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THE BAROMETER.

With the barometer, the pressure of the atmosphere at sea level is measured. Observation of the pressure of the atmosphere over the earth's surface—particularly the sea—its distribution and change, is the surest way of foretelling wind.

It can be fairly claimed that there is no instrument on board a ship—other than the primary instruments of navigation—which is more useful to seamen. It is a delicate instrument and is deserving of great care. Through the service of "Selected Ships" with Wireless telegraphy communication, observation of the pressure of the atmosphere over the sea has been much improved of late years. Only ships which have on board a reliable mercurial barometer are detailed as "Selected Ships". Ships are better able to benefit from the world wide system of Selected Ships' Routine Wireless Weather reports if they have an accurate barometer. We wish to encourage the use of good barometers in the British Merchant Navy.

A fine example is set by the Peninsular and Oriental Steam Navigation Company, the British India Steam Navigation Company, Messrs. T. & J. Brocklebank, the Harrison Line, the Royal Mail Steam Packet Co., the Pacific Steam Navigation Co., the Houlder Line and other Shipping Companies who include in their ships' outfit a Mercurial Barometer of what is known as the Board of Trade pattern, which much resembles the Kew pattern mercurial barometer of the Meteorological Office.

The maintenance of a good mercurial barometer as part of the permanent equipment of a ship costs very little. When mercurial barometers are lent by the Meteorological Office, there is not only the initial cost, and the cost of maintenance, but the cost of frequent transfers from ship to ship is considerable, and is attended by risk of breakage, and a good deal of work by the Port Meteorological Officers and Merchant Navy Agents, to say nothing of the necessary store-accounting.

Seeing the value of their voluntary work to seamen and shipping of all nations as well as to the Meteorological Services of the world, Marine Observers are asked to take special care of barometers whether they belong to their ships or are lent by the Meteorological Office.

They will receive every possible assistance from the Port Meteorological Officers and Merchant Navy Agents who examine instruments on board regular observing ships at regular intervals.

Guidance for the handling, care and use of Barometers is given in THE MARINE OBSERVER'S HANDBOOK.

A well kept barometer reflects credit upon the officers of a ship.

MARINE SUPERINTENDENT.

London,
11th June, 1932.

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.

TIDE RIP.

Caribbean Sea.

THE following is an extract from the Meteorological Log of S.S. *Clan Malcolm*, Captain L. S. GEORGE, New York to Trinidad. Observer, Mr. R. W. COOK, 2nd Officer.

September 26th, 1931, at 2 a.m. A.T.S. (0600 G.M.T.) in Latitude 11° 14' N., Longitude 62° 00' W. encountered strong tide rips running in S.E. and N.W. direction, steering affected by same, starboard helm. Weather, light S.E. wind, slight sea, E'ly swell. Temperature and density of water 82°, 1021, distinct rumbling noise as passing through same. From noon position Latitude 13° 20' N., Longitude 62° 22' W. to position Latitude 11° 14' N., Longitude 62° 00' W. set and drift 90° 6 miles.

PHOSPHORESCENCE.

Arabian Sea.

THE following is an extract from the Meteorological Log of S.S. *Elpenor*, Captain R. J. WILSON, Suez to Penang. Observer, Mr. F. STOTT.

September, 11th, 1931, at 10 p.m. encountered numerous patches of vivid phosphorescent water. These patches seemed to arise from the depths of the ocean, the water swirling as if there was an upward and spiral movement.

At midnight the same phenomenon was observed in more pronounced form, the observer then finding that a ray of light from a torchlight was instrumental in producing the phosphorescent effect wherever shown. Weather conditions overcast and gloomy. Wind N.W. by N. force 2. The sky at times mentioned was enshrouded in a veil of Cirro-Nebula. Position of ship, Latitude 9° 12' N., Longitude 69° 20' E.

At midnight of the 12th several specimens of the small animalculæ which are mentioned in THE OBSERVER'S HANDBOOK were obtained. These were found moving in the canvas container when the observer took the sea temperature. Each emitted a brilliant blue light, and in size was similar to that of common lice. Position of ship, Latitude 7° 37' N., Longitude 74° 43' E.

DISCOLOURED WATER.

Arabian Sea.

THE following is an extract from the Meteorological Record of M.V. *Durenda*, Captain J. MOON, Suez to Karachi. Observers, Messrs. R. BRIGNAL, 3rd Officer, and A. R. MAC TAVISH, 4th Officer.

6th September, 1931, in Latitude 18° 25' N., Longitude 59° 21' E., 6.30 p.m. A.T.S. Wind S.S.W. force 4. Swell S.W. 4. 6.40 p.m. A.T.S., wind and sea dropped suddenly to force 1, the swell almost completely disappearing. The colour of the water changed from a dark greeny black to a very light clear green, the temperature rising slightly, and the barometer and air temperatures remaining constant.

7.30 p.m. A.T.S. Colour of sea turned to a dirty white, looking like sheet ice. Latitude 18° 46' N., Longitude 59° 42' E. 9.00 p.m. A.T.S., weather conditions became normal. Wind S.S.W. force 3, swell S.W. 3, sea S.S.W. 2.

7th September, 00.10 a.m. A.T.S. in Latitude 19° 10' N., Longitude 60° 20' E., the above phenomenon again observed. 00.20 a.m. A.T.S. sky became suddenly overcast. 00.30 a.m. A.T.S. sky commenced to clear and sea returned to its normal aspect.

DEAD FISH.

Arabian Sea.

THE following is an extract from the Meteorological Record of S.S. *Modasa*, Captain J. W. GILCHRIST, East Africa to London.

September 1st, 1931, at 1500 G.M.T. observed numbers of dead fish, floating in water. About the same time observed a remarkable drop in temperature of sea surface of from 72° to 60° within a few minutes. Wind S.S.W. strong, rough sea and moderate swell.

Position of ship, Latitude 10° 00' N., Longitude 51° 26' E.

NOTE:—

On August 27th, 1931, large quantities of dead fish were seen in the same region by S.S. *Atreus*. An account of this observation will be found in the Marine Observer's Log for August. In both cases a considerable drop of sea temperature was recorded. The death of so many fish may have been due to this cause but on the other hand sea temperature variation is not uncommon in approaching Ras Hafun. In THE MARINE OBSERVER Volume VII, 1930, p. 168, observations made on board S.S. *Somerset* were published. In this case a drop of 16° in sea temperature was recorded between 8 a.m. and noon on August 29th, 1929.

FISH SPAWN.

South African Waters.

THE following is an extract from the Meteorological Record of S.S. *Tactician*, Captain F. TRINICK, O.B.E., Liverpool to South African Ports. Observer, Mr. E. P. SIMMONS, 3rd Officer.

September 13th, 1931, from 1100 to 1430 G.M.T., between Latitude 33° 00' S., Longitude 28° 12' E. and Latitude 33° 27' S., Longitude 27° 31' E., passed through large patches of fish spawn, bright red in colour, and disposed in lines in a N'ly and S'ly direction as far as eye could see. At times thick enough to prevent the bow wave from breaking, the action being similar to that of oil. Temperature, Sea 72°. Wind S.S.E. force 3. Long heavy S'ly swell. Believed to be salmon spawn; for the reason that large shoals of salmon had been reported recently off the coast in this neighbourhood.

AURORA.

Bay of Fundy.

THE following is an extract from the Meteorological Log of S.S. *Manchester Hero*, Captain G. M. MITCHELL, St. John N.B. to Baltimore. Observer, Mr. M. BARNES, 3rd Officer.

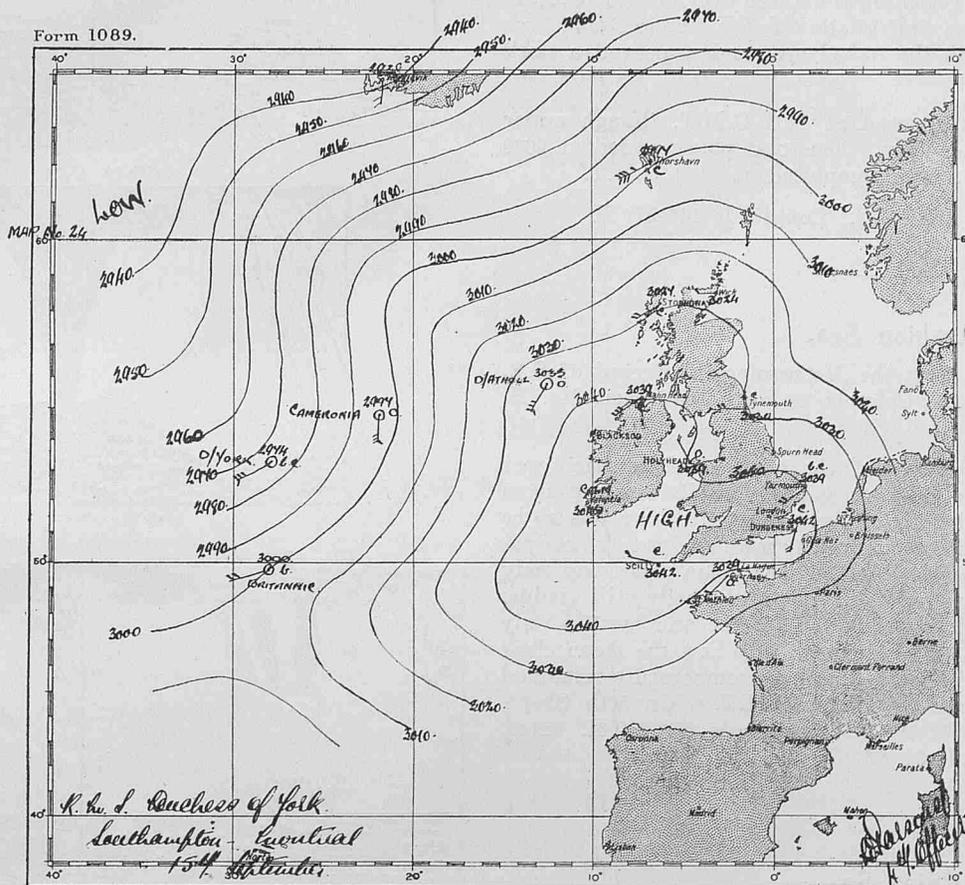
September 4th, 1931, at 11.15 p.m. A.T.S. auroral lights were seen extending from N.N.W. to N. by E. in a fan-shaped formation. The rays on the outer edge were of the greatest brilliance and highest altitude, approximately 6° above the horizon and disappeared before they finally reached the horizon. The inside beams of light, five in number, attained an approximate altitude of 3° to 4° though much weaker in power. The character of the lights appeared to be constant in altitude and brightness and remained so until they faded away about 11.50 p.m. The night at this time was exceptionally clear, a light breeze from the N.N.W., and the shore lights, Gannet Rock and Brier Island being seen for 24 and 27 miles respectively, which allowing for the height of eye on board is more than the calculated distances. Position of ship, Latitude 43° 40' N., Longitude 67° 15' W.

WEATHER CHART MADE AT SEA.

Eastern North Atlantic.

Weather Chart made at sea on board S.S. *Duchess of York*. Commander R. N. STUART, V.C., D.S.O., R.N.R., Southampton to Montreal by Mr. D. PARSONS, 4th Officer.

0600 G.M.T., 15th September, Latitude 53° 21' N., Longitude 27° 52' W. Course 275°. Speed 17.0 Knots.



FORECAST.—0600, 15th September, till 0600 16th September. Moderate winds between S. and W. ; Cloudy with probable rain and moderate visibility.

ACTUAL WEATHER.—Wind S.W. by W.4, backed to S.S.W.5, then veered to W. by S.3 at 1630, and falling light at 0000 hours and backing to W.S.W. Weather fair becoming overcast with light drizzle and misty weather, 1640 mist cleared remaining overcast.

LUNAR FOGBOWS.

North Atlantic.

THE following is an extract from the Meteorological Record of S.S. *Minnetonka*, Captain T. F. GATES, C.B.E., London to New York. Observer, Mr. H. E. D. McCARTNEY, 5th Officer.

September 6th, 1931, while traversing a small patch of thin fog observed a double lunar bow. Weather blue sky with occasional small patches of thin fog. Air 61°, Sea 61°. The moon being one day past her last quarter was very bright, and bearing east almost right astern of the ship, a bow was observed to form right ahead of the ship and from the bridge appeared to arch over the fore-castle almost touching it, and extending to the water equidistant on either bow.

The spectrum was easily discernable though not brilliant, the red and green mostly. Above this bow appeared a pale yellow bow about five degrees removed from the violet of the primary and concentric with it.

The phenomenon lasted for about ten minutes, the period of greatest luminosity being noticed about three minutes after the appearance and lasting for about two minutes.

Position of ship approximately Latitude 40° 50' N., Longitude 67° 30' W.

SOLAR HALOS.

North Indian Ocean.

THE following is an extract from the Meteorological Record of S.S. *Karapara*, Captain R. W. WHITE, Penang to Rangoon. Observer, Mr. J. B. WALKER, 2nd Officer.

September 7th 1931 at Noon (A.T.S.) observed double halo of the sun, the first halo was very distinct and well-defined, the colours were red nearest the sun then outside this, orange, yellow, and green. The radius was approximately 18°. At 01.40 A.T.S. the second halo appeared with its arc cutting that of the first halo and passing about 10° from the sun's upper limb, although not so well-developed as the first halo, prismatic colours were observable. The clouds near the sun were Alto-stratus and Cirro-stratus. Nimbus clouds were observed, to the west. At 02.30 A.T.S. this phenomenon disappeared.

Barometer 29.77 in. Temperature Air 86°, Sea 83°.

Position of ship. Latitude 13° 07' N. Longitude 96° 50' E.

NOTE.—This is an interesting example of abnormal halo phenomena. The halo first observed was rather smaller than the common halo which has a radius of about 22°. The second one is of a type rather rarely seen, neither having the sun at its centre nor forming an arc of contact to any of the more usually observed halos. A somewhat similar example will be found in Figure 16 of THE MARINE OBSERVERS HANDBOOK.

ECLIPSE OF THE MOON.

South African Waters.

THE following is an extract from the Meteorological Log of S.S. *Australia*, Captain W. SCUTT, Liverpool to Fremantle via Cape of Good Hope. Observer, Mr. L. W. SMITH, Chief Officer.

September 26th, 1931. Total eclipse of the moon, at 1745 G.M.T. observed lower limb of moon becoming shadowed over, at 1831 G.M.T. moon was approximately one half shadowed the portion that was dark being easily visible with the naked eye, and appeared a dark reddish-brown.

The moon was completely covered at 1905 G.M.T. though upper limb still showed up fairly brightly. The total phase ended at 2030 G.M.T., and the phenomenon was completed at 2142 G.M.T.

Position of ship Latitude $33^{\circ} 29' S.$, Longitude $14^{\circ} 57' E.$

Arabian Sea.

THE following is an extract from the Meteorological Record of S.S. *Bendigo*, Captain F. N. WYATT, Colombo to Suez. Observer, Mr. H. MORGAN, 2nd Officer.

26th September, 1931. The sky at the time of observation was practically free from clouds, only occasional Cu-Nb crossing from the Westward. At 1740, a shadow of light reddish colour was to be seen on the northern face of the moon and 13 minutes later the eclipse began, moving from north-south. At 1901 the moon was completely covered by a moderately dark reddish shadow, the body still visible. By 2032 the northern portion began to get lighter and by 2144 only a shadow similar to that at 1740 remained, 2155 saw the moon clear again. Nothing unusual was witnessed and the temperature remained steady throughout. All times given are G.M.T. On 26th Ship's Position:—1740. Latitude $09^{\circ} 16' N.$, Longitude $65^{\circ} 53' E.$ 2144, Latitude $09^{\circ} 25' N.$, Longitude $64^{\circ} 55' E.$

China Sea.

THE following is an extract from the Meteorological Log of S.S. *Aeneas*, Captain W. K. WALLACE, Shanghai to Hong Kong. Observer, Mr. H. D. RUDD, 3rd Officer.

27th September, 1931, 3 a.m. (standard time) total eclipse of the moon observed. A faint brownish shadow covered the whole of the moon, through which the moon was still visible. Owing to the presence of numerous junks and fishing vessels, no other data was obtained. Position of ship in vicinity of Latitude $30^{\circ} 00' N.$, Longitude $122^{\circ} 30' E.$

WATERSPOUT.

Gulf of Mexico.

THE following is an extract from the Meteorological Log of S.S. *Cerinthus*, Captain N. RAMSAY, Manchester to Port Arthur, Texas. Observer, Mr. V. H. KIRKLAND, 3rd Officer.

On September 9th, 1931, about 11.30 a.m. A.T.S. a heavy thunderstorm was noticed to be approaching from the westward, the base of a large Cumulo-Nimbus was observed to be very ragged and torn. At 00.10 the spout was seen to be forming and the sea being whirled round, as far as could be seen in an anti-clockwise direction, and being lifted to a height of about 15 feet (Fig. 1). At 00.12 the spout joined with sea, at 00.13 it became very narrow and dark for about half its length (Fig. 3), half a minute later it seemed to rapidly return to the cloud and then apparently divided into three, the sea still remaining very disturbed (Fig. 4). At 00.15 a small narrow spout suddenly appeared, joined the sea and then almost immediately receded into the cloud again. No further signs of sea disturbance or spouts were observed again. Barometer 1012.5 mb. Air 85° , Wet Bulb $80^{\circ}.8$, Sea $85^{\circ}.5$, Light airs with smooth sea, Clouds Cirro-Stratus and Cumulo-Nimbus 9/10ths during the whole phenomenon;

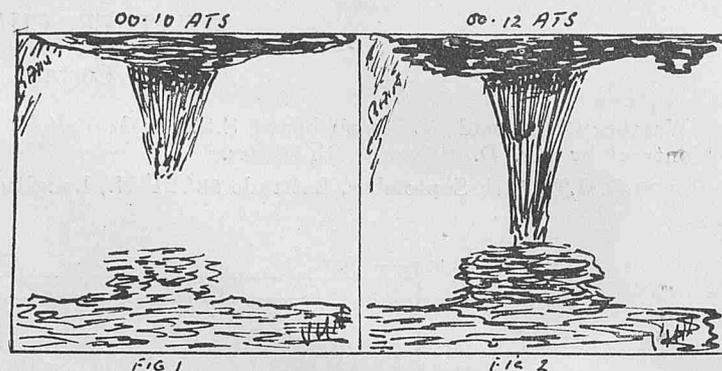


FIG 1

FIG 2

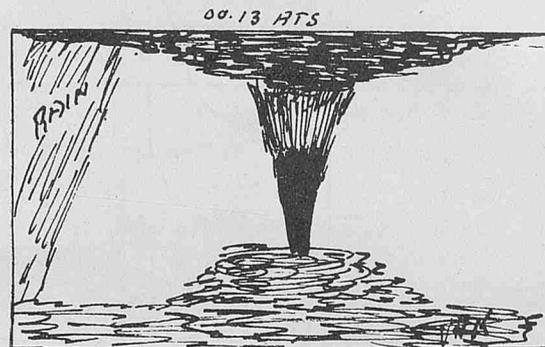


FIG 3

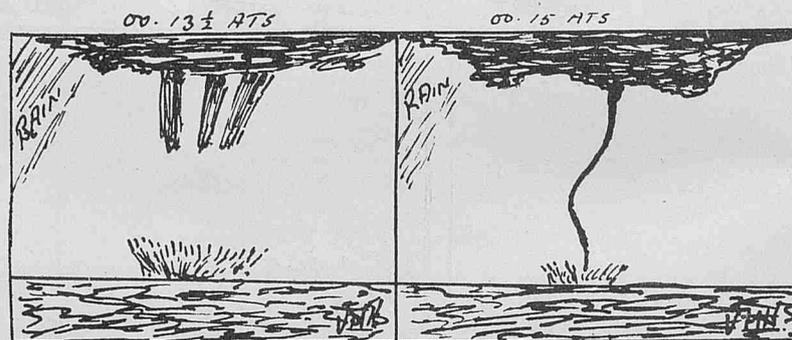


FIG 4

FIG 5

lightning was very vivid especially near the spout. Shortly after the vessel passed under the bank of clouds and experienced a light rain shower with continual blasts of hot and cold air from the N.E. force 3.

Position of ship Latitude $27^{\circ} 54' N.$, Longitude $90^{\circ} 20' W.$

METEORS.

Gulf of Suez.

THE following is an extract from the Meteorological Record of S.S. *Atreus*, Captain J. H. WILLCOX, Jibuti to Suez. Observer, Mr. E. A. H. GEPP, 3rd Officer.

On September 2nd, 1931, at 2031 G.M.T. (10.42 p.m. A.T.S.) observed a brilliant meteor which appeared as a big falling ball of fire.

Owing to the awnings being spread over the bridge, the point of origin of this meteor was not observed, but it appears to have been somewhere right overhead, near the "Great Square of Pegasus", its flight being straight down the Gulf, in a S.S.E'y direction, the period of flight being about 3 seconds, and the point of its sudden disappearance about 15° about the horizon.

The meteor had the appearance of being very close to the ship, possibly owing to its large diameter and great brilliancy. No tail was observed behind it. Despite the fact that the moon, five days after full, had risen about 15° , and was casting quite a good light, this meteor gave rise to an unexpectedly brilliant illumination during its flight, causing rapidly moving shadows to be cast on the white paintwork of the bridge by the funnel and other objects, the intensity of which illumination was considerably more than that caused by the beam of Ras Abu Deraj Light, so much so that the

momentary impression gained, before looking aft and observing the meteor in the sky, was that someone had switched on one of the arc-lights on the mainmast, and let it fall suddenly from aloft. Other smaller meteors were observed during the watch. Very good visibility. Clouds:—A few small clusters of cumulus clouds over the hill tops.

Position of ship:—In the Gulf of Suez, Latitude $29^{\circ} 30' N.$, Longitude $32^{\circ} 35' E.$, 7 miles north of Ras Abu Deraj Light, Course $N. 23^{\circ} W.$

Red Sea.

THE following is an extract from the Meteorological Record of S.S. *Pyrrhus*, Captain A. L. DAVIS, Suez to Penang. Observer, Mr. E. M. ROBB, 3rd Officer.

On the night of September 8th, 1931, a meteor of unusual brilliancy was observed at 2055 G.M.T., 11.24 p.m. at ship. Estimated bearings and altitudes of its appearance and disappearance (200° , altitude 70° and 220° , altitude 18°) gave those positions to be Declination $5^{\circ} N.$, R.A. 22h. 02m. and Declination $33^{\circ} S.$, R.A. 20h. 25m., respectively; the duration of visibility being about $1\frac{1}{2}$ seconds in a clear sky.

The brilliancy of this meteor was exceptional, it having been first observed through the cloth of an awning, when it gave the impression of a magnesium flare being burned just overhead and brilliantly illuminating the ship. Its size was quite apparent, the diameter being estimated at about 7 minutes of arc, its colour being brilliant white with a faint bluish tinge. Upon its suddenly burning out a dull red patch seemed to travel onwards in its place for a fraction of a second, continuing the fall to about 12° or 13° above the horizon. No sound was audible, though it would appear that the meteor was comparatively close to the ship. Position of ship, Latitude $23^{\circ} 45' N.$, Longitude $36^{\circ} 37' E.$

CURRENTS IN THE PERSIAN GULF, NORTHERN PORTION OF ARABIAN SEA, BAY OF BENGAL, ETC.

II.—The S.W. Monsoon Period.

In this article a description of the currents shown on the Marine Observer Charts for the two quarters May to July and August to October will be given. These charts cover the period when the S.W. Monsoon is blowing north of the equator and includes the transition month of October. The different regions will be described in the same order as was used in the first article.

Currents of the Persian Gulf.—The charts show no definite system of currents in the Persian Gulf and the mean currents are weak. The roses indicate that westerly and south-easterly currents are the most frequent, while sets between N. and E. are seldom experienced and are very weak. Stronger sets due N., however, occur in the quarter May to July. The maximum drift observed in the Persian Gulf for the period 1910 to 1931 was 31 miles per day, N. $67^{\circ} W.$, recorded by S.S. *Barpeta* on 12th May, 1925, in Latitude $27^{\circ} 18' N.$, Longitude $51^{\circ} 42' E.$

Currents of the North Arabian Sea.—The charts now being published do not cover the entire Arabian Sea, the southerly part having been already included in the Marine Observer charts for 1930. While the actual currents experienced in the North Arabian Sea are variable, like those of every other part of the ocean, the mean currents during the quarter May to July are very regular. The Arabian sea is for practical purposes a large bay, roughly semi-circular in form, and there is an unbroken flow of mean current round the coastal regions in May to July. The mean current also flows directly across the Sea but sets due E. only in the centre of the Sea. The only region which is outside this main circulation is the Gulf of Oman where the mean set in these three months is southerly and very weak. The strongest flow of current is found along the S.E. coast of Arabia, with mean drifts of 15 to 18 miles per day, while the areas of weakest flow are two in number, along the Makran coast and south of the centre of the Sea. The current down the west coast of India is very well-defined from Bombay to Cape Comorin.

In the region Latitude $12^{\circ} N.$ to $14^{\circ} N.$, Longitude $68^{\circ} E.$ to $72^{\circ} E.$, the mean current is S. in the quarter May to July. The chart for the same quarter published in the 1930 volume of THE MARINE OBSERVER shows south-easterly sets in the neighbourhood of, and to the west of, Minikoi. The southerly flow above referred to is probably connected with these south-easterly sets, forming a continuous sweep round of current towards Minikoi from latitude $14^{\circ} N.$

In the quarter August to October the same general system of current prevails in the North Arabian Sea but the mean sets are weaker and less uniform over the greater part of the region. The decrease is particularly marked off the Arabian Coast where the mean drifts are reduced to about half of what they were in the quarter May to July. In contrast to this general statement the

current down the west coast of India, south of Latitude $18^{\circ} N.$, fully maintains its strength in the quarter August to October.

It is evident from the charts for both quarters that the current which was supposed to flow from Ras al Hadd north-westwards into the Gulf of Oman, and referred to in the first article, does not exist. There is, on the other hand, a southerly or south-easterly mean flow out of the Gulf towards Ras al Hadd, more particularly in the quarter August to October.

The maximum drift observed in the North Arabian Sea during the period 1910 to 1931 was at the rate of 69 miles per day, N. $67^{\circ} E.$, recorded by S.S. *Rialto* on 30th October, 1924, in Latitude $14^{\circ} 53' N.$, Longitude $51^{\circ} 04' E.$

Currents of the Bay of Bengal (including the Andaman Sea).—In the quarter May to July there is a system of currents in this region, essentially similar to that of the Arabian Sea. In comparing the regions of the Bay of Bengal and the Arabian Sea, we must, however, include the southern part of the Arabian Sea shown on the charts published in 1930. The stronger E. and N.E. sets shown on the chart of the Bay of Bengal south of Latitude $10^{\circ} N.$ in the quarter May to July have their counterpart in similar latitudes between the African Coast and Cape Comorin.

As in the North Arabian Sea the strongest mean sets are up the western side of the Bay, along the Coromandel Coast past Madras. There is, however, no southerly set down the south-eastern side of the Bay corresponding to the current of the west coast of India. Apart from this essential difference we see that the currents of the Bay of Bengal, north of Latitude $10^{\circ} N.$, are not quite so strong as those of the North Arabian Sea, particularly in the centre of the Bay. The mean sets also are less uniform.

One further important difference must be specially remarked. In the North Arabian Sea the circulation round the coasts extends, though with somewhat less strength, fully up to the head of the Sea, which is formed by the Makran coast. In the Bay of Bengal, where the head is smaller and more enclosed, the main clockwise circulation does not extend north of Latitude $18^{\circ} N.$ Between Latitude $18^{\circ} N.$, and the head of the Bay is a small complete circulation in the opposite or counterclockwise direction.

In the quarter August to October the mean current in the Bay of Bengal weakens very considerably. In particular the north-easterly current up the Coromandel Coast almost disappears. The same weakening occurs in this quarter in the easterly current in the region south of Latitude $10^{\circ} N.$, eastward of Ceylon, and also in the easterly current of the southern part of the Arabian Sea shown in the 1930 chart.

The maximum drift observed in the Bay of Bengal during the period 1910 to 1931 was 93 miles per day, N. 62° E., recorded by S.S. *Arracan* on 9th August, 1923, in Latitude 7° 22' N., Longitude 83° 28' E.

The general weakening of the currents of the Arabian Sea and the Bay of Bengal in August to October may be explained by reference to the S.W. Monsoon. This is generally speaking somewhat weaker over the whole region in August and September than in June and July. Furthermore, the chart for the third quarter includes the transitional month of October. In the month of May, which is included in the second quarter, the S.W. Monsoon is not fully established but considerably more S.W. wind is experienced than in October. The greater strength of the currents in the North Arabian Sea than in the Bay of Bengal, in both quarters, may also be explained by the fact that the Monsoon is strongest, generally speaking, in the Arabian Sea. In July, for example, the Monthly Meteorological Chart of the East Indian Seas show a considerably higher percentage of gales from a south-westerly direction than in the case of the Bay of Bengal.

The small counterclockwise circulation at the head of the Bay is again seen on the chart for August to October. In the small area north of Latitude 20° N. and west of Longitude 88° E., lying to the south-west of the mouth of the Hugli River, the mean drift, based on 11 observations, is 17.5 miles per day. This is the greatest mean drift shown during this quarter, not only in the Bay of Bengal but also in the whole chart. The other mean sets in this small circulation, north of Latitude 18° N., are not appreciably greater than in the quarter May to July, but on the other hand the chart for August to October affords some evidence that the circulation commences on the eastern side of the head of the Bay from as far south as Latitude 16° N. (Cape Negrais).

The existence of this small circulation as a whole does not appear to have been previously recognised. In the Admiralty Current Chart for September there is evidence of the entire circulation, starting from Latitude 14° N. on the eastern side of the head of the Bay, but no reference is made to the circulation in the written accounts of the currents in the Sailing Directions. That part of the circulation comprised by the S.W. set of current down the western side of the Bay is also shown on the Admiralty Current Charts for July and August. There is a partial reference to this south-westerly set in previous accounts of the currents, but it was included in the first article mainly on the evidence of the Admiralty Charts. On the other hand in Somerville's "Ocean Passages of the World", the following statement is made:—"Head of bay.—The currents here are practically the same in direction, according to the time of year, as on the west coast but with less speeds".

Currents in the Neighbourhood of Ceylon.—The current on the west side of the Bay of Bengal shows a definite point of division. South of Latitude 10° N., the mean current flows S. and S.E. down the east coast of Ceylon; north of Latitude 10° N., it flows up the east coast of India with N.N.E. and N.E. sets. This applies mainly to the quarter May to July. In the quarter August to October the north-flowing current is, as previously stated, much less in evidence. There is still, however, a definite point of division at Latitude 12° N., south of which the current sets S.E.

Currents of the Malacca Strait.—The rose for the quarter May to July shows a preponderance of current out of the Strait with sets from N. to W. In the quarter August to October the sets are much more evenly distributed in all directions giving on the mean a slight southerly set into the Strait.

Currents of the Indian Ocean West of Sumatra.—South of Latitude 4° N. off the west coast of Sumatra the mean sets shown are irregular, while many of them are weak and most of them depend on a small number of observations. In the chart for May to July there is evidence, between Longitude 88° E., and 96° E., of a flow of current which would connect the easterly Counter-Equatorial Current of the Indian Ocean with the westerly Equatorial Current, the sets being successively S.E., S. and S.W. The sets here, however, are different in the quarter August to October.

In the Marine Superintendent's note on Currents in Indian Waters published in the March number of the present year attention was drawn to the statements that very strong currents occur during

cyclones and that a strong westerly current is experienced at the head of the Bay before the approach of a cyclone from the Bay. In response to the Marine Superintendent's request for information on these points several replies have been received and quotations from these will be given below. An investigation has also been made by taking individual observations of strong currents near the head of the Bay and ascertaining whether cyclones were in the neighbourhood at the time of each current observation, or within two or three days before or afterwards. For this purpose all available current observations for the period 1910 to 1931 were examined and those in which the current equalled or exceeded 24 miles per day were selected.

Of the 257 observations of current used in preparing the Marine Observer charts for the region from Latitude 18° N. to the head of the Bay, during the six months May to October, only 37 were found to indicate drifts equalling or exceeding 24 miles per day. Of these observations 28 were fully examined, as Indian weather charts were not available for the remainder. Of these 28 observations, exactly half the sets were found to occur at the time when cyclones or depressions of varying intensity were in the Bay while the other half were observed in the absence of cyclones. It must be noted, however, that not all of these strong currents had a westerly set. Of the 14 currents occurring with cyclones, 8 had sets between S. and W. while 6 had sets between N. and E. The number of westerly and easterly sets with strong drifts in the absence of cyclones was equal, 7 in each case. Furthermore, the average drift of the 8 westerly sets occurring with cyclones is 32 miles per day and that of the 7 westerly sets in the absence of cyclones is 31 miles per day, so that there is no real difference. The greatest drift observed in this region was 45 miles per day, in the absence of a cyclone, the next highest being 43 miles per day, occurring with a cyclone.

The figures above given thus show that as far as our information goes neither the occurrence nor the actual set or drift of strong currents near the head of the Bay depends on the vicinity of a cyclone. It must, however, be remembered that the observations used were made on ships steaming to or from the Hugli River. Strong westerly currents might exist near the head of the Bay not extending far from the shore. The width of such a current would, therefore, be only a small part of the day's run.

The following quotations are extracted from the replies received in response to the Marine Superintendent's Note:—

Captain R. W. HOCKING, S.S. *Talma*.

"I have often heard of the very strong currents said to be set up immediately before and during the presence of a storm in the Bay, but I have never personally experienced them.

On the other hand, currents alternating in direction in narrow streaks over short distances and running with considerable velocity, at times perhaps, as much as four knots seem to be well authenticated."

Captain C. C. GWYN, S.S. *Tairea*.

"Regarding cyclones I have found it impossible to get accurate observations of currents, owing to the various distances, the bearings of the centres from the vessel, the extent of the disturbances, and also the position of the vessel in the Bay.

When cyclones are situated in the Northern part of the Bay, I have found that they cause a strong Westerly set. The pilot vessel stationed off the Sandheads would be able to give more detailed information on the subject than a vessel which is constantly altering her position.

With cyclones off the Madras coast I have experienced strong Southerly sets, as much as 100 miles during the 24 hours.

During a cyclone in the Bay in October, 1930, this vessel experienced a Southerly set of 5 miles per hour."

Captain F. DOLTON, S.S. *Karua*.

"With reference to the paragraph referring to a strong Westerly current at the Head of the Bay during a cyclone, I have never experienced this set although I have heard of it, and have been several times in that part of the Bay during a cyclonic storm."

Captain T. C. WEATHERBY, S.S. *Shirala*.

"As to the excessive westerly set experienced at the head of the

Bay after a cyclonic storm, I have never experienced it personally. I certainly think that a cyclonic storm is liable to upset the currents all over the Bay or at any rate that portion of the Bay that lies within the area of disturbed weather."

Mr. F. H. A. LENDRUM, Branch Pilot of the Bengal Pilot Service, has also stated that in his opinion the westerly current at the head of the Bay may strengthen to as much as 4 to 5 knots before an advancing cyclone.

A few examples of the actual strong current observations investigated will now be given, showing their relation to cyclonic conditions. The first three are of westerly sets before cyclones.

S.S. *Astronomer*, Captain J. RICHARDS, Perim to Calcutta. On September 14th, 1926, "From noon to embarkation of Pilot 5.45 p.m., a strong current was experienced setting S. 60° W., true 2.0 knots. This is the usual experience when a storm is travelling from the direction of the Andaman Islands as is the case now, and travelling to W.N.W." The cyclone was centred in Latitude 17° N., Longitude 89° E. on this day.

S.S. *Shadwell*, Captain W. H. KNOX, London to Calcutta. From noon June 1st, 1914, to noon June 2nd, a current of S. 37° W., 43 miles per day was observed, the mid-position being Latitude 19° 44' N., Longitude 86° 58' E. There was an almost stationary depression centred on June 1st at the head of the Bay in Latitude 20° N., Longitude 88° E. This intensified into a cyclone on June 2nd and became severe the next day.

S.S. *Gryfevale*, Captain J. W. STEEL, Calcutta to Karachi. From 3.40 p.m. on May 12th, 1914, at Sandheads to noon May 13th a current at the rate of 33 miles per day, S. 33° W., was recorded, the mid-position being Latitude 19° 33' N., Longitude 87° 29' E. On the next day, May 14th, the ship encountered winds of force 10 and heavy seas. A depression was centred on May 13th in Latitude 14° N., Longitude 91° E., near the Andaman Islands.

The next example is of a north-easterly current experienced near the head of the Bay before a cyclone.

S.S. *Garryvale*, Captain W. H. McCLURE, Calcutta to Rangoon. From noon on August 26th, 1912, to noon on August 27th a current of 30 miles per day, N. 51° E., was recorded, the mid-position being Latitude 19° 01' N., Longitude 90° 40' E. The wind was at first south-easterly but veered to S.W. by S. and rose to force 5 on the morning of the 27th. A cyclone had formed in the centre of the Bay and was strong on the 26th, thence very slowly moving northward till it passed inland over the head of the Bay on the 29th.

The next two are examples of westerly sets associated with fresh winds but not with cyclones.

S.S. *Malakand*, Captain T. A. TYSON, Calcutta to London. From 2.30 a.m. to noon July 22nd, 1921, a current at the rate of 23 miles per day, S. 13° W., was recorded, the ship's position at noon being Latitude 19° 25' N., Longitude 87° 33' E. The strength of the S.W. Monsoon experienced rose to forces 7 and 8 on the 23rd with heavy squalls of hurricane force and was still as high as forces 6 and 7 on the 24th. There was no cyclone in the Bay. Though one mile per day under the limit assigned for the currents examined, this example has been included as of special interest.

S.S. *Matheran*, Captain N. P. CORNISH, Calcutta to Colombo. From 2 a.m. to noon October 6th, 1922, a current at the rate of 24 miles per day, S. 11° W., was recorded, the ship's position at noon being Latitude 19° 02' N., Longitude 87° 22' E. The force of the Monsoon experienced was 4 on October 6th, with rain and wind squalls and it did not decrease to force 3 until the evening of the 7th. There was no cyclone in the Bay.

The next example is of a strong westerly set not associated with a cyclone. Though the barometer was somewhat low over the Bay, with rain, there was no strong wind and no definite depression developed.

S.S. *Hatimura*, Captain S. R. LANE, Aden to Calcutta. From noon October 9th, 1927, to noon on the 10th a current of 45 miles per day, S. 37° W., was recorded, the mid-position being Latitude 18° 37' W., Longitude 85° 22' E. The wind was westerly force 2 and fell calm on the evening of the 10th.

These examples will be concluded with two cases of north-easterly currents in the rear of cyclones which had passed inland from the head of the Bay.

S.S. *Novara*, Captain COSSEY, Calcutta to Bombay, "Experienced a cyclonic storm down Hugli River July 27th to 29th". At 10.40 a.m. the pilot left and the current to noon (position not stated) was at the rate of 31 miles per day, N. 44° E., with high S.W. sea and wind S.W. force 6.

S.S. *Macharda*, Captain W. O. TYERS, Calcutta to Suez, from noon June 17th, 1927, to noon June 18th, recorded a current of 28 miles per day, N. 29° E., the mid-position being Latitude 19° 26' N., Longitude 87° 35' E. A cyclone was centred on the coast in Latitude 20° N., Longitude 86° E., on the morning of June 17th, which moved inland W.N.W. on the 18th. The wind experienced during the time of the current observation was S.S.W., force 8, with sea S.S.W. decreasing from 8 to 7.

The conclusion which we are entitled to draw from this investigation is as follows. It must, however, again be emphasised that narrow streaks of westerly current may exist close to the head of the Bay which will not be fully shown by the observations used. There is during the S.W. Monsoon period a small counterclockwise current circulation, occupying the region between Latitude 18° N., and the head of the Bay. The advance of a cyclone or a depression from the Bay will usually strengthen the westerly current at the head of the Bay which is part of the above normal circulation, but on the other hand a N.E. set is sometimes produced. The small circulation and westerly current is, however, strengthened at times in other ways, for example, by an increase in strength of the S.W. Monsoon, and possibly also by other causes, as yet unrecognised. The increase in the westerly current is therefore not an infallible indication of the advent of a cyclone. Furthermore, the stronger cyclones are liable to produce other temporary changes or strengthening of currents and in particular strong N.E. currents may be produced in the rear of a cyclone which has passed inland from the head of the Bay.

It has not been found possible to investigate the currents within the inner field of a strong cyclone owing to the difficulty or impossibility of getting sights in such conditions and nothing further can be added to the remarks made on this subject in the Marine Superintendent's Note.

SOUTHERN ICE REPORTS.

During the Year 1931—September.

No reports of Ice, sighted in the Southern Ocean during the month of September, in the year 1931, have been received at the Meteorological Office.

WEATHER SIGNALS.

I.—SHIPS' WIRELESS WEATHER SIGNALS.

Urgent Meteorological reports should be made at any time. Any ship at any time encountering a tropical revolving storm should report to all ships and the appropriate station, continuing to report at intervals of three hours so long as the ship remains under the influence of the storm.

Ships experiencing gales in which the wind reaches Force 10 or above in the Beaufort Scale should inform all ships within range.

Ships encountering Ice or other navigational dangers should report immediately to all ships and the appropriate station; see instructions for Danger to Navigation Signals for all ships, pages 28 and 29, Vol. IX, No. 97.

For full particulars of "Selected Ships" Routine Meteorological Reports with Schedule for Communication, see pages 13 to 16, Vol. IX, No. 97.

See List of W/T Stations detailed to receive reports from **A Selected Ships** with particulars up to date below, also on Chart X.

In parts of the world where such stations and particulars are not given, British **A Selected Ships** should make their reports to **CQ**

on 2100 metres (143 kc/s) as stated on page 15, Vol. IX, No. 97 (January, 1932, MARINE OBSERVER).

B Selected Ships broadcast their reports to C.Q. on 600 m. spark, and these may be intercepted by the stations ringed in on Chart X. In making these reports to C.Q. "B Selected Ships" should make special endeavour to ensure that the report is received at these shore stations. With a view to assisting Meteorological Services who have provided information and to ensuring that routine reports from all "Selected Ships" within range of certain coast stations may be received by those services a list of stations specially detailed to receive reports from "B Selected Ships" is also given on pages 174 and 175. The procedure given on pages 13 to 16, Vol. IX, No. 97, should be adhered to as far as possible.

According to agreement reached by the International Meteorological Conference, 1929, all arrangements for the co-operation of shipping in Voluntary Marine Meteorological work are to be made through the Meteorological Services of the different countries in which the ships are registered, in accordance with the agreed upon International plan for all parts of the World, following the International Convention for Safety of Life at Sea, 1929.

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

Request for Information.

THE ATTENTION OF METEOROLOGICAL SERVICES IS INVITED TO THE INVITATION GIVEN ON PAGE 13 OF VOL. IX, NO. 97, JANUARY MARINE OBSERVER.

Ocean.	Station.	Position.	Call Sign.	Frequency and Wave Length.		Area and limits covered by Station.	Telegraphic address of Meteorological Centre.	Information required—Limit of Groups.	Notes.
				For Station to call up "Selected Ships."	For "Selected Ships" to report to Station.				
North Atlantic and North Sea.	Portishead.	Lat. 51° 28' 41" N. Long. 2° 47' 30" W.	GKU.	149 kc/s. (2013 metres).	143 kc/s. (2100 metres).	North Sea and Eastern North Atlantic East of Longitude 40° W. and North of Latitude 38° N. but not within 300 miles of station. (see Chart X.)	Weather London	Weather only, up to seven groups, preferably No. 3 Supplementary Groups.	Control system. "Selected Ships" chosen to report in given order notified by station daily at 2230, 0330, and 1030 G.M.T. Roll call thus—Weather London—call sign of chosen "Selected Ships" to report through GKU at schedule times on 2100 m. Radio Horta—call sign of ships to report through CTH at schedule times on 2400 m.
	Chatham Mass., Sayville N.Y. Rockland. West Palm Beach.	Lat. 41° 42' N. Long. 70° 00' W. Lat. 40° 45' N. Long. 73° 06' W. Lat. 44° 09' N. Long. 69° 13' W. Lat. 26° 42' N. Long. 80° 02' W.	WCC. WSL. WAG. WMR.		142.9 kc/s. (2098 metres).	North Atlantic West of Longitude 40° W.	Observer Washington.	Weather only. First four groups of observations taken at 0000 and 1200 G.M.T. only required.	No control. All British "A Selected Ships" within area to address their 0000 and 1200 G.M.T. observations to Observer Washington and their 1800 G.M.T. observations to CQ in accordance with schedule.
	Horta, Azores.	Lat. 38° 32' N. Long. 28° 38' W.	CTH.	125 kc/s. (2400 metres).	125 kc/s. (2400 metres).	"A Selected Ships" indicated by roll call made through Portishead to report to Horta—E'n. N. Atlantic, east of long. 40° W. and N. of lat. 35° N. "A Selected Ships" S. of lat. 38° N.—N. Atlantic from lat. 10° to 38° N. eastward of long. 40° W.	Radio Horta.	Weather only, up to seven groups, preferably No. 3 Supplementary Groups.	"A Selected Ship" in the E'n. N. Atlantic, N. of lat. 38° N., chosen to report to Horta will be indicated by a special roll call made through Portishead daily at 2230, 0330 and 1030 G.M.T. immediately following the roll call of selected ships chosen to report to Weather London These ships should report to CTH in the order indicated in accordance with schedule and on 2400 m. S. of 38° N., no control all British "A Selected Ships" within area should report in accordance with schedule.

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

(Continued.)

Ocean.	Station.	Position.	Call Sign.	Frequency and Wave Length.		Area and limits covered by Station.	Telegraphic address of Meteorological Centre.	Information required—Limit of Groups.	Notes.
				For Station to call up "Selected Ships."	For "Selected Ships" to report to Station.				
Mediterranean and Red Sea.									
South Atlantic.	Slangkop (Cape Town)	Lat. 34° 08' 46" S. Long. 18° 19' 18" E.	ZSC	—	143 kc/s. (2100 metres).	South Atlantic Westward of 25° E. and within a range of about 2,000 miles of station.	Met.	Weather only. Four universal groups and first group of No. 6 Supplementary groups.	No control. Only 0600 G.M.T. observation required. All British "A Selected Ships" within area should report, commencing at 0618 G.M.T.
Indian Ocean.	Jacobs (Durban).	Lat. 29° 55' 51" S. Long. 30° 58' 38" E.	ZSD	—	143 kc/s. (2100 metres).	Indian Ocean S. of 20° S. and Eastward of 25° E. and within a range of about 2,000 miles of station.	Met.	Weather only. Four universal groups and first group of No. 6 Supplementary groups.	No control. Only 0600 G.M.T. observations required. All British "A Selected Ships" within area should report, commencing at 0618 G.M.T.
	Bombay.	Lat. 19° 04' 55" N. Long. 72° 49' 54" E.	VWB	—	143 kc/s. (2100 metres).	Arabian Sea N. of line C. Comorin to Ras Fartak.	Weather.	Weather only. No. 6 Supplementary groups.	All British "A Selected Ships" are requested, when convenient, to report 0000 G.M.T. observations commencing at 0018 G.M.T. in addition to schedule times.
	Madras.	Lat. 12° 59' 17" N. Long. 80° 10' 56" E.	VWM	—	143 kc/s. (2100 metres).	Bay of Bengal N. of line C. Comorin to Achin Head.	Weather.	Weather only. No. 6 Supplementary groups.	All British "A Selected Ships" are requested when convenient, to report 1200 G.M.T. observations commencing at 1218 G.M.T. in addition to schedule times.
	Colombo.	Lat. 6° 55' 14" N. Long. 79° 52' 46" E.	VPB	130 kc/s. (2300 metres).	143 kc/s. (2100 metres).	Indian Ocean South of a line Ras Fartak, C. Comorin and Achin Head, and within a range of about 1500 miles.	Obs.	Weather only. No. 6 Supplementary groups preferred.	No control—all British "A Selected Ships" within area should report in accordance with Schedule.
	Mombasa.	Lat. 4° 03' 11" S. Long. 39° 39' 51" E.	VPQ	—	125 kc/s. (2400 metres).	From Ras Hafun to Lat. 26° S. when westward of the Colombo area.	Weather Nairobi.	Weather only. No. 6 Supplementary groups.	No control—all British "A Selected Ships" within area should report 0600 G.M.T. observations.
	Perth.	Lat. 32° 01' 51" S. Long. 115° 49' 31" E.	VIP	125 kc/s. (2400 metres).	143 kc/s. (2100 metres).	Indian Ocean and Southern Ocean between Long. 105° and 135° E.; but not within 100 miles of the coast.	Weather.	Weather only. No. 6 Supplementary groups.	No control—all British "A Selected Ships" within area should report in accordance with Schedule. Reports not required for observation times not starred on Chart I, p. 15, Vol. IX. No. 97 (January).
North Pacific and China Sea.	Cape d'Aguilar, Hong Kong.	Lat. 22° 12' 39" N. Long. 114° 15' 11" E.	VPS.		125 kc/s. (2400 metres).	China Sea and North Pacific to about 1,500 miles from station.	Royal Observatory.	Weather only, preferably No. 6 Supplementary Groups.	No control—all British "A Selected Ships" within area should report in accordance with Schedule.
South Pacific.	Sydney.	Lat. 33° 46' 00" S. Long. 151° 03' 09" E.	VIS	125 kc/s. (2400 metres).	143 kc/s. (2100 metres).	S. Pacific, Coral and Tasman Seas and Southern Ocean between Long. 135° and 160° E.; but not within 100 miles of the coast.	Weather.	Weather only. No. 6 Supplementary groups.	No control—all British "A Selected Ships" within area should report in accordance with Schedule. Reports not required for observation times not starred on Chart I, p. 15, Vol. IX. No. 97 (January).

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

Ocean.	Station.	Position.	Call Sign.	Telegraphic address of Meteorological Centre desiring information.	Information desired.	Notes.	
North Atlantic.	Horta, Azores.	Lat. 38° 32' N. Long. 28° 38' W.	CTH.	Radio Horta	Weather only, up to 7 groups, preferably No. 3 Supplementary Groups.		
South Atlantic.	Salinas	Lat. 0° 35' 00" S. Long. 47° 18' 45" W.	PPL.	Metereo Rio.	Weather only, including supplementary groups.		
	S. Luiz	Lat. 2° 31' 48" S. Long. 44° 16' 51" W.	PXM.				
	Fortaleza	Lat. 3° 46' 21" S. Long. 38° 32' 26" W.	PPC.				
	Natal	Lat. 5° 46' 41" S. Long. 35° 18' 24" W.	PXN.				
	F. Noronha	Lat. 3° 50' 24" S. Long. 32° 24' 48" W.	PXF.				
	Olinda	Lat. 8° 00' 35" S. Long. 34° 51' 00" W.	PP0.				
	Amaralina	Lat. 13° 00' 12" S. Long. 38° 30' 45" W.	PPA.				
	Abrolhos	Lat. 17° 57' 30" S. Long. 38° 41' 05" W.	PXH.				
	Victoria	Lat. 20° 10' 00" S. Long. 40° 17' 46" W.	PPT.				
	Rio	Lat. 22° 53' 42" S. Long. 43° 13' 24" W.	PPR.				
	Santos	Lat. 23° 56' 27" S. Long. 46° 19' 28" W.	PPS.				
	Florianopolis.	Lat. 27° 36' 00" S. Long. 48° 30' 18" W.	PPF.				
	Junçao	Lat. 32° 04' 00" S. Long. 52° 07' 00" W.	PPJ.				
Indian Ocean.	Jacobs (Durban).	Lat. 29° 55' 51" S. Long. 30° 58' 38" E.	ZSD	Met.	Weather only, 4 universal groups and first group of No. 6 Supplementary groups.		
	Algoa Bay (Port Elizabeth).	Lat. 33° 57' 16" S. Long. 25° 35' 30" E.	ZSQ	Met.		Weather only, 4 universal groups and first group of No. 6 Supplementary groups.	
	Calcutta.	Lat. 22° 33' 31" N. Long. 88° 20' 16" E.	VWC.	Weather.	Weather only up to 6 groups, No. 6 Supplementary Groups preferred.		
	Rangoon.	Lat. 16° 45' 57" N. Long. 96° 11' 51" E.	VTR.				
	Madras.	Lat. 12° 59' 17" N. Long. 80° 10' 56" E.	VWM.				
	Bombay.	Lat. 19° 04' 55" N. Long. 72° 49' 54" E.	VWB.				
	Karachi.	Lat. 24° 51' 05" N. Long. 67° 02' 32" E.	VWK.				
	Matara.	Lat. 6° 01' 07" N. Long. 80° 35' 39" E.	GZP.				
	Mombasa.	Lat. 4° 03' 11" S. Long. 39° 39' 51" E.	VPQ			Weather Nairobi.	
	Dar-es-Salaam.	Lat. 6° 50' 38" S. Long. 39° 17' 24" E.	ZBZ			Weather Nairobi.	
	Mauritius.	Lat. 20° 23' S. Long. 57° 35' E.	VRS.			Observatory Mauritius.	Weather 4 universal groups and first of No. 6 Supplementary Groups.
	Geraldton.	Lat. 28° 47' 15" S. Long. 114° 36' 24" E.	VIN			Weather.	Weather only, including No. 6 Supplementary Groups.
	Esperance.	Lat. 32° 01' 51" S. Long. 121° 53' 34" E.	VIE				

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

(Continued.)

Ocean.	Station.	Position.	Call Sign.	Telegraphic address of Meteorological Centre desiring information.	Information desired.	Notes.
North Pacific and China Sea.	Cape d'Aguilar, Hong Kong.	Lat. 22° 12' 39" N. Long. 114° 15' 11" E.	VPS.	Royal Observatory.	Weather only, preferably No. 6 Supplementary Groups.	
South Pacific.	Auckland.	Lat. 36° 50' 36" S. Long. 174° 46' 08" E.	ZLD.	Weather Wellington.	Weather only, up to 7 groups.	
	Wellington.	Lat. 41° 16' 26" S. Long. 174° 45' 55" E.	ZLW.			
	Awarua.	Lat. 46° 30' 27" S. Long. 168° 22' 21" E.	ZLB.			
	Chatham Island.	Lat. 43° 57' 02" S. Long. 176° 31' 04" W.	ZLC.			
	Rarotonga.	Lat. 21° 11' 54" S. Long. 159° 48' 51" W.	ZKR.			
	Apia.	Lat. 13° 15' 17" S. Long. 170° 49' 42" W.	ZMA.			
	Thursday I.	Lat. 10° 35' 14" S. Long. 142° 12' 43" E.	VII	Weather	Weather only, including No. 6 Supplementary Groups.	
	Townsville	Lat. 19° 16' 09" S. Long. 146° 49' 47" E.	VIT			
	Brisbane	Lat. 27° 25' 34" S. Long. 153° 07' 19" E.	VIB			
	Melbourne	Lat. 37° 46' 56" S. Long. 144° 52' 09" E.	VIM			
	Adelaide	Lat. 34° 51' 14" S. Long. 138° 31' 55" E.	VIA			

II.—WIRELESS WEATHER SIGNALS. WIRELESS WEATHER BULLETINS.

United States of America (Pacific Coast).

(C.W. Issues.)

San Francisco, California, W/T Station, approximate Latitude 38° 06' N., Longitude 122° 17' W., call sign **NPG**, broadcasts weather bulletins as follows:—

At 0330 G.M.T., and at 1530 G.M.T., on wavelengths of 7,000 and 2776 metres (C.W.) simultaneously.

The bulletins commence with the letters **USWB** (U.S. Weather Bureau) and are divided into two parts.

Part I is broadcast in code* and contains observations from the stations in the list below, taken at 0100 G.M.T. for the 0330 G.M.T., bulletin and at 1300 G.M.T., for the 1530 G.M.T., bulletin, except as follows, where the observations do not synchronise:—

St. Paul, Juneau, Kodiak and Dutch Harbour, Alaska, observations are taken at Midnight and Noon G.M.T. Observations at remaining Alaskan stations are taken at 1700 and 0500 G.M.T.

Honolulu observations taken at 0630 and 1830 G.M.T.

Guam, Manila, China and Japan observations taken at 2200 G.M.T.

Midway observations taken at 0630 G.M.T.

First Part.

Indicator Letters and Stations.

Indicator Letters.	Station.	Position (approx.).	
—	—	Latitude.	Longitude.
<i>Alaska.</i>			
NM	- Nome	- 64° 30' N.	165° 24' W.
SPI	- St. Paul	- 57° 15' N.	170° 10' W.
DH	- Dutch Harbour	- 53° 55' N.	166° 30' W.
TN	- Tanana	- 65° 10' N.	152° 06' W.
EA	- Eagle	- 64° 46' N.	141° 12' W.
KD	- Kodiak	- 57° 47' N.	152° 22' W.
CV	- Cordova	- 60° 32' N.	145° 42' W.
JU	- Juneau	- 58° 18' N.	134° 24' W.
<i>Canada.</i>			
ED	- Edmonton, Alberta	- 53° 33' N.	113° 30' W.
KA	- Kamloops, B.C.	- 50° 41' N.	120° 29' W.
CY	- Calgary, Alberta	- 51° 02' N.	114° 02' W.
SC	- Swift Current, Sask.	- 50° 19' N.	108° 02' W.
PR	- Prince Rupert, B.C.	- 54° 18' N.	130° 18' W.
<i>United States, etc.</i>			
TAT	- Tatoosh I, Wash.	- 48° 23' N.	124° 44' W.
SE	- Seattle, Wash.	- 47° 38' N.	122° 20' W.
NH	- North Head, Wash.	- 46° 16' N.	124° 04' W.
PD	- Portland, Oreg.	- 45° 32' N.	122° 41' W.
RO	- Roseburg, Oreg.	- 43° 13' N.	123° 20' W.
EUR	- Eureka, Calif.	- 40° 48' N.	124° 11' W.
RB	- Red Bluff, Calif.	- 40° 10' N.	122° 15' W.
SM	- Sacramento, Calif.	- 38° 35' N.	121° 30' W.
SF	- San Francisco, Calif.	- 37° 48' N.	122° 26' W.
FN	- Fresno, Calif.	- 36° 43' N.	119° 49' W.
SPE	- San Pedro, Calif.	- 33° 44' N.	118° 16' W.
PAR	- Point Arguello, Calif.	- 34° 35' N.	120° 39' W.
LA	- Los Angeles, Calif.	- 34° 03' N.	118° 15' W.
DI	- San Diego, Calif.	- 32° 43' N.	117° 10' W.
SPO	- Spokane, Wash.	- 47° 40' N.	117° 25' W.
WW	- Walla Walla, Wash.	- 46° 02' N.	118° 20' W.
BA	- Baker, Oreg.	- 44° 46' N.	117° 50' W.
HL	- Helena, Mont.	- 46° 34' N.	112° 04' W.
BS	- Boise, Idaho	- 43° 37' N.	116° 13' W.
LD	- Lander, Wyo.	- 42° 50' N.	108° 45' W.

Indicator Letters and Stations—cont.

Indicator Letters.	Station.	Position (approx.).	
—	—	Latitude.	Longitude.
<i>United States, etc. (continued).</i>			
WM	- Winnemucca, Nev.	- 40° 58' N.	117° 43' W.
R	- Reno, Nev.	- 39° 32' N.	119° 49' W.
SLC	- Salt Lake City, Utah	- 40° 46' N.	111° 54' W.
MD	- Modena, Utah	- 37° 48' N.	113° 54' W.
DV	- Denver, Colo.	- 39° 45' N.	105° 00' W.
GJ	- Grand Junction, Colo.	- 39° 04' N.	108° 34' W.
SA	- Santa Fe, N. Mex.	- 35° 41' N.	105° 57' W.
PH	- Phoenix, Ariz.	- 33° 28' N.	112° 00' W.
YU	- Yuma, Ariz.	- 32° 45' N.	114° 36' W.
HO	- Honolulu, Hawaii	- 21° 19' N.	157° 52' W.
MDI	- Midway Island	- 28° 12' N.	177° 22' W.
FMA	- Manila P.I.	- 14° 35' N.	120° 59' E.
FGM	- Guam.	- 13° 27' N.	144° 45' E.

China and Japan, etc.

FHO	- Hong Kong, China	- 22° 18' N.	114° 10' E.
FSH	- Shanghai, China	- 31° 15' N.	121° 29' E.
FBI	- Bonin Island	- 27° 05' N.	142° 11' E.
FKO	- Koshun, Formosa	- 22° 00' N.	120° 45' E.
FNA	- Naha, Japan	- 26° 13' N.	127° 41' E.
FKA	- Kagoshima, Japan	- 31° 34' N.	130° 33' E.
FTO	- Tokio, Japan	- 35° 41' N.	139° 45' E.
FNE	- Nemuro, Japan	- 43° 20' N.	145° 35' E.

Weather reports from ships in the North Pacific Ocean follow the reports from the land stations in Part I. Ship's observations taken at Midnight G.M.T. being broadcast in the 0330 G.M.T. bulletin and those taken at Noon G.M.T. being broadcast in the 1530 G.M.T. bulletin. They are broadcast in the four universal groups of the International Ships' Wireless Weather Code, see Decode for use with the International Wireless Weather Messages from Ships, M.O. 329, for each ship, preceded by the W/T call sign of the reporting ship.

Part II of the bulletins is in plain language and consists of a summary of general pressure distribution; wind and weather forecasts for the off-shore areas—N. of Cape Blanco; between C. Blanco and Point Conception; and S. of Point Conception, and storm warnings (for particulars see p. 177).

The period covered by the Forecasts in the 0330 G.M.T. bulletin is for 24 hours beginning at 0800 G.M.T., and in the 1530 G.M.T. bulletin for 24 hours beginning at 2000 G.M.T.

San Francisco W/T Station also transmits a report containing barometric pressure, wind direction and force and state of weather in the Bonita Channel, at 0000, 0430 0800, 1200, 1630 and 2000 G.M.T. Wavelength 2,776 metres (C.W.). The message is also sent on request.

Hawaiian Islands.

(C.W. Issue.)

Honolulu-Pearl Harbour W/T Station, approximate Latitude 21° 12' N., Longitude 157° 58' W., call sign **NPM**, broadcasts weather forecasts daily (except Sundays and holidays), for the Hawaiian Islands and neighbouring ocean areas at 2230 G.M.T., on a wavelength of 2,828 metres (C.W.). The station also broadcasts the barometric reading, wind direction and force and state of weather at Honolulu at 0230, 0630, 1830 2230 G.M.T. on a wavelength of 5,552 metres (C.W.). The messages are also transmitted on request.

* The code used is not the International Ships' Wireless Weather Code referred to in "Weather Signals," page 2, Vol. IX, No. 97, January, 1932, Marine Observer.

WIRELESS STORM WARNINGS.

III. WIRELESS TIME SIGNALS.

United States of America. (Pacific Coast.)

United States of America.

(C.W. Issues).

THE following W/T Stations broadcast storm warnings at the times stated below. Ships may request any of the stations mentioned to furnish the latest storm warning. The warnings are for a period of 24 hours beginning at the hour indicated in the messages.

For method of transmission of the undermentioned Time Signals see diagram, p. 163, Vol. IX, No. 104.

United States of America, Pacific Coast.

(C.W. Issues.)

W/T Station and position (approx.).	Call Sign.	Wave-length. metres.	Broad-casting Time G.M.T.	Particulars.
Puget Sound - Lat. 47° 42' N. - Long. 122° 37' W.	NPC	2,941 (C.W.)	0100 0400, 1300 1700, 2100	Storm Warnings.
Eureka, Calif. - Lat. 40° 42' N. - Long. 124° 16' W.	NPW	2,776 (C.W.)	0018, 0433 0818, 1218 1633, 2018	
" " -	"	600	When issued and repeated after the first silent period.	---
San Francisco, Calif. Lat. 38° 06' N. - Long. 122° 17' W.	NPG	7000 (C.W.) 2,776 (C.W.)	0330, 1530	Storm Warnings. In Second part of weather bulletin.
" " -	"	2,776 (C.W.)	0000, 0430 0800, 1200 1630, 2000	Storm Warnings. For N. California coast.
San Diego, Calif. Lat. 32° 42' N. - Long. 117° 15' W.	NPL	2,941 (C.W.)	0430, 1630 2200	Storm Warnings. Broadcast on receipt and at times stated.
" " -	"	600	When issued and repeated after the first silent period.	---

W/T Station.	Call Sign.	Wavelength metres.	Time of Signal being made G.M.T.	—																								
San Francisco, Calif. Lat. 38° 05' 55" N. - Long. 122° 16' 37" W.	NPG	4,543 (C.W.)	<table border="0"> <tr> <td>h.</td><td>m.</td><td>s.</td> <td>h.</td><td>m.</td><td>s.</td> </tr> <tr> <td>2</td><td>55</td><td>00-</td> <td>3</td><td>00</td><td>00</td> </tr> <tr> <td>7</td><td>55</td><td>00-</td> <td>8</td><td>00</td><td>00</td> </tr> <tr> <td>16</td><td>55</td><td>00-</td> <td>17</td><td>00</td><td>00</td> </tr> </table>	h.	m.	s.	h.	m.	s.	2	55	00-	3	00	00	7	55	00-	8	00	00	16	55	00-	17	00	00	Sent daily.
h.	m.	s.	h.	m.	s.																							
2	55	00-	3	00	00																							
7	55	00-	8	00	00																							
16	55	00-	17	00	00																							

NOTE.—The above time signal is a rebroadcast of Arlington Va. time signal and is normally correct to one tenth of a second.

Hawaiian Islands (C.W. and I.C.W. Issues).

W/T Station.	Call Sign.	Wavelength metres.	Time of Signal being made G.M.T.	—												
Honolulu, Pearl Hbr. Lat. 21° 20' 45" N. Long. 157° 57' 56" W.	NPM	7,895 (C.W.) and 2,828 (I.C.W.)	<table border="0"> <tr> <td>h</td><td>m</td><td>s</td> <td>h</td><td>m</td><td>s</td> </tr> <tr> <td>23</td><td>55</td><td>00-</td> <td>0</td><td>00</td><td>00</td> </tr> </table>	h	m	s	h	m	s	23	55	00-	0	00	00	Sent daily.
h	m	s	h	m	s											
23	55	00-	0	00	00											

NOTE.—These time signals are relayed from the standard clock at Pearl Harbour, which is checked periodically by means of the time signals broadcast from San Francisco. They are normally correct to less than 0.5 sec. having a generally constant lag.

GREAT BRITAIN.

AMENDMENTS.

WIRELESS GALE WARNINGS.

III. WIRELESS TIME SIGNALS.

Wireless Telephony (R/T) Issues.

Wireless Telephony (R/T) Issues.

Vol. IX, No. 98.

Vol. IX, No. 98.

Page 48, column 2, line 21, for 1500 G.M.T., substitute 1615 G.M.T.

Page 49, column 1, line 24, for 1500 G.M.T., substitute 1615 G.M.T.

THE FOLLOWING AMENDMENTS TO COME INTO FORCE ON SEPTEMBER 1st, 1932.

“WEATHER SHIPPING” BULLETIN.

WIRELESS GALE WARNINGS.

C.W. Issues.

I.C.W. and Spark Issues.

Vol. IX, No. 98.

Vol. IX, No. 100.

Page 46. Times of transmission delete 2118 G.M.T., and substitute 2133 G.M.T.

Page 88. Under Stations—

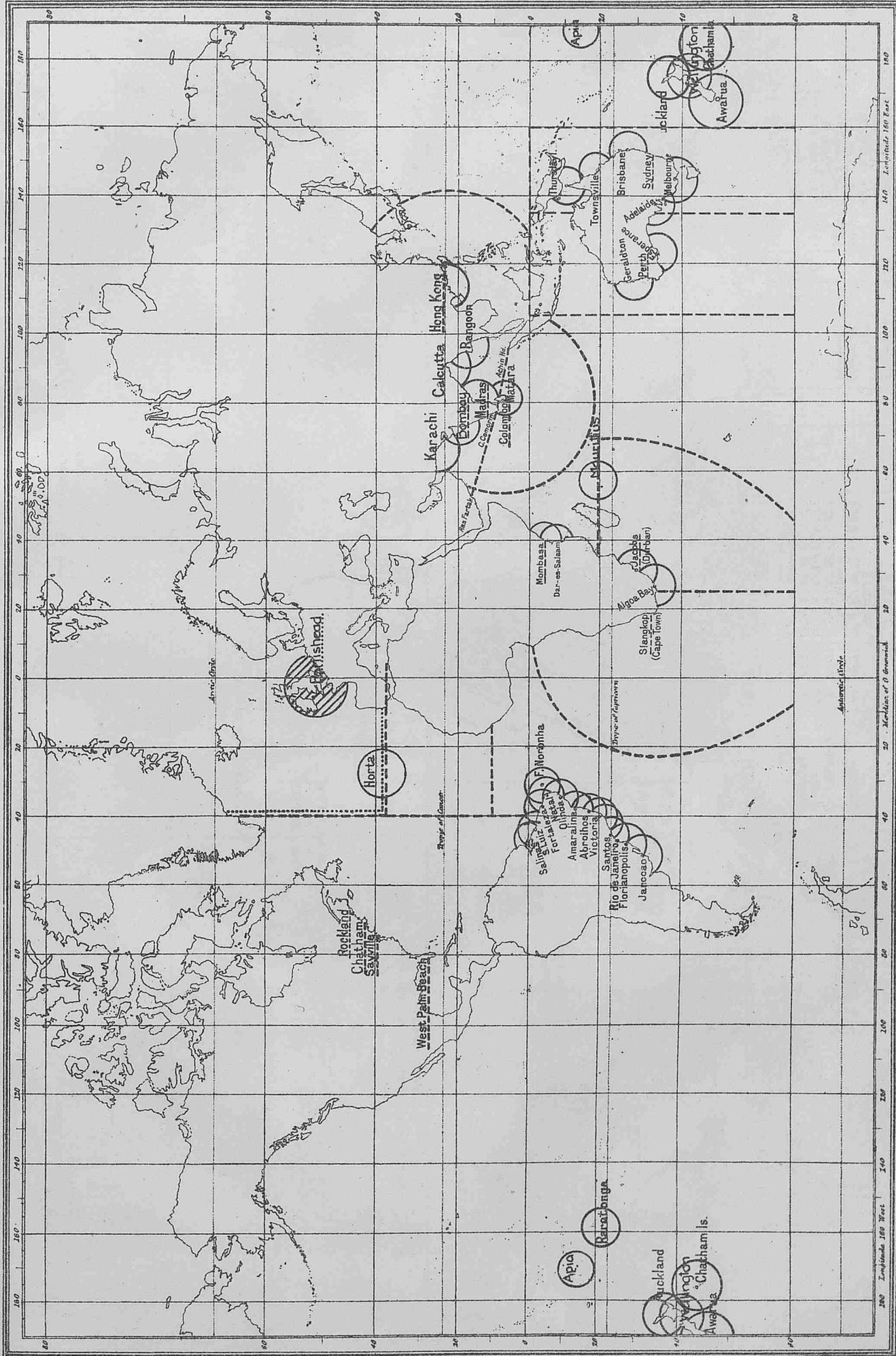
Delete Fishguard GRL 52° 01' N. 4° 59' W.
Substitute Lands End GLD 50° 07' N. 5° 40' W.

Special Notices Regarding Personnel.

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

Chart IX - SHIPS' WIRELESS WEATHER SIGNALS.

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



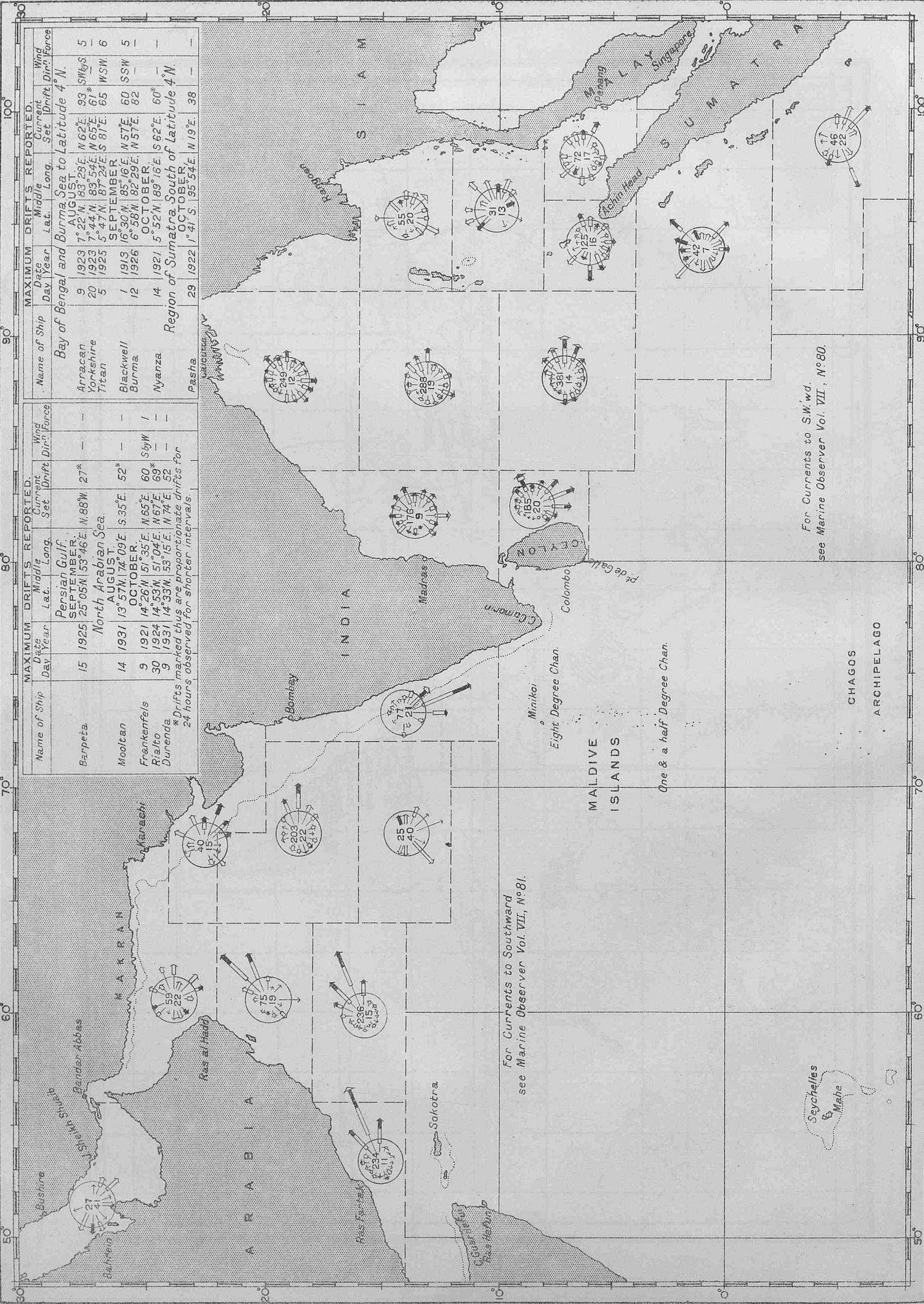
The dotted line indicates the area in which British "A" Selected Ships report under control to Portishead.

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

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

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

CURRENTS ON THE TRADE ROUTES IN THE PERSIAN GULF, NORTHERN PORTION OF THE ARABIAN SEA, BAY OF BENGAL, AND IN THE REGION OF SUMATRA.
AUGUST SEPTEMBER and OCTOBER.
Observations of ships regularly observing for the British Meteorological Office, 1910-1931.



MAXIMUM DRIFTS REPORTED.				MAXIMUM DRIFTS REPORTED.			
Name of Ship	Date	Middle Lat.	Long.	Name of Ship	Date	Middle Lat.	Long.
Barpeita	15 1925	25°05'N	53°46'E	Arracan	9 1923	7°22'N	83°28'E
Mooltan	14 1931	13°57'N	74°09'E	Yorkshire	20 1923	5°44'N	85°54'E
Frankenfels	9 1921	14°26'N	51°35'E	Titkan	5 1925	5°47'N	87°24'E
Rialto	30 1924	14°53'N	51°04'E	Region of Sumatra South of Latitude 4°N.			
Durenda	9 1931	14°33'N	55°15'E	Blackwell	1 1913	16°30'N	85°16'E
* Drifts marked thus are proportionate drifts for 24 hours observed for shorter intervals.				Burma	12 1926	6°58'N	82°29'E
				Nyanza	14 1921	5°52'N	89°16'E
				Pasha	29 1922	1°41'S	95°54'E

MAXIMUM DRIFTS REPORTED.				MAXIMUM DRIFTS REPORTED.			
Name of Ship	Date	Middle Lat.	Long.	Name of Ship	Date	Middle Lat.	Long.
Persian Gulf.				Bay of Bengal and Burma Sea to Latitude 4°N.			
SEPTEMBER.				AUGUST.			
North Arabian Sea.				OCTOBER.			
SEPTEMBER.				SEPTEMBER.			
AUGUST.				OCTOBER.			
OCTOBER.				OCTOBER.			

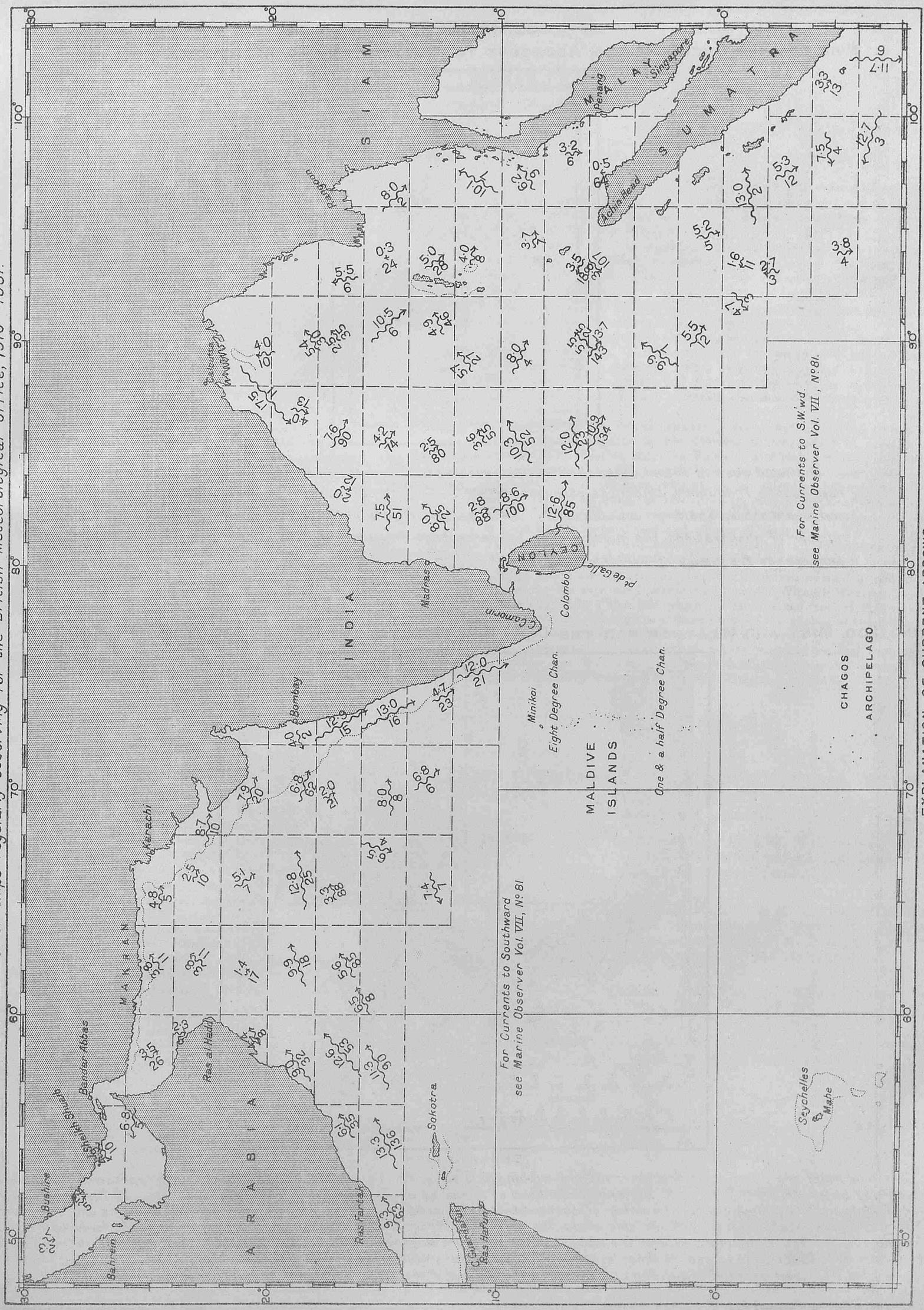
For Currents to Southward see Marine Observer Vol. VII, No. 81.

For Currents to S.W. wd. see Marine Observer Vol. VII, No. 80.

EXPLANATION OF CURRENT ROSES.
 The current roses are drawn from observations within the potted lines. Arrows show the current; length represents frequency, thickness strength. 5% Scale. The upper figure in centre of rose gives total number of observations, the lower figure the percentage frequency of currents less than 6 miles per day.
 The upper figure in centre of rose gives total number of observations, the lower figure the percentage frequency of currents less than 6 miles per day.

CURRENTS ON THE TRADE ROUTES IN THE PERSIAN GULF, NORTHERN PORTION OF THE ARABIAN SEA, BAY OF BENGAL, AND IN THE REGION OF SUMATRA.

AUGUST SEPTEMBER and OCTOBER,
Observations of ships regularly observing for the British Meteorological Office, 1910-1931.



For Currents to S.W. wd.
see Marine Observer Vol. VII, No 81.

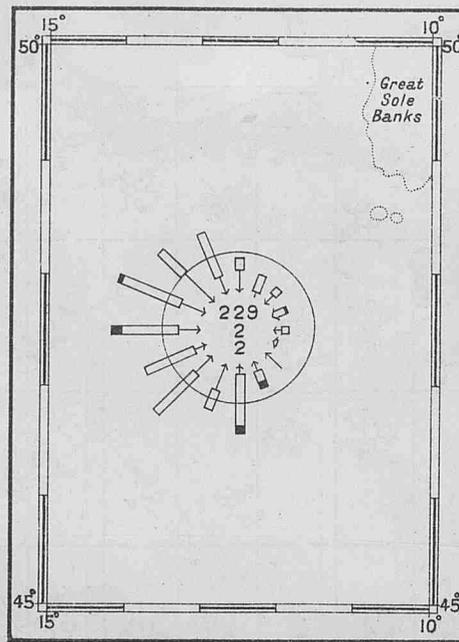
For Currents to Southward
see Marine Observer Vol. VII, No 81

EXPLANATION OF CURRENT ARROWS.

The arrows flow with the current and represent the resultant of currents observed within the packed lines. The centre of each arrow lies in the mean position of observations. The figures above the arrows give the velocity in miles per day; the figures below the arrows the number of observations. In cases where the arrows drawn to scale are inconveniently long the symbol  is substituted.

SEPTEMBER.

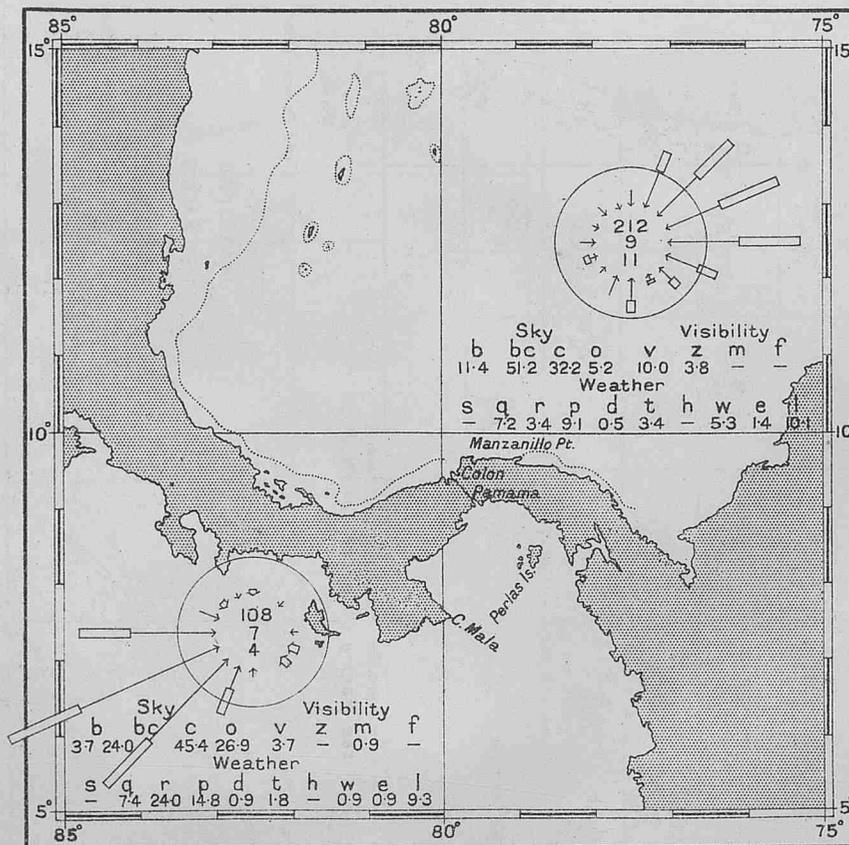
WIND FOR THE OCEAN REGION ADJACENT TO THE S.W. APPROACHES TO GREAT BRITAIN.



EXPLANATION.

The wind rose is drawn from observations within the 5° square. Arrows fly with the wind, length represents frequency, thickness strength. Distance from head of arrow to circle represents 5%. Scale:- 10% 20% The upper figure in the centre of the rose gives total number of observations; the middle figure, the percentage frequency of calms; the lower figure the percentage frequency of variable winds.

WIND, FOG, MIST AND WEATHER FOR THE OCEAN REGIONS TO THE N.E. AND S.W. OF THE PANAMA CANAL.



EXPLANATION.

The wind roses are drawn from Sea observations within the 5° squares. Arrows fly with the wind, length represents frequency, thickness strength. Distance from head of arrow to circle represents 5%. Scale:- 10% 20% The upper figure in the centre of the rose gives total number of observations, The middle figure the percentage frequency of calms, and the lower figure the percentage frequency of variable winds. The percentage frequency of types of weather are shown in the lower half of each 5° square by the figures beneath each of the letters of the Beaufort weather notation. For example in the 5° square Latitude 5° to 10°N, Longitude 80° to 85°W, bc was logged 24 times in every 100 observations while m was logged less than one.

Compiled from observations of British Ships received since the adoption of the Hollerith system of extraction covering the years 1921-1930.

MARINE METEOROLOGY.

Co-operation of Shipowners, Masters and Mates.

Captains and Officers of ships registered in Great Britain and Northern Ireland, who wish to co-operate regularly with the Meteorological Office should apply to the appropriate Port Meteorological Officer or Agent, a list of whom, with addresses, is given below

In accordance with the International Convention for Safety of Life at Sea, the Meteorological Office arranges for certain "Selected Ships" to take meteorological observations at specified hours, and to transmit such observations by wireless telegraphy, for the benefit of other ships and the various meteorological services.

Arrangements are also made for a limited number of ships to keep meteorological logs in certain trades for the purpose of completing the meteorological survey of the oceans.

Ships performing these voluntary duties are known as Observing Ships; the whole as the Voluntary Observing Fleet; and the commanders and officers of these ships as the Corps of Voluntary Marine Observers.

At present the observing fleet is limited to a number not exceeding 366 observing ships. The number of British "Selected Ships" is determined upon the British proportion of world tonnage, on the assumption that there should be a total of 1,000 "Selected Ships" of all nations.

The observing fleet list indicating which are "Selected Ships," with the names of commanders, officers, and other particulars, is published in THE MARINE OBSERVER and kept up to date monthly.

A general description of marine meteorological work, including the particulars desired from intending marine observers, is given in Chapter I of THE MARINE OBSERVER'S HANDBOOK, 5th Edition, which is supplied to all observing ships, and may also be obtained from H.M. Stationery Office, direct, or through any bookseller, price 2s. 6d.

THE MARINE OBSERVER is sent monthly to the captain of every observing ship, for the information and guidance of his observing officers, and in the case of "Selected Ships," the wireless operators also. The Captains of observing ships are also supplied on request with charts, and atlases, according to trade, if available, as meteorological equipment.

Ships keeping the Meteorological Log, Form 915, are lent a complete set of official tested instruments.

"Selected Ships," other than meteorological log keeping ships, keep the Ships' Meteorological Record, Form 911. All "Selected Ships" also keep the Ships' Wireless Weather Register, Form 138.

No observing ship is detailed as a "Selected Ship" unless she has on board a reliable mercurial barometer.

Official tested instruments are lent to "Selected Ships" when necessary.

The commanders of observing ships keeping the meteorological log are requested to return it (accompanied by Form 138 in the case of "Selected Ships") through the appropriate Port Meteorological Officer or Agent at intervals of not more than five months.

Commanders of observing ships keeping Forms 911 are requested to return them (accompanied by Form 138 in the case of "Selected Ships") by post direct to the Meteorological Office, London, at the end of each voyage, or at intervals of not more than two months.

These forms have the address and "On His Majesty's Service" printed upon them, and should be folded for posting accordingly.

The Port Meteorological Officers and Merchant Navy Agents inspect official instruments in Meteorological log ships half-yearly, and in "Selected Ships" quarterly, when possible; and they will replace defective gear. These officers will also check the accuracy of barometers in observing ships, but marine observers should themselves frequently check by comparison.

The work of the British observing fleet, that of the observing fleets of other nations party to the Convention for Safety of Life at Sea, together with Weather Shipping Bulletins and Gale and Hurricane Warnings conforming to the International Convention for Safety of Life at Sea, provide the necessary information for shipping. Thus a world wide service for all shipping, at the minimum cost to national funds, is provided. Shipowners are asked to facilitate this voluntary work which is done by the commanders and officers of their ships.

Shipowners will greatly assist by facilitating the forwarding of postal matter from the Air Ministry addressed to the Captains of ships.

Ships which are not regular observing ships are advised to procure the DECODE for use with the International Code for Wireless Weather Messages from Ships, M.O. Pubn. 329, which can be obtained from H.M. Stationery Office, price 3d. This gives a description of the system of communication of "Selected Ships," as well as the DECODE.

For guidance in the practical use of wireless weather intelligence, WIRELESS AND WEATHER AN AID TO NAVIGATION may be obtained from H.M. Stationery Office, through any bookseller, price 5s.

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

LONDON	Captain L. A. BROOKE SMITH, R.D., R.N.R., Marine Superintendent. Commander J. HENNESSY, R.D., R.N.R., Senior Nautical Assistant. Room 319, Adastral House, Kingsway, W.C.2. (Telephone No.: Holborn 3434 Extension 421). Nearest station Temple, District Railway.	Agents (contd.).
THAMES	Lieut. Commander C. H. WILLIAMS, R.N.R., Port Meteorological Officer, P.L.A. Building, King George V Dock (south side), London, E.16. (Telephone No.: Albert Docks 2659. Telegraphic Address: Barometric Aldock, London).	FORTH Captains C. G. BONNER, V.C., D.S.C., and D. AITCHISON, Leith Salvage and Towage Co., Ltd., 2, Commercial Street, Leith.
MERSEY	Commander M. CRESSWELL, R.N.R., Port Meteorological Officer, Dock Office, Liverpool. (Telephone No.: Bank 8959. Telegraphic Address: Meteorite, Liverpool).	HONG KONG, China. Lieut. Commander G. B. R. RUDYERD-HELPMAN, R.N., Superintendent, Admiralty Chart and Chronometer Depot, H.M. Dockyard. (Telephone No.: 108 Dockyard).
BRISTOL CHANNEL	Captain T. JOHNSTON, Technical College, Cathays Park, Cardiff. (Telephone No.: Cardiff 6813).	HUMBER Captain A. M. BROWN, Ellerman Wilson Line Office, Hull. (Telephone No.: Central 2180).
CLYDE	Mr. ROBERT CLEARY, Master Mariner, The Clutha Stevedoring Co., Ltd., Princes Dock, Glasgow. (Telephone No.: 513 Ibrox).	SOUTHAMPTON Captain Sir BENJAMIN CHAVE, K.B.E., Room 35, Royal Mail Steam Packet Buildings.
	Agents.	SYDNEY, New South Wales. Commander G. D. WILLIAMS, D.S.O., R.D., R.N.R., Deputy Director of Navigation. Captain R. G. BLAYNEY. Customs House. (Telephone No.: B6421).
		TYNE Captain J. J. McEWAN, Marine School, South Shields.

ICE CHART. WESTERN NORTH ATLANTIC.

LETTERS OF TRANSATLANTIC TRACKS INDICATE

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

- (C) From 1st July to 10th April, inclusive.
- (F) From 16th May to Opening of Belle Isle route and to 30th November when not using the Belle Isle route. Westbound, on approaching Cape Race steer a course to pass 10 miles S. of Cape Race. Eastbound, steer from position 25 miles S. of Cape Race.
- (G) From the opening of the Straits of Belle Isle to 14th November.

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

ROUTE NOTICES.

For latest information re Tracks see pages 80 and 81 of Vol. IX, No. 100, April, 1932, Number.

SYMBOLS USED ON THE CHART.

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

PHENOMENAL POSITIONS OF ICE.

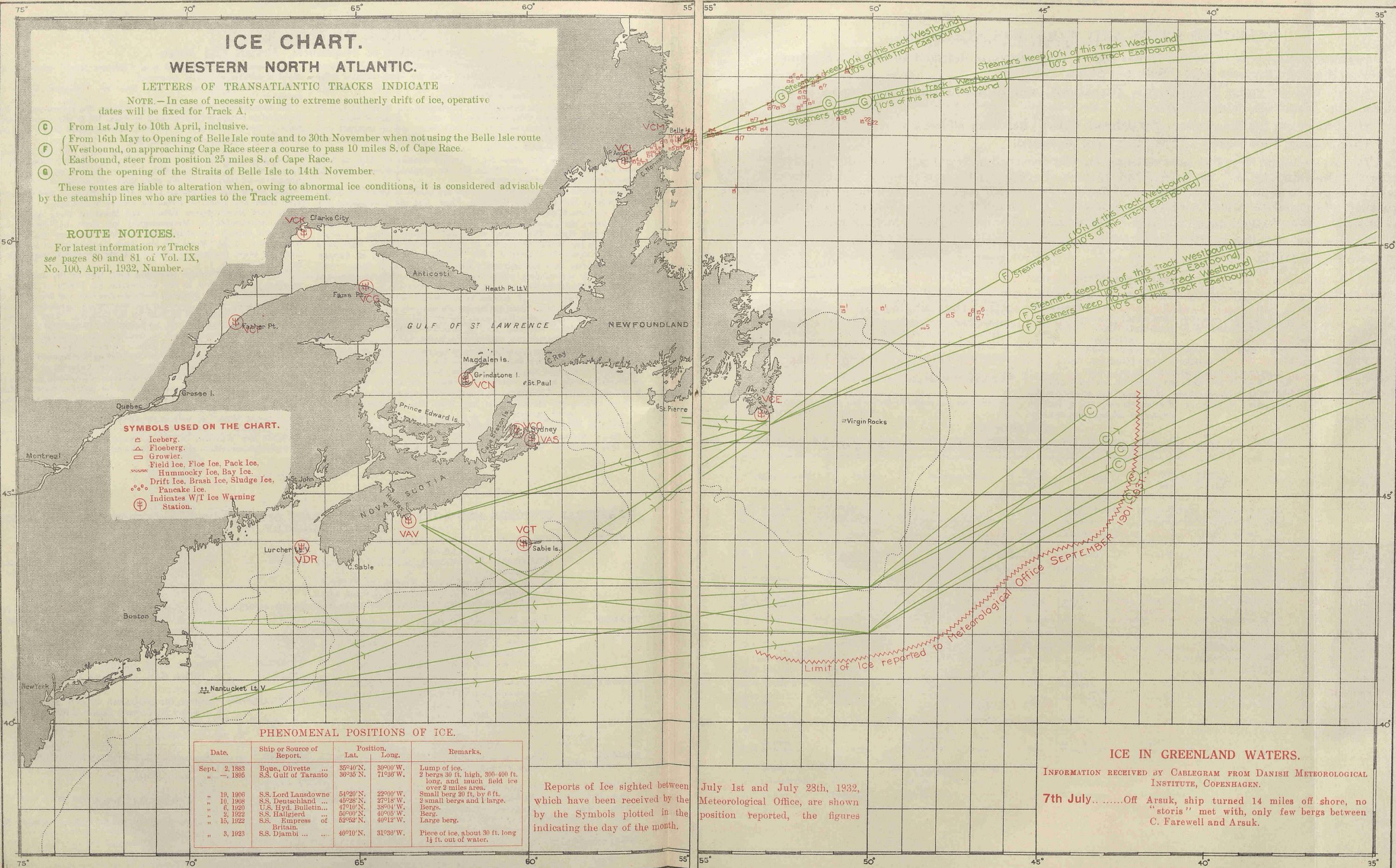
Date.	Ship or Source of Report.	Position. Lat. Long.	Remarks.
Sept. 2, 1883	Boue, Olivette ...	35°40' N. 30°00' W.	Lump of ice.
" —, 1885	S.S. Gulf of Taranto	36°35' N. 71°36' W.	2 bergs 30 ft. high, 300-400 ft. long, and much field ice over 2 miles area.
" 19, 1906	S.S. Lord Lansdowne	54°20' N. 22°00' W.	Small berg 20 ft. by 6 ft.
" 10, 1908	S.S. Deutschland ...	45°28' N. 27°18' W.	2 small bergs and 1 large.
" 6, 1920	U.S. Hyd. Bulletin...	47°10' N. 36°04' W.	Bergs.
" 2, 1922	S.S. Hallgeird ...	50°00' N. 40°05' W.	Berg.
" 15, 1922	S.S. Empress of Britain.	52°52' N. 40°12' W.	Large berg.
" 3, 1923	S.S. Djambi ...	40°10' N. 31°38' W.	Piece of ice, about 30 ft. long 1 1/2 ft. out of water.

Reports of Ice sighted between July 1st and July 23th, 1932, which have been received by the Meteorological Office, are shown by the Symbols plotted in the position reported, the figures indicating the day of the month.

ICE IN GREENLAND WATERS.

INFORMATION RECEIVED BY CABLEGRAM FROM DANISH METEOROLOGICAL INSTITUTE, COPENHAGEN.

7th July.....Off Arsuk, ship turned 14 miles off shore, no "storis" met with, only few bergs between C. Farewell and Arsuk.



NOTICES.

SELECTED SHIPS AND WIRELESS STATIONS.

Particular attention is invited to the list of W/T stations detailed to receive Routine Wireless Weather Reports from "Selected Ships".

In this number some amendments, alterations, and additions have been made, all of which come into force immediately.

The procedure for the station, Portishead, G.K.U. has been added to.

The procedure for Horta, C.T.H., has been amended.

The wave-length for the two stations on the Australian coast for receiving reports from "A Selected Ships" in Australian Waters, Perth, V.I.P., and Sydney, V.I.S., have been changed to 2100 meters so that all "A Selected Ships" reports in Southern Waters, whether addressed to Meteorological Centres or "All Ships", may be made on the same wave length, thereby making it possible for ships to receive more reports at long range.

Stations are detailed on the South African coasts, a most welcomed addition.

See Pages 172 to 175.

It should always be remembered by all concerned and particularly W/T operators in "Selected Ships" and stations detailed in the lists referred to above, that Routine W/T Weather Reports addressed to stations should be made so that they may be intercepted by ships, just as the reports made to "All Ships" may be intercepted by stations within range, detailed for the purpose.

The schedule given on page 14 of the January, 1932, Marine Observer is intended as a guide to all concerned and should be followed as nearly as possible in the circumstances of the place and time.

DERELICTS AND FLOATING WRECKAGE.

Date.	Position.		Description.	Date.	Position.		Description.
	Latitude.	Longitude.			Latitude.	Longitude.	
NORTH SEA.				North Atlantic—contd.			
24.7.32	51°44'N.	2°52'E.	Black and white painted mooring buoy with letters <i>MACLE</i> painted on top, apparently adrift with rope or wire attached, dangerous to navigation.	6.7.32	48°39'N.	10°58'W.	Buoy apparently conical.
IRISH SEA.				7.7.32	36°46'N.	60°00'W.	Log about 40 ft.
4.7.32	Maidens bearing NNW distant 3½ miles.		Upturned boat 16 ft. long with white topsides and grey bottom, with mast and yards floating in vicinity.	8.7.32	41°00'N.	71°51'W.	Tree trunk about 35 ft. long and 2 ft. in diameter.
NORTH ATLANTIC.				10.7.32	36°30'N.	74°50'W.	Spar about 75 ft. long.
4.7.32	41°34'N.	52°15'W.	Large conical red buoy with black horizontal band.	12.7.32	48°03'N.	5°32'W.	Four red conical buoys drifting.
4.7.32	29°21'N.	32°26'W.	Conical buoy with a 10 ft. staff.	13.7.32	17°48'N.	75°30'W.	Log about 20 ft. long and 1 ft. in diameter.
6.7.32	36°50'N.	67°46'W.	Large timbers apparently part of a wharf.	15.7.32	30°46'N.	64°12'W.	Wreckage consisting of part of a wooden vessel about 60 ft. long and showing 10 ft. out of water.
				NORTH PACIFIC.			
				3.7.32	36°04'N.	125°20'W.	Log about 25 ft. long and 4 ft. in diameter, floating light.

LIST OF VOLUNTARY OBSERVING SHIPS

FLEET LIST.

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 records received, are given with the date and description of last log, register or record 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 records within a reasonable period will automatically be removed from the list and the free issue of THE MARINE OBSERVER discontinued; it is, therefore, earnestly requested that changes of service, probable periods of lay up or transfer of Commanders may be notified whenever possible.

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

The number of voluntary observing ships is limited to a maximum total of 366.

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

Explanation of Abbreviations.

Unless otherwise stated, vessels on the following list are s.s.—M.V. indicates Motor Vessel; S.T. = Steam Trawler.

M.L. = Equipped with tested Instruments lent by the Meteorological Office for keeping Meteorological Logs.

W.T. = Equipped wholly or partly with tested Instruments lent by the Meteorological Office for reporting in code by W/T in the International Selected Ship system.

No. = No Meteorological Office instrumental equipment on board.

M = Ship's barometer *mercurial*.

A = Ship's barometer *aneroid*.

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

To indicate the nature of the wireless apparatus of Selected Ships—

†† preceding ship's name indicates fitted for long range continuous wave transmission and reception.

*† = Short range transmission and long range continuous wave reception.

** = Short range transmission and reception.

The numbers preceding the names of ships are for identification purposes, when observations are re-transmitted in synoptic messages by wireless or cable, and are not intended for use at sea.

Selected Ships.

Those ships in this list which have a number and symbols indicating W/T apparatus before their names are "Selected Ships" invited to make by W/T, reports of observations taken at arranged G.M. Times to "All Ships."

Name of Vessel	Captain.	Observing Officers.	Meteorological Equipment.	Line.	Last Log, Register, or Record Contributed. Received up to 15.7.32.	Date Received.
122 †† <i>Accra</i> , M.V.	Shooter, J. C.	R. B. Ellis	W.T.-M.	Elder Dempster	Forms 911 & 138 1.6.32 to 9.7.32	15.7.32
156 *† <i>Achilles</i>	Cosker, W.	C. Broad, J. Simpson	W.T.	A. Holt	Form 915 5.9.31 to 19.1.32	23.1.32
955 *† <i>Actor</i>	Whyte, D. L.	G. Penston, E. Pearce, P. Harrow.	No. M.	Harrison	Forms 911 & 138 27.11.31 to 31.1.32	19.2.32
123 †† <i>Adda</i> , M.V.	Lawson, J. H.	E. Moors, S. Baker	W.T.-M.	Elder Dempster	" " 21.4.32 to 20.5.32	1.6.32
273 *† <i>Adrastus</i>	Lloyd, R.	S. R. Evans, J. P. Makepeace, F. E. Jackson	M.L.	A. Holt	Form "915" 3.3.32 to 4.4.32	24.6.32
050 †† <i>Adriatic</i>	Freeman, C. P., R.D., Commr., R.N.R.	T. Holmes, R. S. Walker, R. Hawkins.	W.T.	White Star	Forms 911 & 138 30.5.32 to 18.6.32	22.6.32
090 *† <i>Aeneas</i>	Wallace, W. K.	W. Williams, R. A. Hanney, P. Dunsire.	"	A. Holt	" " 25.4.32 to 20.5.32	20.6.32
166 *† <i>Agamemnon</i>	Beswick, W., D.S.C., Commr., R.N.R.	W. K. Hole	"	"	Form 911 6.6.32 to 14.6.32	22.6.32
<i>Alban</i>	Evans, L.	"	M.L.	Booth	"	"
127 *† <i>Albion Star</i>	Hopper, G. E.	R. White, W. H. Gore	No. M.	Blue Star	Forms 911 & 138 18.12.31 to 6.3.32	21.6.32
080 †† <i>Aleantara</i> , M.V.	Clarke, E., R.D., Commr., R.N.R.	W. W. Dovell, T. Davies, R. Smith.	W.T.	R.M.S.P.	" " 3.4.32 to 15.5.32	23.5.32
178 *† <i>Alipore</i>	Carter, E. A. J., W., R.D., Commr., R.N.R.	J. P. McArthur	No. M.	P. & O.	" " 31.3.32 to 25.5.32	13.6.32
175 †† <i>Almanzora</i>	Shillitoe, B., R.D., Commr., R.N.R.	E. W. Martin, F. J. Brett, J. G. Scott.	W.T.	R.M.S.P.	" " 22.5.32 to 4.7.32	6.7.32
012 †† <i>Almeda Star</i>	Turner Russell, W.	L. S. Hassell, O. G. Russell, C. N. Williams.	No. M.	Blue Star	" " 8.5.32 to 21.6.32	2.7.32
103 †† <i>Andalucia Star</i>	Vernon, R.	W. L. Hall, B. Stratta, E. Osgood.	" M.	"	" " 16.4.32 to 25.5.32	31.5.32
079 *† <i>Antiloehus</i>	Dougall, A. T.	B. L. Parker, W. Murray, C. F. Lock.	W.T.	A. Holt	" " 9.5.32 to 22.5.32	20.6.32
209 †† <i>Aorangi</i> , M.V.	Spring-Brown, J. F.	E. Anderson, D. H. Richards, R. N. Turner.	M.L.	Canadian-Australasian	Form 915 12.11.31 to 25.2.32	5.5.32
120 †† <i>Apapa</i> , M.V.	Beith, A.	V. E. Thomas, S. S. Franklin	W.T.-M.	Elder Dempster	Forms 911 & 138 5.5.32 to 9.6.32	15.6.32
029 †† <i>Appam</i>	Draper, J. M.	W. M. M. Hutchings, O. Owens, B. C. Haigh.	W.T.	"	" " 18.5.32 to 27.6.32	28.6.32
017 †† <i>Aquitania</i>	Townley, J., R.D., Capt., R.N.R.	E. A. Divers, G. V. Locke, J. Jeffries.	"	Cunard	" " 19.6.32 to 5.7.32	8.7.32
115 †† <i>Arandora Star</i>	Moulton, E. W.	H. F. Partridge, R. C. Freaker, R. T. Hales.	No. M.	Blue Star	" " 11.6.32 to 22.6.32	28.6.32
<i>Architect</i>	Mowat, I.	G. Dewar	" M.	Harrison	Form 911 14.12.31 to 21.3.32	5.4.32
293 *† <i>Ariguani</i>	Scudamore, J. H. H., D.S.C., R.D., Commr., R.N.R.	G. McKee, W. Ireland, A. Crone.	W.T.	Elders & Fyffes	Forms 911 & 138 3.5.32 to 5.6.32	14.6.32
144 †† <i>Arlanza</i>	Huff, G. F.	B. A. Gammon, A. E. Randle, H. V. Todd.	"	R.M.S.P.	" " 16.4.32 to 31.5.32	2.6.32
081 †† <i>Armada Castle</i>	Whitfield, G. J.	W. Pace, A. H. Parry, L. G. May.	"	Union Castle	" " 21.5.32 to 10.7.32	13.7.32
296 *† <i>Arracan</i>	Thomson, S.	G. Davidson	"	P. Henderson	Form 911 13.12.31 to 31.1.32	29.3.32

THE MARINE OBSERVER

Name of Vessel.	Captain.	Observing Officers.	Meteoro-logical Equipment.	Line.	Last Log, Register, or Record Contributed. Received up to 15.7.32.	Date Received.
095 †† <i>Arundel</i> ...	Shaw, B. ...	E. Hill ...	C.C.	Southern Ry.	Telegraphic Report 12.7.32 ...	12.7.32
095 †† <i>Arundel Castle</i> ...	Stuart, C. E., R.D., Capt., R.N.R.	G. L. Clarke ...	W.T.	Union Castle ...	Form 911 24.1.32 to 12.3.32 ...	19.3.32
280 *† <i>Astronomer</i> ...	Richards, J. ...	W. P. Baker, R. Williams, E. B. Stephens.	No. M.	Harrison ...	Forms 911 & 138 7.12.31 to 2.3.32 ...	14.3.32
065 †† <i>Asturias M.V.</i> ...	Hannam, F. S. ...	H. G. Whittle, S. J. Hill, T. W. Stevens.	W.T.	R.M.S.P. Co. ...	" " 1.5.32 to 12.6.32 ...	14.6.32
281 *† <i>Auditor</i> ...	Windsor, G. R. ...	L. Richardson, A. H. Thompson.	No. M.	Harrison ...	" " 8.3.32 to 27.5.32... ..	6.7.31
212 *† <i>Australia</i> ...	Scutt, W. ...	H. Falkiner, E. H. Lidstone, L. Smith.	" M.	British India ...	Form 915 5.9.31 to 19.1.32 ...	3.2.32
124 †† <i>Avila Star</i> ...	Thomas, R. J. ...	F. N. Johnson ...	" M.	Blue Star ...	Forms 911 & 138 27.3.32 to 11.5.32 ...	13.5.32
068 †† <i>Balmoral Castle</i> ...	Barron, A. ...	A. C. G. Price, G. F. Oakley, R. F. Pembry.	W.T.	Union Castle ...	Forms 911 & 138 23.4.32 to 12.6.32 ...	14.6.32
179 *† <i>Balvanald</i> ...	Short, C. E. ...	F. M. Pearce, E. R. Physick	No. M.	P. & O. Branch ...	" " 12.6.32 to 19.6.32 ...	28.6.32
051 †† <i>Baltic</i> ...	Hume, R. ...	G. T. Kavanagh, G. Law, N. E. Banke.	W.T.	White Star ...	" " 4.6.32 to 27.6.32 ...	28.6.32
248 *† <i>Banffshire</i> ...	Page, W. J. ...	A. Banks ...	No. M.	Turnbull Martin ...	Form 912 " 4.6.32 to 27.6.32 ...	28.6.32
180 *† <i>Baradine</i> ...	Elliot Smith, H., R.D., Lt.-Commr., R.N.R.	G. L. Farnfield ...	" M.	P. & O. Branch ...	Forms 911 & 138 18.3.32 to 18.4.32 ...	30.5.32
037 *† <i>Baronesa</i> ...	Compton, R. W. ...	J. R. Faulkner, F. W. Kent, J. G. Freeman.	" M.	Houlder ...	" " 21.2.32 to 18.4.32 ...	27.4.32
213 *† <i>Barpeta</i> ...	Wordingham, W. T. ...	J. M. Croghan, J. H. Pool, R. C. Davies.	" M.	British India ...	" " 25.5.32 to 22.6.32 ...	11.7.32
181 *† <i>Barrabool</i> ...	Sheepwash, J. S. ...	W. Elvy, D. Swabey, C. Holmes.	" M.	P. & O. Branch ...	" " 3.1.32 to 9.4.32 ...	12.4.32
070 †† <i>Bayano</i> ...	Legge, A. W. ...	F. H. Leach, J. C. Thomas, S. A. Ray.	W.T.	Elders & Fyffes ...	" " 8.6.32 to 8.7.32... ..	15.7.32
<i>Beaverburn</i> ...	Landy, E. ...	L. L. Thornton, W. J. P. Roberts, W. E. Halberd.	M.L.	Canadian Pacific {	Form 915 1.11.31 to 7.3.32 ...	10.3.32
059 †† <i>Belgenland</i> ...	Morehouse, W. A. ...	F. Good, J. Mackie, J. R. Loe.	W.T.	Red Star ...	" 912 17.6.32 to 27.6.32 ...	5.7.32
183 †† <i>Bendigo</i> ...	Wyatt, F. N. ...	H. Morgan, T. Hopkins ...	W.T.-M.	P. & O. Branch ...	" " 4.4.32 to 12.6.32 ...	13.6.32
237 †† <i>Berengaria</i> ...	Britten, E. T., R.D., Commr., R.N.R.	J. A. Croasdale, W. A. Robson, G. Duguid.	W.T.	Cunard ...	" " 5.6.32 to 12.7.32 ...	14.7.32
145 *† <i>Berwickshire</i> ...	Evens, E. H. ...	E. Coulthart, J. O. Woodall, R. Frankish.	"	Turnbull Martin ...	" " 21.2.32 to 8.6.32 ...	17.6.32
057 †† <i>Britannic M.V.</i> ...	Vaughan, P. R., D. S. C., R.D., Commr., R.N.R.	G. L. Jones, A. J. Fisher, O. V. Lucas.	"	White Star ...	" " 20.6.32 to 9.7.32 ...	11.7.32
269 *† <i>British Admiral</i> ...	Putt, R. O. ...	H. J. Were, C. Finch ...	No. M.	British Tankers ...	" " 25.5.32 to 5.7.32 ...	15.7.32
249 *† <i>Buteshire</i> ...	Westropp, T. G. ...	P. McMillan, S. W. Brown, J. D. Elvish.	W.T.	Turnbull Martin ...	" " 19.4.32 to 19.6.32 ...	12.7.32
931 †† <i>Caledonia</i> ...	Collie, A. ...	J. J. Walmsley, J. K. McMillan, R. Blake.	W.T.	Anchor... {	Forms 911 & 138 11.4.32 to 14.5.32 ...	31.5.32
139 †† <i>California</i> ...	Smart, R. W. ...	D. Morrison, J. F. Adams, R. L. Robertson.	"	" ... {	Form 912 11.4.32 to 14.5.32 ...	31.5.32
<i>Cambria</i> ...	Copland, C. P. ...	O. W. Ll. Jones ...	C.C.	L.M. & S. Rly... {	Forms 911 & 138 19.6.32 to 9.7.32 ...	12.7.32
180 *†† <i>Cambridge</i> ...	Williams, R. ...	H. Fryer, R. Belfield, T. M. Devitt.	M.L.	Federal ... {	Form 912 19.6.32 to 9.7.32 ...	12.7.32
266 †† <i>Cameronia</i> ...	Gemmell, W. ...	W. J. Harvey, E. Stormont, D. Bone.	W.T.	Anchor ... {	Telegraphic Report 14.7.32 ...	14.7.32
295 †† <i>Camito</i> ...	Jack, D. A. ...	C. R. Hodder, G. Binks, R. W. King.	"	Elders & Fyffes ... {	Form 915 8.2.32 to 21.5.32 ...	4.6.32
<i>Canonesa</i> ...	Brodie, W. H. ...	F. F. Feint ...	No. M.	Houlder ...	Forms 911 & 138 12.6.32 to 3.7.32 ...	7.7.32
<i>Cape of Good Hope</i> ...	Jacobson, T. A. ...	W. R. Carling ...	" A.	Lyle S.S. Co. ...	Form 912 15.5.32 to 5.6.32 ...	9.6.32
282 †† <i>Carinthia</i> ...	Murchie, P. A., O.B.E., R.D., Capt., R.N.R.	J. Chapman, A. B. Fasting, G. S. Hutchinson.	W.T.	Cunard ... {	Forms 911 & 138 25.5.32 to 25.6.32 ...	27.6.32
092 †† <i>Carnarvon Castle</i> M.V.	Harvey, H. B. ...	G. F. Pettitt, E. Clancy ...	"	Union Castle ...	Form 912 21.5.32 to 13.6.32 ...	15.6.32
184 †† <i>Cathay</i> ...	Dalzell Niven, J. ...	A. J. McHattie, B. H. Nankivell, M. G. Morris.	No. M.	P. & O. ...	Forms 911 & 138 30.4.32 to 18.6.32 ...	21.6.32
<i>Cerinthus M.V.</i> ...	Ramsay, N. ...	E. Allen, C. L. Seaman, J. B. Williams.	M.L.	Hadley Shipping ...	" " 6.5.32 to 14.7.32 ...	15.7.32
<i>Changuinola</i> ...	Bostock, R. J. ...	O. H. Pulman ...	No. A.	Elders & Fyffes ...	Form 911 12.10.31 to 23.10.31 ...	27.10.31
191 *† <i>Chindwin</i> ...	Mc. Pherson, A. ...	D. M. Wilkie, J. Aitkin, G. Paterson	W.T.	Henderson ...	Forms 911 & 138 9.4.32 to 23.6.32 ...	27.6.32
067 *† <i>Chinese Prince</i> ...	Uncles, H. ...	T. D. Forbes, S. N. Gerrans, W. S. Jolliffe	M.L.	Furness Withy ...	" " 21.5.32 to 13.6.32 ...	15.6.32
192 †† <i>Chitral</i> ...	Siggers, O. ...	E. Bonfield, R. W. Leese ...	No. M.	P. & O. ...	Forms 911 & 138 22.4.32 to 23.6.32 ...	29.6.32
265 *† <i>City of Baroda</i> ...	Bremner, D. M. ...	H. H. Asher ...	W.T.	Ellerman ...	" " 15.3.31 to 23.5.32 ...	8.6.32
<i>City of Cambridge</i> ...	Jackson, ...	Robinson, T. ...	"	" ...	Form 911 25.5.32 to 3.7.32 ...	6.7.32
<i>City of Camberra</i> ...	Whyper, J. ...	F. Deighton, E. Brook-Williams.	M.L.	" ...	" " ...	"
274 *† <i>City of Harvard</i> ...	MacMillan, J. ...	J. S. Stevenson, L. C. Rithy, A. N. G. Jones.	W.T.	" ...	Form 911 20.4.32 to 21.5.32 ...	24.5.32
089 *† <i>City of Hereford</i> ...	Ricketts, R. J. ...	C. C. Collard, R. Pulford, W. G. Lister.	No. M.	" ...	Forms 911 & 138 26.4.32 to 5.5.32 ...	20.5.32
271 *† <i>City of Roubaix</i> ...	Radcliffe, A. V., R.D., Lt.-Commr., R.N.R.	C. S. Humphries, H. G. Griffith.	" M.	" ...	" " 2.5.32 to 14.5.32 ...	26.5.32
272 *† <i>City of Singapore</i> ...	Gardner, R. ...	" " 29.5.32 to 18.6.32 ...	" M.	" ...	" " 14.5.32 to 26.5.32 ...	3.6.32
035 *† <i>City of Sydney</i> ...	Mason, E. ...	" " 25.3.32 to 23.6.32 ...	" M.	" ...	" " 29.5.32 to 18.6.32 ...	24.6.32
<i>City of Yokohama</i> ...	Jenkins, D. ...	W. N. Tudman, A. H. Black, D. W. Gibbons.	W.T.	Clan ...	Forms 911 & 138 21.1.32 to 15.2.32 ...	18.2.32
027 *† <i>Clan Keith</i> ...	Waterhouse, J. ...	J. L. Jones ...	"	" ...	Form 911 11.5.32 to 23.6.32 ...	27.6.32
<i>Clan Macalister</i> ...	Stenson, F. J., A.D.C., R.D., Capt., R.N.R.	W. C. Woodruffe ...	"	" ...	" " 7.2.32 to 15.5.32 ...	20.5.32
241 *† <i>Clan Macbeth</i> ...	Giles, H. J., R.D. R.N.R.	W. H. Simpson ...	"	" ...	" " 15.11.31 to 12.3.32 ...	7.4.32
287 *† <i>Clan Macfarlane</i> ...	Redford, L. F., Lt.- Commr., R.N.R.	J. C. Dunphy ...	"	" ...	" " 25.3.32 to 5.6.32 ...	16.6.32
118 *† <i>Clan Macindoe</i> ...	Scott-Smith, H. F. G., O.B.E., R.D., Lt.- Commr., R.N.R.		"	" ...		

LIST OF VOLUNTARY OBSERVING SHIPS

Name of Vessel.	Captain.	Observing Officers.	Meteoro-logical Equipment.	Line	Last Log, Register, or Record Contributed. Received up to 15.7.32.	Date Received.
33 *† <i>Clan Mackellar</i> ...	Waterhouse, J. ...	J. J. Stormont ...	W.T.	Clan ...	Forms 911 & 138 24.4.32 to 4.6.32	20.6.32
004 *† <i>Clan Macnair</i> ...	Holman, W. G. ...	F. H. Petheridge A. Woodrow, J. F. Vooght, R. G. Bagnall ...	"	" ...	" " 20.3.31 to 11.6.32	13.6.32
001 *† <i>Clan Macphee</i> ...	Giles, ...	R. G. Bagnall ...	"	" ...	Form 911 25.4.32 to 17.5.32 ...	31.5.32
168 *† <i>Clan Macgogart</i> ...	West, W. F. ...	" ...	"	" ...	" ...	4.7.32
002 *† <i>Clan Macwhirter</i> ...	O'Bryne, C. E. ...	M. J. Lewis, ...	"	" ...	Forms 911 & 138 27.5.32 to 26.5.32	18.6.32
003 *† <i>Clan Malcolm</i> ...	George, L. S. ...	A. Lynch, K. Banks, N. N. Birtley, ...	"	" ...	Form 911 7.4.32 to 10.6.32 ...	5.7.32
283 *† <i>Clan Morrison</i> ...	Porterfield, W. M., Lt. Commr., R.N.R. ...	A. Hambley, E. Croucher, A. G. Beynon, ...	"	" ...	" 22.5.32 to 12.6.32 ...	16.6.32
300 *† <i>Clan Sinclair Colonial</i> ...	Cater, H. ...	D. Mc Allister ...	No. M.	Harrison ...	" 1.5.32 to 24.5.32 ...	29.6.32
298 *† <i>Comedian</i> ...	Cadogan, A. ...	F. M. Eales, W. G. Ellis ...	" M.	" ...	Forms 911 & 138 8.4.32 to 28.4.32	9.5.32
185 *† <i>Comorin</i> ...	Cartright, C. W., D.S.C. ...	R. E. Tucker, I. M. S. Sinclair, K. W. Richardson, ...	" M.	P. & O. ...	Form 911 21.3.32 to 2.6.32 ...	3.6.32
198 *† <i>Contractor</i> ...	Owen, W. T. ...	N. F. O'Neill, L. Seddon, R. Myles, ...	" M.	Harrison ...	Forms 911 & 138 3.5.32 to 4.6.32	7.6.32
049 ** <i>Coptic, M.V.</i> ...	Williams, G. ...	J. G. James, P. Saville, W. Burt, ...	W.T.	Shaw, Savill & Albion	" " 8.5.32 to 9.6.32	14.7.32
258 †† <i>Corfu</i> ...	French, F. E., R.D., Captain, R.N.R. ...	" ...	W.T.-M.	P. & O. ...	" ...	"
100 *† <i>Cornwall</i> ...	Reilly, H. E. ...	R. S. Miller, C. Saul, G. V. Harrison, ...	M.L.	Federal ...	Form 915 1.2.32 to 26.5.32... ..	1.7.32
006 †† <i>Coronado</i> ...	Harvey, A. E. ...	A. Magill, K. H. Mackay, H. Holmes, ...	W.T.	Elders & Fyffes ...	Forms 911 & 138 12.5.32 to 10.6.32	13.6.32
214 *† <i>Counsellor</i> ...	Jackson, J. ...	G. C. Heaton, J. Davidson, J. L. Curle, ...	No. M.	Harrison ...	" " 6.12.31 to 7.3.32	19.3.32
036 *† <i>Cumberland</i> ...	Maltby, T. L. ...	J. McCulloch, S. R. Leggett, J. Brooke Smith, ...	W.T.	Federal ...	Form 915 4.3.32 to 14.6.32 ...	20.6.32
285 *† <i>Custodian</i> ...	O'Connor, T. ...	W. H. Corlett, J. L. Williams, J. Glen, ...	No. M.	Harrison ...	Form 912 4.5.32 to 14.6.32 ...	20.6.32
					Forms 911 & 138 4.12.31 to 5.2.32	19.3.32
169 *† <i>Dalgoma</i> ...	Beeching, P. H. ...	" ...	No. M.	British India	" ...	"
016 †† <i>Darro Denis</i> ...	Matthews, G. P. ...	F. Jeyes ...	W.T.-M.	R.M.S.P. Co. ...	Forms 911 & 138 12.4.32 to 2.6.32	6.6.32
	Griffiths, W. ...	A. W. Hanchett, J. H. Stoker, S. Pollock, ...	M.L.	Booth ...	Form 915 14.11.31 to 21.1.32 ...	26.1.32
011 †† <i>Deseado</i> ...	Buret, J. F. C. ...	L. T. Peterson, H. Sang, A. Osborn, ...	W.T.-M.	R.M.S.P. Co. ...	Forms 911 & 138 24.4.32 to 10.6.32	24.6.32
117 †† <i>Desna</i> ...	Green, J. ...	W. Edginton, A. Nichols ...	"	" ...	" " 15.3.32 to 6.5.32	17.5.32
252 *† <i>Devon</i> ...	Clarke, P. B., D.S.C. ...	G. Chaplin, J. D. Marks, G. McLannahan, ...	No. M.	Federal ...	" " 14.5.32 to 28.6.32	7.7.32
		E. A. Biles, E. Hill ...	C.C.	Southern Railway ...	Telegraphic Report 15.7.32 ...	15.7.32
	Lidbetter, W. ...	A. E. Rogers, H. W. Jones, M. G. O'Brien, ...	No. M.	Harrison ...	Forms 911 & 138 5.1.32 to 28.4.32	23.5.32
284 *† <i>Dieppe Director</i> ...	Worthington, B. ...	" ...	"	" ...	" ...	"
138 *† <i>Discovery II, R.R.S</i> ...	Carey, W. M., Commr., R.N. ...	R. A. B. Ardley, A. L. Nelson, L. C. Hill, ...	M.L.	Falkland Is. Govt. ...	Form 915 5.1.32 to 4.3.32 ...	7.4.32
136 *† <i>Dorie Star</i> ...	Mills, D. H. ...	L. Vernon, H. Butt, J. McLean ...	No. M.	Blue Star ...	Form 911 2.11.31 to 25.1.32 ...	11.2.32
275 *† <i>Dramatist</i> ...	Meek, A. J. ...	G. H. Howard, I. W. Page, R. L. Bryde, ...	" M.	Harrison ...	Forms 911 & 138 4.5.32 to 30.5.32	20.6.32
142 †† <i>Duchess of Atholl</i> ...	McQueen, D. S. ...	A. E. Shergold, C. E. Duggan, E. Glennie, ...	W.T.-M.	Canadian Pacific	" " 19.6.32 to 8.7.32 ...	12.7.32
152 †† <i>Duchess of Bedford</i> ...	Sibbons, H. ...	L. Outram, F. Stell ...	"	"	Form 912 19.6.32 to 8.7.32 ...	12.7.32
			"	"	Forms 911 & 138 29.5.32 to 17.6.32	20.6.32
			"	"	Form 912 27.5.32 to 17.6.32 ...	20.6.32
151 †† <i>Duchess of Richmond</i> ...	Freer, A., R.D., Capt., R.N.R. ...	J. B. Hewson, E. N. Lloyd ...	"	"	Forms 911 & 138 12.6.32 to 14.6.32	4.7.32
143 †† <i>Duchess of York</i> ...	Stuart, R. N., V.C., D.S.O., Commr., R.N.R. ...	D. Parsons, S. W. Keary, J. S. Dobson, ...	"	"	Form 912 12.6.32 to 16.6.32 ...	4.7.32
			"	"	Forms 911 & 138 5.6.32 to 23.6.32	28.6.32
			"	"	Form 912 5.6.32 to 23.6.32 ...	27.6.32
098 †† <i>Dunbar Castle, M.V</i> ...	Vincent, E. S., R.D., Commr., R.N.R. ...	T. W. McAllen, J. W. S. Brooks, J. A. Ferguson, ...	W.T.	Union Castle ...	Forms 911 & 138 18.3.32 to 21.5.32	24.5.32
	Ramsay, J. D. ...	T. J. Hewlett ...	No. A.	Glen & Co. ...	Form 911 15.4.31 to 13.5.32 ...	7.6.32
052 *† <i>Dunster Grange</i> ...	Wilson, G. F. ...	J. Allerton, E. G. Raynor, D. Murray, ...	" M.	Houlder ...	Forms 911 & 138 24.4.32 to 28.6.32	1.7.32
102 *† <i>Duquesa</i> ...	Frost, C. R. ...	E. W. Denman, F. D. Jones, H. W. Brammell, ...	" M.	Furness Withy ...	" " 2.4.32 to 2.6.32 ...	8.6.32
215 *† <i>Durenda, M.V.</i> ...	Blencowe, J. ...	T. R. Jackson, G. H. Davies... ..	" M.	British India ...	" " 30.11.31 to 12.2.32	19.2.32
077 †† <i>Edinburgh Castle</i> ...	Gilbert, E. F. ...	L. H. Farrow, T. Campbell ...	W.T.	Union Castle ...	Forms 911 & 138 7.5.32 to 26.6.32	28.6.32
107 *† <i>El Argentino, M.V.</i> ...	Ellis, F., D.S.C. ...	W. Findlay, J. Burch, C. G. Adlard, ...	No. M.	Houlder ...	" " 29.2.32 to 3.5.32	3.6.32
	Burns, R. ...	" ...	" M.	J. & J. Denholm ...	" ...	"
009 *† <i>Elmworth, M.V.</i> ...	Dick, J. ...	" ...	" M.	R. S. Dalgleish ...	Form 911 18.3.32 to 7.4.32 ...	4.5.32
158 *† <i>Elpenor</i> ...	Wilson, R. J. ...	J. Macfarlane, F. Vose, F. Stott, ...	W.T.	A. Holt ...	Forms 911 & 138 18.2.32 to 23.6.32	29.6.32
108 *† <i>Elstree Grange</i> ...	Williams, W. E. ...	P. A. Hawkesworth ...	No. M.	Houlder ...	" " 16.2.32 to 28.4.32	12.5.32
190 *† <i>El Paraguayo</i> ...	Owen, R. ...	G. Fletcher, F. Rice, R. L. Aldridge, ...	" M.	"	" " 7.3.32 to 13.5.32	19.6.32
110 *† <i>El Uruguayo</i> ...	McNamara, T. ...	F. E. Hailstone ...	" M.	"	" " 8.2.32 to 15.4.32	18.4.32
088 *† <i>Empire Star</i> ...	Owen, G., R.D., Lt. Commr., R.N.R. ...	R. Thorne, R. McKraith, P. H. Hunt, ...	W.T.	Blue Star ...	Form 915 21.2.32 to 28.5.32 ...	1.6.32
006 †† <i>Empress of Australia</i> ...	Griffiths, E., Lt. Commr., R.N.R. ...	O. F. Pennington, E. Roberts, A. H. Pigott, ...	"	Canadian Pacific ...	Forms 911 & 138 2.6.32 to 7.7.32	9.7.32
034 †† <i>Empress of Britain</i> ...	Latta, R. G. ...	W. P. Phillips, J. H. Tudor, N. W. Duck, ...	"	"	Form 912 " 9.6.32 to 6.7.32...	9.7.32
		G. O. Baugh, R. H. Foley, H. Kennedy, G. W. R. Graves, ...	M.L.	"	Form 915 19.7.31 to 16.12.31 ...	18.1.32
154 †† <i>Empress of Canada</i> ...	Hailey, A. J., Lt. Commr., R.N.R., Douglas, L. D., Lieut - Commr., R.N.R. ...	" ...	"	"	"	"
153 †† <i>Empress of Japan</i> ...	Robinson, S., C.B.E., R.D., Commr., R.N.R. ...	R. Goss, R. Walfenden ...	"	"	" 25.6.31 to 5.1.32 ...	28.5.32
<i>Explorer</i> ...	Allan, J. ...	A. Stout ...	"	Scottish Fishery Brd.	Form 911 8.5.32 to 11.5.32 ...	2.6.32

Name of Vessel.	Captain.	Observing Officers.	Meteoro-logical Equipment.	Line.	Last Log, Register, or Record Contributed. Received up to 15.7.32.	Date Received.
074 *† <i>Fordsdale</i> ...	Avern, J., Commr. R.N.R.	L. Hopkins, F. Davies, M. Harries.	No. M.	Aberdeen Common-wealth.	Forms 911 & 138 28.4.32 to 27.5.32	21.6.32
030 †† <i>Franconia</i> ...	Gibbons, G., R.D., Capt., R.N.R.	J. Ashcroft, E. J. R. Pollitt, W. B. Tauner.	W.T.	Cunard	" " 13.6.31 to 1.7.32	4.7.32
159 *† <i>Fresno City</i> ...	Davies, D.	F. W. P. Davies	M.L.	Sir W. Reardon Smith and Sons Ltd.	" " " " " " " "	"
186 †† <i>Georgic</i>	Summers, F. F., R.D., Commr., R.N.R.	" " " " " " " "	W.T.	White Star	" " " " " " " "	"
234 *† <i>Glaucus</i>	Beale, H. E.	" " " " " " " "	M.L.	A. Holt... ..	" " " " " " " "	"
125 *† <i>Glenamoy</i> , M.V. ...	Ings, W. J.	F. Laycock, L. Eccles, A. C. Radley.	W.T.	Glen Line	Form 915 22.6.31 to 27.10.31	2.11.31
126 *† <i>Glengarry</i> , M.V. ...	Angier, J.	G. Morgan, I. G. Neill, S. W. Bell.	No. M.	"	Forms 911 & 138 12.11.31 to 13.3.32	19.3.32
085 *† <i>Governor</i>	Windsor, G. R.	A. Watson, J. Stanhope ...	" M.	Harrison	" " 3.11.31 to 31.1.32	4.2.32
111 *† <i>Hardwicke Grange</i>	Fowler, W. H.	W. L. Baker, A. W. Seybold, W. E. Ellis.	No. M.	Houlder	Forms 911 & 138 2.8.31 to 7.10.31	13.10.31
<i>Harmonides</i>	Elwell, F. R.	J. H. Kirkwood, A. G. McPherson, T. G. Mitchell.	" A.	R. P. Houston ...	Form 911 13.5.32 to 9.6.32 ...	28.6.32
282 ** <i>Hauraki</i> , M.V. {	Hender, W.	H. A. Brockett, J. Sadleir, E. R. Pate.	M.L.	Union S.S. Co., N.Z....	Form 915 2.8.31 to 19.1.32 ...	24.3.32
253 *† <i>Hertford</i>	Norton, A. T.	Burton Davies, J.	"	Federal	" 18.11.31 to 23.2.32 ...	5.3.32
<i>Hibernia</i>	Williams, E. R.	P. Shakespeare, W. H. Timberlake, P. Block.	C.C.	L.M. & S. Railway ...	Telegraphic Report 8.7.32 ...	8.7.32
182 †† <i>Highland Brigade</i>	Lloyd, H.	C. A. Marsh	No. M.	Nelson	Forms 911 & 138 16.5.32 to 6.7.32	14.7.32
116 †† <i>Highland Chieftain</i> , M.V.	Simmonds, P. C.	N. Hersee, G. Parry, W. William.	W.T.—M.	"	" " 20.4.32 to 3.6.32	9.6.32
099 †† <i>Highland Monarch</i> , M.V.	Ashby Graves, F.	W. J. Presland, L. Irving, J. E. Pink.	No. M.	"	" " 3.4.32 to 25.5.32	28.5.32
250 †† <i>Highland Princess</i> , M.V.	Collings, D.	E. Card	W.T.—M.	"	" " 4.5.32 to 20.6.32	25.6.32
075 *† <i>Hobson's Bay</i> ...	Roberts, T. V., R.D., Lt.-Commr., R.N.R.	F. L. Gross, H. C. Smith, C. Carroll.	No. M.	Aberdeen Common-wealth.	" " 21.3.32 to 13.6.32	8.7.32
026 †† <i>Homeric</i>	Frank, F. A., D.S.O., R.D., Commr., R.N.R.	B. Harrison, A. Dyer, J. Waltaire.	W.T.	White Star	" " 2.6.32 to 17.6.32	21.6.32
261 *† <i>Huntingdon</i>	Field, H. G. B.	P. S. Calcutt, H. F. Wilkinson, M. T. D. Walter.	"	Federal... ..	" " 20.1.32 to 6.4.32	25.4.32
200 *† <i>Huntsman</i>	Russell, H.	J. Richardson	No. M.	Harrison	" " 15.12.31 to 25.2.32	29.3.32
235 *† <i>Hurunui</i>	Pretty, F. C.	" " " " " " " "	W.T.	New Zealand Ship- ping.	" " " " " " " "	"
289 *† <i>Inanda</i>	Gibbins, W. H.	W. A. Short, D. C. Brown, R. L. Williams.	No. M.	Harrison	Forms 911 & 138 22.5.32 to 20.6.32	29.6.32
<i>Ingoma</i>	Richardson, R.	D. D. Kerr	" M.	"	Form 911 24.4.32 to 1.2.32 ...	6.6.32
160 *† <i>Ixton</i>	Hughes, R. T.	C. S. Pope, G. Collier, F. G. Corfe, J. S.	M.L.	A. Holt	Form 915 17.9.31 to 4.2.32 ...	24.5.32
072 ** <i>Jamaica Planter</i> ...	P. D. Allen	G. R. Wortley	W.T.	Jamaica Direct Fruit	Forms 911 & 138 7.4.32 to 5.5.32	26.5.32
203 *† <i>Japanese Prince</i> ...	Hardcastle, E.	" " " " " " " "	M.L.	Prince	" " " " " " " "	"
226 *† <i>Javanese Prince</i> , M.V.	Morrison, B.	W. A. Hall	W.T.	" " " " " " " "	Form 911 26.3.32 to 2.4.32 ...	15.4.32
187 *† <i>Jeypore</i>	Harris, W. L.	A. G. Edwards	No. M.	P. & O.	Forms 911 & 138 31.5.32 to 6.6.32	14.7.32
188 †† <i>Kaisar-i-Hind</i> ...	Headlam, P. C., R.D., Commr., R.N.R.	J. D. Strike, L. J. Cooke, P. J. Sturdee.	No. M.	P. & O.	Forms 911 & 138 13.3.32 to 22.4.32	29.4.32
041 *† <i>Karamea</i> , M.V. ...	Kenworthy, V.	N. S. Milne, C. Sendall, P. Campbell.	M.L.	Shaw, Savill & Albion	Form 915 11.12.31 to 4.4.32 ...	7.4.32
217 *† <i>Karapara</i>	White, R. W.	E. Wood, J. H. Pratt. ...	No. M.	British India... ..	Form 912 23.5.32	14.7.32
114 *† <i>Kenya</i>	Miller, A. C.	G. E. Stephenson, P. Lusher, J. P. Kilbee.	" M.	" " " " " " " "	Forms 911 & 138 7.5.32 to 30.5.32	5.7.32
218 *† <i>Khandalla</i>	Eadie, J. D.	D. W. Dix, W. G. Pitcher ...	" M.	" " " " " " " "	" " 21.4.32 to 3.6.32	4.7.32
147 †† <i>Laconia</i>	Hawkes, W., R.D., Capt., R.N.R.	" " " " " " " "	W.T.	" " " " " " " "	" " 7.4.32 to 20.5.32	13.6.32
193 *† <i>Lahore</i>	Hollow, J. H.	J. D. Archer, M. Boston, G. Noonan.	W.T.	Cunard... ..	Forms 911 & 138 2.5.32 to 18.6.32	27.6.32
167 †† <i>Lancastria</i>	Hollow, J. H.	J. G. K. Gregory, F. Hull, H. M. Fawcett.	No. M.	P. & O.	" " 13.4.31 to 4.6.32	14.6.32
082 *† <i>La Paz</i> , M.V.	Dolphin, G. R., R.D., Commr., R.N.R.	J. S. Glendinning, J. C. Daw-sons, R. V. Youd.	W.T.	Cunard	Form 911 21.2.32 to 10.4.32 ...	12.4.32
134 †† <i>Laplant</i>	Morgan, D. R.	G. Pattison	No. M.	Pacific S.N. Co. ...	Forms 911 & 138 4.1.32 to 17.4.32	22.4.32
	Harvey, H.	F. Good, —, Wood, W. A. Fletcher.	W.T.	Red Star	" " 1.5.32 to 28.6.32	25.6.32

LIST OF VOLUNTARY OBSERVING SHIPS

Name of Vessel.	Captain.	Observing Officers.	Meteoro-logical Equipment.	Line.	Last Log, Register, or Record Contributed. Received up to 15.7.32.	Date Received.
076 *† Largs Bay ...	Jermyn, W. M. ...	F. B. Marsden ...	No. M.	Aberdeen Common-wealth.	Forms 911 & 138 15.10.31 to 25.11.31	15.2.32
112 *† La Rosarina ...	Bearpark, L. ...	T. C. Townsend, S. W. Howell, S. Gorlett.	" M.	Houlder ...	" " 20.3.32 to 28.5.32	31.5.32
267 *† Lassez ...	Lindsay, J. M. ...	" " " " " "	W.T.	Lamport & Holt ...	Form 911 24.8.31 to 13.11.31 ...	16.12.31
064 † Laurentie ...	Jackson, W. H. P. ...	H. Solomon, J. Dray, A. Thompson.	"	White Star ...	Forms 911 & 138 12.6.32 to 2.7.32	4.7.32
083 *† Lautaro, M.V. ...	Kite, E. ...	J. Lloyd Jones, J. Williams, C. Stowe.	No. M.	Pacific S.N. Co. ...	Forms 911 & 138 8.1.32 to 10.2.32	27.2.32
254 *† Limerick ...	Molyneux, P. L. ...	J. Trotter, N. A. Thomas ...	" M.	Federal... ...	" " 13.4.32 to 10.5.32	23.5.32
093 *† Llandaff Castle ...	Linklater, H. ...	J. M. Goode ...	W.T.	Union Castle ...	" " 26.2.32 to 2.5.32	6.5.32
097 † Llangibby Castle, M.V.	Nicholl, D. ...	G. W. Lloyd ...	"	" " ...	" " 26.3.32 to 28.5.32	31.5.32
094 *† Llandovery Castle	Morgan, A. O., R.D., Commr., R.N.R.	H. S. Warren ...	"	" " ...	" " 26.4.32 to 27.6.32	2.7.32
216 *† Llanstephan Castle	Bickford, C. N. ...	I. A. Wilson, S. Smith ...	" M.	" " ...	" " 2.5.32 to 30.6.32	5.7.32
084 *† Lobos, M.V.	Good, W. T. ...	R. H. Sissons, J. Kerr, E. Potter.	No. M.	Pacific S.N. Co. ...	" " 21.2.32 to 23.5.32	27.5.32
137 *† Logician ...	Herschel, R. J. ...	E. L. Stockley, J. Wallis, W. R. Mackenzie.	" M.	Harrison ...	" " 7.3.32 to 2.6.32	7.6.32
008 *† Losada ...	Ridyard, A. ...	L. W. Hutchinson ...	" M.	Pacific S.N. Co. ...	" " 14.4.32 to 25.4.32	28.5.32
013 *† Macharda ...	Hanna, R. G. ...	C. Lindsay Miller, C. Parry, G. A. Jackson.	No. M.	Brocklebank ...	Forms 911 & 138 17.1.32 to 15.2.32	7.3.32
232 *† Madura ...	Morton, R. A. ...	A. Usher, W. Bain, L. G. Tol-free.	" M.	British India... ...	" " 8.5.32 to 1.6.32	23.6.32
078 *† Magician ...	Bury, E. R. ...	W. E. Shotton, R. Armstrong	" M.	Harrison ...	" " 29.2.32 to 12.5.32	17.5.32
141 *† Mahia ...	Andrews, C. M. ...	G. Sangwin, M. P. Congdon, J. Jackson.	W.T.	Shaw, Savill & Albion	" " 24.12.31 to 14.4.32	18.4.32
140 *† Mahratta ...	Owen, L. T. ...	T. C. Eddy, H. F. Scoins, J. Wilson.	No. M.	Brocklebank ...	" " 6.6.32 to 11.6.32	22.6.32
014 *† Mahronda ...	Whitham, F. ...	W. Le Brocq, M. Melville, H. Willington.	" M.	" " ...	" " 11.4.32 to 11.5.32	17.5.32
015 *† Mahsud ...	Kershaw, R. W. ...	S. Richardson, J. R. Paisley, H. Gillespie.	" M.	" " ...	" " 7.3.32 to 31.5.32	6.6.32
042 *† Matmoa ...	Johnson, J. W. ...	M. Bennett, E. J. Baker, W. R. Rogers.	M.L.	Shaw, Savill & Albion	Form 915 8.2.32 to 24.5.32 ...	2.6.32
054 † Majestic ...	Trant, E. L., R.D., Commr., R.N.R.	W. Murphy, R. B. O'Brien, E. Stuart.	W.T.	White Star ...	Forms 911 & 138 17.6.32 to 28.6.32	30.6.32
018 *† Makalla ...	Maughan, J. W. ...	A. C. Hocking, J. Richardson	No. M.	Brocklebank ...	" " 21.5.32 to 23.6.32	29.6.32
225 *† Makura ...	MacDonald, D. ...	A. P. Cousin, J. Billingham, J. H. Johnson.	M.L.	Canadian- Australasian	Form 915 23.12.31 to 2.4.32 ...	5.7.32
019 *† Malakuta ...	Adamson, F. L. ...	H. Simpson ...	No. M.	Brocklebank ...	Forms 911 & 138 11.5.31 to 2.12.31	29.1.32
020 *† Malancha ...	Cochran, G. N. ...	L. F. Dodson, A. Hill, R. Penston.	" M.	" " ...	" " 15.2.32 to 16.3.32	11.4.32
303 *† Malayan Prince ...	Holloway, J. ...	" " " " " "	M.L.	Prince ...	" " " " " "	" " " " " "
219 *† Malda ...	Denne, G. H. A. ...	D. Macfadyen, F. M. Ben-castle, K. K. Boyd.	No. M.	British India ...	Forms 911 & 138 18.10.31 to 12.1.32	15.1.32
195 † Maloja ...	Browning, J. B., R.D., Commr. R.N.R.	R. E. Baldwin - Wiseman, G. R. Peters, J. J. Manning.	W.T.-M.	P. & O. ...	" " 30.1.32 to 4.5.32	11.5.32
196 † Malwa ...	Britten, P. O. ...	F. E. Berner ...	No. M.	" " ...	Form 911 30.4.32 to 17.6.32 ...	23.6.32
053 *† Manaar ...	Thowless, E. ...	A. L. Harrop, J. Robinson, R. G. Widdon.	" M.	Brocklebank ...	Form 911 & 138 20.7.31 to 9.10.31	21.10.31
Manchester Brigade	Stott, C. H. ...	E. E. Bonnaud, J. Eccles, G. L. Southern.	M.L.	Manchester Liners ...	Form 915 8.8.31 to 15.2.32 ...	19.2.32
Manchester Com-merce.	Linton, P. ...	" " " " " "	"	" " ...	" " " " " "	" " " " " "
028 † Mandala ...	Parkin, J. W. ...	R. Buret, R. Christmas, E. A. Stuart.	No. M.	British India... ...	Forms 911 & 138 19.4.32 to 29.4.32	11.6.32
146 *† Mandasor ...	Richardson, T. ...	H. Fosbrooke, F. C. Madden, J. B. Leigh.	" M.	Brocklebank ...	" " 12.1.32 to 30.3.32	5.4.32
220 *† Manela ...	Maples, S. H. ...	W. F. Solly, T. M. Robertson	" M.	British India ...	" " 21.5.32 to 27.6.32	1.7.32
022 *† Manipur ...	Fulcher, H. D. ...	J. L. Rodger ...	" M.	Brocklebank ...	" " 6.2.32 to 8.3.32	4.4.32
221 *† Manora ...	Hudson, H. T., R.D., Commr., R.N.R.	A. F. Baber, H. Treseder, B. Barclay Prest.	" M.	British India... ...	" " 20.3.32 to 1.6.32	13.6.32
177 *† Mantola ...	James, D. F. ...	W. R. Day, S. Henderson, H. I. Fisher.	" M.	" " ...	" " 20.1.32 to 11.4.32	19.4.32
197 † Mantua ...	Hignett, R.D., Commr., R.N.R.	C. S. Pirie, J. A. Wilde, G. du Fosse.	W.T.-M.	P. & O. ...	" " 3.4.32 to 11.5.32	17.5.32
299 *† Marella ...	Mortimer, S. ...	A. W. Blair, D. Pemberton, A. G. W. Thomas.	M.L.	Burns Philp ...	Form 915 7.11.31 to 21.2.32 ...	5.7.32
222 † Margha ...	Kitson, G. A. ...	J. Small, G. Wright, P. Vaughan.	W.T.	British India... ...	Forms 911 & 138 14.5.32 to 23.6.32	2.7.32
104 *† Marquesa ...	Smiles, R. S. ...	J. Wetherall ...	No. M.	Furness Houlder ...	" " 14.3.32 to 21.5.32	25.7.32
021 *† Masila ...	Fitt, W. A. ...	J. L. Richardson, W. Ascroft P. Sims.	" M.	British India ...	" " 23.2.32 to 3.5.32	9.5.32
251 *† Matakana ...	Gordon, H. R. ...	H. Thompson, D. L. G. Turner, J. G. Allin.	W.T.	Shaw, Savill & Albion	" " 1.4.32 to 10.7.32	13.7.32
023 *† Matheran ...	Mulcahy, J. J. ...	S. S. Slade, J. F. Butter-worth, W. Cowrie.	No. M.	Brocklebank ...	" " 9.6.32 to 10.7.32	13.7.32
223 *† Matiana ...	Green, F. V. ...	L. A. Bunn, J. S. Thomson, D. Robertson.	" M.	British India... ...	" " 24.5.32 to 28.6.32	30.6.32
024 *† Matra ...	Cornish, N. P. ...	G. Shaw, W. Robertson, G. Henshaw.	" M.	Brocklebank ...	" " 4.1.32 to 6.5.32	21.5.32
032 † Mauretania... ..	Peel, R. V., R.D., Capt., R.N.R.	R. H. C. Crawford, E. W. Connell, L. R. Sharpe.	W.T.	Cunard ...	" " 12.6.32 to 29.6.32	1.7.32
101 † Melita ...	Stewart, A. ...	H. W. Saunders, A. M. Watt, G. Mowatt.	W.T.-M.	Canadian Pacific ...	" " 20.3.32 to 8.4.32	11.4.32
278 *† Middlesex ...	Almond, J. G. ...	G. C. Hocart, J. R. Ricketts, J. Clarke.	W.T.	Federal ...	Form 915 8.2.32 to 5.6.32 ...	11.6.32
224 † Minnetonka ...	Gates, T. F., C.B.E.	W. S. Harrison, H. E. D. McCartney, L. C. Hill.	W.T.-M.	Atlantic Transport {	Forms 911 & 138 29.5.32 to 18.6.32	20.6.32
157 † Minnewaska ...	Claret, F., O.B.E., R.D., Commr., R.N.R.	E. Pengelly, D. Davies, F. Mummery.	"	" " ...	Form 912 29.5.32 to 18.6.32 ...	20.6.32
194 † Moldavia ...	Allin, C. H. C. ...	T. E. Heath, J. K. Crone, E. J. Kerridge.	"	P. & O. ...	Forms 911 & 138 12.6.32 to 2.7.32	4.7.32
199 † Mongolia ...	Rhodes, H. R. ...	H. Tee, H. C. Slinn, G. K. Fox.	No. M.	" " ...	" " 11.6.32 to 15.6.32	18.6.32

LIST OF VOLUNTARY OBSERVING SHIPS

Name of Vessel.	Captain.	Observing Officers.	Meteoro-logical Equipment.	Line.	Last Log, Register, or Record Contributed. Received up to 15.7.32.	Date Received.
010 *† Port Fremantle, M.V.	Gilling, W.	A. Naismith, G. F. Parnett, E. J. H. Gorley.	M.L.	Commonwealth and Dominion.	Form 915 21.11.31 to 12.3.32	17.3.32
176 *† Port Gisborne, M.V.	Higgs, W. G.	R. B. Linklater, L. J. Skailes, C. E. Midwinter.	"	" " "	" 19.12.31 to 23.3.32	9.4.32
135 *† Port Hunter	Durham, R. S., D.S.C.	G. T. C. Harris, C. R. Townshend, P. A. Mundy.	"	" " "	" 9.1.32 to 30.4.32	5.5.32
129 *† Port Wellington	Jones, C. N.	W. B. Hopkins	W.T.	" " "	Form 911 26.8.31 to 4.1.32	11.1.32
106 *† Princesa	Friend, A. B.	F. Poulson, E. Lougheed, O. Sheard.	No. M.	Houlder	Forms 911 & 138 20.6.32 to 6.7.32	9.7.32
163 *† Proteslaus	Williams, J. P.	A. Anderson, W. C. McGugan, E. R. Owen.	M.L.	A. Holt	Form 915 6.10.31 to 11.4.32	24.6.32
205 †† Rajputana	Holland, R.	G. Aspinall, H. M. Askin, C. F. Wright.	W.T.-M.	P. & O.	Forms 911 & 138 30.1.32 to 28.4.32	9.5.32
063 *† Rancher	McCullum, J.	G. Harvey, C. F. Minshall, A. O. Lewis.	No. M.	Harrison	" " 20.2.32 to 12.5.32	17.5.32
228 †† Ranchi	Brooke, C., D.S.O., R.D., Commr., R.N.R.	T. A. Sargeant	" M.	P. & O.	" " 4.4.32 to 6.7.32	11.7.32
236 †† Rangitane, M.V.	McKellar, A. W., R.D., Capt., R.N.R.	A. Brown, R. C. Aldridge, C. J. P. Guille.	W.T.-M.	New Zealand Shipping	" " 20.11.31 to 3.3.32	9.3.32
257 †† Rangitata, M.V.	Hunter, J. L. B.	J. Oxnard, D. Chadwick, L. Griffith.	"	" " "	" " 12.3.32 to 13.6.32	23.6.32
240 †† Rangitiki, M.V.	Barnett, H.	H. Hill, L. F. Malcouronne, J. V. Halliday.	"	" " "	Forms 911 & 138 17.1.32 to 25.4.32	29.4.32
207 †† Ranpura	Furlong, G. H. S., R.D., Capt., R.N.R.	F. Ferguson, R. A. Perry, H. Toon.	No. M.	P. & O.	" " 6.3.32 to 7.6.32	16.6.32
071 †† Rawalpindi	Stringer, R.H., O.B.E., R.D., Commr., R.N.R.	E. C. White, D. We t. H. V. Forbes.	W.T. M.	" " "	" " 20.2.32 to 25.5.32	3.6.32
247 *† Recorder	Egerton, J. J.	A. S. Milne, H. C. Blyth, A. Robertson.	No. M.	Harrison	" " 15.2.32 to 20.4.32	25.4.32
132 *† Reina del Pacifico, M.V.	Kite, E.	W. A. Hearle, R. Bridson, J. K. Campbell.	" M.	Pacific S.N. Co.	" " 19.4.32 to 8.6.32	13.6.32
239 *† Remuera	Wilde, H. J.	F. Cooke, A. J. Angell, J. R. Vincent.	M.L.	New Zealand Shipping	Form 915 19.12.31 to 4.4.32	9.4.32
Rhezenor	Stout, G. L.	J. S. Parry, G. Edge	No. A.	A. Holt	Form 911 5.2.32 to 6.5.32	20.6.32
189 *† Rother	Sherwood, R. H.	H. Robinson, E. Hatfield	W.T.	Goole Steam Shipping	Forms 911 & 138 28.5.32 to 18.6.32	21.6.32
062 *† Royal Star	Walsh, W.	A. F. Day, J. Higgin, J. W. McHugh.	No. M.	Blue Star	Form 915 24.12.31 to 16.3.32	23.3.32
246 *† Ruahine	Kinnell, G.	A. Hocken, R. Warren, L. Mercer.	W.T.	New Zealand Shipping	Forms 911 & 138 23.4.32 to 20.5.32	4.6.32
St. Heller	Pitman, R.	H. O. Freeman	C.C.	G.W. Railway	Telegraphic Report 6.7.32	6.7.32
St. Julien	Richardson, L.	H. O. Freeman	"	" " "	" " 14.7.32	14.7.32
St. Minver, S.T.	Hatton, A.	" " "	No. A.	Bunch Steam Fishing Co.	Form 911 16.6.32 to 12.7.32	15.7.32
St. Patrick	Sanderson, —	" " "	C.C.	G. W. Railway	Telegraphic Report 13.7.32	13.7.32
038 †† Samaria	Main, R. G., Lt.-Commr., R.N.R.	F. G. Watts, J. A. Myles, H. Hudson.	W.T.	Cunard	Forms 911 & 138 30.5.32 to 20.6.32	17.3.32
061 *† Saxon Star	Griffiths, G. A.	K. Griffiths	"	Blue Star	Form 912 27.5.32 to 21.6.32	28.6.32
291 *† Scholar	Peterkin, A. G.	T. E. Steel, D. O. Percy	No. M.	Harrison	Forms 911 & 138 24.4.32 to 13.6.32	20.6.32
033 †† Scotia	O'Neill, J.	W. H. Hughes	C.C.	L.M. & S. Railway	Telegraphic Report 21.6.32	21.6.32
033 †† Seythia	Oram, B. B., R.D., Commr., R.N.R.	W. H. Stewart, A. Bridgewater, H. L. Pryse.	W.T.	Cunard	Forms 911 & 138 13.6.32 to 2.7.32	8.7.32
211 *† Shropshire, M.V.	English, G. L.	D. Hetherington, I. D. Minto, G. W. Dobson.	"	Bibby	Forms 911 & 138 7.2.32 to 15.4.32	20.4.32
121 *† Siamese Prince	Jones, E. E.	" " "	M.L.	Prince	" " "	" " "
230 *† Somerset	Pilcher, C. R.	C. Edgecombe, H. M. Knight, H. V. G. Hastings.	"	Federal	Form 915 7.1.32 to 1.5.32	5.5.32
277 *† Spero	Montgomery, H.	H. W. Vickers, A. Kirk	"	Ellerman Wilson	" 10.10.31 to 5.3.32	15.3.32
Stephen	Barlow, F. P.	J. Whayman, G. H. Daniels, W. W. Torkington.	"	Booth	" 18.1.32 to 21.6.32	2.7.32
270 †† Strathaird	Townshend, W. P.	R. H. Hand, H. Fitzmarsh, W. J. Alington.	W.T.-M.	P. & O.	Forms 911 & 138 13.2.32 to 20.5.32	24.5.32
259 *† Surrey	Lettington, A. E.	R. Rees, D. J. Murray, H. H. Mackillican.	W.T.	Federal	Form 915 15.11.31 to 31.3.32	12.4.32
Tacoma City	Paul, H.	T. J. Paull	M.L.	Reardon Smith	Form 911 24.12.31 to 2.6.32	9.6.32
229 *† Tactician	Trinick, F., O.B.E.	E. P. Simmons	No. M.	Harrison	" 19.7.31 to 7.10.31	10.10.31
045 †† Tainui	McIntosh, A.	G. A. Harvey, J. Worrall, D. Pickersgill.	M.L.	Shaw, Savill & Albion	Form 915 5.12.31 to 20.3.32	30.3.32
081 *† Tairoa	Grayston, E. T., D.S.C., R.D., R.N.R.	G. L. Almond, W. Thowless, L. B. Miller.	W.T.	" " "	" 26.3.32 to 28.6.32	7.7.32
046 †† Tamaroa	Hartman, W. H.	L. R. Bull, R. R. Roseman, F. Luyven.	W.T.-M.	" " "	Forms 911 & 138 29.1.32 to 8.5.32	11.5.32
264 ** Tanda	Pilcher, E. T., Lt.-Commr., R.N.R.	B. W. Dun, F. O. Colvin, G. Chadwick Smith.	M.L.	E. & A. S.S. Co.	Form 915 2.12.31 to 29.2.32	28.5.32
165 *† Tantalus, M.V.	Melling, C. F.	E. Saville, W. B. Hailstone, L. A. Munday.	W.T.	A. Holt	Forms 911 & 138 25.4.32 to 5.6.32	11.7.32
047 *† Taranaki, M.V.	Wood, C., D.S.C.	G. Campbell, T. Chapman	"	Shaw, Savill & Albion	Form 915 22.1.32 to 10.5.32	25.5.32
Tarantia	Caithness, J. B.	J. M. Cherry	No. A.	Anchor	Form 911 9.5.32 to 2.6.32	27.6.32
Tasmania	Williams, J. W.	" " "	W.T.	New Zealand Shipping	" " "	" " "
069 *† Tekoa	McNish, R. H. L., D.S.O., Lt.-Commr., R.N.R.	C. W. Roberts	No. M.	" " "	Form 911 30.12.31 to 25.1.32	15.2.32
048 †† Themistocles	Elford, H. C.	F. C. Muggleston, A. S. Marshall, J. W. Best.	W.T.-M.	Aberdeen Commonwealth.	Forms 911 & 138 10.7.31 to 3.3.32	20.4.32
007 *† Thistleglen	Whitfield, G. A., O.B.E.	S. B. Davis, G. L. Hetherington.	No. M.	Allan Black & Co.	" " 14.2.32 to 5.6.32	9.6.32

Name of Vessel.	Captain.	Observing Officers.	Meteoro-logical Equipment.	Line.	Last Log, Register, or Record Contributed, Received up to 15.7.32.	Date Received.
161 *† <i>Titan</i>	Elford, W. J.	F. B. Smith, A. K. Sandersor, B. L. Parker.	W.T.	A. Holt	Forms 911 & 138 22.11.31 to 25.3.32	30.3.32
244 *† <i>Tongarivo</i>	Hamilton, F. S.	E. A. Quick, D. Baldwin, H. Dawson.	M.L.	New Zealand Shipping	Form 915 6.2.32 to 13.5.32	23.5.32
025 †† <i>Transylvania</i>	Bone, D. W.	A. Middleton, J. Lefevre, J. O. Dunn.	W.T.	Anchor	Forms 911 & 138 5.6.32 to 26.6.32	28.6.32
288 *† <i>Traveller</i>	Barrow, W. T. C.	R. Ledger	No. M.	Harrison	Form 912 5.6.32 to 26.6.32	28.6.32
119 *† <i>Trojan Star</i>	Griffin, G. A.	L. S. Hassell, K. Griffiths, D. W. Marshall.	" M.	Blue Star	" 911 20.1.32 to 28.3.32	1.4.32
245 *† <i>Turakna</i>	Laird J.	H. G. Letts, E. G. Williams, J. Reeve.	" M.	New Zealand Shipping	" " 29.11.31 to 18.4.32	30.4.32
276 †† <i>Tuscania</i>	Rome, W. B.	J. Noble, G. Squires, G. Robertson.	W.T.	Anchor... ..	" " 28.5.32 to 5.6.32	16.6.32
					Form 912" 28.5.32 to 5.6.32	16.6.32
113 *† <i>Upwey Grange, M.V.</i>	Goodrick, H. P.	A. Bradbury, G. T. Hurst, P. J. Walper.	No. M.	Houlder	Forms 911 & 138 12.4.32 to 13.6.32	21.6.32
292 †† <i>Viceroy of India</i>	Thornton, E. J., R.D., Capt., R.N.R.	R. H. Turner, M. F. Shute, E. R. Physick.	W.T.-M.	P. & O.	Forms 911 & 138 8.5.32 to 8.6.32...	13.6.32
242 ** <i>Waiotapu</i>	Davis, — ... ..	... ..	M.L.	Union S.S. Co. of N.Z.	... ..	... ..
263 ** <i>Wairuna</i>	Hender, W. H.	J. B. Williams, R. E. Suckling.	"	" "	Form 915 7.12.31 to 3.3.32	5.5.32
005 †† <i>Warwick Castle</i>	Owens, G.	P. Clissold, W. D. Roach, J. Wilson.	W.T.	Union Castle	" 911 16.4.32 to 5.6.32	7.6.32
060 †† <i>Westernland</i>	Doughty, J. H.	J. H. Mackie, J. L. McLaren, W. F. Godwin.	"	Red Star	Forms 911 & 138 19.6.32 to 9.7.32	11.7.32
056 *† <i>Westmoreland</i>	Holland, E. ... ..	... ..	"	New Zealand Shipping	Form 912 19.6.32 to 9.7.32	11.7.32
208 †† <i>Winchester Castle M.V.</i>	Morton Betts, W.	G. F. Moon, A. G. Patey.	"	Union Castle ... ..	... ..	... ..
096 †† <i>Windsor Castle Worthing</i>	Kerbey, J. H. Marmery, S.	F. Hunter C. Munton, F. Balcombe	C.C.	" " Southern Railway	Forms 911 & 138 14.5.32 to 3.7.32	5.7.32
					Form 911 10.4.32 to 29.5.32	17.6.32
					Telegraphic Report 5.7.32	5.7.32
043 ** <i>Zealandic, M.V.</i>	Elford, H. C.	P. Horwood, J. Thompson, B. Morris.	W.T.	Shaw, Savill & Albion	Forms 911 & 138 14.3.32 to 6.5.32	9.5.32
<i>Conway, H.M.S.</i>	Richardson, F. A., D.S.C., Commr., R.N.	The Senior Cadets	Cadets' M.L.	... ..	Cadets' Met. Log. 17.1.32 to 19.3.32	29.3.32
<i>Pangbourne Nautical College</i>	Tracy, A. F. G., Commr., R.N.	" " ... ..	"	... ..	Cadets' Met. Log. 17.1.32 to 19.3.32	29.3.32
<i>Worcester, H.M.S.</i>	Steele, G. C., V.C., Commr., R.N.	" " ... ..	"	... ..	Cadets' Met. Log. 22.1.32 to 13.4.32	18.4.32
<i>Abaco</i> ... ..	... ..	The Keepers	Lighthouse Register.	... ..	Lighthouse Register 1.7.31 to 31.12.31	27.2.32
<i>Cay Lobos</i> ... ..	... ..	" ... ..	"	... ..	Lighthouse Register 1.7.31 to 31.12.31	27.2.32
<i>Double Headed Shot</i> ... ..	... ..	" ... ..	"	... ..	Lighthouse Register 1.7.31 to 31.12.31	27.2.32
<i>Inagua</i> ... ..	... ..	" ... ..	"	... ..	Lighthouse Register 1.7.31 to 31.12.31	27.2.32
<i>Sombrero</i> ... ..	... ..	" ... ..	"	... ..	Lighthouse Register 26.2.31 to 5.9.31	5.10.31
<i>Watling Island</i> ... ..	... ..	" ... ..	"	... ..	Lighthouse Register 1.7.31 to 31.12.31	28.1.32
<i>Cape Pembroke (Falkland Is.)</i> ... ..	... ..	" ... ..	"	... ..	Lighthouse Register 1.7.31 to 31.12.31	27.2.32
					Lighthouse Register 1.7.31 to 31.12.31	18.2.32

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

Name of Vessel.	Captain.	Observing Officer.	Line.	Last Case of Water Samples, Reports, etc., received up to 30.6.32.	Date Received.
<i>Dakartan</i>	Hannaford, W.	A. A. Johnson	Leyland	Water Samples	10.6.32
<i>Darian</i> ... ..	... ..	W. R. Vaughan ... ..	... ..	" " ... ..	18.9.31
<i>Darro</i>	Matthews, G. P.	F. R. Jeyes	R.M.S.P. Co.	" "	11.6.32
<i>Davistan</i>	Thomas, R.	H. B. Peters	Leyland	" "	27.6.32
<i>Dorelian</i>	Hughan, C.	A. W. Wood ... ..	... ..	" " ... ..	23.4.32
<i>Hilary</i>	Buck, R. H., R.D., Capt., R.N.R.	F. H. Good	Booth	" "	4.6.32

September, M.O., 1932.

LIST OF SOME OF THE PUBLICATIONS PUBLISHED BY THE AUTHORITY OF
THE METEOROLOGICAL COMMITTEE AND BY THE HYDROGRAPHIC DEPARTMENT
OF THE ADMIRALTY.

MARINE METEOROLOGY, ATLASES, BOOKS AND MEMOIRS.

CHARTS :—

ATLANTIC (NORTH AND SOUTH) :—

Monthly Current Charts for the Atlantic Ocean, from information collated and prepared in the Meteorological Office. (No. 132, 1897) (22½ × 18 in.) (Published by the Admiralty.)

Charts of Meteorological Data for the Nine 10° Squares of the Atlantic which lie between 20° N. and 10° S., and extend from 10° to 40° W., with accompanying Remarks, ending with the Best Routes across the Equator. (No. 27, 1876) 24s. (17 × 20 in.)

ATLANTIC (NORTH) :—

Atlas of Currents on the Main Trade Routes of the North Atlantic. (No. 323, 1930. 6s. 6d.) (29¼ × 19½ in.)

Meteorological Charts of the North Atlantic for each month of the year, giving normals of Pressure, Air and Sea Surface Temperature and Ocean Currents, with Frequencies of Winds, also Ice Limits. (No. 149A, 1923.) 1s. each (35 × 22½ in.). Sold by J. D. Potter, 145, Minories, E.1.

Synchronous Weather Charts of the North Atlantic and the adjacent Continents, 1st August, 1882, to 3rd September, 1883. Parts I to IV (33 sheets each). (No. 71, 1886) 17s. each Part. (26 × 22 in.)

Charts of Meteorological Data for Square 3, Lat. 0°-10° N., Long. 20°-30° W. (20 × 13½ in.) and Remarks to accompany the Monthly Charts, which show the Best Routes across the Equator for each Month, &c. (17 × 16½ in.) (No. 20, 1874). 20s.

Discussion of the Meteorology of that Part of the Atlantic lying North of 30° N., for the eleven days ending 8th February, 1870. With Charts (No. 13, 1872). 5s. (4to.)

ATLANTIC (SOUTH) :—

Wind Charts for the Coastal Regions of South America, from information collated and prepared in the Meteorological Office. (No. 159, 1902.) (27 × 20½ in.) (Published by the Admiralty.)

The relation between Pressure, Temperature, and Air Circulation over the South Atlantic Ocean. By M. W. Campbell Hepworth, C.B., R.D., Captain R.N.R., Marine Superintendent. (No. 177, Second Edition, 1917.) 1s. (8vo.)

BAFFIN BAY AND DAVIS STRAIT :—

Monthly Meteorological Charts of Baffin Bay and Davis Strait. (No. 221, 1917.) 8s. (30 × 25½ in.)

CHARTS :—*continued.*

INDIAN OCEAN :—

Meteorological Charts of the East Indian Seas for each month of the year, giving Normals of Pressure, Air and Sea Temperatures and Ocean Currents, with Frequencies of Winds. (No. 181A, 1923.) 1s. each. (35 × 22½ in.) Sold by J. D. Potter, 145, Minories, E.1.

Monthly Current Charts for the Indian Ocean, from information collated and prepared in the Meteorological Office. (No. 124, 1896.) (20 × 24½ in.) (Published by the Admiralty.)

PACIFIC OCEAN :—

Quarterly Current Charts for the Pacific Ocean, from information collated and prepared in the Meteorological Office. (No. 134, 1897.) (26½ × 28½ in.) (Published by the Admiralty.)

Wind Charts for the Coastal Regions of South America, from information collated and prepared in the Meteorological Office. (No. 159, 1902.) (27 × 20½ in.) (Published by the Admiralty.)

RED SEA :—

Meteorological Charts of the Red Sea. (No. 106, 1895.) 21s. (22 × 13½ in.)

SOUTHERN OCEAN :—

Meteorological Charts of the Southern Ocean between the Cape of Good Hope and New Zealand. (No. 123, 1917.) 7s. 6d. (12½ × 9½ in.)

BOOKS :—

Wireless and Weather, An Aid to Navigation, with Appendices. (No. 297, 1928.) 5s. (4to.)

The Marine Observer's Handbook. Fifth Edition. (No. 218, 1930.) 2s. 6d. (8vo.)

PAMPHLET :—

Decode for use with the International Code for Wireless Weather Messages from Ships. Second Edition. (No. 329, 1931.) 3d. (8vo.)

GEOGRAPHICAL MEMOIRS (4to.) :—

19. **Hurricanes and Tropical Revolving Storms**. By Mrs. E. V. Newnham, M.Sc. With an Introduction on "The Birth and Death of Cyclones," by Sir Napier Shaw, F.R.S. (No. 220i, 1922.) 12s. 6d.

28. **The Doldrums of the Atlantic**. By C. S. Durst, B.A. (No. 254h, 1926.) 1s. 6d.

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