

VOL. VII. No. 79.

THE MARINE OBSERVER.

JULY, 1930.

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A PORT METEOROLOGICAL OFFICE FOR THE PORT OF LONDON.

In order that regular observing ships using the Port of London shall be properly cared for a Port Meteorological Office has been established at the Royal Albert Docks and an officer who has long worked as a member of the Corps of Voluntary Marine Observers at sea has been placed in charge, Lieutenant C. H. WILLIAMS, R.N.R., until lately 2nd Officer in the UNION CASTLE LINE, being the officer selected for the post.

Up to the present the needs of observing ships in the Port of London have been dealt with as far as possible direct from the Marine Division, and up to last July Mr. W. T. GRIEVES, an Officer of the Merchant Navy, was employed as visiting officer. All who know the Port of London, with its many docks, scattered berths, and its great volume of shipping will realize what a task one officer single-handed had in working the port from the Marine Division in Kingsway. That observing ships in a large measure received their requirements, does credit to the officer who struggled thus single-handed to satisfy the needs of the Service in the Port of London.

Mr. GRIEVES took with him the goodwill and good wishes of the Marine Division and Corps of Voluntary Observers when he decided to return to sea, and we wish him every success in his venture as shipowner and master.

Under the International Convention of Safety of Life at Sea, 1929, the Governments of the Countries party to the Convention undertake to arrange for certain "Selected Ships" to take meteorological observations and to report them by Wireless Telegraphy for the benefit of shipping and the various official Meteorological Services and through the International Meteorological Organization it has been agreed that these voluntary services by shipping and seamen for general benefit, shall be performed upon a tonnage basis.

Great Britain, having the greatest mercantile tonnage, therefore has to maintain the greatest number of "Selected Ships"; and as more tonnage uses the Port of London than any other Port in the World it follows that London has to provide more "Selected Ships" than any other Port.

The Port Meteorological Office at Liverpool, the first of its kind in the British Empire, has proved its value to the shipping and seamen of that Port, to the Meteorological Service, and it has done much for regular observing ships sailing out of Liverpool and adjacent ports. That office and its work was described by the officer in charge, Lieutenant Commander M. CRESSWELL, R.N.R., in an article entitled, "The Port Meteorological Office, Liverpool," pages 201 to 202, Volume IV of this JOURNAL. When that article was

written the Liverpool office had been established six years, and much was done in those six years.

It must not be expected that the Port Meteorological Office, London, will immediately be able to perform all the services undertaken at Liverpool; that will come in time.

For more than nine months it has not been possible to inspect the instrumental equipment of London observing ships, and before that the work had so much increased that it was not possible to cope with it. Therefore, the first duties of the Port Meteorological Officer and his assistant, will be to muster official instruments in London observing ships and to make such replacements, exchanges, withdrawals, and issues as are necessary to obtain the desired number of "Selected Ships" trading to all parts of the World.

At the outset, the accommodation of the Port Meteorological Office will be small, too small to accommodate more than one or two

callers from observing ships, and therefore all concerned are invited to note the telephone number of the Port Meteorological Office which appears in the list of addresses given each month on the reverse side of the North Atlantic Ice Chart, i.e., Albert Dock 2659.

The Merchant Navy has asked for this facility to aid its voluntary work in co-operation with the Marine Division of the Meteorological Office. We ask the Merchant Navy in return to give Mr. WILLIAMS its co-operation and support in his arduous duties which are intended to serve the needs of shipping and seamen in the Port of London interested in Marine Meteorology, and relieve headquarters of work of a local nature so that the Marine Division may better be able to cope with the World wide work which is entrusted to it.

London,

22nd April, 1930.

MAY 1st, 1930.

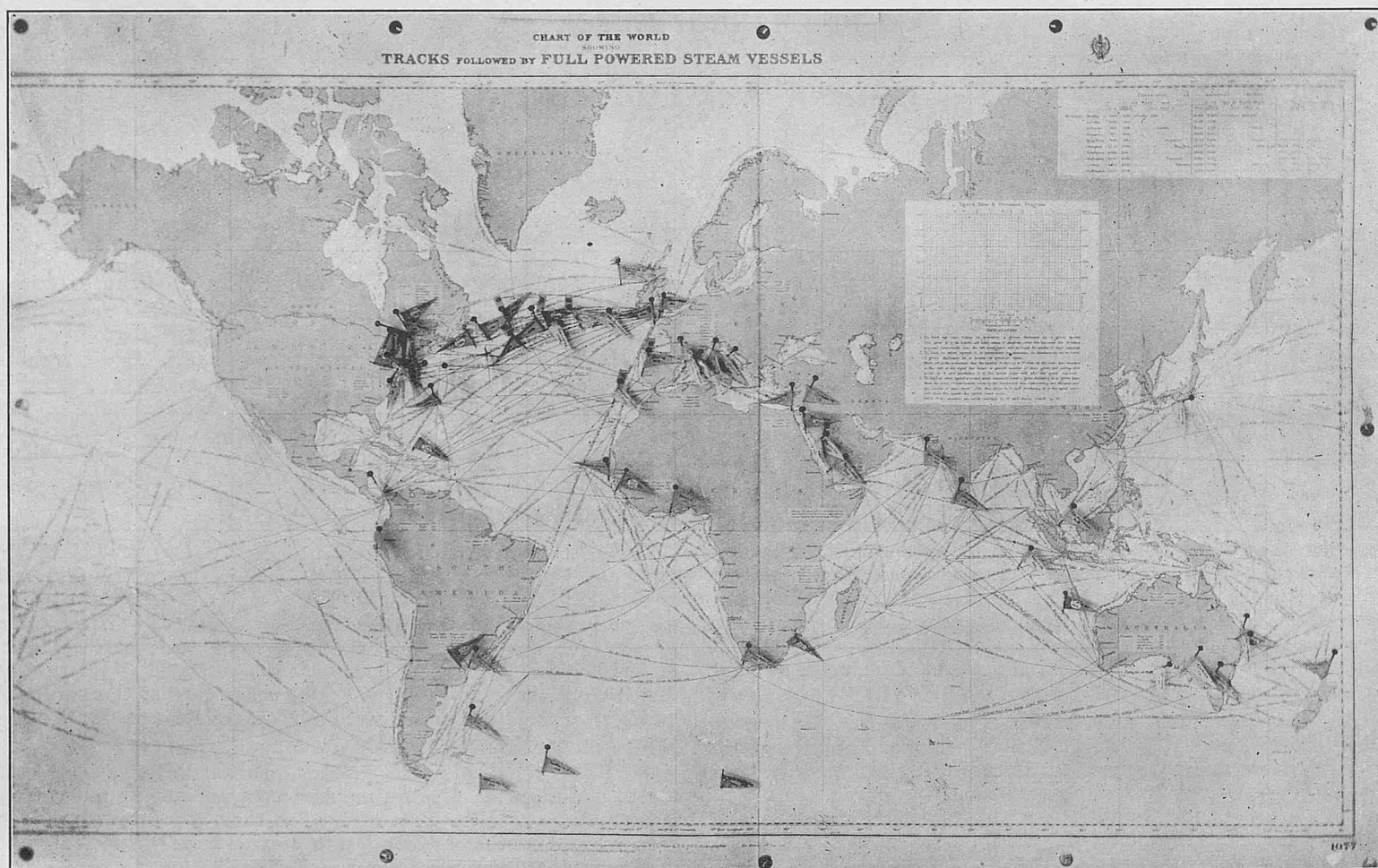
It is too soon to say much about the working of the World Wide scheme of "Selected Ship" Routine Meteorological Wireless reports which commenced on May 1st, for we cannot be in a position to review it for a long time, probably at earliest in Work of the Year in next year's June Number. However, the photograph of the position chart and the list of chosen "Selected Ships" for May 1st, with these notes added to this number while in the press, may be of interest and assistance to the Corps of Voluntary Marine Observers.

The following was the roll call for May 1st: *Carmania, Arabic, Cedric, Duchess of Atholl, Minnewaska, Darro, Windsor Castle.*

As yet, written returns have only been received from the first of these to arrive in a home port, *Duchess of Atholl.*

According to her Forms 911 and 138 and the messages received, not only were her observations excellent, but she appears to have adhered in every respect to the required times for observation and transmission and to have carried out the procedure of communica-

ESTIMATED NOON POSITIONS OF A Selected Ships ON THURSDAY, MAY 1ST, 1930.



The small flags stuck into the chart each indicate the position of an **A Selected Ship** at sea or in ports abroad and alongside this chart is a board in which abreast their numbers are stuck small flags representing **A Selected Ships** in home ports.

There are about two **B Selected Ships** scattered all over the World to each **A Selected Ship** but **B Selected Ships** do not work under the control system in the Eastern North Atlantic for the reasons given in January MARINE OBSERVER.

tion in the best possible way, thus making the information available not only to the Meteorological Services, but to all ships within range in such a manner that they could most easily receive it.

Possibly from force of habit or through lack of information through failure of delivery of THE MARINE OBSERVER a few **A Selected Ships** not on the roll call as "Chosen Selected Ships" for the day, reported to Weather, London. Now if the roll call is not adhered to, the control may become ineffective and without control

in such parts of the World as the Eastern North Atlantic where there may be many "Selected Ships", jamming and confusion will continue. Moreover a good geographical distribution of reported observations cannot be obtained without control. Remember, many reports made without order have proved to result in failure of purpose, while comparatively few reports well organized achieve their object.

It was not expected that the scheme would work perfectly in every detail from the first, and considering all things the first day of its working is a fine indication that it will meet with success.

Let "Selected Ships" thereby be encouraged and we ask them to do their utmost to carry out the procedure laid down in the January MARINE OBSERVER.

The Officer in Charge of Portishead Radio, who is doing so much to help us, will report in due course to the Inspector of Marine Wireless Telegraphy and suggest any necessary changes of detail, so that within the principles laid down the scheme may be the more effective; and we hope that Commanders of "Selected Ships" will, if necessary, forward any suggestions regarding details of communication which may appear to be desirable, and which are within the main principles of the scheme which was drawn up upon the experience of those who have done pioneer work since re-organization of Marine Meteorology after the Great War.

We shall be glad to have information from Marine Observers as soon as possible of the working of this scheme by British "Selected Ships" in parts of the World not controlled through Portishead.

May 3rd, 1930.

MARINE SUPERINTENDENT.

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.

CURRENT.

Mediterranean.

THE following is an extract from the Meteorological Log of S.S. *Clan Malcolm*, Captain L. G. HANNAY, Barry to Port Said. Observer, Mr. D. D. INGRAM, 2nd Officer.

"On July 3rd, 1929, at about 1 a.m. (midnight G.M.T.) when 18 miles N.W. of Pantellaria (Latitude 36° 50' N., Longitude 11° 56' E.) we experienced a strong N.W'ly set at the rate of 3.5 miles per hour W.N.W. True. After the island was passed the set was E.S.E. (T), but at a rate of only 1 mile per hour. We passed 5.5 miles off the light. The weather at the time was good with light E.S.E. breeze, slight sea and swell, heavy dew and slightly misty, banks of mist observed passing across the moon. Barometer 1014.0 mb. Temperature, Dry Bulb 74° F., Wet Bulb 75.5° F. Sea 75.5° F. At this time we were overhauling a vessel some five to six miles to the N.E. of us fairly rapidly, that is prior to experiencing contrary set: but during the interval from Midnight to 0137 G.M.T. (light abeam) we hardly gained on her, although our engine revolutions were the same as previously, but soon after passing the island we overtook her and soon lost her astern. We came to the conclusion that the set was only felt close to the island and the other vessel being five miles further from it than ourselves did not experience it, or if she did it was less strong where she was."

STEAMSHIP ROUTE FROM COLOMBO AND THE EAST TO PERIM, DURING THE S.W. MONSOON.

THE following is an extract from the Meteorological Report of S.S. *Jeypore*, Captain C. P. COOPER, O.B.E., R.N.R., China to London. Observer Mr. F. M. SQUIRE, 3rd Officer.

"Left Colombo at 4.43 p.m., 2nd July, 1929, and passed through the following positions:—7° 01' N. 76° 47' E., 6° 58' N. 73° 03' E., 6° 45' N. 69° 38' E., 6° 41' N. 66° 25' E., 6° 27' N. 63° 24' E., 6° 17' N. 60° 29' E., 6° 07' N. 57° 26' E. Up to the Maldives, light to moderate W'ly winds, sea and swell were experienced. Current setting about 120° at the rate of $\frac{3}{4}$ knot. Thence, to position 6° 07' N. 57° 26' E., which was reached at noon 9th July, wind was W.S.W. to S.W. varying in force from 5 to 7, with rough sea and heavy swell from W.S.W. Currents, although adverse, were not strong, varying from 4 to 12 miles per day. The weather was clear and star positions were obtainable morning and evening. The conditions experienced after this were as follows:—10th, Noon. 6° 47' N. 54° 31' E. Current from 9th Noon set 94°, drift 23 miles. Wind S.S.W. force 6. Rough sea and heavy W.S.W. swell. 8.0 p.m., in position by stars 6° 56' N. 53° 19' E., current having set 274°, drift 16 miles since noon. Course was altered to 328°. Weather conditions similar. Sea and swell now being abaft the beam, better progress was made. 11th, 5.20 a.m. star position 8° 21' N. 52° 24' E. Current having set 322°, drift 11 miles since 8.0 p.m. 10th; forenoon observations

indicated that the ship was setting strong to the E.N.E. Noon position being 9° 28' N. 52° 07' E. Current having set 65°, drift 17 miles since a.m. star position. Course was then altered to 309° with the object of making Ras Hafun in daylight, which was then distant 74 miles. Wind S.W. by S. force 6 to 7 with high S.W. by S'ly sea and swell. Slight Monsoon haze, clear sky, star position at 6.54 p.m., 10° 26' N. 51° 36' E. Current from Noon set 56°, drift 27 miles. The land, which was then 15 miles distant, was not visible. At 8.12 p.m. in position 10° 35' N. 51° 25' E. Sounding $\frac{43}{5}$ course was altered to 000°. Wireless bearings at this time, both from Guardafui of the ship, and from the ship of Guardafui, indicated that the ship was 5 miles to the westward of this position, which would be very near the shore, but this was subsequently proved not to be the case. The cause of the error in the wireless bearings was put down to 'coast refraction.'

"Proceeding on this course with a high S.S.W. sea and swell, taking W/T bearings of Guardafui station and sounding every hour, C. Guardafui light was made at 1.47 a.m. 12th bearing 332° at a distance of 21 miles, and rounded at 3.47 a.m. dist. 4 miles. Wind, sea and swell, suddenly dropped and ship proceeded Westward in smooth water. The position at noon was 12° 09' N. 49° 52' E.

"Notwithstanding the fact that the weather experienced after passing the Maldives was considerably more severe than was anticipated, and in consideration of the wireless weather reports received daily from ships on the 'Northern route,' which compared, both as regards weather and currents, unfavourably with our conditions, an undoubted saving of time and an easier passage was experienced by taking the 'Southern route,' although it added approximately 180 miles to the length of the voyage."

NOTE:—It is hoped to publish an article on the currents in this region in a later number of THE MARINE OBSERVER.

Thus it is again borne out that the recommendation given on page 127, Volume VI, viz.: "To put the case in a nutshell, if using the Southern Route, keep well to the southward," is well founded and in view of *Jeypore's* experience it may well be added never neglect the lead even if you have W/T Directional bearings when making the land about Ras Hafun.

ICE.

North Atlantic.

THE following is an extract from the Meteorological Log of S.S. *Port Darwin*, Captain I. R. SAWBRIDGE, Halifax to London. Observer Mr. A. McCLOUNAN, 4th Officer. Illustrated by Mr. R. WAKEFORD, Apprentice.

"4th July, 1929. 0845 G.M.T. Latitude 43° 08' N., Longitude 49° 33' W., 5.30 a.m. A.T.S. sighted one berg, one small berg and one growler. Visibility poor. Course 093°, 5 Kts., water 50° F. Air 51° F. Approximate height of larger berg 80 feet. 4th July, 1929, 1100 G.M.T. Latitude 43° 07' N., Longitude 48° 49' W. At 7.45 a.m. A.T.S. sighted two bergs and several growlers. Visibility

good. Course 093° , 12 Kts., Water 49° F., Air 50.5° F. Approximate height of berg 15 feet. Approximate lengths of bergs 150 feet."

NOTE:—These paintings can only be reproduced in black and white, the originals were water colour sketches.

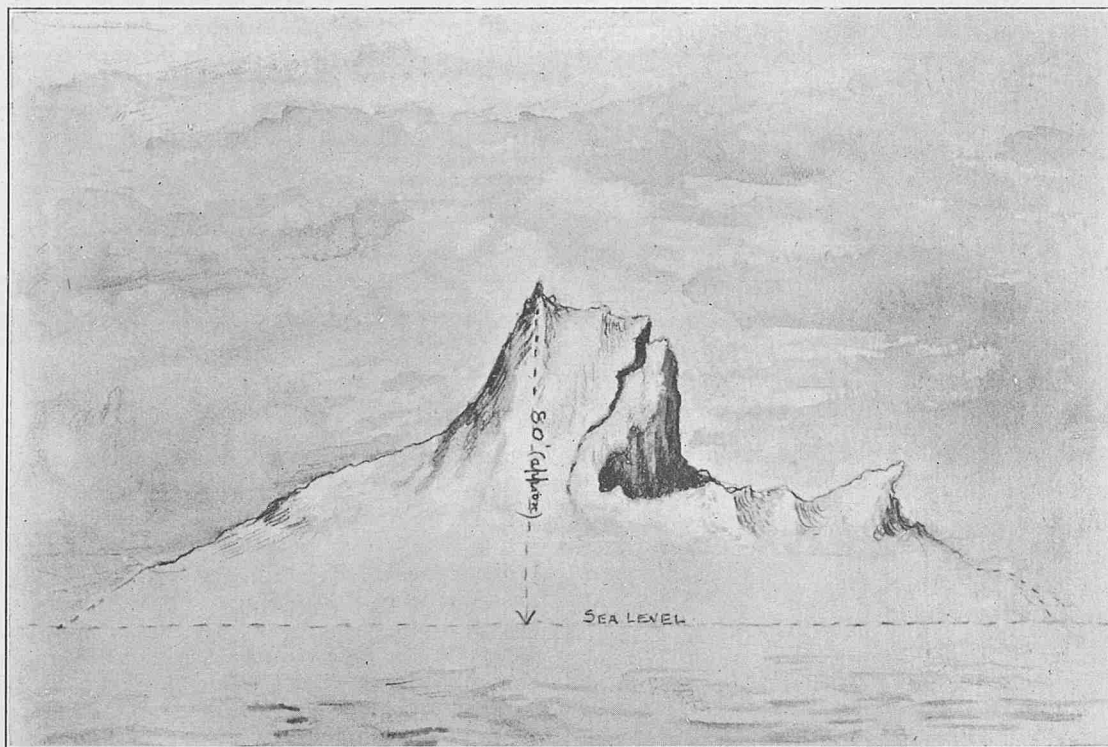


FIGURE 1.—Iceberg sighted at 5.30 a.m. A.T.S. 4th July, 1929.

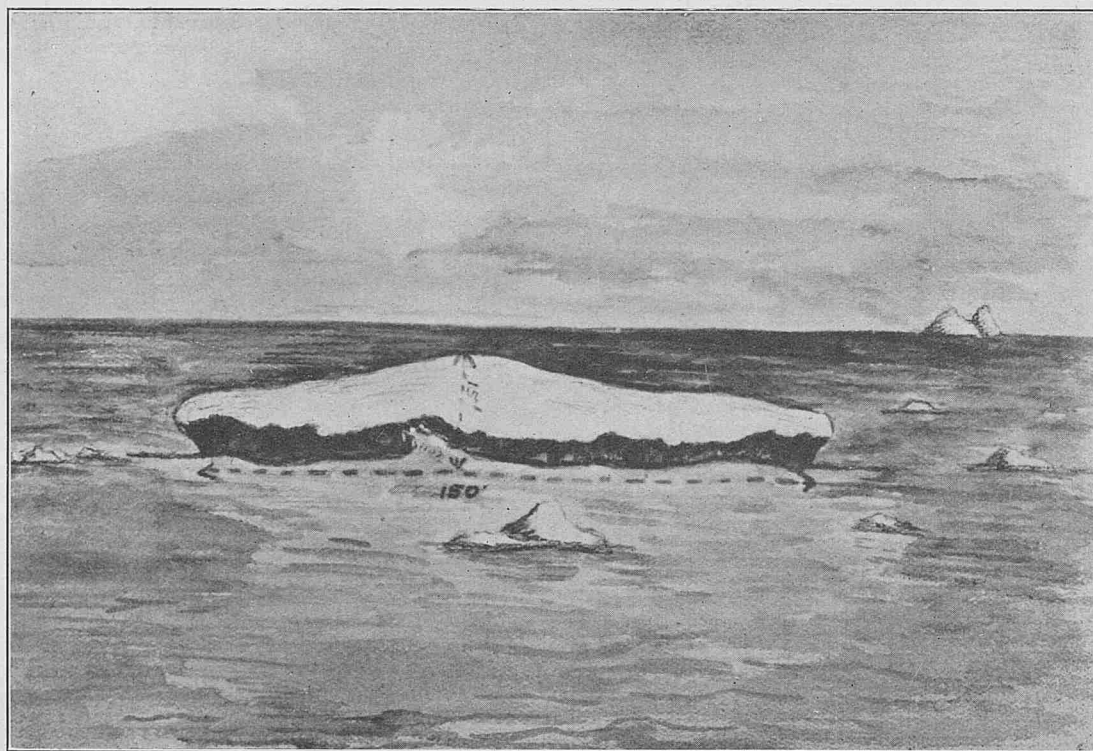


FIGURE 2.—Iceberg sighted at 7.45 a.m. A.T.S. 4th July, 1929.

CHANGES IN SEA TEMPERATURE.

Arabian Sea.

THE following is an extract from the Meteorological Report of S.S. *Laomedon*, Captain J. HATFIELD, Suez to Penang. Observer Mr. O. P. H. WYNNE, 3rd Officer.

"July 29th, 1929, 16.00 A.T.S. in Latitude $12^{\circ} 26' N.$, Longitude $44^{\circ} 34' E.$ During the afternoon watch the temperature of the sea water fell 18° F., the temperature at noon being 83° F. and at 16.00, 65° F. The density also decreased considerably being 1019 at 4 p.m. At 8 p.m. the sea temperature had risen to 82° F. and the density was again normal. From the existing conditions one might almost suspect the presence of a fresh water gusher in the sea bed."

NOTE:—In this position the soundings are 44 fathoms, according to the Admiralty Chart 1012, just inside the hundred fathom line with rapid increase to seaward, and a sudden fall of sea surface temperature might be attributed to upwelling cold sea water were it not for the reported decrease of density. Further observations in this region are asked for.

TIDE RIP.

South Atlantic.

THE following is an extract from the Meteorological Log of S.S. *Matakana*, Captain H. P. THURSTON, Montevideo to Teneriffe. Observer Mr. B. F. MOFFATT, 2nd Officer.

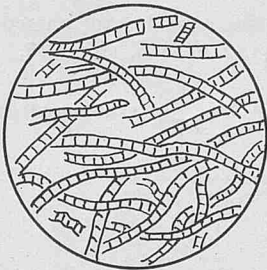
"July 7th, 1929 in Latitude $32^{\circ} 50'$ S., Longitude $51^{\circ} 30'$ W. (D.R. from noon) 3.40 p.m. (7th, 1914 G.M.T.). Observed apparent tide rip stretching from horizon to horizon in S.E. by S. and N.W. by N. direction. While approaching, this rip showed as a long line of small 'white caps.' On crossing, the colour of the water to the S'd was found to be considerably darker than that to the N'd. The line while crossing showed as if heavy tropical rains were beating on it. No difference was found in the temperature of the water taken just before and just after. Wind S. force 3. Barometer 1029 mb. Temperature Air 57° F., Sea 54.4° F. Slight sea and moderate swell (Southerly)."

DISCOLOURED WATER.

Red Sea.

THE following is an extract from the Meteorological Log of S.S. *Baradine*, Captain C. H. C. ALLIN, Aden to Suez. Observer Mr. C. B. ROCHE.

"7th July, 1929, 0838 G.M.T. 10.38 A.T.S. Latitude $26^{\circ} 28'$ N., Longitude $34^{\circ} 55'$ E. A very dense streak of what appeared to be *Trichodesmium* was observed on the starboard bow. Course was altered to pass through the middle, and a sample of the water drawn. Temperature 81° F., Specific Gravity 27. Under a microscope a form of Algae, like *Calothrix* was found. Rough sketch attached."



Gulf of Mexico.

THE following is an extract from the Meteorological Log of S.S. *Remuera*, Captain A. W. McKELLAR, R.D., R.N.R., Colon to Curacao. Observer Mr. R. C. ALDRIDGE.

"July 13th, 1929, at 5.00 p.m. A.T.S. in Latitude $11^{\circ} 13'$ N. Longitude $75^{\circ} 25'$ W. A discoloured patch of water was observed from 2 points on the port bow extending to 6 points on the starboard bow. On entering this the two colours were seen to be very distinct, with apparently no intermingling. The colour of the water was previously blue and became light green. Specific gravity was found to be 1023.1 and temperature 80° F. in the light-coloured water. At noon the specific gravity was 1024, temperature 84° F. and the temperature at 4.00 p.m. 82° F. The water was still discoloured when the light failed. Course 069° , 13.5 kts., Barometer 1010.0 mb., Air temperature 83° F."

PHOSPHORESCENCE.

Arabian Sea.

THE following is an extract from the Meteorological Log of S.S. *Oronsay*, Captain W. S. SHELFORD, London to Australia via Suez. Observers Mr. W. RICE, 2nd Officer, and Mr. E. M. MACKAY, 4th Officer.

"At 02.30 A.T.S. on July 9th, 1929, in Latitude $12^{\circ} 35'$ N., Longitude $55^{\circ} 32'$ E. entered an area of phosphorescent water, extending from horizon to horizon, of whitish appearance. Ship steering 103° at 15.3 knots. At 3 a.m. the temperature of the sea was 77° F. Sky cloudless. Slight haze round the horizon. Strong S.W. wind, squally, moderately rough sea. At 03.55 A.T.S. ship passed out of this area."

THE following is an extract from the Meteorological Log of S.S. *Tongariro*, Captain C. R. KETTLEWELL, Adelaide to Suez. Observer Mr. G. D. BALDWIN.

"July 14th, 1929, at 1.20 a.m. A.T.S. in Latitude $7^{\circ} 30'$ N., Longitude $57^{\circ} 00'$ E. Sea became bright milky white in colour against a dark cloudless sky, giving the appearance of a bright moonlight night. At 2.00 a.m. a draw bucket showed water alive with phosphorescence, also that the temperature of the water had fallen $4\frac{1}{2}^{\circ}$ to 74.2° . At 3.00 a.m. conditions gradually becoming normal. Barometer 1008.7 mb. Temperature, Dry Bulb 75.3° F., Wet Bulb 73.8° F., Sea 74.2° F. Wind S.S.W. force 4. Fine. Clear overhead with slight haze around horizon."

THE following is an extract from the Meteorological Report of S.S. *Laomedon*, Captain J. HATFIELD, Suez to Penang. Observer Mr. O. P. H. WYNNE, 3rd Officer.

"July 31st, 1929, 20.00 A.T.S. in Latitude $12^{\circ} 22'$ N. Longitude $56^{\circ} 28'$ E. Barometer 29.77 in. Wind S.S.W. force 6 with rough sea and swell; at 19.00 when darkness set in, the ship appeared to be surrounded by a luminous halo reflected from the water. By 20.00 the water had turned a greyish white colour which, however, did not appear to be caused by surface phosphorescence as there was little or no sparkle from the bow wave. This discolouration extended to the horizon in all directions giving it a misty appearance except between S.S.E. and W.S.W. where the horizon remained clearly defined. This phenomenon continued until 21.50 when it gradually closed in round the ship again and finally disappeared leaving the sea a normal colour with no phosphorescence. While the ship was in this discoloured water, the sea appeared to calm down considerably though the wind remained force 6. The air temperature remained steady at 79° F. but the sea temperature fell from 78° F. to 76° F. but had risen to 79° by 23.00 hrs."

Timor Sea.

THE following is an extract from the Meteorological Log of S.S. *Marella*, Captain S. MORTIMER, E. Indies to Australia. Observer, Mr. J. CUMMINGS, 4th Officer.

"11th July, 1929, at 3.30 a.m. while crossing the Timor Sea, wind E.S.E. 4, sea 2, sky heavily clouded, the whole expanse of sea surrounding the ship took a phosphorescent glow, giving it the appearance of being lighted from beneath.

"The horizon line was clearly defined, the sky appearing black and the sea lighted as stated above.

"At 5 a.m. sea commenced to darken, and at 5.20 a.m. was normal.

"As the speed of the vessel was about twelve knots, the diameter of this phenomenon must have been about 22 miles."

ACCOUNT OF HEAVY WEATHER, SOUTHERN OCEAN.

THE following account of heavy weather is taken from the log of S.S. *Junee*, Captain F. D. FLETCHER, under date July 30-31st, 1929, when employed searching for the Danish Training Ship *Kobenhavn*.

"30-31st July, 1929. Latitude 42° S. Longitude 96° E. The glass had been a bit unsteady for 2 days previously, but its fluctuations gave no indication of particularly heavy weather. It fell steadily and slowly from 4 a.m. on the 30th till 8 p.m. on the same date by which time I had hove to. From then till 10.30 a.m. on 31st it was nearly steady and during this time the gale was at its height. Between 4 a.m. and 10.30 a.m. on the 31st the wind was of great fury with most violent squalls, and the ship was enveloped in sheets of spray, whipped from the wave tops. The sea was not true, but high, steep and confused, a very ugly sea indeed. During this time I had great difficulty in controlling the ship, as she was racing so badly, the engineer at times could not give me steerage way and she frequently fell off during the squalls and at those times shipped considerable water. The line squall came away about 10.30 a.m. and was some squall. It absolutely staggered the ship and she just lay about 4 pts. off the wind with spray, hail and an occasional sea driving over her. She simply would not face it. At this time I lost 2 ventilators off the fore deck and stove in a door for'ard. The atmosphere at this time was a sickly yellow all round. The glass started to rise rapidly and by 4 p.m. we had the true S.W. sea running in tremendous ridges, but nice easy seas to deal with, and the weather getting better all the time. At 10 p.m. I wore away to the nor'ard to bring the wind and sea on the quarter, and she went along nice and comfortably."

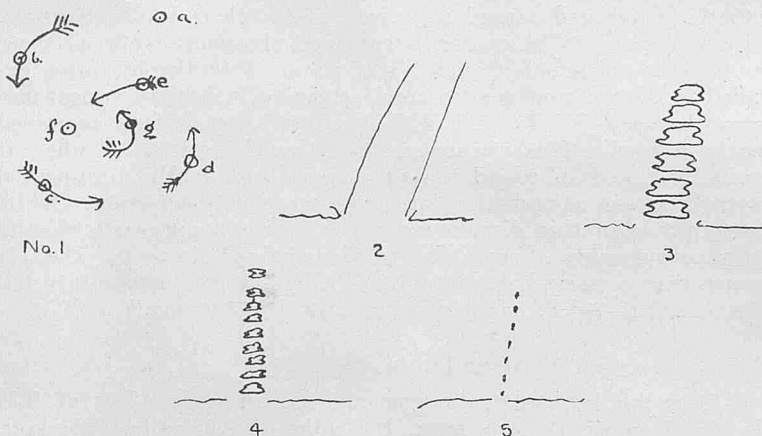
THUNDERSTORM.

Balboa Channel.

Pacific Coast, Central America.

THE following report has been received from S.S. *Salvador*, Captain W. H. MORGAN. Observer Mr. R. W. GILL, 2nd Officer.

"26th July, 1929. Experienced a very heavy thunder and lightning storm with heavy rain. The lightning was most vivid and very close to the ship, the flashes commencing on the starboard bow worked round and round in an anti-clockwise direction, their circles becoming smaller (see sketch No. 1). At 2.15 (75th Mer. Time., approx.) a flash of lightning on the port hand appeared to enter the sea about 100 yards from the vessel. It appeared as a stream of molten metal being poured from a height into the sea and of about one to two feet wide. It first made a most



peculiar shattering noise (as a china plate would make if dropped on a stone floor), then, as it broke up the noise changed to a sizzling sound (as fat being thrown on a fire). On breaking up it appeared as a disjointed spinal column (Sketches 2, 3, 4, 5) and the sea as if water was being poured into it. The flash, of course, only lasted a matter of seconds but the above description is how it appeared to the pilot, others who saw it, and myself."

SQUALL.

North Atlantic.

THE following is an extract from the Meteorological Report of S.S. *Hesione*, Captain A. B. McCOMISH, Cape Town to Liverpool. Observer Mr. J. L. THORPE, 2nd Officer.

"During the early afternoon of the 15th July, 1929, Latitude 13° N. Longitude 17° 45' W. (approx.) observed two heavy Cumulo-Nimbus clouds, one on each bow, about 50° apart, apparently moving to S.E. and S.W. respectively. Wind North, force 3, Barometer 30.00 in., Temperature 79° F., Sea North 3. Ship's course 015°, speed 10 kts. About 2.45 p.m. wind veered to E.S.E. freshening to force 6 accompanied by heavy rain which was being blown upwards at an angle of 102° from horizontal. The temperature dropped about 5° during the heaviest part. In the middle of the squall the waves were high and confused but on the edge there was little difference. Throughout the squall the visibility was mainly moderate.

"At 3.5 p.m. after the squall had passed Barometer 29.97 in., temperature 79° F., wind E.S.E. force 5, Sea E.S.E. 4, Ci-St. A-Cu.

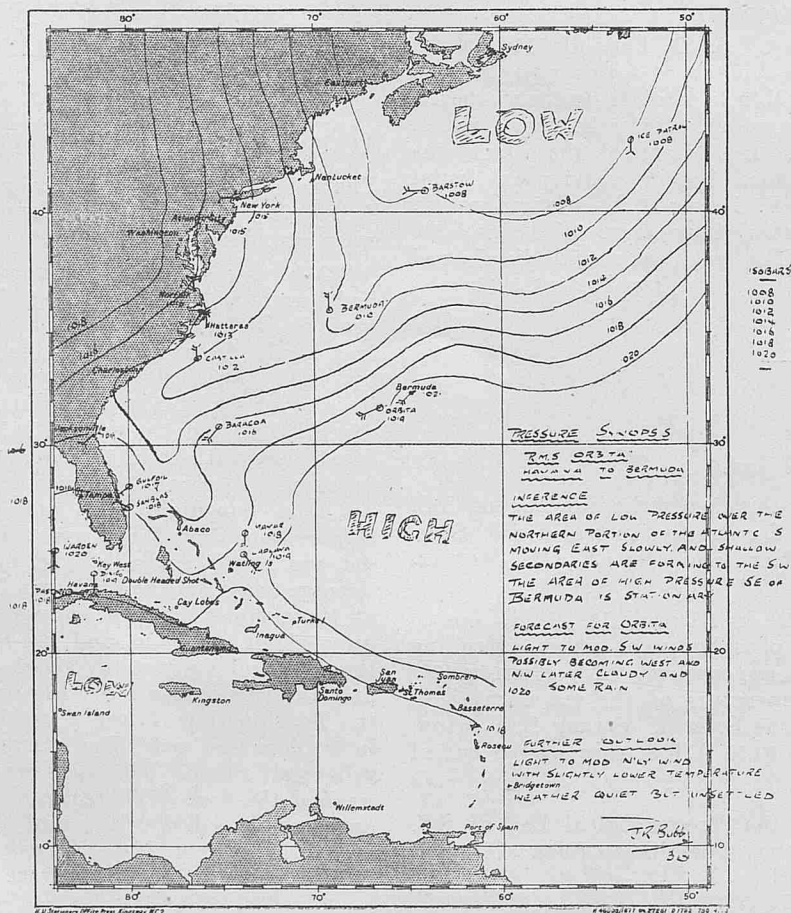
"The observed squall was on starboard bow, one to Westward too far off for observation."

WEATHER CHARTS MADE AT SEA.

Western North Atlantic.

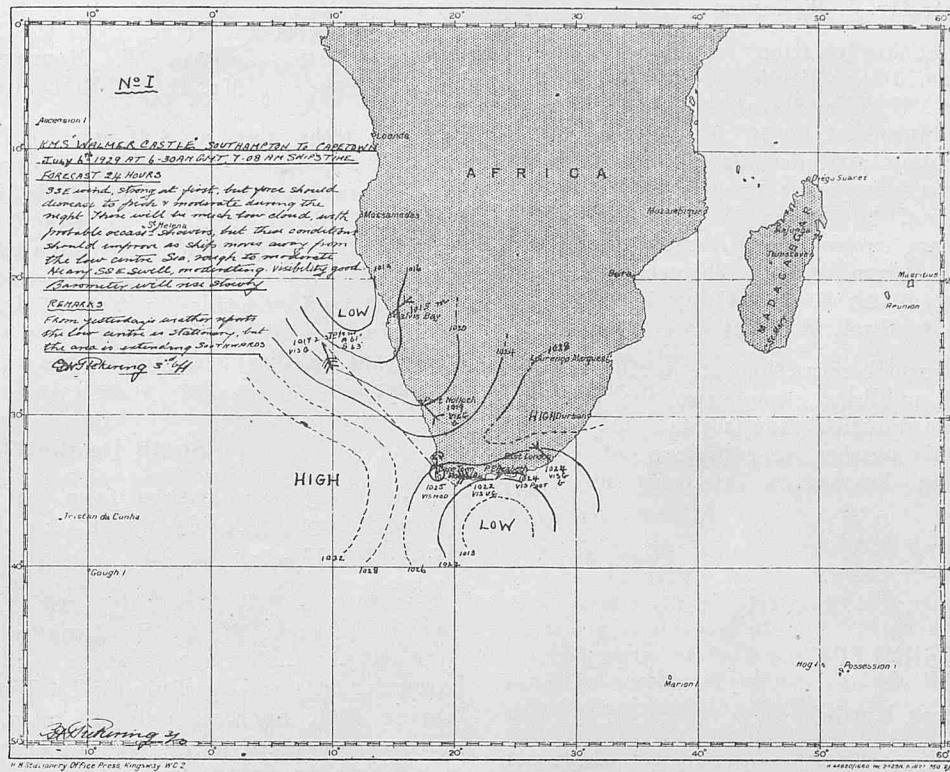
Weather Chart (one of a series) made at sea on board S.S. *Orbita*, Captain R. H. DOMINY, C.B.E., Havana to Bermuda, by Mr. J. R. BUBB, 3rd Officer.

3rd July, 1929, at 1330 G.M.T.



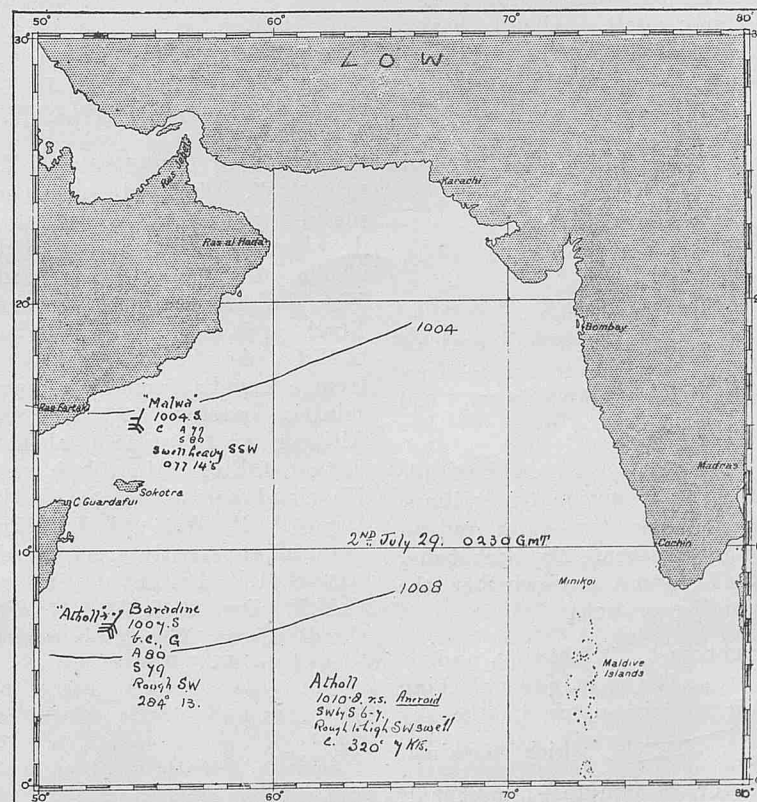
South African Waters.

Weather Chart (one of a series) made at sea on board S.S. *Walmer Castle*, Captain W. MORTON-BETTS, Southampton to Cape Town, by Mr. G. H. PICKERING, 3rd Officer.



Arabian Sea.

Weather Chart (one of a series) made at sea on board S.S. *Baradine*, Captain C. H. C. ALLIN, Colombo to Aden, by Mr. C. B. ROCHE, Chief Officer.



REFRACTION.

Indian Ocean.

THE following is an extract from the Meteorological Report of S.S. *Clan Murdoch*, Captain R. H. WYNNE, Birkenhead to Red Sea and East Africa. Observer Mr. J. B. DAVIES.

"July 31st, 1929. Approximate position Latitude $4^{\circ} 10'$ N., Longitude $48^{\circ} 15'$ E. The meridian altitude of Sun obtained at noon was later proved by DF W/T bearings, checked at twilight by stellar observation, to be incorrect by $16'$ of altitude due to excessive refraction. Ex-meridian altitudes also found $13'$ to $16'$ incorrect. These observations were made by four of the ship's officers between 11.45 a.m. and 12.09 p.m. A.T.S. Weather at time of observation:—Sky part covered by Cirrus clouds, and elsewhere small wisps of thin Cirro-Stratus. Barometer 30.12 in. falling slightly. Temperature of Air 79° F. Water 77° F., Wind S.W. force 4. Sea W.S.W. 3. Swell S.S.W.2."

NOTE:— Such reports of abnormal refraction are useful, in that experiences of this sort, if published, emphasize the need for caution in the use of single position line sights. It should, however, be noted that in this number an experience of *Jeypore* indicates that W/T Directional Bearing on this coast may sometimes be faulty.

VISIBILITY.

Cape Verde.

THE following is an extract from the Meteorological Log of S.S. *Abinsi*, Captain H. E. MILLSON, West Coast of Africa to Liverpool. Observer Mr. S. LEWIS, 2nd Officer.

"12th July, 1929, approaching Cape Verde from 157° at G.M.T. 1400 in Latitude $14^{\circ} 16'$ N., Longitude $17^{\circ} 19'$ W. experienced unusual visibility. Cape Verde Lighthouse itself being plainly discernible at a distance of 29.5 miles, whilst the buildings in the Town, particularly the Arsenal, were easily distinguished at 26 miles.

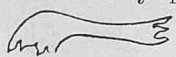
"The weather at the time of observation was:—Wind West, force 1, Sea smooth with slight westerly swell. Clouds heavy Cumulus to S.W., Cumulus at low altitude to North and East, with A-Cu. and Ci. overhead moving slowly to the Eastward."

METEOR.

South Pacific.

THE following is an extract from the Meteorological Report of S.S. *Port Gisborne*, Captain S. W. HAYTER, Liverpool to New Zealand via Panama. Observer Mr. H. G. BOYS-SMITH, 3rd Officer.

"At 9.56 p.m. on the night of July 2nd, 1929, in Latitude $24^{\circ} 25'$ S., Longitude $129^{\circ} 35'$ W. a quite exceptionally brilliant meteor was observed bearing 344° . It took the form of, an explosive flash, when about 30° above the horizon. My back being turned at the moment of the flash, I cannot say whether the meteor had visibly fallen before exploding or not.

"The flash was as brilliant as a bright flash of lightning, and lit up the whole sea in a similar manner. The most unusual thing about it was that the explosion left a fiery patch in the sky shaped roughly in this manner  which remained bright and visible to the naked eye for 26 minutes—almost half

an hour. During this time it hardly moved at all, though it did actually drift two or three degrees in a N.W'ly direction. It gradually became larger and more attenuated and finally faded away."

South Indian Ocean.

THE following is an extract from the Meteorological Log of S.S. *Walmer Castle*, Captain W. MORTON BETTS, Durban to East London. Observer Mr. G. H. PICKERING.

"July 18th, 1929, at 8.21 p.m. A.T.S. 1821 G.M.T. Latitude $31^{\circ} 03'$ S., Longitude $30^{\circ} 30'$ E. Observed a brilliant meteor about two to three times greater magnitude than Venus. It commenced at an altitude of about 45° in region of Southern Cross and bore S. 40° W. (T) and ended at an altitude of about 10° bearing S. 78° W. (T). The colour was at first a bluish green (very brilliant) and resembled a ball of fire shooting across the sky leaving a trail of light behind it. The whole phenomenon from commencement to disappearance of the tail of light lasted about 35 seconds."

South Pacific Ocean.

THE following is an extract from the Meteorological Log of S.S. *Aorangi*, Captain R. CRAWFORD, Auckland to Suva. Observer Mr. V. KNIGHT.

"At 1410 G.M.T. 31st July, 1929, 1.55 a.m. Ship's Time 1st August, Latitude $25^{\circ} 58'$ S., Longitude $176^{\circ} 49'$ E. Course by Gyro 008° . Light airs, smooth and fine. Clouds St-Cu. 2. Barometer 30.00 in. Dry Bulb 63° F., Wet Bulb 54° F. First observed bearing 000° , approximately at an altitude of about 10° . Its brilliance increased as an almost perfect arc of 80° was described in a North to South direction, finally disappearing immediately overhead after a flash common to a bursting marine rocket."

WATERSPOUT.

North Atlantic.

THE following is an extract from the Meteorological Log of S.S. *Culebra*, Commander C. J. GOBLE, R.D., R.N.R., London to Bermuda. Observer Mr. A. H. PHILLIPSON.

"July 2nd, 1929, 1523 G.M.T. in Latitude $45^{\circ} 29'$ N., Longitude $13^{\circ} 55'$ W. Observed waterspout 241° , altitude 4° . Sea upheaval plainly visible 238° , distant 5 miles. 1529 G.M.T. vanished, drawing upwards into very dark Cu-Nb. cloud. Falling rain visible on poleward side. Barometer 1003.6 mb. Dry Bulb 69° F., Wet Bulb 63° F., Cu-Nb. clouds from South through West to North and blue sky from South through East to North. 1540 G.M.T. Another waterspout, sea upheaval appeared like smoke from a vessel's funnel and spreading, column from cloud rapidly joining, bearing 231° , 1543 G.M.T. vanished drawing upwards. Altitude $4^{\circ} 18'$ distant about 6 miles. 1548 G.M.T. heavy belt distant falling rain, black streaky in colour 228° from different Nb. cloud from above. 1555 G.M.T. Temperature appreciably colder. Dry 65° F., Wet 59° F. Wind from W.N.W. Clouds motion changed apparently from travelling Northward to travelling S.W. 1600 G.M.T. Distant falling rain from W.S.W. to N.N.W. 1650 G.M.T. Dry 61.5° , Wet 57° F. Rainbow bearing 090° under Cu. cloud. Heavy Nb. clouds now travelling West. 1700 G.M.T. Wind backed to W.S.W."

WIND, FOG AND MIST APPROACHES TO TABLE BAY.

PREPARED IN THE MARINE DIVISION BY J. HENNESSY, SENIOR
NAUTICAL ASSISTANT.

THE following notes relate to the Wind, Fog and Mist roses covering the years 1921-1928 which are being published in the present volume of THE MARINE OBSERVER.

When examining these roses it must be remembered that no winds under force 8 are here considered as Gales and that both Fog and mist are combined.

The area covered by the roses lies in the 5° square between the parallels of 30° and 35° South and the meridians of 15° and 20° East. It embraces that portion of the South African Coast from Cape Agulhas northward to Schulpfontein Point.

Owing to the effect of ocean currents within this area the sea temperatures are very irregular throughout the year and they in turn influence the temperature of the air in a variable manner.

This fact was recognised by navigators in Sailing Ship days as is shown from the following remarks taken from the Meteorological Log of the Wooden Ship *Marlborough*, Captain HENRY TOYNBEE, under date 21st February, 1861.

"The extreme cold of the surface water on the Agulhas Bank, more especially on its western edge gives the material for some interesting research. By referring to the Weather Book of our outward passage it will be noticed that with one exception we experienced the coldest surface water in about Latitude 40° South and between the meridian of Greenwich and Longitude 14° East, there the temperature was nearly down to 47° and the current was easterly, but in Longitude 14° E. the temperature suddenly rose to 62°. This would lead one to suppose that a current to the N.E. originates here and runs parallel to the S.W. current coming down the Mozambique channel this is supported by the fact that on September 2nd, 1860, in Longitude 10° E. the current was to the North Eastward and on September 5th after having the sea water 67° for nearly 24 hours the current had been S.W. so that we may suppose South Africa to be (as it were) wrapt up in a cushion of cold water brought from the parallel of 40° South which most materially affects its climate; one cannot doubt that the low temperature of Table Bay is a great boon to Cape Town built as it is in the midst of the reflected and radiated heat of Table Mountain.

"This also accounts for the fogs brought into Table Bay by west winds one of which we experienced on the 21st instant. When about 12 miles to the Westward of Table Bay the surface temperature was 58°, the wind was westerly and there was a dense fog, but after proceeding about 35 miles to the W.N.W. the surface

water was 65.8°, here was a difference of nearly 8° in the temperature of the surface water and we had a corresponding decrease in the amount of fog. Hence we may conclude that because the sea far west of Table Bay is much warmer than that near the land and because the warm air over the sea is capable of holding a large quantity of water in suspension which it is obliged to give out when the west wind brings it in contact with the colder water, therefore fogs will come with west winds; experience proves this to be the case. As we sailed into the warmer water the fog lifted into streaky clouds."

In 1882, when Captain TOYNBEE was Marine Superintendent at the Meteorological Office, charts of the ocean districts adjacent to the Cape of Good Hope were compiled under his direction. These charts show that the Agulhas current brings a body of warm water from tropical regions down to the southward of the Agulhas Bank where it meets and intermingles with a current setting in a North Easterly direction, bringing cold water from Antarctic regions. From the position in which these two primary currents meet a warm current sets to the eastward and a cold current sets Northwestward.

Owing to the action of the S.E. trades which during the summer blow right down to the Cape, water is drawn away from the coast and replaced partly by the cold Northwesterly current and partly by the rising of cold bottom water to the surface, causing a marked strip of cold surface water to flow Northward along the South-west coast of Africa from the Cape to Mossamedes. This cold current sets strongly to the N.W. throughout the southern summer, but is not so pronounced during the southern winter when owing to the greater frequency of N.W. winds its flow is greatly retarded and may sometimes be reversed.

During summer (October to April) the lowering of the air temperature due to this strip of cold water setting up the coast is mainly responsible for the fogs experienced. These generally occur during calm or with North Westerly winds and are rarely experienced in the then prevailing South Easterly wind.

During winter (April to October) fogs are more frequent than in the summer months, but like the fogs of the latter season mainly occur during calm and with the then prevailing North Westerly winds. The fogs occurring with North Westerly winds are sea fogs and are generally very dense and may be experienced with a strong breeze blowing, while a large number of the fogs experienced in this season during calm are low drift fogs from the coast caused by the flow of chilled surface air from the surrounding high land.

FOG AT SEA—II.

PREPARED IN THE MARINE DIVISION BY E. W. BARLOW,
SENIOR PROFESSIONAL ASSISTANT.

In this article the detailed distribution of sea fog and its seasonal frequency over the oceans will be described so far as our available information allows. With the exception of some information relating to fog at oceanic islands, the present article will deal only with fog in the open oceans. We have seen that the formation of coastal fog and fog in narrow waters may be quite different from that of sea fog and the inclusion of such data would therefore tend to confuse the issue in addition to necessitating much more space. Information as to such local fog is available in Sailing Directions and other publications. The information in the present article is based mainly on the oceanic charts published by Great Britain and the United States, together with one or two special investigations that have been made. For the North Atlantic and North Pacific Oceans the article by W. E. HURD, previously referred to, has also been used. A general caution is, however, necessary. Almost all the data available is derived from

observations made before the introduction for international use of the visibility scale now in operation, in which the observation of fog, mist or conditions of good visibility depends upon the visibility of objects at definite distances. The scales of estimation previously in use were vague and it frequently happened that different observers gave inconsistent estimates, some describing an obscurity as fog while others called the same degree of obscurity mist, and so on. It is, therefore, necessary to accept the results with some reserve, particularly as regards the finer details. The broad outline of the distribution of fog over the oceans is probably substantially correct, but such differences as one or two per cent. of fog frequency between one area and another might well be fictitious. Unfortunately the introduction of the standard visibility scale has not entirely solved the problem of consistent observations at sea since objects at the requisite distance at any particular time are often lacking.

North Atlantic Ocean.

The area of maximum fog over the Grand Banks varies considerably in extent and also somewhat in position during the year. The following are the maximum percentages of days of fog in this region as given on the U.S. Pilot Charts:—30 to 35 per cent. in September to February inclusive, 40 to 45 per cent. in March, April and May, 60 to 65 per cent. in June, 50 to 55 per cent. in July and 40 to 45 per cent. in August. Practically no fog is experienced south of Latitude 40° N. except towards the American coast where the southernmost limit of oceanic fog for the year is a little to the south of Cape Hatteras in about Latitude 46° N. There is a definite concentration of fog in summer in the region immediately to the east of Cape Cod, to the south of Nova Scotia, where the maximum frequency of days of fog is 40 to 45 per cent. in May and June. After a decrease of foginess in July there is a secondary maximum in this region in August and September, with 30 to 35 per cent. of days.

March or April and August and September are the transition months between summer and winter conditions over the ocean as a whole, there being a moderate or considerable increase of fog during the two former months and a rapid decrease during the two latter months.

On the eastern half of the ocean there is a relatively foggy area extending from north of the Azores, in about Latitude 42° N. to the mouth of the English Channel. In January and February there are 10 to 15 per cent. of days in part of this region. In March it is more restricted ending at about Latitude 44° N., Longitude 22° W. In May, over the same restricted area, the percentage rises to 10 to 20 and in June, as far as Latitude 47° N., Longitude 16° W., there are 20 to 25 per cent. of days of fog. In July there is as much as 20 per cent. of days only at the mouth of the English and Saint George's Channels. The area extending to the Azores is well-developed again in October, when 20 to 25 per cent. of days of fog are experienced between Longitudes 17° W. and 25° W., and to a lesser extent also in November and December. For the approaches to home waters, Latitude 48° N. to 52° N., Longitude 5° W. to 10° W., the monthly roses for the period 1921 to 1928 being published in the

present volume of THE MARINE OBSERVER and the note therein in the May number show that the fog reaches its maximum in this region in May, July and October, with 12.1, 10.6 and 11.8 per cent. of observations respectively.

Some degree of fog is experienced over nearly all the North Atlantic Ocean north of Latitude 40° N. throughout the year. A small region centred in about Latitude 53° N., Longitude 33° W. shows a frequency of from 10 to 15 per cent. of days in the months of February and April.

In THE MARINE OBSERVER, Volume IV, 1927, monthly charts of fog and mist were published for the North Atlantic Ocean between Latitude 30° N. and 60° N., derived from the Hollerith cards for the period 1921 to 1925. Fog south of Latitude 40° N. is shown only in three isolated five-degree squares in the western part of the ocean, one in each of the three months April, May and June, the highest percentage of observation of fog shown being 2.9 in April for the square Latitude 30° N. to 35° N., Longitude 55° W. to 60° W. The highest percentage of fog shown on these charts in the Grand Banks region is 46.0 in June. These results must be accepted with reserve on account of the short period. In any case it should be noted that the figures for the same area would not be the same as those quoted above derived from the U.S. pilot charts, for the latter refer to percentage of days of fog while those now under consideration are percentages of fog noted at all observations.

The percentage of observations of fog rises to 20 between Iceland and Norway in the spring and summer, falling to 10 in the autumn and winter. The North Sea as a whole has more summer than winter fog, except in the extreme south where fogs of the winter land type prevail.

South Atlantic Ocean.

The results given below, together with Figures 1 and 2, are taken from an investigation carried out in the Meteorological Office, using ships' observations from 1855 to 1899. The figures show the distribution of fog for the months of April and November. The upper figure in each subsquare gives the percentage of fog, the lower figure

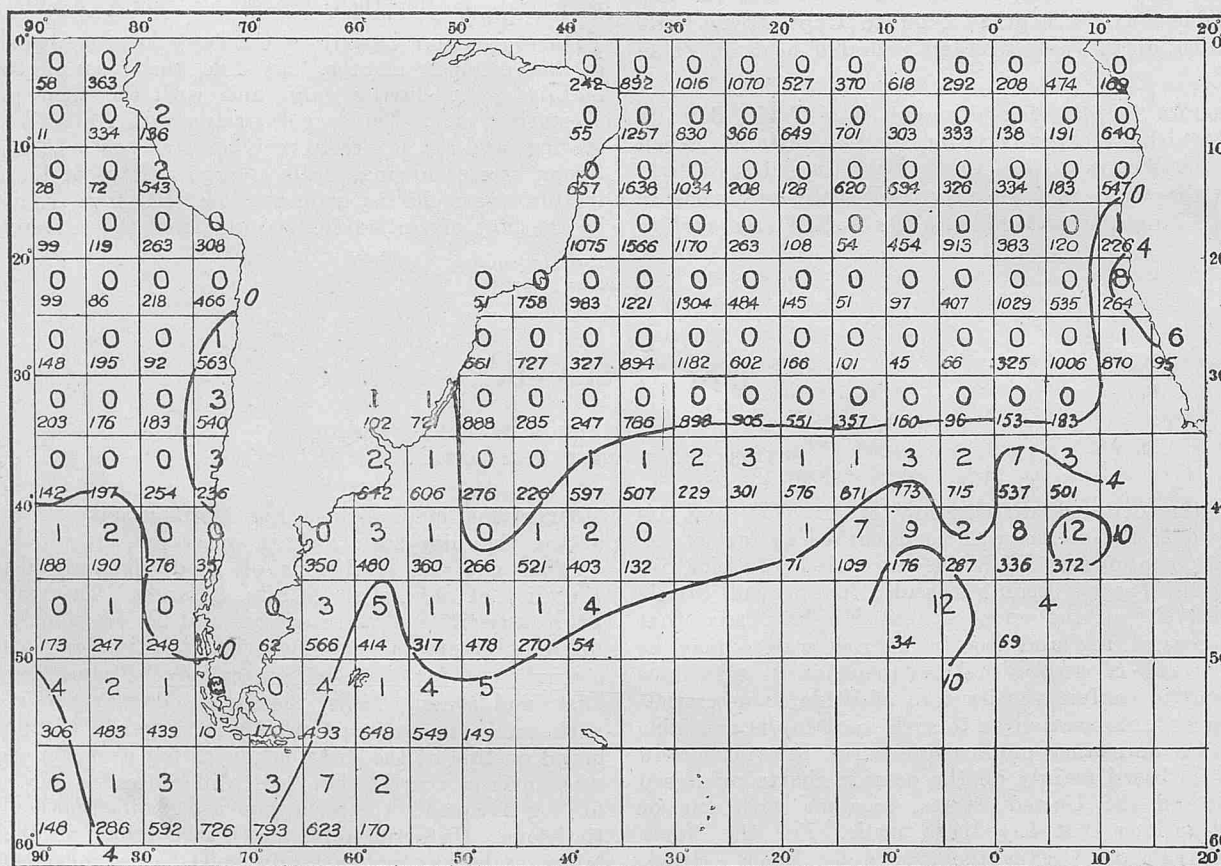


Figure 1. Fog Frequency. S. Atlantic Ocean—April.

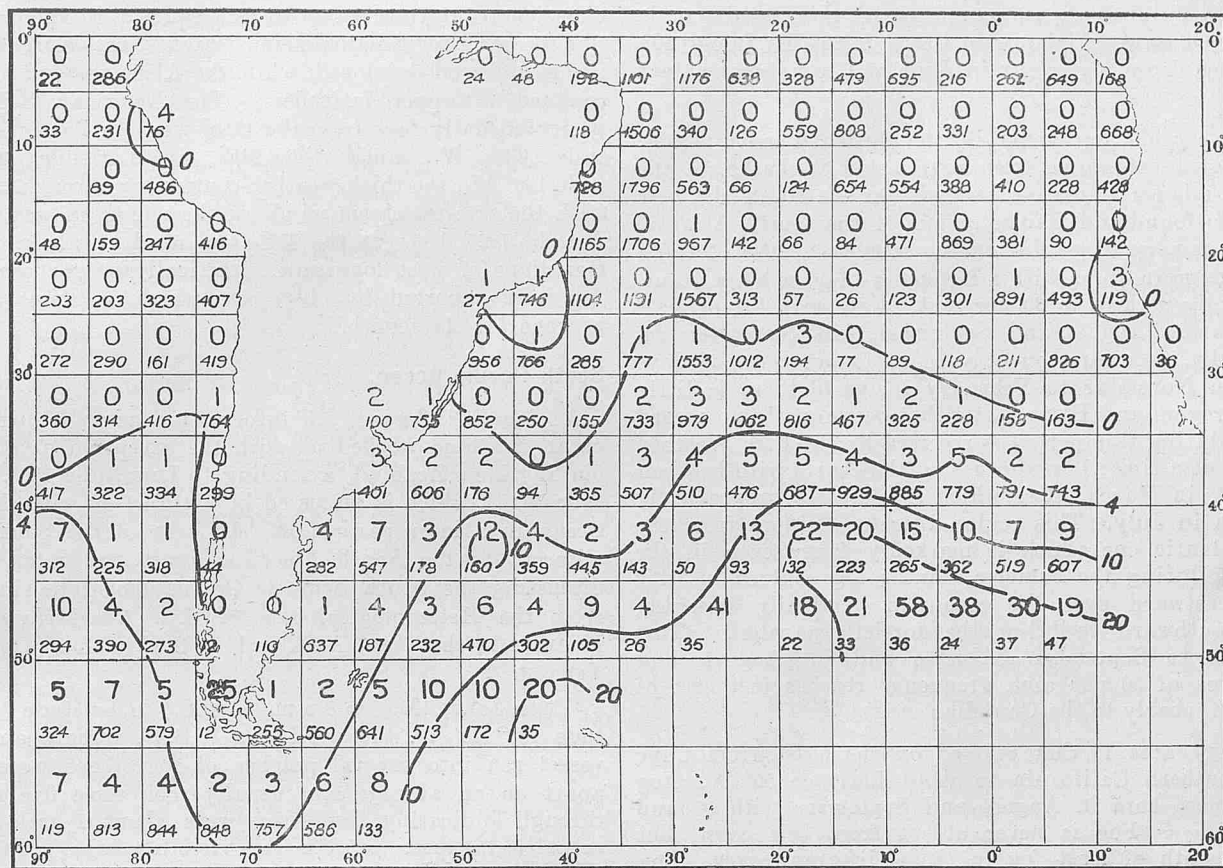


Fig. 2. Fog Frequency. S. Atlantic Ocean—November.

is the total number of observations. April and May are the least foggy months in the open ocean, November and December the most foggy. It is hoped to publish the complete series of twelve charts in *THE MARINE OBSERVER* for 1931. Only one or two isolated observations of fog in the open ocean were received for the period 1855 to 1899 between the equator and 15° South Latitude and in comparison with the large number of observations falling monthly within the Marsden square the percentage of fog observation is nil. Similar remarks apply also to the open ocean between 15° and 30° South Latitude for ten months of the year, but during the spring month of November and the summer month of December the occurrence of fog reaches one per cent. in isolated areas, and in one case three per cent.

The lines of equal fogginess show considerable irregularities and, as stated in the introduction, must not be accepted as necessarily exactly true. It is, however, possible from the general run of the lines to make the following interesting generalisation. In the neighbourhood of the projecting and relatively narrow land masses of Southern South America and Southern Africa, sea fog, in latitudes south of 30° South is less than in the open ocean. The lines of equal fogginess, broadly speaking, run southward on each side of the ocean leaving the most foggy areas in the form of a more or less rounded tongue in the open ocean projecting northwards from the Southern Ocean. It should be noted that the apex of this tongue is not in mid-ocean but lies towards the eastern side of the ocean, being centred in approximately Longitude 0° to 20° W. during the whole year. The line of 20 per cent. of fog moves northward during the foggy months, nearly reaching the parallel of 40° in the longitudes mentioned, and retreats southward in the least foggy months. It does not appear at all within the limits of the charts for the months of March, April, May and June. Isolated patches of relatively high fog frequency occur in some months on or near the coasts, while the general effect of the coasts is to extend the area of small fog frequencies northward. Thus while the lines of 4 per cent. and 10 per cent. of fog trend southwards towards the coast, as above stated, the boundary line of 0 per cent. in general curves northward towards the coast on both sides of the ocean.

If we compare these fog charts with the mean sea surface temperature charts, published monthly in *THE MARINE OBSERVER*, Volume IV, 1927, we see that there is a northward intrusion of relatively cold water during the most foggy months of November and December and also that the water is coldest on the eastward side of mid-ocean. Corresponding therefore to the northward projecting tongue of fog during these months is a northward intrusion of colder water. Similarly, if we examine the temperature charts for the least foggy months of April and May we see that to find mean sea temperature less than 50° F. we have to look several degrees of latitude further south, although there is still a tendency for the water to be cooler on the eastward side of mid-ocean. The relatively cold sea temperature in this area, which is evidently associated with water coming up from the eastward-flowing Southern Ocean Drift, coupled with the fact that air temperature is higher in the summer months, are sufficient to account for the fog. There is indeed a general similarity between the trend of the isotherms in all months and the trend of the lines of equal fog, both turning southward as the coastal districts on either side of the ocean are approached. The northward trend of fog frequencies of between 0 and 4 per cent. near the coasts, referred to above, is also paralleled in many cases by the isotherms of higher sea temperature in the same regions and this fog near the coast is associated with the cool coastal currents, the Falkland Current on the west side of the Ocean and the Benguela Current on the east side.

A small area of the Eastern South Pacific Ocean is also shown on these charts. During most months of the year the general run of the 0 and 4 per cent. lines of fog is similar to that on the eastern side of the South Atlantic Ocean, the 0 per cent. line usually trending northwards and the 4 per cent. line southward as the coast is approached. Isolated areas of fog also appear on both the American and African coast in some months.

North Pacific Ocean.

Broadly speaking the ocean north of Latitude 30° N. is subject to fog at certain seasons. Fog is not usually experienced by vessels after entering the N.E. Trade Wind area, but sometimes when the Trades are temporarily displaced by intruding depressions occasional

local fog banks may be met. An exception to this statement is constituted by the Ogasawara Islands in Latitude 28° N., Longitude 142° E., where some dense fogs occur in June and to a lesser extent in July.

There are two notable fog areas in the North Pacific Ocean. The first is the area extending from south of Kamchatka to the western Aleutian Islands which corresponds, as stated in the first article, to the Newfoundland Banks region of the North Atlantic Ocean. This area is very foggy during the summer months, the fog reaching its maximum in June, with a frequency of 40 to 50 per cent. of days, and in July with 55 to 60 per cent. Extensive fog persists in this region during August and September, but thereafter decreases very rapidly, occurring on only 10 to 15 per cent. of days in October. From November to February inclusive there is little or no fog in this region and HURD states that occasionally no record of its occurrence during this period is received by the U.S. Weather Bureau for weeks at a time; it reappears on the charts with between 5 and 10 per cent. in March, after which it increases progressively till the maximum in July. This region therefore differs from the corresponding Atlantic one which is markedly foggy even in the winter months. During the summer months fog centred on this region extends eastward over the ocean in gradually lessening frequency and southward to below the fortieth parallel. This occurs from June to September inclusive and in August and September the area of 30 per cent. frequency reaches just east of Longitude 140° W., nearly to the Canadian coast.

The second foggy area is that centred on the coast from Cape San Lucas in Southern California to about Latitude 50° N. Fog reaches its maximum here in August and September with 30 and 40 per cent. of days. Fog is never absent from this coast, but January is the month of least fog in the Californian area. Fog centred on the region described is by no means only coastal; it may extend seaward from 50 miles to a few hundred miles or in some months half-way or even right across the ocean. Thus in March the whole system of lines of equal fog, as far west as the Kamchatka area, is centred on the American coast. During this month fog frequency increases progressively across the ocean from 5 per cent. south of Kamchatka to 15 to 20 per cent. in the eastern half of the ocean. In all months the belt of fog off the Southern Californian coast south of Latitude 30° N., absent only in January, is a very narrow one. From November to January the ocean is freest from fog which is then confined to the eastern half. In January neither the Kamchatka nor the American coast fog areas are in evidence and fog is confined to the north-eastern part of the ocean. Here 15 to 20 per cent. of days of fog are experienced north-eastward of a line running from the Aleutian Islands to about Latitude 27° N. in Longitude 130° to 140° W. but not affecting the coast south of Vancouver. In April the largest fog area, 15 to 20 per cent. of days, is mid-ocean and from May to September the two main fog areas join across the ocean, giving relatively high fog frequencies everywhere north of Latitude 30° N.

The following instances of extensive fog are quoted by HURD:—

"The American S.S. *West Chopaka*, sailing from Japan to San Francisco in July, 1925, experienced fog from the 19th, when in Latitude $46^{\circ} 30'$ N., Longitude $149^{\circ} 38'$ E., until the 28th, in Latitude $46^{\circ} 29'$ N., Longitude $146^{\circ} 01'$ W. Quotation is made from the weather report of the American S.S. *President Madison*, covering the 13th to 22nd of August, 1924: 'We had overcast weather every day between Seattle and Yokohama. About every afternoon the sky cleared up, though thick fog banks were seen passing. At night we had plenty of misty and drizzly weather. Generally from 5 to 8 a.m. the sky cleared, and then set in again overcast, with fog, mist, and rain.' On the 16th of the same month the *Bear* left Bering Sea bound for San Francisco. During the next four days, according to the observer, 'from Unalaska to about Latitude 48° N., Longitude 143° W., continuous fog and mist encountered, clearing about ship at intervals, yet always present in some direction in the immediate vicinity, rolling along in sheets.'

"In January, 1927, during which month 15 days with fog occurred at San Francisco, the amount of fog observed east of the 180th meridian, between the 30th and 55th parallels, was equal to that

experienced at times of greatest frequency in summer. Throughout this month the North Pacific 'high' was more than ordinarily stable and well developed, while the Aleutian 'low' was principally confined to upper latitudes. The American S.S. *Eldridge* experienced daily fogs from the 17th, when in Latitude 50° N., Longitude 175° W., until the 24th, in Latitude 49° N., Longitude 130° W., the thick weather continuing through the 19th, the day with the severest storm winds of the month in west longitudes. In March, 1925, between the 45th and 52nd parallels, 170th and 140th meridians of west longitude, practically 60 per cent. of days with fog were reported by observers, which is about four times the average for the month."

South Pacific Ocean.

As far as is known, no information as to fog frequency in this ocean has been worked up with the exception of a small area, including New Zealand, extending to Longitude 180° , South of Latitude 30° S. which is discussed in conjunction with the South Indian Ocean in a later paragraph. An area of the South Pacific Ocean adjacent to the South American coast was referred to above in discussing the South Atlantic Ocean. The following is an extract from the Meteorological Log of S.S. *Cumberland*, Captain D. MACMILLAN, between Auckland and Panama. Observer Mr. H. VERNON.

"20th June, 1929, at 8 a.m. (A.T.S.) in Latitude $35^{\circ} 52'$ S., Longitude $165^{\circ} 45'$ W. the wind was W.S.W. force 3 and veering. The vessel ran into several patches of fog, these were about 2 miles apart on an average and usually took some five minutes to pass through indicating that they were about 1 mile wide. Whilst actually in these patches the visibility was reduced to about 1 (Visibility Scale), at 9.30 we cleared the fog patches by which time the wind had veered to W.N.W. At noon there was a very slight mist, just enough to make the horizon indistinct. A note in the log for the afternoon watch reads, 'Misty banks to Northward and Westward.' Again on the 2nd September when homeward bound on the same track (Auckland to Panama) in Latitude $35^{\circ} 35'$ S., Longitude $164^{\circ} 59'$ W. at 8 p.m. A.T.S. the vessel ran into thick fog which lasted until 11.30 p.m. During the forenoon there had been drizzling rain and poor visibility and during the afternoon and dog watches there was poor visibility. At midnight the fog developed into small banks with clear intervals between. The middle watch for 3rd September reads 'Foggy throughout, frequent thick banks.' The morning watch records, 'Occasional misty patches.' We were not finally clear of the fog until 8 a.m. 3rd September in Latitude $35^{\circ} 14'$ S., Longitude $162^{\circ} 19'$ W. It will be noticed that these positions are not very far apart although there are something over 2 months between the observations. At 10 a.m. 20th June the meteorological readings were, Wind W.N.W. force 3, corrected barometer 1005.5 mb. Dry Bulb 61.1° , Wet Bulb 60.3° , clouds A-St and St 6, bc, sea W.N.W. 2., swell rough N.W., sea temperature 61° . At midnight 2nd September the wind was calm, corrected barometer 988.0 mb. Dry Bulb 56.0° , Wet Bulb 55.8° . Fog, smooth sea and heavy N.E. swell, sea temperature 55° . At 4 a.m. 3rd September the wind was W.N.W. force 3 and the other readings much the same. Captain MACMILLAN has very often made this passage and never remembers encountering fog in this locality previous to this voyage."

Indian Ocean.

The North Indian Ocean lies too near the equator for any appreciable development of oceanic fog, and the same applies to the South Indian Ocean as far as about Latitude 30° S. where little or no fog is experienced in any month of the year. The remarks which follow therefore refer to the South Indian Ocean between Latitude 30° S. and 51° S. Two main sources of information are available for this region, "Meteorological Charts of the Southern Ocean between the Cape of Good Hope and New Zealand" published by the Meteorological Office, 3rd Edition, 1917 and the U.S. Pilot Charts of the Indian Ocean. These sources are in good general agreement as to the distribution of fog, and also with regard to the prevalence of local foggy areas in individual months. The Meteorological Charts of the Southern Ocean are based on observations from 1855 to 1899 and give the percentage of fog for each

month for each area of ten degrees of longitude by three degrees of latitude. They also extend into the South Pacific Ocean as far as Longitude 180°, and in various longitudes extend below Latitude 51° S., occasionally as far as Latitude 57° S. The percentage figures from these charts have been used in making the tables given below.

Generally speaking the mean frequency of fog increases with latitude south of 30° S., as in the South Atlantic Ocean, but this is not invariably true for all longitudes. Thus in almost any month it is possible to find on the charts cases of less foggy squares lying immediate to the south of more foggy squares. Even south of Latitude 51° S. such instances occasionally occur. Between Latitudes 39° S. and 51° S., the western part of the Ocean, from Longitude 10° E. to 90° E. is decidedly more foggy than the eastern part, from Longitude 90° E. to 180° E. South of Latitude 51° S. fog increases in the eastern part, but the information is only partial and is even less complete in the western part so that comparison cannot be made. So far as information is available, January, August and October are the most foggy, and May and September the least foggy, months in the region of Latitudes 51° S. to 57° S., Longitude 150° E. to 180° E.

In the western part fog increases fairly rapidly in general between Latitudes 40° S., and 50° S. Though fog occurs in all longitudes at some time of the year it is most prevalent between Longitudes 30° E. and 60° E., including Prince Edward and the Crozet Islands. The months of least fog are March, April, June, August and September. The most foggy area shown on the charts is Latitude 48° S. to 51° S., Longitude 10° E. to 20° E. in November where fog occurs at 50 per cent. of the observations.

The northern limit of fog is an irregular line lying in most months mainly between Latitudes 30° S. and 40° S., but is on the whole more southerly in the eastern part of the ocean and in certain longitudes in the latter half of the year reaches Latitude 45° S. or below. The following tables have been compiled to summarise the more important fog information shown on the Charts of the Southern Ocean.

TABLE 1.—Areas in the Southern Ocean South of Latitude 30° S. between Longitude 90° E. and 180° E., in which the Mean Percentage of Observations of Fog equals or exceeds 10.

N.B.—In two cases an area is given which extends from Longitude 80° E. to avoid division.

Latitude 48° S. to 51° S.			Latitude 45° S. to 48° S.		
Month.	Longitude E.	Highest Percentage shown on Charts.	Month.	Longitude E.	Highest Percentage shown on Charts.
Jan.	...	—			
Feb.	...	80°–110°			29
"	...	140°–150°			13
"	...	170°–180°			10
Mar.	...	140°–160°			11
April	...	160°–170°			10
May	...	80°–100°	May	...	100°–110°
June	...	100°–120°			30
"	...	170°–180°	"	...	120°–130°
July	...	150°–160°	"	...	170°–180°
Aug.	...	100°–110°	July	...	170°–180°
"	...	140°–150°			11
Sept.	...	170°–180°			
Oct.	...	100°–110°			
"	...	140°–150°			
Nov.	...	90°–120°	Nov.	...	170°–180°
"	...	140°–150°			12
"	...	170°–180°			
Dec.	...	120°–130°			
"	...	160°–170°			

NOTE.—Latitude 39° S. to 42° S., Longitude 90° E. to 100° E., has 12 per cent. of fog in February.

In Table 2, to avoid making it too long and complex, the limit has been taken as 20 per cent., as against 10 per cent. for the eastern part of the Ocean in Table 1.

TABLE 2.—Areas in the Southern Ocean South of Latitude 30° S. between Longitude 10° E. and 90° E. in which the Mean Percentage of Observations of Fog equals or exceeds 20.

Latitude 48° S. to 51° S.			Latitude 45° S. to 48° S.		
Month.	Longitude E.	Highest Percentage shown on Charts.	Month.	Longitude E.	Highest Percentage shown on Charts.
Jan.	...	40°–60°			
Feb.	...	50°–60°	Feb.	...	40°–50°
"	...	80°–90°			27
Mar.	...	—			
Apr.	...	—	Apr.	...	40°–50°
May	...	30°–40°	May	...	40°–50°
"	...	50°–70°			20
June	...	—	June	...	40°–50°
July	...	50°–60°	July	...	40°–60°
Aug.	...	—			21
Sept.	...	—			24
Oct.	...	30°–40°			
Nov.	...	10°–20°			
Dec.	...	20°–30°	Dec.	...	60°–70°
		22			20

NOTE.—Latitude 51° S. to 54° S., Longitude 50° E. to 70° E., has as its highest mean value 39 per cent. in January and the same latitude, Longitude 60° E. to 70° E. has 20 per cent. in December.

China Seas.

During the late autumn and winter when the great Asiatic high-pressure system is in existence there is little fog formation in the South China Sea and its coastal districts. Fog occurs mainly in the months of March and April during the transition period between the N.E. Monsoon and the warm moist S.W. Monsoon. Thus about 40 per cent. of the average of 37 foggy days in the year at Hong Kong occur in these two months. By June the temperature of the sea and air is nearly equal and there is little fog. The spring fogs of the South China Sea are mainly coastal and are rarely, if ever, encountered as much as 100 miles from the shore. Further south off the coast of Annam fog is more prevalent in the winter than in the spring and occurs also during the rainy season, from May to September.

On the back of the later editions of the Monthly Meteorological Charts of the East Indian Seas frequencies of various kinds of weather are given for each five-degree square on charts of the South China Sea. There is, however, no fog information for the greater part of the region. The area of Latitude 20° N. to 25° N., Longitude 115° E. to 120° E., between Hong Kong and Formosa, shows a maximum of 8 days in April, while the more northerly area to the north of Formosa shows a maximum of 13 days in May. Further northward the maximum of fog generally speaking occurs later with increasing north latitude until the summer maximum of the general North Pacific Ocean is reached. Thus in Chosen (Korea) the maximum occurs during June and July and at the Japanese island of Nemuro in June, July and August.

Fog at Oceanic Islands in the Southern Hemisphere.

Table 3 is reproduced in a slightly modified form from Sir NAPIER SHAW'S "Manual of Meteorology," Volume II.

TABLE 3.—FOG AT OCEANIC ISLANDS, SOUTHERN HEMISPHERE.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Days of Fog.													
Easter Island ...	0	0	0	0.5	3	1	1	0.3	0.3	0.3	0	0	6.4
Tonga Islands...	2	1.5	1.5	0	0	0	0	0	0	0	0	0	5
Kerguelen ...	0	0	—	—	0	1	2	—	—	—	0	0	—
S. Georgia ...	3	3	4	3	3	1.5	2	0.9	2	2	1	3	30
Laurie Island,	13	16	27	17	24	26	26	26	21	22	23	14	255
S. Orkneys (includes mist and fog).													
New Year Island	5	2	2	4	2	5	1	0	2	2	2	4	31
Hours of Fog.													
S. Orkneys ...	184	139	50	100	197	192	201	228	174	156	97	155	1,874
Percentage of Observations every four hours from ships.													
St. Pauls Island, Indian Ocean.	11	0	2	4	6	4	1	0	1	2	3	11	4

The Relation of Wind Direction to Fog.

Very little investigation has as yet been done on the subject of the relation of fog to that of winds from different directions. We have seen, however, that it is estimated that approximately four-fifths of all sea fog is caused by the blowing of relatively warm air over relatively cold water, and it therefore seems probable that there is no special significance in the relation of wind direction with fog. The wind direction associated with most fog should be that from which the warmest moist winds blow and such a direction is in general a fixed one for any given locality and month. In some areas there may, however, be more than one direction from which a wind sufficiently warm to produce fog blows. The Grand Banks of Newfoundland illustrates this point. In summer this area is surrounded on three sides by land and sea of relatively high temperature and any wind not from some northerly direction will therefore tend to produce fog.

Wind, Fog and Mist Roses for the S.W. Approaches to Home Waters are being published monthly in the present volume of THE MARINE OBSERVER. In the accompanying note published in THE MARINE OBSERVER for May, 1930, a graph is given showing the monthly percentage frequency of gales and of fog and mist. An excess of fog and mist is shown during the months of May, July and October. That of May and July is associated with winds from all points of the compass, but approximately half the fog occurs with the warmer winds between S. and W. N.W. winds are also favourable to fog in both months and in addition S.E. winds in July. The

fog of October is mainly due to anticyclonic conditions with the spreading of autumn land fog seawards. Similar roses for the Approaches to Table Bay are also being published monthly in the present volume of THE MARINE OBSERVER and a note will be found on page 149 of the present number.

In a paper by the Deutsche Seewarte published in 1904 the results of an investigation of the frequency of fog with winds of different directions are given and Table 4 is taken from this source.

TABLE 4.—FREQUENCY OF FOG WITH DIFFERENT WIND DIRECTIONS. NORTH ATLANTIC OCEAN BETWEEN LATITUDES 40° N. AND 50° N.

MONTH.	WIND DIRECTION.								
	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
FOG FREQUENCY IN PERCENTAGES.									
January ...	3.6	2.8	4.4	7.4	23.1	28.7	17.4	6.2	6.4
April ...	7.6	6.2	9.3	12.5	18.1	20.4	12.2	8.4	5.3
July ...	3.6	2.7	3.2	5.5	17.2	31.2	23.5	6.6	6.5
October ...	5.6	7.1	7.7	11.7	19.9	18.6	14.0	6.5	8.9
Year ...	4.6	4.1	5.0	7.9	18.1	27.2	19.5	7.0	6.6
WIND DIRECTION IN PERCENTAGES.									
January ...	9.9	5.4	4.8	6.4	12.3	18.4	22.5	18.8	1.5
April ...	10.0	7.3	8.7	11.0	13.6	15.7	17.4	14.2	2.1
July ...	8.8	6.9	4.7	5.7	14.3	23.8	20.7	11.9	3.2
October ...	13.5	7.9	7.0	7.5	12.1	14.9	17.0	17.8	2.3
Year ...	10.5	6.9	6.3	7.6	13.1	18.2	19.4	15.7	2.3

This table brings out the predominance of the warmer winds, S., S.W. and W., in producing fog in the North Atlantic Ocean. For this purpose we not only note the higher fog percentages against those winds in the upper part of the table, but we compare the fog figures with the corresponding wind direction percentages in the lower part of the table. For example in January 12.3 per cent. of winds blow from S. and 23.1 per cent. of fog occurs with S. wind. Therefore the S. wind is very nearly twice as foggy as it would be if fog were associated equally with winds from all directions. Similarly in January there are 9.9 per cent. of N. wind and only 3.6 per cent. of fog occurring with N. wind, showing that wind from this direction is considerably less than half as foggy as it would be if fog were associated equally with winds from all directions.

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

I.—SHIPS' WIRELESS WEATHER SIGNALS.

No. 73, MARINE OBSERVER, the list below gives information of those stations which have been detailed, up to the time of going to press, to receive on C.W., reports from **A Selected Ships**, and Chart VIII herewith illustrates this, also spark stations which may intercept reports from **B Selected Ships**, addressed to **CQ**.

Request for Information.

THE ATTENTION OF METEOROLOGICAL SERVICES IS INVITED TO THE INVITATION GIVEN ON PAGE 14 OF VOL. VII, No. 73, JANUARY
MARINE OBSERVER.

[illegible]

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, page 27, Vol. VII, No. 73.

For full particulars of Selected Ships Routine Meteorological Reports with Schedule for Communication, see pages 22 to 24, Vol. VII, No. 73.

See List of W/T Stations detailed to receive reports from **A Selected Ships** with particulars up to date in this number.

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 24, Vol. VII, No. 73 (January, 1930, MARINE OBSERVER).

B Selected Ships when within range of stations ringed in on Chart VIII, in making their reports to **CQ** should make special endeavour to ensure that the report is received, at these shore stations.

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 and owned, in accordance with the agreed upon International plan for all parts of the World.

II.—WIRELESS WEATHER SIGNALS.

WIRELESS WEATHER BULLETINS.

China Sea.

The method of decoding station weather reports made in code from shore stations intended for shipping was described in the British "Weather Shipping" Bulletin, on page 52 of Volume VII, No. 74. (The February, 1930 Number.)

French Indo-China.

Spark Issues.

Mitho W/T Station, approximate Latitude $10^{\circ} 21' N.$, Longitude $106^{\circ} 22' E.$, call sign **HVM**, broadcasts weather bulletins at 0300 and 1330 G.M.T. on a wavelength of 600 metres, as follows:—

0300 G.M.T. Bulletin.

This bulletin commences with the words "Obs. 6 heures" and contains 2300 G.M.T. observations taken at the following stations:—

Fu Lien	...	Latitude $20^{\circ} 49' N.$	Longitude $106^{\circ} 47' E.$	(approx.)
Tourane	...	" $16^{\circ} 07' N.$	" $108^{\circ} 13' E.$	"
Cape St. James	...	" $10^{\circ} 20' N.$	" $107^{\circ} 05' E.$	"
Fort Bayard	...	" $21^{\circ} 13' N.$	" $114^{\circ} 16' E.$	"

Form of bulletin. One seven-figure group for each station is broadcast in the order given above. The group for Fort Bayard has six figures only.*

1330 G.M.T. Bulletin.

This bulletin is broadcast *en clair* and gives a summary of 0900 G.M.T. observations taken at Indo-China stations and 0700 G.M.T. weather conditions at Hong Kong. The observations of each station are broadcast in the following order:—

Barometric pressure, barometric tendency during the preceding 24 hours, wind direction and force (Beaufort), state of the sky, temperature and state of the sea.

The same method of decoding weather reports applies in all cases where the International Ships' Wireless Weather Telegraphy Code is used having regard to the Key figures given in each case where they differ from the British Weather Shipping Bulletin.

NOTE.—It has been said that there is a "Zone of silence" along the Anam Coast, between Padaran and Varella Point which renders the reception of W/T signals from Mitho W/T Station difficult.

Hong Kong.

C.W. and Spark Issues.

Cape d'Aguilar W/T Station, Latitude $22^{\circ} 13' N.$, Longitude $114^{\circ} 15' E.$, call sign **VPS**, broadcasts weather bulletins containing observations from various stations in the Far East at 0400, and 1200 G.M.T. on a wavelength of 600 metres, repeated at 0500 G.M.T. on 2913 m. C.W. and at 1300 G.M.T. on 2913 m. C.W., after Time Signal.

The observation stations included in these broadcasts, together with the hours at which the observations are taken are given in the lists below:—

As it has not been found possible to secure complete synchronisation, the barometer readings broadcast at 0400 G.M.T., will be reduced approximately to 2200 G.M.T. and those broadcast at 1200 G.M.T. to 0600 G.M.T.

* No information is available up to time of going to press as to changes of Key Letters or Code, following the Conference of Safety of Life at Sea, 1929, and the International Meteorological Conference at Copenhagen, 1929.

0400 G.M.T. Bulletin.

Index Letters.	Station.	Position (approximate).		Time of observation (G.M.T.).
		Latitude.	Longitude.	
NG	Nagasaki ...	32° 45' N.	129° 53' E.	2100
OS	Oshima ...	—	—	2100
NA	Naha ...	26° 13' N.	127° 41' E.	2100
IS	Ishigakijima ...	24° 20' N.	124° 10' E.	2100
IC	Ichang ...	30° 42' N.	111° 16' E.	2200
HW	Hankow ...	30° 35' N.	114° 18' E.	2200
KK	Kiu Kiang ...	29° 44' N.	115° 59' E.	2200
SH	Shanghai ...	31° 15' N.	121° 30' E.	2200
SP	Sharp Peak ...	25° 59' N.	119° 27' E.	2300
AM	Amoy ...	24° 27' N.	118° 04' E.	2200
SW	Swatow ...	23° 23' N.	116° 42' E.	2200
TK	Taihoku ...	25° 02' N.	121° 31' E.	2100
KH	Koshun ...	—	—	2100
PD	Pescadores ...	23° 30' N.	119° 30' E.	2100
HK	Hong Kong ...	22° 18' N.	114° 10' E.	2200
PR	Pratas Island ...	20° 42' N.	116° 43' E.	2200
PL	Phulien ...	20° 49' N.	106° 47' E.	2300
TR	Tourane ...	16° 07' N.	108° 13' E.	2300
CJ	Cape St. James ...	10° 20' N.	107° 05' E.	2300
BS	Basco ...	20° 26' N.	121° 58' E.	2200
AP	Aparri ...	18° 31' N.	122° 07' E.	2200
MN	Manila ...	14° 35' N.	120° 59' E.	2200
LG	Legaspi ...	13° 10' N.	123° 45' E.	2200
TC	Tacloban ...	11° 15' N.	125° 00' E.	2200
IL	Iloilo ...	10° 42' N.	122° 34' E.	2200
SU	Surigao ...	9° 48' N.	125° 29' E.	2200

Form of message. One group containing 12 figures is broadcast for each of the stations given in the list.*

1200 G.M.T. Bulletin.

Index Letters.	Station.	Position (approximate).		Time of observation (G.M.T.).
		Latitude.	Longitude.	
SH	Shanghai ...	31° 15' N.	121° 30' E.	0600
SP	Sharp Peak ...	25° 59' N.	119° 27' E.	0600
AM	Amoy ...	24° 27' N.	118° 04' E.	0600
SW	Swatow ...	23° 23' N.	116° 42' E.	0600
TK	Taihoku ...	25° 02' N.	121° 31' E.	0300
KH	Koshun ...	—	—	0300
PD	Pescadores ...	23° 30' N.	119° 30' E.	0300
HK	Hong Kong ...	22° 13' N.	114° 16' E.	0600
PR	Pratas Island ...	20° 42' N.	116° 43' E.	0600
PL	Phulien ...	20° 49' N.	106° 47' E.	0700
TR	Tourane ...	16° 07' N.	108° 13' E.	0700
CJ	Cape St. James ...	10° 20' N.	107° 05' E.	0700
BS	Basco ...	20° 26' N.	121° 58' E.	0600
AP	Aparri ...	18° 31' N.	122° 07' E.	0600
MN	Manila ...	14° 35' N.	120° 59' E.	0600
LG	Legaspi ...	13° 10' N.	123° 45' E.	0600
TC	Tacloban ...	11° 15' N.	125° 00' E.	0600
IL	Iloilo ...	10° 42' N.	122° 34' E.	0600
SU	Surigao ...	9° 48' N.	125° 29' E.	0600

Form of message. Same form as 0400 G.M.T. Bulletin.*

A weather report and forecast follow the stations' reports.

Wireless Telephony, R/T Issues.

Victoria Peak, W/T Station, approximate Latitude 22° 17' N., Longitude 114° 09' E., call sign **ZBW**, broadcasts by word of mouth weather reports and forecasts at 0548 and 1148 G.M.T. on 350 m. (R.T.).

* No information is available up to time of going to press as to changes of Key Letters or Code, following the Conference of Safety of Life at Sea, 1929, and the International Meteorological Conference at Copenhagen, 1929.

China.

Pratas Island.

Spark and C.W. Issues.

Pratas Island W/T Station, approximately Latitude 20° 42' N., Longitude 116° 43' E., call sign **XPI**, broadcasts a daily weather report and forecasts based upon observations from about 90 stations in the Far East at:—

0600 G.M.T. (based upon 2200 G.M.T. observations) wavelength 600m. (spk.).

1100 G.M.T. („ „ 0600 „ „) wavelength 600m. (spk.).

Repeated at 0610 and 1110 G.M.T. respectively, on a wavelength of 1450m. (C.W.).

The weather report and forecasts are broadcast *en clair* in English and are preceded by QST QST QST de XPI XPI XPI. The message is broadcast twice and contains the following information:—

Part I. Particulars regarding general atmospheric pressure distribution including the location of high and low pressure areas.

Part II. Location and expected direction of movement of depression, or typhoon, affecting the China Sea, Eastern Sea, Yellow Sea, Japan Sea (including the Pacific Ocean to the eastward) or S.E. of the Philippine Islands extending northward from Guam and adjacent islands to Northern Japan.

Part III. Wind and weather forecast for Formosa Channel, China Sea and neighbouring areas.

Part IV. Wind direction and force, and state of the weather at Pratas Island.

Weather reports are also transmitted on request free of charge.

Shanghai.

C.W. and I.C.W. Issues.

Shanghai W/T Station, approximate Latitude 31° 12' N., Longitude 121° 26' E., call sign **FFZ**, broadcasts weather bulletins *en clair*, in French and English, for China and the China Seas, on a wavelength of 650 metres (I.C.W.), repeated immediately on 1500 metres (I.C.W.), at:—

0300 G.M.T., after Time Signal, containing observations made at 0100 G.M.T.

0900 G.M.T., after Time Signal, containing observations made at 0700 G.M.T.

1400 and 1800 G.M.T., containing observations made at 1200 G.M.T.

NOTE.—Owing to the alleged existence of “zones of silence” along the China Coast which apparently make reception of W/T messages difficult from Shanghai W/T station, meteorological observations will be broadcast at 0945 G.M.T. and the 0900 G.M.T. weather bulletin and storm warning will also be broadcast on a short wavelength of 28.5 metres at 1130 G.M.T. preceded by the general call and the call sign of **Shanghai W/T Station FFZ**.

These zones are said to be as follows:—

In the centre of Formosa Strait up to the Foochow Coast.

In the Gulf of Pechili behind Shantung Promontory, and

In the Yangtse-kiang river between Nanking and Chingkiang.

The range of the Shanghai W/T station short wave set has been ascertained to be approximately 2,000 miles.

Japan.

C.W. Issues.

The Central Meteorological Observatory, Tokyo, W/T Station, approximate Latitude 35° 39' N., Longitude 139° 44' E., call sign **JGA**, broadcasts weather bulletins on a wavelength of 4,000 metres C.W. as follows:—

(1) **Synoptic data** messages giving a summary of the weather situation over Japan and the neighbouring seas in code* for 20 (or less) selected stations.

(2) **Storm warnings**, for particulars *see* page 159.

Synoptic data messages are broadcast as follows:—

At 2350 G.M.T. containing observations taken at 2100 G.M.T. (previous day).

„ 0550 G.M.T. „ „ „ 0300 „
„ 1100 „ „ „ 0900 „

List of Selected Meteorological Stations.

Index Letter.	Name of Station.	Position (approx.).	
		Latitude.	Longitude.
		N.	E.
1	Kōsyun	22° 09'	120° 45'
2	Taihoku	25° 02'	121° 31'
4	Okinawa	26° 12'	127° 39'
6	Kagasima	31° 34'	136° 33'
9	Tomie	32° 37'	128° 46'
A	Ituhara	34° 12'	129° 17'
B	Muroto	33° 15'	134° 11'
D	Hamamatsu	34° 43'	137° 43'
F	Hatizozima	33° 06'	139° 50'
G	Chichi jima (Bonin Is.)	27° 05'	142° 11'
H	Wazima	37° 23'	136° 54'
I	Mera	34° 55'	139° 50'
K	Miyako	39° 38'	141° 59'
L	Hakodate	41° 47'	140° 43'
M	Sapporo	43° 04'	141° 21'
N	Nemuro	43° 20'	145° 35'
O	Odumari	46° 39'	142° 46'
P	Syana	45° 14'	147° 53'
U	Yūki	42° 20'	130° 24'
W	Yingkow	40° 40'	122° 14'

List of Auxiliary Stations.

Index Letter.	Name of Station.	Position (approx.).	
		Latitude.	Longitude.
3	Ishigaki	24° 20'	124° 10'
5	Nase	28° 23'	129° 31'
7	Minami Ōgari	25° 51'	131° 14'
8	Shiomisaki	33° 27'	135° 46'
C	Miyadu	35° 32'	135° 12'
E	Nagaturo	34° 36'	138° 51'
J	Aikawa	38° 02'	138° 14'
Q	Abasiri	44° 01'	144° 17'
R	Ishinomaki	38° 26'	141° 19'
S	Akita	39° 43'	140° 06'
T	Korgo	36° 42'	128° 48'
V	Hamada	34° 54'	132° 04'
X	Changchun	43° 55'	125° 18'
Y	Tsingtao	36° 04'	120° 19'
Z	Shanghai	31° 15'	121° 30'

WIRELESS STORM WARNINGS.

French Indo-China.

Spark Issues.

Mitho W/T Station, call sign **HVM**, broadcasts typhoon or storm warnings in a special code,* immediately after the weather bulletins at 0300 and 1330 G.M.T. and at other times, as necessary, on a wavelength of 600 metres.

Similar warnings are also broadcast by the following W/T stations in French Indo-China, in a similar manner to Mitho W/T.

W/T Station.	Position (approx.).		Call Sign.	Wavelength, Metres.
	Latitude.	Longitude.		
Cape Padaran ...	11° 22' N.	109° 01' E.	FRR	600 (spk)
Tourane	16° 07' N.	108° 13' E.	FRI	600 (spk)
Kien an	20° 48' N.	106° 37' E.	FRK	600 (spk)
Fort Bayard ...	21° 13' N.	110° 23' E.	FRF	600 (spk)

Hong Kong.

Spark Issue.

Cape d'Aguilar W/T Station, call sign **VPS**, broadcasts typhoon warnings on 600 metres.

The warnings from Hong Kong observatory are broadcast on receipt and at 18 minutes past each hour until 1600 G.M.T. and the warnings from Shanghai and Manila are broadcast on receipt and repeated after an interval of 10 minutes.

Wireless Telephony R/T Issues.

Victoria Peak W/T Station, call sign **ZBW**, wave length 350 m. R/T, broadcasts by word of mouth typhoon warnings received from Hong Kong observatory immediately following the weather bulletins at 0548 and 1148 but when the Hong Kong local storm signals are displayed they will be broadcast on receipt and at 48 minutes past every hour until the signals are lowered. The warnings from Shanghai and Manila will be broadcast on receipt and repeated after an interval of 10 minutes when the Hong Kong local storm signals are displayed.

China.

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

Pratas Island W/T Station, call sign **XPI**, broadcasts typhoon warnings for the China Sea when necessary. The warnings are broadcast *en clair* in English and are preceded by the Safety Signal TTT (— — —). They are issued as frequently as changes are observed, or at such intervals as may be deemed most expedient. Wave length, 600 metres (spark).

Shanghai W/T Station, call sign **FFZ**, broadcasts typhoon and gale warnings, when necessary after the weather bulletins described on p.159 at 0300 (after Time Signal), 0900 (after Time Signal), 1400 and 1800 G.M.T. The warnings are broadcast *en clair* and give information concerning the position of the centres of typhoons or continental depressions, for China and the China Seas.

Wavelength 650 metres (I.C.W.), repeated immediately on 1500 metres (I.C.W.).

Typhoon Warnings Broadcast on Short Wavelength and also on request by Shanghai W/T. FFZ.

For the benefit of ships who experience difficulty in the reception of W/T messages from **Shanghai W/T Station, FFZ**, owing to the alleged existence of "Zones of silence" along certain portions of the China coast these warnings will, if necessary, be broadcast on a short wavelength of 28.5 metres C.W. at 0945 and 1130 G.M.T.

* No information is available up to time of going to press as to changes of Key Letters or Code, following the Conference of Safety of Life at Sea, 1929, and the International Meteorological Conference at Copenhagen, 1929.

Ships are invited in case of difficulty, to ask Shanghai W/T station, FFZ for **special typhoon warnings** which will be transmitted free of charge.

Particulars of these "zones" are given on p. 157.

Japan.

I.C.W. and C.W. Issues.

The **Central Meteorological Observatory, Tokyo, W/T Station** call sign, **JGA**, broadcasts storm warnings *en clair*, in English after the weather bulletins explained on p. 157. The warnings contain the following information:—approximate position of typhoon (or cyclone), the direction in which it is moving, or expected movement, or information concerning severe gales, or duration of monsoon, over Japan and the neighbouring seas.

Time 2350 G.M.T. } Wavelength 4000 metres (C.W.).
 „ 0550 G.M.T. }
 „ 1100 G.M.T. }

In cases of urgency they will be broadcast immediately on 600 metres I.C.W. and repeated at the end of the next compulsory silent period.

III.—WIRELESS TIME SIGNALS.

Hong Kong.

I.C.W. Issues.

Wireless time signals controlled by the Royal Observatory, Hong Kong, are broadcast from **Cape d'Aguilar W/T Station**, Latitude 22° 12' 39" N., Longitude 114° 15' 19" E., call sign **VPS**, on a wavelength of 2913 metres (I.C.W.) at the following times:—

G.M.T.
 h. m. s. h. m. s.
 1 55 00 to 2 00 00
 and from 12 55 00 to 13 00 00

The time signals consist of dots (- - - - - etc.) each of about 0.2 seconds duration, sent at every second, the 28th, 29th, 54th, 55th, 56th, 57th, 58th, and 59th seconds being omitted for the purpose of identifying the signals.

Preliminary warning signals are transmitted between 1h. 53m. 00s. and 1h. 55m. 00s., and between 12h. 53m. 00s. and 12h. 54m. 00s., G.M.T., as follows:—"CQ de HK Time wait."

In the event of failure the time signals are transmitted 30 minutes later.

The signals are not transmitted on Sundays or Public Holidays.

China.

Wireless time signals controlled by Zikawei Observatory are broadcast by **Shanghai W/T Station**, Latitude 31° 13' 16" N., Longitude 121° 27' 47" E., call sign **FFZ**, on a wavelength of 650 metres, I.C.W. after the general call (CQ de FFZ) in the following manner:—

G.M.T. Signal.
 h. m. s. h. m. s.
 2 } 55 00 to 2 } 56 45 - - - - -
 8 } 57 00 „ 57 50 - - - - - etc.
 57 55 „ 58 00 { 55 56 57 58 59 60 Time signal.

G.M.T. Signal.
 h. m. s. h. m. s.
 2 } 58 08 to 2 } 58 10 - - -
 8 } 58 18 „ 58 20 - - -
 58 28 „ 58 30 - - -
 58 38 „ 58 40 - - -
 58 48 „ 58 50 - - -
 58 55 „ 59 00 { 55 56 57 58 59 60 Time signal.
 59 06 „ 59 10 - - -
 59 16 „ 59 20 - - -
 59 26 „ 59 30 - - -
 59 36 „ 59 40 - - -
 59 46 „ 59 50 - - -
 2 } 59 55 „ 3 } 00 00 { 55 56 57 58 59 60 Time signal.
 8 } 00 00 { 55 56 57 58 59 60
 - - - = 1 sec.; - = 0.2 sec.








IV.—VISUAL STORM WARNINGS.

Hong Kong.

Local Storm Signals.

In addition to the China seas storm signals, symbols from which are displayed when necessary at Blackhead Hill, Kowloon, the following system of local storm signals is in force at Hong Kong.

Day Signals.

Signal.	Symbol.	Signification.
1		A typhoon exists which may possibly cause a gale at Hong Kong within 24 hours.
2		Gale expected from the North (N.W. to N.E.).
3		Gale expected from the South (S.E. to S.W.).
4		Gale expected from the East (N.E. to S.E.).
5		Gale expected from the West (N.W. to S.W.).
6		Gale expected to increase.
7		Wind of typhoon force expected (any direction).

The symbol for Signal No. 1 is coloured *red*, the remaining symbols are *black*.

Signal No. 7 will be accompanied by three explosive bombs, fired at intervals of 10 seconds at the Water police station, and repeated at the Harbour Office.

The signals will be lowered when it is considered that all danger is over.

Day signals displayed at Harbour Office, H.M.S. *Tamar*, Gough Hill, W/T mast Royal Observatory, Green Island signal mast, a flagstaff on the premises of the Hong Kong and Kowloon Wharf and Godown Coy. at Kowloon, the Standard Oil Coy.'s flagstaff at Lai chi Kok, and a flagstaff near the field officers' quarters at Lye mun.

Night Signals (Lights).

Signal No. 1	2	3	4	5	6	7
WHITE	WHITE	GREEN	GREEN	WHITE	GREEN	RED
WHITE	GREEN	WHITE	GREEN	WHITE	GREEN	GREEN
WHITE	GREEN	WHITE	WHITE	GREEN	GREEN	RED

Night signals displayed, at sunset, on the tower of the railway station, W/T mast Royal Observatory, H.M.S. *Tamar*, Gough Hill, and on the Harbour Office flagstaff. They have the same significance as the day signals.

Signal No. 7 will be accompanied by explosive bombs, as above, in the event of the information conveyed by this signal being first published at night.

Supplementary Warnings.

When local signals are displayed in the harbour, signals will be displayed at the following stations:—

Aberdeen	Sai kung
Cheung chow	Sha tau kok
Gap rock	Tai Po
Ping shan	Tsun wan
Stanley	Tai O
Sau ki wan	Waglan

to notify the fact to native craft and passing ocean vessels.

The signals displayed are as follows:—

When No. 1 signal is displayed in the harbour:

Red T by day.

2 red lights vertically by night.

When Nos. 2 to 7 signals are displayed in the harbour:—

Black cone by day.

Two green lights vertically by night.

Further details can always be given to ocean vessels on demand, by signal from lighthouses.

The object of the system is to give at least 24 hours' warning of a gale (force 8 Beaufort scale) and also warnings of expected changes in the direction and force of the wind. Owing, however, to the uncertain movements of typhoons and to insufficient telegraphic observations it will occasionally happen that Signals 2 to 5 may be displayed without a gale occurring at Hong Kong, or even Gap rock, but the reverse is not likely to happen, except in the case of typhoons forming in the vicinity and travelling rapidly towards Hong Kong, or of a located typhoon increasing its rate of progression abnormally. Signal No. 1 is intended as a warning to "Stand by" and watch for the next signal.

NOTE.—The China seas storm signal system necessitates a mast-head symbol which should not be mistaken for a black signal of the local system.

Philippine Islands.

Typhoon Warning Signals.

TYPHOON warning signals are displayed upon receipt of information from the Weather Bureau at Manila, as follows:—

Day Signals.—Black cylinder, 1½ feet in diameter, 2 feet high. Black cone, base 1½ feet in diameter, 2 feet high. Black sphere, 2 feet in diameter. Flag, 3 or 4 feet square, of any convenient colour.

Night Signals.—Red and White lights shown vertically or horizontally.

No. By Day. By Night.

Meaning.

1



Indicates (a) A distant typhoon the direction of whose movements is still unknown. The signal will be changed in case the typhoon approaches.

(b) The direction of the distant typhoon is at present such that the storm may pass off without seriously affecting the archipelago.

(c) A general warning, viz., when the weather indications are dangerous but such as are not covered by any one of the other signals in use; for instance, when the typhoon recurves east of the archipelago. In such cases see the daily weather note posted at all the meteorological and telegraph stations and Custom houses.

Precautions.—Vessels should prepare to strengthen their moorings and to get up steam. Small vessels, especially open launches, should not risk going far from port.

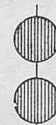
2



Indicates that the centre of the typhoon will pass (or is passing) to the northward at a considerable distance. Winds from west to south are to be expected, which may acquire considerable force and continue for several days.

Precautions. — Vessels should strengthen their moorings. It is considered advisable that vessels should send down light yards and masts. Steam vessels should be ready to use their engines at short notice. Dangerous for small vessels to be in Manila bay.

3



Indicates that the centre of the typhoon will pass (or is passing) to the southward at a considerable distance. Winds from east to south are to be expected. These are generally less violent than those referred to in signal No. 2.

Precautions.—As for signal No. 2.









4



Indicates that the location of the typhoon is dangerous for the place where the signal is hoisted, though the danger is not imminent. Look out for the next signal.

Precautions. — Vessels should strengthen their moorings. Steam vessels must be ready to use their engines in case of sudden emergency. Small vessels must remain at their moorings.

Signal

No.	By Day.	By Night.	Meaning.
5			Indicates that the centre of the typhoon will pass (or is passing) to the northward at a short distance. Strong winds from north, through west, to south are to be expected, which may become very violent. Precautions. —Vessels should strengthen their moorings as much as possible. Lower and secure all gear. Use steam to help anchors. Vessels outside Manila harbour may find it necessary to seek refuge in Kavite. No vessels should be under way while this signal is hoisted.
6			Indicates that the centre of the typhoon will pass (or is passing) to the southward at a short distance. Strong winds from north, through east, to south are to be expected, which may become very violent, though usually they are less severe than those referred to in signal No. 5. Precautions. —As for signal No. 5.
7			Indicates that the centre of the typhoon will pass over the place where the signal is hoisted. Precautions. —As for signal No. 5. It must be noted, however, that after the absolute or relative lull, due to the actual passing of the centre, the wind will suddenly change to a direction opposite to the one from which it came before the lull; also that it may often be more violent than before.
8			Indicates very high tides, and floods. Precautions. —Vessels of any description must not attempt to enter or leave a harbour or river, nor to move about inland waters while this signal is hoisted. The flag in this signal is of any convenient colour.











CHINA SEAS STORM SIGNAL SYSTEM.

Typhoon and Storm Signals.

THE China seas storm signal system which has been drawn up by joint agreement between the observatories at Zi-ka-wei and Hanoi and the Chinese Maritime Customs, is now definitely adopted along the whole China coast, including Hong Kong and the Indo-China ports.

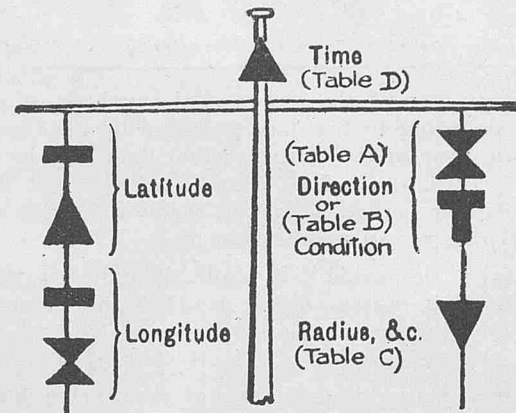
General Explanation.

The signals are made by means of certain symbols, each corresponding, for certain purposes, to a number:—

									
1	2	3	4	5	6	7	8	9	0

The symbols are hoisted at the yardarms and masthead of the storm-signal mast and have the general characteristics as shown below.

Typhoon Signal.

















Meaning.—A severe typhoon within 30 miles of Lat. 26° N., Long. 120° E., travelling N.E. Warning issued this morning.

The two upper symbols, on one yardarm indicate latitude, 26°, the lower two figures longitude, the 100 being omitted, *i.e.*, 20 indicates longitude 120°.







The two upper symbols on the opposite yardarm indicate the direction in which a typhoon is travelling, *see* Table A.

Table A.

DIRECTION SIGNALS.													
													
N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW









(NOTE.—The numbers corresponding to the symbols indicate the number of points from North or alternatively certain conditions of the typhoon, *see* Table B.)

Table B.

CONDITION SIGNALS.					
					
Forming	Two centres	Direction unknown.	Stationary or very slow.	Recurring.	Filling up.

The lower symbol on this side indicates the radius of the circle in miles whose centre is shown by the latitude and longitude. This symbol may also indicate degree of intensity. In the case of a continental depression it indicates that it is such, and the corresponding latitude and longitude is the centre of an indefinite area affected. *See* Table C.

Table C.

RADIUS AND INTENSITY SIGNALS.									
Radius of position Circle.	120	60	30						
									
Intensity:	Unknown	Severe	Unknown	Severe	Deepening	Unknown	Severe	Excep. velocity	Contin. depres. uncertain

NOTE.—It should be clearly understood that the position indicated is not necessarily the centre of the typhoon, but merely indicates the centre of a circle of a specified radius within which the centre of the typhoon is believed to lie.

The signal at the masthead indicates the time the warning was issued by the Observatory. *See* Table D.

Table D.

TIME SIGNALS.			
			
Yesterday morning.	Yesterday afternoon.	This morning.	This afternoon.

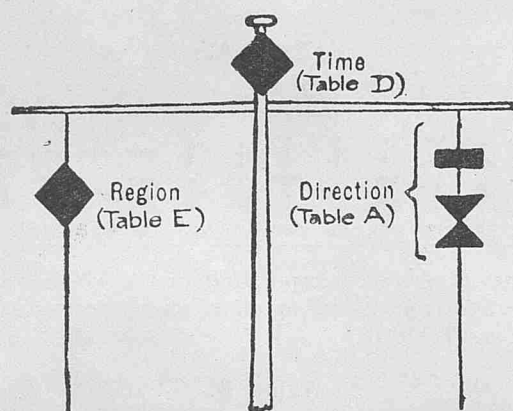
NOTE.—The position of the centre of the typhoon as signalled is the position according to the data possessed by the Observatory at the time of the issue of the warning; that data may be as much as 12 hours old. Thus, if the time signal indicates that the warning was issued "This morning," it may be that the position corresponds to data concerning yesterday afternoon.

If the signal "Deepening" is made, it indicates that there is reason to believe that the barometric gradient and, consequently, the intensity of the typhoon are increasing.

If the signal "Exceptional velocity" is made, it indicates that there is reason to believe that the rate of progression is 25 per cent. or more greater than the average rate.

If the signal "Position uncertain" is made, it indicates that the data possessed is unreliable and that the position signalled is a mere probability.

GALE SIGNALS.



MEANING.—The north coast of Hokkaido threatened by a gale from S.W. Warning issued yesterday afternoon.

The one symbol at one end of the yardarm shows the region threatened. See Table E.

Table E.

DISTRICT SIGNAL.									
	—	⊥	T	+	▲	▼	◆	■	⋈
Coast of G. of Tongking	Formosa	Formosa	Yangtze to G. of Yalu	Sea of Japan.	North of Hokkaido.	East Coast of Japan.	South of Japan.	Kiusiu.	
Annam.	to Swatow	Straits.	to Yangtze.	Shantung.	G. of Pechihli.				

The two symbols at the other yardarm show the direction from which the gale is expected to blow. See Table A.

The symbol at the masthead shows the time the warning was issued by the Observatory. See Table D.

NOTE.—In addition to the above general signals, local storm signals are displayed at Hong Kong. See p. 159.

Japan.

Storm Signals.—The storm signals made at various places on the coasts of Japan consist of General storm signals and Local storm signals. The former, shown on special masts, give the time, the position, the direction, the rate of progressive movement and intensity of the storm, while the latter only furnish a general idea of the character of the storm expected.

General Storm Signals.

By day the signals are made from a mast with a yard by means of certain symbols; these symbols and their equivalent numbers are as follows:—

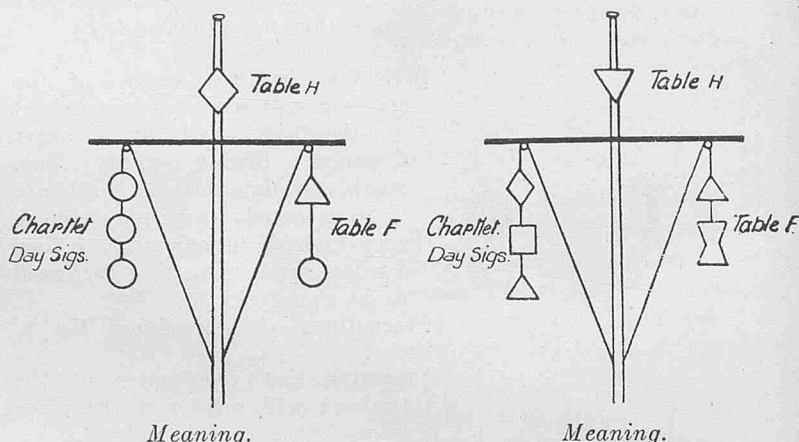
					
1	2	3	4	5	6

The symbols are usually *red*, but in some places, to suit local conditions, they are *white*.

By night the signals are made by means of *red*, *white*, and *green* lights.

1. Day Signals.

Examples of Day Signals.



Meaning.

Last night, at 10 p.m. a typhoon or cyclone off the north-east coast of Japan moving towards north-east with a velocity of 10 to 20 miles per hour, the intensity not indicated.































Meaning.

This morning, at 6 a.m. a violent typhoon in northern Formosa moving towards the north-west, its velocity not indicated.

Three symbols, vertical, at one yardarm of the storm-signal mast, indicate the number of the district in which the centre of a typhoon or cyclone is situated. See CHARTLET, DAY SIGNALS, p. 163.

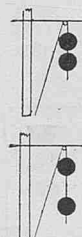
Two symbols at the other yardarm show the direction of the progressive motion. See Table F.

Table F.—Direction of Motion.

														
N.	NNE.	NE.	ENE.	E.	ESE.	SE.	SSE.	S.	SSW.	SW.	WSW.	W.		
														
WNW.	NW.	NNW.	Forming	Filling up	Unknown.	Recurving	Steady or Slow.							

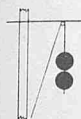
The rate of progression is shown by changing the relative positions of the direction symbols to the yardarm. See Table G.

Table G.—Rate of Progression.

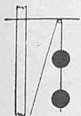


Direction symbols separated by the normal distance. Velocity not known.

Direction symbols separated 10 to 20 miles per hour. by twice normal distance.



Twice normal distance 20 to 30 miles per hour. between yardarm and upper symbol.



Twice normal distance Above 30 miles per hour. between yardarm and upper symbol. Also twice normal distance between the two symbols.

(In Table G the symbols represent an easterly movement of the typhoon.)

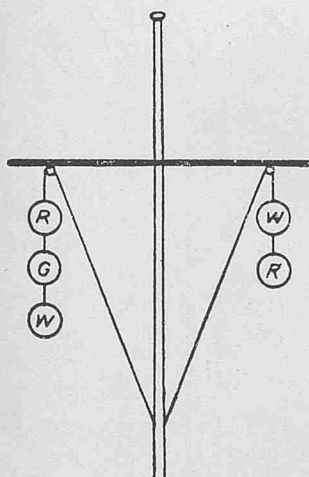
One symbol at the masthead shows the time at which the centre was located, and the intensity (force) of the typhoon. See Table H.

Table H.—Time and Force.

Time Force.	This Morning 6 am.	This Afternoon 2 pm.	Last Night 10 pm.
Not indicated.	●	⊗	◆
Violent.	▼	▲	■

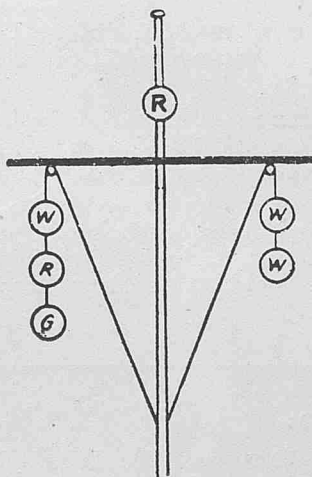
2. Night Signals.

Examples of Night Signals.



Meaning.

A cyclone or typhoon over Korea, moving towards the north-east.



Meaning.

A cyclone over Hokkaido, moving towards the east.

Three lights, vertical, at one yardarm indicate the district in which the typhoon or cyclone is situated. See POSITION LIGHT CHARTLET.

One light at the masthead shows the subdivision of the district in which the centre is situated. See Table I. and POSITION LIGHT CHARTLET.

Table I.—Subdivision Light.

1 st Quadrant.	2 nd Quadrant.	3 rd Quadrant.	4 th Quadrant.
W	R	G	None

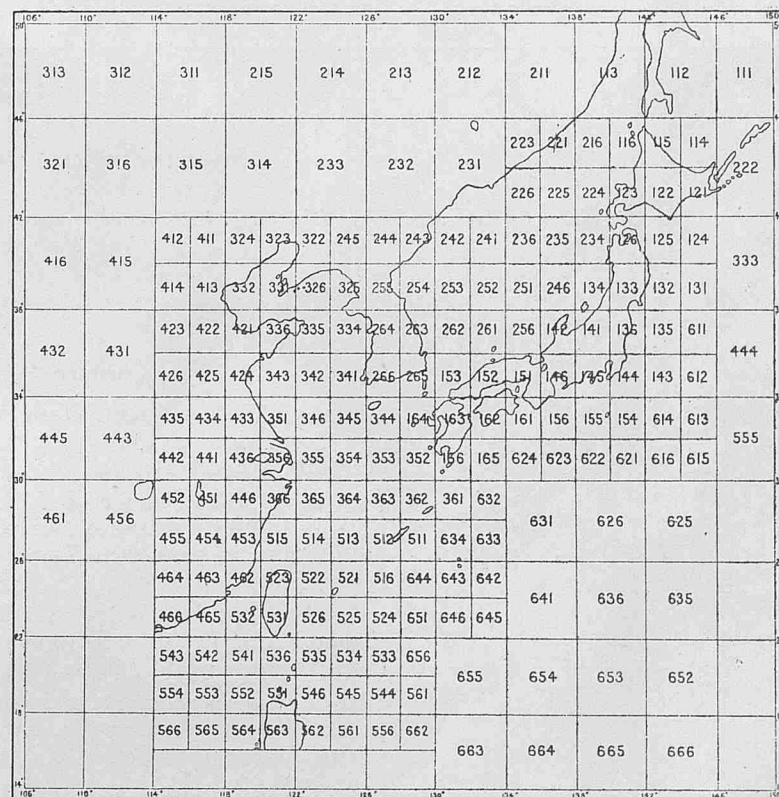
Two lights, vertical, at the other yardarm show the direction of the motion of the centre. See Table J.

Table J.—Direction of Motion Lights.

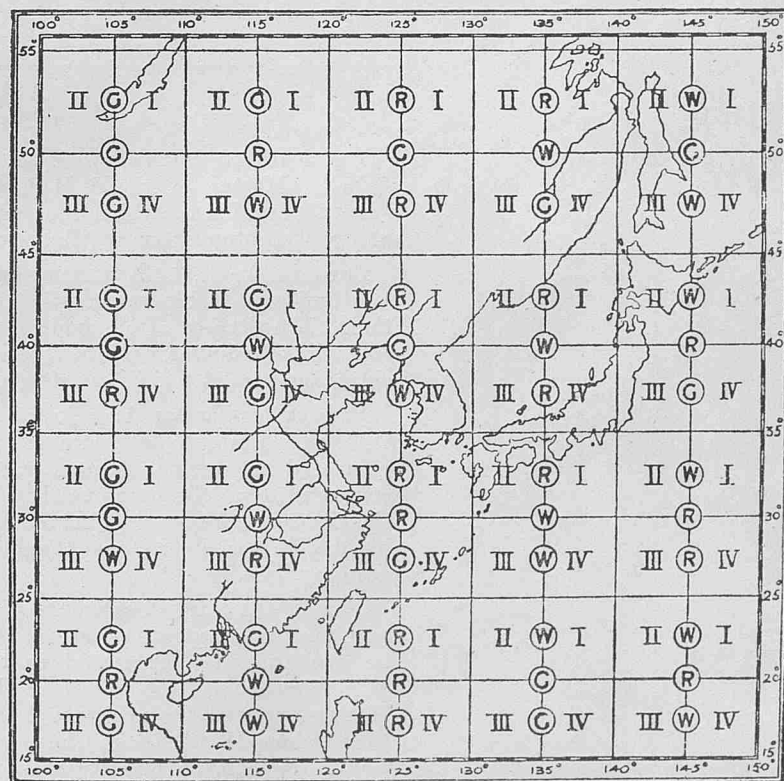
G	W	W	R	R	R	G	W
W	R	W	R	G	W	G	G
N.	NE.	E.	SE.	S.	SW.	W.	NW.

The letters W.R.G. in Tables I. and J. denote white, red, and green, respectively.

Chartlet indicating position of Storm Centre. Day Signals. Japan.



Position Light Chartlet. Night Signals, Japan.



The letters W.R.G. denote White, Red, and Green, respectively.

Local Storm Signals.

These signals are made by day with either a *red* ball, a *red* cylinder, or a *red* cone; and by night by coloured lights, which have the following significance:—

Day Signals.	Night Signals.	Signification.
A <i>red</i> ball ...	A <i>red</i> light ...	Strong winds or gales expected.
A <i>red</i> cylinder	A <i>green</i> light...	Rain or snow storm.
A <i>red</i> cone ...	A <i>red</i> light over a <i>green</i> light.	Approach of a cyclonic storm of dangerous intensity.

Special Notices Regarding Personnel.

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

Captain W. F. Stanley.

Captain W. F. STANLEY, Master of the R.M.M.V. *Carnarvon Castle* and Commodore of the UNION CASTLE LINE Fleet, has retired after over fifty years' service afloat.

Captain STANLEY commenced his sea career at the age of fourteen when in 1879 he was apprenticed to Messrs. DEVITT and MOORE, serving his time in their ship *Hawkesbury* trading between London and Australia.

On obtaining his master's certificate in 1890 he joined the UNION Company and in 1906 was appointed to the command of Sir DONALD CURRIES steam yacht *Iolaire*.

Since then Captain STANLEY has commanded several of the UNION CASTLE Fleet including the *Dunnottar Castle*, *Gascon*, *Dunluce Castle*, *Llanstephan Castle*, *Kinfauns Castle*, *Saxon*, *Walmer Castle*, and *Carnarvon Castle*.

A regular member of the Voluntary Corps of Marine Observers since 1921, Marine Observers join with the Marine Division in wishing Captain STANLEY long life and happiness in his well earned retirement.

Obituary.

The death of Commodore WILLIAM MARSHALL, C.B., D.S.O., R.D., R.N.R., Master of the R.M.S. *Majestic* and Commodore of the WHITE STAR FLEET, which took place on May 28th at his residence at Southampton after an illness of six weeks, is noted with regret.

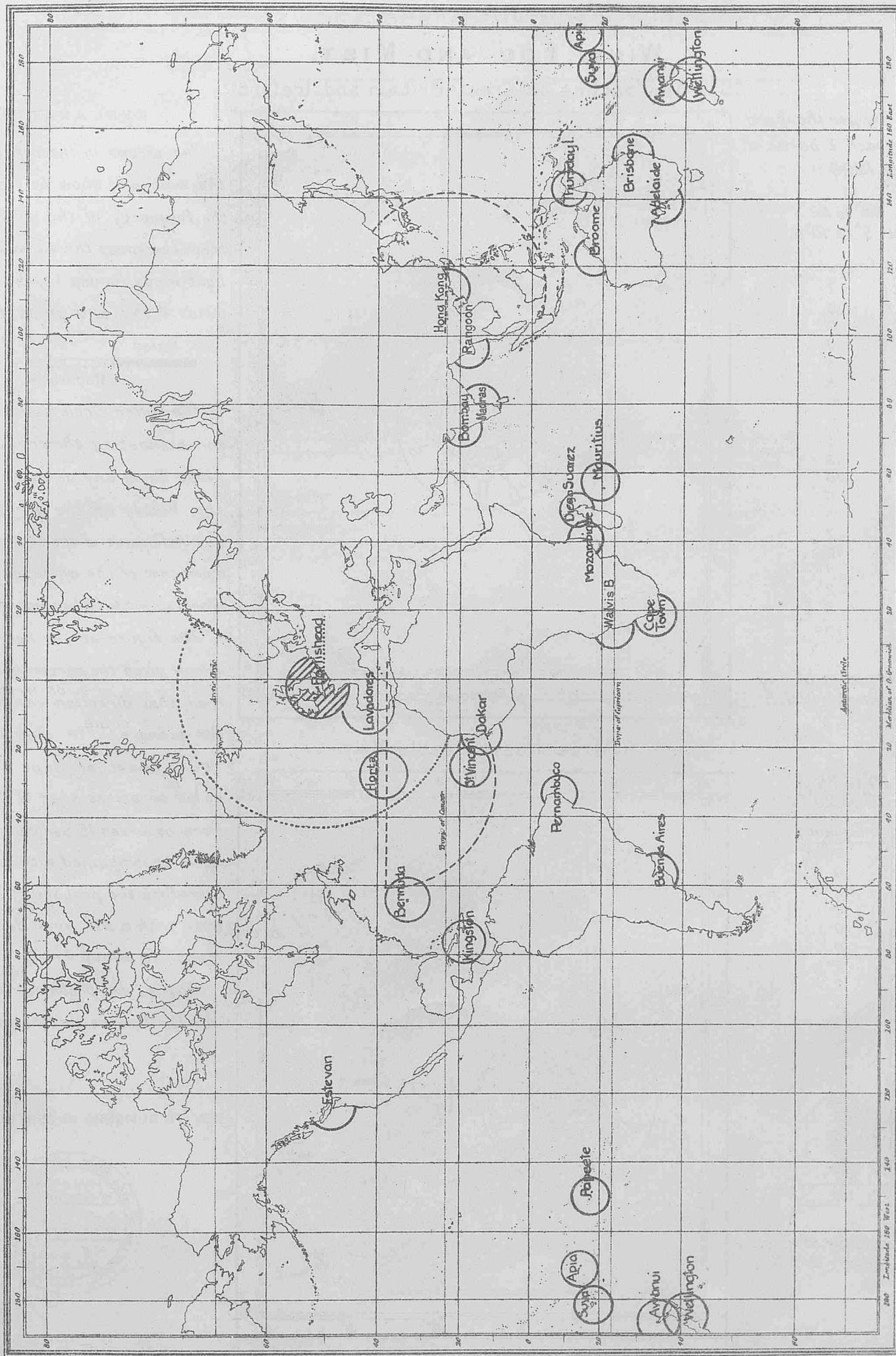
Born in April, 1873, Commodore MARSHALL was an old Conway boy and served his apprenticeship with the WHITE STAR LINE in their Ship *Copley*. On completing his time he joined Messrs. GILLISON and CHADWICK's ship *Drumlanrigg* as second mate, and on obtaining his 1st mate's certificate sailed in the same ship as mate.

Passing for master, he rejoined the WHITE STAR LINE in January, 1899, as a junior officer, and rising through the several grades was promoted to command in August, 1911. Since this date he has commanded all the finest vessels of the WHITE STAR FLEET, including the *Teutonic*, *Megantic*, *Cedric*, *Olympic*, and *Majestic*. He hoisted his flag in the *Majestic* as Commodore of the WHITE STAR FLEET in January last.

During the war, Commodore MARSHALL served in the Royal Navy and for his conspicuous service held the D.S.O. with bar. In 1925 he was created a C.B. and in the following year was appointed aide-de-camp to the KING, acting in that capacity when His MAJESTY opened the new Gladstone Dock, Liverpool, in July, 1927. Commodore MARSHALL had been a regular member of the Corps of Voluntary Marine Observers since 1921.

Chart VIII.—SHIPS' WIRELESS WEATHER SIGNALS.

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



The dotted circle indicates the area in which British "A Selected Ships" report to Portishead. The small shaded circle indicates the area from which reports are prohibited to Portishead.

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

The full-line circles indicate the areas round islands and coast stations which could receive spark "Selected Ships" reports to C.Q.

JULY.

WIND, FOG AND MIST.

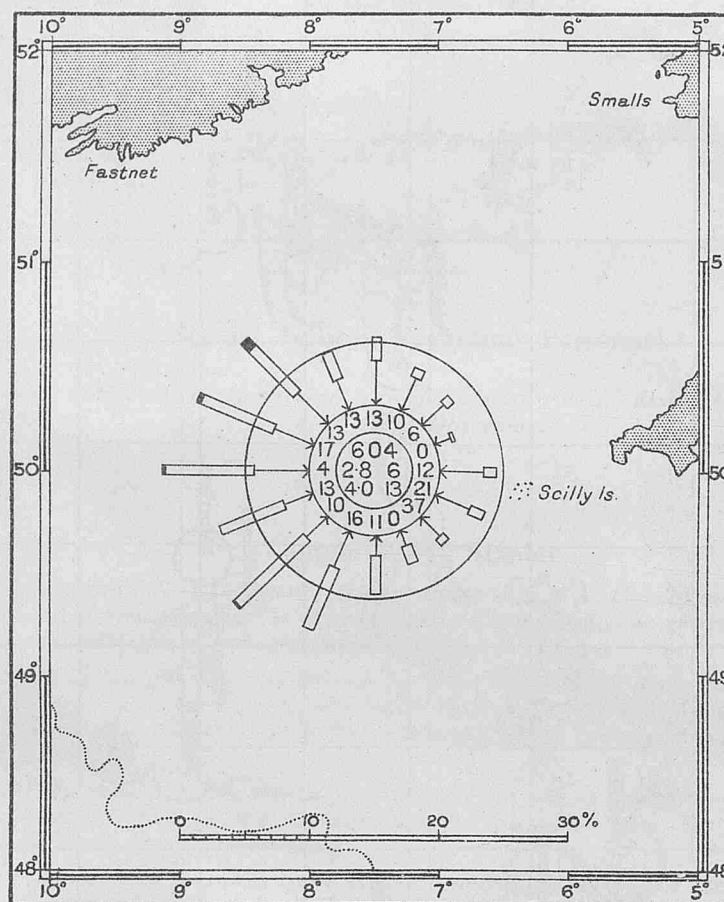
S.W. Approaches to Great Britain and Ireland

Frequency of fog per thousand observations for each 2 points of compass, 1921 to 1928.

Latitude 48° to 52° N.
Longitude 5° to 10° W.

Direction.	Frequency.
N	7
NNE	3
NE	2
ENE	0
E	5
ESE	8
SE	10
SSE	0
S	5
SSW	13
SW	10
WSW	10
W	5
WNW	2
NW	12
NNW	7
Calm	2
Var.	5
TOTAL	106

Percentage Frequency of Fog and Mist for area = 10.6 %.



EXPLANATION.

The arrows in the roses fly with the wind and show by their length the frequency of the winds and by their thickness the various forces, light winds forces 1 to 3, moderate winds 4 to 7 and gales 8 to 12.

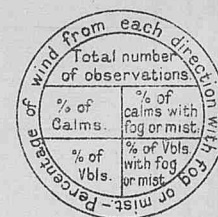
Gales Light
Moderate

The outer circle supplies a scale for estimating the frequency of winds from any direction. From the heads of the arrows to the circumference of the circle represents 5 per cent of the whole number of observed winds. (100 per cent = 10° longitude).

The figure at the head of the arrow gives the percentage of wind from that direction with fog or mist, for example:- In July off the West coast of Cape Colony on all occasions when NWly winds were observed 15 per cent of them were accompanied with fog or mist, therefore the probability of fog or mist with a NW wind during this month is about 1 in 7.

Fog is most probable in this month with Var. Winds, the percentage being 3.3.

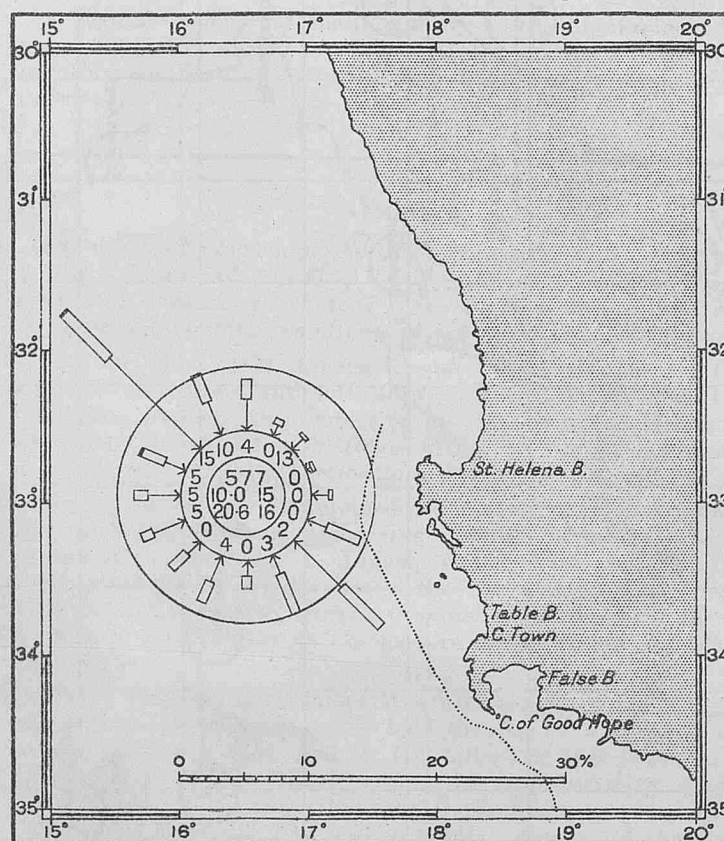
KEY TO NUMBERS IN CENTRE OF ROSES.



Latitude 30° to 35° S.
Longitude 15° to 20° E.

Direction.	Frequency.
N	2
NNE	0
NE	2
ENE	0
E	0
ESE	0
SE	2
SSE	2
S	0
SSW	2
SW	0
WSW	2
W	2
WNW	2
NW	23
NNW	5
Calm	16
Var.	33
TOTAL	93

Percentage Frequency of Fog and Mist for area = 9.3 %.



Compiled from observations of British Ships received since the adoption of the Hollerith system of extraction covering the years 1921 to 1928.

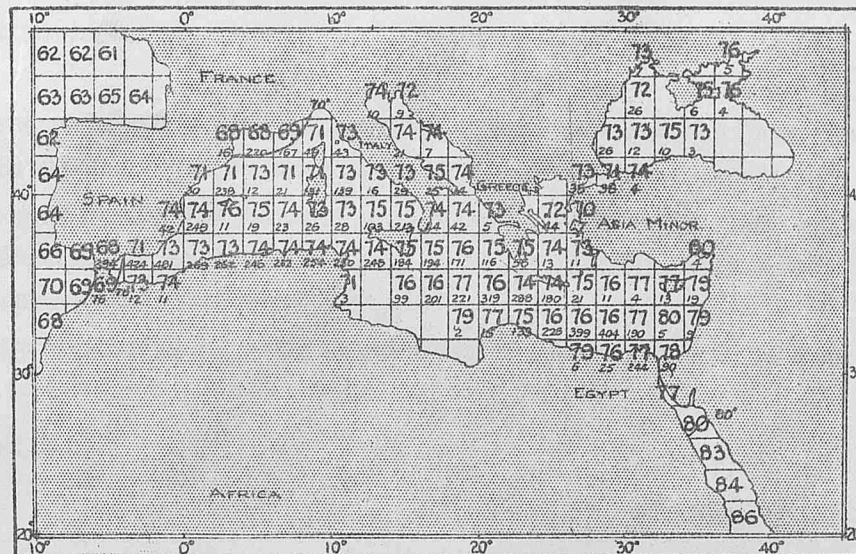
MEDITERRANEAN SEA

SEA SURFACE TEMPERATURES

JULY.

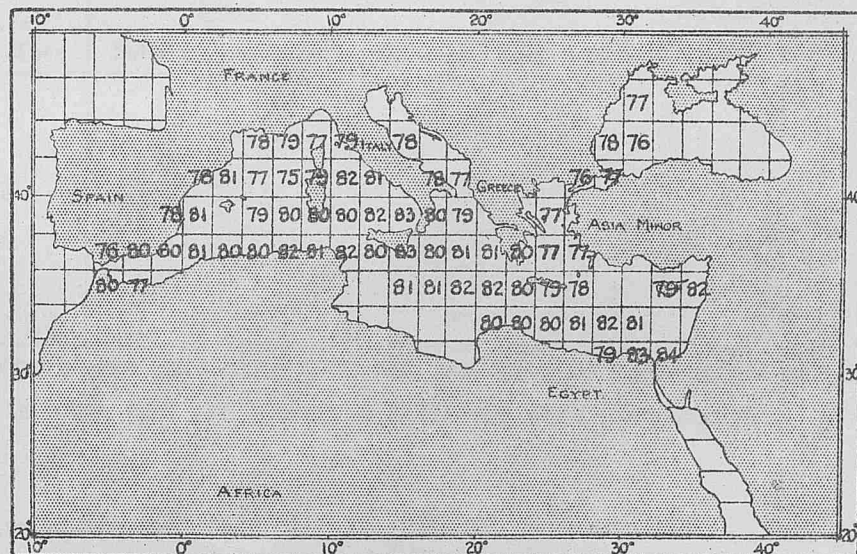
Vol. VII. N° 79.

MEAN.

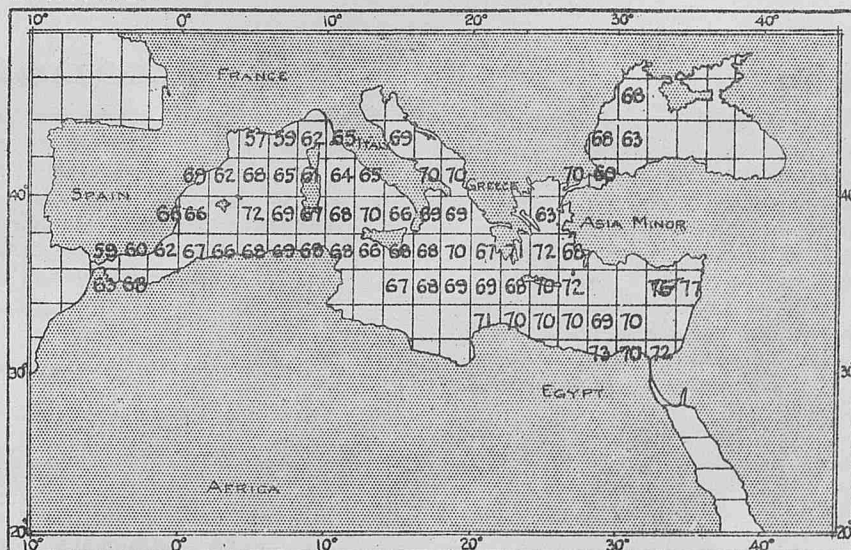


Small figure gives number of observations.

MAXIMUM.



MINIMUM.



Computed from observations of British Ships during the years 1900-1914 in the Mediterranean and Black Seas.

Maximum and Minimum figures are not shown unless the Mean Temperature has been computed from not less than 12 observations.

10000
MEDITERRANEAN SEA

SEA SURFACE TEMPERATURE

1 JULY 1954

Mean



10000
MEDITERRANEAN SEA
SEA SURFACE TEMPERATURE
1 JULY 1954
Mean

NOTICES.

OBSERVATIONS OF CURRENT IN THE WESTERN PORTION OF THE INDIAN OCEAN.

It is hoped to chart and investigate the currents on the tracts along the East Coast of Africa next year.

Captains of ships who have navigated East African waters since 1910 can greatly assist by providing information.

Copies of reliable observations of set and drift of current between the Cape of Good Hope and Latitude 6°N. off the East Coast of Africa are required for the years 1910-1930.

It is requested that observations of current which have previously been returned to the Meteorological Office, whether in Meteorological Logs, Forms 911, or in manuscript, should not again be returned as such duplication adds to difficulty in investigation.

It will be convenient if observations can be returned in the form ruled as under by the end of September, 1930.

Current logged on board S.S.

Captain

Address

From. To.				Position.				Set Direction True.	Drift Nautical Miles.	Wind.		Remarks.
From.		To.		Latitude.		Longitude.				Dir. (True.)	Force.	
Date.	Time.	Date.	Time.	Latitude.	Longitude.	Latitude.	Longitude.					

We certify that the above observations of set and drift of current are reliable, the Dead Reckoning having been carefully kept, and the observed Positions fixed accurately.

Signature of Master.

Signature of Navigating Officer.

POSTAL ARRANGEMENTS.

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

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

S.S. Captain

Port of Call

Date of Homeward Departure

Postal Address

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

ICE REPORTS.

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

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

"Selected Ships" on the Trade Routes of the Southern Ocean are requested to add to their routine Wireless Weather reports information of floating ice seen or reported within the last 24 hours so that this information may be disseminated to the utmost advantage of all concerned.

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.

- (B) From 1st April to 31st August, 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 89-90 of Vol. VII, No. 76, April, 1930, Number.

SYMBOLS USED ON THE CHART.

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

PHENOMENAL POSITIONS OF ICE.

Date.	Ship or Source of Report.	Position. Lat.	Long.	Remarks.
July, —, 1890	S.S. Slavonia	48°53'N.	24°11'W.	Last remnants of berg.
" —, 1902	2 reports by Fishermen.	56°30'N.	69°30'W.	40 to 50 ft. long, 15 ft. wide, 2 ft. 6 in. out of water.
" 31, 1909	S.S. Shimosa	39°01'N.	30°01'W.	25 ft. long, 3 to 8 ft. wide.
" 10, 1913	S.S. Lothian	37°27'N.	38°48'W.	Piece 6 ft. high, 50 ft. in cir.
" 18, 1916	U.S. Hydrographic Bulletin.	32°09'N.	54°28'W.	Piece of berg 3 or 4 ft. out of water.
" 23, 1916	S.S. San Giorgio	42°09'N.	63°24'W.	Berg, 60 ft. long.
" 23, 1918	U.S. Hyd. Bulletin	44°25'N.	35°01'W.	Large berg.
" 18, 1921	Do.	44°30'N.	39°28'W.	Small berg about 15 ft. sq.
" 21, 1921	Do.	36°09'N.	40°39'W.	Berg.
" 31, 1921	Do.	37°37'N.	27°28'W.	Berg.
" 10, 1926	S.S. Chelatos	42°42'N.	36°45'W.	2 pieces of ice.

Reports of Ice sighted between May 1st and May 31st, 1930, 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 12th May, 1930, was received from the Canadian Signal Service, Quebec:—

"Belle Isle to Point Amour, heavy close packed ice everywhere, bergs and growlers westward to Cape St. George, Newfoundland, across to about Table Head, Anticosti, open ice but close packed at some points, other points no ice in sight."

ICE IN GREENLAND WATERS.

INFORMATION RECEIVED BY CABLEGRAM FROM DANISH METEOROLOGICAL INSTITUTE, COPENHAGEN.

10th May "Free of ice 75 miles off Cape Farewell."

19th May "Off ARSUK, ice extends from 4 miles off coast, 56 miles westward. The outer edge of ice is open but becomes compact farther in. The ice extends beyond visibility to the north."

CO-OPERATION OF SHIPOWNERS, MASTERS AND MATES.

Captains and officers who wish to co-operate regularly with the Meteorological Office should apply by letter to The Director, Meteorological Office, Air Ministry, Kingsway, London, W.C.2, or in person to the Marine Superintendent at the same address, or any of the gentlemen whose names and addresses appear below, acting as agents at the respective ports. A general description of Marine Meteorological Work, including the particulars desired from intending Marine Observers, is given in Chapter I of THE MARINE OBSERVER'S HANDBOOK, 5TH EDITION, which may be obtained from H.M. Stationery Office direct, or through any bookseller, price 2/6.

The names of vessels regularly observing for the Meteorological Office, London, together with their Commanders and Observing Officers, are given monthly in THE MARINE OBSERVER, which may be obtained from H.M. Stationery Office, price 2s., 2s. 2d. post free.

The Captains and Officers of regular observing ships constitute the Corps of Voluntary Marine Observers. For certain branches of this work tested instruments are lent to the Captains of British ships registered at ports in Great Britain. A certain number of Regular Observing ships are detailed as "Selected Ships" for the purpose of the World Wide Scheme of Routine Ships' Wireless Weather Telegraphy Reporting. These "Selected Ships" are indicated monthly in the "Fleet List" in THE MARINE OBSERVER by a number.

Only ships registered at Ports in Great Britain will, in future, be included in the Meteorological Office, London, "Fleet List."

Marine Observers are asked to send in their Meteorological Log through the appropriate Port Meteorological Officer or Agent (accompanied by Form 138 in the case of "Selected Ships") at intervals of not more than six months. The Meteorological Record Form 911 (accompanied by Form 138 in the case of "Selected Ships") should be posted direct to the Meteorological Office, London, at the end of each voyage.

When sending in the Meteorological Log or Record, Regular Observing ships will render great assistance if they will notify the Port Meteorological Officer or Agent of their requirements.

The Port Meteorological Officers and Agents inspect official instruments at regular intervals, replacing those which are defective.

Where ships' instruments are found by comparison to be reliable they may be used for the work of "Selected Ships." A reliable mercurial barometer is essential as part of the equipment of a "Selected Ship."

A copy of THE MARINE OBSERVER is sent monthly to the Captain of every observing ship for the information and guidance of the officers doing this work. He is also supplied with THE MARINE OBSERVER'S HANDBOOK and such charts and atlases as are considered necessary as Meteorological equipment for The Work of a Regular Observing ship in a particular trade.

WIRELESS AND WEATHER AN AID TO NAVIGATION, published by H.M. Stationery Office, which affords information and guidance for the practical application of Marine Meteorology to Navigation, may be purchased through any bookseller, price 5s.

Returns made by Regular Observing ships are acknowledged monthly in THE MARINE OBSERVER, and a list of those Commanders and Officers who have performed specially fine work is published yearly in THE MARINE OBSERVER and Excellent Awards are made to them.

The work done by Regular Observing Ships in making written returns, and by "Selected Ships" in broadcasting routine information by W/T, together with "Weather Shipping" Bulletins broadcast from the shore, conforming with the recommendations of the International Convention of Safety of Life at Sea, 1929, provide the necessary information for the use of all shipping. Thus by shipowners encouraging the specialist work in those of their ships whose names appear in THE MARINE OBSERVER, this Voluntary Work under the supervision of the Meteorological Office provides a service to all shipping at minimum cost to the National funds.

Shipowners are asked to facilitate the forwarding of postal matter from the Air Ministry addressed to the Captains of their ships.

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

LONDON ... Captain L. A. BROOKE SMITH, R.D., R.N.R., Marine Superintendent.
Commander J. HENNESSY, R.D., R.N.R., Senior Nautical Assistant.
Room 319, Adastral House, Kingsway, W.C.2.
(Telephone No.: Holborn 3434 Extension 421).
Nearest station Temple, District Railway.

THAMES ... Lieut. C. H. WILLIAMS, R.N.R., Port Meteorological Officer, Royal Albert Docks, E.16.
(Telephone No.: Albert Docks 2659. Telegraphic Address: Barometric Aldock, London).

MERSEY ... Lieut. Commander M. CRESSWELL, R.N.R., Port Meteorological Officer, Dock Office, Liverpool.
(Telephone No.: Bank 8959. Telegraphic Address: Meteorite, Liverpool).

BELFAST ... Captain J. MCINTYRE, Harbour Master, Harbour Office. (Telephone No.: Belfast 4090).

CARDIFF ... Captain T. JOHNSTON, Technical College, Cathays Park. (Telephone No.: Cardiff 6813).

CLYDE ... Mr. ROBERT CLEARY, Master Mariner, The Clutha Stevedoring Co., Ltd., Princes Dock, Glasgow. (Telephone No.: 513 Ibrox).

FREMANTLE ... Captain J. J. AIREY, Deputy Director of Navigation, Customs House.
W. Australia. (Telephone No.: B 1391).

DERELICTS AND FLOATING WRECKAGE.

Date.	Position.		Description.
	Latitude.	Longitude.	
NORTH SEA.			
4.5.30	51°44'N.	2°48'E.	Two big white conical buoys, one marked <i>Fayover</i> in big black letters, <i>RE</i> in copper letters, both floating very deep, distance between them about 300 yards. Dangerous to navigation.
ENGLISH CHANNEL.			
2.5.30	49°57'N.	1°52'W.	Cylindrical object.
2.5.30	50°17'N.	4°08'W.	Heavy floating wreckage awash.
19.5.30	6 m. S.S.W. of Dun- geness.		Cylinder 30 ft. by 7 ft., chain and buoy attached ; dan- ger to navigation.
MEDITERRANEAN.			
1.5.30	43°03'N.	6°58'E.	Buoy surmounted by a cylinder.
NORTH ATLANTIC.			
2.5.30	39°48'N.	62°47'W.	Buoy with white framework, from 10 to 15 ft. high and showing a white flag above a cylindrical ball topmark.
7.5.30	40°27'N.	71°55'W.	Spar projecting about 4 ft. out of water.
7.5.30	39°49'N.	73°54'W.	Two buoy rafts with a long dredge pipe.
7.5.30	40°—'N.	48°25'W.	Large buoy with black framework surmounted by two lamps and a blue flag marked 9.
10.5.30	40°27'N.	73°43'W.	Two heavy logs about 20 ft. long, lashed at right angles.
10.5.30	40°53'N.	42°17'W.	Spar about 15 ft. long and 2 ft. in diameter.
10.5.30	40°47'N.	49°51'W.	Bell buoy.
10.5.30	40°49'N.	33°18'W.	Red buoy with part of superstructure gone.
12.5.30	33°05'N.	75°37'W.	Derelict Scow awash, house and two derricks above water.
12.5.30	46°33'N.	56°—'W.	Red conical buoy adrift.
14.5.30	43°09'N.	41°38'W.	Nun buoy, bottom up.
18.5.30	Ushant Creach Lt.- house bearing N. 43 (deg.) E. true 11 miles.	}	Large open motor boat, apparently no one on board.
19.5.30	39°43'N.		9°35'W.
21.5.30	45°26'N.	15°52'W.	Large conical red buoy.
26.5.30	48°22'N.	6°54'W.	Iron cylinder, approximately 25 (?) feet) long in rusty condition ; dangerous to navigation.
GULF OF MEXICO.			
12.5.30	15°26'N.	81°19'W.	Bell buoy.
NORTH PACIFIC.			
3.5.30	31°20'N.	131°10'W.	Partly submerged log about 40 ft., 4 ft. in diameter.

Agents (contd.).

HONG KONG, China. Lieut. Commander R. G. H. MILLIGAN, R.N., Superintendent, Admiralty Chart and Chronometer Depot, H.M. Dockyard.
(Telephone No.: 108 Dockyard).

HULL ... Captain A. M. BROWN, Ellerman Wilson Line Office. (Telephone No.: Central 2180).

LEITH ... Captains G. BLACK and C. G. BONNER, V.C., D.S.C., Leith Salvage and Towage Co., Ltd., 2, Commercial Street.

SOUTHAMPTON Captain D. FORBES, Nautical Academy, 1, Albion Place.

SYDNEY, New South Wales. Captain C. LINDBERGH.
Commander C. D. MATHESON, R.D., R.N.R., Acting Deputy Director of Navigation.
Customs House.
(Telephone No.: B6421).

TYNE ... Captain J. J. McEWAN, Marine School, South Shields.

VANCOUVER, British Columbia. Mr. T. S. H. SHEARMAN, 61, Leigh Spencer Building, 553, Granville Street.
(Telephone No.: Seymour 3309).