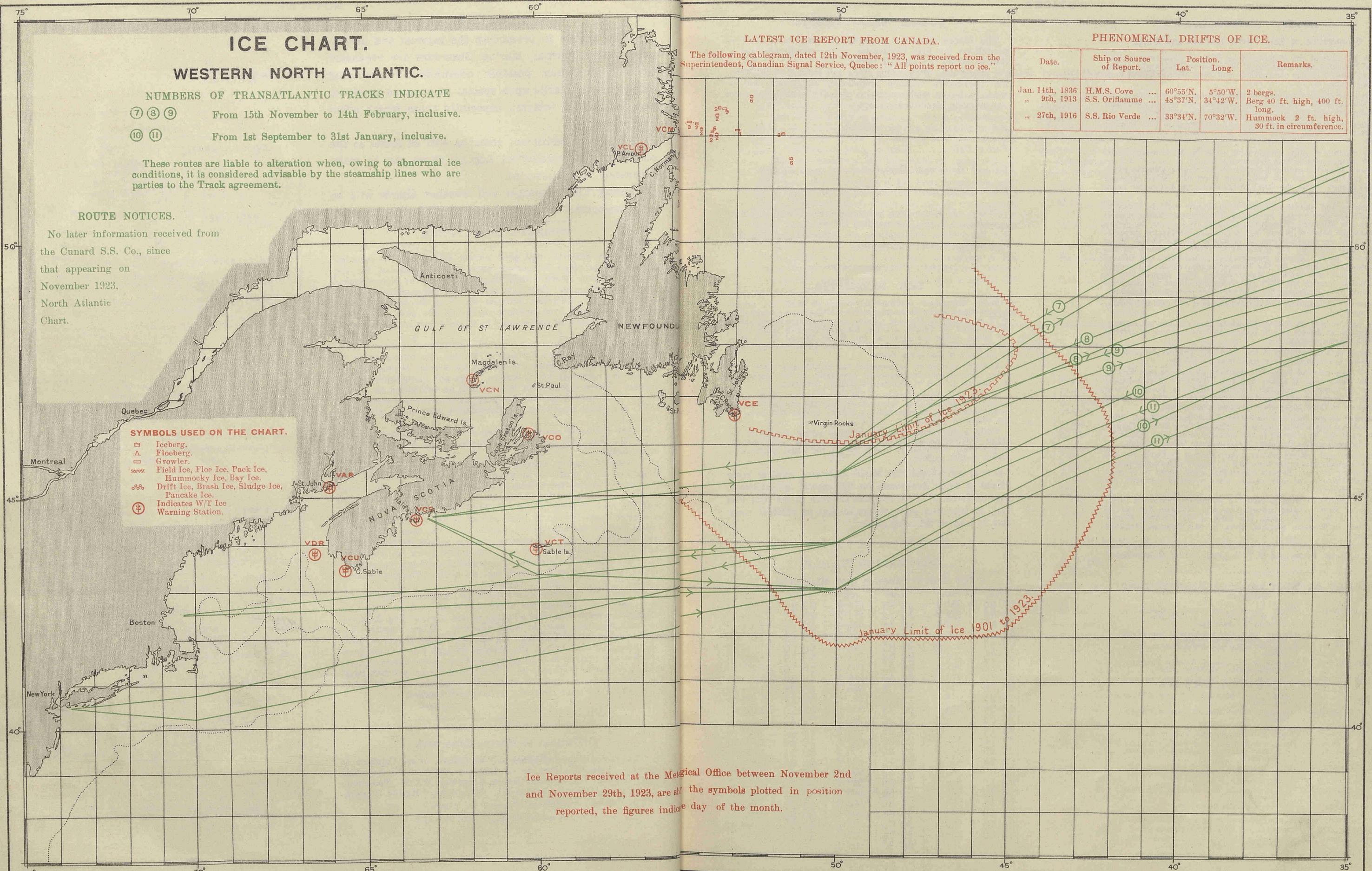
These routes are liable to alteration when, owing to abnormal ice conditions, it is considered advisable by the steamship lines who are parties to the Track agreement.

ROUTE NOTICES.

No later information received from the Cunard S.S. Co., since that appearing on November 1923, North Atlantic Chart.

SYMBOLS USED ON THE CHART.

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



LATEST ICE REPORT FROM CANADA.

The following cablegram, dated 12th November, 1923, was received from the Superintendent, Canadian Signal Service, Quebec: "All points report no ice."

PHENOMENAL DRIFTS OF ICE.

Date.	Ship or Source of Report.	Position.		Remarks.
		Lat.	Long.	
Jan. 14th, 1836	H.M.S. Cove ...	60°55'N.	5°50'W.	2 bergs.
" 9th, 1913	S.S. Ori flame ...	48°37'N.	34°42'W.	Berg 40 ft. high, 400 ft. long.
" 27th, 1916	S.S. Rio Verde ...	33°34'N.	70°32'W.	Hummock 2 ft. high, 30 ft. in circumference.

Ice Reports received at the Meteorological Office between November 2nd and November 29th, 1923, are shown by the symbols plotted in position. When the symbols are not plotted, the figures indicate the day of the month.

MARINE METEOROLOGY.

Co-operation of Shipowners, Masters and Mates.

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

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

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

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

Vessels observing regularly for the Meteorological Office to which office instruments are not lent, keep Form 911, Ships Meteorological Report, using the ship's instruments, the barometer being compared with Standards.

Captains and Officers who wish to co-operate with the Meteorological Office should apply *by letter* to The Director, Meteorological Office, Air Ministry, Kingsway, London, W.C.2; or *in person* between the hours of 10 a.m. and 4 p.m., to the Marine Superintendent at the same address or to any of the gentlemen whose names and addresses are given below acting as agents at the respective ports. Marine Observers (*i.e.*, Captains and Officers who regularly observe for the Meteorological Office), will greatly assist if they will send in Meteorological Logs immediately on completion through the Port Meteorological Officer or Agent, at the same time notifying him of any possible instrumental defects.

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

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

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

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

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

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

All Masters who wish to assist in developing the rapid interchange of Meteorological information and Weather Forecasting at sea can do so by using the form of W/T Weather Report suggested in "Weather Signals," given in this Journal, January Number.

The Marine Observer is sent monthly to all ships regularly contributing Logs, Forms and W/T Registers to the Meteorological Office.

Marine Agencies and Port Meteorological Officers.

LIVERPOOL	..	(Port Meteorological Office) Commander G. H. Lloyd, R.D., R.N.R., Dock Office. Telephone No.: Bank 8959.
CARDIFF	..	{ Captain James Weir, Examiner of Masters and Mates, Mercantile Marine Office. Captain W. H. Hunter, Board of Trade Surveyor's Office.
DUNDEE	..	Captain W. K. Stewart, Nautical Instructor, Technical College, Bell Street, Dundee.
THE CLYDE	..	Captain M. Corrance, Board of Trade Surveyor's Office, 73, Robertson Street, Glasgow.
HULL	..	Captain Geo. B. Sturdy, Ellerman's-Wilson Line, Ltd.
SOUTHAMPTON	..	Captain D. Forbes, Nautical Academy, 1, Albion Place.
TYNE	..	Commander E. S. Macleod, R.D., R.N.R., Board of Trade Surveyor's Office, North Shields.
DUBLIN	..	{ Captain M. H. Clarke, Chief Surveyor, Ministry of Industry and Commerce, Marine Department, 27, Eden Quay.
HONG KONG	..	Lieut.-Commander P. W. S. Henderson, R.N., Superintendent, Admiralty Chart and Chronometer Depot.
VANCOUVER	..	T. S. H. Shearman, Esq., Room 40, Post Office Building.
AUSTRALIA	..	The Commonwealth Meteorologist.
The Deputy Directors of Navigation act as sub-agents as follows :-		
SYDNEY	..	Captain G. D. Williams, D.S.O., Customs House.
MELBOURNE	..	Captain L. J. Bolger, Mercantile Marine Office (1st Floor), Siddeley Street.
FREMANTLE	..	Captain J. J. Airey, Dalgety's Buildings.

POSTAL ARRANGEMENTS.

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

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

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

Port of Call.....

Date of Homeward Departure.....

Postal Address.....

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

THE BAROMETER.

Before barometer readings are compared with the normal isobars shown on the Meteorological Ocean Charts, transmitted by W/T or plotted on Weather Charts, mercurial barometers should be corrected for height, gravity, temperature and index error, for which tables are given on pp. 80 to 83 and 84 to 86 of the Marine Observer's Handbook. A table for converting inches to millibars is also given below.

Aneroids require to be corrected for height and index error only. They should be frequently compared, as the mechanism is liable to get out of adjustment without detection.

Readings of the barometer should be entered in the Meteorological Log as read—*i.e.*, uncorrected—and the attached thermometer should also be recorded. A column is now also given for the corrected reading.

While a difference from the pressure values shown on the charts does not necessarily mean unusual weather, when there is a divergence the mariner should be on the alert, particularly within cyclone regions.

It is strongly urged that Marine Observers, whether using Official or Ship's Barometers, for W/T reports, Meteorological Logs or Forms 911, will complete and send in the Blue Post Card, at least once every voyage, so that an effectual check may be kept on the index error.

CONVERSION TABLE.

To Convert Inches into Millibars.

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

LIST OF VOLUNTARY OBSERVING SHIPS.

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

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

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

Only in special cases will individual letters be sent.

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

Ships not contributing logs or reports within a reasonable period will automatically be removed from

the list and the free issue of the "Marine Observer" discontinued; it is, therefore, earnestly requested that changes of service, probable periods of lay up or transfer of Commanders may be notified whenever possible.

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

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

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

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

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

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

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed.	Date Received.
<i>Abu</i> ...	Hughes, J. ...	W. E. Thomas ...	No.	Elder Dempster ...	Form 911 8.2.23 to 16.3.23 ...	20.3.23.
<i>Abaris</i> ...	Rippon, A. P. ...	R. C. Jones ...	"	L. Walford ...	" 11.8.23 to 21.8.23 ...	24.8.23
<i>Abinsi</i> ...	Wright, J. B. ...	H. Welton ...	"	Elder Dempster ...	" 7.3.23 to 14.4.23 ...	23.4.23.
<i>Actor</i> ...	Haylett, E. ...	F. Medwell ...	"	Harrison ...	" 3.5.23 to 31.5.23 ...	4.6.23.
<i>Adia</i> ...	Toft ...	G. R. Langmaid ...	"	Elder Dempster ...	" ...	"
<i>Adriatic</i> ...	Beadnell, F. E., Commr., R.N.R.	L. Thompson, J. Collins, J. Farrell.	W.T.	White Star ...	{ W.T. Reg. 14.10.23 to 2.11.23... Form 911 13.10.23 to 4.11.23... }	6.11.23. 9.11.23.
<i>Agapenor</i> ...	Ramsay, J. ...	P. S. Atkins ...	No.	A. Holt ...	" 24.8.23 to 4.9.23 ...	6.11.23.
<i>Alban</i> ...	Whayman, W. R. ...	R. Griffiths ...	"	Booth ...	" 22.4.23 to 4.6.23 ...	27.6.23.
<i>Albania</i> ...	Gibbons, G., R.D., Commr., R.N.R.	H. A. W. Waterhouse ...	"	Cunard ...	" 20.9.23 to 8.10.23 ...	15.10.23.
<i>Aleppo</i> ...	Duncan, W. B. ...	H. B. Smith ...	"	Ellerman Wilson ...	" 28.4.23 to 30.6.23 ...	5.7.23.
<i>Algerian Prince</i> ...	Rowlands, D. ...	G. Potts ...	"	Prince ...	" 17.9.23 to 1.10.23 ...	6.10.23.
<i>Alipore</i> ...	Gordon, L. M. ...	R. E. Cowell ...	"	P. and O. ...	" 30.5.23 to 18.6.23 ...	10.7.23.
<i>Almanzora</i> ...	Mackenzie, G. A. ...	H. Chamberlain ...	"	R.M.S.P. ...	" 11.8.23 to 27.9.23 ...	6.10.23.
<i>Alondra</i> ...	Prendergast, J. J. ...	H. Martin ...	"	Yeoward ...	" 21.7.23 to 11.8.23 ...	21.8.23.
<i>Alpine Range</i> ...	Fell ...	W. C. Excell ...	"	Furness Withy ...	" 5.1.23 to 18.1.23 ...	23.1.23.
<i>Ampetco</i> ...	Vorstichelen, A. ...	R. Janssen ...	"	American Petroleum ...	" 9.10.23 to 20.10.23 ...	1.11.23.
<i>Anglia</i> ...	Serge ...	W. H. Hughes ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report 5.10.23 ...	5.10.23.
<i>Antiochus</i> ...	McHutchon, W. H. ...	J. J. Daniel ...	No.	A. Holt ...	Form 911 12.10.23 to 29.10.23	12.11.23.
<i>Appam</i> ...	Yardley, H. A. ...	... ..	M.L.	Elder Dempster ...	" ...	"
<i>Aquitania</i> ...	Charles, Sir J. T. W., K.B.E., C.B., R.D., Commodore, R.N.R.	J. L. Croasdaile, P. A. Morgan, R. Hughes.	W.T.	Cunard ...	W.T. Reg. 14.10.23 to 28.10.23	31.10.23.
<i>Arafura</i> ...	Gordon, A. S. ...	W. McIntyre ...	No.	Eastern and Australian ...	Form 911 19.5.23 to 28.7.23 ...	25.9.23.
<i>Araguaya</i> ...	Gillard, G. S. ...	H. M. Rennie ...	"	R.M.S.P. ...	" 9.9.23 to 28.9.23 ...	3.10.23.
<i>Arana</i> ...	Moir, A. G. ...	R. Jones ...	"	" ...	" ...	"
<i>Armada Castle</i> ...	George, J., O.B.E. ...	L. G. May ...	"	Union Castle ...	Form 911 28.9.23 to 15.10.23 ...	17.10.23.
<i>Armagh</i> ...	Vint, S. ...	M. D. Stewart ...	"	Union S.S. Co., N.Z. ...	" 25.6.23 to 4.11.23 ...	9.11.23.
<i>Arracan</i> ...	Willis, M. ...	R. MacInnes, H. E. Canner, W. Wilson, A. Olding.	M.L.	P. Henderson ...	Met. Log. 16.6.23 to 10.9.23 ...	12.9.23.
<i>Arundel</i> ...	... ..	... ..	C.C.	Southern Rly. ...	Telegraphic Report 12.11.23 ...	12.11.23.
<i>Arundel Castle</i> ...	Hague, J. W., Capt., R.N.R.	Blailhock, C. Williams, C. Keen	M.L.	Union Castle ...	Met. Log. 23.3.23 to 15.7.23 ...	26.7.23.
<i>Assyria</i> ...	Erskine, R. ...	J. Hamilton ...	No.	Anchor ...	Form 911 8.9.23 to 6.10.23 ...	12.10.23.
<i>Astronomer</i> ...	Booth, W. M. ...	W. A. Hall, S. W. Baker, W. H. Corlett.	M.L.	Harrison ...	Met. Log. 1.3.23 to 15.6.23 ...	29.6.23.
<i>Athenic</i> ...	Crosland, J. E., R.D., Lt.-Commr., R.N.R.	A. C. I. Anson ...	No.	White Star ...	Form 911 16.8.23 to 28.9.23 ...	4.10.23.
<i>Aisuta Maru</i> ...	Segawa, N. ...	H. Kubota ...	"	Nippon Yusen Kaisha ...	" 29.9.23 to 11.10.23 ...	24.10.23.
<i>Auldmuir</i> ...	Ramsay, J. D. ...	A. Kelso ...	"	Glen & Co. ...	" 1.9.23 to 9.10.23 ...	17.10.23.
<i>Author</i> ...	Kinlock, R. ...	A. Goddard ...	"	Harrison ...	" 29.8.23 to 7.10.23 ...	12.10.23.
<i>Ballena</i> ...	Pape, E. R. ...	W. Webster ...	No.	P.S.N. Co. ...	Form 911 19.9.23 to 11.10.23 ...	15.10.23.
<i>Baltic</i> ...	Roberts, J., C.B.E., D.S.O., R.D., Capt., R.N.R.	E. S. Bell, A. E. Weller, G. D. R. Eales.	W.T.	White Star ...	{ W.T. Reg. 1.10.23 to 25.10.23 } Form 911 30.9.23 to 20.10.23 }	26.10.23.
<i>Bambra</i> ...	Wyles, W. S. ...	H. W. Norris, G. Buckeridge, J. E. Turner, P. Bolton.	M.L.	State Service, Australia ...	Met. Log. 5.3.23 to 5.6.23 ...	18.8.23.
<i>Bampton Castle</i> ...	Swiney, W. A. ...	F. Norfolk, F. O. Wilbraham, G. W. Smith.	M.L.	Union Castle ...	Met. Log. 26.2.22 to 12.6.22 ...	2.12.22.
<i>Banffshire</i> ...	Wynne, R. H. ...	... ..	No.	Turnbull Martin ...	Form 911 9.9.23 to 29.9.23 ...	24.10.23.
<i>Barambah</i> ...	Mayne, W. ...	T. Swann ...	"	Commonwealth Govt. ...	" 4.8.23 to 5.9.23 ...	16.10.23.
<i>Baron Cawdor</i> ...	Baillie, T. ...	A. Campbell ...	"	Hogarth & Sons ...	" 16.6.23 to 5.7.23 ...	10.8.23.
<i>Beaufort</i> ...	Knowles, C. H., D.S.O., Commr., R.N.	H. L. Wheeler ...	M.L.	His Majesty's Ship ...	Met. Log. 31.7.22 to 3.10.22 ...	10.10.22.
<i>Belgenland</i> ...	Bradshaw, J. ...	... ..	M.L.	Red Star ...	" ...	"
<i>Benalder</i> ...	Cole, J. H., D.S.C. ...	A. K. Watson ...	No.	Ben Line ...	Form 911 6.9.23 to 6.10.23 ...	24.10.23.
<i>Benedict</i> ...	Aspinal, W. ...	H. R. Mackay, K. S. Monro	"	Booth ...	" 17.6.23 to 13.8.23 ...	27.8.23.
<i>Bengloe</i> ...	McCorquodale, A. ...	M. A. Gilmour ...	"	Ben Line ...	" 4.7.23 to 22.7.23 ...	21.8.23.
<i>Berengaria</i> ...	Irvine, W. R. D., R.D., Capt., R.N.R.	J. A. Myles, J. E. P. Hocken, E. R. Taylor.	W.T.	Cunard ...	W.T. Reg. 7.10.23 to 21.10.23 ...	24.10.23.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed.	Date Received.
<i>Bernini</i> ...	Evans, W.	...	No.	Lampert & Holt	...	...
<i>Berrima</i> ...	Hussey Cooper, E. M., R.D., Commr., R.N.R.	G. R. Wheeler ...	"	P. & O. Branch	Form 911 30.8.23 to 17.9.23	9.10.23.
<i>Bolingbroke</i> ...	Lewis, H. ...	R. Campbell, R. Walker, W. Hains.	M.L.	Canadian Pacific	Met. Log. 12.8.22 to 4.2.23	21.2.23.
<i>Borda</i> ...	Holland, R.	J. F. Wrigley ...	No.	P. & O. Branch	Form 911	...
<i>Borneo</i> ...	Morzer Bruyns, M. F.	C. Zimmerman ...	"	Nederland	10.7.23 to 8.8.23	13.8.23.
<i>Bosworth</i> ...	McDonald, J.	J. Alexander ...	M.L.	Canadian Pacific	Met. Log. 19.5.23 to 8.8.23	29.8.23.
<i>Bothwell</i> ...	Freer, A.	K. Hutchings ...	No.	"	Form 911 23.5.23 to 7.6.23	11.6.23.
<i>Braemar Castle</i> ...	Whitfield, G. I.	C. G. Dann ...	"	Union Castle	6.9.23 to 23.9.23	24.10.23.
<i>Brandon</i> ...	Newman, J. H.	L. Hammersley ...	"	Canadian Pacific	29.7.23 to 28.8.23	5.9.23.
<i>Brecon</i> ...	Griffiths, J. N.	...	M.L.	"	Met. Log. 9.5.23 to 29.7.23	27.8.23.
<i>Brighton</i> ...	...	...	C.C.	Southern Railway	Telegraphic Report 18.10.23	18.10.23.
<i>British Engineer</i> ...	Putt, R. O.	A. Campbell ...	No.	British Tankers	Form 911 14.9.23 to 27.9.23	3.10.23.
<i>British Lantern</i> ...	Taylor, R. J.	C. O. Tucker ...	"	"	12.8.23 to 6.9.23	25.10.23.
<i>Browning</i> ...	Davies, G. W.	W. Simcox ...	"	Lampert & Holt	13.3.23 to 9.4.23	14.4.23.
<i>Bruyere</i> ...	Heasley, W. S.	A. P. Kennedy ...	"	"	19.5.23 to 11.8.23	31.8.23.
<i>Bulla</i> ...	Daniel, F.	...	"	Commonwealth Govt.	28.4.23 to 17.5.23	5.6.23.
<i>Calypso</i> ...	Brown, A. M.	E. R. Montgomery ...	M.L.	Ellerman's Wilson	Met. Log. 3.6.22 to 1.10.22	19.10.22.
<i>Cambria C.S.</i> ...	Wightman, H. G. E., D.S.C.	...	M.L.	Eastern Tel. Co.	...	...
<i>Cambria</i> ...	...	V. S. Phillips ...	C.C.	L.M. & S. Rly.	Telegraphic Report 14.9.23	14.9.23.
<i>Camito</i> ...	Scudamore, J. H. H., D. S. C., R. D., Commr., R.N.R.	D. A. Jack, D. Hay, D. V. Smith, F. Gregg.	M.L.	Elders & Pyffes	Met. Log. 19.6.23 to 13.10.23	18.10.23.
<i>Canada</i> ...	Smith, R. S.	S. S. Fieldwood ...	No.	White Star-Dominion	Form 911 7.10.23 to 27.10.23	30.10.23.
<i>Canadian Scottish</i> ...	Hocking, N. P.	S. Fieldhouse ...	"	Canadian Govt. Merch- chant Marine.	16.5.23 to 11.7.23	31.8.23.
<i>Canadian Skir- misher.</i> ...	Miller, W. H.	G. B. Price ...	"	" " "	28.5.23 to 5.8.23	5.9.23.
<i>Canadian Winner</i> ...	Wingate, W.	J. N. Downes ...	"	" " "	4.11.22 to 27.1.23	19.3.23.
<i>Carmania</i> ...	McNeil, S. G. S., R.D., Capt., R.N.R.	S. Scholfield, J. S. Glendinning, H. R. Lane.	W.T.	Cunard " " "	W.T. Reg. 23.9.23 to 13.10.23	17.10.23.
<i>Caronia</i> ...	Diggle, E. G., R.D., Capt., R.N.R.	J. H. Wood, R. Allen, G. H. Morris.	W.T.	Cunard ...	W.T. Reg. 7.10.23 to 27.10.23	30.10.23.
<i>Carpentaria</i> ...	Rowe, S. N.	D. A. C. Ellwood, W. C. Cripps, J. Gibson.	M.L.	British India	Form 911 7.10.23 to 27.10.23	31.10.23.
<i>Cassandra</i> ...	Mitchell, W. E.	A. Murray ...	No.	Anchor Donaldson	Met. Log. 24.9.22 to 13.3.23	20.3.23.
<i>Cawdor Castle</i> ...	Purse, C. R.	J. A. Lowden, F. P. Wyeth, W. S. J. Aldous, C. B. Hoggan.	M.L.	Union Castle	Form 911 28.3.23 to 25.4.23	27.4.23.
<i>Cedric</i> ...	Trant, E. L., R.D., Commr., R.N.R.	E. F. Hughes, J. W. Peters, E. E. Burt.	W.T.	White Star ...	Met. Log. 22.12.21 to 14.4.22	10.5.22.
<i>Celtic</i> ...	Greame, C. H.	R. S. Walker, O. V. Lucas, G. T. Kavanagh.	W.T.	" " "	W.T. Reg. 10.9.23 to 29.9.23	3.10.23.
<i>Ceramic</i> ...	Summers, A. H.	H. A. Billiard ...	No.	" " "	Form 911 9.9.23 to 29.9.23	...
<i>Changechow</i> ...	Byers, G.	Messrs. Hunter, Adkins and Wherby.	M.L.	China Nav. Co.	W.T. Reg. 24.9.23 to 13.10.23	16.10.23.
<i>Changsha</i> ...	Gambrill, F. C.	...	M.L.	Yuill & Co...	Form 911 23.9.23 to 14.10.23	23.7.23.
<i>Chignecto</i> ...	Green, J.	H. H. Treweek, A. F. Walker	"	R.M.S.P. Co.	Met. Log. 25.10.22 to 23.7.23	6.9.23.
<i>China</i> ...	King, A. M., D.S.C.	E. Cox Walker ...	"	P. & O.	Form 911 5.1.23 to 20.5.23	12.7.23.
<i>Chindwara</i> ...	Jones	C. E. Cara, S. Waldron ...	"	British India	Form 911 8.6.23 to 22.7.23	23.10.23.
<i>Chindwin</i> ...	Paterson, G.	J. Walker, L. Ratcliffe, H. Poole, D. Frame.	M.L.	P. Henderson	" 15.9.23 to 4.10.23	9.10.23.
<i>City of Baroda</i> ...	Haddy, B. H.	A. V. Radcliffe, R. J. Witton, A. B. Carson.	M.L.	Ellerman	" 18.7.23 to 15.9.23	11.10.23.
<i>City of Batavia</i> ...	Spencer, H.	J. L. Robertson ...	No.	"	Met. Log. 2.6.23 to 20.8.23	25.8.23.
<i>City of Benares</i> ...	Macdonald, K., O.B.E.	A. A. Fullerton ...	"	"	Form 911 29.9.23 to 24.10.23	2.11.23.
<i>City of Brisbane</i> ...	Pine, R.	F. B. McLaren, R. H. Spear- man, W. Robinson.	"	"	" 24.9.23 to 12.10.23	30.10.23.
<i>City of Canterbury</i> ...	Bremner, D. M.	W. H. Matheson ...	"	"	" 17.7.23 to 28.8.23	6.9.23.
<i>City of Chester</i> ...	Teague, R. E.	F. S. Honeyman, P. C. Wilson, M. G. Fraser.	M.L.	"	" 21.9.23 to 3.10.23	8.10.23.
<i>City of Dunkirk</i> ...	Seaborne, F. O.	W. Leadbeater ...	No.	"	Met. Log. 3.8.23 to 29.10.23	31.10.23.
<i>City of London</i> ...	Martin, D.	C. Inglis ...	"	"	Form 911 21.9.23 to 4.10.23	17.10.23.
<i>City of Marseilles</i> ...	Henderson, R. C.	G. M. Womersley ...	"	"	" 4.10.23 to 14.10.23	22.10.23.
<i>City of Newcastle</i> ...	Oliver, R. E., D.S.C.	C. Paton ...	"	"	Form 911 29.9.23 to 19.10.23	24.10.23.
<i>City of Rangoon</i> ...	Williams, T. L.	W. Ibbotson, S. L. Hoare, T. A. Dexter.	M.L.	"	" 26.9.23 to 22.10.23	31.10.23.
<i>City of Valencia</i> ...	Williamson, W. A.	A. R. Muir ...	No.	"	Met. Log. 25.4.23 to 9.8.23	16.8.23.
<i>City of Yokohama</i> ...	Nelson, C.	K. Townsend ...	"	"	Form 911 2.7.23 to 7.8.23	14.8.23.
<i>Clan Buchanan</i> ...	George, L. S.	P. G. de Gruchy ...	"	Clan	" 2.6.23 to 13.6.23	19.6.23.
<i>Clan Lindsay</i> ...	Baker, C. W.	S. J. Shennan ...	"	"	" 26.9.23 to 10.10.23	24.10.23.
<i>Clan Macgillivray</i> ...	...	...	"	"	" 6.8.23 to 25.8.23	9.10.23.
<i>Clan Macindoe</i> ...	Miller, W.	E. R. Dunn ...	"	"	Form 911 16.8.23 to 5.9.23	3.10.23.
<i>Clan Macinnes</i> ...	Mee, F. T.	A. Lynch, R. Dando ...	"	"	" 4.12.22 to 25.3.23	17.4.23.
<i>Clan Mackay</i> ...	Waterhouse, J.	J. A. Forster, J. Steven, J. E. Gordon.	M.L.	"	Met. Log. 30.6.23 to 25.10.23	30.10.23.
<i>Clan Mackenzie</i> ...	Young, G.	W. G. Arthur, J. M. Lorimer	No.	"	Form 911 22.7.23 to 26.8.23	29.9.23.
<i>Clan Mackinnon</i> ...	Thomson, W.	F. Elwell, W. S. Holden, T. Kay.	M.L.	"	Met. Log. 6.4.23 to 4.8.23	17.8.23.
<i>Clan Maclaren</i> ...	Scott, G.	L. Copland ...	No.	"	Form 911 21.1.23 to 15.2.23	13.3.23.
<i>Clan Macnaughton</i> ...	Gray, J. N.	C. D. Worthington, F. B. Parke	"	"	" 12.6.23 to 7.9.23	11.9.23.
<i>Clan Macphee</i> ...	Gourlay, J. B.	P. Haydon, J. H. Mellor, R. J. Roberts.	M.L.	"	Met. Log. 28.10.22 to 30.4.23	3.5.23.
<i>Clan Macvicar</i> ...	Phillips, G. P.	J. O. Woodall ...	No.	"	Form 911 21.9.23 to 15.10.23	7.11.23.
<i>Clan Malcolin</i> ...	Higgins, C. J.	J. Robson, T. G. Young, M. Robertson	M.L.	"	Met. Log. 10.3.23 to 18.6.23	21.6.23.
<i>Clan Morrison</i> ...	Porterfield, W. M.	D. A. Evans ...	No.	"	Form 911 28.7.23 to 11.8.23	22.8.23.
<i>Clan Ronald</i> ...	Henderson, C. W.	P. J. Green ...	"	"	" 14.9.23 to 7.10.23	15.10.23.
<i>Clan Ross</i> ...	Christian, W. G. M.	S. M. Werrey Easterbrook ...	"	"	" 3.8.23 to 8.10.23	19.10.23.
<i>Clan Sinclair</i> ...	Neill, G. A.	J. L. A. Hogg ...	"	"	" 4.7.23 to 16.7.23	28.8.23.
<i>Clan Urquhart</i> ...	Stenson, F. J.	D. A. Evans ...	"	"	" 9.5.23 to 22.5.23	2.6.23.
<i>Colonia, C.S.</i> ...	Campos, V., O.B.E., Lt.-Commr. R.N.R.	S. A. Garnham, A. S. Muir, W. E. Allen S. Hall.	M.L.	Telegraph Construction & Maintenance.	Met. Log. 14.8.23 to 15.9.23	17.9.23.
<i>Colonial</i> ...	Barrow, R. K.	A. V. Jones ...	No.	Harrison	Form 911 17.5.23 to 14.8.23	18.9.23.
<i>Colonian</i> ...	Gittins, R. P.	J. Crangle ...	"	Leyland	" 10.10.23 to 20.10.23	25.10.23.

LIST OF VOLUNTARY OBSERVING SHIPS

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed.	Date Received.
<i>Columbia</i> ...	Gemmill, W. ...	T. C. Watson ...	No.	Anchor ...	Form 911. 20.9.23 to 12.10.23...	16.10.23.
<i>Comino</i> ...	Nuttall, E. L. ...	A. McVicar ...	"	Furness Withy ...	" 6.9.23 to 16.10.23 ...	30.10.23.
<i>Coote</i> ...	Festa, M. ...	C. Keen, D. C. Rees ...	"	Commonwealth Govt. ...	Form 911. 29.6.23 to 16.8.23 ...	8.10.23.
<i>Copenhagen</i> ...	Kerr, J. J. ...	W. G. Rees ...	"	Glen & Co. ...	" 27.4.23 to 6.6.23 ...	23.7.23.
<i>Corinthic</i> ...	Hart, F. ...	W. T. Fitzgerald ...	M.L.	White Star ...	Met. Log. 26.1.23 to 15.5.23 ...	22.5.23.
<i>Cornish City</i> ...	Bowen, T. S. ...	G. S. Dawes ...	No.	Reardon Smith ...	" ...	"
<i>Cornwall</i> ...	Robertson, H. W. ...	R. Wilkins ...	"	Dowie, J., & Co. ...	Form 911 21.8.23 to 10.9.23 ...	18.9.23.
<i>Cyclops</i> ...	Cosker, W. ...	E. W. Jones ...	"	A. Holt ...	" 21.7.23 to 9.8.23 ...	23.8.23.
<i>Dardanus</i> ...	Shaw, A. T. ...	F. Parker ...	No.	A. Holt ...	" ...	"
<i>Darian</i> ...	Masters, W. ...	J. L. McLaren ...	"	Leyland ...	Form 911. 12.10.23 to 26.10.23 ...	13.11.23.
<i>Darro</i> ...	Smith, W. E., D.S.O., R.D., Capt., R.N.R.	E. H. Giller ...	"	R.M.S.P. Co. ...	" 8.9.23 to 4.11.23 ...	6.11.23.
<i>Daytonian</i> ...	Walker, C. T. ...	C. E. Cleaver ...	"	Leyland ...	" 18.8.23 to 29.8.23 ...	3.9.23.
<i>Delta</i> ...	Brooks, C., D.S.O., R.D., Commr., R.N.R.	J. O. V. Young ...	"	P. & O. ...	" 25.8.23 to 14.9.23 ...	9.10.23.
<i>Demerara</i> ...	Hill, T. A. ...	H. J. Holland ...	"	R.M.S.P. Co. ...	" 20.10.23 to 26.10.23 ...	30.10.23.
<i>Desado</i> ...	Wakeman, E. C. ...	T. Powell ...	"	" ...	" 16.7.23 to 9.9.23 ...	17.9.23.
<i>Desna</i> ...	Adam, C., R.D., Commr., R.N.R.	H. D. Jackman ...	"	" ...	" 29.7.23 to 22.9.23 ...	26.9.23.
<i>Deucalion</i> ...	Batt, A. E. ...	W. G. Smith ...	"	A. Holt ...	" ...	"
<i>Devon</i> ...	Gardner, H. W. ...	" ...	"	New Zealand S.S. Co. ...	Form 911. 23.8.23 to 13.10.23...	19.10.23.
<i>Dieppe</i> ...	" ...	" ...	C.C.	Southern Railway ...	Telegraphic Report. 13.11.23 ...	13.11.23.
<i>Digby</i> ...	Chambers, F. W., D.S.C.	J. Pascoe, J. W. Murphy W. P. Paterson	M.L.	Furness Withy ...	Met. Log. 29.3.23 to 22.9.23 ...	3.10.23.
<i>Director</i> ...	Watson, R. ...	L. Jones ...	No.	Harrison ...	Form 911. 31.1.23 to 13.3.23 ...	21.3.23.
<i>Discoverer</i> ...	Sawyer, E. I. ...	J. Stanhope ...	"	" ...	" 8.4.23 to 29.5.23 ...	8.6.23.
<i>Dogra</i> ...	Robb, G. P. ...	H. Hardwick ...	"	Asiatic S.N. Co. ...	" 4.8.23 to 27.8.23 ...	25.9.23.
<i>Doric</i> ...	Davies, J. ...	F. Kean ...	"	White Star ...	" 29.9.23 to 22.10.23...	24.10.23.
<i>Dorington Court</i> ...	Barcham, H. C. ...	H. Tulloch ...	"	Haldin & Co. ...	" 23.5.23 to 12.6.23 ...	19.6.23.
<i>Dramatist</i> ...	Gibbings, W. H. ...	R. W. Roberts ...	"	Harrison ...	" 2.10.23 to 2.11.23 ...	8.11.23.
<i>Dromore Castle</i> ...	Harvey, H. B. ...	R. May ...	"	Union Castle ...	" 13.7.23 to 15.8.23 ...	20.8.23.
<i>Duendes</i> ...	Jones, J. S. ...	B. M. Morris ...	"	Pacific S.N. Co. ...	" 19.5.23 to 4.6.23 ...	20.9.23.
<i>Duquesa</i> ...	Jarvis, G. ...	C. Lockwood, R. Martin, D. Thornton	"	Furness Withy ...	" 8.7.23 to 22.9.23 ...	27.9.23.
<i>Durham</i> ...	Hains, F. P. ...	" ...	"	Federal ...	" 29.11.22 to 26.1.23...	30.1.23.
<i>Eastern</i> ...	Laing, J. D. ...	J. W. Kavanagh, F. R. Miller, H. H. Litchfield	M.L.	Eastern and Australian ...	Met. Log. 14.2.23 to 16.8.23 ...	8.10.23.
<i>Edinburgh Castle</i> ...	Culverwell, J. N. ...	C. J. Lovegrove, W. C. G. Smith, F. P. Wyeth, J. Allan	M.L.	Union Castle ...	" 23.2.23 to 25.6.23 ...	26.6.23.
<i>Eemland</i> ...	Van Noppen, C. D. ...	G. W. Yonwen ...	No.	Holland Lloyd ...	Form 911. 27.4.23 to 25.7.23 ...	4.8.23.
<i>Egort</i> ...	McDowall, J. ...	K. Redmore ...	"	Elder Dempster ...	" 16.9.23 to 2.10.23 ...	15.10.23.
<i>El Cordobes</i> ...	Noton, F. G. ...	W. Myerscough ...	"	British & Argentine S.N. Co.	" 5.3.23 to 26.3.23 ...	8.5.23.
<i>Elmina</i> ...	Evans, D. ... Millson, H. E. ...	J. Kelsey, W. Q. McKeown, H. Millson, R. A. Kenyon, J. L. Hughes.	M.L.	Elder Dempster ...	Met. Log. 4.1.23 to 2.5.23 ...	7.6.23.
<i>El Paraguayo</i> ...	Ellis, F. ...	E. B. Sergeant ...	No.	Houlder Bros. ...	Form 911. 10.3.23 to 17.7.23 ...	25.7.23.
<i>Elpenor</i> ...	Evans, T. R. ...	D. L. Evans, C. Houghton, L. Johnston.	M.L.	A. Holt ...	Met. Log. 8.4.23 to 15.7.23 ...	26.7.23.
<i>Elysia</i> ...	Kinnaird, J. ...	G. K. Lynas ...	No.	Anchor ...	Form 911. 25.4.23 to 21.6.23 ...	20.7.23.
<i>Empress of Asia</i> ...	Douglas, L. D., R.D., Lt. Commr., R.N.R.	F. C. Stratford, R. Jackson, W. T. Kinley, R. J. Hickey.	M.L.	Canadian Pacific ...	Met. Log. 19.4.23 to 22.9.23 ...	29.10.23.
<i>Empress of Australia</i> ...	Robinson, S., R.D., Commr., R.N.R.	" ...	M.L.	" ...	" 24.11.22 to 23.5.23...	26.6.23.
<i>Empress of Britain</i> ...	Latta, R. G. ...	S. C. Fox, J. B. Marriott, O. F. Pennington.	W.T.	" ...	W.T. Reg. 18.10.23 to 2.11.23 } Form 911.	6.11.23.
<i>Empress of Canada</i> ...	Hailey, A. J. ...	" ...	M.L.	" ...	Met. Log. 14.12.22 to 17.6.23...	30.7.23.
<i>Empress of France</i> ...	Griffiths, E. ...	B. Grant, D. Parsons, R. Campbell, F. Hutchings.	M.L.	" ...	" 6.1.23 to 16.5.23 ...	6.6.23.
<i>Empress of Russia</i> ...	Hosken, A. J. ...	I. H. Blythe, A. B. Smith, J. D. Vosper, J. B. Napier, C. S. Morris.	M.L.	" ...	" 22.3.23 to 2.7.23 ...	30.7.23.
<i>Endeavour</i> ...	Geary Hill, S. A., D.S.O., Commr., R.N. Nares, J. D., D.S.O., Capt., R.N.	H. Exton Turner ...	M.L.	His Majesty's Ship ...	" 3.7.22 to 8.6.23 ...	18.6.23.
<i>Essequibo</i> ...	Pearce, A. W. ...	C. S. Humphries ...	No.	R.M.S.P. Co. ...	Form 911 19.8.23 to 4.10.23 ...	2.11.23.
<i>Eumaeus</i> ...	Read, J. W. ...	D. L. Hoare ...	"	A. Holt ...	" 5.9.23 to 20.9.23 ...	24.10.23.
<i>Euripides</i> ...	Collins, P. J., O.B.E.	Cox, A. R. Payne, F. Fuller	M.L.	Aberdeen ...	Met. Log. 28.3.23 to 20.7.23 ...	31.7.23.
<i>Eurybates</i> ...	Lloyd, R. ...	W. H. Michie ...	No.	A. Holt ...	Form 911 14.7.23 to 31.7.23 ...	21.8.23.
<i>Explorer</i> ...	Lamont, J. ...	" ...	M.L.	Scottish Fishery Board	" ...	"
<i>Fantome</i> ...	Maxwell, P. S. E., Commr., R.N.	A. D. Conder ...	M.L.	His Majesty's Ship ...	Met. Log. 1.1.23 to 11.1.23 ...	5.6.23.
<i>Finland</i> ...	Newman, C. ...	A. B. Thompson ...	No.	Red Star ...	Form 911 3.3.23 to 11.3.23 ...	19.3.23.
<i>Fitzroy</i> ...	Woodhouse, A. F. B., Lt.-Commr., R.N.	C. W. Sabine ...	M.L.	His Majesty's Ship ...	Met. Log. 25.7.23 to 1.11.23 ...	10.11.23.
<i>Flandria</i> ...	Veldkamp, G. J. ...	H. D. Sicherer ...	No.	Holland Lloyd ...	Form 911 16.10.22 to 22.1.23...	14.2.23.
<i>Flinders</i> ...	Henderson, D. A., Lt.-Commr., R.N.	A. B. Foulston ...	M.L.	His Majesty's Ship ...	Met. Log. 25.7.23 to 1.11.23 ...	10.11.23.
<i>Francisco</i> ...	Wilkins, J., O.B.E.	J. Clark ...	No.	Ellerman Wilson ...	Form 911 16.8.23 to 29.8.23 ...	17.10.23.
<i>France</i> ...	Gatley, E. ...	H. J. Prout ...	"	Royal Fleet Auxiliary ...	" 23.3.23 to 9.5.23 ...	27.6.23.
<i>Frankenfels</i> ...	Taylor, A., O.B.E., Lieut., R.N.R.	J. Gardiner, J. W. Allingham, F. Davenport.	M.L.	India Office Shipping	Met. Log. 20.3.23 to 23.6.23 ...	4.7.23.
<i>Freienfels</i> ...	Cleugh, J. W. ...	C. F. Bennett ...	"	" " "	Form 911 7.8.23 to 6.9.23 ...	11.9.23.
<i>Galic</i> ...	Summers, F. F. ...	H. C. Rugg ...	No.	White Star ...	" 12.8.23 to 21.9.23 ...	6.11.23.
<i>Galtymore</i> ...	Codling, F. W. ...	D. Wilson ...	"	Furness Withy ...	" 21.9.23 to 6.10.23 ...	9.10.23.
<i>Garret</i> ...	Visser, C. W. ...	" ...	"	Rotterdam Lloyd ...	" 16.9.23 to 3.10.23 ...	23.10.23.
<i>Garthgarry, Ship</i> ...	Roberts, D. ...	W. Wylie, J. Pearce, H. Bento	M.L.	Marine Nav. Co. ...	Met. Log. 15.7.22 to 27.7.23 ...	4.10.23.
<i>Gascoyne</i> ...	Mills, A. ...	J. Donaldson ...	No.	Dalgely & Co. ...	Form 911 2.9.23 to 16.9.23 ...	5.11.23.
<i>Gelria</i> ...	Kolkman, J. M. ...	" ...	"	Holland Lloyd ...	" 21.9.23 to 9.11.23 ...	13.11.23.
<i>Glenamoy, M.V.</i> ...	Angier, J. ...	L. C. Riggs ...	"	Glen Line ...	" 11.9.23 to 2.10.23 ...	8.11.23.
<i>Glenapp, M.V.</i> ...	Griffiths, J. E. ...	F. Poate ...	"	" ...	" 16.7.23 to 3.8.23 ...	14.8.23.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed.	Date Received.
<i>Glenluce</i> , M.V. ...	Kennett, W. H. ...	A. Hodd ...	No.	Glen Line ...	Form 911 31.7.23 to 10.9.23 ...	16.10.23.
<i>Gloucestershire</i> ...	Robin, E. ...	T. E. Field ...	"	Bibby ...	" 25.5.23 to 5.8.23 ...	2.11.23.
<i>Gorala</i> ...	D'Cruz, A. B. ...	J. R. Wilson, A. R. H. Barton ...	"	British India ...	" 21.8.23 to 20.9.23 ...	31.10.23.
<i>Gorgon</i> ...	Hughes, J. W. ...	J. E. Cooper ...	"	Dalgety & Co. ...	" 13.7.23 to 17.9.23 ...	23.10.23.
<i>Governor Musgrave</i>	Coalstad, C. ...	C. B. Odman, E. W. Hughes ...	"	Commonwealth Light-house Service.	" 25.6.23 to 19.7.23 ...	26.9.23.
<i>Graciana</i> ...	Yeoman, J. T. ...	P. Hays, M. C. Turner ...	M.L.	Furness Withy ...	Met. Log. 23.3.22 to 29.9.22 ...	25.10.22.
<i>Griqua</i> ...	Clark, J. ...	A. Rearch ...	No.	Ellerman Bucknall ...	Form 911 23.12.22 to 3.2.23 ...	14.2.23.
<i>Hahartus</i> ...	Marsh, L. V. ...	W. H. Upton ...	No.	R. P. Houston ...	" 3.7.23 to 7.8.23 ...	21.8.23.
<i>Harmonides</i> ...	Hughes, W. J. ...	R. P. Davies ...	"	"	" 24.7.23 to 13.8.23 ...	20.8.23.
<i>Harmony</i> , AUXY.	Jackson, J. C. ...	A. W. Bush ...	"	Moravian Mission ...	" 3.7.23 to 19.8.23 ...	11.9.23.
<i>Hatarana</i> ...	Cutbush, H. M. ...	J. L. Durkee, F. Wells, E. B. Heath ...	M.L.	British India ...	Met. Log. 28.4.23 to 25.7.23 ...	8.8.23.
<i>Hauraki</i> , M.V. ...	Showman, A. C. ...	D. McLeish ...	No.	Union S.S. Co., N.Z. ...	Form 911 7.7.23 to 9.9.23 ...	1.10.23.
<i>Hazel Branch</i> ...	Barnet, P. K. ...	R. S. Young ...	"	Nautilus ...	" 16.3.23 to 18.6.23 ...	23.6.23.
<i>Henry Holmes</i> , C.S.	Bicker-Caarten, A. ...	R. Rudd ...	"	W. I. & Panama Telegraph Co. ...	" 14.8.23 to 7.9.23 ...	2.10.23.
<i>Herefordshire</i> ...	Stanley, W. ...	P. Hawkins, P. Flood, B. Beesley, M. Simmons, G. Whitworth, P. S. Cooper, H. Moore.	M.L.	Bibby ...	Met. Log. 3.2.23 to 22.7.23 ...	11.8.23.
<i>Herschel</i> ...	Carey, W. J. ...	S. C. Smith ...	No.	Lampert & Holt ...	Form 911 23.6.23 to 29.8.23 ...	3.9.23.
<i>Hibernia</i> ...	Tanner ...	R. Woodall ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report. 13.11.23 ...	13.11.23.
<i>Highland Enterprise</i>	Pond, R. H. ...	"	No.	Nelson ...	Form 911 23.6.23 to 13.7.23 ...	27.7.23.
" <i>Glen</i>	Jones, T. J. ...	F. Abbott ...	"	"	Met. Log. 23.12.22 to 22.3.23 ...	28.3.23.
" <i>Heather</i>	Powell, G. A. ...	G. Watson, R. Sinclair Davies, J. C. Morton.	M.L.	"	Form 911 29.4.23 to 14.6.23 ...	3.7.23.
" <i>Laddie</i> ...	Alford, C. ...	A. H. Barnes ...	No.	"	Met. Log. 10.10.22 to 11.4.23 ...	2.5.23.
" <i>Laird</i> ...	Davis, G. O. ...	A. S. Jones, J. S. Collins, J. H. Cobles.	M.L.	"	" 31.5.23 to 4.8.23 ...	14.8.23.
" <i>Piper</i> ...	Collings, D. ...	McKinnon, H. Devlin, Sargeant.	"	"	" 30.12.22 to 23.5.23 ...	29.5.23.
" <i>Pride</i> ...	Robinson, R. H. ...	F. W. Harvey, S. G. King, A. Kelly.	"	"	Form 911 10.7.23 to 23.9.23 ...	27.9.23.
" <i>Rover</i> ...	Ashby Graves, F. ...	G. Ronguie, E. Williams, E. Baillie.	M.L.	Commonwealth Govt.	Met. Log. 13.3.23 to 23.6.23 ...	29.6.23.
" <i>Warrior</i>	Brooke, W. ...	G. P. Kitto ...	No.	"	Form 911 31.7.23 to 23.9.23 ...	1.10.23.
<i>Hobsons Bay</i> ...	Ogilvie, F. J. ...	W. Hill, F. Patchett ...	W.T.	Lampert & Holt ...	W.T. Reg. 27.9.23 to 13.10.23 ...	16.10.23.
<i>Holbein</i>	Symons, P. ...	Commr., R.N.R.	"	White Star ...	Form 911 28.3.23 to 5.9.23 ...	12.9.23.
<i>Homeric</i> ...	Howarth, F. B. ...	W. E. McMullen ...	"	Pacific S.N. Co. ...	" 5.7.23 to 15.7.23 ...	14.8.23.
<i>Huanchaco</i> ...	Jenkins, J. H. ...	C. C. Beal ...	"	Booth ...	Met. Log. 2.2.23 to 22.6.23 ...	6.7.23.
<i>Hubert</i> ...	Evans, T. G. ...	A. Smith, S. Bryant, J. Carpenter.	M.L.	New Zealand S.S. Co.	"	"
<i>Hurunui</i> ...	Burton Davies, J. ...	"	"	"	"	"
<i>Ibez</i> ...	Langdon, C. ...	"	C.C.	G.W. Railway ...	Telegraphic Report. 18.10.23 ...	18.10.23.
<i>Ikala</i> ...	Meetham, J. T. ...	E. Lightfoot ...	No.	Welsford, J. H. ...	Form 911 9.6.23 to 19.6.23 ...	26.7.23.
<i>Ionic Star</i> ...	Wilson, G. ...	J. Sinclair ...	"	Blue Star ...	" 17.1.23 to 19.3.23 ...	22.3.23.
<i>Iroquois</i> ...	Tinson, C. W., O.B.E., Commr., R.N.	"	M.L.	His Majesty's Ship.	"	"
<i>Ixion</i> ...	Price, T. A. ...	J. T. Fettes ...	No.	A. Holt ...	Form 911 12.11.22 to 28.12.22 ...	24.1.23.
<i>John Pender</i> , C.S.	Smythe, T. W., O.B.E.	B. C. Farrow ...	No.	Eastern Tel. Co. ...	" 15.10.23 to 25.10.23 ...	31.10.23.
<i>Junin</i> ...	Barkley, E. ...	E. F. Potter ...	"	Pacific S.N. Co. ...	" 29.1.23 to 23.2.23 ...	6.3.23.
<i>Kaikoura</i> ...	Downton, M. ...	H. Emmett, C. Pilcher, N. Anderson, J. Hopkins.	M.L.	New Zealand S.S. Co.	Met. Log. 19.6.22 to 23.6.23 ...	26.6.23.
<i>Kaisar-i-Hind</i> ...	Manley, G. ...	R. K. Lowry ...	No.	P. & O. ...	Form 911 9.8.23 to 9.9.23 ...	1.10.23.
<i>Kamo Maru</i> ...	Okano, Y. ...	S. Matsumura ...	"	Nippon Yusen Kaisha	" 22.6.23 to 29.7.23 ...	8.8.23.
<i>Kangaroo</i> ...	Norris, H. C. ...	C. M. Clayton, W. Johnston, R. J. Sinclair, F. Humble.	M.L.	State Service Australia	Met. Log. 19.12.22 to 27.5.23 ...	3.7.23.
<i>Karoo</i> ...	Robinson, T. ...	S. J. Nash ...	No.	Ellerman Bucknall ...	Form 911 30.6.23 to 11.7.23 ...	27.7.23.
<i>Kashima Maru</i> ...	Shinomiya, T. ...	J. G. Tsukada ...	"	Nippon Yusen Kaisha	" 1.8.23 to 9.9.23 ...	16.10.23.
<i>Kashmir</i> ...	Bartlett, E. B., O.B.E.	F. Hopkins ...	"	P. & O. ...	"	"
<i>Kellett</i> ...	Haselfoot, F. E. B., D.S.O., Commr., R.N.	E. H. B. Baker, W. C. Jenks	M.L.	His Majesty's Ship ...	Met. Log. 1.7.23 to 22.10.23 ...	2.11.23.
<i>Khiva</i> ...	Redhead, C. M., D.S.O., R.D., Capt., R.N.R.	J. D. Strike, J. Maxwell, L. Fraser.	M.L.	P. & O. ...	" 25.5.23 to 17.9.23 ...	4.10.23.
<i>Khyber</i> ...	Pinckney, L. D., O.B.E.	"	No.	"	" 4.9.23 to 22.9.23 ...	13.10.23.
<i>Kia Ora</i> ...	Thurston, H. P. ...	P. W. Kime ...	"	Shaw Savill & Albion	" 13.10.23 to 2.11.23 ...	13.11.23.
<i>Kinderdijk</i> ...	Herbschleb, G. C. ...	A. H. Van der Vliet ...	"	Holland America ...	" 10.10.22 to 12.1.23 ...	6.2.23.
<i>Kitano Maru</i> ...	Kamada, N. ...	G. Chilara ...	"	Nippon Yusen Kaisha	" 4.8.23 to 29.8.23 ...	1.10.23.
<i>Knight Companion</i>	Beale, H. E. ...	E. H. Powell ...	"	A. Holt ...	" 29.9.23 to 11.10.23 ...	16.10.23.
<i>Kovno</i> ...	Casson, D. H., R.D., Commr., R.N.R.	E. R. Massam, G. H. Duncan, L. Griffiths	M.L.	Ellerman Wilson ...	Met. Log. 9.12.22 to 1.5.23 ...	7.5.23.
<i>Kroonland</i> ...	Newman, C. ...	W. E. Leaman ...	No.	Red Star ...	Form 911 18.11.22 to 1.1.23 ...	5.1.23.
<i>Kurmark</i> ...	Cartmer, G. E., O.B.E.	J. Mackie, E. R. Vizer, S. E. Clowser.	M.L.	Graham & Co. ...	Met. Log. 2.2.23 to 13.5.23 ...	18.5.23.
<i>Lady Brenda</i> ...	Young, W. J. ...	B. L. Brind ...	No.	Dawson ...	Form 911 25.9.23 to 4.10.23 ...	13.10.23.
<i>Lady Denison Pender</i> , C.S.	"	"	"	Eastern Tel. Co. ...	"	"
<i>Laguna</i> ...	Pleignier, H. T. S. ...	F. W. Parker ...	"	Pacific S.N. Co. ...	Form 911 15.10.23 to 4.11.23 ...	8.11.23.
<i>Lalande</i> ...	Bambra, W. A. ...	N. Webster ...	"	Lampert & Holt ...	" 29.9.23 to 5.10.23 ...	30.10.23.
<i>Lancashire</i> ...	Beckett, F. W. ...	T. Owen ...	"	Bibby ...	" 23.6.23 to 2.9.23 ...	6.9.23.
<i>Laomedon</i> ...	Smith, A. ...	A. S. Barclay ...	"	A. Holt ...	"	"
<i>La Paz</i> , M.V. ...	Ress, J. ...	R. Collister ...	"	Pacific S.N. Co. ...	Form 911 19.9.23 to 8.10.23 ...	30.10.23.
<i>Laplace</i> ...	Symons, P. ...	J. W. Boyde, I. O. Jones ...	"	Lampert & Holt ...	" 20.1.23 to 29.3.23 ...	10.4.23.
<i>Lapland</i> ...	Howell, T. ...	B. T. Harris, H. H. Grace, J. M. Appleby.	W.T.	Red Star ...	W.T. Reg. 5.10.23 to 24.10.23 ...	2.11.23.
<i>Leicestershire</i> ...	De Legh, P. ...	R. Cuming ...	M.L.	Bibby ...	Form 911 2.10.23 to 12.10.23 ...	18.10.23.

LIST OF VOLUNTARY OBSERVING SHIPS

V

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed.	Date Received.
<i>Leitrim</i> ...	Robertson, A. ...	H. C. Roberts ...	No.	Dowie, J., & Co. ...	Form 911 16.8.23 to 5.9.23 ...	24.10.23.
<i>Levant, C.S.</i> ...	West, G. W. ...	...	...	Eastern Tel. Co. ...	...	...
<i>Levington</i> ...	Adams, S. E. ...	A. T. Church, J. McInnes, C. H. Robison.	M.L.	Furness Withy ...	Met. Log. 28.4.22 to 4.9.22 ...	11.9.22.
<i>Ling Nam</i> ...	...	...	No.	Chunghwa Nav. Co. ...	...	...
<i>Llanstephan Castle</i> ...	Samuel, D. ...	E. Perkins ...	...	Union Castle ...	Form 911 15.6.23 to 24.8.23 ...	28.8.23.
<i>Loch Katrine, M.V.</i> ...	Matthews, G. P. ...	P. Cooper ...	...	R.M.S.P. Co. ...	" 4.2.23 to 3.3.23 ...	8.3.23.
<i>Loreto, M.V.</i> ...	Splatt, W. A. ...	...	...	Pacific S.N. Co. ...	...	...
<i>Losada, M.V.</i> ...	Barkley, E. ...	A. H. Turner ...	...	...	Form 911 27.8.23 to 16.9.23 ...	20.9.23.
<i>Lowestoft</i> ...	Brownrigg, H. J. S., D.S.O., Capt., R.N.	...	M.L.	His Majesty's Ship	...	...
<i>Macedonia</i> ...	Potter, H. W., R.D. Commr., R.N.R.	G. Readman ...	No.	P. & O. ...	...	...
<i>Macharda</i> ...	Tyers, W. O. ...	W. Moore ...	...	Brocklebank ...	Form 911 4.8.23 to 27.10.23 ...	31.10.23.
<i>Mahana</i> ...	Kershaw, W. A. R. ...	F. M. Smith ...	...	Shaw Savill & Albion ...	" 5.8.23 to 25.8.23 ...	16.10.23.
<i>Maharaja</i> ...	Elliott, G. F. ...	W. J. Corp ...	...	Asiatic S.N. Co. ...	" 3.5.23 to 28.6.23 ...	24.7.23.
<i>Mahopac</i> ...	Puttick, J. ...	F. J. Mummery ...	...	Atlantic Transport ...	" 23.4.23 to 3.8.23 ...	27.8.23.
<i>Maihar</i> ...	Rowe, J. P. ...	C. Straw, L. Robertson, H. F. Scoins.	M.L.	Brocklebank ...	Met. Log. 14.4.23 to 18.7.23 ...	24.8.23.
<i>Maimyo</i> ...	Hamilton, G. ...	R. A. L. Williams ...	No.	...	Form 911 7.10.23 to 18.10.23...	29.10.23.
<i>Maine</i> ...	Seymour, A. ...	J. W. Prier ...	...	Atlantic Transport ...	" 29.5.23 to 8.6.23 ...	18.6.23.
<i>Majestic</i> ...	Hayes, Sir B. F., K.C.M.G., D.S.O., R.D., Commodore, R.N.R.	A. F. Butcher ...	W.T.	White Star ...	W.T. Reg. 27.10.23 to 8.11.23	10.11.23.
<i>Makambo</i> ...	Williams, D. J. ...	J. S. Sangster, W.R. Robertson, F. C. Rec.	M.L.	Burns Philp ...	Met. Log. 1.9.22 to 11.2.23 ...	10.7.23.
<i>Makura</i> ...	Brown, J. F. S. ...	A. W. Creese, C. A. Stern, R. B. Denniston, T. A. McPherson, R. K. Parry, F. Spicer.	M.L.	Canadian-Australasian	" 24.2.23 to 23.6.23 ...	30.7.23.
<i>Malancha</i> ...	Whitham, F. ...	J. Robertson ...	No.	Brocklebank ...	Form 911 23.8.23 to 16.9.23 ...	2.10.23.
<i>Maldia</i> ...	Gray, T. N. ...	F. R. K. Langdon ...	...	British India ...	...	...
<i>Manchester</i> ...	Everest, J. E. ...	V. R. Jeffrey ...	...	Manchester Liners ...	Form 911 18.10.23 to 28.10.23	6.11.23.
<i>Manchester Mariner</i> ...	Riley, J. E. ...	...	M.L.	...	Form 911 19.3.23 to 31.3.23 ...	8.5.23.
<i>Manchester Merchant</i> ...	Barclay, J. ...	D. H. Burton ...	No.	" "	Form 911 19.3.23 to 31.3.23 ...	8.5.23.
<i>Mandasor</i> ...	Kershaw, R. W. ...	W. Baxter ...	...	Brocklebank ...	" 10.2.23 to 15.5.23 ...	19.6.23.
<i>Manhattan</i> ...	Lazell, F. W. ...	...	...	Atlantic Transport ...	" 12.3.23 to 7.4.23 ...	11.4.23.
<i>Manipur</i> ...	Scurr, T. W. ...	...	...	Brocklebank ...	...	...
<i>Manistee</i> ...	Isaacson, J. M. ...	F. McColm, A. M. Houghton, H. E. Carter, L. C. Bach, L. A. Flower.	M.L.	Elders & Fyffes ...	Met. Log. 9.3.23 to 1.7.23 ...	6.7.23.
<i>Marburn</i> ...	Clews, A. H. ...	A. M. Watt, W. R. Reid, W. Masson.	M.L.	Canadian Pacific ...	" 12.5.23 to 6.10.23 ...	26.10.23.
<i>Marella</i> ...	Mortimer, S. ...	...	M.L.	Burns Philp ...	" 21.2.23 to 11.7.23 ...	8.9.23.
<i>Margha</i> ...	Milne, R. A. ...	J. Strachan, R. W. Cooper, E. H. Rabey, E. Shepherd.	M.L.	British India ...	" 28.4.23 to 22.7.23 ...	27.7.23.
<i>Marglen</i> ...	Landy, E. ...	E. Laurence ...	No.	Canadian Pacific ...	Form 911 18.5.23 to 25.5.23 ...	11.6.23.
<i>Masirah</i> ...	Thowless, E. ...	R. C. Baker ...	...	Brocklebank ...	" 30.4.23 to 2.6.23 ...	29.6.23.
<i>Massilia</i> ...	Caithness, J. B. ...	G. H. Squires ...	...	Anchor ...	" 12.5.23 to 4.6.23 ...	27.6.23.
<i>Matakana</i> ...	Bosdet, V. J. ...	H. C. Mont, S. Oswald ...	...	Shaw, Savill & Albion ...	" 20.6.23 to 31.7.23 ...	11.8.23.
<i>Matheran</i> ...	Smith, W. ...	G. C. Smith, W. J. Miller, G. W. Barker.	M.L.	Brocklebank ...	Met. Log. 14.5.23 to 7.8.23 ...	10.8.23.
<i>Matiana</i> ...	Langlands, D. H. ...	E. H. Brady ...	No.	British India ...	...	...
<i>Matina</i> ...	Henderson, J. ...	J. W. Parsons, H. Carden, N. A. Moore.	M.L.	Elders & Fyffes ...	Met. Log. 9.9.22 to 24.3.23 ...	26.4.23.
<i>Mauretania</i> ...	Rostron, A. H., C.B.E., R.D., Capt., R.N.R.	G. H. Jones, P. O. Davis, W. C. A. Robson.	W.T.	Cunard ...	W.T. Reg. 21.10.23 to 4.11.23... Form 911 29.9.23 to 14.10.23...	8.11.23. 23.10.23.
<i>Megantic</i> ...	Berry, G. ...	H. J. C. Day, R. Conway ...	W.T.	White Star ...	W.T. Reg. 24.9.23 to 14.10.23...	19.10.23.
<i>Melita</i> ...	Landy, E. ...	J. Shearer, R. Campbell, H. Knight.	W.T.	Canadian Pacific ...	" 1.9.23 to 19.9.23 ...	29.9.23.
<i>Memnon</i> ...	Salter, G. H. ...	E. R. Pritchard ...	No.	A. Holt ...	Form 911 26.5.23 to 15.6.23 ...	3.7.23.
<i>Menominee</i> ...	Finch, E. ...	H. E. McCartney ...	...	Atlantic Transport ...	" 19.8.23 to 17.9.23 ...	21.9.23.
<i>Mesaba</i> ...	Claret, F. H. ...	L. A. Williams ...	...	...	" 2.7.23 to 11.7.23 ...	27.8.23.
<i>Metagama</i> ...	Henderson, W. ...	H. A. MacCallum, H. Coughlan	W.T.	Canadian Pacific ...	W.T. Reg. 14.10.23 to 1.11.23...	6.11.23.
<i>Miami</i> ...	Maxwell Brown, W. E.	A. Orchard ...	No.	Elders & Fyffes ...	Form 911 3.9.23 to 7.10.23 ...	15.10.23.
<i>Michigan</i> ...	Tribe, A. E. ...	H. E. McCartney ...	...	Atlantic Transport ...	" 13.5.23 to 15.6.23 ...	21.6.23.
<i>Minderoo</i> ...	Richardson, E. ...	B. J. Bennie, W. J. McPhedron, J. H. Oxtan.	M.L.	West Australia Nav. Co.	Met. Log. 16.2.23 to 10.7.23 ...	17.9.23.
<i>Minnedosa</i> ...	Sibbons, H. ...	R. Fegan, L. Outram, H. F. Pullen.	W.T.	Canadian Pacific ...	W.T. Reg. 13.10.23 to 1.11.23 Form 911 26.10.23 to 1.11.23	10.11.23.
<i>Mirror, C.S.</i> ...	...	...	No.	Eastern Tel. Co. ...	...	...
<i>Mississippi, M.V.</i> ...	Wylie, J. T. J. ...	A. H. Middleton ...	...	Atlantic Transport ...	Form 911 6.10.23 to 15.10.23...	23.10.23.
<i>Missouri</i> ...	Hutchison, J. G. ...	W. W. Howard ...	...	...	" 30.7.23 to 2.9.23 ...	6.9.23.
<i>Moldavia</i> ...	Burleigh, C. W. ...	H. Robbins ...	...	P. & O. ...	...	...
<i>Mongolian Prince</i> ...	Chilvers, J. ...	H. A. Shaw ...	...	Prince ...	Form 911 15.8.23 to 27.8.23 ...	12.9.23.
<i>Monkbarns, Ship</i> ...	Davies, W. ...	M. B. Glasier ...	...	J. Stewart & Co. ...	" 10.3.23 to 13.7.23 ...	18.9.23.
<i>Montcalm</i> ...	Rennie, A., O.B.E.	F. E. Williams, J. Sharples ...	W.T.	Canadian Pacific ...	W.T. Reg. 6.10.23 to 24.10.23... Form 911 6.10.23 to 26.10.23...	27.10.23. 30.10.23.
<i>Montclare</i> ...	Webster, G. S., R.D., Commr., R.N.R.	E. J. Jones, M. Cresswell, M. Jack.	W.T.	" "	W.T. Reg. 29.9.23 to 20.10.23...	22.10.23.
<i>Montrose</i> ...	Parry, H. ...	H. McFadyen, J. Soame, F. W. Roberts.	W.T.	" "	Form 911 13.10.23 to 1.11.23	5.11.23.
<i>Morvada</i> ...	Mills, T. L., O.B.E., R.D., Commr., R.N.R.	J. Longhurst, S. J. Inman, D. Lonie, F. Dyson.	M.L.	British India ...	Met. Log. 16.3.23 to 12.6.23 ...	15.6.23.
<i>Mulbera</i> ...	Steadman, W. R. ...	E. Holland, R. B. Clark ...	No.	" "	Form 911 13.9.23 to 18.9.23 ...	27.9.23.
<i>Musician</i> ...	Egerton, J. J. ...	O. Stanhope ...	...	Harrison ...	" 5.4.23 to 17.6.23 ...	2.8.23.
<i>Mutine</i> ...	Douglas, H.P., C.M.G., Capt., R.N.	R. A. Stephens ...	M.L.	His Majesty's Ship	Met. Log. 10.4.23 to 7.8.23 ...	30.8.23.
<i>Nagara</i> ...	Turner, E. A. ...	C. E. Mason ...	No.	R.M.S.P. Co. ...	Form 911 17.6.23 to 11.8.23 ...	18.8.23.
<i>Napierian</i> ...	Kerruish, W. ...	J. E. Williams ...	...	Levland ...	" 20.9.23 to 29.9.23 ...	10.10.23.
<i>Nardana</i> ...	Brown, H. ...	K. C. Le Breton ...	...	British India ...	" 3.3.23 to 5.8.23 ...	21.8.23.
<i>Nariva</i> ...	Macey, W. H. ...	W. H. Grimshaw, F. O. Newton, H. H. Lancaster.	M.L.	R.M.S.P. Co. ...	Met. Log. 3.5.23 to 27.6.23 ...	29.6.23.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed.	Date Received.
<i>Nascopie</i> ...	Smellie, T. F. ...	P. Lloyd, R. J. Summers, R. S. Mott.	M.L.	Hudson's Bay Co. ...	Met. Log. 15.6.23 to 24.10.23...	31.10.23.
<i>Navasota</i> ...	Willan, F. G. L. ...	Ingram, E. B. ...	No.	R.M.S.P. Co. ...	Form 911 9.5.23 to 8.7.23 ...	21.7.23.
<i>Navigator</i> ...	Mowat, J. ...	... ..	..	Harrison ...	.. 29.4.23 to 26.6.23 ...	11.7.23.
<i>Nawab</i> ...	Smith, J. F. ...	... ..	..	Asiatic S.N. Co. ...	.. 7.8.23 to 24.9.23 ...	17.10.23.
<i>Nebraska</i> ...	Collins, A. R. D. ...	J. Vivian ...	..	R.M.S.P. Co. ...	.. 20.6.23 to 31.8.23 ...	24.9.23.
<i>Nellore</i> ...	Murray, F. S., R.D., Lt. - Commr., R.N.R.	G. Aspinall ...	..	P. & O. ...	.. 16.8.23 to 5.9.23 ...	1.10.23.
<i>Nestor</i> ...	Owen, R. D., O.B.E.	W. J. Eyson ...	..	A. Holt ...	.. 23.8.23 to 6.10.23 ...	9.10.23.
<i>Nevasa</i> ...	Swanson, C. J. ...	C. D. White ...	..	British India ...	.. ..	.. ..
<i>Newby Hall</i> ...	Kendall, J. W. ...	W. Rogerson, E. J. Myles, A. MacAllister.	M.L.	Ellerman ...	Met. Log. 5.1.23 to 19.6.23 ...	18.7.23.
<i>Niagara</i> ...	Rolls, J. T. ...	R. M. Scott, N. G. Buxton, O. C. Bray.	M.L.	Canadian-Australian... ..	.. 2.6.23 to 28.9.23 ...	29.10.23.
<i>Ningchow</i> ...	Wilson, C. A. ...	W. K. Kerr ...	No.	A. Holt ...	Form 911 18.7.23 to 10.9.23 ...	14.9.23.
<i>Nizam</i> ...	Park, G. ...	... ..	..	Asiatic S.N. Co. ...	.. 21.4.23 to 1.5.23 ...	29.5.23.
<i>Nore</i> ...	Randall H. W., R.D., Capt., R.N.R.	J. C. Ablewhite, R. W. Mackie, J. O. Divers, H. C. Slinn.	M.L.	P. & O. ...	Met. Log. 30.6.23 to 21.9.23 ...	27.9.23.
<i>Norfolk Range</i> ...	Moore ...	H. Richardson ...	No.	Furness Withy ...	Form 911 27.9.23 to 11.10.23...	24.10.23.
<i>Norman</i> ...	Morton Betts, W. ...	D. A. Hodgson ...	..	Union Castle ...	.. 27.8.23 to 15.9.23 ...	19.10.23.
<i>Norseman, C.S.</i> ...	Barter, H. O. ...	S. M. Hammond, E. R. Duffey, L. M. Cooper.	M.L.	Western Tel. Co. ...	Met. Log. 12.2.23 to 21.8.23 ...	24.9.23.
<i>Northumberland</i> ...	Haines, F. P. ...	... ..	No.	Federal ...	Form 911 16.6.23 to 28.7.23 ...	31.7.23.
<i>Nortonian</i> ...	McCormick, J. ...	T. Miller ...	..	Leyland ...	.. 9.9.23 to 11.10.23 ...	23.10.23.
<i>Nubian</i> ...	Watmough, T. M. ...	G. H. Jolly ...	..	..	.. 30.6.23 to 13.9.23 ...	18.9.23.
<i>Nyanza</i> ...	Fitzroy, F. H., R.D., Capt., R.N.R.	F. Aheir, S. J. Holland, F. Ardern.	M.L.	P. & O. ...	Met. Log. 17.3.23 to 8.7.23 ...	12.7.23.
<i>Odland I.</i> ...	Villiamsen ...	H. Svendgaard ...	No.	Hannevig Bros. ...	Form 911 20.7.23 to 5.8.23 ...	20.8.23.
<i>Ohio</i> ...	Lainson, W. H. ...	... ..	M.L.	R.M.S.P. Co. ...	.. ..	.. ..
<i>Olympia</i> ...	Duncan, A. R. ...	H. Gorman, J. F. Adam, D. Haig.	M.L.	Anchor ...	Met. Log. 22.3.22 to 26.8.23 ...	1.10.23.
<i>Olympic</i> ...	Marshall, W., D.S.O., R.D., Capt., R.N.R.	S. B. Morfee, J. C. M. Boyce	W.T.	White Star ...	W.T. Reg. 11.10.23 to 25.10.23	29.10.23.
<i>Omar</i> ...	Simmer, G. L., R.D., Commr., R.N.R.	A. J. Baxter, N. Savage, A. J. Croft-Cohen, G. C. Lyllie.	M.L.	Orient ...	Met. Log. 27.1.23 to 16.5.23 ...	25.5.23.
<i>Onitsha</i> ...	Williams, T. E. ...	J. Nelson ...	No.	Elder Dempster ...	Form 911 20.1.23 to 27.1.23 ...	3.4.23.
<i>Oranian</i> ...	Watmough, T. M. ...	R. J. S. Pope ...	..	Leyland ...	.. 12.2.23 to 26.4.23 ...	30.4.23.
<i>Orari</i> ...	Robinson, F. W. ...	C. H. Denton, C. F. Hicks, E. Mills.	M.L.	New Zealand S.S. Co. ...	Met. Log. 3.2.23 to 19.7.23 ...	25.7.23.
<i>Orator</i> ...	Flynn, D. ...	J. C. Sinclair ...	No.	Harrison ...	Form 911 2.7.23 to 22.7.23 ...	22.8.23.
<i>Orbita</i> ...	Parker, W. H., C.B.E., R.D., Capt., R.N.R.	D. R. Lee, H. H. Lancaster...	W.T.	R.M.S.P. Co. ...	W.T. Reg. 14.10.23 to 4.11.23... Form 911 14.10.23 to 5.11.23...	8.11.23. 9.11.23.
<i>Orcoma</i> ...	Pearson, A. T. D. ...	R. E. Ward, J. J. Buckley ...	M.L.	Pacific S.N. Co. ...	Met. Log. 24.8.23 to 9.11.23 ...	10.11.23.
<i>Orduna</i> ...	Warner, G. E. ...	J. W. Carr, J. Vivian, J. Smith, A. A. Martin.	W.T.	R.M.S.P. Co. ...	W.T. Reg. 30.9.23 to 21.10.23... Form 911 29.9.23 to 22.10.23...	25.10.23. 26.10.23.
<i>Oriana</i> ...	Christian, G. H. ...	G. Pattison, Mason, G. F. Nicholson, Cruikshank.	M.L.	Pacific S.N. Co. ...	Met. Log. 26.1.23 to 14.8.23 ...	18.8.23.
<i>Orita</i> ...	Dominy, R. H., C.B.E., Commr., R.N.R.	H. S. Roberts, J. A. Adamson	M.L.	.. ..	Met. Log. 23.3.23 to 18.7.23 ...	15.9.23.
<i>Ormonde</i> ...	Staunton, H. G., C.B.E., R.D., Commr., R.N.R.	G. A. Moir, F. J. L. Butler, E. G. Smithard.	M.L.	Orient ...	.. 1.1.23 to 23.4.23 ...	30.4.23.
<i>Ormuz</i> ...	James, L. V., D.S.C.	H. Schofield, J. S. Metcalf, H. H. McLean, I. E. G. Goldsworthy.	M.L.	.. ..	.. 1.4.23 to 17.7.23 ...	21.7.23.
<i>Oroya</i> ...	Daniel, T. ...	S. Lewis ...	No.	Pacific S.N. Co. ...	Form 911 27.7.23 to 15.10.23...	19.10.23.
<i>Orsova</i> ...	Matheson, C. G., D.S.O., R.D., Commr., R.N.R.	C. Fox, J. C. K. Dowding, T. J. Jones, J. C. Jackson.	M.L.	Orient ...	Met. Log. 29.4.23 to 12.8.23 ...	22.8.23.
<i>Ortega</i> ...	Chittenden, A. ...	J. G. Aitken ...	No.	Pacific S.N. Co. ...	Form 911 18.7.23 to 22.9.23 ...	29.9.23.
<i>Orvieto</i> ...	Owens, A. L., R.D., Lt.-Commr., R.N.R.	G. H. Wylie, A. J. Baxter, G. E. Martin, A. O. H. O'Brien, M. C. Lester.	M.L.	Orient ...	Met. Log. 24.6.23 to 7.10.23 ...	24.10.23.
<i>Osterley</i> ...	Coad, A. J., R.D., Commr., R.N.R.	F. G. Goodman, T. B. Grainger-Grieve, E. Hatch.	M.L.	.. ..	.. 4.3.23 to 18.6.23 ...	18.7.23.
<i>Othello</i> ...	Pearson, Z. C. ...	A. J. Walker ...	No.	Ellerman Wilson ...	Form 911 10.10.23 to 27.10.23	31.10.23.
<i>Oxfordshire</i> ...	Adamson, B. W. ...	W. L. Foster, C. V. S. Bulteel, C. J. Blyten-Beesley, H. J. Jarrett.	M.L.	Bibby ...	Met. Log. 8.6.23 to 22.8.23 ...	24.8.23.
<i>Pakeha</i> ...	Hartman, W. H. ...	W. L. P. Cox ...	No.	Shaw, Savill & Albion Southern Rly. ...	Form 911 3.1.23 to 5.5.23 ... Telegraphic Report. 22.9.23 ...	11.5.23. 22.9.23.
<i>Paris</i> ...	... ..	... ..	C.C.	.. ..	.. ..	.. ..
<i>Patia</i> ...	Downes, F. J. ...	S. A. Sapsworth ...	No.	Elders & Fyffes ...	Form 911 2.1.23 to 4.2.23 ...	9.2.23.
<i>Patrol, C.S.</i> ...	Bredenberg, F. ...	Davison, Gardiner, Albrecht, Morrell.	M.L.	Eastern Extension (A. & C.) Telegraph Co. ...	Met. Log. 3.3.23 to 26.6.23 ...	3.8.23.
<i>Persic</i> ...	Davies, E. ...	W. A. Calway ...	No.	White Star ...	Form 911 30.4.23 to 27.8.23 ...	3.9.23.
<i>Peshawur</i> ...	Hester, C. ...	... ..	M.L.	P. & O. ...	.. ..	.. ..
<i>Philadelphian</i> ...	Baker, ...	... ..	No.	Leyland ...	.. ..	.. ..
<i>Polyphemus</i> ...	Hatfield, J. ...	F. Silva ...	..	A. Holt ...	.. ..	.. ..
<i>Poona</i> ...	Furlong, G. H. S. ...	A. N. du T. Pownall ...	..	P. & O. ...	Form 911 6.5.23 to 19.6.23 ...	4.7.23.
<i>Port Albany</i> ...	Robinson, C. A. ...	G. L. Hazlewood, A. W. Jenkyns, J. S. Beardshaw, W. B. Craig.	M.L.	Commonwealth & Dominion.	Met. Log. 18.5.23 to 23.9.23 ...	2.10.23.
<i>Augusta</i> ...	Hearn, G. W. ...	G. T. Harris, R. C. Carter, C. F. Coate.	M.L.	.. ..	.. 14.4.23 to 19.9.23 ...	25.9.23.
<i>Caroline</i> ...	Renaut, F. A. ...	E. G. Fullick, R. B. Linklater, P. H. Pedrick.	M.L.	.. ..	.. 27.1.23 to 25.5.23 ...	29.5.23.
<i>Darwin</i> ...	Farmer, F. ...	E. T. N. Lawrey ...	No.	.. ..	Form 911 3.8.23 to 23.9.23 ...	9.10.23.
<i>Hacking</i> ...	Stickland, A. E. ...	E. M. Robb ...	..	.. ..	.. 18.3.23 to 16.9.23 ...	5.10.23.
<i>Hunter</i> ...	Cottell, S. C. ...	C. P. Thrower, W. R. Johnston, L. Copeland, A. G. Newbury.	M.L.	.. ..	Met. Log. 4.5.23 to 22.9.23 ...	27.9.23.
<i>Lytelton</i> ...	Ferris, J....	W. L. Lynd, E. Leavett, G. Fergusson, G. H. Harvey.	M.L.	.. ..	.. 24.2.23 to 16.8.23 ...	18.8.23.
<i>Melbourne</i> ...	Kearney, F. J. ...	D. G. H. Bradley, C. F. Post, T. L. Kidwell.	M.L.	.. ..	.. 15.3.23 to 18.7.23 ...	25.7.23.
<i>Nicholson</i> ...	Hoad, A. C. ...	J. G. Lewis, W. G. Jones, J. Buchan, F. Dow.	M.L.	.. ..	.. 30.12.22 to 24.6.23...	28.6.23.

LIST OF VOLUNTARY OBSERVING SHIPS

vii

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed.	Date Received.
<i>Port Pirie</i> ...	Higgs, W. G. ...	H. C. Jeffery, E. E. Roswell, R. S. Stannard, E. N. Rogerson.	M.L.	Commonwealth & Dominion.	Met. Log. 22.2.23 to 8.7.23 ...	13.7.23.
„ <i>Stephens</i> ...	Sawbridge, I. K. ...	E. J. Syvret, H. G. B. Pinkney, L. Bayley.	M.L.	„ „ „	„ 28.1.23 to 13.6.23 ...	10.7.23.
„ <i>Sydney</i> ...	Lea, W. H. ...	H. E. Higgs, A. W. Sams, A. R. Martin, J. Fishwick.	M.L.	„ „ „	„ 15.6.23 to 16.10.23...	20.10.23.
„ <i>Victor</i> ...	Jack, J. ...	J. Hunter, R. S. Keating, R. T. R. Tomsett.	M.L.	„ „ „	„ 6.4.23 to 3.9.23 ...	14.9.23.
<i>President Jackson</i> ...	Griffith, J. ...	C. W. Hawkins ...	No.	Pacific S.S. Co. ...	Form 911 25.4.23 to 24.5.23 ...	7.8.23.
<i>Professor</i> ...	Lowe, J. ...	W. Squirrel ...	„	Harrison ...	„ 19.11.22 to 26.1.23...	31.1.23.
<i>Prolea, H.M.S.A.S.</i>	Dalglish... ..	H. McMaster ...	„	South African Naval Service.	„ 14.5.23 to 29.6.23 ...	31.7.23.
<i>Protesilaus</i> ...	Wilkinson, H. ...	T. Miners, R. C. Neville, A. Woolfenden, F. Smith.	M.L.	A. Holt ...	Met. Log. 28.6.23 to 3.9.23 ...	1.10.23.
<i>Pyrrhus</i> ...	Clark, G. T. ...	F. Berry ...	No.	„ ...	Form 911 28.4.23 to 7.5.23 ...	10.5.23.
<i>Rajah</i> ...	Park, G. ...	„ „ „	No.	Asiatic S.N. Co. ...	„ 17.6.23 to 10.7.23 ...	15.8.23.
<i>Regina</i> ...	Morehouse, W. A. ...	L. G. A. Farmer ...	„	White Star-Dominion	„ 19.8.23 to 7.9.23 ...	12.9.23.
<i>Reindeer</i> ...	Mulhall, W. ...	„ „ „	C.C.	G.W. Railway ...	Telegraphic Report 13.11.23 ...	13.11.23.
<i>Rhodesian Transport</i> ...	Fowler, W. H. ...	E. A. Insley ...	No.	Houlder Bros. ...	Form 911 25.4.23 to 27.7.23 ...	10.8.23.
<i>Rialto</i> ...	Mordue, J. A. ...	„ „ „	„	Ellerman Bucknall ...	„ 12.10.23 to 24.10.23 ...	12.11.23.
<i>Rimutaka</i> ...	Hemming, F. A. ...	P. McCallum, H. Horwood, W. Kyles.	M.L.	New Zealand S.S. Co.	Met. Log. 7.4.23 to 19.8.23 ...	24.8.23.
<i>Romney</i> ...	Leicester, F. S. ...	E. S. Phillips ...	No.	Lampont & Holt ...	Form 911 2.8.23 to 14.10.23 ...	30.10.23.
<i>Royal Transport</i> ...	Dove, J. ...	F. W. Pawson ...	„	Houlder Bros. ...	„ 3.7.23 to 13.10.23 ...	17.10.23.
<i>Ruapehu</i> ...	McKellar, A. W., R.D., Capt., R.N.R.	„ „ „	M.L.	New Zealand S.S. Co.	„ „ „	„
<i>Sachem</i> ...	Furneaux, S. ...	C. Waldron, A. Tomkins ...	No.	Furness Withy ...	Form 911 28.7.23 to 1.9.23 ...	6.9.23.
<i>Samaria</i> ...	Horsburgh, G. ...	E. Esson ...	„	Cunard ...	„ 24.9.23 to 10.10.23...	16.10.23.
<i>Sandown Castle</i> ...	Jackson, C. R. ...	W. F. Malden ...	„	Union Castle ...	„ 2.9.23 to 6.10.23 ...	8.11.23.
<i>Saoirse, Yacht</i> ...	O'Brien, C. ...	H. S. Hodges ...	„	C. O'Brien ...	„ 1.9.23 to 6.10.23 ...	7.11.23.
<i>Sardinia</i> ...	Cadiz, F. G. ...	C. E. Arundel ...	„	P. & O. ...	„ 13.6.23 to 3.7.23 ...	19.7.23.
<i>Saturnia</i> ...	Black, J. ...	T. Ure ...	W.T.	Anchor Donaldson ...	W.T. Reg. 22.9.23 to 12.10.23... Form 911 22.9.23 to 13.10.23...	19.10.23. 22.10.23.
<i>Sazoleine</i> ...	Biddick, E. ...	C. S. Rodgers ...	No.	Hunting & Son ...	„ 7.10.23 to 25.10.23...	6.11.23.
<i>Saxon</i> ...	Stanley, W. F. ...	R. S. W. Harris ...	„	Union Castle ...	„ 7.9.23 to 29.10.23...	31.10.23.
<i>Saonia</i> ...	Storey, F. E., R.D., Capt., R.N.R.	E. S. Simmonds ...	„	Cunard ...	„ 27.9.23 to 23.10.23...	2.11.23.
<i>Scholar</i> ...	O'Connor, T. ...	W. J. Wearing ...	„	Harrison ...	„ 18.4.23 to 2.5.23 ...	15.5.23.
<i>Scientist</i> ...	Hansen, W. A. ...	D. G. Russell ...	„	„ ...	„ 9.6.23 to 3.9.23 ...	20.9.23.
<i>Scindia</i> ...	Matthews, W. ...	H. D. Campsie ...	„	Anchor ...	„ 7.7.23 to 19.9.23 ...	25.9.23.
<i>Scotia</i> ...	Telfer ...	O. W. L. Jones ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report 26.10.23 ...	26.10.23.
<i>Scottish Eard</i> ...	McDonnell, S. ...	W. H. Campbell ...	No.	Tankers, Ltd. ...	Form 911 25.8.23 to 14.9.23 ...	1.10.23.
<i>Scottish Borderer</i> ...	Jeffrey, D. G., D.S.O.	G. F. Widger ...	„	„ ...	„ 30.8.23 to 18.9.23 ...	9.10.23.
<i>Seythia</i> ...	Prothero, W. ...	J. McKie, A. Hamer, T. Parry	W.T.	Cunard ...	W.T. Reg. 8.9.23 to 25.9.23 ... Form 911 9.8.23 to 31.8.23 ...	29.9.23. 4.9.23.
<i>Sheaf Mount</i> ...	Groves, C. V. ...	J. L. Forster ...	No.	Souter, W. A. ...	„ 28.3.23 to 17.4.23 ...	3.7.23.
<i>Sheaf Spear</i> ...	Whitfield, G. A., O.B.E.	Mr. Harvey, Mr. Grisewood	M.L.	„ ...	Met. Log. 18.3.23 to 20.8.23 ...	8.10.23.
<i>Sicilia</i> ...	Miller, E. C. ...	H. Sanders ...	No.	P. & O. ...	Form 911 19.9.23 to 2.10.23 ...	31.10.23.
<i>Socrates</i> ...	James, F. R. ...	E. R. Hartley ...	„	Lampont & Holt ...	„ 8.8.23 to 28.8.23 ...	8.11.23.
<i>Sokoto</i> ...	Dennitts, W. ...	J. M. Stuart, J. McNae, D. S. Mackenzie.	M.L.	Elder Dempster ...	Met. Log. 27.3.23 to 26.6.23 ...	28.6.23.
<i>Somerset</i> ...	Barnett, H. ...	C. H. Landfield ...	No.	New Zealand S.S. Co.	Form 911 2.8.23 to 3.9.23 ...	24.10.23.
<i>Somme</i> ...	Miles, F. E., Commr., R.N.R.	P. A. Yeatman, B. K. Berry, W. Smith, D. P. Larham	M.L.	R.M.S.P. Co.	Met. Log. 17.7.22 to 24.4.23 ...	18.8.23.
<i>Songster</i> ...	Smith, D. P. ...	J. R. McIntyre, D. Richards, W. H. Hunt.	M.L.	Harrison ...	„ 16.7.22 to 23.10.22...	2.11.22.
<i>Spectator</i> ...	Owen, W. F. ...	L. Seddon ...	No.	„ ...	Form 911 6.9.23 to 9.10.23 ...	8.11.23.
<i>Spero</i> ...	French, H. E. ...	„ „ „	M.L.	Ellerman Wilson ...	„ „ „	„
<i>Stephan, C.S.</i>	Carlton, G. F., O.B.E., Commr., R.N.R.	L. J. Hegarty, J. Matthews, F. B. Bolingbroke.	M.L.	Telegraph Construction & Maintenance.	Met. Log. 5.5.23 to 3.10.23 ...	10.10.23.
<i>Surrey</i> ...	Kettlewell, C. R. ...	G. W. Allard, S. E. Hobbin, D. McIntyre.	M.L.	Federal ...	„ 27.5.23 to 3.11.23 ...	7.11.23.
<i>Sussex</i> ...	Upton, E. C. S. ...	W. A. Ewington ...	No.	„ ...	Form 911 21.4.23 to 27.5.23 ...	3.7.23.
<i>St. Albans</i> ...	„ „ „	„ „ „	„	Eastern and Australian.	„ „ „	„
<i>St. Patrick</i> ...	Bearpark, E. W. ...	W. P. Baker ...	„	Rankin Gilmour ...	Form 911 13.9.23 to 26.9.23 ...	7.11.23.
<i>Tainui</i> ...	Kelly, R. A. ...	T. T. Oliver ...	No.	Shaw, Savill & Albion	Form 911 5.12.22 to 14.1.23 ...	12.2.23.
<i>Tairoa</i> ...	Summers, W. G. ...	J. Steele ...	„	„ „ „	„ 16.10.22 to 27.2.23...	7.3.23.
<i>Taiyuan</i> ...	Hamilton, H. E. ...	R. D. Thomas, W. Bailley ...	M.L.	Yuill & Co. ...	Met. Log. 15.9.22 to 26.2.23 ...	12.6.23.
<i>Talkhivius</i> ...	Agnew, J. ...	F. Parker ...	No.	A. Holt ...	Form 911 26.11.22 to 10.1.23...	20.2.23.
<i>Tambora</i> ...	Meerburg, J. M. ...	H. Van Manen ...	„	Rotterdam Lloyd ...	„ 16.8.23 to 7.10.23 ...	19.10.23.
<i>Teiresias</i> ...	Reynard, J. G. ...	W. F. Dark ...	„	A. Holt ...	„ 23.7.23 to 2.8.23 ...	14.8.23.
<i>Teucer</i> ...	Hamney, T. W. ...	J. C. Norton ...	„	„ ...	„ 8.9.23 to 18.9.23 ...	1.10.23.
<i>Themistocles</i> ...	Jermyn, W. M. ...	R. H. Harrison ...	„	Aberdeen ...	„ „ „	„
<i>Theseus</i> ...	Williams, D. T. ...	W. Cowperthwaite ...	„	A. Holt ...	Form 911 18.10.23 to 26.10.23 ...	6.11.23.
<i>Titan</i> ...	Ireland, T. R. ...	J. P. Williams, A. C. H. Jones, D. J. Davies, A. Taylor.	M.L.	„ „ „	Met. Log. 3.6.23 to 7.10.23 ...	10.10.23.
<i>Tolmie, S.F. Bqtn.</i>	Stewart, J. C. ...	F. Burch ...	No.	B. C. Mills Tug and Barge Co.	Form 911 4.11.22 to 17.1.23 ...	1.3.23.
<i>Totori Maru</i> ...	Karita, I. ...	S. Ariyoshi ...	„	Nippon Yusen Kaisha	„ 20.7.23 to 4.9.23 ...	14.9.23.
<i>Transmitter, C.S.</i>	Jones, L. T. M.B.E.	S. P. Sheldon ...	„	Eastern Tel. Co.	„ 17.9.23 to 7.10.23 ...	13.11.23.
<i>Traveller</i> ...	Jones, E. W. ...	„ „ „	„	Harrison ...	„ 4.8.23 to 8.10.23 ...	18.10.23.
<i>Tredenham</i> ...	Evans, J. O. ...	C. Warren ...	„	Hain S.S. Co. ...	„ 24.6.23 to 31.7.23 ...	26.9.23.
<i>Trematon</i> ...	Hicks, F. H. ...	J. Christopher, D. Thomas, F. J. Webb.	M.L.	„ „ „	Met. Log. 28.8.22 to 30.3.23 ...	18.4.23.
<i>Tropic</i> ...	Greame, C. H. ...	B. Harrison ...	„	White Star ...	Form 911 13.11.22 to 23.3.23...	3.4.23.
<i>Tuscania</i> ...	Bone, D. W. ...	J. McGill Brown ...	No.	Anchor ...	„ 23.9.23 to 14.10.23...	17.10.23.
<i>Tuscanstar</i> ...	Thomas, R. J. ...	W. H. Webster ...	„	Blue Star ...	„ 29.5.23 to 3.7.23 ...	11.7.23.
<i>Tyndareus</i> ...	Adcock, F. ...	H. G. S. Emery ...	„	A. Holt ...	„ 7.9.23 to 4.10.23 ...	13.11.23.
<i>Valacia</i> ...	Doyle, M. ...	H. H. Kidwell ...	No.	Cunard ...	Form 911 20.7.23 to 27.7.23 ...	31.7.23.
<i>Valdura</i> ...	Rennie, A. ...	„ „ „	M.L.	Gow Harrison.	„ „ „	„

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed.	Date Received.
<i>Vardulia</i> ...	Townley, J. C. ...	S. L. Carter ...	No.	Cunard ...	Form 911 20.9.23 to 25.10.23...	31.10.23.
<i>Vasconia</i> ...	Inch, F. ...	P. S. Britten ...	"	" ...	" 3.7.23 to 12.7.23 ...	18.7.23.
<i>Vellavia</i> ...	Fear, E. T. C. ...	J. W. Caunce ...	"	" ...	" 22.6.23 to 5.7.23 ...	11.8.23.
<i>Vennonia</i> ...	Gronow S. ...	L. V. Dewdney ...	"	" ...	" 2.7.23 to 16.8.23 ...	4.9.23.
<i>Ventura de Lar-rinaga.</i>	Echevarria, J. Vde. A.	G. W. E. Brazendale ...	"	Larrinaga ...	" 9.5.23 to 24.5.23 ...	30.5.23.
<i>Venusia</i> ...	Stafford, W. ...	W. P. Armour ...	"	Cunard ...	" 3.6.23 to 4.7.23 ...	10.7.23.
<i>Verbania</i> ...	Hatcher, W. H. ...	H. R. Rooper ...	"	" ...	" 24.9.23 to 4.10.23 ...	10.10.23.
<i>Verentia</i> ...	Stafford, W., D.S.C., R. D. Lt.-Commr., R.N.R.	A. S. W. Watts ...	"	" ...	" 3.9.23 to 5.10.23 ...	9.10.23.
<i>Victoria</i> ...	Fisher, F. T. ...	J. Males, E. Peacock, J. Archer	M.L.	China-Australia ...	Met. Log. 29.3.23 to 29.8.23 ...	6.10.23.
<i>Vindelia</i> ...	Henderson, J. L. ...	G. Harrison ...	No.	Cunard ...	Form 911 5.5.23 to 3.6.23 ...	7.6.23.
<i>Vitoria</i> ...	Jackson, G. W. ...	F. Galbraith ...	"	Vittoria S.S. Co. ...	" 10.5.23 to 20.6.23 ...	26.6.23.
<i>Waihemō</i> ...	Showman, A. C. ...	G. Atwood ...	No.	Union S.S. Co., N.Z....	Form 911 23.2.23 to 16.5.23 ...	20.6.23.
<i>Waiotapu</i> ...	Ruxton, G. M. ...	F. A. Wilson ...	"	Canadian-Australasian	" 8.5.23 to 3.6.23 ...	26.6.23.
<i>Walmer Castle</i> ...	Chave, Sir B., K.B.E.	E. E. Spradbrow ...	"	Union Castle ...	" 20.7.23 to 10.9.23 ...	19.9.23.
<i>Wangaratta</i> ...	O'Connor, E. W., D.S.C.	W. Scutt, A. M. Stumbles, P. C. Wilson, W. Hunt.	M.L.	British India ...	Met. Log. 25.11.22 to 20.4.23...	2.6.23.
<i>Warfela</i> ...	Steel, R. ...	W. A. Hughes ...	No.	" " ...	Form 911 27.7.23 to 20.8.23 ...	27.8.23.
<i>Welshman</i> ...	Rollerson, W. ...	J. F. Spears ...	"	White Star-Dominion	" 3.10.23 to 30.10.23...	5.11.23.
<i>Winifredian</i> ...	Harrocks, W. ...	G. P. Boyle ...	"	Leyland ...	" 23.8.23 to 16.9.23 ...	21.9.23.
<i>Woodarra</i> ...	Reilly, J. V. ...	F. L. Sampson, L. D. Graham, F. W. Felgate A. V. Fisher	M.L.	British India ...	Met. Log. 10.2.23 to 9.8.23 ...	23.8.23.
<i>Yorkshire</i> ...	Millson, G. C. ...	E. Jones ...	No.	Bibby ...	Form 911 7.7.23 to 15.9.23 ...	19.9.23.
<i>Zeeland</i> ...	Thomas, A. J. ...	F. Chilman ... Unless otherwise stated,	No. vessels on t	Red Star ...	Form 911 31.8.23 to 20.9.23 ...	21.9.23.
<i>Conway</i> , H.M.S.	Broadbent, H. W., R.D., Capt., R.N.R.	The Senior Cadets...	Cadets' M.L.	...	Cadets' Met. Log. 6.5.23 to 21.7.23	28.7.23.
<i>Pangbourne Nauti-cal College.</i>	Tracy, A. F. G., Commr., R.N.	" " ...	"	...	Cadets' Met. Log. 14.5.23 to 28.7.23	1.8.23.
<i>Worcester</i> , H.M.S.	Sayer, M. B., O.B.E., R.D., Capt., R.N.R.	" " ...	"	...	Cadets' Met. Log. 4.5.23 to 25.7.23	1.8.23.
<i>Abaco</i> ...	...	The Keepers ...	Lighthouse Register.	...	Lighthouse Register 1.1.23 to 30.6.23	12.9.23.
<i>Cay Lobos</i> ...	...	" ...	"	...	Lighthouse Register 1.1.23 to 30.6.23	12.9.23.
<i>Double Headed Shot</i> ...	...	" ...	"	...	Lighthouse Register 1.1.23 to 30.6.23	12.9.23.
<i>Inagua</i>...	...	" ...	"	...	Lighthouse Register 1.1.23 to 30.6.23	12.9.23.
<i>Sombrero</i> ...	...	" ...	"	...	Lighthouse Register 1.1.23 to 30.6.23	10.8.23.
<i>Watling Island</i> ...	...	" ...	"	...	Lighthouse Register 1.1.23 to 30.6.23	12.9.23.
<i>Cape Pembroke</i> (Falkland Is.).	...	" ...	"	...	Lighthouse Register 1.1.23 to 30.6.23	27.8.23.

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

Name of Vessel.	Captain.	Observing Officer.	Line.	Last Case of Water Samples, Reports, etc., Received.	Date Received.
<i>Alban</i> ...	Whayman, W. R. ...	R. Griffiths ...	Booth ...	Water Samples ...	24.3.23.
<i>Hillebrand</i> ...	Maddrell ...	H. Welsh ...	" ...	" " ...	4.9.23.
<i>Patia</i> ...	Downes, F. J. ...	S. A. Sapsworth ...	Elder & Fyffes ...	" " ...	29.10.23.
<i>Tortuguero</i> ...	Martin ...	H. H. Dunning ...	" " ...	" " ...	22.9.23.