

VOL. IX. No. 104.

THE MARINE OBSERVER.

AUGUST, 1932.

TABLE OF PRINCIPAL CONTENTS.

	PAGE.	
Sail	145	Lithographic illustrations after page 164:—
The Marine Observer's Log (with illustrations)	147	Chart IX.—Ships' Wireless Weather Signals.
Waterspouts	153	Wind for the region adjacent to S.W. Approaches to Great Britain— <b>August.</b>
Weather Signals:—		Wind, Fog, Mist and Weather for the region N.E. and S.W. of Panama Canal— <b>August.</b>
Wireless Stations detailed to receive Routine Coded Weather Reports from "A Selected Ships"	156	
Wireless Stations detailed to intercept Routine Coded Weather Reports from "B Selected Ships"	158	
Canada, United States Atlantic Coast, and West Indies	160	

SAIL.

In accordance with our promise in the January number we reproduce in this number recent photographs of a sailing training ship, that of the Belgian ship *L'Avenir*, contributed by Captain T. McNAMARA, with some very interesting remarks in which he points to the development of qualities of resource, initiative, and individuality, which training in such a ship produces.

Commander the Rt. Hon. Sir BOLTON EYRES MONSELL, Royal Navy (retired), First Lord of the Admiralty, in March said, speaking on his own although he thought that there would be a great and ready response in the great majority of the senior officers in the service:—

"In my opinion there is no training in the world for a sailor like the training provided by masts and yards, making and shortening sail, reefing top-sails in a strong wind, and all sail drill, which necessitates the closest co-operation and trust between all hands. Nothing can surpass it for developing character and self reliance."

Since the advent of double topsail yards and the reduction of crews in Merchant sailing ships there was not much sail drill as it was known in the Royal Navy, but all the other work was there though somewhat harder.

Modern organization with wireless communication and centralization do not tend to increase that independence and self-reliance which has been a strong characteristic in the officers of the British Merchant Navy.

Though there may not be agreement as to the practicability of re-establishing sail training in large foreign-going square-rigged ships in the British Merchant Navy, there is no doubt that a great many senior masters of the Merchant Navy who were contemporary with Sir EYRES MONSELL when he received his training in the masted ships of the Royal Navy have come to not unsimilar conclusions as to the desirability of training which develops good qualities of leadership.

The desired results may be attained in smaller vessels in Home Waters.

Recently H.R.H. THE PRINCE OF WALES as Master of the Honourable Company of Master Mariners in speaking to a great gathering at the Mansion House said:—

There was one point that he would particularly like to stress. He was glad to know that there were some shipowners there that evening of his own generation. "Perhaps we of our generation",

he continued, "have had to combat and have had to tackle problems very different from those of our predecessors. Master craftsmen have always been in positions of responsibility in whatever trade they happened to be craftsmen, but I do not know of any craftsmen who have greater responsibility than the master craftsmen of the sea. The shipowner engages the officers and men, and when the ship goes to sea, whatever the cargo, or whatever he has planned for the journey, who is responsible for that ship once she gets to sea? It is the master or the captain. He is responsible in a way that I do not believe any other craftsmen can be. Sometimes he gets that responsibility very young. Great responsibility comes to us of our generation, and it is good that we should realise it".

In order that those officers and men should serve them to the best advantage, he said, they must first of all see to their training. He was not saying that there were not many shipping companies in this country who saw to it that the officers and men serving them were well trained, but some of them were not able to see to that training to the same extent. That was one way that his Company was anxious to help—to co-ordinate the training of all the men who went down to the sea in ships.

The collection of photos and notes which was started in the November, 1931, MARINE OBSERVER may be of even greater interest than we then contemplated.

Following H.R.H. THE PRINCE OF WALES' special call to sportsmen for their help in the way of personal service for the country in this time of her trouble, Lord BADEN-POWELL, the Chief Scout, has appealed through the Nautical Magazine to yachtsmen and seamen to take in hand a few boys and train them in boatwork.

He says:—

"I was brought up knocking about in sailing boats and small yachts and I have many a time since had to thank my stars that I had learned something of the handiness and ready resource which that life implants. Therefore, I know what a valuable as well as health-giving training it is for a lad, no matter what line of life he afterwards takes up. The war killed off a million of our best men and invalidated thousands more. This deprived their sons of the father's or elder brother's guidance in their youth.

"Then the post-war economic depression and consequent universal unemployment are to-day stranding thousands of our lads on the dole, without ability to work, and, through no fault of their own, is unfitting them for any kind of work in the future. They are thus left to lead a useless existence as waste human material, naturally disgruntled and a ready prey to anti-social influence.

"So here lies an opportunity open to every yacht and boat owner for doing a really useful, national service, through his own sport, in this difficult time for our country. In the Boy Scout Movement we have a branch of so-called Sea Scouts doing this very work. Our only need is more men with a knowledge of boat-management to act as leaders for the hundreds of boys who want to join us, as soon as such leaders are forthcoming.

"The Sea Scouts are under Vice-Admiral A. V. CAMPBELL, C.B., D.S.O., at 25, Buckingham Palace Road, London, S.W.1, and he will gladly give any information that may be desired.

"Meantime, if you take one boy it is a life helped to make good; if you take half a dozen you will have in no time a smart little ship's company of ardent young sportsmen under your hand, with the satisfaction of knowing that you are making your sport of service to others and not merely an indulgence of self. Hope I'm not preaching!"

Lord BADEN-POWELL is a nephew of the late Captain HENRY TOYNBEE, Marine Superintendent of the Meteorological Office from 1867 to 1888, who when in command of the Blackwall ships *Gloriana*, *Marlbrough* and *Hotspur*, did much for the training of midshipmen, ordinary seamen and boys. It is a great pleasure to pass on his appeal to members of the Corps of Voluntary Marine Observers past and present who are ashore and may be able to help.

Boat building, sailmaking, boat sailing, sailorizing and initiating the youth of the present day in them gives good sport, and are a fine means of refreshment to those who after sea service are continuously employed in office work ashore, while the gain to boys through such work with the lead of experienced seamen is all that the Chief Scout claims for it.

In these hard times if you can't afford a yacht, build a boat!

It is not beyond the capacity of half a dozen lads with the help and guidance of a seaman who has accustomed himself to use the carpenters tools to do so, if they keep their eyes skinned every time they see a boat builder at work and pick up ideas by observation. Experience will prove that it is much easier than it seems—to those who have not tried—to build a clinker built centre board sailing dinghy, she may not be up to competing for the Prince of Wales cup, but then everybody cannot be in the race and you want to carry as many lads as you safely can!

Lads can learn much during the winter evenings in designing, planning, building, and rigging, which can all be done even at places remote from the sea.

Transport by river, road, or rail is not difficult with so light a craft.

The satisfaction to all hands who have shared in the work will be far greater than it could possibly be if the boat had been ready built for them.

Half a dozen lads with such a boat, light tents, and the lead of an experienced seaman during a summer holiday may cruise and camp round our coasts at small expense, and there can be no more beneficial pleasure and experience!

A health giving fine sport, which if properly used, develops character, powers of endurance, observation and resource and gives knowledge and self respect.

MARINE SUPERINTENDENT.

London.

May 18th, 1932.

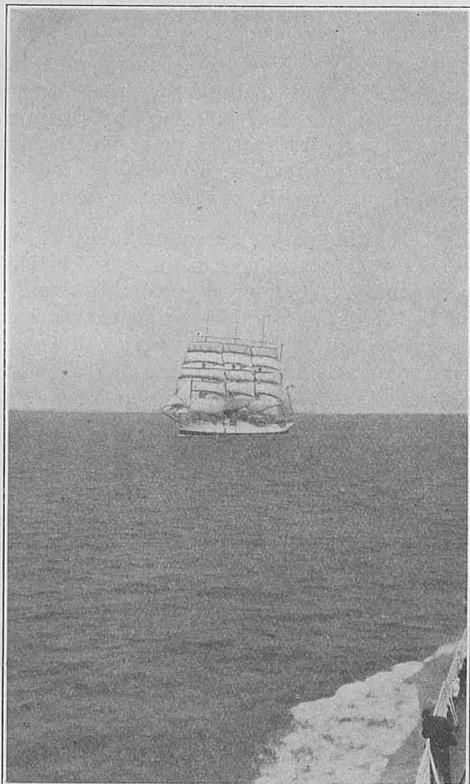
## THE MARINE OBSERVER'S LOG.

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.

## SHIP "L'AVENIR".

## Training Ship for Officers of the Belgian Merchant Service.

THESE photographs are contributed by Captain T. McNAMARA of S.S. *El Uruaguayo*. Taken when *L'Avenir* was running with the

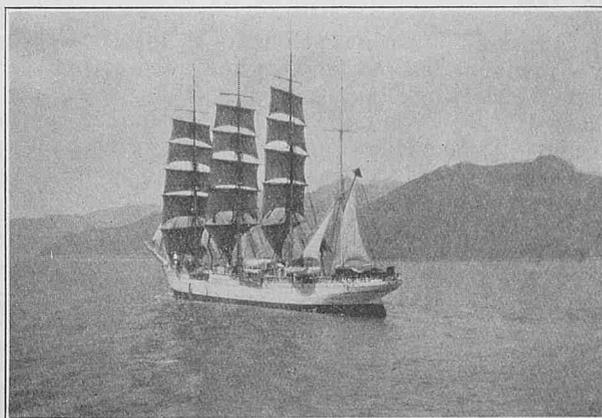


N.E. trade at about 8 knots off Anaga Point Teneriffe at 11.40 a.m. on September 25th, 1931.

He remarks:—

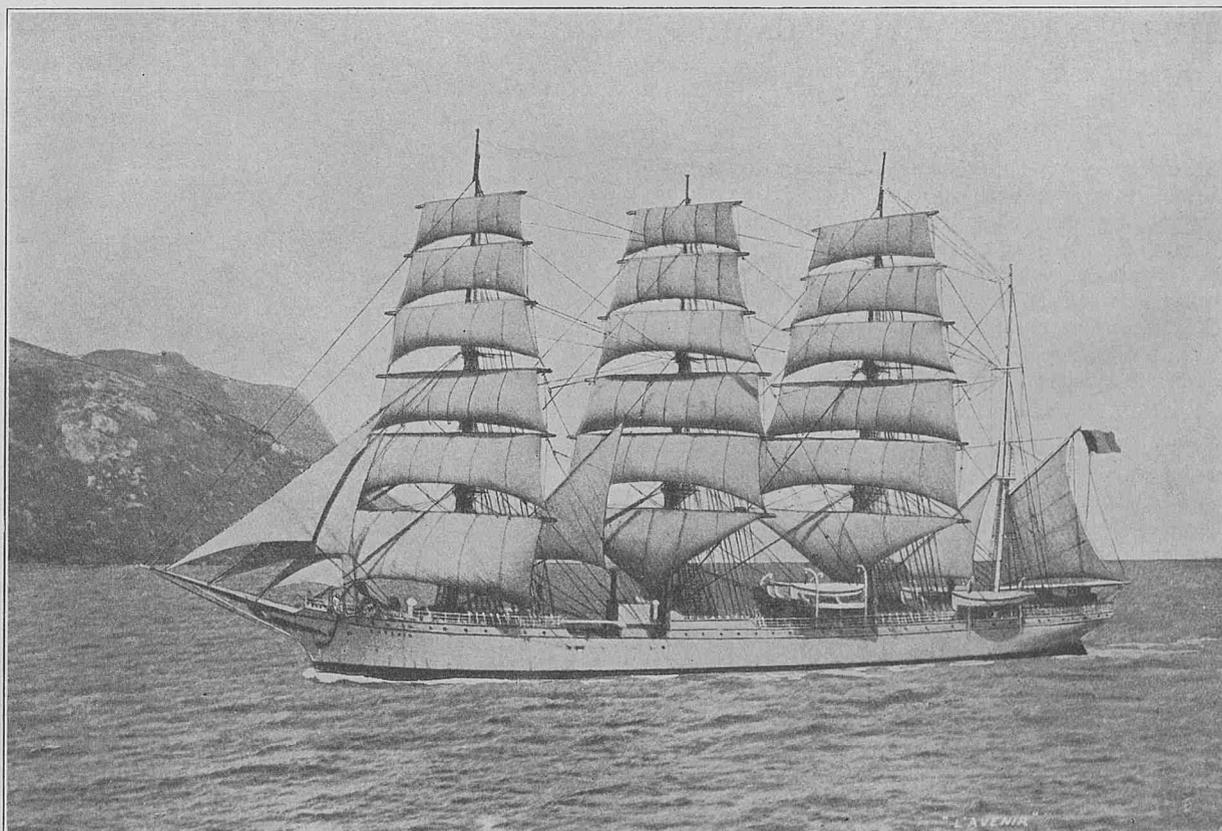
Of 3,600 tons gross her complement consists of 7 officers, wireless operator, Chaplain, 58 Cadets and 14 other ratings.

Captain VAN DE SANDE, who I believe is in command, served in several British ships before the war.



On her present voyage *L'Avenir* sailed from Antwerp on August 18th, 1931, for Casablanca where she arrived on September 4th, and proceeded to Madeira April 9th, arrived on September 15th, and after a short stay at Funchal sailed for Teneriffe.

The main and cross-jack courses are fitted with midship sheets.



*L'Avenir* is credited with having a good turn of speed and has made some good passages; in 1928 she sailed from Charleston, U.S.A., to Delfzyl, Holland, in 29 days. We noted that she was steered from amidships and her cadets were on deck apparently preparing for entering port. On the fore-castle head one of the officers was engaged with a number of Cadets getting the anchors overside ready for anchoring whilst the others appeared to be variously employed breaking buntline stops, etc., and seeing all clear for running.

It was also noticed that she was fitted with a large Donkey Engine just forward of the mainmast but nevertheless one could imagine the rivalry that exists between "masts" clewing up and furling sail coming to an anchor, as no doubt there would be an equal number of cadets told off to each mast.

There was at one time another three-masted full-rigged ship called *L'Avenir* under the Norwegian flag, formerly *River Fallock*. Shortly after the war I ran across her in Buenos Aires—she was then under the Italian flag.

Belgian lads desiring to become officers in the Mercantile Marine must pay a premium and pass an entrance examination before being admitted to the floating Nautical College Ship *Comte de Smet de Nayer*, moored in the River Scheldt. The lad does 12 months in this ship where he is instructed in general principles of seamanship and on passing an examination is sent to *L'Avenir* where he stays two voyages lasting about 15 months.

She is run on a commercial basis and trades in all seas.

The lads have the good fortune to obtain practical experience in handling a ship under sail dependent upon Nature's forces, thus acquiring qualities of resource, initiative, and individuality, a good foundation for their future career.

To make up the remaining sea time for 2nd mate, the cadets continue in Belgian tramps and liners.

These were the ships of yester year.  
They are fading now, so we shed a tear.  
Call it sentiment, or what you may.  
They trained us well for our work to-day.

### AUDIBILITY OF DUNGENESS FOG SIGNAL.

The following is an extract from the Meteorological Log of S.S. *Cerinthus*, Captain N. RAMSAY, Port Arthur, Texas, to Antwerp. Observer, Mr. E. ALLEN, 2nd officer.

August 13th, 1931, approaching Dungeness on a course 059° weather conditions as follows. Overcast with nimbus, light drizzling rain setting in, visibility moderate to poor and steadily decreasing. Calm with catspaws at times, sea smooth; air temperature, dry bulb 60°.6, wet 60°.5, sea 60°. State of the tide was four hours after high water at Dover, being between half ebb and slack water at the Ness. Position at 1345 G.M.T. on observing the lighthouse 4½ miles distant, Latitude 50° 51½' N., Longitude 1° 03½' E. Altered course 331° in order to obtain a reliable position before setting a course for Dover.

Fog signal of Dungeness (3 low blasts—short—long—short—every 2 minutes) was very faintly audible. At 1350 siren bearing 311°, distant 3½ miles, the signal became definitely audible. At 1400 having obtained a position in Latitude 50° 54' N., Longitude 1° 01' E., altered course 050° for Dover. During the subsequent ten minutes as the vessel proceeded on her course the signal appeared almost stronger than at 1400. It then remained definitely audible until 1450 when the siren bore approximately 242° distant by dead reckoning 9 miles, and was no more heard. Weather remained overcast during this period with increasing drizzle and reduced visibility: calm and smooth.

### DEAD FISH.

#### Arabian Sea.

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

On Thursday, August 27th, 1931, making up towards Ras Hafun from the south-eastward, large numbers of dead fish were observed floating on the surface. These fish appeared to be of several different varieties, varying in size from 3 or 4 inches to about 2 feet in length. The majority of them were small, and of a bluish-grey colour with white underside, having a large fin on their backs, and most of them, to judge by their swollen condition, had apparently been dead for some time.

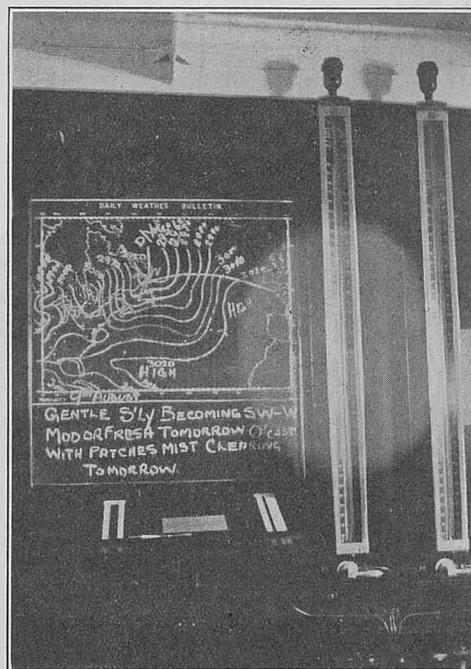
The fish were irregularly scattered, singly and in small shoals, but between 7.30 a.m. (A.T.S.), when they were first seen, and 8.30 a.m., scarcely a minute passed without numbers being visible. From then to 10.15 a.m. they became rather more widely distributed, with the exception of a large shoal which was passed about 9.45 a.m. amongst which black and white mottled fish were noticed.

No traces of oil or other injurious substances were observed, and, as the meeting of the cold and warm currents to the south of Ras Hafun conceivably might, but most probably would not, account for the death of the fish, the probability of some submarine disturbance seems to be indicated. The ship, during this period was steaming on a 331° course at 13.3 knots, and the fish were seen over a distance of about 36 miles, so their number was very considerable.

The changes in temperature about this time are interesting. At 2 a.m. (A.T.S.) the sea was 77° F., the same as on the preceding day. At 5 a.m. it had dropped to 75°, at 5.15 a.m. to 70°, and at 6 a.m. to 68°, the air temperature also being 68°; at 10 a.m. the sea and air were respectively 64° and 65°, having risen by noon to 68° and 69° respectively (off Ras Hafun), finally reaching 86° and 85°.5 at 10 p.m. in a position 9 miles north of Ras Filuk. Position of ship:—Latitude 9° 43' N., Longitude 51° 45' E.

### PHOTOGRAPH OF WEATHER CHART MADE AT SEA.

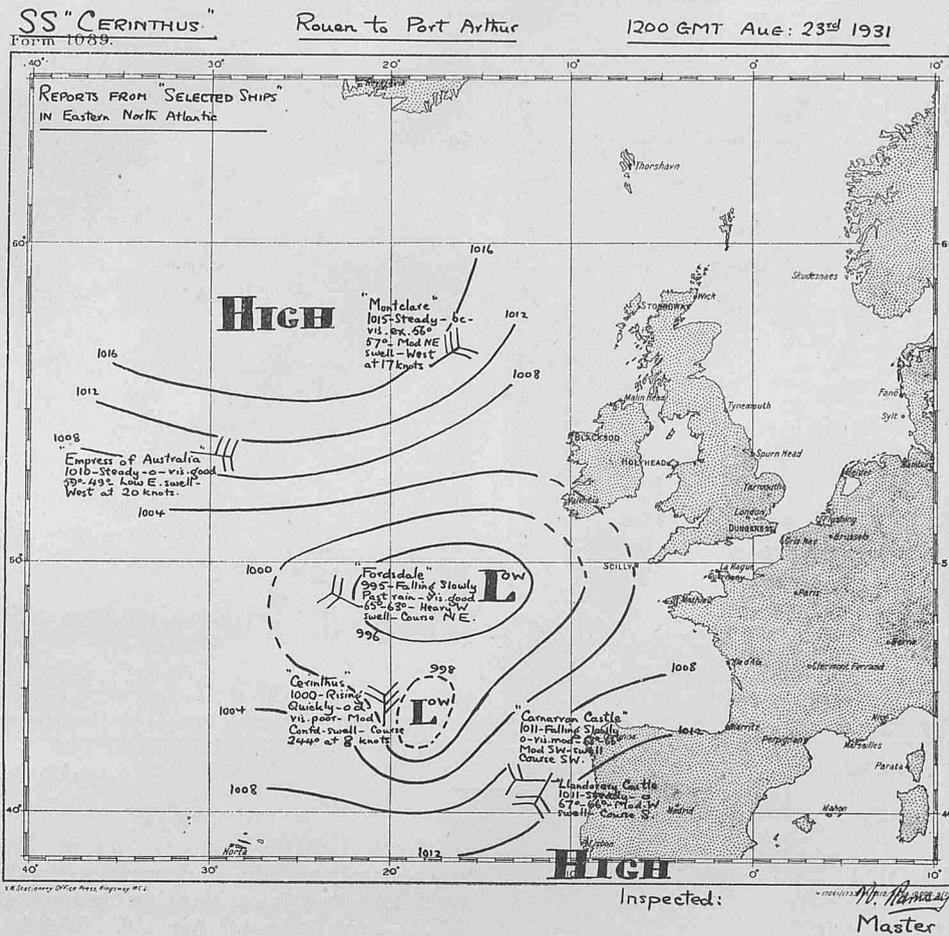
The accompanying photograph has been received from S.S. *Duchess of York*, Commander R. N. STUART, V.C., D.S.O., R.D., R.N.R., and shows the daily weather chart which is prepared and displayed in the Chart Room each day.



WEATHER CHARTS MADE AT SEA.

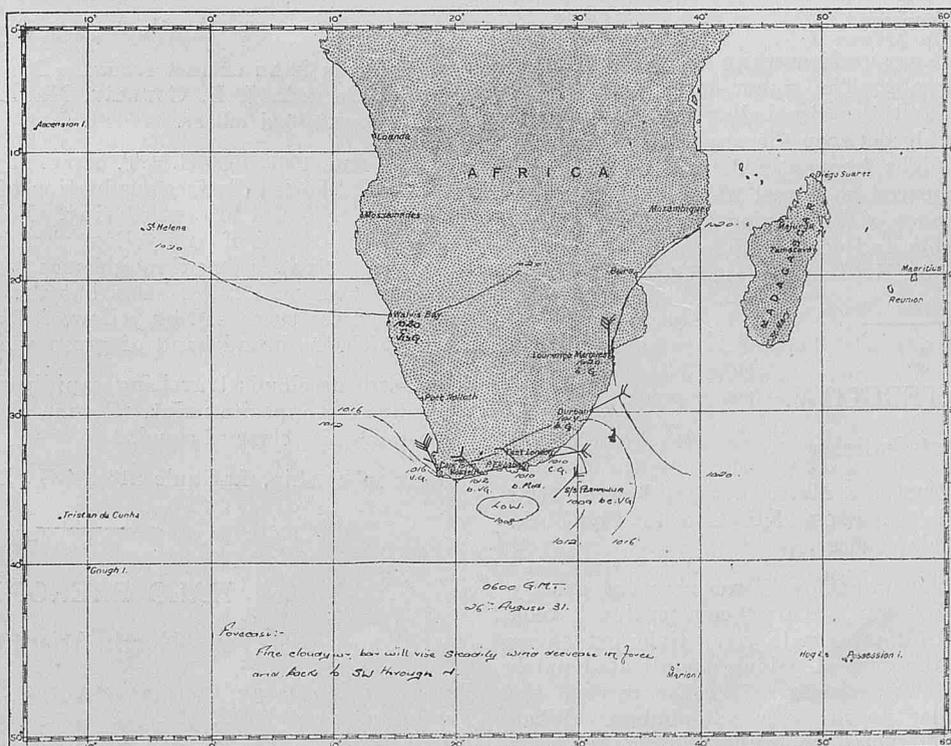
Eastern North Atlantic.

Weather Chart made at sea on board S.S. *Cerinthus*, Captain N. RAMSAY, Rouen to Port Arthur, Texas, by Mr. E. ALLEN, 2nd Officer.



South African Waters.

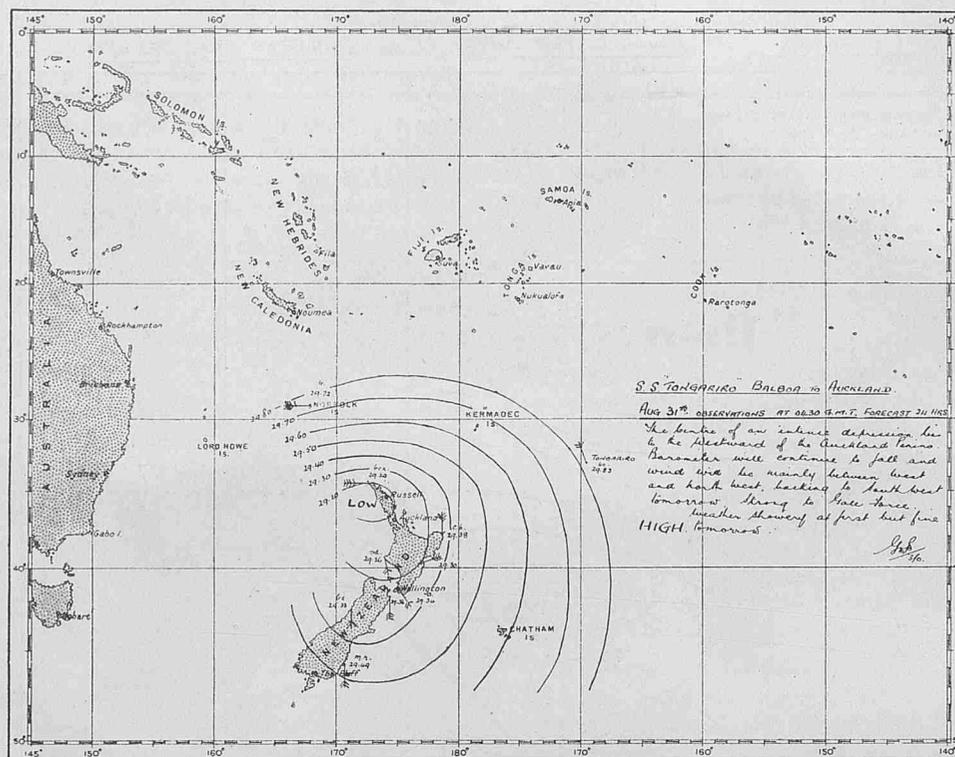
Weather Chart made at sea on board S.S. *Peshawur*, Captain C. B. ROCHE, Cape Town to Fremantle.



## WEATHER CHARTS MADE AT SEA (continued).

## South Pacific.

Weather Chart made at sea on board S.S. *Tongariro*, Captain F. S. HAMILTON, Balboa to Auckland, N.Z., by Mr. G. D. BALDWIN, 3rd Officer.



## AURORA.

## North Atlantic.

THE following is an extract from the Meteorological Log of S.S. *Manchester Hero*, Captain G. M. MITCHELL, Liverpool to St. John, N.B. Observer Mr. R. O. JONES, 2nd officer.

August 25th, 1931, Dark clear night, visibility excellent. At 00.30 a.m. ship's apparent time, an arc of auroral light became visible extending approximately from W.N.W. to N.N.E., both extremities of the arc being visible to the horizon.

The whole arc appeared as a nearly uniform white light and attained its greatest brilliancy at 1.15 a.m. The upper edge reached an altitude of approximately 10° and the sky below the lower edge appeared dark. Stars were visible between the arc and the horizon. At 1.30 a.m. until 1.40 rays of light frequently darted upwards and retreated rapidly and also appeared to travel along the arc from West to East giving an appearance of an opening fan. By 2.00 a.m. only a dim light remained visible and continued so until daybreak. Position of ship:—Latitude 54° 53' N., Longitude 20° 40' W.

## COUNTERGLOW.

## West Indies.

THE following is an extract from the Meteorological Log of S.S. *Jamaica Merchant*; Captain L. C. BACH, Kingston to Plymouth. Observer, Mr. B. W. SMITH, Chief Officer.

August 9th, 1931, a curious "counterglow" was observed exactly opposite the setting—but not set—sun. This "counterglow" took the form of a solitary uniform pillar of pale green light extending vertically from the horizon to the base of a long complicated patch of typical doldrum cumulo-nimbus, elevated 2 $\frac{3}{4}$ °; the sun at the time was concealed by a similar patch of cumulo-nimbus. When the sun emerged from behind the cloud the counterglow paled so as

to be barely visible, and appeared to take a "cant" and resolve itself into two faint slanting beams. Barometer 1016.9 mb., Wind E.N.E. force 3 to 4. Air 83°. Wet bulb 78°.1. Sea 83°. Clouds cumulus and cumulo-nimbus, from N.E. Weather bev.

Position of ship Latitude 21° 45' N., Longitude 72° 56' W. Course 051°. Speed 12 kts.

## LUNAR CORONA.

## South Indian Ocean.

THE following is an extract from the Meteorological Log of S.S. *Clan Macphee*, Captain J. B. GOURLAY, Mauritius to Durban. Observer, Mr. G. DRAKE, 3rd officer.

August 2nd, 1931, 1930 G.M.T. observed very brilliant lunar corona. The aureole showed distinct graduation of colour instead of the usual white-blue field and brown-red ring. Following the white-blue field was a distinct band of pale yellow, then following the various shades of orange to red, fading through puce to the customary violet. The blue was barely distinguishable but the green was very bright and broad and was succeeded by yellow, red and violet in narrow bands after which the broad band of green was repeated.

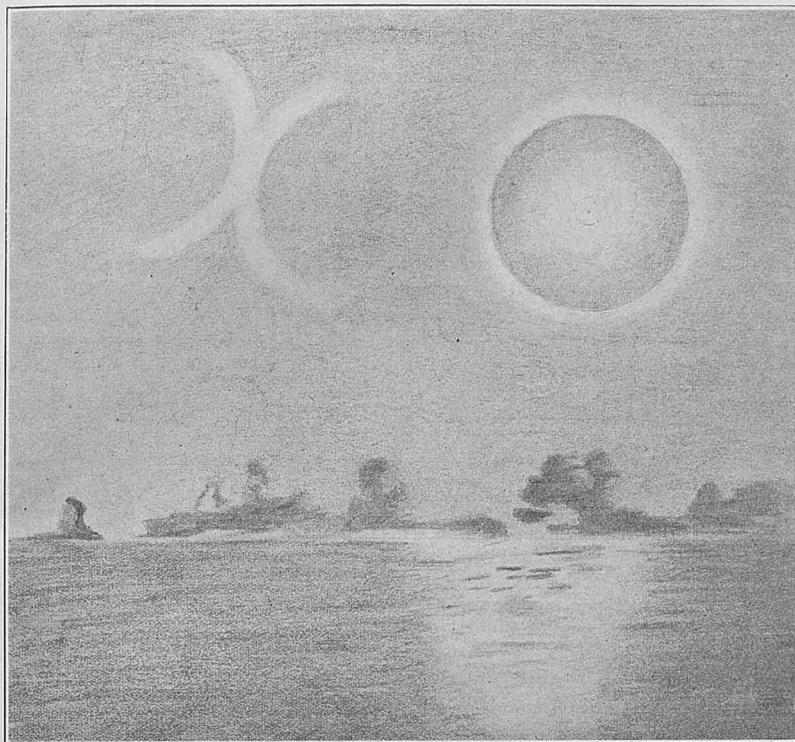
Alto-stratus clouds travelling rapidly from N.N.E. Lower clouds from directly opposite point. Corona clearly visible, however, when moon was quite clear of cloud.

Position of ship, Latitude 21° 52' S., Longitude 53° 30' E.

## HALO PHENOMENA.

## North Atlantic.

THE following is an extract from the Meteorological Log of S.S. *Trematon*, Captain F. CUNDY, Barry to Buenos Aires. Observer, Mr. S. E. J. CARRIVICK, 2nd officer.



3rd August, 1931, at 2.30 a.m. A.T.S. (0410 G.M.T.), observed white bow completely encircling the moon. Altitude of moon  $80^\circ$ , bearing  $111^\circ$  True; Radius of circle  $19^\circ 40'$ ; Barometer 1013.9 mb. Air temperature  $78^\circ.5$ ; Cloud cumulus 3/10; visibility 8.

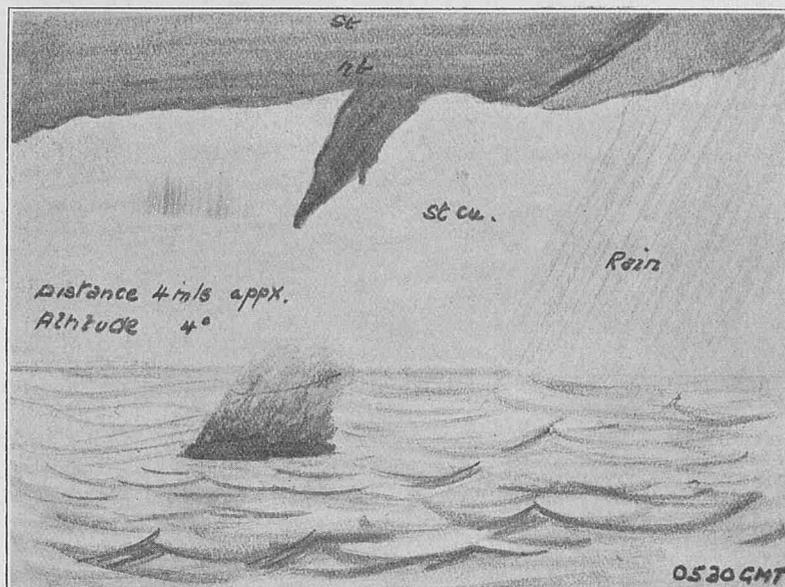
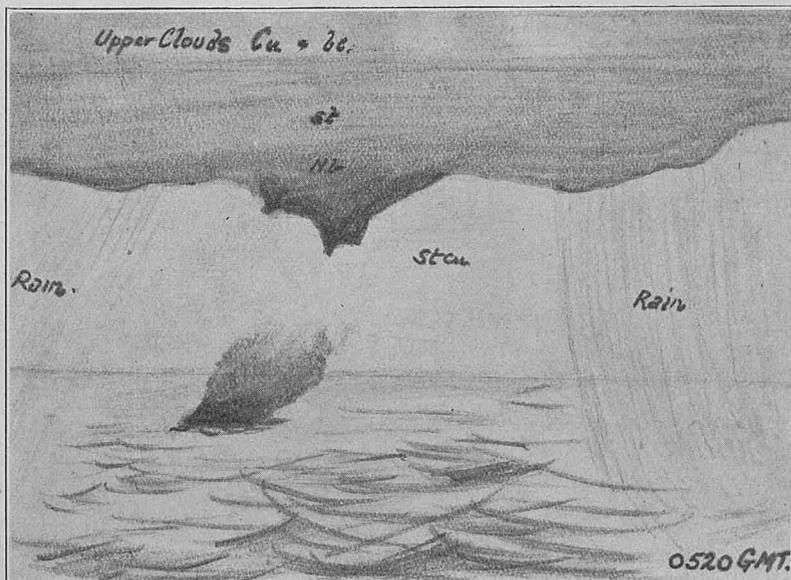
At 3.25 a.m. in the N.E. direction  $50^\circ$  from the moon two small arcs were observed forming a tangent which together with the circle remained until 3.35 a.m., when all disappeared.

Position of ship Latitude  $11^\circ 43' N.$ , Longitude  $21^\circ 37' W.$  Course True  $195^\circ$ .

### WATERSPOUTS.

#### South African Waters.

The following is an extract from the Meteorological Log of S.S. *Windsor Castle*, Captain J. H. KERBEY, South African Ports. Observer, Mr. F. HUNTER, 4th officer.



30th August, 1931, 0520 G.M.T. observed waterspout on starboard bow, bearing  $315^\circ$ , approximate distance 5 miles. Barometer 1013.3 mb. Temperature  $51^\circ$  Dry,  $47^\circ$  Wet. Wind W.N.W. Force 8, Heavy W'y Sea and Swell. Visibility 6-7. 0525 upon passing waterspout, wind increased in force for short period and backed W.S.W. 0530 observed second waterspout on starboard bow, bearing  $315^\circ$ , distant 4 miles. Altitude of cloud by sextant when abeam  $4^\circ$ . 0555 wind veered W.N.W. The waterspouts had the appearance of smoke rising from water gradually disappearing about 20 feet from surface.

Position of ship, Latitude  $33^\circ 45' S.$ , Longitude  $22^\circ 12' E.$

### METEOR.

#### Suez Bay.

The following is an extract from the Meteorological Record of S.S. *City of Sydney*, Captain E. MASON. At anchor in Suez Bay. Observer, Mr. H. GRIFFITH, 3rd officer.

August 5th, 1931, about 1800 G.M.T., a very bright meteor of about four times the magnitude of Venus was observed bearing N.  $\frac{1}{2}$  W. (approx.). Angular height about  $30^\circ$ . Colour bright white. Duration 5 to 7 secs. As it hardly changed its position in the sky but gradually brightened it would appear to be travelling towards us. It suddenly disappeared without falling from its position. Shortly afterwards, while on a course to Ras Abu Deraj, the light there was visible at 28 miles and Tafarana light at 40 miles (actual lights, not looms).

### METEOR.

#### West Indies.

The following is an extract from the Meteorological Record of S.S. *Inanda*, Captain WILLIS GIBBINGS, Trinidad to Grenada. Observer, Mr. D. C. BROWN, 3rd officer.

August 8th, 1931, at 11.50 p.m. A.T.S. observed an extraordinarily brilliant meteor emitting an exceptionally bright white light with edges distinctly greenish commencing between Caph ( $\beta$  Cassiopeiæ) and Schedar ( $\alpha$  Cassiopeiæ) travelling towards Pleiades at altitude about  $35^\circ$ . After traversing about one-third of the distance between these constellations and perhaps rather nearer to Pleiades it lost its original form, i.e. herring bone, and burst into a luminous gas forming a most perfect Z; this Z looked exactly as if an aeroplane had been writing in the sky, only, broader.

It then recurred towards the horizon in a wide ribbon of very brilliant luminous gas or light, then it appeared to develop a broad arrowhead just as if this ribbon of light had been in collision, this

## METEOR SHOWER.

## North Atlantic.

THE following is an extract from the Meteorological Record of M.V. *Apapa*, Captain A. BEITH, Lagos to Plymouth. Observer, Mr. V. FEENEY, 4th officer.

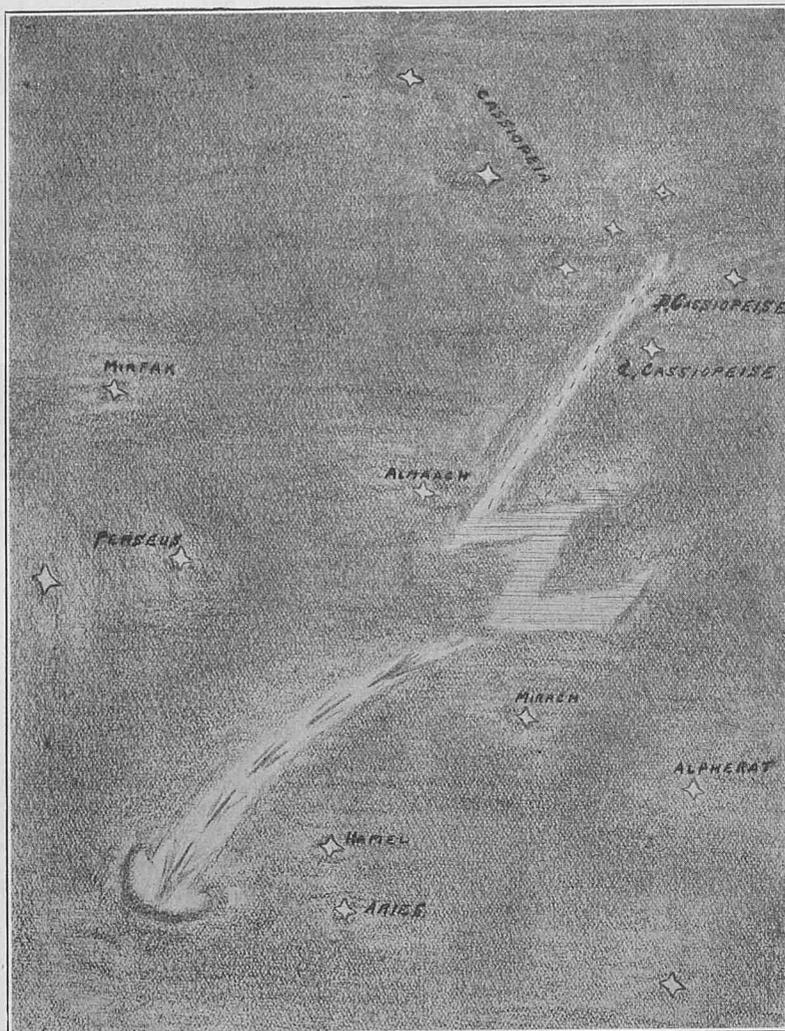
On Tuesday morning, August 11th, 1931, 0015 to 0415 G.M.T., the following celestial occurrence took place, the sky being cloudless at the time and visibility very good.

An innumerable number of meteors of the third magnitude were observed. They appeared at frequent intervals at an altitude of  $30^{\circ}$  above the horizon and disappeared at an altitude of  $5^{\circ}$ . Their duration was about one to two seconds; they were more frequent in the Western than the Eastern sky.

Towards the end of the watch, they decreased somewhat in number, but increased in altitude and brilliancy. The last observed meteor arose out of the constellation of Perseus and possessed the magnitude of 0.3.

Ship's position, Latitude  $22^{\circ} 00' N.$ , Longitude  $17^{\circ} 40' W.$  to Latitude  $23^{\circ} 00' N.$ , Longitude  $17^{\circ} 30' W.$

NOTE.—The meteors observed were Perseids, radiating from the constellation of Perseus. This shower is observed annually all over the world, if conditions are favourable. The greatest number of these meteors are seen between August 10th and 13th, the maximum being usually on August 11th and 12th.



last form then gradually faded from view, the last of it being seen at 11.52½ p.m. A.T.S., making the total duration exactly 2½ minutes.

But for fully ten minutes after all trace of the ribbon had disappeared the Z remained perfectly clear, after which it slowly dispersed.

Weather at time of observation, Wind N.N.E. force 3, slight sea and moderate N.E. swell. Sky cloudless with no moon. Position of ship, Latitude  $10^{\circ} 40' N.$ , Longitude  $61^{\circ} 48' W.$

## METEORS.

## North Pacific.

THE following is an extract from the Meteorological Record of S.S. *Albion Star*, Captain J. B. HALL, Tyne to Vancouver, B.C. Observer, Mr. W. H. GORE, 3rd officer.

August 8th, 1931, from 0600 to 0800 G.M.T. Several small meteors and one bright one were observed. They became visible in the centre of the constellation of Ursa Minor and travelled mainly in two directions, towards Ursa Major and towards Altair. The bright meteor, which has a magnitude of about  $-0.5$ , appeared about  $2^{\circ}$  South of  $\beta$  Ursæ Minoris and travelled towards Altair, leaving behind a train of sparks, then on towards the planet Saturn which lay to the southward of Altair, disappearing before it reached the planet. The flight was of  $3\frac{1}{2}$  seconds duration, the sparks being visible for 2 seconds. The total number of meteors was nine. After 0800 observations of further meteors were excluded by the moon, which was very bright.

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

## WATERSPOUTS.

PREPARED IN THE MARINE DIVISION BY L. E. FLETCHER, CLERICAL ASSISTANT.

So impressive a phenomenon as a waterspout must have been a very terrifying spectacle to primitive man, and there is little doubt that what were called sea-serpents and sea dragons in mythologies were often in reality waterspouts. In a later part of this article it will be shown that waterspouts are of comparatively frequent occurrence in the Mediterranean, the sea of the ancients. Rather curious means were used to placate or destroy the "monster," and since waterspouts seldom last more than half-an-hour any such method would appear to be successful and give authority and credit to the originator of the attempt. In modern times cannon and guns have been fired at the waterspout column in order to disperse it.

Most sailors have, at some time or other, seen a waterspout, so it is unnecessary to give detailed accounts; from time to time, such accounts by seamen can be read in the "Marine Observer's Log."

At first there seems to be a certain similarity between the American tornado on land and the waterspout at sea, and in some works of reference the waterspout is called "the funnel-shaped cloud of the tornado when occurring at sea." When a waterspout is first observed to form, a funnel point of cloud descends slowly from low—sometimes extremely low—cloud, usually of the nimbus type. The sea beneath this point becomes agitated and clouds of spray are formed into which the funnel point dips, thus joining the cloud to the sea and giving the appearance of a water column. Most of the liquid in the column is probably rain water. A series of six photographs taken from H.M.S. *Iroquois* was published in THE MARINE OBSERVER for October, 1930, and they illustrate what might be called the birth, life and death of a waterspout. Two of the finest waterspout photographs received in the Marine Division were taken in August, 1916, by Captain J. ALLAN MORDUE, commanding S.S. *Korongu*, approximate position Latitude 40° N., Longitude 180° E. Figure 1.

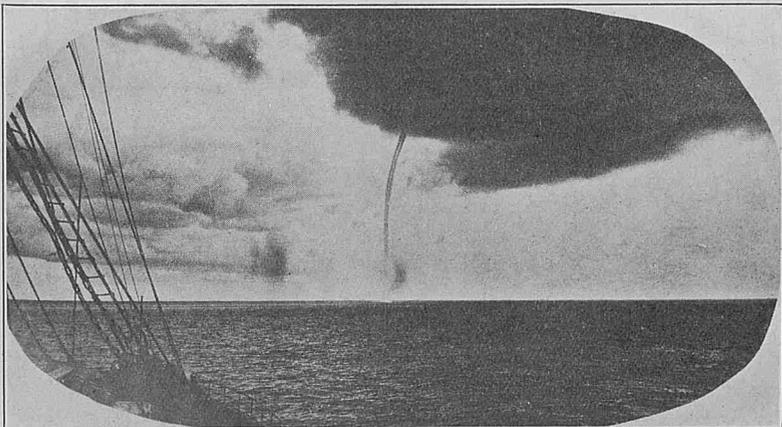
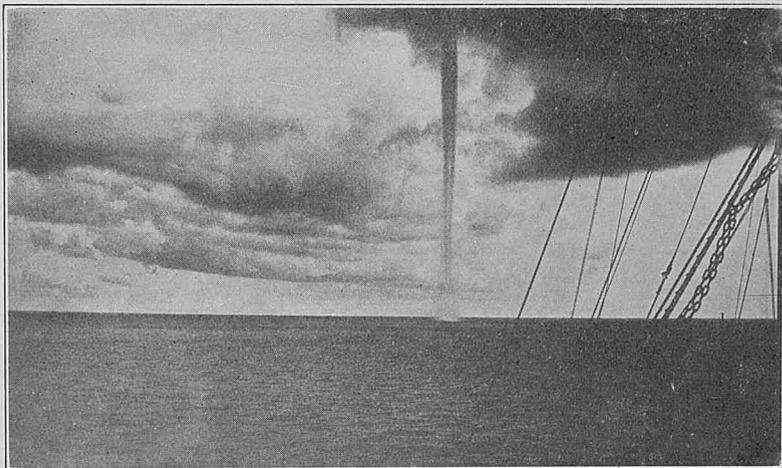


Figure 1

Frequently it is reported that two or three (sometimes even more) waterspouts are seen fairly close to each other, and an observer once reported having seen two waterspouts connecting two clouds and not joining the sea at all.

The tops of waterspouts adjoining the cloud are inclined to travel more quickly than the base on the surface of the sea. A waterspout's diameter is about 20 feet and its height may be any length from 100 feet to 2,000 feet; it seldom lasts for more than 30 minutes, and although it is violent, its violence is only local. The wind in the neighbourhood seems to rush in a circular path round the column, and observers often report a wind squall in conjunction with the phenomenon. Although the vast majority of waterspouts has been seen at sea, they can form in mountain lakes and fresh-water rivers.

The tornado of America, sometimes thought to be the land equivalent of a waterspout, is an extremely violent revolving storm of small diameter usually occurring in spring and early summer in association with depressions. The most violent are accompanied by the tornado cloud with a funnel-shaped mass, tapering down towards the earth, very similar in appearance to the more familiar waterspout. A tornado travels a distance of from 20 to 50 miles and the whole tornado column moves along at a rate of about 30 miles an hour; the velocity of the wind revolving round the column has been known to be as high as 300 miles per hour. Tornadoes of this type are more likely to be experienced in the Mississippi basin and in Australia, but they have been known in Europe in a much less violent form. Very great destruction follows in the path of a tornado. A remarkably fine photograph of a tornado can be seen in the "Encyclopedia Britannica."

There is, however, considerable difference between tornadoes and waterspouts. Whereas tornadoes normally form in the South-eastern quadrant of a depression, a waterspout can develop in any part of an anticyclone or depression. The barometric distributions existing at the time of two different waterspouts reported in home waters illustrate this fact and are shown in the weather charts given overleaf in Figures 2 and 3.

In fact a waterspout can form in practically any area where the atmospheric conditions are locally unstable and where a vortex of air may develop. Tornadoes are generally very dangerous. Waterspouts can be dangerous, for in November, 1855, five ships were sunk in Tunis Harbour by a waterspout, and in ALLINGHAM'S "Marine Meteorology" reference is made to the disaster to the barque *Lilian Morris*. She had her fore-topgallant mast, main and mizen topmasts and all canvas blown away. Mr. ALLINGHAM gives several other examples of waterspout disasters, including that of the schooner *Alice*, which was totally lost. Apart from these examples there are not many cases where a waterspout has been destructive, probably because they can be avoided by an alteration of course.

Since the year 1920 reports of phenomena observed at sea (including reports of waterspouts) have been indexed, and the observations of waterspouts during the years 1920-1931 have been examined. During these twelve years 739 observations of waterspouts were received. Figure 4 shows the distribution of these reports over the world in ten-degree squares. A blank square does not necessarily mean that waterspouts have not occurred in that area. The frequency of waterspouts reported indicated for different parts of the world on this chart is not a true indication of the frequency with which they actually occur since the observing fleet is never stationary nor are observing ships distributed evenly in all parts of the world. A reasonable amount of reliance, however, may be placed on the numbers in Figure 4 and the graphs which follow.

One or two conclusions can be made from an examination of Figure 4. It can be seen that waterspouts are more prevalent in the tropics than in other zones.

Also they are most frequently observed in the Mediterranean, the West Indies and the North-eastern part of the Indian Ocean. It is significant that the last two areas are dotted with innumerable small land masses. The actual areas, together with Home Waters, are marked out on Figure 4 and are discussed later. Another conclusion from Figure 4 is that observations are much rarer in mid-ocean, especially in the North Atlantic and Pacific Oceans.

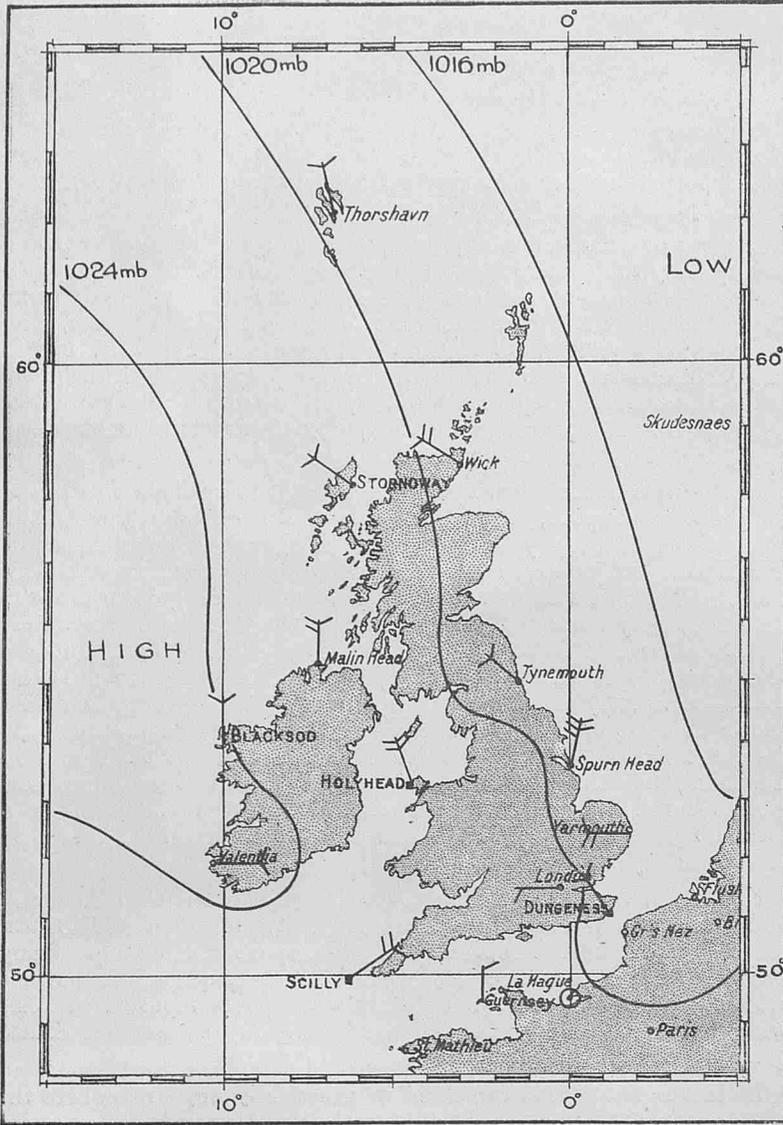


Figure 2.—Pressure distribution at time of waterspout observed from S.S. *Alban*, Captain F. C. P. HARRIS, when 5 miles W.N.W. of Le Havre Light Vessel at 10h. 20m. 7th September, 1931. Position of waterspout shown thus ⊙.

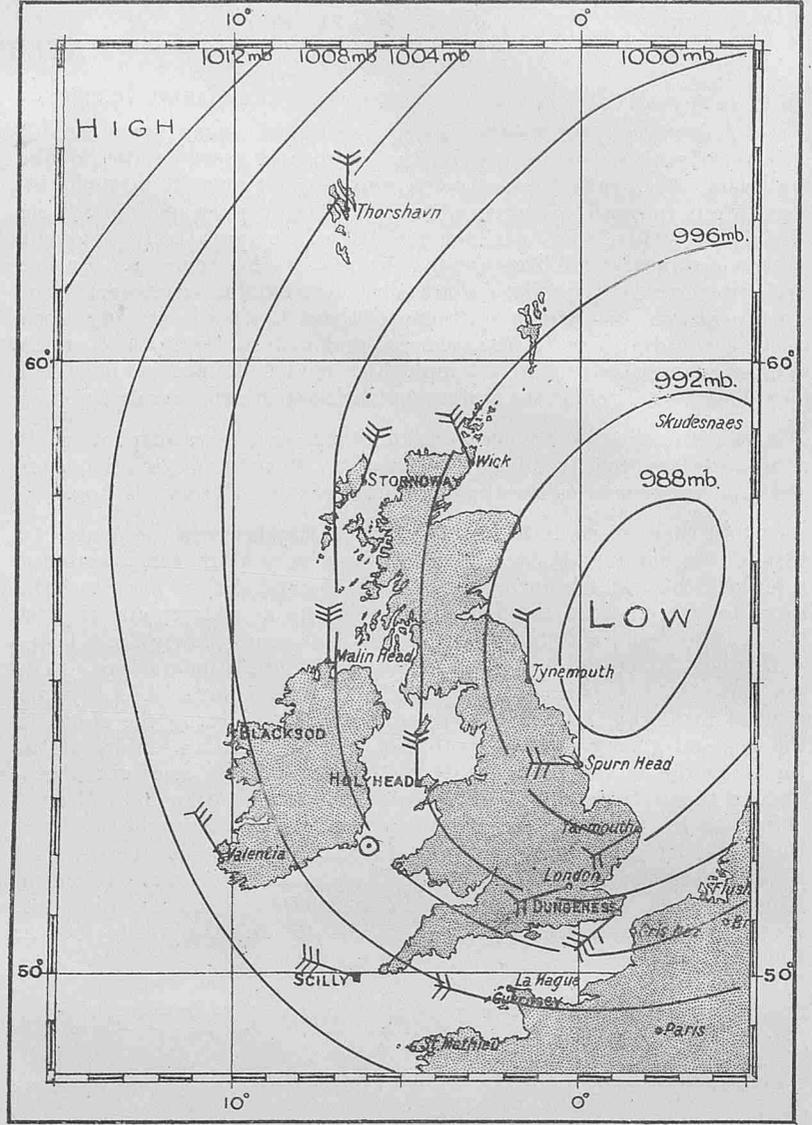


Figure 3.—Pressure distribution at time of waterspout observed from S.S. *Digby*, Captain F. W. CHAMBERS, D.S.C., when in Latitude 52° 25' N. and Longitude 5° 50' W. at 16h. 25m. 11th May, 1923. Position of waterspout shown thus ⊙.

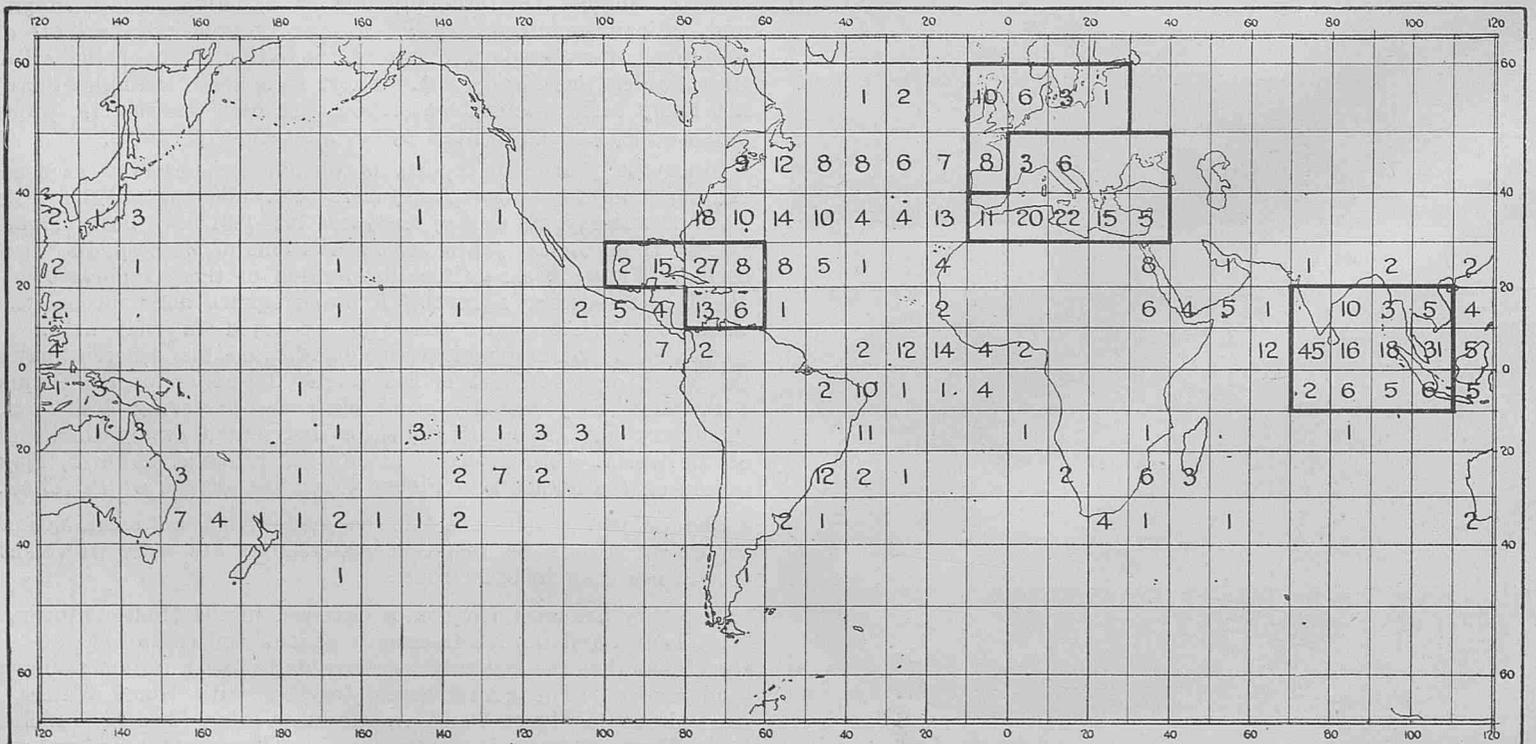


Figure 4.—Number of Waterspouts reported in each 10° square during the period 1920-1931 by British ships observing for the Meteorological Office.

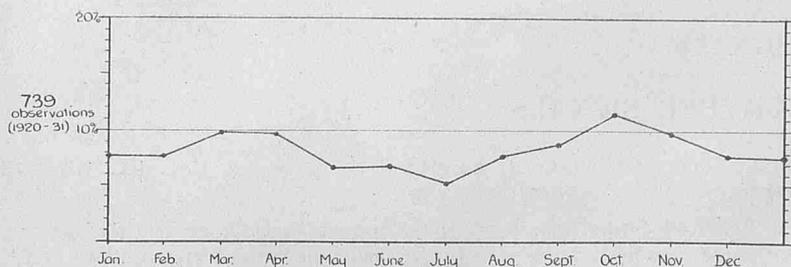


Figure 5.—Percentage of observations reported each month for all oceans.

Figure 5 gives the percentage monthly variation in graphical form of frequency for the whole world, and the periods of greater and smaller frequency of waterspouts seem to correspond roughly with the dates of the sun's equinoxes and solstices. October is the month in which more waterspouts form than in any other month of the year, while there is a marked falling off in frequency in July.

A slight connection having been found between waterspout frequency and the sun's equinoxes and solstices, it was thought advisable to separate the data used in Figure 5 into data for the two hemispheres. The majority of the observations are for the Northern Hemisphere; only 156 of the 739 are for the Southern Hemisphere.

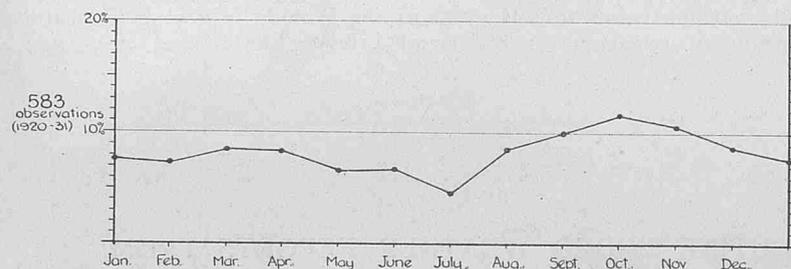


Figure 6.—Percentage of observations reported each month for Northern Hemisphere.

Figures 6 and 7 give the percentage monthly frequency for the Northern and Southern Hemispheres respectively, and in the former the graph corresponds very nearly to that for the world in Figure 5. That for the Southern Hemisphere does not conform, and the maximum numbers of waterspouts were observed in the months of March and April and the minimum in September and December. The difference between these two graphs may be due to the paucity of observations for the Southern half of the globe and the Southern hemisphere graph should be taken with reserve.

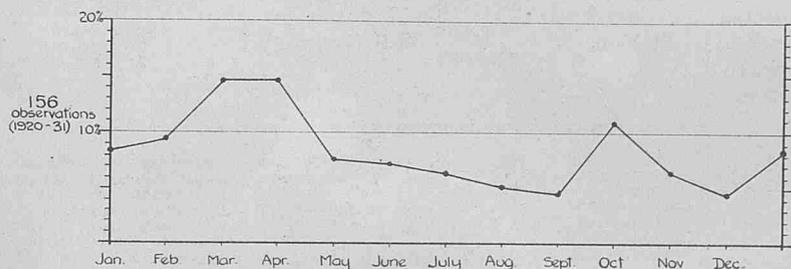


Figure 7.—Percentage of observations reported each month for Southern Hemisphere.

The following table gives the number of observations received for the squares marked out on Figure 4 which include the Mediterranean.

Nearly a fourth of the total number of observations received were for the month of October, and marked maxima are shown for January and October. For the whole period of twelve years not one observation was reported for the months of June and July.

TABLE I (Mediterranean).

Month.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
No. of observations 1920-1931.	15	5	8	2	3	0	0	4	8	19	14	4
Percentage of total (82).	18.2	6.1	9.7	2.4	3.7	0.0	0.0	4.9	9.7	23.2	17.2	4.9

Table II gives the number of observations received for the squares, marked out on Figure 4, which include the West Indies and the Gulf of Mexico.

TABLE II (West Indies and Gulf of Mexico).

Month.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
No. of observations 1920-1931.	6	3	4	2	7	10	2	15	13	6	3	0
Percentage of total (71).	8.4	4.2	5.6	2.8	9.9	14.2	2.8	21.2	18.3	8.4	4.2	0.0

In this area more waterspouts have been observed in August than in any other month, whereas there have been no observations reported for December. It is curious how the frequency percentage of 2.8 for July follows the 14.2 per cent. for June and is succeeded by the 21.2 per cent. for August.

TABLE III (N.E. Indian Ocean).

Month.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
No. of Waterspouts observed 1920-1931.	11	12	24	21	9	15	8	4	9	13	11	10
Percentage of total (147).	7.5	8.2	16.3	14.3	6.1	10.2	5.4	2.7	6.1	8.9	7.5	6.8

In the above table for the North-eastern part of the Indian Ocean (see Figure 4) it can be seen that the months of greater frequency occur during the transition periods between the South-west and North-east monsoons. The month of maximum frequency is March and that of minimum frequency is August, but the variation in frequency is of much lower amplitude than for the other parts of the world studied in this article. One can therefore expect to observe waterspouts in any month of the year when in these waters.

TABLE IV (Home Waters).

Month.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
No. of Waterspouts observed 1920-1931.	0	0	2	0	2	0	3	5	11	1	3	1
Percentage of total (28).	0.0	0.0	7.2	0.0	7.2	0.0	10.7	17.8	39.2	3.6	10.7	3.6

In Figure 4 the area marked out to provide the data in the above table for Home Waters is nearly as big as that used for Table II, yet during the twelve years for this analysis only 28 observations of waterspouts have been reported. Of these 28, as many as 11 have been observed in September, whose percentage frequency is nearly forty. Four months of the year, January, February, April and June, are months in which no waterspouts have been observed in Home Waters. It seems that in these waters waterspouts are of fairly rare occurrence and that when they do occur they do so in the late summer only.

SOUTHERN ICE REPORTS.

During the Year 1931—August.

No reports of Ice, sighted in the Southern Ocean during the month of August, 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 IX.

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 report to C.Q. on 600 m. spark, and these may be intercepted by the stations ringed in on Chart IX. 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 158 and 159. 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 IX.)	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 begins—Call signs of chosen "Selected Ships"—Weather ends.				
	Chatham Mass., Sayville N.Y. or West Palm Beach.	Lat. 41° 42' N. Long. 70° 00' W. Lat. 40° 45' N. Long. 73° 06' W. Lat. 26° 42' N. Long. 80° 02' W.	WCC. WSL. 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).	North Atlantic South of Latitude 38° N. and East of Longitude 40° W.	Radio Horta.	Weather only, up to seven groups, preferably No. 3 Supplementary Groups.

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.									
Indian Ocean.	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. 20° S. when westward of the Colombo area.	Weather Nairobi.	Weather only. No. 6 Supplementary groups.	No control — all British "A Selected Ships" within area should report 0600 G.M.T. observations.
	Perth.	Lat. 32° 01' 51" S. Long. 115° 49' 31" E.	VIP	—	125 kc/s. (2400 metres).	Indian Ocean and Southern Ocean between Long. 105° and 135° E.; but not within 100 miles of station.	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).	S. Pacific, Coral and Tasman Seas and Southern Ocean between Long. 135° and 160° E.; but not within 100 miles of station.	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.	Metoro 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. Juncçao	Lat. 27° 36' 00" S. Long. 48° 30' 18" W. Lat. 32° 04' 00" S. Long. 52° 07' 00" W.	PPF. PPJ.					
Indian Ocean.	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.					
	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.			
	Perth.	Lat. 32° 01' 51" S. Long. 115° 49' 31" E.	VIP.					
	Esperance.	Lat. 33° 52' 40" S. Long. 121° 53' 34" E.	VIE.					

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

(Continued.)

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			
	Sydney	Lat. 33° 46' 00" S. Long. 151° 03' 09" E.	VIS			
	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.

Canada, Nova Scotia, Newfoundland and Labrador, etc.

First Part.

(I.C.W. and Spark Issues.)

THE following stations broadcast weather bulletins, giving forecasts,\*\* on 600 metres spark, unless otherwise indicated. Where the times of transmission are omitted, forecasts are sent on request. Stations marked with an asterisk (\*) are open during the season of navigation only.

Country.	W/T Station.	Call Sign.	Position (approx.).		Time, G.M.T.
			Lat. N.	Long. W.	
Canada (Nova Scotia).	†Lurcher Lt. Vsl. ...	VDR	43° 49'	66° 32'	—
	†Yarmouth ...	VAU	43° 46'	66° 07'	0430, 1630
	†Chebucto Head ...	VAV	44° 30'	63° 31'	0440, 1640
	North Sydney ...	VCO	46° 13'	60° 15'	—
	Sable Island ...	VCT	43° 56'	60° 02'	—
Canada ...	§Louisburg ...	VAS	46° 09'	59° 57'	0400, 1600
	Grindstone Island ...	VCN	47° 23'	61° 54'	—
	*†Fame Point, Que....	VCG	49° 07'	64° 36'	0430, 1630
	*Clarke City, Que. ...	VCK	50° 11'	66° 37'	—
	*†Father Point, Que.	VCF	48° 31'	68° 28'	0420, 1620
	*†Quebec ...	VCC	46° 48'	71° 12'	0410, 1610
	*†Montreal ...	VCA	45° 34'	73° 38'	0400, 1600
	*Heath Point Lt. Vsl. (Anticosti I.).	VCH	49° 03'	61° 30'	—
Canada (New Brunswick).	†St. John ...	VAR	45° 14'	66° 03'	0400, 1600
Newfoundland and Labrador.	†Belle Isle ...	VCM	51° 53'	55° 22'	0440, 1640
	Cape Race ...	VCE	46° 39'	53° 04'	0215, 1415
	Point Amour ...	VCL	51° 27'	56° 50'	—
St. Pierre and Miquelon Is.	†St. Pierre ...	FQN	46° 47'	56° 11'	0130, 1330
Hudson Bay and Strait.	*†Port Churchill ...	VAP	58° 47'	94° 09'	1620
	*†Cape Hopes ...	VAY	61° 05'	69° 33'	—
	Advance				
	*†Nottingham Is. ...	VCB	63° 06'	77° 56'	—
	*†Resolution Is. ...	VAW	61° 20'	64° 50'	1620

† The station keeps watch for the first half of every odd hour from 1200 to 0000, and from 0300 to 0330, G.M.T.  
 ‡ Wavelength, 600 metres (I.C.W.).  
 § Wavelength, 2,804 metres (I.C.W.).

Wireless Telephony R/T Issues.

THE following stations broadcast weather forecasts,\*\* issued by the Canadian meteorological service, by word of mouth.

Country.	Station.	Call Sign.	Position (approx.).		Time G.M.T.	Wave-length R/T.
			Lat. N.	Long. W.		
Canada (New Brunswick).	St. John...	CFBO	45° 14'	66° 03'	1000, 1200	337 m.
Canada (Nova Scotia).	Sambro Outer Bank Lt.-V.	VCX	44° 22'	63° 26'	1200 1730	435 m.
	Louisburg ...	VAS	46° 09'	59° 57'	0800, 1700	435 m.

\*\* Details of areas, periods and elements not available.

United States of America (Atlantic Coast).

C.W. Issues.

Washington.—Arlington W/T Station, approximate Latitude 38° 52' N., Longitude 77° 05' W., call sign NAA, broadcasts weather bulletins at 0300 and 1500 G.M.T., on wavelengths of 2653 metres (C.W.) and †4690 metres (C.W.) simultaneously.

The bulletins are divided into two parts and begin with the words "Weather Bureau Bulletin."

† Transmission on 4690 m. ceases at 0400 G.M.T. for 0300 G.M.T. bulletin.

Part I of the 0300 and 1500 G.M.T. bulletins contains observations taken at 0100 and 1300 G.M.T., respectively, from a number of stations followed by weather reports from ships at sea.

Key letters	Name of station	Latitude		Longitude west
		north	west	
TP	The Pas, Man ...	53° 35'	101° 12'	
WG	Winnipeg, Man ...	49° 55'	97° 10'	
BK	Bismarck, N. Dak ...	46° 49'	100° 49'	
O	Omaha, Nebr. ...	41° 16'	95° 58'	
KC	Kansas City Mo. ...	39° 05'	94° 35'	
OK	Oklahoma City, Okla ...	35° 29'	97° 31'	
DA	Dallas, Tex. ...	32° 45'	96° 48'	
GV	Galveston, Tex. ...	29° 19'	94° 50'	
DU	Duluth, Minn. ...	46° 49'	92° 09'	
M	Marquette, Mich. ...	46° 33'	87° 26'	
LC	La Crosse, Wis. ...	43° 50'	91° 12'	
CH	Chicago, Ill. ...	41° 50'	87° 40'	
SL	St. Louis, Mo. ...	38° 39'	90° 13'	
CN	Cincinnati, Ohio ...	39° 07'	84° 30'	
NV	Nashville, Tenn. ...	36° 11'	86° 50'	
LR	Little Rock, Ark. ...	34° 41'	92° 15'	
VK	Vicksburg, Miss ...	32° 17'	90° 50'	
NO	New Orleans, La. ...	30° 00'	90° 05'	
P	Pensacola, Fla. ...	30° 25'	87° 12'	
L	Alpena, Mich. ...	45° 05'	83° 25'	
D	Detroit, Mich. ...	42° 21'	83° 03'	
F	Buffalo, N.Y. ...	42° 53'	78° 50'	
PB	Pittsburgh, Pa. ...	40° 26'	79° 57'	
LB	Lynchburg, Va. ...	37° 27'	79° 08'	
CT	Charlotte, N.C. ...	35° 17'	89° 39'	
AT	Atlanta, Ga. ...	33° 45'	84° 21'	
TA	Tampa, Fla. ...	27° 59'	82° 29'	
K	Key West, Fla. ...	24° 40'	81° 48'	
MI	Miami, Fla. ...	25° 46'	80° 12'	
NU	Nassau, Bahamas ...	25° 05'	77° 23'	
TI	Turks Island, W.I. ...	21° 20'	71° 10'	
SJ	San Juan, P.R. ...	18° 29'	66° 06'	
JA	Jacksonville, Fla. ...	30° 21'	81° 40'	
C	Charleston, S.C. ...	32° 50'	79° 58'	
WL	Wilmington, N.C. ...	34° 18'	77° 59'	
H	Cape Hatteras, N.C. ...	35° 14'	75° 32'	
NF	Norfolk, Va. ...	36° 51'	76° 18'	
BAL	Baltimore, Md. ...	39° 18'	76° 38'	
AC	Atlantic City, N.J. ...	39° 22'	74° 27'	
NY	New York, N.Y. ...	40° 43'	74° 01'	
T	Nantucket, Mass. ...	41° 15'	70° 00'	
BN	Boston, Mass. ...	42° 22'	71° 02'	
N	Northfield, Vt. ...	44° 08'	72° 40'	
E	Eastport, Me. ...	44° 54'	67° 00'	
CK	Cochrane, Ont. ...	49° 04'	80° 58'	
DC	Doucet, Que. ...	48° 17'	76° 40'	
PN	Parry Sound Ont. ...	45° 20'	80° 01'	
ML	Montreal, Que. ...	45° 31'	73° 34'	
FP	Father Point, Que. ...	48° 30'	68° 30'	
BC	Port Aux Basques, N.F. ...	47° 33'	59° 10'	
CR	Cape Race, N.F. ...	46° 40'	53° 04'	
SAB	Sable Island, N.S. ...	43° 56'	60° 00'	
HX	Halifax, N.S. ...	44° 38'	63° 35'	
B	Bermuda ...	32° 18'	64° 42'	
HT	Horta, Azores ...	38° 32'	28° 29'	

The stations are indicated by the letters given above and are followed by two groups of five figures.\*

Ship Reports.—Weather reports from ships in the Atlantic Ocean, and during the hurricane season additional reports from ships in the

\* 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.

Gulf of Mexico and Caribbean Sea, follow the land stations' reports as follows:—

**0300 G.M.T. bulletin** contains 0000 G.M.T. observations; also Noon G.M.T. observations which were received too late for inclusion in the 1500 G.M.T. bulletin.

**1500 G.M.T. bulletin** contains Noon G.M.T. observations; also 0000 G.M.T. observations received too late for inclusion in the 0300 G.M.T. bulletin.

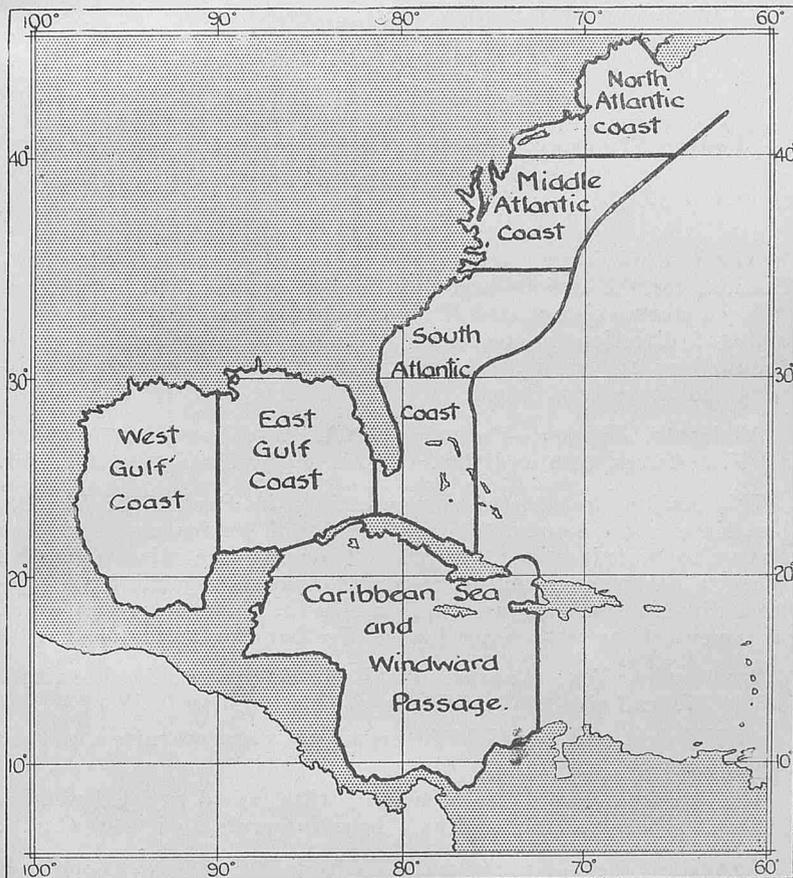
**NOTE.**—Ship reports of previous observations are only included when conditions are unusual.

The reports from ships are given in the four Universal groups of the International Ships' Wireless Weather Code, see DECODE for use with the International Wireless Weather Messages from ships, MO 329, for each ship, preceded by the call sign of the ship.

**Second Part.**

**Part II** of the bulletin is in plain language, and consists of a summary of general pressure distribution, including the location of high and low areas, and the barometric readings at their centres; wind and weather forecasts for the areas shown on the CHARTLET below.

Storm warnings are also broadcast for these areas.



**Weather Information broadcast for the benefit of Shipping approaching New York Harbour.**

The following W/T stations broadcast weather conditions at Sandy Hook from observations made one hour previous to the times of transmission. The information will include barometric pressure, temperature, wind direction and force, state of sky, state of sea, and visibility.

W/T Station.	Call Sign.	Position (approx.).		Time, G.M.T.	Wave length. Metres.
		Latitude.	Longitude		
Tuckerton, N.J....	WSC	39° 33' N.	74° 23' W.	1400, 2200	650, 2256 (I.C.W.). 2328 (C.W.).
Marion, Mass. ...	WCC	41° 43' N.	70° 46' W.	1400, 2200	

**United States of America, Caribbean Sea, Gulf Coast and West Indian Islands.**

Weather bulletins are broadcast from the under-mentioned W/T stations. They are of the same general character. They are based upon observations taken in the U.S.A. at 0100 and 1300 G.M.T. and one hour earlier at stations in the Gulf of Mexico and Caribbean Sea. The bulletins are divided into two parts.

**Part I** contains observations from stations in the following lists given in a five-figure group\* for each station preceded by the indicator letter or letters of the station. If observations from any station cannot be supplied, the indicator letters and code figures will be omitted altogether. If only a portion of the observations are missing the letter "X" will be sent in lieu.

**Part II.**—Sent in plain language, consists of wind and weather forecasts, storm and hurricane warnings for the various areas shown on the CHARTLET.

For particulars of storm and hurricane warnings, see p. 162.

**W/T Stations from which the Bulletins are Broadcast. (C.W. and Spark Issues.)**

**Almirante-Panama**—by arrangement with the United Fruit Co. (owners of the W/T station).

Approximate Latitude 9° 20' N., Longitude 82° 17' W.

Call sign **RXA** Wavelength, 4,075 metres (C.W.) and 600 metres C.W. simultaneously.

Times of broadcast, 0445 and 1730 G.M.T.

**Part I** is broadcast only in the 1730 G.M.T. bulletin and *only during the hurricane season, June to November inclusive.* **Part II** is broadcast daily *throughout the year* at both times.

Observation Stations in Part I of Bulletin.				Areas covered by Part II of Bulletin.
Indicator Letters.	Station.	Position (approx.).		Wind and Weather forecasts for West Gulf of Mexico. Wind and Weather forecasts for East Gulf of Mexico. Wind and Weather forecasts for Caribbean Sea and Windward Passage. Storm and Hurricane Warnings. See Chartlet.
		Lat.	Long.	
CG	Cape Gracias, Nic.	15° 00' N.	83° 13' W.	
BZ	Belize, Honduras	18° 00' N.	88° 20' W.	
BFD	Bluefields, Nic.	12° 00' N.	83° 45' W.	
W	Willemstadt, Curaçao.	12° 10' N.	69° 00' W.	
SJ	San Juan, P.R.	18° 28' N.	66° 06' W.	
PP	Port au Prince, Haiti.	18° 37' N.	72° 17' W.	
CFG	Cienfuegos, Cuba	22° 11' N.	80° 33' W.	
GUE	Guane, Cuba			
KN	Kingston, Jamaica	18° 10' N.	76° 48' W.	
TI	Turks I., Bahamas	21° 31' N.	71° 08' W.	

**NOTE.**— The above bulletins are sent by W/T to **Almirante W/T station** from the **Tropical Radio Telegraph Station at New Orleans La.**, call sign **WNU** at 0430 and 1630 G.M.T. on a wavelength of 3331 metres (C.W.) and ships are invited to intercept them.

**Key West, Fla.**—Approximate Latitude 24° 33' N., Longitude 81° 48' W.

Call sign **NAR.** Wavelength, 2,653 metres (I.C.W.).

Time of broadcast, 0400 G.M.T.

Observation Stations in Part I of Bulletin.				Areas covered by Part II of Bulletin.
Indicator Letters.	Station.	Position (approx.).		Wind and Weather forecasts for South Atlantic Coast. Wind and Weather forecasts for East Gulf of Mexico. Wind and Weather forecasts for West Gulf of Mexico. Wind and Weather forecasts for Caribbean Sea and Windward Passage. Storm and Hurricane Warnings. See Chartlet.
		Lat.	Long.	
H	Hatteras, N.C.	35° 14' N.	75° 32' W.	
C	Charleston, S.C.	32° 43' N.	78° 52' W.	
JA	Jacksonville, Fla.	30° 19' N.	81° 51' W.	
MI	Miami, Fla.	30° 35' N.	81° 13' W.	
K	Key West, Fla.	24° 33' N.	81° 48' W.	
P	Pensacola, Fla.	30° 21' N.	87° 19' W.	
GV	Galveston, Tex.	28° 19' N.	94° 48' W.	
BV	Brownsville, Tex.	28° 53' N.	97° 26' W.	
FW	Fortworth, Tex.	32° 30' N.	97° 40' W.	
KN	Kingston, Jam.	18° 01' N.	76° 48' W.	
TI	Turks Island	21° 31' N.	71° 08' W.	
HA	Havana, Cuba	23° 10' N.	82° 29' W.	
GO	Guantanamo Bay (Cuba).	19° 54' N.	75° 12' W.	
CG	Cape Gracias, Nic.	15° 00' N.	83° 13' W.	
SJ	San Juan, P.R.	18° 28' N.	66° 06' W.	

\* 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.

**Key West W/T Station** also broadcasts wind and weather forecasts, storm and hurricane warnings for the Florida, South Atlantic and east Gulf of Mexico Coasts at 1800 G.M.T. on a wavelength of 2,653 metres (C.W.).

**San Juan P.R.** (*July 1 to November 15, inclusive*).—Approximate Latitude 18° 28' N., Longitude 66° 06' W.

Call sign, **NAU**.

Time of broadcast, 0200 G.M.T.

Wavelength, 2,653 metres (C.W.).

Observation Stations in Part I of Bulletin.		Part II of Bulletin.	
Indicator Letters.	Station.	Position (approx.). Lat. Long.	
SJ	San Juan, P.R.	18° 28' N.	66° 06' W.
ST	St. Thomas, Virgin Is.	18° 23' N.	64° 55' W.
BT	Basseterre, St. Kitts	17° 18' N.	62° 43' W.
RS	Roseau, Dominica	15° 17' N.	61° 24' W.
BB	Bridgetown, Barbados.	13° 09' N.	59° 35' W.
SD	Santo Domingo, D.R.	18° 28' N.	69° 53' W.
PL	Puerto Plata, D.R.	19° 49' N.	70° 42' W.
LU	Castries, St. Lucia	14° 01' N.	61° 00' W.
W	Willemstadt, Curaçao.	12° 10' N.	69° 00' W.
PS	Port of Spain, Trinidad.	10° 40' N.	61° 30' W.
SM	St. Martins, D.W.I.	18° 02' N.	63° 04' W.

Hurricane Warnings.

**Repetition of "Arlington" bulletin.**

**San Juan W/T Station** re-broadcasts Part I and portions of Part II of the 0300 and 1500 G.M.T., Washington-Arlington (NAA) bulletins, previously explained on pp. 160-161, at 0430 and 1600 G.M.T., respectively, on a wavelength of 2,653 metres (C.W.). This re-broadcast is **not** made when conditions do not permit the reception of the Arlington bulletins at San Juan.

**Barbados.**

**Bridgetown W/T station**, approximate position latitude 13° 06' N, longitude 59° 37' W, call sign **VPO**, broadcasts the following weather information, received from the Meteorological Station, Codrington (latitude 13° 07½' N., longitude 59° 36' W.), when unsettled weather conditions prevail or indications of stormy weather are observed:—

Barometric pressure, barometric tendency, wind direction and force (or velocity in miles per hour), weather at time of observation, and G.M.T. of the observation.

If possible the approximate position of the centre of a tropical cyclonic disturbance will be broadcast.

**WIRELESS STORM WARNINGS.**

**United States of America (Atlantic Coast).**

Storm warnings are broadcast when necessary by the following stations, at the times and for the areas indicated:—

W/T Station.	Call Sign.	Position. (Approx.) Latitude, Longitude.	Time. G.M.T.	Wave-length. (Metres.)	Area.
Jupiter, Fla. ...	NAQ	26° 57' N. 80° 05' W.	1630, 2300	1,621 (I.C.W.).	Miami to Key West.
St. Augustine, Fla.	NAP	29° 53' N. 81° 17' W.	1700	1,621 (C.W.).	Jacksonville to Miami.
Savannah, Ga.	NEV	32° 05' N. 81° 06' W.	1600, 2330	1,621 (I.C.W.).	Coast of Georgia.
Charleston, S.C.	NAO	32° 52' N. 79° 58' W.	1530, 2300	2,458 (C.W.).	Coast of S. Carolina,
Norfolk, Va. ...	NAM	36° 50' N. 76° 18' W.	0130, 0900, 1330, 1600, 2100	2,458 (C.W.).	Virginia and N. Carolina coast.
Washington (Arlington)	NAA	38° 52' N. 77° 05' W.	0300*	2,653, 4,409 C.W. simultaneously.	N. Atlantic and Gulf coasts.
			1500*		

W/T Station.	Call Sign.	Position. (Approx.) Latitude, Longitude.	Time G.M.T.	Wave-length. (Metres.)	Area.
Philadelphia ...	NAI	39° 53' N. 75° 11' W.	1548, 2200	2,883 (C.W.).	New Jersey, Delaware and Maryland.
New York ...	NAH	40° 28' N. 74° 00' W.	1530, 2130	2,939 (C.W.).	N. and middle Atlantic coasts and Gulf in W. Indian waters.
Boston, Mass.	NAD	42° 21' N. 70° 57' W.	1600, 2200	2,941 (C.W.).	N. Atlantic Coast.

\* In Part II of the Weather Bulletin.

Hurricane warnings are broadcast when necessary on 600 metres (I.C.W.) and repeated at intervals as stated, by:—

**Jupiter W/T Station, NAQ**, hourly for 12 hours.

**St. Augustine W/T Station, NAP**, every two hours until 2300 G.M.T.

**Savannah W/T Station, NEV**, every two hours until 0100 G.M.T.

**Charleston W/T Station, NAO**, every two hours for 24 hours.

**Norfolk W/T Station, NAM**, at hourly intervals.

**United States of America (Caribbean Sea, Gulf Coast) and West Indian Islands.**

(C.W., I.C.W. and Spark Issues.)

STORM and hurricane warnings are broadcast by the following W/T Stations for the various areas etc. shown on the CHARTLET, p. 161. When a storm exists that is likely to affect an area, the location and expected direction of movement of the storm centre will be given, followed by any storm or hurricane warnings and advices to shipping that have been issued.

**Almirante, Panama.**—Call sign **RXA**. Wavelength 4,075 metres (C.W.). Times, 0445 and 1730, G.M.T., *daily, throughout the year.*

This station broadcasts storm warnings in Part II of Weather bulletin explained on p. 161 for the Gulf of Mexico and Caribbean Sea, also warnings of "Northers" during the winter months. When a hurricane is in progress, information regarding its location, direction and progress, etc., will be broadcast every two hours, at the even hour, after issue by the Weather Bureau.

**Brownsville, Tex.**—Approximate Latitude 25° 52' N., Longitude 97° 26' W., call sign **NAY**. Wavelength 2,885 metres (C.W.):—

At Midnight and 1700 G.M.T., broadcasts storm warnings for west Gulf Coast etc.

Hurricane warnings also broadcast, when issued by local weather bureau. These are repeated at 2 hour intervals until 0500 G.M.T.

**Galveston, Tex.**—Approximate Latitude 29° 19' N., Longitude 94° 47' W., call sign **WGV**. Wavelength 830 metres (I.C.W.):—

At 1630 G.M.T. (except Sundays and holidays) and 2300 G.M.T., broadcasts storm warnings for west Gulf Coast etc.

Hurricane warnings also broadcast, same routine as Brownsville.

**New Orleans, La.**—Approximate Latitude 29° 57' N., Longitude 90° 02' W., call sign **NAT**. Wavelength 2,885 metres (C.W.):—

At 1600 G.M.T., broadcasts storm and hurricane warnings for south Atlantic and Gulf Coasts.

**Key West Fla.**, call sign **NAR**:—

At 0400 G.M.T. on a wavelength of 2,653 metres (C.W.), broadcasts storm warnings for south Atlantic Coast (Hatteras to Key West) and for east and west Gulf Coasts (Key West to Brownsville) and all hurricane warnings. At 1800 G.M.T., on a wavelength of 2,653 metres (C.W.), broadcasts storm and hurricane warnings for the Florida, south Atlantic and east Gulf of Mexico Coasts. Storm and hurricane warnings are also broadcast on 600 metres.

**San Juan P.R.**, call sign **NAU**. At 0430 and 1600 G.M.T., on 2,653 metres (C.W.) broadcasts hurricane warnings. Hurricane warnings and information relating thereto are also broadcast whenever issued by the Weather Bureaux at Washington D.C. and San Juan on 600 metres and 8,870 metres (C.W.) and repeated at the even hour for 12 hours if not previously cancelled.

**Guantanamo (Cuba)**—**NAW**—600 (I.C.W.) repeated hourly for 12 hours.  
**Port au Prince (Haiti)** **NSC**—600 (C.W.) repeated hourly for 12 hours.  
**St. Thomas** { Virgin Islands } **NBB**—600 (spk.) repeated hourly for 12 hours.  
**Santo Domingo**—**HIA**—600 (spk.) repeated every 4 hours.  
**Ensenada (Porto Rico)**—**WPR**—600 (spk.) repeated every 4 hours.

These W/T stations broadcast hurricane warnings when issued by the Weather Bureaux at Washington D.C. and San Juan, and repeat them at the intervals as stated, if not previously cancelled.

**Barbados.**

See Weather Bulletins issued as necessary during the hurricane season, page 162.

No information of a regular Wireless Storm Warning Service has yet come to hand, but these messages will go some way in supplying warnings for shipping.

In addition to which Bridgetown W/T station re-broadcasts urgent weather reports from ships in or near hurricanes.

Marine Observers visiting Barbados are advised to consult the Harbour Master at Bridgetown and to give him every assistance in working up this service.

**WIRELESS ICE WARNINGS.**

Canada, Nova Scotia, Newfoundland and Labrador, etc.

(Spark, I.C.W. and C.W. Issues.)

The following W/T stations broadcast ice warnings:—

W/T Station.	Latitude N. (approximate.)	Longitude W.	Call Sign.	Wave length (Metres).	G.M.T. of issue.
Lürcher Lt.-V...	43° 49'	66° 32'	VDR	600 (Spk.)	On request.
Chebucto Head...	44° 30'	63° 31'	VAV	600 (I.C.W.)	On request.
Sable Island ...	43° 56'	60° 02'	VCT	600 (Spk.)	On request.
North Sydney ...	46° 13'	60° 15'	VCO	600 (Spk.)	On request.
† Louisburg ...	46° 09'	59° 57'	VAS	2804 (C.W.)	0400, 1600.
‡ Grindstone Island	47° 24'	61° 51'	VCN	600 (Spk.)	On request.
Fame Point ...	49° 07'	64° 36'	VCG	600 (I.C.W.)	0430, 1630
Father Point ...	48° 31'	68° 28'	VCF	600 (I.C.W.)	0200, 1400
Clarke City ...	50° 11'	66° 37'	VCK	600 (Spk.)	On request.
Heath Pt. Lt.-V.	49° 03'	61° 30'	VCI	600 (Spk.)	On request.
Cape Race ...	46° 39'	53° 04'	VCE	600 (Spk.)	0215, 1415
Pt. Amour ...	51° 27'	56° 52'	VCL	600 (Spk.)	On request.
Belle Isle ...	51° 53'	55° 22'	VCM	600 (I.C.W.)	0440, 1640

‡ Broadcasts Gulf of St. Lawrence Ice Patrol report giving ice conditions between C. Race and Quebec and recommended route to be followed.

**III. WIRELESS TIME SIGNALS.**

Canada (Nova Scotia).

Spark Issue.

**Chebucto Head D/F Station**, Latitude 44° 30' 01" N., Longitude 63° 31' 20" W., call sign **VAV** broadcasts a time signal daily (Sundays excepted) at 14h. 00m. 00s., G.M.T., on a wavelength of 600 metres (spark).

The procedure is as follows:—

G.M.T.	Signal.
h. m. s. h. m. s.	
13 58 00 to 13 58 57	A dot (•) is transmitted at each second.
13 59 00	(•) Time signal.
13 59 03 to 13 59 50	A dot (•) is transmitted at each second.
14 00 00	(•) Time signal.

For the purpose of these signals the observatory at St. John (New Brunswick) is connected by land telegraph to Chebucto Head D/F Station.

**United States of America (Atlantic Coast).**

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

Time Signals are broadcast according to the United States System (See Diagram of Washington—Annapolis W/T Time Signals below), from the following W/T Stations:—

**Washington—Arlington**, Latitude 38° 52' 05" N., Longitude 77° 04' 47" W., call sign **NAA** on wavelengths\* of 435 R/T and 2,653 metres (I.C.W.) on high power, at 3h. 00m. 00s., and 17h. 00m. 00s., G.M.T. and on 2,653 metres (I.C.W.) at 08h. 00m. 00s.

The time signals are broadcast daily and are controlled by the Naval Observatory, Washington. They are broadcast simultaneously on the above-mentioned wavelengths.

The transmission of each time signal will be followed by the letters **VA**. In case of error or failure the words "No Time" will be sent together with the time when the next correct time signal will be made.

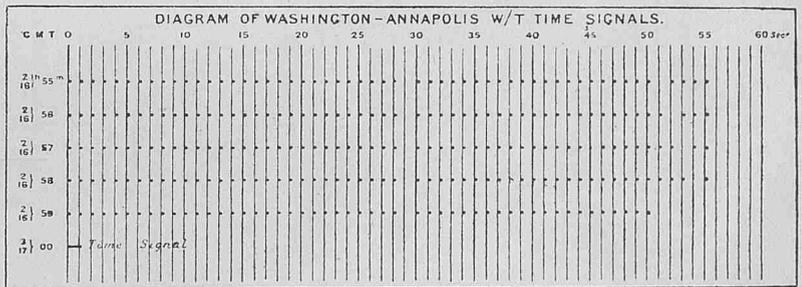
The error of the time signal is generally less than 0.1 second.

**Washington—Annapolis**, Latitude 38° 59' 00" N., Longitude 76° 27' 00" W., call sign **NSS**, on a wavelength of 16,840 metres (C.W.), at 3h. 00m. 00s., 8h. 00m. 00s., and 17h. 00m. 00s. G.M.T.

The time signals are relayed from the U.S. Naval Observatory and are broadcast on high power.

See Washington—Arlington for alternative broadcast times in case of failure.

The error of the time signal is generally less than 0.1 second.



The following W/T Stations broadcast a time signal at 17h. 00m. 00s., G.M.T., only when Washington—Arlington is out of action (Sundays and holidays excepted):—

Station	Latitude.	Longitude.	Call Sign.	Wavelength. Metres.
New York ...	40° 48' 00" N.	73° 50' 00" W.	NAH	2,939 (C.W.)
Norfolk ...	36° 49' 33" N.	76° 17' 46" W.	NAM	2,458 (I.C.W.)
Charleston ...	32° 51' 36" N.	79° 57' 49" W.	NAO	2,458 (I.C.W.)

\* Sharp tuning to the transmitting wavelengths is necessary in order to receive satisfactorily.

**Panama.**

(C.W. Issues.)

W/T Stations.	Call. Sign.	Wavelength metres.	Time of Signal being made G.M.T.	—
Colon - - -	NAX	2,271 (I.C.W.)	h. m. s. h. m. s. 3 55 00- 4 00 00	} Sent daily.
Lat. 9° 22' 09" N. Long. 79° 54' 07" W.			17 55 00-18 00 00	

**United States of America, Gulf Coast.**

(C.W. Issues.)

W/T Stations.	Call. Sign.	Wavelength metres.	Time of Signal being made G.M.T.	—
New Orleans - - -	NAT	2,883 (C.W.) 880 (I.C.W.)	h. m. s. h. m. s. 16 55 00-17 00 00	} Sent daily.
Lat. 29° 56' 50" N. Long. 90° 02' 18" W.				
Key West - - -	NAR	2,828 (C.W.)	16 55 00-17 00 00	} "Lag" of Key West time signal is 0.5 second or more.
Lat. 24° 33' 22" N. Long. 81° 48' 21" W.				

NOTE.—The Key West time signals are operated by long distance telegraphic control lines from Washington D.C.

Special Notices Regarding Personnel.

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

Captain R. J. Taylor.

Captain R. J. TAYLOR, commander of the M.V. British Dominion has retired from the sea after 44 years' service afloat.

Captain TAYLOR commenced his sea career in 1888 serving his time in the Barque Anglo Norman and Ships Lady Lawrence and Enone.

On completing his time he joined the Barque Pendragon as 2nd mate, and remained in sail until he obtained his Master's certificate. On transferring to steam he joined the Indra Line in which service he obtained his first command.

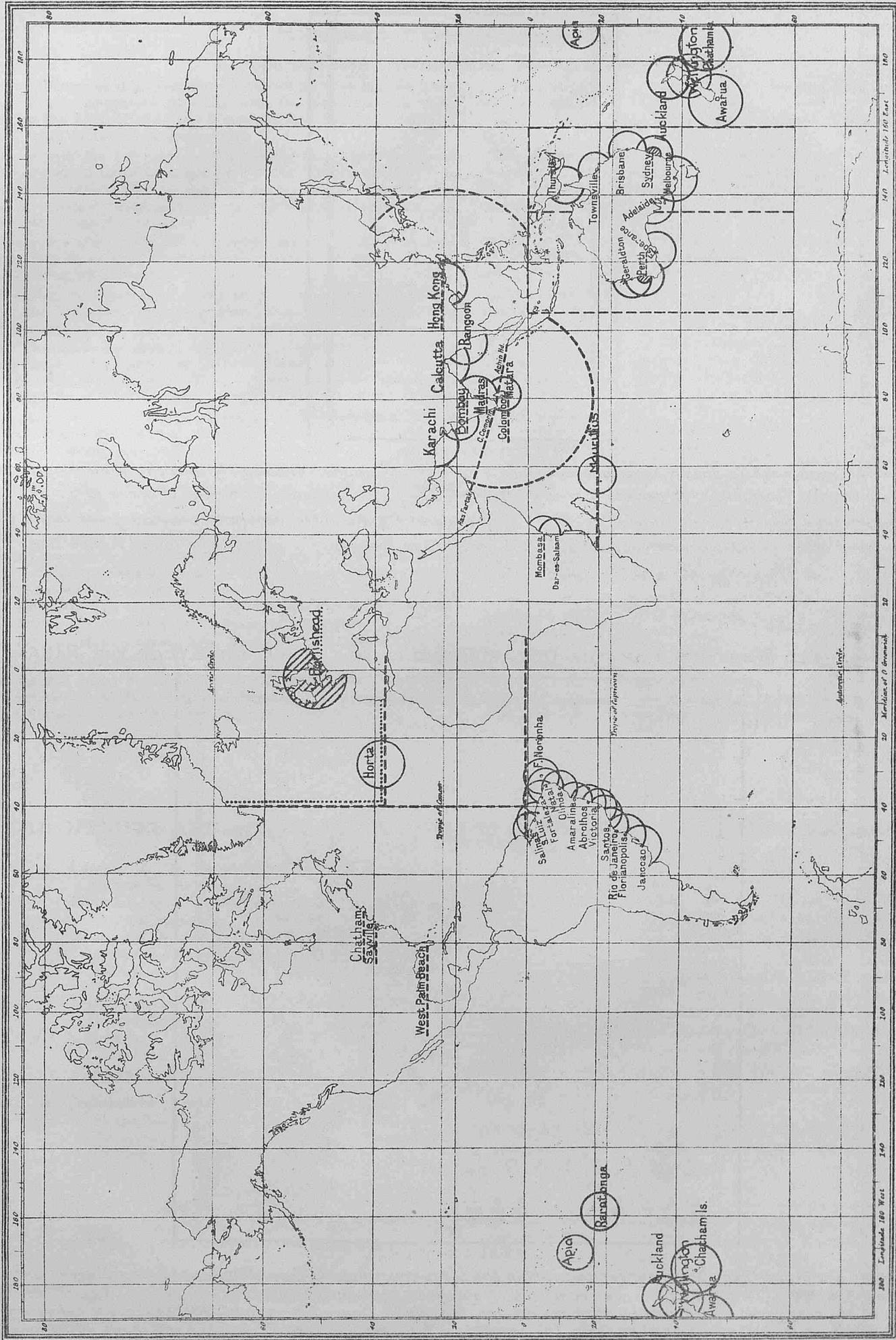
At the end of the war he joined the British Tanker Co., and was appointed to command the British Lantern. Since then he has had charge of several vessels in the British Tanker Fleet including the British Advocate, British Colonel and British Dominion.

A regular member of our corps since 1922, Captain TAYLOR has by his example done much to assist in the application of weather work at sea to the interests of safe and economical navigation.

Marine Observers join with the Marine Division in wishing Captain TAYLOR long life and happiness in his retirement.

# 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.

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 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.



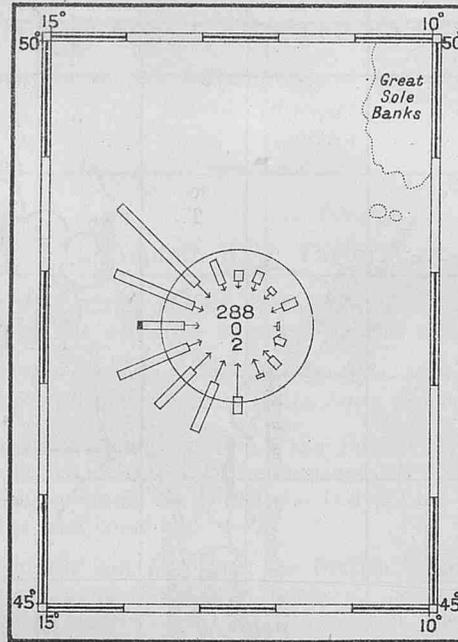
The small shaded areas round stations detailed to receive reports from "A" Selected Ships" indicate where these ships should not report on account of congestion.



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.

AUGUST

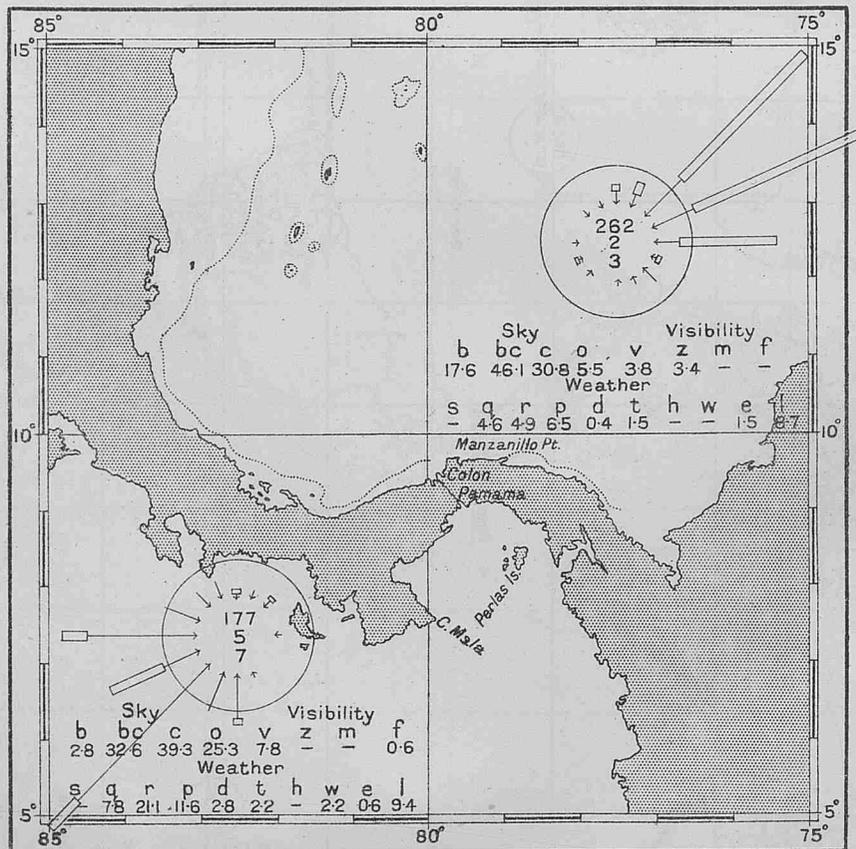
WIND FOR THE OCEAN REGION ADJACENT TO THE S.W. APPROACHES TO GREAT BRITAIN.



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:- 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:- 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 10° to 15° N. Longitude 75° to 80° W, bc was logged 46 times in every 100 observations while r was logged about 5 times.

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



# 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.	Lat.	Long.	Remarks.
Aug. 12, 1903	S.S. Saxon Prince ...	37°52'N.	71°30'W.	Piece 3 ft. high, 40 ft. long.
" 7, 1908	S.S. Caronia ...	50°31'N.	18°55'W.	2 pieces 10 ft. square and 15 ft. square.
" 2, 1909	S.S. Shimosa ...	37°18'N.	42°06'W.	Piece 18 ft. by 5 ft., 2 ft. out of water.
" 14, 1912	S.S. Ulstermore ...	43°55'N.	39°16'W.	Piece.
" 27, 1912	S.S. Lux ...	42°30'N.	15°28'W.	50 ft. sq., 4 ft. out of water.
" 10, 1915	S.S. St. Louis ...	41°02'N.	48°00'W.	Berg.
" 16, 1915	S.S. St. Leonards ...	41°08'N.	56°43'W.	—
" 21, 1915	S.S. Strathgarry ...	40°46'N.	68°20'W.	Growler.
" —, 1915	Do.	39°00'N.	46°20'W.	Piece 20 ft. long, 4 ft. high.
" 29, 1929	U.S. Hyd. Bulletin	40°30'N.	47°52'W.	Berg.

Reports of Ice sighted between June 1st and June 30th, 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.

### LATEST ICE REPORT FROM CANADA.

The following cablegram, dated 11th June, 1932, was received from the Canadian Signal Service, Quebec:—

Numerous bergs and growlers in Belle Isle Strait: other points no ice in sight.

### ICE IN GREENLAND WATERS.

INFORMATION RECEIVED BY CABLEGRAM FROM DANISH METEOROLOGICAL INSTITUTE, COPENHAGEN.

15th June..... "Ice edge 80 miles off Cape Farewell, the edge consists of open ice. Bergs met with in longitude 42°W."

**ATTENDANCE UPON OBSERVING SHIPS AT THE PORTS.**

The Marine Division of the Meteorological Office wishes to give every possible assistance to the commanders of voluntary observing ships through its Port Meteorological Officers and Merchant Navy Agents, in the work of their observing officers and W.T. operators.

Difficulty is often experienced by the Port Meteorological Officers and Merchant Navy Agents in carrying out their duties of attendance upon observing ships, owing to absence on leave of those concerned; and it is sometimes necessary for them to visit a ship several times before they can render the desired service to her commander and officers.

The Commanders of observing ships will greatly facilitate the work of the Port Meteorological Officers and Agents, and so further the work of the whole corps of voluntary marine observers, if they will kindly notify the Port Meteorological Officer or Agent at their home port when it will be convenient for them to see him on board; or instruct their principal observing officer or other responsible deputy to do so.

It will greatly facilitate the inspection of Meteorological Office

instruments, for the maintenance of which these port officers and agents are responsible, if all Meteorological Office gear is kept assembled in one place in port, preferably the Chart House; so that in case of the absence on leave of the officer deputed by the Captain in charge of Meteorological Office instruments, they may be found without difficulty.

All Port Meteorological Officers and Merchant Navy Agents of the British Marine Meteorological Service are now master mariners, appointed for their special knowledge of this voluntary work and the merchant service; and they can advise and assist the commanders of observing ships and their observing officers and W.T. operators far better than is possible to do so by letter from headquarters.

It is therefore in the interests of the whole service that their time should not be wasted in making unnecessary journeys to and from observing ships, when by telephone advice this can be avoided.

The names, addresses, and telephone numbers of the Port Meteorological Officers and Agents are given on the reverse side of this ice chart.

**INTERIM NOTICE.**

The amendments below, in red, to—**WIRELESS STATIONS DETAILED TO RECEIVE ROUTINE CODED WEATHER REPORTS FROM "A SELECTED SHIPS"**—will be included in the list published in the September number, they should be brought into force on **AUGUST 3RD, 1932.**

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.	<b>GKU.</b>	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 IX.)	<b>Weather London</b>	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 2100m. Radio Horta—call sign of ships to report through CTH at schedule times on 2400m.
	Horta, Azores.	Lat. 38° 32' N. Long. 28° 38' W.	<b>CTH.</b>	125 kc/s. (2400 metres).	125 kc/s. (2400 metres).	"A Selected Ships" indicated by roll call made through Portishead to report to Horta—En. N. Atlantic E. of long. 40° W. and N. of lat. 38° N.  "A Selected Ships" S. of lat. 38° N.—N. Atlantic from lat. 10° to 38° N. Eastward of long. 40° W.	<b>Radio Horta.</b>	Weather only, up to seven groups, preferably No. 3 Supplementary Groups.	"A Selected Ships" in the En. 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 2400m. S. of lat. 38° N., no control, all British "A Selected Ships" within area should report in accordance with schedule.

**DERELICTS AND FLOATING WRECKAGE.**

Date.	Position.		Description.
	Latitude.	Longitude.	
<b>NORTH SEA.</b>			
15.6.32	52°23' N.	1°55' E.	Capsized white-painted boat; no name. White and black chequered round buoy with part of hawser attached.
23.6.32	51°44' N.	2°52' E.	
<b>NORTH ATLANTIC.</b>			
1.6.32	38°01' N.	75°— W.	Log about 60 ft. long and 2½ ft. in diameter, with square ends.
1.6.32	38°55' N.	73°50' W.	Spar about 35 ft. long and 2 ft. in diameter.
1.6.32	39°43' N.	73°58' W.	Large piece of wreckage projecting 10 ft. out of water; apparently part of a wooden vessel and attached to a submerged object.
1.6.32	40°30' N.	65°27' W.	Large black can buoy.
2.6.32	37°24' N.	69°50' W.	White can buoy.
2.6.32	17°50' N.	68°55' W.	Large tree trunk with roots and branches projecting about 8 ft. out of water.
3.6.32	47°42' N.	13°12' W.	Drifting buoy; head painted in white.
3.6.32	43°20' N.	41°— W.	Red conical buoy.
4.6.32	10 miles S. 35° W.	Plate Pt. St. Pierre.	Auxiliary schooner <i>SYLVIA II</i> reported on fire. Dangerous to navigation.
6.6.32	26°01' N.	59°56' W.	

Date.	Position.		Description.
	Latitude.	Longitude.	
<b>North Atlantic—contd.</b>			
8.6.32	46°00' N.	8°08' W.	Floating wreck, mast above water with rags of sails attached; dangerous to navigation.
10.6.32	41°18' N.	48°02' W.	Raft of heavy timber about 20 ft. long and 8 ft. wide.
13.6.32	40°59' N.	56°— W.	Red gas and whistle buoy with a white structure marked <i>z C</i> ; light not burning.
14.6.32	36°41' N.	72°47' W.	Log about 40 ft. long, 18 in. in diameter; dangerous to navigation.
14.6.32	36°24' N.	55°04' W.	Small sailing vessel, a wash.
15.6.32	42°01' N.	9°08' W.	Capsized boat, black side, red bottom, white sail; no crew seen.
15.6.32	40°08' N.	50°33' W.	Partly submerged spar about 30 ft. long, 3 ft. in diameter, and covered with heavy marine growth.
15.6.32	36°27' N.	75°09' W.	Floating wreckage consisting of a part of deck 25 ft. square.
<b>RED SEA.</b>			
6.6.32	27°12' N.	34°15' E.	Drifting buoy.
<b>GULF OF MEXICO.</b>			
9.6.32	19°14' N.	74°29' W.	Large cocoa-nut tree about 50 ft. long.
9.6.32	27°44' N.	90°06' W.	Can buoy flying a red flag.

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 17.6.32.	Date Received.
122 †† <i>Acera</i> , M.V. ...	Shooter, J. C. ...	R. B. Ellis ...	W.T.-M.	Elder Dempster ...	Forms 911 & 138 6.4.32 to 14.5.32	18.5.32
155 *† <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
055 *† <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
<i>Adrastus</i> ...	Lloyd, R. ...	Lloyd, R. ...	M.L.	A. Holt ...	" " " " " " " "	" " " " " " " "
050 †† <i>Aëriatic</i> ...	Freeman, C. P., R.D., Commr., R.N.R.	T. Holmes, G. Dray, R. Walker.	W.T.	White Star ...	Forms 911 & 138 27.3.32 to 17.4.32	20.4.32
090 *† <i>Aeneas</i> ...	Wallace, W. K. ...	W. Williams, R. A. Hanney, P. Dunsire.	"	A. Holt ...	" " 7.1.32 to 26.3.32	30.3.32
166 *† <i>Agamemnon</i> ...	Beswick, W., D.S.C., Commr., R.N.R.	W. K. Hole, W. G. Harrison, O. Thomas.	"	" ...	" " 22.12.31 to 22.4.32	25.4.32
<i>Alban</i> ...	Evans, L. ...	" " " " " " " "	M.L.	Booth ...	" " " " " " " "	" " " " " " " "
127 *† <i>Abion Star</i> ...	Hall, J. B. ...	T. Gilchrist ...	No M.	Blue Star ...	Form 911 8.7.31 to 29.10.31 ...	25.11.31
080 †† <i>Alcantara</i> , M.V. ...	Clarke, E., R.D., Commr., R.N.R.	W. W. Dovell, T. Davies, R. Smith.	W.T.	R.M.S.P. ...	Forms 911 & 135 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.	W.T.	R.M.S.P. ...	" " 20.3.32 to 3.5.32	4.5.32
012 †† <i>Almeda Star</i> ...	Turner Russell, W. ...	H. Metcalf, E. Russell, C. L. Williams.	No. M.	Blue Star ...	" " 7.3.32 to 20.4.32	25.4.32
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>Antiochus</i> ...	Dougall, W. T. ...	B. L. Parkin, W. Murray, C. F. Lock.	W.T.	A. Holt ...	" " 29.4.32 to 7.5.32	17.5.32
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.	" ...	" " 23.3.32 to 2.5.32	4.5.32
017 †† <i>Aquitania</i> ...	Irving, R. B., O.B.E., R.D., A.D.C., Capt., R.N.R.	G. F. Jeffries, S. Toyne, G. V. Locke.	"	Cunard ...	" " 8.5.32 to 14.6.32	16.6.32
115 †† <i>Arandora Star</i> ...	Moulton, E. W. ...	C. O. Worth, H. F. Partridge, F. Graham.	No. M.	Blue Star ...	" " 22.4.32 to 7.6.32	13.6.32
<i>Architect</i> ...	Mowat, I. ...	G. Dewar ...	" M.	Harrison ...	Form 911 14.12.31 to 21.3.32 ...	5.4.32
293 *† <i>Ariguaní</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
091 †† <i>Armada Castle</i> ...	Whitfield, G. J. ...	W. Pace, A. H. Parry, C. L. Lloyd.	"	Union Castle ...	" " 20.3.32 to 8.5.32	10.5.32
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.	Meteorological Equipment.	Line.	Last Log, Register, or Record Contributed. Received up to 17.6.32.	Date Received.
095 †† <i>Arundel Castle</i> ...	Shaw, B. ... Stuart, C. E., R.D., Capt., R.N.R.	E. Hill ... G. L. Clarke ...	C.C. W.T.	Southern Rly. Union Castle ...	Telegraphic Report 16.6.32 ... Form 911 24.1.32 to 12.3.32 ...	16.6.32 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> ...	Owen, W. T. ...	L. Richardson ...	No. M.	Harrison ...	" " 2.8.30 to 29.9.31...	14.10.31
212 *† <i>Australia</i> ...	Scutt, W. ...	H. Falkiner, E. H. Lidstone, L. Smith.	" M.	British India ...	Form 915 15.9.31 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>Babranald</i> ...	Short, C. E. ...	H. P. Maller, J. B. Child, J. A. Stewart	No. M.	P. & O. Branch ...	Form 911 5.5.32 to 7.5.32 ...	19.5.32
051 †† <i>Baltic</i> ...	Hume, R. ...	S. Boden, G. Law, N. E. Banke.	W.T.	White Star ...	Forms 911 & 138 9.5.32 to 29.5.32 ...	1.6.32 1.6.32
248 *† <i>Banffshire</i> ...	Page, W. J. ...	A. Banks ...	No. M.	Turnbull Martin ...	Forms 911 & 138 18.3.32 to 18.4.32	30.5.32
180 *† <i>Buradine</i> ...	Elliot Smith, H. ...	G. L. Farnfield ...	" M.	P. & O. Branch ...	Form 911 125.11.31 to 20.2.32	25.2.32
037 *† <i>Baronesa</i> ...	Compton, R. W. ...	J. R. Faulkner, F. W. Kent, J. G. Freeman	" M.	Houlder ...	Forms 911 & 138 21.2.32 to 18.4.32	27.4.32
213 *† <i>Barpeta</i> ...	Partridge, H. ...	D. Clundison, J. Pool, R. C. H. Davies.	" M.	British India ...	" " 10.2.32 to 9.3.32	29.3.32
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. ...	T. C. Thomas ...	W.T.	Elders & Fyffes ...	" " 27.4.32 to 27.5.32...	3.6.32
<i>Beaverburn</i> ...	McCombie, G. F. ...	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. Lo.	W.T.	Red Star ...	Form 912 8.5.32 to 29.5.32 ...	2.6.32
133 †† <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
<i>Bengore Head</i> ...	Kane, G. ...	C. J. Rea ...	No. A.	Ulster S.S. Co. ...	Form 911 8.4.32 to 29.4.32	2.5.32
237 †† <i>Berengaria</i> ...	Britten, E. T., R.D., Commr., R.N.R.	J. A. Croasdaile, W. A. Robson, G. Duguid.	W.T.	Cunard ...	Forms 911 & 138 16.5.32 to 31.5.32	2.6.32
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> ...	Frank, F. A., D.S.O., R.D., Commr., R.N.R., Vaughan, P. R., D.S.C., R.D., Commr., R.N.R.	G. N. Jones, A. J. Fisher, O. V. Lucas.	"	White Star ...	" " 24.4.32 to 11.6.32	14.6.32
269 *† <i>British Admiral</i> ...	Pitt, R. O. ...	H. J. Were, D. J. Baird ...	No. M.	British Tankers ...	" " 28.4.32 to 24.5.32	4.6.32
249 *† <i>Buteshire</i> ...	Westropp, T. G. ...	P. McMillan, S. W. Brown, J. D. Elvish.	W.T.	Turnbull Martin ...	" " 14.3.32 to 18.4.32	30.6.32
031 †† <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. L. Jones ...	C.C.	L.M. & S. Rly. ...	Forms 911 & 138 24.4.32 to 11.6.32	16.6.32
190 *† <i>Cambridge</i> ...	Williams, R. ...	H. Fryer, R. Belfield, T. M. Devitt.	M.L.	Federal ...	Form 912 25.5.32 to 11.6.32	16.6.31
266 †† <i>Cameronia</i> ...	Gemmell, W. ...	D. Blair, E. Stormont, D. Bone.	W.T.	Anchor ...	Forms 911 & 138 15.5.32 to 5.6.32 ...	10.6.32
295 †† <i>Camito</i> ...	Jack, D. A. ...	C. R. Hodder, G. Binks, R. King.	"	Elders & Fyffes ...	Form 912 15.5.32 to 5.6.32	9.6.32
<i>Cape of Good Hope</i> ...	Jacobson, T. A. ...	W. R. Carling ...	No. A.	Lyle S.S. Co. ...	Forms 911 & 138 13.4.32 to 13.5.32	17.5.32
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 ...	Form 911 27.4.31 to 23.5.32 ...	2.6.32
092 †† <i>Carnarvon Castle M.V.</i> ...	Morton Betis, W. ...	G. F. Pettitt, E. Clancy ...	"	Union Castle ...	Forms 911 & 138 17.5.32 to 12.6.32 ...	15.6.32
273 *† <i>Carnarvonshire</i> ...	Gulston, H. S. ...	G. F. Pettitt, E. Clancy ...	"	Union Castle ...	Forms 911 & 138 28.2.31 to 17.4.32	19.4.32
184 †† <i>Cathay</i> ...	Daziell Riven, J. ...	S. W. Spencer, W. B. Blair, D. T. Sherwell.	No. M.	Glen ...	" " 29.1.32 to 27.4.32	10.5.32
<i>Cavina</i> ...	Forrester, W. T. ...	A. J. McHattie, B. H. Nonkivell, M. G. Morris.	" M.	P. & O. ...	" " 24.4.32 to 5.5.32	13.6.32
<i>Cerinthus M.V.</i> ...	Ramsay, N. ...	B. R. Coe ...	" A.	Elders & Fyffes ...	Form 911 8.3.32 to 11.4.32 ...	15.4.32
<i>Changuinola</i> ...	Bostock, R. J. ...	E. Allen, C. L. Seaman, J. B. Williams.	M.L.	Hadley Shipping ...	Form 915 16.2.32 to 27.5.32 ...	2.6.32
191 *† <i>Chindwin</i> ...	Hughes, E. ...	O. H. Pulman ...	No. A.	Elders & Fyffes ...	Form 911 12.10.31 to 23.10.31 ...	27.10.31
067 *† <i>Chinese Prince</i> ...	Uncles, H. ...	J. A. Wilson ...	W.T.	Henderson ...	" " 19.12.31 to 2.3.32 ...	15.3.32
192 †† <i>Chitral</i> ...	Siggers, O. ...	T. D. Forbes, S. N. Gerrans, W. S. Jolliffe	No. M.	Furness Withy P. & O. ...	Forms 911 & 138 10.4.32 to 19.4.32	23.5.32
265 *† <i>City of Baroda</i> ...	Bremner, D. M. ...	E. Bonfield, R. W. Leese ...	W.T.	Ellerman ...	" " 15.3.31 to 23.5.32	8.6.32
<i>City of Cambridge</i> ...	Ewing, W. ...	H. H. Asher ...	No. A.	" ...	Form 911 15.2.32 to 7.3.32 ...	2.5.32
274 *† <i>City of Harvard</i> ...	MacMillan, J. ...	F. Deighton, E. Brook-Williams.	W.T.	" ...	" " 20.4.32 to 21.5.32 ...	21.5.32
089 *† <i>City of Hereford</i> ...	Ricketts, R. J. ...	F. Tibbetts, J. H. T. Vizer ...	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.	J. S. Stevenson, L. C. Rithy, A. N. G. Jones.	" M.	" ...	" " 2.5.32 to 14.5.32	26.5.32
272 *† <i>City of Singapore</i> ...	Gardner, R. ...	C. C. Collard, R. Pulford, W. G. Lister.	" M.	" ...	" " 14.5.32 to 26.5.32	3.6.32
035 *† <i>City of Sydney</i> ...	Mason, E. ...	C. S. Humphries, H. G. Griffith.	" M.	" ...	" " 19.3.32 to 9.4.32	2.5.32
027 *† <i>Clan Keith</i> ...	Waterhouse, J. ...	W. N. Tudman, A. H. Black, D. W. Gibbons.	W.T.	Clan ...	" " 21.1.32 to 15.2.32	18.2.32
<i>Clan Macalister</i> ...	Stenson, F. J., A.D.C., R.D., Capt., R.N.R.	J. L. Jones ...	No. A.	" ...	Form 911 29.3.32 to 15.4.32 ...	17.5.32
241 *† <i>Clan Macbeth</i> ...	Giles, H. J., R.D., R.N.R.	W. C. Woodriffe ...	W.T.	" ...	" " 7.2.32 to 15.5.32 ...	20.5.32
287 *† <i>Clan Macfarlane</i> ...	Redford, L. F., Lt.- Commr., R.N.R.	W. H. Simpson ...	"	" ...	" " 15.11.31 to 12.3.32 ...	7.4.32
118 *† <i>Clan Macindoe</i> ...	Scott-Smith, H. E. G., O.B.E., R.D., Lt.- Commr., R.N.R.	J. C. Dunphy ...	"	" ...	" " 25.3.32 to 5.6.32 ...	16.6.32

LIST OF VOLUNTARY OBSERVING SHIPS

Name of Vessel.	Captain.	Observing Officers.	Meteoro-logical Equipment.	Line.	Last Log, Register, or Record Contributed. Received up to 17.6.32.	Date Received.
33 *† <i>Clan Mackellar</i> ...	Lyall, A. B. ...	A. V. Howard, G. S. Bullock, E. E. Arthur.	W.T.	Clan ...	Forms 911 & 138 10.11.31 to 26.1.32	16.2.32
004 *† <i>Clan Macnair</i> ...	Holman, W. G. ...	F. H. Petheridge A. Woodrow, J. F. Vooght.	"	" ...	" " 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 Macaggart</i> ...	West, W. F. ...	" ...	"	" ...	" ...	" ...
002 *† <i>Clan Macawirter</i> ...	O'Bryne, C. E. ...	M. J. Lewis, H. Whitehead, C. Rodger.	"	" ...	Form 915 11.6.31 to 30.10.31	7.11.31
003 *† <i>Clan Malcolm</i> ...	George, L. S. ...	A. Lynch, M. Banks, N. N. Birtley.	"	" ...	" 25.3.32 to 5.4.32	14.4.32
283 *† <i>Clan Morrison</i> ...	Porterfield, W. M., Lt-Commr., R.N.R.	A. G. Beynon ...	"	" ...	Form 911 10.4.32 to 15.4.32	19.4.32
300 *† <i>Clan Sinclair Colonial</i> ...	Cater, H. ... Harrendon, W. E. ...	D. Mc Allister ... W. Moore, A. P. Brown, A. Smart.	No. M.	Harrison ...	" 1.5.32 to 24.5.32 14.2.32 to 17.5.32	16.6.32 23.3.32
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	" " 14.3.32 to 16.4.32	19.1.32
301 †† <i>Corfu</i> ...	French, F. E., R.D., Captain, R.N.R.	" ...	W.T.-M.	P. & O. ...	" ...	" ...
100 *† <i>Cornwall</i> ...	Reilly, H. E. ...	H. Hopkins, C. Saul, R. S. Miller.	M.L.	Federal ...	Form 915 16.8.31 to 12.12.31	27.1.32
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. Curie.	No. M.	Harrison ...	" " 6.12.31 to 7.3.32	19.3.32
036 *† <i>Cumberland</i> ...	Maltby, T. L. ...	S. R. Leggett, J. Brooke Smith, F. R. F. Wilson.	W.T.	Federal ...	Form 915 18.10.31 to 20.2.32	1.3.32
285 *† <i>Custodian</i> ...	O'Connor, T. ...	W. H. Corlett, J. L. Williams, J. Glen.	No. M.	Harrison ...	Forms 911 & 138 4.12.31 to 5.2.32	19.3.32
169 *† <i>Dalgoma</i> ...	Beeching, P. H. ...	" ...	No. M.	British India ...	" ...	" ...
302 †† <i>Darvo Dents</i> ...	Matthews, G. P. ... Griffiths, W. ...	F. Jeyes ... A. W. Hanchett, J. H. Stoker, S. Pollock.	W.T.-M. M.L.	R.M.S.P. Co. ... Booth ...	Forms 911 & 138 12.4.32 to 2.6.32 Form 915 14.11.31 to 21.1.32	6.6.32 26.1.32
304 †† <i>Deseado</i> ...	Buret, J. F. C. ...	L. T. Peterson, H. Lang ...	W.T.-M.	R.M.S.P. Co. ...	Forms 911 & 138 15.2.32 to 8.4.32	12.4.32
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. ...	G. Chaplin, J. D. Marks, G. McLannahan.	No. M.	Federal ...	" " 10.3.32 to 1.4.32	6.6.32
<i>Dieppe</i> ...	Lidbetter, W. ...	E. A. Biles ...	G.C.	Southern Railway ...	Telegraphic Report 17.6.32	17.6.32
284 *† <i>Director</i> ...	Worthington, B. ...	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
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>Doric 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 4.2.32 to 17.3.32	21.3.32
142 †† <i>Duchess of Atholl</i> ...	McQueen, D. S. ...	A. E. Shergold, C. E. Duggan, F. Glennie.	W.T.-M.	Canadian Pacific {	" " 24.4.32 to 9.6.32 ... Form 912 " 22.5.32 to 9.6.32 ...	13.6.32 13.6.32
152 †† <i>Duchess of Bedford</i>	Sibbons, H. ...	L. Outram, F. Stell ...	"	" " {	Forms 911 & 138 1.5.32 to 19.5.32	23.5.32
151 †† <i>Duchess of Richmond</i>	Freer, A., R.D., Capt., R.N.R.	J. B. Hewson, E. N. Lloyd ...	"	" " {	" " 15.5.32 to 2.6.32	6.6.32
143 †† <i>Duchess of York</i> ...	Stuart, R. N., V.C., D.S.O., Commr., R.N.R.	D. Parsons, S. W. Keary ...	"	" " {	Form 912 " 8.5.32 to 26.5.32 ...	1.6.32 31.5.32
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
<i>Dunrobin</i> ...	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 17.1.32 to 23.3.32	29.3.32
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, W. Aldous ...	W.T.	Union Castle ...	Forms 911 & 138 5.3.32 to 24.4.32	5.5.32
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
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. Scott.	W.T.	A. Holt ...	Form 915 23.8.31 to 3.1.32	11.1.32
108 *† <i>Elstree Grange</i> ...	Williams, W. E. ...	P. A. Hawkesworth ...	No. M.	Houlder ...	Forms 911 & 138 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	19.5.32
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. ...	O. F. Pennington, E. Roberts, A. H. Pigott.	"	Canadian Pacific ...	Forms 911 & 138 6.5.32 to 20.5.32	23.5.32
034 †† <i>Empress of Britain</i>	Latta, R. G. ...	J. R. Bubb, W. P. Phillips, J. H. Tudor.	"	" " {	Form 912 " 22.5.32 to 3.5.32 ...	6.6.32
154 †† <i>Empress of Canada</i>	Hailey, A. J., Lt-Commr., R.N.R., Douglas, L. D., Lieut.-Commr., R.N.R.	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
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
011 †† <i>Euripides</i> ...	Cole, N. ...	R. Conway, R. G. Aird, J. Smallwood.	W.T.-M.	White Star ...	Forms 911 & 138 6.3.32 to 7.4.32	23.5.32
<i>Explorer</i> ...	Allan, J. ...	A. Stout ...	M.L.	Scottish Fishery Brd.	Form 911 8.5.32 to 11.5.32	2.6.32

Name of Vessel.	Captain.	Observing Officers.	Meteorological Equipment.	Line.	Last Log. Register, or Record Contributed. Received up to 17.6.32.	Date Received.
074 † <i>Fordsdale</i> ...	Avern, J., Commr. R.N.R.	L. Hopkins, F. Davies, M. Harrier.	No. M.	Aberdeen Commonwealth.	Forms 911 & 138 7.2.32 to 16.3.32	25.4.32
030 † <i>Franconia</i> ...	Gibbons, G., R.D., Capt., R.N.R.	J. Ashcroft, E. R. Taylor, E. J. R. Pollitt.	W.T.	Cunard ... ..	" " 29.5.31 to 4.6.32	6.6.32
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	" "
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, F. Mitchell.	" A.	R. P. Houston ... ..	Form 911 24.4.32 to 5.5.32 ... ..	23.5.32
262 ** <i>Hawaki</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
206 † <i>Herminius</i> ... ..	Thurston, H. P. ... ..	E. Riccard, A. G. Collins, G. MacNab.	"	Shaw, Savill & Albion	" 22.11.31 to 14.3.32 ... ..	21.3.32
253 † <i>Hertford</i> ... ..	Burton Davies, J. ... ..	P. Shakespeare, W. H. Timberlake, P. Block.	"	Federal ... ..	" 18.11.31 to 28.2.32 ... ..	5.3.32
<i>Hibernia</i> ... ..	Williams, E. R. ... ..	C. A. Marsh ... ..	G.C.	L.M. & S. Railway ...	Telegraphic Report 14.6.32 ... ..	" "
182 † <i>Highland Brigade</i>	Lloyd, H. ... ..	W. Stephen, N. Hersee, C. Morgan.	No. M.	Nelson ... ..	Forms 911 & 138 25.12.31 to 16.2.32	14.3.32 23.2.32
116 † <i>Highland Chieftain</i> , M.V.	Simmonds, P. C. ... ..	W. J. Presland, L. Irving, J. E. Pink.	W.T.—M.	" " " " " "	" " 20.4.32 to 3.6.32	9.6.32
099 † <i>Highland Monarch</i> , M.V.	Ashby Graves, F. ... ..	E. Card ... ..	No. M.	" " " " " "	" " 3.4.32 to 25.5.32	28.5.32
250 † <i>Highland Princess</i> , M.V.	Collings, D. ... ..	C. E. Leech, J. H. Fitton, F. W. Seabrook	W.T.—M.	" " " " " "	" " 25.2.32 to 10.4.32	14.4.32
075 † <i>Hobson's Bay</i> ...	Roberts, T. V., R.D., Lt.-Commr., R.N.R.	F. L. Gross, C. Smith, C. Carroll.	No. M.	Aberdeen Commonwealth.	Form 915 9.7.31 to 11.10.31 ...	19.10.31
026 † <i>Homerie</i> ... ..	" " " " " "	" " " " " "	W.T.	White Star ... ..	" " " " " "	" "
261 † <i>Huntingdon</i> ... ..	Field, H. G. B. ... ..	P. S. Calcutt, H. F. Wilkinson, M. T. D. Walter.	"	Federal... ..	Forms 911 & 138 26.1.32 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	" "
235 † <i>Hurunui</i> ... ..	Pretty, F. C. ... ..	" " " " " "	W.T.	New Zealand Shipping.	" " " " " "	29.3.32
289 † <i>Inanda</i> ... ..	Gibbins, W. H. ... ..	D. C. Brown, R. L. Williams, F. H. Davies.	No. M.	Harrison ... ..	Forms 911 & 138 26.3.32 to 5.5.32	17.5.32
<i>Ingoma</i> ... ..	Richardson, R. ... ..	D. D. Kerr ... ..	" M.	" " " " " "	Form 911 24.4.32 to 1.2.32 ... ..	" "
160 † <i>Iacon</i> ... ..	Hughes, R. T. ... ..	C. S. Pope, G. Collier, F. G. Corie, J. S. ... ..	M.L.	A. Holt ... ..	Form 915 17.9.31 to 4.2.32 ... ..	6.6.32 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>Jeyapore</i> ... ..	Harris, W. L. ... ..	A. G. Edwards ... ..	No. M.	P. & O. ... ..	Forms 911 & 138 11.4.32 to 13.5.32	6.6.32
188 † <i>Katsar-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>Karama</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>Karayara</i> ... ..	White, R. W. ... ..	L. G. Jones, J. H. Pratt ...	No. M.	British India... ..	Forms 911 & 138 9.4.32 to 2.5.32	23.5.32
114 † <i>Kenya</i> ... ..	Miller, A. C. ... ..	G. E. Stephenson, P. Lusher, G. Spedding.	" M.	" " " " " "	" " 25.2.32 to 7.4.32	9.4.32
218 † <i>Khandalla</i> ... ..	Eadie, J. D. ... ..	D. W. Dix, W. G. Pitcher ...	" M.	" " " " " "	" " 7.4.32 to 20.5.32	13.6.32
147 † <i>Laconia</i> ... ..	Hawkes, W., R.D., Capt. R.N.R.	J. D. Archer ... ..	W.T.	Cunard... ..	Forms 911 & 138 30.11.31 to 19.12.31	29.12.31
193 † <i>Lahore</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
167 † <i>Lancastria</i> ... ..	Dolphin, G. R., R.D., Commr. R.N.R.	J. S. Glendinning, J. C. Dawsons, R. V. Youd.	W.T.	Cunard ... ..	Form 911 21.2.32 to 10.4.32 ... ..	12.4.32
082 † <i>La Paz</i> , M.V. ...	Morgan, D. R. ... ..	G. Pattison ... ..	No. M.	Pacific S.N. Co. ...	Forms 911 & 138 4.1.32 to 17.4.32	22.4.32
134 † <i>Laplant</i> ... ..	Harvey, H. ... ..	L. Williams, H. Patterson, R. M. Farmer.	W.T.	Red Star ... ..	" " 19.10.31 to 24.10.31	10.11.31

LIST OF VOLUNTARY OBSERVING SHIPS

V

Name of Vessel.	Captain.	Observing Officers.	Meteoro-logical Equipment.	Line.	Last Log. Register, or Record Contributed. Received up to 17.6.32.	Date Received.
076 *† <i>Largs Bay</i> ...	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 *† <i>La Rosarina</i> ...	Bearpark, L. ...	T. C. Townsend, S. W. Howell, S. Gorlett.	" M.	Houlder ...	" " 20.3.32 to 28.5.32	31.5.32
267 *† <i>Lassez</i> ...	Lindsay, J. M. ...	" " " " " "	W.T.	Lampton & Holt ...	Form 911 24.8.31 to 13.11.31 ...	16.12.31
064 †† <i>Laurentie</i> ...	Jackson, W. H. P. ...	H. Solomon, T. H. Dray, A. Thompson.	"	White Star ...	Forms 911 & 138 15.5.32 to 4.6.32	7.6.32
083 *† <i>Lautaro, M.V.</i> ...	Kite, E. ...	J. Lloyd Jones, J. Williams, C. Stowe.	No. M.	Pacific S.N. Co. ...	Form 912 15.5.32 to 4.6.32	7.6.32
254 *† <i>Limerick</i> ...	Molyneux, P. L. ...	J. Trotter, N. A. Thomas ...	" M.	Federal... ...	Forms 911 & 138 8.1.32 to 10.2.32	27.2.32
093 *† <i>Llandaf Castle</i> ...	Linklater, H. ...	J. M. Goode ...	W.T.	Union Castle ...	" " 13.4.32 to 10.5.32	23.5.32
097 †† <i>Llangibby Castle, M.V.</i> ...	Nicholl, D. ...	G. W. Lloyd ...	"	" " ...	" " 26.2.32 to 2.5.32	6.5.32
094 *† <i>Llandovery Castle</i> ...	Morgan, A. O., R.D., Commr., R.N.R.	R. C. J. Hatt ...	"	" " ...	" " 26.3.32 to 28.5.32	31.5.32
216 *† <i>Llanstephan Castle</i> ...	Bickford, C. N. ...	S. Smith, H. Close, G. Willis	" M.	" " ...	" " 10.2.32 to 3.4.32	20.4.32
084 *† <i>Lobos, M.V.</i> ...	Good, W. T. ...	R. H. Sissons, J. Kerr, E. Potter.	No. M.	Pacific S.N. Co. ...	" " 25.1.32 to 19.3.32	30.3.32
137 *† <i>Logician</i> ...	Herschel, R. J. ...	E. L. Stockley, J. Wallis, W. R. Mackenzie.	" M.	Harrison ...	" " 21.2.32 to 23.5.32	27.5.32
008 *† <i>Losada</i> ...	Ridyard, A. ...	L. W. Hutchinson ...	" M.	Pacific S.N. Co. ...	" " 7.3.32 to 2.6.32	7.6.32
013 *† <i>Macharda</i> ...	Hanna, R. G. ...	C. Lindsay Miller, C. Parry, G. A. Jackson.	No. M.	Brocklebank ...	" " 14.4.32 to 25.4.32	28.5.32
232 *† <i>Madura</i> ...	Wright, J. A. ...	A. Usher, W. Bain ...	" M.	British India... ...	Forms 911 & 138 17.1.32 to 15.2.32	7.3.32
078 *† <i>Magician</i> ...	Bury, E. R. N. ...	W. E. Shotton, R. Armstrong	" M.	Harrison ...	" " 13.3.32 to 30.4.32	3.6.32
141 *† <i>Mahia</i> ...	Andrews, C. M. ...	G. Sangwin, M. P. Congdon, J. Jackson.	W.T.	Shaw, Savill & Albion	" " 24.2.32 to 12.5.32	17.5.32
140 *† <i>Mahratta</i> ...	Owen, L. T. ...	T. C. Eddy, H. F. Scoins, J. Wilson.	No. M.	Brocklebank ...	" " 24.12.31 to 14.4.32	18.4.32
014 *† <i>Mahronda</i> ...	Whitham, F. ...	W. Le Brocq, M. Melville, H. Willington.	" M.	" " ...	" " 25.3.32 to 13.4.32	23.5.32
015 *† <i>Mahsud</i> ...	Kershaw, R. W. ...	S. Richardson, J. R. Paisley, H. Gillespie.	" M.	" " ...	" " 11.4.32 to 11.5.32	17.5.32
016 *† <i>Maidan</i> ...	Ison, W. A. ...	F. Moore, F. L. Attwood, L. E. Jeans.	" M.	" " ...	" " 7.3.32 to 31.5.32	6.6.32
042 *† <i>Maimoa</i> ...	Johnson, J. W. ...	M. Bennett, E. J. Baker, W. R. Rogers.	M.L.	Shaw, Savill & Albion	" " 26.2.31 to 8.5.31	12.5.31
054 †† <i>Majestic</i> ...	Trant, F. L., R.D., Commr., R.N.R.	E. Stuart, J. Murphy, R. Barry.	W.T.	White Star ...	Form 915 8.2.32 to 24.5.32 ...	2.6.32
018 *† <i>Makalla</i> ...	Maughan, J. W. ...	A. C. Hocking, J. Richardson	No. M.	Brocklebank ...	Forms 911 & 138 8.5.32 to 8.6.32	11.6.32
225 *† <i>Makura</i> ...	MacDonald, D. ...	A. P. Cousin, J. Billingham, H. McRae.	M.L.	Canadian-Australasian	Form 915 6.8.31 to 17.12.31 ...	15.3.32
019 *† <i>Malakuta</i> ...	Adamson, F. L. ...	H. Simpson ...	No. M.	Brocklebank ...	Forms 911 & 138 11.5.31 to 2.12.31	29.1.32
020 *† <i>Malancha</i> ...	Cochran, G. N. ...	L. F. Dodson, A. Hill, R. Penston.	" M.	" " ...	" " 15.2.32 to 16.3.32	11.4.32
303 *† <i>Malayan Prince</i> ...	Holloway, J. ...	" " " " " "	M.L.	Prince ...	" " 18.10.31 to 12.1.32	15.1.32
219 *† <i>Malda</i> ...	Denne, G. H. A. ...	D. Macfadyen, F. M. Ben- castle, K. K. Boyd.	No. M.	British India ...	" " 30.1.32 to 4.5.32	11.5.32
195 †† <i>Malaja</i> ...	Browning, J. B. R.D., Commr., R.N.R.	R. E. Baldwin - Wiseman, G. R. Peters, J. J. Manning.	W.T.-M.	P. & O. ...	Form 911 20.3.32 to 8.4.32 ...	9.4.32
196 †† <i>Malwa</i> ...	Britten, P. O. ...	F. E. Berner ...	No. M.	" " ...	Form 911 & 138 20.7.31 to 9.10.31	21.10.31
053 *† <i>Manaar</i> ...	Thowless, E. ...	A. L. Harrop, J. Robinson, R. G. Widdon.	" M.	Brocklebank ...	Form 915 8.8.31 to 15.2.32 ...	19.2.32
<i>Manchester Brigade</i>	Stott, C. H. ...	E. E. Bonnaud, J. Eccles, G. L. Southern.	M.L.	Manchester Liners ...	" " " " " " " " " " " "	" " " " " " " " " "
<i>Manchester Com- merce.</i>	Linton, P. ...	" " " " " "	"	" " ...	" " " " " " " " " "	" " " " " " " " " "
028 †† <i>Mandala</i> ...	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 *† <i>Mandasor</i> ...	Richardson, T. ...	H. Fosbrooke, F. C. Madden, J. B. Leigh.	" M.	Brocklebank ...	" " 12.1.32 to 30.3.32	5.4.32
220 *† <i>Manela</i> ...	Maples, S. H. ...	W. F. Solly, T. M. Robertson, G. B. Adam.	" M.	British India... ...	" " 22.4.32 to 5.5.32	30.5.32
022 *† <i>Manipur</i> ...	Fulcher, H. D. ...	J. L. Rodger ...	" M.	Brocklebank ...	" " 6.2.32 to 8.3.32	4.4.32
221 *† <i>Manora</i> ...	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	15.6.32
177 *† <i>Mantola</i> ...	James, D. F. ...	W. R. Day, S. Henderson, H. I. Fisher.	" M.	" " ...	" " 20.1.32 to 11.4.32	19.4.32
197 †† <i>Mantua</i> ...	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 *† <i>Marella</i> ...	Donaldson, A. ...	A. W. Blair, D. Pemberton, A. G. W. Thomas.	M.L.	Burns Philp ...	Form 915 3.6.31 to 23.10.31 ...	7.1.32
222 †† <i>Margha</i> ...	Kitson, G. A. ...	J. Smail, P. Wright, P. W. Clark.	W.T.	British India... ...	Forms 911 & 138 19.4.32 to 12.5.32	6.6.32
104 *† <i>Marquesa</i> ...	Smiles, R. S. ...	J. Wetherall ...	No. M.	Furness Houlder ...	" " 14.3.32 to 21.5.32	25.7.32
021 *† <i>Masula</i> ...	Pitt, W. A. ...	J. L. Richardson, W. Ascroft P. Sims.	" M.	British India ...	" " 23.2.32 to 3.5.32	9.5.32
251 *† <i>Matakana</i> ...	Gordon, H. R. ...	H. Thompson, D. L. G. Turner, G. C. Allen.	W.T.	Shaw, Savill & Albion	Form 915 10.11.31 to 2.2.32 ...	9.3.32
044 †† <i>Mataroa</i> ...	Gaskell, J. H., R.D., Lt.-Commr., R.N.R.	H. A. Hill, F. C. Charnley, K. Owen.	M.L.	" " " " " "	" " 6.11.31 to 15.2.32 ...	23.2.32
023 *† <i>Matheran</i> ...	Mulcahy, J. J. ...	S. S. Slade, J. F. Butter- worth, W. Cowrie.	No. M.	Brocklebank ...	Forms 911 & 138 15.4.32 to 5.5.32	30.5.32
223 *† <i>Matiana</i> ...	Green, F. V. ...	L. A. Bunn, J. S. Thomson ...	" M.	British India... ...	" " 21.4.32 to 15.5.32	7.6.32
024 *† <i>Matra</i> ...	Cornish, N. P. ...	G. Shaw, W. Robertson, G. Henshaw.	" M.	Brocklebank ...	" " 4.1.32 to 6.5.32	21.5.32
032 †† <i>Mawretania</i> ...	Townley, J. C., R.D., Commr., R.N.R.	E. W. Connell, R. H. C. Crawford, L. R. Sharpe.	W.T.	Cunard ...	" " 22.5.32 to 6.6.32	8.6.32
101 †† <i>Melita</i> ...	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 *† <i>Middlesex</i> ...	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 †† <i>Minnetonka</i> ...	Gates, T. S., C.B.E. ...	" " " " " "	W.T.-M.	Atlantic Transport ...	" " " " " " " " " " " "	" " " " " " " " " "
157 †† <i>Minnewaska</i> ...	Claret, F., O.B.E., R.D., Commr., R.N.R.	E. Pengelly, D. Davis, F. Mummery.	"	" " ...	Forms 911 & 138 15.5.32 to 3.6.32	6.6.32
194 †† <i>Moldavia</i> ...	Allin, C. H. C. ...	T. E. Heath, J. K. Crone, E. J. Kerridge.	"	P. & O. ...	" " 21.1.32 to 31.3.32	6.4.32
199 †† <i>Mongolia</i> ...	Rhodes, H. R. ...	H. Tee, H. C. Slinn, G. K. Fox.	No. M.	" " ...	" " 25.3.32 to 10.6.32	13.6.32

Name of Vessel.	Captain.	Observing Officers.	Meteorological Equipment.	Line.	Last Log, Register, or Record Contributed Received up to 17.6.32.	Date Received.
260 *† <i>Monowai</i> ...	Toten, A. T. ...	L. B. Elhert, E. W. Gibson, ...	M.L.	Union S.S. of N.Z. ...	Form 915 25.11.31 to 8.4.32 ...	1.6.32
148 †† <i>Montcalm</i> ...	Martin, W. ...	L. P. Bourke, ...	W.T.-M.	Canadian Pacific ...	Forms 911 & 138 1.5.32 to 20.5.32	23.5.32
149 †† <i>Montclare</i> ...	Rothwell, A. ...	W. P. Haines, T. L. Gillette, ...	W.T.	" " ...	" " 11.4.32 to 30.4.32	2.5.32
150 †† <i>Montrose</i> ...	Turnbull, J., C.B.E., ...	J. Shearer, J. Soames, A. ...	W.T.-M.	" " ...	" " 21.2.32 to 4.4.32	6.4.32
164 †† <i>Mooltan</i> ...	R.D., Capt. R.N.R.	R. Fegan, K. Hutchings, ...	"	P. & O. ...	" " 10.1.32 to 13.4.32	16.4.32
200 *† <i>Musician</i> ...	Dott, J. F. ...	N. Duck, ...	No. M.	Harrison ...	" " 18.3.31 to 12.5.32	18.5.32
	Morton, A. J. ...	R. M. Richardson, J. L. ...				
	Bostock, O. ...	Dunkley, A. D. Dennis, ...				
		K. H. Davies, H. Philpott, ...				
		S. H. Diamond.				
073 *† <i>Nagara</i> ...	Miles, A. G. ...	E. N. Giller, H. Marker, ...	No. M.	R.M.S.P. Co. ...	Forms 911 & 138 4.2.32 to 21.4.32	27.4.32
201 †† <i>Naldera</i> ...	Harrison, R., D.S.O., ...	R. P. Bennett, ...	W.T.	P. & O. ...	" " 25.12.31 to 31.3.32	4.4.32
286 *† <i>Natia</i> ...	R.D., Capt. R.N.R.	P. Tankin, S. H. Baldwin, ...	No. M.	R.M.S.P. ...	" " 20.12.31 to 10.2.32	15.2.32
227 *† <i>Nardana</i> ...	Womersley, H. ...	J. Brown, ...	" M.	British India ...	Form 915 1.11.31 to 17.3.32 ...	23.3.32
202 †† <i>Narkunda</i> ...	Reilly, J. V. ...	F. Thacker, J. E. P. Matthews ...	W.T.-M.	P. & O. ...	Form 911 24.3.32 to 17.4.32 ...	9.5.32
305 *† <i>Nebraska</i> ...	Cadiz, F. G., D.S.C. ...	D. B. Lattin, A. Woodward, ...	No. M.	R.M.S.P. Co. ...	Forms 911 & 138 24.1.32 to 19.4.32	27.4.32
162 *† <i>Nestor</i> ...	Bridges, A. E. ...	H. L. Bowkes, C. K. Brown, ...	W.T.	A. Holt ...	Form 915 22.1.32 to 1.5.32 ...	6.5.32
210 ** <i>Niagara</i> ...	Adecock, F. ...	P. R. Cocks, ...	M.L.	Canadian- Australasian	" " 10.12.31 to 26.3.32 ...	27.5.32
256 *† <i>Norfolk</i> ...	Martin, W. ...	P. Elder, W. Pearce, J. M. ...	"	Federal ...	" " 12.12.31 to 20.3.32 ...	9.4.32
297 *† <i>Northumberland</i> ...	Hill, T. V. ...	G. H. Kime, D. A. Menlove, ...	No. M.	" " ...	Forms 911 & 138 27.2.32 to 27.5.32	2.6.32
231 *† <i>Nuddea</i> ...	Howell - Price, J., ...	J. W. S. Madden, ...	" M.	British India ...	Form 912 21.4.32 to 8.5.32 ...	2.6.32
	D.S.O., D.S.C.	K. M. L. Jones, G. D. Lyver, ...			Forms 911 & 138 16.3.32 to 1.5.32	6.6.32
	Upton, H. L., D.S.C., ...	G. E. Mason, ...				
	R.D., Commr., R.N.R.	H. S. Cashmore, G. B. Cathie, ...				
	Ramsay, D. M. ...	H. I. Phillips, ...				
		D. A. Jones, T. Hodgkinson, ...				
		B. Emmerson.				
294 †† <i>Olympic</i> ...	Binks, J. W., R.D., ...	O. N. Tugwell, G. Brooks, ...	W.T.	White Star ...	Forms 911 & 138 28.4.32 to 2.6.32	4.6.32
243 *† <i>Opawa, M.V.</i> ...	Lt.-Commr. R.N.R.	S. Weller, ...	No. M.	New Zealand Shipping	Form 915 30.11.31 to 23.3.32 ...	13.4.32
170 †† <i>Orama</i> ...	Robinson, F. W. ...	H. D. Horwood, H. P. William- son, R. H. Chapman,	W.T.	Orient ...	Forms 911 & 138 22.2.32 to 24.5.32	1.6.32
086 †† <i>Orcoma</i> ...	Matheson, C. G., ...	B. W. Gordon, C. H. Denton	W.T.-M.	Pacific S.N. Co. ...	" " 2.8.31 to 30.9.31	7.10.31
087 †† <i>Orduna</i> ...	D.S.O., R.D., Capt. R.N.R.	T. R. Scott, H. J. Jones, H. D. Dillon.	"	" " ...	" " 15.3.32 to 19.5.32	27.5.32
258 *† <i>Oregon Star</i> ...	Benson, E. W. ...	P. L. Hockey, W. Horsfall, H. B. Reece.	No. M.	Blue Star ...	" " 8.4.32 to 10.5.32 ...	17.5.32
171 †† <i>Orford</i> ...	Galloway, M. ...	E. T. Blaxland ...	W.T.-M.	Orient ...	Forms 911 & 138 6.3.32 to 7.6.32	16.6.32
174 †† <i>Ormonde</i> ...	Lewis, G. ...	C. B. Hubert ...	W.T.	" " ...	" " 5.12.31 to 8.3.32	15.3.32
172 †† <i>Cronsay</i> ...	Kennedy, G. S. ...	T. L. Shurrock, N. Smith, C. Blake.	W.T.-M.	" " ...	" " 4.1.32 to 5.4.32	11.4.32
173 †† <i>Orontes</i> ...	James, L. V., D.S.C.	R. B. Stannard, C. W. Pinckney O. C. Davies.	W.T.	" " ...	" " 25.1.32 to 26.4.32	6.5.32
105 †† <i>Orsova</i> ...	Cameron, E. P., R.D., ...	J. M. Swanson, W. L. Mackay	W.T.-M.	Orient ...	" " 28.1.32 to 8.3.32	10.3.32
156 †† <i>Otranto</i> ...	Commr. R.N.R.	O. C. Davies.				
	Hubbard, L. F. ...	J. L. Skilling, J. D. Birch, E. V. Bilger.				
	Staunton, H. G., C.B.E. R. D. Commr., R.N.R.	A. E. Coles, A. Addison, E. M. McKay.				
279 *† <i>Pacific Enterprise</i> ...	Newman, G. W. A. ...	...	M.L.	Furness Withy ...	Forms 911 & 138 22.10.31 to 14.1.32	9.2.32
<i>Pacific Exporter</i> ...	Holland, C. E., R.D., Commr., R.N.R.	W. Edmonds ...	W.T.	" " ...	Form 911 16.6.31 to 16.9.31 ...	21.9.31
<i>Pacific Shipper, M.V.</i> ...	Nuttall, E. L. ...	S. Porter ...	No. A.	Booth ...	Form 915 26.7.31 to 9.3.32 ...	15.3.32
<i>Pancras</i> ...	Reynolds, W. ...	W. H. Cross, L. A. Sayers, S. Adams,	M.L.	" " ...	Form 911 8.10.31 to 20.12.31 ...	22.1.32
<i>Paris</i> ...	Hill, A. ...	T. Mahoney ...	C.C.	Southern Rly. ...	Telegraphic Report. 30.5.32 ...	30.5.32
<i>Patrician</i> ...	Lowe, J. ...	W. E. Williams ...	No. M.	Harrison ...	Forms 911 & 138 11.4.32 to 30.4.32	2.5.32
058 †† <i>Pennland</i> ...	Making, V. L. ...	C. H. Otterson, G. T. Boyle, J. Cross.	W.T.	Red Star ...	Form 915 2.8.31 to 2.12.31 ...	7.12.31
204 *† <i>Peshawur</i> ...	Roche, C. B. ...	P. Haworth, J. A. Hunter, A. Nicklen.	No. M.	P. & O. ...	Forms 911 & 138 6.2.32 to 26.5.32	1.6.32
238 *† <i>Plako</i> ...	Aslin, E. P. C. ...	A. E. Williams, C. A. Cremin, J. F. Clement.	"	New Zealand Shipping	Form 912 27.2.32 to 30.4.32 ...	1.6.32
039 *† <i>Planter</i> ...	Ling, J. T. ...	W. S. Eustance, J. J. Devereux, W. H. Slaughter.	"	Harrison ...	Forms 911 & 138 3.1.32 to 6.4.32	11.4.32
040 *† <i>Port Adelaide</i> ...	Williams, R. ...	F. W. Elger, D. F. Morgan, D. Chamberlain.	W.T.	Commonwealth & Dominion.	" " 27.9.31 to 18.1.32	26.1.32
255 *† <i>Port Alma</i> ...	Hayter, S. W. ...	E. E. Roswell, E. Wheeler, J. Moate.	"	" " ...	Form 915 23.1.32 to 18.5.32 ...	26.5.32
128 *† <i>Port Auckland</i> ...	Robinson, C. A. ...	A. G. Rhind, G. C. Langford, A. Brown.	M.L.	" " ...	" " 21.12.31 to 21.5.32 ...	9.6.32
268 *† <i>Port Bowen</i> ...	Brown, A. H. ...	F. R. Gorman, T. L. Kidwell, T. Soames.	W.T.	" " ...	Forms 911 & 138 7.1.32 to 29.3.32	5.4.32
130 *† <i>Port Caroline</i> ...	Hearn, G. W. ...	E. W. R. Young, J. G. Thorn, R. E. Garner.	"	" " ...	Form 915 5.11.31 to 26.3.32 ...	31.3.32
131 *† <i>Port Darwin</i> ...	Hudson, J. J. ...	R. D. Morgan, H. R. Hill, H. Duckling.	"	" " ...	" " 6.10.31 to 28.1.32 ...	20.2.32
132 ** <i>Port Denison</i> ...	Hall, G. S. ...	P. L. Holloway, E. Leavett, E. A. Rogerson.	"	" " ...	" " 4.11.31 to 3.3.32 ...	15.3.32
133 *† <i>Port Dunedin, M.V.</i> ...	Mason, W. S., D.S.C.	H. M. Post, C. A. Hodson, R. Betters.	M.L.	" " ...	" " 5.10.31 to 29.1.32 ...	2.2.32

LIST OF VOLUNTARY OBSERVING SHIPS

Name of Vessel.	Captain.	Observing Officers.	Meteoro-logical Equipment.	Line.	Last Log. Register, or Record Contributed. Received up to 17.6.32.	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. Skales, 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 *† Princessa	Friend, A. B.	F. Poulson, E. Longheed, O. Sheard.	No. M.	Houlder " " "	Forms 911 & 138 1.5.32 to 19.5.32	14.6.32
163 *† Proteuslaus	Rundle, G. G.	W. C. McGugan	M.L.	A. Holt	Form 915 28.5.31 to 14.9.31	23.10.31
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	" " 29.2.32 to 12.5.32	17.5.32
228 †† Ranchi	Brooks, C., D.S.O., R.D., Commr., R.N.R.	T. A. Sargeant	" M.	P. & O.	" " 7.2.32 to 23.3.32	29.3.32
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, S. Leggett.	"	" " "	" " 24.10.31 to 3.2.32	11.2.32
240 †† Rangitiki, M.V.	Barnett, H.	H. Hill, L. F. Malcouronne, J. V. Halliday.	"	" " "	" " 17.1.32 to 25.4.32	29.4.32
207 †† Ranpura	Furlong, G. H. S., R.D., Capt., R.N.R.	F. Ferguson, K. 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. West, 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
306 *† 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
Rhexenor	Stout, G. L.	J. S. Parry	No. A.	A. Holt	Form 911 14.9.31 to 6.12.31	18.1.32
189 *† Rother	Woodhead, T. H.	H. Robinson, H. L. Marshall	W.T.	Goole Steam Shipping	Forms 911 & 138 16.4.32 to 7.5.32	11.5.32
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, J. Mercer.	W.T.	New Zealand Shipping	Forms 911 & 138 23.4.32 to 30.5.32	4.6.32
St. Helier	Pitman, R.	A. C. Ricketts	C.C.	G.W. Railway	Telegraphic Report 16.6.32	16.6.32
St. Julien	Richardson, L.	A. E. Ricketts, H. D. Freeman.	"	" " "	" " 7.6.32	7.6.32
St. Mlver, S.T.	Hatton, A.	" " " " " "	No. A.	Bunch Steam Fishing Co.	Form 911 13.5.32 to 9.6.32	14.6.32
St. Patrick	" " " " " "	F. E. Martin	C.C.	G.W. Railway	" 912 13.5.32 to 9.6.32	14.6.32
038 †† Samaria	Malin, R. G., Lt.-Commr., R.N.R.	J. G. Watts, J. A. Myles, H. Hudson.	W.T.	Cunard	Telegraphic Report 15.9.31	15.9.31
061 *† Saxon Star	Griffiths, G. A.	K. Griffiths	"	Blue Star	Forms 911 & 138 1.5.32 to 6.5.32	17.5.32
291 *† Scholar	Peterkin, A. G.	R. J. Mackinnon, W. A. Pemberton.	No. M.	Harrison	" " 15.1.32 to 29.3.32	9.9.32
Scotia	O'Neill, J.	W. H. Hughes	C.C.	L.M. & S. Railway	Telegraphic Report 17.6.32	17.6.32
033 †† Scythia	Oram, B. B., R.D., Commr., R.N.R.	W. H. Stewart, A. Bridgewater, H. L. Pryse.	W.T.	Cunard	Forms 911 & 138 17.4.32 to 5.6.32	8.6.32
211 *† Shropshire, M.V.	English, G. L.	D. Hetherington, I. D. Minto, G. W. Dobson.	"	Bibby	Form 912 16.5.32 to 5.6.32	8.6.32
121 *† Siamese Prince	Jones, E. E.	" " " " " "	M.L.	Prince	Forms 911 & 138 7.2.32 to 15.4.32	20.4.32
230 *† Somerset	Pilcher, C. R.	C. Edgecombe, H. M. Knight, H. V. G. Hastings.	"	Federal	" " " " " "	" " " " " "
277 *† Spero	Montgomery, H.	H. W. Vickers, A. Kirk	"	Ellerman Wilson	Form 915 7.1.32 to 1.5.32	5.5.32
Stephen	Barlow, E. P.	G. H. Daniels, C. G. Powell.	"	Booth	" " 10.10.31 to 5.3.32	15.3.32
270 †† Strathaird	Townshend, W. P.	R. H. Hand, H. Fitzmarsham, W. J. Alington.	W.T.-M.	P. & O.	" 26.6.31 to 30.10.31	27.11.31
259 *† Surrey	Lettington, A. E.	R. Rees, D. J. Murray, H. H. Mackillican.	W.T.	Federal	Forms 911 & 138 13.2.32 to 20.5.32	24.5.32
Tacoma City	Paul, H.	T. J. Paull	M.L.	Reardon Smith	Form 915 15.11.31 to 31.3.32	12.4.32
229 *† Tactician	Trinick, F., O.B.E.	E. P. Simmons	No. M.	Harrison	Form 911 24.12.31 to 2.6.32	9.6.32
045 †† Tainui	McIntosh, A.	G. A. Harvey, J. Worrall, D. Pickersgill.	M.L.	Shaw, Savill & Albion	" " 19.7.31 to 7.10.31	10.10.31
081 *† Tairua	Grayston, E. T., D.S.C., R.D., R.N.R.	G. L. Almond, W. Thowless, L. B. Miller.	"	" " "	Form 915 5.12.31 to 20.3.32	30.3.32
046 †† Tamaroa	Hartman, W. H.	L. R. Bull, R. R. Roseman, F. Lutyen.	W.T.-M.	" " "	" " 30.10.31 to 24.2.32	3.3.32
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.	Forms 911 & 138 29.1.32 to 8.5.32	11.5.32
165 *† Tantalus, M.V.	Melling, C. F.	A. C. H. Jones, J. R. C. Evans, E. Saville.	W.T.	A. Holt	Form 915 2.12.31 to 29.2.32	28.5.32
047 *† Taranaki, M.V.	Wood, C., D.S.C.	G. Campbell, T. Chapman	"	Shaw, Savill & Albion	Forms 911 & 138 21.12.31 to 23.3.32	30.3.32
Tarantia	Caithness, J. B.	J. M. Cherry	No. A.	Anchor	Form 915 22.1.32 to 10.5.32	25.5.32
069 *† Tekoa	McNish, R. H., Lt.-Commr., R.N.R.	C. W. Roberts	" M.	New Zealand Shipping	Form 911 1.2.32 to 21.2.32	15.3.32
048 †† Themistocles	Elford, H. C.	F. C. Muggleston, A. S. Marshall, J. W. Best.	W.T.-M.	Aberdeen Commonwealth.	" " 30.12.31 to 25.1.32	15.2.32
007 *† Thistleglen	Whitfield, G.A., O.B.E.	S. B. Davis, G. L. Hetherington.	No. M.	Allan Black & Co.	Forms 911 & 138 10.7.31 to 3.3.32	20.4.32
					" " 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 17.6.32.	Date Received.
161 *† <i>Titan</i> ... ..	Elford, W. J. ... ..	F. B. Smith, A. K. Sanderson, 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. Green.	W.T.	Anchor ... ..	Forms 911 & 138 22.5.32 to 29.5.32	31.5.32
288 *† <i>Traveller</i> ... ..	Barrow, W. T. C. ... ..	R. Ledger ... ..	No. M.	Harrison ... ..	Form 912 21.5.32 to 29.5.32 ... ..	31.5.32
119 *† <i>Trojan Star</i> ... ..	Griffin, G. A. ... ..	L. S. Hassell, K. Griffiths, D. W. Marshall.	„ M.	Blue Star ... ..	Form 911 20.1.32 to 28.3.32 ... ..	1.4.32
245 *† <i>Turakina</i> ... ..	Laird J. ... ..	H. G. Letts, E. G. Williams, J. Reeve.	„ M.	New Zealand Shipping	Forms 911 & 138 9.10.31 to 30.12.31	29.1.32
276 †† <i>Tuscania</i> ... ..	Rome, W. B. ... ..	J. Noble, G. Squires, G. Robertson.	W.T.	Anchor ... ..	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 6.1.32 to 7.3.32	12.3.32
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, — ... ..	J. B. Williams, R. E. Suckling.	M.L.	Union S.S. Co. of N.Z.	Form 915 7.12.31 to 3.3.32 ... ..	5.5.32
263 ** <i>Wairuna</i> ... ..	Hender, W. H. ... ..	P. Clissold, W. D. Roach, J. Wilson.	W.T.	Union Castle ... ..	Form 911 16.4.32 to 5.6.32 ... ..	7.6.32
005 †† <i>Warwick Castle</i> ... ..	Owens, G. ... ..	J. H. Mackie, R. Fairnie, J. McLaren.	„	Red Star ... ..	Forms 911 & 138 24.4.32 to 10.6.32	13.6.32
060 †† <i>Westernland</i> ... ..	Doughty, J. H. ... ..	„ ... ..	„	New Zealand Shipping	Form 912 22.5.32 to 10.6.32 ... ..	13.6.32
056 *† <i>Westmoreland</i> ... ..	Holland, E. ... ..	„ ... ..	„	„	„ ... ..	„
208 †† <i>Winchester Castle M.V.</i>	Gardner, G. F., O.B.E., Lt.-Commr., R.N.R.	G. F. Moon, A. G. Patey ... ..	„	Union Castle ... ..	Forms 911 & 138 12.3.32 to 30.4.32	3.5.32
096 †† <i>Windsor Castle</i> ... ..	Kerbey, J. H. ... ..	F. Hunter ... ..	„	„	Form 911 10.4.32 to 29.5.32 ... ..	17.6.32
<i>Worthing</i> ... ..	Marmery, S. ... ..	C. Munton, E. Balcombe ... ..	C.C.	Southern Railway ... ..	Telegraphic Report 16.6.32 ... ..	16.6.32
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>Coy 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 26.2.31 to 5.9.31	5.10.31
<i>Sombrero</i> ... ..	„ ... ..	„ ... ..	„	„ ... ..	Lighthouse Register 1.7.31 to 31.12.31	28.1.32
<i>Watling Island</i> ... ..	„ ... ..	„ ... ..	„	„ ... ..	Lighthouse Register 17.7.31 to 31.12.31	27.2.32
<i>Cape Pembroke (Falkland Is.)</i> ... ..	„ ... ..	„ ... ..	„	„ ... ..	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 31.5.32.	Date Received.
<i>Dakarlan</i> ... ..	Brown, W. ... ..	A. A. Johnson ... ..	Leyland ... ..	Water Samples ... ..	17.3.32
<i>Dartan</i> ... ..	Hannaford, W. ... ..	W. R. Vaughan ... ..	„ ... ..	„ ... ..	18.9.31
<i>Darro</i> ... ..	Matthews, G. P. ... ..	F. R. Jeyes ... ..	R.M.S.P. Co. ... ..	„ ... ..	17.3.32
<i>Davstian</i> ... ..	Thomas, R. ... ..	F. Steventon ... ..	Leyland ... ..	„ ... ..	5.4.32
<i>Dorelan</i> ... ..	Hughan, C. ... ..	A. W. Wood ... ..	„ ... ..	„ ... ..	23.4.32
<i>Hilary</i> ... ..	Jones, W. C. H., R.D., Commr., R.N.R.	„ ... ..	Booth ... ..	„ ... ..	...

August, 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.)

GEOPHYSICAL 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.

The Admiralty Publications are on sale by J. D. POTTER, 145, Minories, London, E.1

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