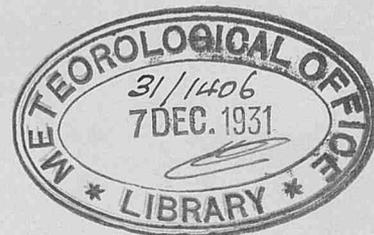


The Marine Observer



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

Vol. IX., 1932.

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

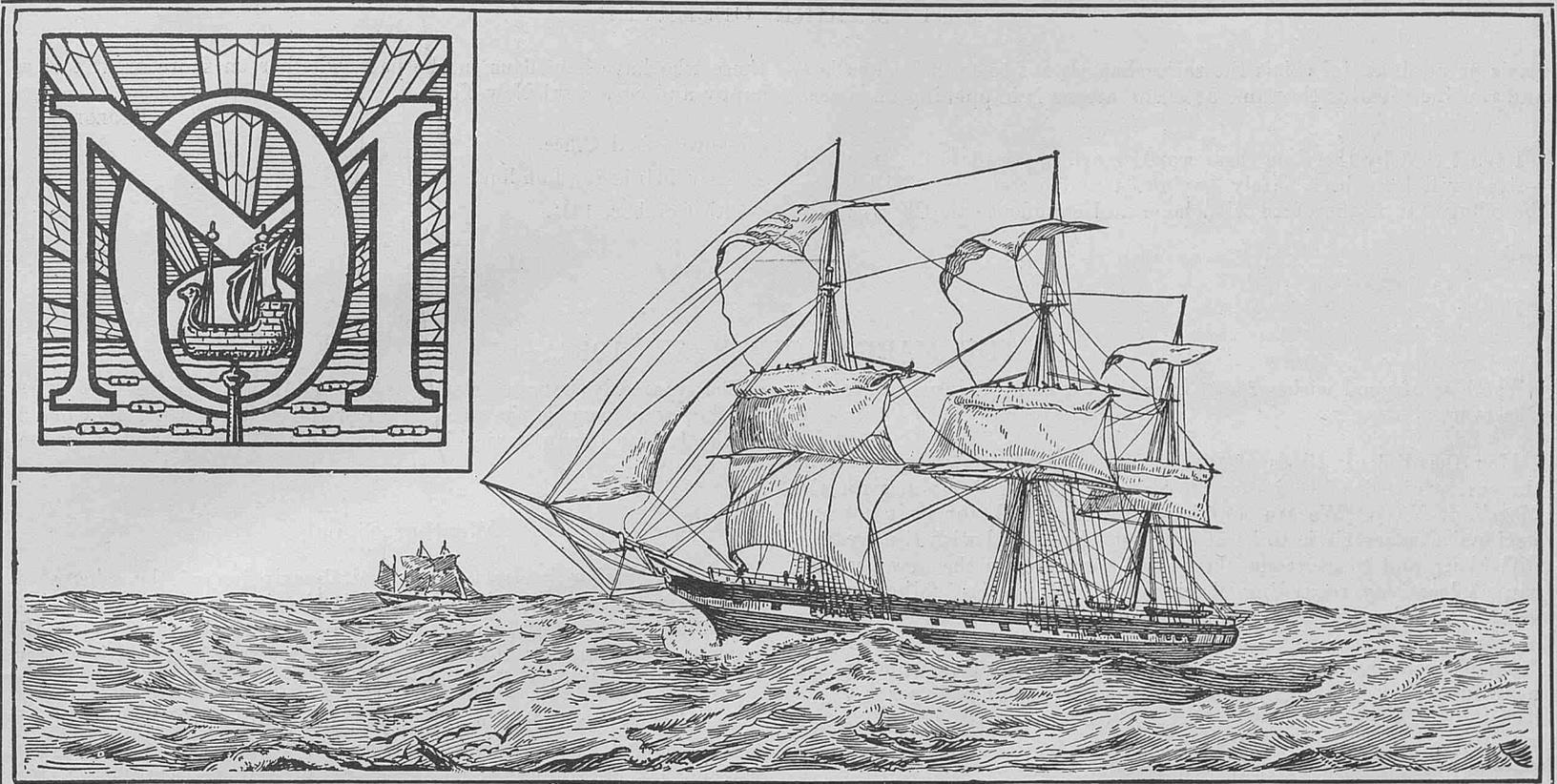


THE JOURNAL OF THE ROYAL ANTHROPOLOGICAL INSTITUTE

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Published by the Royal Anthropological Institute
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Natural History

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Natural History



VOL. IX. No. 97.

THE MARINE OBSERVER.

JANUARY, 1932.

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FOREWORD TO VOLUME IX.

By DR. G. C. SIMPSON, C.B., F.R.S.

This is my New Year Greeting to all our marine observers and colleagues in the work of marine meteorology; but owing to editorial requirements it has to be written a long time before it will be published. I am therefore writing in the middle of October when the country is passing through an intense economic crisis and with a general election a few days ahead. My thoughts naturally are of economy and restriction of activities instead of advances and expansions which have always been the motif of previous forewords. Still it is impossible not to be confident of the future of our Great Empire and we are all firmly convinced that the present clouds will soon roll away and that we shall come through our difficulties strengthened by our experience, to continue our work on land and sea for the happiness and prosperity of all.

Although it may be necessary to stay our expansion for a short time there must be no question of going back. I am confident that the work at sea will continue so long as British ships sail the oceans, and we in the Meteorological Office will not relax our efforts to use to the full every observation sent in to us. At the moment the staff of the Marine Division is stronger than it has ever been and there is no proposal to reduce it. We can therefore maintain the level we have reached, consolidate the position gained, and plan for the future when better times return.

It is extremely encouraging to know that, in spite of the serious times through which British shipping is passing, there has been no decrease in enthusiasm for meteorological work at sea. Financial

crisis or no financial crisis the sailor has always to face the weather and routine remains the same at sea whatever is happening on shore.

I trust that by the time these words reach my readers the troubled waters will have been safely navigated and better times will be in the offing. It is therefore with hope and confidence that I wish all

those who have helped us in the past, whether on shore or at sea, a happy and successful New Year.

DIRECTOR.

Meteorological Office,

Air Ministry, London.

20th October, 1931.

THE MARINE OBSERVER, 1932.

The best of good wishes for 1932 to the Corps of Voluntary Marine Observers.

May the difficult times of 1931 which have fallen so heavily upon the sea service lead to improved commerce and better times for the Merchant Navy. We are confident that they will, for is it not our national characteristic to be at our best when faced with the greatest difficulties and to overcome them? In commencing the new year we can at least say regarding Marine Meteorology that following the recent reduction in the observing fleet and the increase in the number of computers, that we are now extracting all useful observations from Meteorological Logs as they are received and we hope in the near future to commence recovering the arrears of past years.

Wind Roses.

In this year's MARINE OBSERVER we are publishing wind roses for the region adjacent to the South West approaches to the British Isles, that is the 5° square to the S.W. of the Great Sole Banks; also wind roses with the frequency of different kinds of weather for the regions to the N.E. and S.W. of the Panama Canal.

These, being compiled by the Hollerith system from observations recorded since 1921 in parts of the world used by a very large proportion of the British Corps of Voluntary Marine Observers, not only give information which will be useful to a great many navigators, but they show how the work is progressing and serve as a check on the whole system of data extraction and compilation.

These Baillie Wind roses have the great advantage of giving clear indications of the *frequency* of the different strengths of the wind as well as the frequency of its different directions, and it is well worth the while of every sea officer to study them. We believe that they represent experience in the best way it can be depicted for seamen.

Charting Currents.

Commencing with the March number there will be published charts indicating the currents of the Persian Gulf, northern portion of the Arabian Sea, Bay of Bengal and region near Sumatra, now being compiled from observations made since the year 1910.

Commanders of ships who have used these waters are invited to send in remarks of their experience of currents, and to assist us by bringing to light any peculiarities of current which they may have observed, and how such knowledge may best be used in navigation.

Information of the set and drift of current when it has been possible to obtain it during cyclones is sought, and will be most helpful.

The charting of the currents along the main trade routes between Perim, Colombo and Fremantle and off the South and East Coasts of Africa as far eastward as Mauritius during the last two years, has been the means of adding much to our knowledge of the currents of the Indian Ocean and particularly of their seasonal changes. We hope during the coming year to find out more that is not now generally known of these currents, and to publish the information in THE MARINE OBSERVER. That information can only be complete if those who have had experience in navigating these waters will put it on paper and send it along so that it may be made common property for the benefit of all navigators.

The quarterly current charts to be published this year will be another step towards the production of the Atlas of Current Charts of the Indian Ocean, which it is intended shall be completed by the end of 1935.

Weather Signals.

In this number is given a general description of the scheme of communication for "Selected Ships," the instructions to British "Selected Ships" for routine Wireless Weather Telegraphy in all parts of the world, and the International Ships Wireless Weather Telegraphy Code, also the Decode.

In subsequent numbers will be given descriptions of Wireless Time, Weather, and Ice signals, made from the different coasts of the world, in geographical order, commencing with Great Britain, for the information of mariners. Only those Wireless Weather signals which are suitable for shipping will be included, and no other code than the International Ships' Wireless Weather Telegraphy Code will be given or encouraged in these pages.

The Visual Gale Warning signals for the British Coasts will be given in the February number. In the first eight volumes of THE MARINE OBSERVER each year, month by month we published descriptions of Visual Gale, Storm, and Hurricane warning signals in different parts of the world, hoping not only that the information would be of value in service, but by so collecting all these different signals in THE MARINE OBSERVER we might possibly assist towards their unification.

As Great Britain has now decided to retain her own system of visual gale warning signals, and visual gale storm and hurricane signals for each part of the world are given in the Admiralty Pilots, those for other parts of the world than Great Britain will not appear in these pages.

Utility of the Voluntary Work of the Corps of Marine Observers and its National Value.

At this time when so much thought is being given to the country's financial position, the restoration of trade and making ships pay, the Corps of Voluntary Marine Observers may do more good than ever by their example. In Marine Meteorological work progress is necessarily slow, so slow that some may become impatient and fail to realize the mastery of the work which is gradually coming to the British Merchant Navy. In the Merchant Navy there is in fact a wonderful store of knowledge of winds, weather, currents, and ice and their behaviour, mainly gained by experience. The Merchant Navy has been steadily improving its ability to apply this knowledge to navigation since the invention of Wireless Telegraphy.

In past years in these pages we have endeavoured to show how this knowledge of the officers of the Merchant Navy may be used to the best advantage by applying methods which have been used in the study of weather over the sea for many years by the Marine Division and long before Wireless Telegraphy was invented.

These methods were described as simply as we could in a series of articles which first appeared in the First Volume of THE MARINE OBSERVER, and have since been published in a separate book, WIRELESS AND WEATHER, AN AID TO NAVIGATION.

We showed how such knowledge aided by wireless communication and simple weather charts could be made to make navigation safer, also how in steamers with reciprocating engines and coal fuel, such

as we had commanded, economy of fuel could be effected. We also appealed to commanders of steamers with turbine engines and oil fuel, and to commanders of motor vessels, to give us the benefit of their experience regarding economies of fuel, through studying weather and currents. Here is where **The Work** can now be made of the greatest national value. If every British ship can save a small percentage of coal or other fuels in making her passage, through the application of information of weather and currents, the total gain to the nation will pay for the cost of all the instruments, literature and weather intelligence for shipping provided at the cost of the Exchequer, over and over again.

The Marine Observer's Log.

Our methods of encouraging the application of Marine Meteorology to navigation through these pages have been consistent throughout, ever since THE MARINE OBSERVER was launched eight years ago. We have sought to help those who help themselves, and so to encourage that resourcefulness in the officers of the Merchant Navy which has made the service what it is.

We occasionally receive written accounts from the Captains and officers of British Ships of experiences in which they have been able to better the navigation of their ships through the practice of Marine Meteorology. Many of these have been published in the pages of this journal headed "The Marine Observer's Log"; but we have

also heard of many more experiences, some of them more valuable as examples than any yet published. These could not be published on hearsay without the necessary confirmatory evidence. Now the way that British Voluntary Marine Meteorological work has gained all its success is simply through giving due credit to those at sea who do the work, and by making known whenever possible cases illustrative of practical utility and scientific interest.

Here then is a way in which the officers of the Merchant Navy and Marine Observers in particular can in the coming year serve the cause of Marine Meteorology, and by so doing assist towards the real economy which we strive for in our service which is entirely National, but also Imperial and International.

By economy we mean efficient work without wasted energy or expense.

Keep a look out on the weather, current, and ice; make use of the reports you receive from "Selected Ships," and when you find that you have really gained, write a true description of your experience and send it in with the weather charts you used or other documentary evidence so that it may be published in these pages to give proof to all of the value and utility of The Work and so further encourage it.

MARINE SUPERINTENDENT.

London.

October 5th, 1931.

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 Records of regular Marine Observers. Responsibility for statements rests with the Contributor.

SAIL.

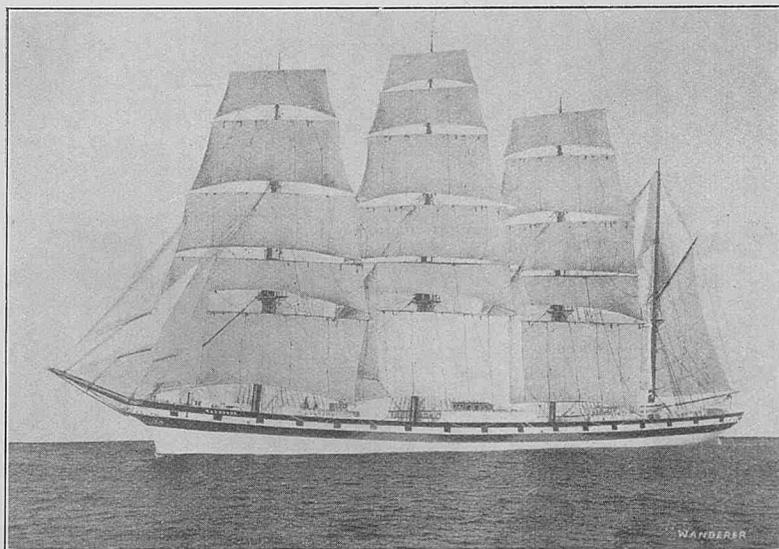
The publication of the note under this heading, with "A Rare Sight", in the November 1931 number has focussed the interest of marine observers, and we are now able to reproduce pictures of the four masted Barque *Wanderer* and the Ship *Siren*.

Further remarks and recent photographs of modern sailing training ships will be published in appropriate numbers.

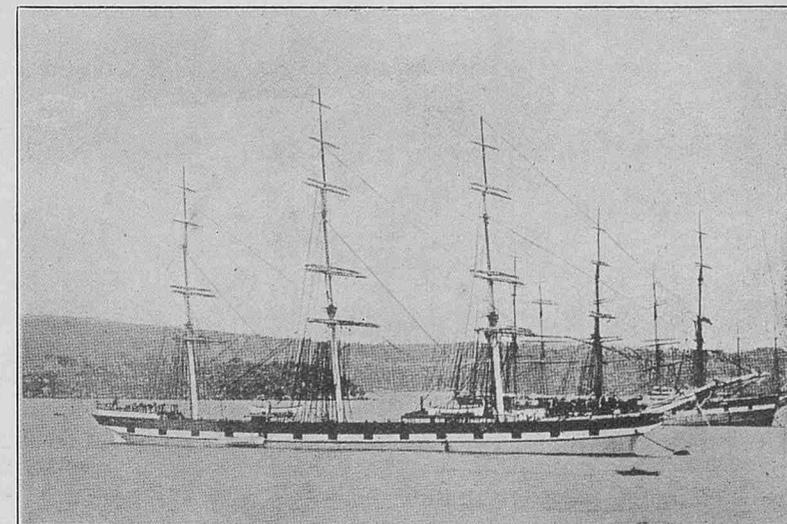
While this number was going to press news came to hand of the death of Captain JOHN BRANDER at Weymouth who was *Wanderer's* first master.

In 1907, when living at Weymouth in retirement, Captain BRANDER awoke one night shouting that he had seen his old ship go to destruction. Captain BRANDER told Mr. JOHN MASEFIELD, the Poet Laureate:—

"I saw the *Wanderer* at anchor, I saw her anchor light burning, I felt the inrush of water and I saw the crew leave the ship."



Four Masted Barque "Wanderer"



Ship "Siren"

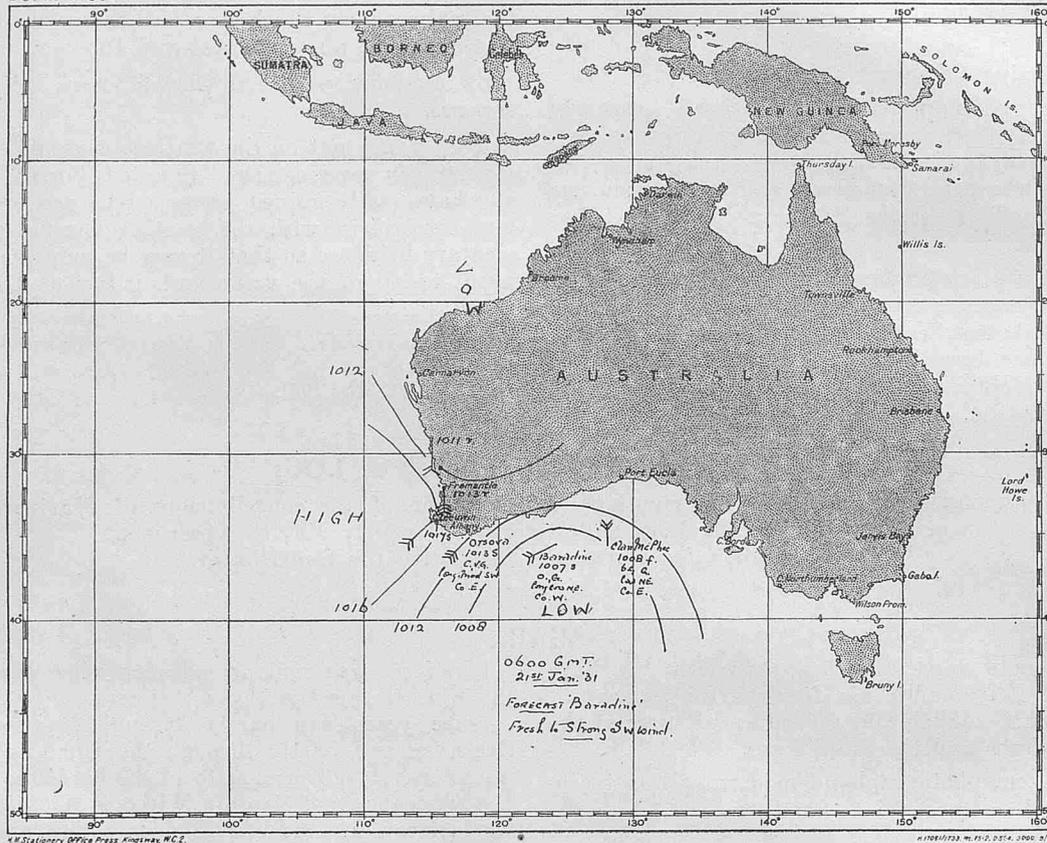
WEATHER CHARTS MADE AT SEA.

Australian Waters.

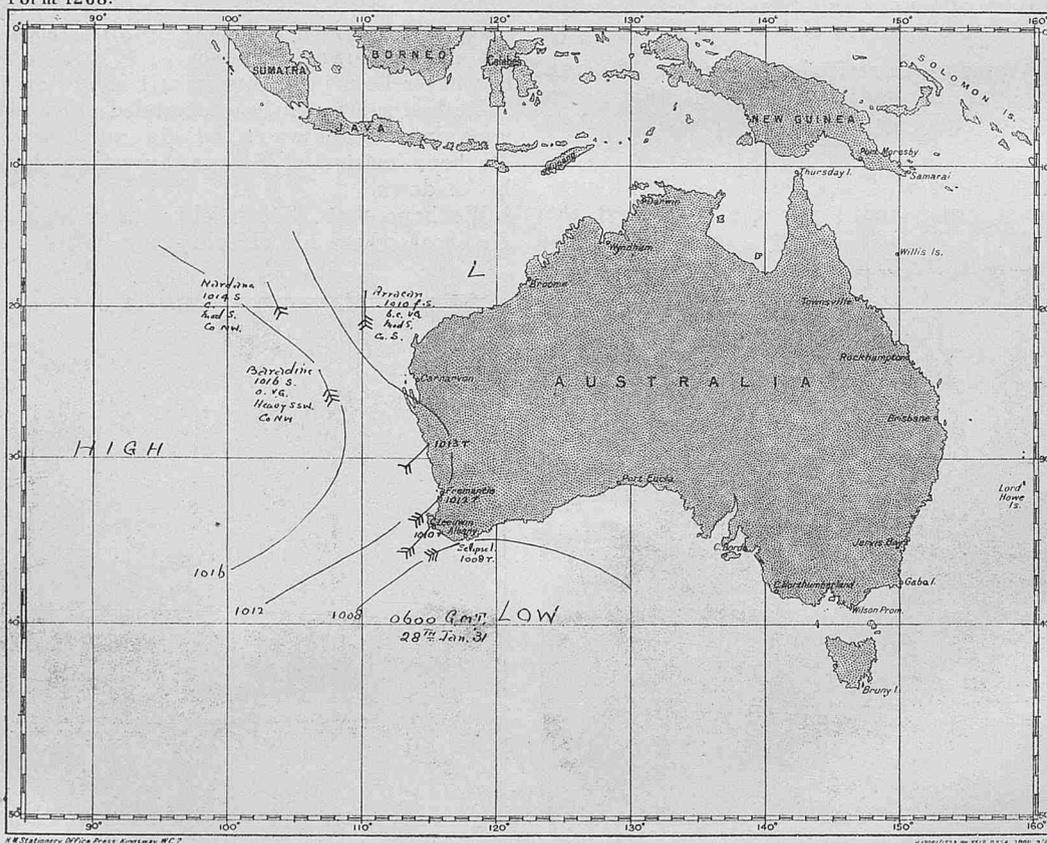
The weather charts below are two of a series made on board S.S. *Baradine*, Captain H. ELLIOTT-SMITH, by Mr. C. B. ROCHE, Chief Officer, who has done so much to develop the practice of wireless

and weather an aid to navigation and who has recently been promoted commander in the P. & O. Company's service.

Form 1268.



Form 1268.



PHOTOGRAPH OF CULPEPPER ISLAND.

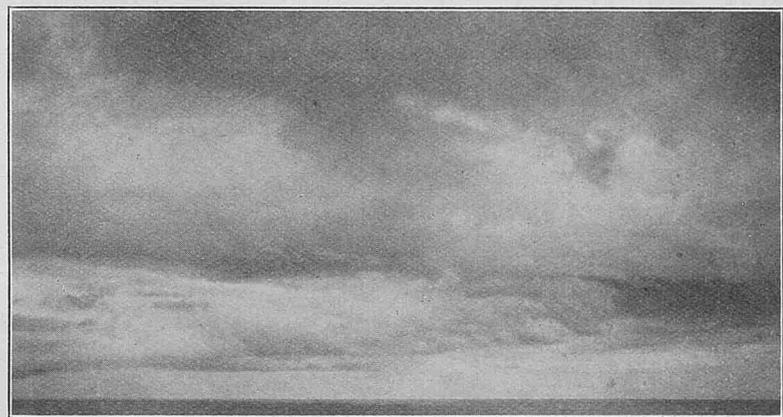
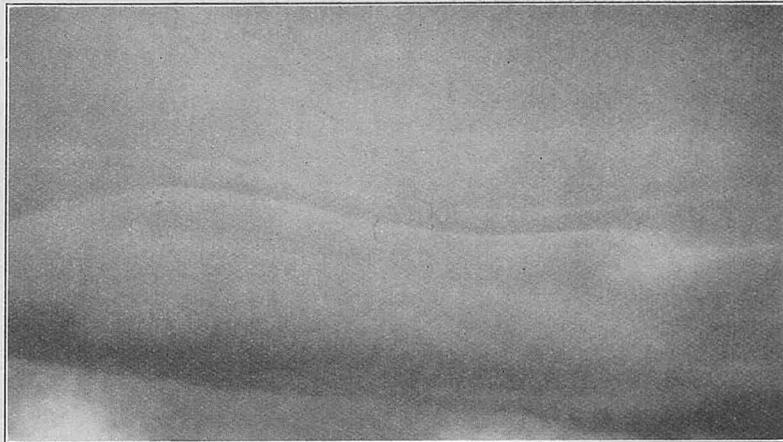
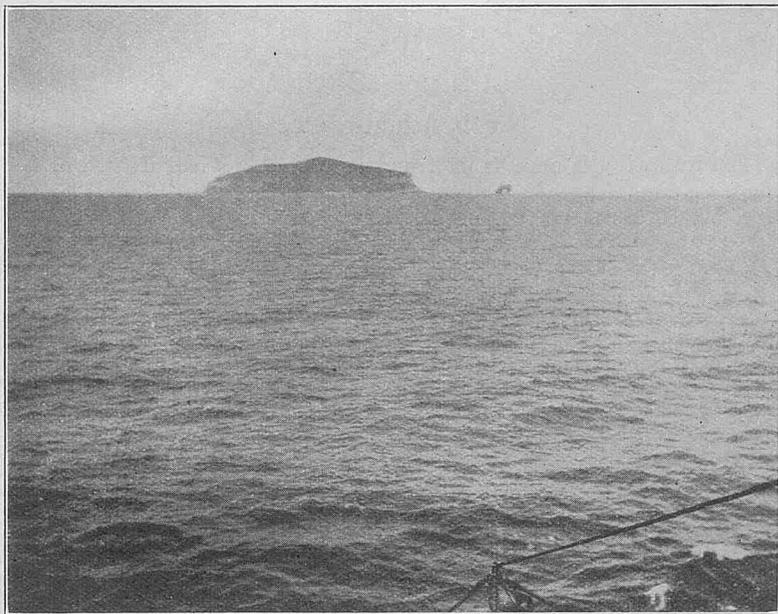
The accompanying photograph was received with the Meteorological Log of S.S. *Cambridge*, Captain R. WILLIAMS, Balboa to Auckland, N.Z.

"The photograph of the island was taken by Captain R. WILLIAMS on January 14th, 1931, at 11.04 a.m. when the island bore N. 41° W. True, distant 2.6 miles, showing adjacent perforated rock open to S.E. of main island. A sounding gave $\frac{1}{150}$

The current experienced in the vicinity of the island was found to be setting N. 56° W. True, one knot.

Wind S.E. by S. Force 2-3. Weather bc. Cumulus. Cloud amount 4.

Position: Culpepper Island Latitude 1° 39½' N. Longitude 92° 00' W."



Photograph taken on January 3rd, 1931, at 4 p.m. A.T.S. in Latitude 1° 01' S. Longitude 63° 47' E. According to the Meteorological Log the clouds were Ci, Ci-St, A-Cu, Cu-Nb and Nb. Cloud amount 7.



DISCOLOURED WATER.

East Indies.

The following is an extract from the Meteorological Log of S.S. *Arracan*, Captain S. THOMSON, Saigon to Geraldton, West Australia, observer Mr. G. DAVIDSON.

"Wednesday 21st January, 1931, at 6.15 p.m. A.T.S. a very distinct line was observed on the sea surface lying in a N.W. and S.E.'ly direction where light green water met muddy water. The densities taken one hundred feet on either side of the line showed the northerly green water to be 1020, temperature 83½°, and the muddy water 1015, temperature 83°.

Position of ship Latitude 2° 13' S. Longitude 105° 12' E. in Banka Strait."

CLOUD PHOTOGRAPHS.

South Indian Ocean.

The accompanying photographs have been received from S.S. *Port Sydney*, Captain J. J. HUDSON, Fremantle to Suez. Observer Mr. E. E. ROSWELL, 2nd officer.

Photographs taken on January 2nd, 1931, at 3.20 p.m. A.T.S. in Latitude 4° 32' S. Longitude 67° 13' E. According to *Port Sydney's* meteorological log the clouds at 4 p.m. A.T.S. were Cu-Nb and Nb. Cloud amount 10.

CLOUD FORMATION.

South Pacific.

The following is an extract from the Meteorological Log of M.V. *Karamea*, Captain A. McINTOSH, Lyttelton to Balboa. Observer Mr. K. D. G. FISHER, 2nd officer.

January 10th, 1931, at 0.30 a.m. sky 8/10 clouded, Ci-Cu/A-St. moving rapidly from Westward, A-Cu/St.-Cu slowly from Northward. Wind N. by E. force 3. 1.00 a.m. Large sheet of Ci-St. moving rapidly from Westward, on reaching a position ahead of the ship was observed to rend in all directions, the lanes opening up in a more or less circular formation, apparently caused by a whirl in the

upper air current. The cloud then rapidly broke up into shreds and disappeared to the Southward and Eastward. Considerable activity of this description was observed until 2.00 a.m.

Position of ship—Latitude $40^{\circ} 56'$ S. Longitude $158^{\circ} 22'$ W.

MIRAGE.

North Pacific.

The following is an extract from the Meteorological Record of S.S. *Loch Katrine*, Captain A. COCKS, San Francisco to United Kingdom; observer Mr. J. E. PARDOE MATTHEWS, 4th officer.

SSW SW



"28th January, 1931. 2.00 p.m. observed very pronounced refraction—beneath the sun. The two vessels appeared at first steady not unlike sailing ships, afterwards rising like boxes, distance about 20 miles. Between them the horizon was very jagged and a mirage of the swell could be seen running along the horizon. Half an hour later entered heavy fog.

Temperature, Air 58° Sea 52° .

Ship leaving San Francisco.

E

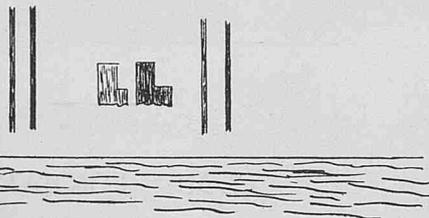


29th January, 1931, after leaving thick fog—C. Blanco Light observed at long distance—dipping and shaking with the swell, and at daylight the land appeared as in illustration. Low hills rose to the same altitude as each other, into fine pointed peaks or the flat topped hill shown and at the level of their apparent summits a belt of smoky haze was seen. Land distant about 37 miles. Apparent altitude of mirage $0^{\circ} 40'$. This was also the bearing at about the approximate sunrise bearing an hour later. Flat calm, Temperature, Air 52° Sea 52° .

Position of ship, Latitude $43^{\circ} 10'$ N., Longitude $125^{\circ} 12'$ W."

Red Sea.

The following is an extract from the Meteorological Record of S.S. *Narkunda*, Captain J. J. W. PARKER, R.D., R.N.R., London to Brisbane. Observers, Messrs. C. H. MOULTON, 2nd officer, and F. COLLINSON, Cadet.



22nd January, 1931, at 0755 Ship's Time (0546 G.M.T.), N.E. of Jubal Island, observed masts and funnel of a small steamer, bearing $S.27^{\circ}W.$, approximately 15 miles, apparently bound North-West through the Towila Channel. On inspection through a telescope a double horizontal mirage effect was distinctly seen—the whole thrown slightly clear of the horizon.

Temperature, air 58° F., sea 68° F., wind N.N.W., force 3.

Ship's Position, Latitude $27^{\circ} 42'$ N., Longitude $33^{\circ} 53'$ E.

ZODIACAL LIGHT.

Indian Ocean.

The following is an extract from the Meteorological Log of S.S. *Port Campbell*, Captain L. H. SWAN, Adelaide to Perim; Observer Mr. N. M. MUZZELL, 3rd officer.

"January 6th, 1931, 7.00 a.m. A.T.S. observed most pronounced whitish glow in the sky extending from the horizon to an elevation of 60° . The base bore 238° to 255° along the horizon maintaining this breadth up to an elevation of 20° and then tapering abruptly. The glow gradually became fainter above 45° and finally disappeared at 60° .

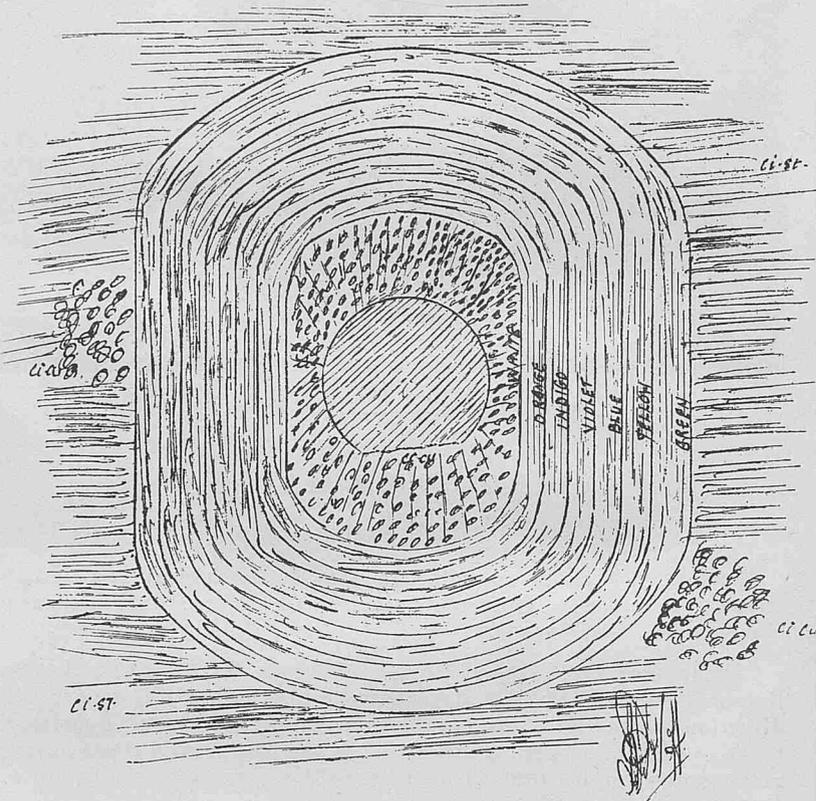
The atmosphere was exceptionally clear, the stars being very brilliant. At moonrise (7.55 A.T.S.) the glow was no longer visible. The moon's bearing on rising was 069° .

Position of ship, Latitude $7^{\circ} 40'$ N., Longitude $55^{\circ} 12'$ E."

LUNAR CORONA.

North Atlantic Ocean.

The following is an extract from the Meteorological Record of S.S. *La Rosarina*, Captain C. WEBB, Liverpool to River Plate, Observer Mr. W. S. HAMBLIN, 1st officer.



At 7.25 p.m. A.T.S. 2109 G.M.T. on January 2nd, 1931, observed a very clear lunar corona, of diameter $7^{\circ} 14'$. Altitude of moon's lower limb $41^{\circ} 22'$. Inner edge of corona very bright white and remaining colours very clear and distinctly defined; it faded from sight at 2120 G.M.T.

Clouds Cu. 2, Ci-Cu. 3, Wind N.N.E. 3. Barometer 30.00 in.
Position of ship (D.R.). Latitude 12° N., Longitude $27^{\circ} 15'$ W.

METEOR.

South Indian Ocean.

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

Port.	Berth.	Observing Ship.	Date and Time of observation.	State of Tide.	Specific Gravity.	Temp. of Sea.	Remarks.
Dunedin	Victoria Wharf	<i>Ruapehu</i>	9-10th February—Noon	Half Ebb	1023·1	59·3°	
New Plymouth	Moturoa Wharf	<i>Ruapehu</i>	11th February, 1931—9·30 a.m.	Half Flood	1023·0	59·0°	
	" "	"	17th February, 1931—10 a.m.	High Water	1025·8	61·2°	
	" "	"	18th February, 1931—11·30 a.m.	Ebb	1026·0	60·8°	
	" "	"	19th February, 1931—9·30 a.m.	Flood	1026·1	61·0°	
	" "	"	23rd February, 1931—6·30 a.m.	Low Water	1025·0	64·2°	Water slightly oily. Heavy rain in last 12 hours.
Geshorne	Newton King Wharf Roadstead	<i>Cambridge</i> <i>Cambridge</i>	16-18th February, 1931—Noon	1-3 hours after high water	1026·1	63°	
Oamaru... ..	Holmes Wharf	<i>Ruapehu</i>	10th March, 1931—11 p.m.	High Water	1025·3	60°	
Timaru	No. 3 Wharf	<i>Ruapehu</i>	11th March, 1931—5 a.m.	Low Water	1024·9	59°	
	" "	<i>Maimoa</i>	26-27th February, 1931		1025·2	57°	
	" "	<i>Ruapehu</i>	2nd March, 1931—10·30 a.m.	Flood	1023·5	59·8°	
Picton	Railway Wharf	<i>Maimoa</i>	18th March, 1931—Noon	High Water at 3·56 p.m.	1025·0	59·8°	
Bluff	" "	<i>Ruapehu</i>	5th March, 1931—9·30 a.m.	Flood	1025·3	60·8°	
	" "	<i>Maimoa</i>	23rd March, 1931—Noon	High Water at 3·50 p.m.	1025·6	56·2°	
Port Chalmers	" "	"	25th March, 1931—Noon	High Water at 5·31 p.m.	1025·2	56·0°	
Curaçao... ..	No. 2 Oil Berth	<i>Maimoa</i>	9-12th March, 1931		1025·5	58°	(Mean of 4 observations)
	Curacao Bay	<i>Cambridge</i>	6th January, 1931—4·30 p.m.		1023·9	80°	
	Inner Harbour	<i>Lochkatrine</i>	6th January, 1931—11·30 p.m.		1023·7	80°	
	" "	<i>Lochkatrine</i>	30th April, 1931—2·30 p.m.		1027	80°	
	" "	"	2nd May, 1931		1025		
Puerto Colombia	" "	"	6th May, 1931	Low Water	1025		
Puerto Armuelles	" "	"	7th January, 1931—4 p.m.	1 hour before high water	1025·0	75°	4 miles from the sea
Rio de Janeiro	Anchorage Bay	<i>Desna</i>	8th January, 1931—11·45 a.m.	$\frac{1}{2}$ hour after high water	1022·0	80°	5 miles from the sea
	No. 17 Armazem Quay	<i>Desna</i>					
	" "	<i>Highland Chieftain</i>	27th July, 1931—3·45 p.m.	2 hours after high water	1027		
	" "	<i>Demerara</i>	9th July, 1931	1 hour before high water	1002	70°	
Santos	No. 18 Shed	<i>Demerara</i>	28th July, 1931	2 hours before high water	1002	68°	
	" "	<i>Desna</i>	9th January, 1931—10 a.m.	$\frac{1}{2}$ Ebb	1014·7	80°	} Heavy local rains the previous night.
	" "	<i>Desna</i>	9th January, 1931—3·15 p.m.	$\frac{1}{2}$ Flood	1015·5	84°	
	" "	<i>Demerara</i>	10th July, 1931—11 a.m.	1 hour 10 min. before high water.	1017	69°	
	" "	<i>Demerara</i>	26th July, 1931	High Water	1012	64°	
Montevideo	No. 5 Shed	<i>Highland Chieftain</i>	28th July, 1931—1 p.m.	1 $\frac{1}{2}$ hours before high water	1024		Irregular Tides at this port. Rise and fall being governed by winds and local currents.
	" "	<i>Desna</i>	13th January, 1931	Apparently Ebb Tide	1010·0	80°	
	" "	<i>Maimoa</i>	22nd April, 1931—Noon		1001·2	63°	
	" "	<i>Demerara</i>	13th July, 1931	1 hour before high water	1000	49°	
Buenos Aires	North Basin	<i>Demerara</i>	23rd July, 1931	3 hours after high water	1000	50°	
	South Basin	<i>Desna</i>	14-16th January, 1931	No appreciable rise and fall	1000	82°	
	" "	<i>Desna</i>	17th January, 1931	Rising	1000	83°	
Esenada	Armours Frigorifico	<i>Demerara</i>	22nd July, 1931	High Water	1000	50°	
	" "	<i>Desna</i>	18th January, 1931—8 a.m.	Rising	1000	81°	
	" "	<i>Desna</i>	19th January, 1931—8 a.m.	Falling	1000	80°	
Port Arthur, Gulf of Mexico.	Swifts Frigorifico	<i>Desna</i>	20th, 21st January, 1931—8 a.m.	Falling	1003	80°	
New York	Texas Co. Oil Berth	<i>British Lantern</i>	21st August, 1931—1 p.m.	—	1007	91°	Practically no tide, much heavy oil on water.
	" "	"					
	Pier 61 North River	<i>Minnewaska</i>	24-25th August, 1931	High Water	1017·7	73°	
	" "	<i>Minnewaska</i>	25-26th August, 1931	Low Water	1017·0	73°	
Montreal	British American Oil Berth.	<i>British Lantern</i>	8-9th August, 1931	Constant Ebb 1 $\frac{1}{2}$ to 2 knots	1000	70°	

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

SOME PROOF OF THE VALUE OF THE BRITISH SELECTED SHIP SERVICE.

Last year in January after a N.W. gale had passed Eastward from the British Coast on the night of Saturday the 17th there followed a spell of strong North Westerly winds, backing West and falling light by Tuesday evening the 20th. On the morning of Wednesday January 21st the wind freshened from the Southward over the region served by forecasts in the British Weather Shipping Bulletin, and by W/T. gale warnings. There were no gales, that is wind of force 8 of any material duration on the British Coast between January 17th and 22nd though there may have been squalls reaching gale force and short spells of winds of force 7 "a moderate gale".

On Thursday evening January 22nd there was a southerly gale on the West Coast of Ireland which spread to the Eastward during the night and winds of gale force were experienced as far East as the Coast of Norway.

The Charts below from the reports of "Selected Ships" upon the roll call—and, where they synchronize with Selected Ships—Observations reported in the Weather Shipping Bulletin, indicate that every ship at sea fitted to receive on C.W. desiring to know, could know of the weather in the Eastern North Atlantic and Home Waters when this gale was approaching the British Isles and what the ships' reports told the Meteorological Office.

During last winter there were probably fewer British Liners running in the Trans North Atlantic service than there have been for many years. Times were very bad for passenger steamers and so there were much fewer ships fitted with long range W/T. in favourable positions to the Westward for the purpose of giving the desired information, than usual.

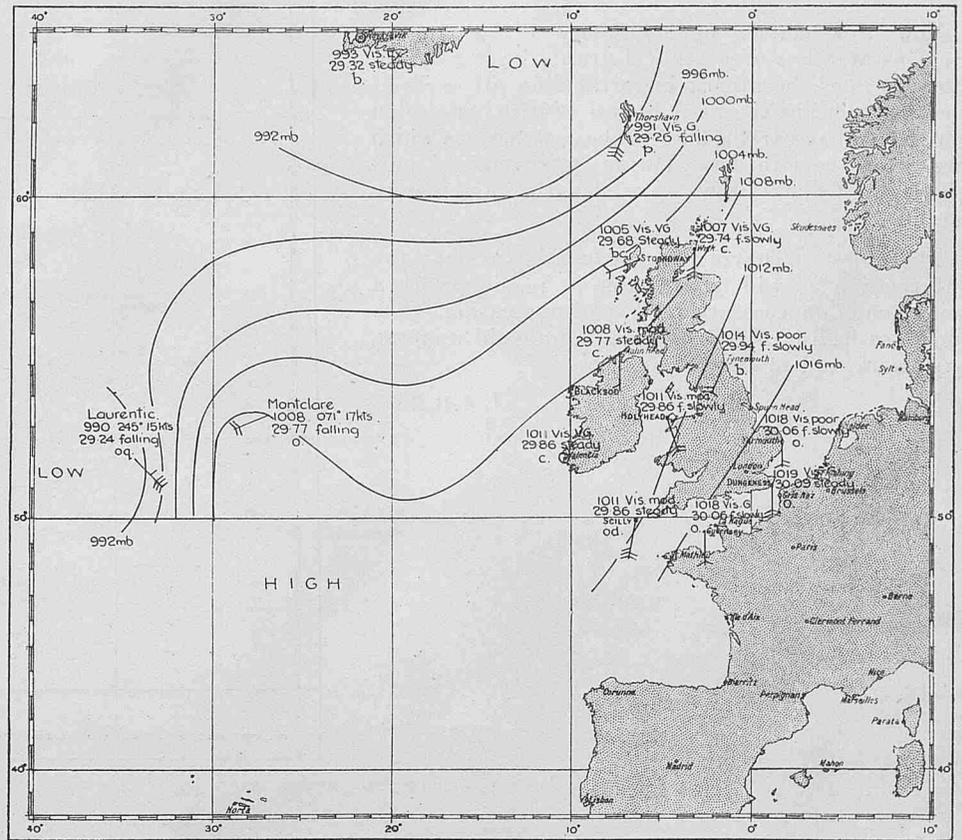
By means of the "Selected Ship" system, that is by maintaining in constant voluntary service a definite number of "Selected Ships" according to national tonnage, for the specific purpose of carrying on a regular service of routine Wireless Weather Telegraphy in all Oceans; notwithstanding the bad times of shipping the necessary reports have always been made.

Chart No. I.—On Wednesday evening January 21st, *Laurentic* and *Montclare*, two ships on the roll call so officered as they are expected to report 1800 G.M.T. observations which in this zone are not made by "Selected Ships" who have not two officers in a watch and a full complement of W/T. operators, provide information of a depression in about Latitude 51° N. Longitude 38° W. The shore observations indicate a depression N.W. of the Faroes and that a gale was probable, on the Northern Coast and in the Shetlands and Orkneys, and a gale warning was accordingly made.

Chart No. II.—At noon on Thursday January 22nd, *Montclare* and *Cameronia*, the only two ships on the roll call in position, report in accordance with schedule at 1218 G.M.T. and their information indicates to all concerned the advance which the depression has made to the Eastward and that gales may be expected on all coasts of the British Isles.

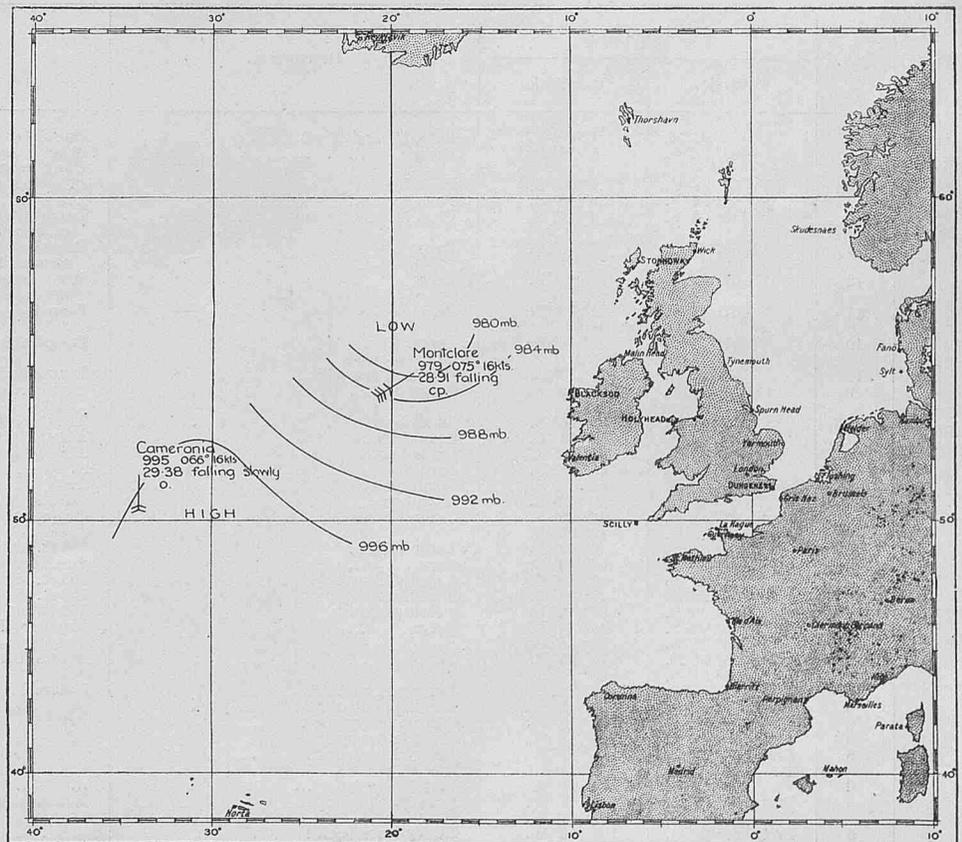
Chart No. III.—With continued unflinching regularity the ships on the roll call which should report do so in the evening that all may know what the weather is and is likely to be.

1800 G.M.T., 21st January, 1931.



Weather Chart No. I.

Noon, 22nd January, 1931.



Weather Chart No. II.

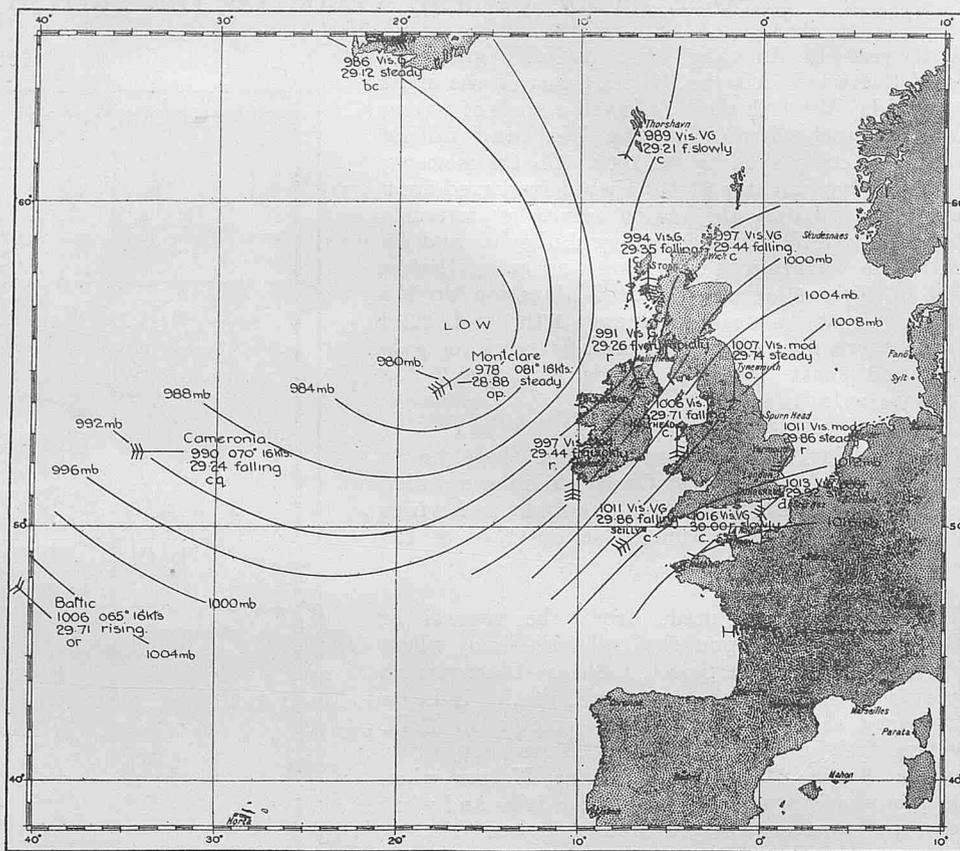
1800 G.M.T., 22nd January, 1931.

By such regular service, service that can be relied upon, the Meteorological Office is enabled to give information of Weather on the British Coasts, to make navigation in Coastal Waters safer and more economical.

Now this matter of regularity of service in Routine Wireless Weather Telegraphy by "Selected Ships" is of the utmost importance in all parts of the world, hence the need for all British "Selected Ships" to pay careful heed to the instructions which are given them in THE MARINE OBSERVER and particularly to use the wave lengths and times specified.

The object of having a schedule is to make the information as widely available as possible with a minimum of unnecessary W/T. communication. The object of having Selected Ships is to avoid unnecessary work and to ensure efficiency.

L.A.B.S.



Weather Chart No. III.

SOUTHERN ICE REPORTS.

During the Year 1931.

January.

Year.	Day.	Position of Ice.		Description.	Remarks.	Name of Ship reporting.
		Latitude.	Longitude.			
1931	15	61° S.	1° 30' E.	Pack Ice and Bergs	Few bergs visible in the pack ice	M.V. <i>Telena</i> .
	17	60° 23' S.	1° 54' E.	Bergs	Cleared main pack ice and saw many medium sized and a few large bergs.	do.
	16	60° 40' S.	2° 00' E.	Pack Ice		do.
	17	60° 50' S.	2° 10' E.	Pack Ice		do.
	14	59° 08' S.	3° 26' E.	Field ice and bergs	Large patch of field ice some 12-15 miles long, fair number of bergs.	do.
	13	58° 04' S.	9° 53' E.	Bergs	Passed at least 50 bergs during the day, some very large ranging from 150 ft. to 500 ft. high.	do.
	12	57° 06' S.	16° 25' E.	Bergs	Many bergs about, 5 to 8 in sight, most of time, most of bergs 150 to 400 ft. high.	do.
	11	57° 05' S.	21° 50' E.	Bergs	Passed about 20 large bergs during the day	do.
	10	57° 25' S.	27° 46' E.	Bergs	Passed about 25 bergs during the day	do.
	10	57° 32' S.	28° 36' E.	Berg and growlers	Very large berg, many growlers and loose bits	do.
	9	58° 25' S.	34° 38' E.	Bergs	Passed many bergs during the day, several always in sight.	do.
	1	55° 15' S.	38° 46' E.	Small berg	About 50 ft. high	do.
	1	55° 24' S.	38° 54' E.	Small berg	About 50 ft. high	do.
	1	56° 30' S.	39° 56' E.	Large berg	About 200 ft. high	do.
	8	60° 25' S.	40° 03' E.	Bergs		do.
	1	56° 50' S.	40° 15' E.	Small berg		do.
	8	60° 56' S.	40° 56' E.	High berg	460 ft. high	do.
	8	From 61° 42' S.	42° 16' E.	Several bergs	One about 1 mile long	do.
		To 61° 34' S.	42° 02' E.			
	3	62° 33' S.	46° 43' E.	Large berg	300 ft. high	do.
	3	62° 38' S.	46° 49' E.	Berg	Smaller than above	do.
	3	62° 59' S.	47° 10' E.	3 medium bergs	100 ft. high	do.
	3	63° 20' S.	47° 31' E.	2 medium bergs	150 ft. high	do.
	3	63° 30' S.	47° 42' E.	2 medium bergs	150 ft. high	do.
	7	From 63° 09' S.	44° 46' E.	Bergs	Number of large and small bergs, sometimes 7 or 8 in sight.	do.
		To 64° 41' S.	47° 48' E.			
	3	From 63° 50' S.	48° 03' E.	Bergs	Several bergs in distance	do.
		To 64° 01' S.	48° 14' E.			
	4	64° 52' S.	48° 26' E.	Bergs and pack ice	5 large bergs and edge of pack ice	do.
	6	69° 29' S.	101° 27' W.	Breaking out of heavy close pack		R.R.S. <i>Discovery II</i> .
	6	69° 23' S.	101° 19' W.	Cleared heavy pack		do.
	6	69° 32' S.	101° 18' W.	Beset in heavy close pack		do.
	6	From 69° 35' S.	101° 11' W.	Heavy loose pack ice		do.
		To 69° 32' S.	101° 18' W.			
	6	69° 46' S.	101° 16' W.	Very heavy ice		do.
	5	From 69° 37' S.	101° 14' W.	Loose pack ice	Working south through loose pack ice	do.
		To 69° 46' S.	101° 15' W.			
	5	From 69° 29' S.	101° 13' W.	Heavy loose pack ice		do.
		To 69° 37' S.	101° 14' W.			
	5	From 69° 17' S.	100° 56' W.	Pack ice		do.
		To 69° 29' S.	101° 13' W.			

SOUTHERN ICE REPORTS (continued).

Year.	Day.	Position of Ice.		Description.	Remarks.	Name of Ship reporting.
		Latitude.	Longitude.			
1931	6	From 69° 17' S.	101° 12' W.	Working through loose pack		R.R.S. <i>Discovery II.</i>
		To 69° 07' S.	100° 59' W.			
	6	From 69° 07' S.	100° 59' W.	Strong blink to southward		do.
	7	From 69° 07' S.	100° 59' W.	Many bergs, but no pack		do.
		To 68° 36' S.	99° 59' W.			
	5	From 69° 09' S.	100° 13' W.	Heavy pack and leads		do.
		To 69° 11' S.	100° 30' W.			
	5	From 69° 09' S.	100° 13' W.	Heavy pack ice	Strong blink to southward	do.
	4	From 69° 11' S.	100° 07' W.	Loose pack ice		do.
	4	From 69° 03' S.	97° 59' W.	Skirting drift ice		do.
		To 69° 14' S.	99° 32' W.			
	4	From 69° 03' S.	97° 59' W.	Pack ice and strong blink to southward		do.
	4	From 68° 39' S.	96° 19' W.	Cleared pack ice		do.
	4	From 68° 35' S.	95° 46' W.	Entered light pack ice		do.
	4	From 68° 33' S.	95° 36' W.	Light drift ice		do.
	7	From 67° 44' S.	95° 31' W.	Several bergs and fragments of ice		do.
	4	From 68° 15' S.	94° 25' W.	Several bergs		do.
	8	From 68° 05' S.	91° 12' W.	Sea littered with loose drift ice		do.
	8	From 68° 05' S.	91° 12' W.	Drift ice		do.
		To 68° 14' S.	89° 55' W.			
	8	From 68° 06' S.	89° 42' W.	Loose pack ice		do.
	8	From 67° 58' S.	89° 28' W.	Loose pack and drift ice		do.
	3	From 66° 35' S.	88° 45' W.	Brash ice	A few small fragments passed	do.
	8	From 67° 52' S.	88° 13' W.	Loose pack and drift ice		do.
	9	From 68° 04' S.	84° 56' W.	Drift ice	Met streams of drift ice, skirted it on various courses	do.
	9	From 68° 06' S.	84° 40' W.	Drift ice		do.
		To 67° 58' S.	83° 05' W.			
	9	From 68° 04' S.	81° 40' W.	Drift ice		do.
		To 67° 43' S.	81° 16' W.			
	1	From 67° 15' S.	81° 15' S.	Streams of Drift Ice		do.
	2	From 66° 58' S.	80° 34' W.	Drift ice	Skirting and in Drift Ice	do.
		To 66° 26' S.	80° 08' W.			
	2	From 66° 24' S.	80° 28' W.	Cleared Drift Ice		do.
	10	From 67° 22' S.	80° 20' W.	Small very thin pancake ice forming		do.
	10	From 67° 04' S.	77° 37' W.	Pack ice		do.
	11	From 68° 07' S.	74° 58' W.	Drift ice		do.
	11	From 67° 46' S.	74° 47' W.	Drift ice		do.
		To 67° 32' S.	74° 51' W.			
	12	From 67° 32' S.	74° 51' W.	Skirting drift ice		do.
		To 67° 13' S.	74° 26' W.			
	11	From 68° 09' S.	74° 47' W.	Entered light pack ice		do.
	11	From 68° 23' S.	74° 38' W.	Loose drift ice		do.
		To 67° 46' S.	74° 47' W.			
	11	From 68° 23' S.	74° 38' W.	Cleared main body of pack ice		do.
	11	From 68° 16' S.	74° 29' W.	Very heavy ice		do.
	11	From 68° 19' S.	74° 25' W.	In heavy pack ice		do.
	12	From 66° 59' S.	71° 34' W.	Pack ice and bergs	Met pack ice: skirted it on various courses. Many bergs	do.
		To 66° 45' S.	71° 16' W.			
	13	From 66° 21' S.	71° 31' W.	A few bergs		do.
	13	From 66° 40' S.	71° 00' W.	Loose drift ice		do.
	13	From 66° 57' S.	70° 37' W.	Bergs	Vessel surrounded by bergs	do.
	12	From 67° 05' S.	70° 27' W.	Many bergs		do.
		To 67° 27' S.	69° 35' W.			
	16	From 66° 16' S.	69° 45' W.	Several bergs		do.
	17	From 67° 47' S.	69° 40' W.	Pack ice		do.
	17	From 67° 15' S.	69° 40' W.	Numerous bergs		do.
		To 67° 47' S.	69° 39' W.			
	16	From 66° 45' S.	69° 37' W.	Ice blink to S.E'd		do.
	20	From 65° 45' S.	67° 46' W.	Many bergs		do.
	20	From 65° 02' S.	67° 20' W.	Many bergs		do.
		To 64° 55' S.	65° 50' W.			
	18	From 66° 39' S.	67° 08' W.	Many bergs and loose ice		do.
		To 66° 42' S.	66° 46' W.			
	19	From 65° 56' S.	66° 54' W.	Many bergs		do.
	18	From 66° 37' S.	66° 38' W.	Much loose ice		do.
	19	From 66° 37' S.	66° 38' W.	Small ice		do.
	19	From 66° 37' S.	66° 38' W.	Bergs and small ice thicker		do.
	20	From 66° 37' S.	66° 38' W.	Drift ice		do.
	21	From 64° 51' S.	64° 48' W.	Much ice	Of heavy floes, in harbour	do.
	22	Port Lockroy.			Harbour nearly full of heavy floes, entrance blocked	do.
	23	do.			Harbour half full of heavy floes	do.
	27	63° 23' S.	61° 30' W.	Several bergs		do.
	3	49° 23' S.	36° 00' W.	Berg	As ship proceeded southward bergs were too numerous to tabulate.	S.S. <i>Elae.</i>
	7	Sailed from South Georgia.		Pack ice	Met extreme northern edge of pack ice drifting in a general north-easterly direction at an average rate of 20 to 30 miles a day. Experienced whalers report the pack ice to be unusually heavy this season and extending farther north than usual in this longitude.	do.
	7	54° 10' S.	35° 22' W.	Berg	This is the same berg as that seen on 4th—showing a drift of 40 miles, setting 92°.	do.
	4	About 4 miles 105° from Cape Saunders (S. Georgia)		Berg		do.
	4	From 53° 06' S.	36° 42' W.			
		To South Georgia and then to				
	7	From 58° 20' S.	18° 12' W.	Numerous bergs and growlers		do.
	7	To 58° 20' S.	18° 12' W.			
	13	From 58° 12' S.	17° 35' W.	Numerous bergs and growlers		do.
	13	To 59° 24' S.	20° 37' W.			
		To 56° 36' S.	23° 20' W.			
		To 54° 33' S.	26° 35' W.	Numerous bergs and growlers		do.
		To 54° 21' S.	31° 30' W.			
	25	To South Georgia				
	27	From South Georgia				
		To 55° 57' S.	32° 34' W.	Numerous bergs and growlers		do.
		To 58° 26' S.	31° 26' W.			
	31	From 54° 20' S.	36° 05' W.	2 Bergs	Small, irregular, tabular	R.R.S. <i>William Scoresby.</i>
	22	From 54° 12' S.	35° 43' W.	2 Growlers	Estimated height 20 feet, estimated length 30 feet	do.
	23	From 54° 20' S.	35° 30' W.	1 growler		do.
	23	From 54° 25' S.	35° 15' W.	1 berg	Small, irregular	do.
	23	From 54° 23' S.	35° 10' W.	2 bergs, 9 growlers	1 moderate, tabular 1/2 mile, 1 small tabular berg	do.
	23	From 54° 30' S.	34° 40' W.	3 bergs, 5 growlers	1 small, 1 large tabular, 1 large irregular berg	do.
	23	From 54° 53' S.	33° 32' W.	2 bergs	Irregular, tabular	do.
	23	From 55° 00' S.	33° 28' W.	3 bergs, 4 growlers	Bergs, small, irregular, pinnaced 1/2 to 1/4 mile	do.
	23	From 54° 54' S.	33° 19' W.	3 bergs, 2 growlers, small ice	2 small weathered bergs, 1 moderate tabular berg	do.
	23	From 55° 05' S.	32° 40' W.	7 bergs, 12 growlers	2 moderate tabular 1/2 to 1/4 mile, 5 small irregular, weather bergs, 145 ft. high measured by sextant.	do.
		To 55° 05' S.	32° 40' W.		5 irregular (3 pinnaced, 2 tabular)	do.
	23	From 55° 12' S.	32° 07' W.	7 bergs		do.
	23	From 55° 12' S.	32° 07' W.			
	24	From 55° 20' S.	31° 40' W.	4 bergs, 14 growlers	Bergs, 2 tabular, 1 irregular, 1 pinnaced	do.
	24	From 55° 20' S.	31° 40' W.	2 bergs, 1 growler	Bergs, 1 irregular, 1 tabular	do.
	24	From 55° 20' S.	31° 40' W.	12 bergs	8 irregular, 4 tabular	do.
	24	From 55° 25' S.	31° 20' W.	9 bergs	Small, irregular	do.
	24	From 55° 25' S.	31° 20' W.	10 bergs	9 small irregular, 1 moderate tabular	do.
		To 55° 30' S.	31° 00' W.			

SOUTHERN ICE REPORTS (continued).

Year.	Day.	Position of Ice.		Description.	Remarks.	Name of Ship reporting.
		Latitude.	Longitude.			
1931	26	56° 25' S.	31° 05' W.	Bergs	Ran into a thick belt of many bergs of various sizes, large and small.	M.V. <i>Telena</i> .
	26	From 57° 25' S.	31° 04' W.	Not much ice ... ..	...	do.
		To 56° 25' S.	31° 05' W.	...	...	do.
	25	57° 40' S.	31° 02' W.	Bergs	Cleared main pack then passed occasional bergs ...	do.
	25	59° 12' S.	31° 00' W.	Pack ice ... ..	...	do.
	24	(Noon position) 55° 30' S.	31° 00' W.	10 bergs	Mainly low, curved and smooth. Few high pinnacled and irregular.	R.R.S. <i>William Scoresby</i> .
	27	53° 33' S.	30° 50' W.	5 very large bergs ... ..	...	M.V. <i>Telena</i> .
	27	52° 21' S.	30° 58' W.	1 berg ... ..	...	do.
	24	55° 35' S.	30° 40' W.	10 bergs, 40 growlers	Bergs mainly small, much weathered, capsized and partly capsized, 2 tabular.	R.R.S. <i>William Scoresby</i> .
	24	55° 40' S.	30° 30' W.	20 bergs, 100 growlers ... ..	...	do.
	28	48° 00' S.	30° 20' W.	1 berg	Last ice seen	M.V. <i>Telena</i> .
	24	56° 00' S.	30° 15' W.	9 bergs, 65 growlers ... ..	...	R.R.S. <i>William Scoresby</i> .
	24	59° 40' S.	29° 50' W.	22 bergs, 12 growlers	8 tabular, 14 irregular and pinnacled bergs	do.
	24	From 59° 40' S.	29° 50' W.	31 bergs, 39 growlers	Bergs 17 irregular (mostly small) 14 tabular and smooth...	do.
		To 55° 44' S.	29° 17' W.	2 bergs	Tabular	do.
	24	From 55° 44' S.	29° 17' W.	13 bergs and 14 growlers	Bergs low, curved, and smooth and tabular	do.
		To 55° 53' S.	28° 50' W.	1 berg, 4 growlers	Berg, Pinnacled	do.
	24	From 55° 53' S.	28° 50' W.	1 berg, 9 growlers ... ..	...	do.
		To 55° 58' S.	28° 34' W.	1 berg, 60 growlers	Tabular, berg, estimated length 1 mile, growlers mainly broken from previous berg.	do.
	24	From 55° 58' S.	28° 34' W.	12 bergs ... ..	...	do.
		To 56° 03' S.	28° 15' W.	6 bergs, 10 growlers, loose ice	Irregular, small bergs	do.
	24	N. W. of Zavadovski.	28° 15' W.	20 bergs, 50 growlers, loose ice	2 Tabular bergs	do.
	24	56° 29' S.	27° 23' W.	5 bergs, 20 growlers	Bergs, tabular	do.
	25	56° 28' S.	27° 14' W.	7 bergs, 5 growlers	6 low tabular bergs, 1 irregular	do.
	25	From 56° 28' S.	27° 14' W.	2 bergs, 2 growlers	Bergs tabular, weather bergs	do.
		To position off Visokoi	27° 14' W.	25 bergs, many growlers, loose ice, drift ice	Mainly low and irregular bergs. Old rotten ice. Honey-combed and snow covered.	do.
		Off Visokoi.	26° 54' W.	8 bergs, many growlers, much loose ice...	Bergs, large irregular, passed through quantity of drift ice	do.
	25	From position off Visokoi	26° 54' W.	1 berg, many growlers	Low tabular berg, length 2½ miles (measured)	do.
		To 56° 13' S.	26° 54' W.	Many bergs and growlers	Skirting drift ice	do.
	25	56° 05' S.	26° 40' W.	20 bergs, drift ice, many growlers	Bergs mainly irregular small, 1 low tabular about 30 ft. Floes very rotten and old.	do.
		To 56° 03' S.	26° 00' W.	30 bergs	Mainly irregular	do.
	25	From 56° 03' S.	26° 00' W.	Many growlers	Mainly irregular growlers	do.
		To 56° 09' S.	25° 16' W.	15 bergs, many growlers, drift ice	Mainly irregular growlers	do.
	26	56° 30' S.	25° 25' W.	Bergs	Many bergs in sight and near all day	M.V. <i>Telena</i> .
	21	(Noon position) 55° 15' S.	24° 27' W.	20 bergs, 50 growlers, drift ice	Bergs small irregular and weathered, 5 moderate tabular, 1 large tabular about 1 mile. Very rotten floes honey-combed.	R.R.S. <i>William Scoresby</i> .
	26	From 57° 30' S.	24° 00' W.	14 bergs, 26 growlers	Bergs tabular, mainly irregular	do.
	27	To 57° 41' S.	23° 12' W.	20 bergs, many growlers, drift ice	Bergs irregular	do.
	27	57° 41' S.	23° 12' W.	6 bergs, many growlers, drift ice	Bergs irregular	do.
	27	57° 30' S.	23° 00' W.	10 bergs, many growlers, drift ice	Bergs irregular	do.
	28	From 57° 30' S.	21° 11' W.	9 bergs, 22 growlers	Bergs mostly irregular, 3 large tabular	do.
		To 58° 10' S.	19° 42' W.	10 bergs, 8 growlers	3 large low tabular bergs	do.
	28	58° 06' S.	19° 35' W.	30 bergs, 15 growlers	Bergs irregular	do.
	28	58° 20' S.	19° 00' W.	15 bergs	Mainly small irregular. Several small tabular	do.
	28	From 58° 20' S.	18° 03' W.	7 bergs, 12 growlers	Bergs mainly small irregular. Several small tabular	do.
		To 58° 43' S.	18° 03' W.	2 bergs, 11 growlers	Bergs small irregular	do.
	29	58° 05' S.	18° 05' W.	1 berg, 1 growler	Berg irregular	do.
	29	58° 43' S.	18° 03' W.	Many growlers, loose ice ... ..	...	do.
	29	60° 50' S.	18° 00' W.	2 bergs, 1 growler	Bergs small irregular	do.
	29	60° 18' S.	17° 59' W.	Bergs, bergy bits and growlers	Many bergs in sight all day, some large, many bergy bits and growlers among the bergs.	M.V. <i>Telena</i> .
	20	(Noon position) 55° 54' S.	16° 46' W.	2 bergs	Irregular	R.R.S. <i>William Scoresby</i> .
	29	63° 02' S.	16° 36' W.	2 bergs	Bergs, small irregular	do.
	29	63° 20' S.	16° 20' W.	2 bergs	Irregular	do.
	29	64° 00' S.	15° 45' W.	4 bergs	Irregular	do.
	29	64° 08' S.	15° 38' W.	4 bergs	Irregular	do.
	29	64° 40' S.	15° 30' W.	4 bergs	Small, irregular	do.
	19	(Noon position) 56° 37' S.	10° 08' W.	Bergs	Few, 3 or 4 very large	M.V. <i>Telena</i> .
	18	58° 26' S.	3° 32' W.	Bergs	Many bergs in sight, all the time, at least 20 always visible.	do.

Reports of Ice previous to January, 1931, will be found in The Marine Observer, Volume VIII, No. 85, p. 14.

WEATHER SIGNALS.

UNDER Weather Signals it is intended to publish particulars and concise descriptions of Signals and Code used for reporting Weather, Ice, and Time in four sections.

- I. Ships' Wireless Weather Signals.
- II. Wireless Weather Signals made from the shore to ships. (Bulletins, Wireless storm, and ice warnings.)
- III. Wireless Time Signals.
- IV. Visual Weather Signals made at the Coast. (Gale warnings.) British Isles only.

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

The International Ships' Wireless Weather Telegraphy Code and Decode which came into force on May 1st, 1930, are given on pp. 20-28.

Request for information to Meteorological Services of Maritime Countries.

Invitation is hereby given to send concise descriptions of Weather Signals made for the information of shipping and seamen in all parts of the World, in accord with the International Convention of Safety of Life at Sea, 1929, with a view to publication in the appropriate number of "The Marine Observer." Only limited space is available.

Request for Information to the Weather Services desiring British Selected Ships' Routine Wireless Weather Reports.

Meteorological Services desiring to receive coded weather reports made by "A selected ships" in the Fleet List in this Journal, are invited to forward the following information in order that it may be included in the instructions to British "Selected Ships":—

- (1) The name of the receiving W/T Station, (C.W.), with call sign, latitude, and longitude and particulars on similar lines to that given on page 16 for Portishead, as far as applicable and with a view to covering the largest area as possible, see Chart II (lithographic).

- (2) The Telegraphic address of the service desiring to receive these Selected Ships' reports, and the groups of the Universal International Ships' Wireless Weather Telegraphy Code desired.

Reports from "B selected ships" may be intercepted by shore stations as required.—see pp. 18 and 19.

In order that all concerned may know what stations in different parts of the world are detailed to receive reports from "B selected ships", information similar to that given in the list on pages 18 and 19 is desired.

I. SHIPS' WIRELESS WEATHER SIGNALS.

VOLUNTARY.

SCHEME OF COMMUNICATION FOR BRITISH SELECTED SHIPS' ROUTINE WIRELESS WEATHER TELEGRAPHY.

Commenced May 1st, 1930.

Based on the experience of British "Selected Ships" in making Meteorological reports by Wireless to all ships and certain shore stations and in view of the difficulties experienced through not having a world-wide system including definite times for reporting by W/T, following Art. 35 of the International Convention of Safety of Life at Sea, 1929, a scheme was submitted for the consideration of the International Meteorological Organisation at Copenhagen in September, 1929.

This recommendation could not be adopted until a trial had been made, and the British Meteorological Office was invited to carry out a trial as soon as possible.

This scheme provides on a voluntary basis for a system by which "Selected Ships," when at sea, make meteorological observations at fixed times G.M.T., and subsequently report these observations at fixed times G.M.T., to certain coast stations and to all ships; the main principles being that:—

- "Selected Ships" fitted for long range transmission to address their reports to the appropriate shore station and use

the wave length allotted to that station; Berne and all concerned being notified that the information may be intercepted and used by all ships.

"Selected Ships" not fitted for long-range transmission to address their reports to C.O. (all ships) using wave length 600 metres spark, shore stations within range intercepting them as required.

"Selected Ships" be limited to a certain total, the complement to be maintained by each maritime country party to the Convention of Safety of Life at Sea to be according to their proportion of the world's tonnage, steam and motor, of vessels of over 100 tons.

The following table gives the world's tonnage and the number of selected ships at present desired for each maritime country of the world, including those that are not yet party to the Convention of Safety of Life at Sea.

Total Merchant Tonnage approximate (Steam and Motor) of the World

(Vessels over 100 tons, Lloyd's Register Book, 1931-32)

and Number of Selected Ships required for making W/T. Weather Reports, in all Oceans, World Wide.

Country.	Steamers and Motor Vessels.		Percentage of World Tonnage.	Number of "Selected Ships" required.	Number of Ships fitted for C.W. Long Wave Transmission (October, 1931).
	Number	Gross Tons.			
Great Britain and Ireland.	7,781	20,193,677	30.6	306	200
Australia and New Zealand.	593	677,463	1.0	10	—
Canada (excluding Lakes).	645	959,671	1.6	16	20
Hong Kong ...	119	273,431	0.4	4	—
India and Ceylon	150	191,551	0.3	3	—
South Africa and Other Colonies*	502	446,820	0.7	7	3
British Empire Total.	9,790	22,742,613	34.6	346	223
America (excluding Lakes) (United States).	2,847	10,454,013	15.8	158	402
Argentina ...	299	303,338	0.5	5	1
Belgium ...	234	542,432	0.8	8	8
Brazil ...	297	493,943	0.7	7	10
Chile ...	113	180,115	0.3	3	3
China ...	229	331,849	0.5	5	—
Danzig ...	41	204,716	0.3	3	—
Denmark ...	677	1,133,201	1.7	17	28
Estonia ...	90	82,089	0.1	1	—
Finland ...	223	244,357	0.4	4	—
France ...	1,521	3,513,179	5.3	53	19
Germany ...	2,151	4,226,050	6.4	64	45
Greece ...	539	1,397,782	2.1	21	—
Holland ...	1,410	3,111,357	4.7	47	28
Italy ...	1,101	3,273,525	5.0	50	58
Japan ...	1,969	4,276,341	6.5	65	219
Jugo-Slavia ...	180	361,365	0.6	6	—
Norway ...	1,981	4,061,629	6.2	62	14
Portugal ...	176	254,258	0.4	4	17
Russia (Soviet Union).	383	600,835	0.9	9	14
Spain ...	771	1,211,817	1.8	18	18
Sweden ...	1,339	1,678,776	2.6	26	3
Turkey ...	190	179,287	0.3	3	—
Other Countries	712	1,040,992	1.5	15	3
Total ...	29,263	65,899,859	100.0	1,000	1,113

* Including Dominion of Newfoundland.

The main points are as follows:—

- (1) The number of messages required for this service is comparatively small, if efficiently organized.
- (2) If not efficiently organized and limited the result has proved to be congestion of communication, wasted energy, expense and consequent loss of efficiency.
- (3) The Marine Meteorological code or form of message used must be universal throughout this Marine Meteorological service, simple and concise, giving only essential information.
- (4) There are two main classes of "Selected Ships" to be considered:—
 - (a) Ships fitted with long range, Type A1 apparatus, mostly mail liners, sailing and arriving at dates fixed by mail contract; termed "A Selected Ships."

(b) Ships fitted with short range A2 or Type B apparatus including many passenger and cargo liners sailing according to an advertised programme; also a number of cargo vessels whose movements are irregular, termed "B Selected Ships."

(5) "A Selected Ships" should work a definite schedule under the control of specified coast wireless stations in parts of the world where there is congestion.

(6) The movements of a number of "B Selected Ships" are uncertain, and in some areas there may be more than are required to report, when the full number of "Selected Ships" of all nations has been reached. Control from coast wireless stations is impracticable; moreover, in some areas where there is not a great deal of shipping, and in certain seasons, it will be necessary for other ships as well as "Selected Ships" to make reports, and this applies particularly to Hurricane, Cyclone and Typhoon regions.

All that can be said is that at present, on the most frequented mail liner routes, notably the Trans-North Atlantic, no routine wireless meteorological reports are necessary from "B Selected Ships," at certain shore stations, except in cases of urgency.

In all parts of the world which cannot be adequately served by "A Selected Ships," "B Selected Ships" should broadcast their reports to C.Q. (all ships) on 600 metres spark at schedule times.

This may result in interference, but at least ships and stations which are anxious to obtain information at no great range will be able to receive it, for obviously those on the spot will arrange matters of communication within the schedule times laid down, and when reports are not received, repetition will be asked for as necessary.

This broadcasting by "B Selected Ships" on 600 metres spark, of routine meteorological reports has its weak points, but at present there is no alternative; and it is of the utmost importance that reports from "Selected Ships" should be available to all ships and meteorological centres through certain stations in all parts of the world, particularly in the hurricane regions, and in the regions of heavy weather on the less frequented trade routes of the Southern Ocean.

The following schedule gives times (Greenwich Mean Time) of observation agreed to internationally and times (G.M.T.) of the commencement of periods for transmission of these reports, based upon these observation times and the established periods of wireless operator watches. It should be noted that they follow immediately after the S.O.S. three-minute period of silence.

Schedule.

All times are G.M.T.

Zones between Greenwich Meridians.	FIRST WEATHER REPORT.			SECOND WEATHER REPORT.		
	Times of observations.	Times of reporting by Type A1 (C.W.) Ships.	Times of broadcasting by Type A2 (I.C.W.) and Type B (Spark) Ships.	Times of observations.	Times of reporting by type A1 (C.W.) Ships.	Times of broadcasting by Type A2 (I.C.W.) and Type B (Spark) Ships.
30° W.—30° E.	0600	{ 0618 } { 0818 }	0830	1200	1218	1230
30° E.—80° E.	0600	{ 0618 } { 0818 }	0630 } 0830 }	1200	1218	1230
80° E.—160° E.	0000	0018	0030	0600	{ 0618 } { 0818 }	0830
160° E.—140° W.	0000	0018	0030	1800	{ 1818 } { 2018 }	2030
140° W.—70° W.	0000	0018	0030	1800	{ 1818 } { 2018 }	1830 } 2030 }
70° W.—30° W.	1200	1218	1230	1800	{ 1818 } { 2018 }	2030

Chart I below gives the W/T operator zones and times of observation, those being starred which are usually during daylight.

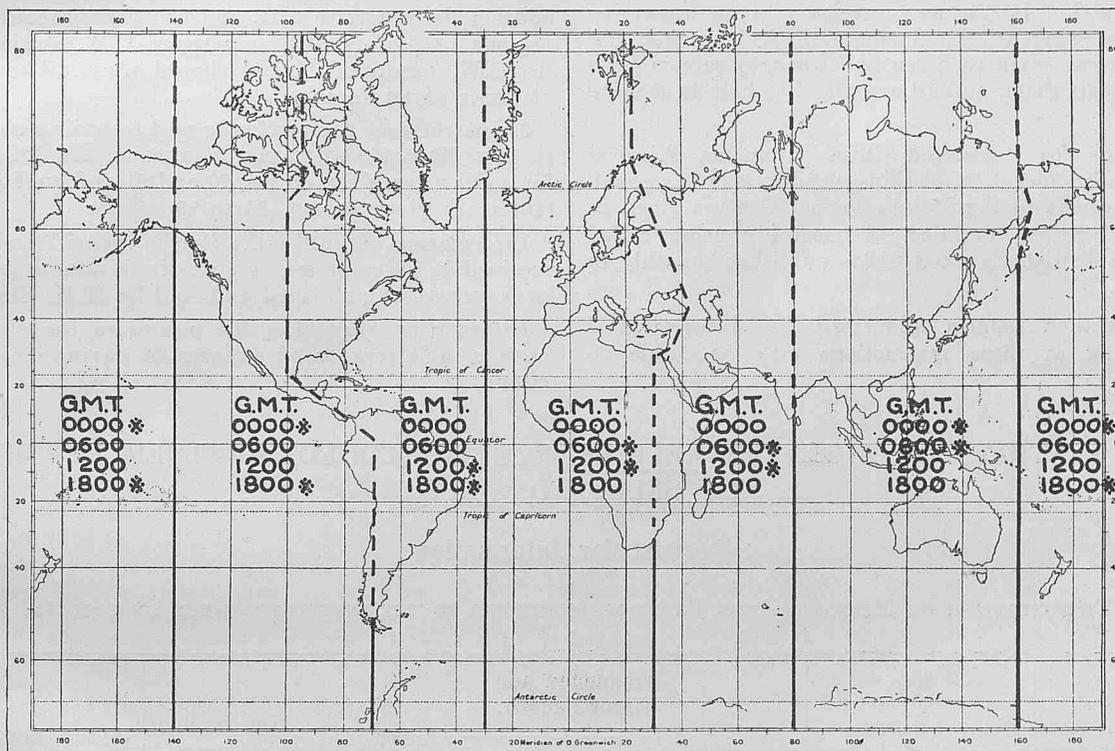
It will be noted that against some of the observation times there are two times of commencement of periods for transmitting. The second of these times, where two occur, are for single operator ships to report, in cases where they would not be keeping wireless watch following the observation hour. It should be remembered that a large proportion of "Selected Ships" carry two or three operators, and they should use the earlier periods for transmission, also

repeating for the benefit of ships with one operator during the second period.

Relaying on the wave lengths given in this Schedule should not be resorted to; but every endeavour should be made for the reports in areas in which the *Jacques Cartier* type of ships are working, to reach those ships, who will relay them to special shore stations for the information of Meteorological Offices on a special short wave for long range.

CHART I.—SHIPS' WIRELESS WEATHER SIGNALS.
International Observation Times for Weather Telegraphy at Sea.

* Indicates usually daylight hours.



In further explanation of this scheme.

There are 3,692 British ships fitted with W/T. The proportion fitted with Type A1 apparatus is about 1 to every 20 fitted with Type A2 or Type B apparatus.

"Selected Ships" are selected from those whose commanders have volunteered to carry out regular Meteorological work at sea, according to their sailing schedule and trade to provide distribution; according to their wireless apparatus to ensure efficient communication; and according to the capacity and keenness of their officers to ensure the most accurate information.

At present about 1 in every 3 British "Selected Ships" has Type A1 apparatus, that is, there is one "A Selected Ship" to every two "B Selected Ships."

It is obvious that "A Selected Ships" whose approximate position on certain dates can be foreseen, can be informed in what order to report, when in areas where there are more "Selected Ships" than are necessary to supply the number and distribution of reports required.

It is equally obvious that a number of "B Selected Ships" cannot be so treated.

With regard to (5), in the case of "A Selected Ships" in the Eastern North Atlantic the Meteorological Office, London, will furnish Portishead Wireless Station (at 1230 G.M.T.) with the names

of chosen "Selected Ships" every day; and Portishead will call up those ships at 2230, 0330 and 1030 G.M.T. daily and indicate the order in which they should make their reports, thus ensuring a minimum of signalling and the best distribution of reported observations.

It has not been found necessary for "A Selected Ships" to be controlled in the same way by stations in parts of the world where there are not likely to be many "A Selected Ships" within range.

Chart II, to be found at the end of this number (lithographic), is intended to illustrate the scheme. It gives coast wireless stations in all parts of the world, which receive or intercept these reports.

Information of stations in different parts of world detailed to work in this scheme are given on pages 16 to 19 and these are revised and repeated monthly in THE MARINE OBSERVER.

Until such information is available "A Selected Ships" should broadcast their reports in parts of the world not covered by such long range stations, at schedule times on 2,100 metres wave length.

The value of Selected Ships' reports made on 2,100 metres wavelength, with a range of about 1,500 miles, is considerable to all ships at sea, distant information being an essential for the purpose of Wireless and Weather as an Aid to Navigation.

Chart I above gives the International times of observation and the wireless watch zones, those observation times in each wireless watch zone which generally fall during daylight being starred.

Many "A Selected Ships" and "B Selected Ships" only have one officer in each watch. The first essential for safe navigation is a good look-out kept by the officer of the watch, as well as the look-out men. In the Merchant Navy the officer of the watch is responsible for meteorological observation and the accuracy of reports. If the officer of the watch at night goes into the lighted charthouse to take meteorological observations and draft a report, not only does he leave his post of look-out, but he returns to the bridge momentarily blinded. Hence Wireless Meteorological Reports at night should not be required as a matter of routine.

There are a number of "Selected Ships" which carry two watch-keeping officers for each watch, and in such ships it is desired that observations should be made and reported at all four times. Those made at the times not starred being reported as soon as convenient.

The schedule was worked out in consultation with wireless experts to overcome the confusion, jamming and waste, which disheartened all concerned. It is not necessary that reporting ships only should know when to signal meteorological reports, but that all ships should know when to listen and when to refrain from communication which jams them, and all are asked to help in making this scheme a success.

No charges are made for "Selected Ships" Routine Wireless Meteorological Reports broadcast to all ships or addressed in accordance with these instructions to the Meteorological Centres given in the list of Wireless Stations detailed to receive routine coded Weather Reports from British Selected Ships published monthly in THE MARINE OBSERVER.

Ships' Wireless Weather reports addressed to Meteorological Centres not conforming to these instructions may be liable to charges.

Brief Instructions for convenience and guidance of Marine Observers and W/T Operators.

1. At 0, 6, 12 and 18 hours G.M.T. record observations on Form 911 or in Form 915. When there are not two officers in the watch omit these observations during darkness.

2. In "Selected Ships" immediately code these observations on Form 138 and write out message on Form 139. In the case of "Selected Ships" fitted for C.W. long range transmission address the report to the appropriate Meteorological Centre. The report should be sent through the appropriate W/T. station indicated in the list on pages 16 and 17, which will be repeated monthly in THE MARINE OBSERVER until further notice, on the wave length indicated for that station, in the order of ships indicated for the day by the station and according to the schedule above which is also given on Code Card Form 138A.

In the case of "Selected Ships" fitted for spark transmission, address the report to C.Q. and broadcast according to schedule. In regions not covered by long range C.W. stations indicated in the list C.W. "Selected Ships" should broadcast to all ships on 2100 m. at times given in schedule.

3. Instructions for observing and recording observations are given in THE MARINE OBSERVERS' HANDBOOK, 5th Edition. Instructions for coding are given on pp. 20 and 21 and on Form 138. The decode tables are given on pp. 25 to 28.

Information and guidance for the use of Wireless Weather reports received in ships at sea is given in WIRELESS AND WEATHER, AN AID TO NAVIGATION, published and sold by H.M. Stationery Office.

Information regarding the procedure for Urgent Meteorological reports, and reports of dangers to navigation are given on pages 28 and 29.

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

Request for Information.

THE ATTENTION OF METEOROLOGICAL SERVICES IS INVITED TO THE INVITATION GIVEN ON PAGE 13.

Ocean.	Station.	Position.	Call Sign.	Frequency and Wave Length.		Area and limits covered by Station.	Telegraphic address of Meteorological Centre.	Information required—Limit of Groups.	Notes.			
				For Station to call up "Selected Ships."	For "Selected Ships" to report to Station.							
North Atlantic and North Sea.	Portishead.	Lat. 51° 28' 41" N. Long. 2° 47' 30" W.	GKU.	149 kc/s. (2013 metres).	143 kc/s. (2100 metres).	North Sea and Eastern North Atlantic East of Longitude 40° W. and North of Latitude 38° N. but not within 300 miles of station. (see Chart II.)	Weather London	Weather only, up to seven groups, preferably No. 3 Supplementary Groups.	Control system. "Selected Ships" chosen to report in given order notified by station daily at 2230, 0330, and 1030 G.M.T. Roll call thus—Weather begins—Call signs of chosen "Selected Ships"—Weather ends.			
	Chatham Mass., Sayville N.Y. or West Palm Beach.	Lat. 41° 42' N. Long. 70° 00' W. Lat. 40° 42' N. Long. 73° 06' W. Lat. 26° 42' N. Long. 80° 02' W.	WCC. WSL. WMR.	142.9 kc/s. (2098 metres).	125 kc/s. (2400 metres).	North Atlantic West of Longitude 40° W.	Observer Washington.	Weather only. First four groups of observations taken at 0000 and 1200 G.M.T. only required.	No control. All British "A Selected Ships" within area to address their 0000 and 1200 G.M.T. observations to Observer Washington and their 1800 G.M.T. observations to CQ in accordance with schedule.			
	Horta, Azores	Lat. 38° 32' N. Long. 28° 38' W.	CTH.							North Atlantic South of Latitude 38° N. and East of Longitude 40° W.	Radio Horta.	Weather only, up to seven groups, preferably No. 3 Supplementary Groups.	No control—all British "A Selected Ships" within area should report in accordance with Schedule.

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

(Continued.)

Ocean.	Station.	Position.	Call Sign.	Frequency and Wave Length.		Area and limits covered by Station.	Telegraphic address of Meteorological Centre.	Information required—Limit of Groups.	Notes.
				For Station to call up "Selected Ships."	For "Selected Ships" to report to Station.				
Mediterranean and Red Sea.									
South Atlantic.									
Indian Ocean.	Colombo.	Lat. 6° 55' 14" N. Long. 79° 52' 46" E.	VPB	2300 metres.	2100 metres.	Indian Ocean including Arabian Sea and Bay of Bengal within a range of about 1500 miles.	Obs.	Weather only. No. 6 Supplementary groups preferred.	No control—all British "A Selected Ships" within area should report in accordance with Schedule.
	Perth.	Lat. 32° 01' 51" S. Long. 115° 49' 31" E.	VIP	—	125 kc/s. (2400 metres).	Indian Ocean and Southern Ocean between Long. 105° and 135° E.; but not within 100 miles of station.	Weather.	Weather only. No. 6 Supplementary groups.	No control—all British "A Selected Ships" within area should report in accordance with Schedule. Reports not required for observation times not starred on Chart I.
North Pacific and China Sea.	Cape d'Aguilar, Hong Kong.	Lat. 22° 12' 39" N. Long. 114° 15' 19" E.	VPS.		125 kc/s. (2400 metres).	China Sea and North Pacific to about 1,500 miles from station.	Royal Observatory.	Weather only, preferably No. 6 Supplementary Groups.	No control—all British "A Selected Ships" within area should report in accordance with Schedule.
South Pacific.	Sydney.	Lat. 33° 46' 00" S. Long. 151° 03' 09" E.	VIS	—	125 kc/s. (2400 metres).	S. Pacific, Coral and Tasman Seas and Southern Ocean between Long. 135° and 160° E.; but not within 100 miles of station.	Weather.	Weather only. No. 6 Supplementary groups.	No control—all British "A Selected Ships" within area should report in accordance with Schedule. Reports not required for observation times not starred on Chart I.

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

Ocean.	Station.	Position.	Call Sign.	Telegraphic address of Meteorological Centre desiring information.	Information desired.	Notes.
North Atlantic.	Horta, Azores.	Lat. 38° 32' N. Long. 28° 38' W.	GTH.	Radio Horta	Weather only, up to 7 groups, preferably No. 3 Supplementary Groups.	
South Atlantic.	Salinas	Lat. 0° 35' 00" S. Long. 47° 18' 45" W.	PPL.	Meteoro Rio.	Weather only, including supplementary groups.	
	S. Luiz	Lat. 2° 31' 48" S. Long. 44° 16' 51" W.	PXM.			
	Fortaleza	Lat. 3° 46' 21" S. Long. 38° 32' 26" W.	PPC.			
	Natal	Lat. 5° 46' 41" S. Long. 35° 18' 24" W.	PXN.			
	F. Noronha	Lat. 3° 50' 24" S. Long. 32° 24' 48" W.	PXF.			
	Olinda	Lat. 8° 00' 35" S. Long. 34° 51' 00" W.	PPO.			
	Amaralina	Lat. 13° 00' 12" S. Long. 38° 30' 45" W.	PPA.			
	Abrahalhos	Lat. 17° 57' 30" S. Long. 38° 41' 05" W.	PXH.			
	Victoria	Lat. 20° 10' 00" S. Long. 40° 17' 46" W.	PPT.			
	Rio	Lat. 22° 53' 42" S. Long. 43° 13' 24" W.	PPR.			
	Santos	Lat. 23° 56' 27" S. Long. 46° 19' 28" W.	PPS.			
	Florianopolis.	Lat. 27° 36' 00" S. Long. 48° 30' 18" W.	PPF.			
	Juncão	Lat. 32° 04' 00" S. Long. 52° 07' 00" W.	PPS.			
Indian Ocean.	Calcutta.	Lat. 22° 33' 31" N. Long. 88° 20' 16" E.	VWC.	Weather.	Weather only up to 6 groups, No. 6 Supplementary Groups preferred.	
	Rangoon.	Lat. 16° 45' 57" N. Long. 96° 11' 51" E.	VTR.			
	Madras.	Lat. 12° 59' 17" N. Long. 80° 10' 56" E.	VWM.			
	Bombay.	Lat. 19° 04' 55" N. Long. 72° 49' 54" E.	VWB.			
	Karachi.	Lat. 24° 51' 05" N. Long. 67° 02' 32" E.	VWK.			
	Matara.	Lat. 6° 01' 07" N. Long. 80° 35' 39" E.	GZP.			
	Mauritius.	Lat. 20° 23' S. Long. 57° 35' E.	VRS.	Observatory Mauritius.	Weather 4 universal groups and first of No. 6 Supplementary Groups.	
	Geraldton.	Lat. 28° 47' 15" S. Long. 114° 36' 24" E.	VIN	Weather.	Weather only including No. 6 Supplementary Groups.	
	Perth.	Lat. 32° 01' 51" S. Long. 115° 49' 31" E.	VIP			
	Esperance.	Lat. 33° 52' 40" S. Long. 121° 53' 34" E.	VIE			

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

(Continued.)

Ocean.	Station.	Position.	Call Sign.	Telegraphic address of Meteorological Centre desiring information.	Information desired.	Notes.
North Pacific and China Sea.	Cape d'Aguilar, Hong Kong.	Lat. 22° 12' 39" N. Long. 114° 15' 19" E.	VPS.	Royal Observatory.	Weather only, preferably No. 6 Supplementary Groups.	
South Pacific.	Auckland.	Lat. 36° 50' 36" S. Long. 174° 46' 08" E.	ZLD.	Weather Wellington.	Weather only, up to 7 groups	
	Wellington.	Lat. 41° 16' 26" S. Long. 174° 01' 00" E.	ZLW.			
	Awarua.	Lat. 46° 30' 27" S. Long. 168° 22' 21" E.	ZLB.			
	Chatham Island.	Lat. 43° 57' 02" S. Long. 176° 31' 04" W.	ZLC.			
	Rarotonga.	Lat. 21° 11' 54" S. Long. 159° 48' 51" W.	ZKR.			
	Apia.	Lat. 13° 15' 17" S. Long. 170° 49' 42" W.	ZMA.			
	Thursday I.	Lat. 10° 35' 14" S. Long. 142° 12' 43" E.	VII	Weather	Weather only, including No. 6 Supplementary Groups.	
	Townsville	Lat. 19° 16' 09" S. Long. 146° 49' 47" E.	VIT			
	Brisbane	Lat. 27° 25' 34" S. Long. 153° 07' 19" E.	VIB			
	Sydney	Lat. 33° 46' 00" S. Long. 151° 03' 09" E.	VIS			
	Melbourne	Lat. 37° 46' 56" S. Long. 144° 52' 09" E.	VIM			
	Adelaide	Lat. 34° 51' 14" S. Long. 138° 31' 55" E.	VIA			

INTERNATIONAL SHIPS' WIRELESS WEATHER TELEGRAPHY CODE

formulated by the International Commission for Synoptic Meteorology and adopted by the International Meteorological Organization at Copenhagen, September, 1929.

Brought into use in British Selected Ships, May 1st, 1930.

Code and Instructions for Coding Messages.

The International Ships' Wireless Weather Code is a figure code, arranged in groups of five figures.

The first four groups are universal and the remaining groups are in two alternative or supplementary sets of groups. The first figure in the fifth group of message (or first supplementary group) indicates which set of supplementary groups is used.

The first four universal groups should always be used, and the supplementary sets of groups may be omitted, or abbreviated by omitting the last group or groups of the set; that is, the code figure message may be shortened as necessary, but the order of the figures and groups must always be strictly maintained, otherwise the message is not decodable.

If an observation or element is not available, an X (or the appropriate number of Xs) (■ • • ■) should take its place in order to maintain the sequence of figures in the groups.

Having entered synchronized weather observations and particulars of set and drift of current and ice in the Ship's Meteorological Record, Form 911, or the Meteorological Log, Form 915 (specially ruled pages at end of book), the observations should be coded, thus—

First. From the list of wireless stations detailed to receive routine coded weather reports from "Selected Ships," ascertain the number of groups and the supplementary groups desired by the shore meteorological services from ships in the part of the world that the ship is in, remembering that the seventh group can only be given completely by ships having a special barograph; and decide on the information to be sent, not forgetting the desirability of information of the set and drift of current, ice, and navigational obstructions being included in reports intended for "all ships," but not through C.W. stations for certain meteorological centres. In such cases brevity being desirable only the first four or universal groups should be given in code.

Thus ensuring the necessary brevity and information for the meteorological centre, and the necessary information for ships at sea. Do not include information in C.W. reports addressed to meteorological centres which they do not require.

Second. On Form 138, the register for coded "Selected Ships" wireless meteorological reports, in No. 1 column write the address of the Meteorological Centre if your ship is fitted for C.W. transmission, but "All Ships' Weather" if Spark.

Universal Groups.

With the Code Card, Form 138A, from synchronized weather observations entered on Form 911 or 915, code as follows:—

	KEY LETTERS.
Column 2.—Code the Day of the Week. Table I ...	P
„ 3.—Code the Octant of the Globe. Table II ...	Q
„ 4.—Code the Latitude by entering the whole degrees (prefixing 0 if necessary to make up two figures); and dividing the minutes by six, neglecting the remainder. Enter the result ...	LLL
„ 5.—Code the Longitude by entering the whole degrees (prefixing 0 if necessary to make up two figures, or omitting the initial 1 if Longitude is 100° or over). Divide the minutes by six, neglecting the remainder. Enter the result ...	lll
„ 6.—Enter the hours of the Greenwich Mean Time of Observation ...	GG

From the Code Card Form 138A.

„ 7.—Code the Direction of the Wind. Table III...	DD
„ 8.—Code the Force of the Wind, forces 9 and above are entered as 9 but if 10, 11 or 12, add the words Gale, Storm, or Hurricane at the end of the message. Table V. ...	F

KEY LETTERS.

Column 9.—Code the Present Weather. Table VI ...	ww
„ 10.—Code the corrected barometer reading by entering the two last whole figures if a millibar barometer, or coding, if inches, by Table VIII ...	BB
„ 11.—Enter the Visibility by Scale. Table XII ...	V
„ 12.—Enter the Air Temperature in whole degrees Fahrenheit, omitting the initial 1, if over 100° ...	TT

No. 3 Supplementary Groups.

If these groups have been decided upon, in Column 13 enter "3" as distinguishing number for the remainder of the coded message.

KEY LETTERS.

Column 14.—Code type of Lower Cloud. Table XIII ...	CL
„ 15.—Code type of Middle Cloud. Table XIV ...	CM
„ 16.—Code type of Upper Cloud. Table XV ...	CH
„ 17.—Code the total amount of sky covered. Table XVII ...	N
„ 18.—Subtract the lesser from the greater of the Air and Sea Temperatures and code the result with Table XVIII ...	td
„ 19.—Enter the Swell by Scale. Table XIX ...	K
„ 20.—Code the True Direction of Swell. Table IV ...	d
„ 21.—Code the Past Weather. Table VII ...	W
„ 22.—Code the proportion of sky covered with Lower Cloud. Table XVII ...	NL
„ 23.—Code the course of ship. Table IV ...	ds
„ 24.—Code the speed of the ship. Table XX ...	f
„ 25.—Code the characteristic of the Tendency of the Barometer, as shown by barograph. Table X ...	a
„ 26.—Code the Amount of rise or fall of the Barometer in the last 3 hours. Table XI ...	bb

No. 6 Supplementary Groups.

If these groups have been decided upon, in Column 27 enter "6" as distinguishing number for the remainder of the coded message.

KEY LETTERS.

Column 28.—Enter the Swell by Scale. Table XIX ...	K
„ 29.—Code the True Direction of the Swell. Table IV ...	d
„ 30.—Code the Predominating type of Cloud. Table XVI ...	C
„ 31.—Code the total amount of sky covered. Table XVII ...	N
„ 32.—Subtract the lesser from the greater of the Air and Sea Temperatures and code the result. Table XVIII ...	td
„ 33.—Code the Course of the Ship. Table IV ...	ds
„ 34.—Code the recorded change of the barometer in the last two, three, or four hours. Table IX ...	A
„ 35.—Code the Past Weather. Table VII ...	W
„ 36.—Code type of Upper Cloud. Table XV ...	CH

For messages which are to be broadcast to C.Q. or made to shore services indicated in the list of W/T. stations in THE MARINE OBSERVER as requiring such information, in Column 37, enter briefly in plain language the set and drift of current experienced, with position from and to, Ice or other navigational obstructions.

On no account should such information be entered in messages for shore services that do not require it.

The ship's call sign should be given in the usual way in sending the report.

In Column 38.—After the message has been despatched enter the call sign of the station through which it was sent, with wave length, or C.Q., as the case may be.

In Column 39.—After the message is sent enter the exact time (G.M.T.) of despatch.

Be sure that your message is correctly coded, and that you have not duplicated the Supplementary Groups.

Write out the message on the signal pad (Form 139) provided and send to the wireless operator for despatch in accordance with instructions given in Scheme of Communication for British Selected Ships' Routine Wireless Weather Telegraphy, pages 13 to 16, schedule for which is also given on Code Card Form 138A.

CODE TABLES FOR W/T WEATHER REPORTS FROM SHIPS AT SEA TO ALL SHIPS AND SHORE STATIONS.

Day and Position.

Table I.

P.—Day of the Week.		Code Figure.	Code Figure.		
Sunday	...	1	Thursday	...	5
Monday	...	2	Friday	...	6
Tuesday	...	3	Saturday	...	7
Wednesday	...	4			

Table II.

Q.—Octant of the Globe.		Code Figure.
Longitude.		
North Latitude.	0° W. — 90° W.	0
	90° W. — 180° W.	1
	180° E. — 90° E.	2
	90° E. — 0° E.	3
South Latitude.	0° W. — 90° W.	5
	90° W. — 180° W.	6
	180° E. — 90° E.	7
	90° E. — 0° E.	8

Compass.

Table III.

DD.—Compass Table for Wind Direction to points.

True Direction.	Code Figures.	True Direction.	Code Figures.
Calm	00	S. by W.	17
N. by E.	01	S.S.W.	18
N.N.E.	02	S.W. by S.	19
N.E. by N.	03	S.W.	20
N.E.	04	S.W. by W.	21
N.E. by E.	05	W.S.W.	22
E.N.E.	06	W. by S.	23
E. by N.	07	W.	24
E.	08	W. by N.	25
E. by S.	09	W.N.W.	26
E.S.E.	10	N.W. by W.	27
S.E. by E.	11	N.W.	28
S.E.	12	N.W. by N.	29
S.E. by S.	13	N.N.W.	30
S.S.E.	14	N. by W.	31
S. by E.	15	N.	32
S.	16		

Table IV.

d and d_s.—Compass Table to Half Cardinal Points.

True Direction.	Code Figure.
No Sea or Swell; or Ship hove to	0
N.E.	1
E.	2
S.E.	3
S.	4
S.W.	5
W.	6
N.W.	7
N.	8
No observation or no information	9

Wind.

Table V.

F.—Wind Force, Beaufort Scale.

Beaufort Number.	Code Figure.
Nought. Calm	0
One. Light airs	1
Two. Light breeze	2
Three. Gentle breeze	3
Four. Moderate breeze	4
Five. Fresh breeze	5
Six. Strong breeze	6
Seven. Moderate gale	7
Eight. Fresh gale	8
Nine. Strong gale	9
Ten. Whole gale	9 Gale*
Eleven. Storm	9 Storm*
Twelve. Hurricane	9 Hurricane*

* These words to be written at end of weather message.

Weather.

Table VI.

ww.—Present Weather. (Abridged for British Ships.)

	Code Figures.
Cloudless	00
Partly cloudy	01
Cloudy	02
Overcast	03
Haze (but visibility greater than one mile)	05
Distant Lightning	07
Mist	08
Precipitation within sight	10
Thunder, without precipitation at the ship or station	11
Ugly threatening appearance of sky	13
Squally weather	14
Heavy Squalls in last three hours	15
Waterspout seen in last three hours	16
Signs of a tropical storm forming	18
Signs that a tropical storm has formed	19
Precipitation (rain, drizzle, hail, snow or sleet) in last hour, but not at time of observation	20
Dust or Sand storm	30
Fog	40
Moderate fog in last hour	41
Thick fog in last hour	42
Fog in patches	49
Drizzle	50
Drizzle and Fog	57
Slight or moderate drizzle and rain	58
Thick drizzle and rain	59
Rain	60
Rain and fog	67
Slight or moderate rain and snow	68
Heavy rain and snow	69
Snow or Sleet	70
Shower or showers	80
Showers of slight or moderate hail, or rain and hail	88
Showers of heavy hail, or rain and hail	89
Thunderstorm	90

Preference should be given to 18 and 19 when they apply, otherwise to the largest number of this code which applies to the weather at the position of the ship at the time of observation.

Table VII.
W.—Past Weather.

	Code Figure.
Fair (clear or slightly clouded)	0
Variable sky	1
Mainly overcast	2
Fog or thick dust haze (visibility less than five cables) ...	3
Drizzle	4
Rain	5
Snow or sleet	6
Showers	7
Sandstorm or duststorm	8
Thunderstorm	9

Barometer.
Table VIII.

BB.—Code Table for corrected barometer readings in millibars and inches.
(Adapted for British Ships.)

Mb.	In.	Code Figs.	Mb.	In.	Code Figs.	Mb.	In.	Code Figs.	Mb.	In.	Code Figs.
925	27.32	25	960	28.35	60	995	29.38	95	1025	30.27	25
926	27.35	26	961	28.38	61	996	29.41	96	1026	30.30	26
927	27.38	27	962	28.41	62	997	29.44	97	1027	30.33	27
928	27.41	28	963	28.44	63	998	29.47	98	1028	30.36	28
929	27.44	29	964	28.47	64	999	29.50	99	1029	30.39	29
930	27.46	30	965	28.50	65	1000	29.53	00	1030	30.42	30
931	27.49	31	966	28.53	66	1001	29.56	01	1031	30.45	31
932	27.52	32	967	28.56	67	1002	29.59	02	1032	30.48	32
933	27.55	33	968	28.59	68	1003	29.62	03	1033	30.51	33
934	27.58	34	969	28.62	69	1004	29.65	04	1034	30.53	34
935	27.61	35	970	28.65	70	1005	29.68	05	1035	30.56	35
936	27.64	36	971	28.67	71	1006	29.71	06	1036	30.59	36
937	27.67	37	972	28.70	72	1007	29.74	07	1037	30.62	37
938	27.70	38	973	28.73	73	1008	29.77	08	1038	30.65	38
939	27.73	39	974	28.76	74	1009	29.80	09	1039	30.68	39
940	27.76	40	975	28.79	75	1010	29.83	10	1040	30.71	40
941	27.79	41	976	28.82	76	1011	29.86	11	1041	30.74	41
942	27.82	42	977	28.85	77	1012	29.89	12	1042	30.77	42
943	27.85	43	978	28.88	78	1013	29.92	13	1043	30.80	43
944	27.88	44	979	28.91	79	1014	29.94	14	1044	30.83	44
945	27.91	45	980	28.94	80	1015	29.97	15	1045	30.86	45
946	27.94	46	981	28.97	81	1016	30.00	16	1046	30.89	46
947	27.97	47	982	29.00	82	1017	30.03	17	1047	30.92	47
948	28.00	48	983	29.03	83	1018	30.06	18	1048	30.95	48
949	28.03	49	984	29.06	84	1019	30.09	19	1049	30.98	49
950	28.05	50	985	29.09	85	1020	30.12	20	1050	31.01	50
951	28.08	51	986	29.12	86	1021	30.15	21	1051	31.04	51
952	28.11	52	987	29.15	87	1022	30.18	22	1052	31.07	52
953	28.14	53	988	29.18	88	1023	30.21	23	1053	31.10	53
954	28.17	54	989	29.21	89	1024	30.24	24	1054	31.13	54
955	28.20	55	990	29.24	90						
956	28.23	56	991	29.26	91						
957	28.26	57	992	29.29	92						
958	28.29	58	993	29.32	93						
959	28.32	59	994	29.35	94						

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

Table IX.

A—Change of Barometer in last 2, 3 or 4 hours.

(Adapted for British Ships.)

(The change in 3 hours should be given if possible.)

	In 2 hours.	In 3 hours.	In 4 hours.	Code Figure.
Barometer steady—Has not risen or fallen more than	0.3 mb. (.01 in.)	0.5 mb. (.01 in.)	0.7 mb. (.02 in.)	0
Barometer rising slowly—Has risen.	0.7–1.0 mb. (.02–.03 in.)	1.0–1.5 mb. (.03–.05 in.)	1.3–2.0 mb. (.04–.06 in.)	1
Barometer rising—Has risen	1.4–2.4 mb. (.05–.07 in.)	2.0–3.5 mb. (.06–.10 in.)	2.8–4.8 mb. (.08–.14 in.)	2
Barometer rising quickly—Has risen.	2.6–4.0 mb. (.08–.12 in.)	4.0–6.0 mb. (.12–.18 in.)	5.2–8.0 mb. (.15–.24 in.)	3
Barometer rising very rapidly—Has risen.	over 4.0 mb. (.12 in.)	over 6.0 mb. (.18 in.)	over 8.0 mb. (.24 in.)	4
Barometer falling slowly—Has fallen.	0.7–1.0 mb. (.02–.03 in.)	1.0–1.5 mb. (.03–.05 in.)	1.3–2.0 mb. (.04–.06 in.)	5
Barometer falling—Has fallen	1.4–2.4 mb. (.05–.07 in.)	2.0–3.5 mb. (.06–.10 in.)	2.8–4.8 mb. (.08–.14 in.)	6
Barometer falling quickly—Has fallen.	2.6–4.0 mb. (.08–.12 in.)	4.0–6.0 mb. (.12–.18 in.)	5.2–8.0 mb. (.15–.24 in.)	7
Barometer falling very rapidly—Has fallen.	over 4.0 mb. (.12 in.)	over 6.0 mb. (.18 in.)	over 8.0 mb. (.24 in.)	8

Barograph.

Table X.

a.—Characteristic of changes of the Barometer in the last three hours.

(Adapted for British Ships.)

	Description of Changes.	Code Figure.
Net result, Barometer same or higher.	Barometer rising at first, then falling by a smaller or like amount	0
	Barometer rising at first, then steady or rising less quickly	1
	Barometer unsteady, but generally rising or stationary	2
	Barometer steady or rising	3
Net result, Barometer lower.	Barometer falling or steady at first, then rising by the same or larger amount	4
	Barometer rising, at an increasing rate	5
	Barometer falling at first, then rising by a smaller amount	6
	Barometer falling at first, then steady or falling less quickly	7
Net result, Barometer lower.	Barometer unsteady, but falling	8
	Barometer falling	9
	Barometer steady or rising at first, then falling by a larger amount	9
	Barometer falling, at an increasing rate	

NOTE.—These changes can generally only be given by ships which have special barographs on board.

For illustration of these characteristic changes and guidance see MARINE OBSERVERS HANDBOOK, 5th Edition.

Table XI.

bb.—Amount of Rise or Fall of the Barometer in the last three hours.

(Adapted for British Ships.)

Amount of Rise or Fall.		Code Figs.	Amount of Rise or Fall.		Code Figs.	Amount of Rise or Fall.		Code Figs.	Amount of Rise or Fall.		Code Figs.
Mbs.	Inches.										
0.2	.01	01	4.6	.14	23	9.0	.27	45	13.4	.40	67
0.4	.01	02	4.8	.14	24	9.2	.28	46	13.6	.41	68
0.6	.02	03	5.0	.15	25	9.4	.28	47	13.8	.41	69
0.8	.02	04	5.2	.16	26	9.6	.29	48	14.0	.42	70
1.0	.03	05	5.4	.16	27	9.8	.29	49	14.2	.43	71
1.2	.04	06	5.6	.17	28	10.0	.30	50	14.4	.43	72
1.4	.04	07	5.8	.17	29	10.2	.31	51	14.6	.44	73
1.6	.05	08	6.0	.18	30	10.4	.31	52	14.8	.44	74
1.8	.05	09	6.2	.19	31	10.6	.32	53	15.0	.45	75
2.0	.06	10	6.4	.19	32	10.8	.32	54	15.2	.46	76
2.2	.07	11	6.6	.20	33	11.0	.33	55	15.4	.46	77
2.4	.07	12	6.8	.20	34	11.2	.34	56	15.6	.47	78
2.6	.08	13	7.0	.21	35	11.4	.34	57	15.8	.47	79
2.8	.08	14	7.2	.22	36	11.6	.35	58	16.0	.48	80
3.0	.09	15	7.4	.22	37	11.8	.35	59	16.2	.49	81
3.2	.10	16	7.6	.23	38	12.0	.36	60	16.4	.49	82
3.4	.10	17	7.8	.23	39	12.2	.37	61	16.6	.50	83
3.6	.11	18	8.0	.24	40	12.4	.37	62	16.8	.50	84
3.8	.11	19	8.2	.25	41	12.6	.38	63	17.0	.51	85
4.0	.12	20	8.4	.25	42	12.8	.38	64	17.2	.52	86
4.2	.13	21	8.6	.26	43	13.0	.39	65	17.4	.52	87
4.4	.13	22	8.8	.26	44	13.2	.40	66			

Visibility.

Table XII.

V.—Visibility.

	Code Figure.
Dense fog. Objects not visible at 50 yards	0
Thick fog. Objects not visible at 1 cable	1
Fog. Objects not visible at 2 cables	2
Moderate fog. Objects not visible at ½ mile (nautical)...	3
Mist or haze, or very poor visibility. Objects not visible at 1 mile (nautical)	4
Poor visibility. Objects not visible at 2 miles (nautical)	5
Moderate visibility. Objects not visible at 5 miles (nautical)	6
Good visibility. Objects not visible at 10 miles (nautical)	7
Very Good visibility. Objects not visible at 30 miles (nautical)	8
Excellent visibility. Objects visible more than 30 miles (nautical)	9

Clouds.

Table XIII.

C_L.—Form of Low Cloud.

Form of Cloud.	Code Figure.
No low clouds	0
Cumulus of fine weather	1
Cumulus (Large, without anvil)	2
Cumulo-Nimbus	3
Strato-Cumulus (spread from Cumulus)	4
Stratus or Strato-Cumulus (in layer)	5
Nimbus	6
Cumulus and Strato-Cumulus of fine weather	7
Cumulus, large (or Cumulo-Nimbus) and Strato-Cumulus	8
Cumulus, large (or Cumulo-Nimbus) and Nimbus	9

Table XIV.

C_M.—Form of Middle Cloud.

Form of Cloud.	Code Figure.
No middle cloud	0
Alto-Stratus, typical thin	1
Alto-Stratus, typical thick (Sun or Moon invisible)	2
Alto-Cumulus or high Strato-Cumulus, single layer	3
Alto-Cumulus, in bands, decreasing	4
Alto-Cumulus, in bands, increasing	5
Alto-Cumulus, spread out from Cumulus	6
Alto-Cumulus with Alto-Stratus; or Alto-Stratus with parts resembling Alto-Cumulus	7
Alto-Cumulus Castellatus (Alto-Cumulus in ragged fragments)	8
Alto-Cumulus in several layers, generally with fibrous veils and chaotic appearance of sky	9

Table XV.

C_H.—Form of Upper Cloud (Cirrus Cloud).

Form of Cloud.	Code Figure.
No upper clouds (cirrus type)	0
Cirrus, fine, not increasing: scarce	1
Cirrus, fine, not increasing: plentiful, but not a continuous layer	2
Cirrus, anvil	3
Cirrus, fine, increasing	4
Cirrus or Cirro-Stratus increasing, below 45° altitude	5
Cirrus or Cirro-Stratus increasing, and reaching above 45° altitude	6
Cirro-Stratus, veil covering whole sky	7
Cirro-Stratus, not increasing, and not covering whole sky	8
Cirro-Cumulus predominating, and a little Cirrus	9

Table XVI.

C.—Predominating Form of Cloud.

Form of Cloud.	Code Figure.
Cirrus	1
Cirro-Stratus	2
Cirro-Cumulus	3
Alto-Cumulus	4
Alto-Stratus	5
Strato-Cumulus	6
Nimbus	7
Cumulus or Fracto-Cumulus	8
Cumulo Nimbus	9
Stratus or Fracto-Stratus	0

Table XVII.

N. and (N_L).—Amount of Cloud.

Proportion of Sky covered, in tenths.	Code Figure.
0	0
Less than 1	1
1	2
2 to 3	3
4 to 6	4
7 to 8	5
9	6
More than 9, but with openings	7
10, completely covered	8
Sky obscured by fog, duststorm or other phenomenon	9

Temperatures.

Table XVIII.

t₁.—Difference between Air and Sea Surface Temperature.

Air Temperature higher than Sea Temperature.	Code Figure.
More than 9° Fahrenheit	0
6° to 9° ,,	1
3° to 6° ,,	2
1° to 3° ,,	3
0° to 1° ,,	4
Air Temperature lower than Sea Temperature.	
0° to 1° Fahrenheit	5
1° to 3° ,,	6
3° to 6° ,,	7
6° to 9° ,,	8
More than 9° ,,	9

Swell.

Table XIX.

K.—Swell.

	Code Figure.
No swell	0
Low swell, short or average length	1
Low swell, long	2
Moderate swell, short	3
Moderate swell, average length	4
Moderate swell, long	5
Heavy swell, short	6
Heavy swell, average length	7
Heavy swell, long	8
Confused swell	9

Speed.

Table XX.

f.—Speed of Ship.

Speed in Knots.	Code Figure.
Ship stopped	0
1 to 3 knots	1
4 to 6 ,,	2
7 to 9 ,,	3
10 to 12 ,,	4
13 to 15 ,,	5
16 to 18 ,,	6
19 to 21 ,,	7
22 to 24 ,,	8
More than 24 knots	9

DECODE TABLES FOR W/T WEATHER REPORTS FROM SHIPS AT SEA TO ALL SHIPS AND SHORE STATIONS.

Day and Position.

Table I.

P.—Day of the Week.

Code Figure.	Code Figure.
1 = Sunday.	5 = Thursday.
2 = Monday.	6 = Friday.
3 = Tuesday.	7 = Saturday.
4 = Wednesday.	

Table II.

Q.—Octant of the Globe.

Code Figure.	Longitude.	
0	0° W. — 90° W.	} North Latitude.
1	90° W. — 180° W.	
2	180° E. — 90° E.	
3	90° E. — 0° E.	
5	0° W. — 90° W.	} South Latitude.
6	90° W. — 180° W.	
7	180° E. — 90° E.	
8	90° E. — 0° E.	

Compass.

Table III.

DD.—Compass Table for Wind Direction to points.

Code Figures.	True Direction.	Code Figures.	True Direction.
00	Calm.	17	S. by W.
01	N. by E.	18	S.S.W.
02	N.N.E.	19	S.W. by S.
03	N.E. by N.	20	S.W.
04	N.E.	21	S.W. by W.
05	N.E. by E.	22	W.S.W.
06	E.N.E.	23	W. by S.
07	E. by N.	24	W.
08	E.	25	W. by N.
09	E. by S.	26	W.N.W.
10	E.S.E.	27	N.W. by W.
11	S.E. by E.	28	N.W.
12	S.E.	29	N.W. by N.
13	S.E. by S.	30	N.N.W.
14	S.S.E.	31	N. by W.
15	S. by E.	32	N.
16	S.		

Table IV.

d and d_s—Compass Table to Half Cardinal Points.

Code Figures.	True Direction.
0	No Sea or Swell or Ship hove to.
1	N.E.
2	E.
3	S.E.
4	S.
5	S.W.
6	W.
7	N.W.
8	N.
9	No observation or no information.

Wind.

Table V.

F.—Wind Force, Beaufort Scale.

Code Figure.		Beaufort Number.
0 ...	Calm	Nought
1 ...	Light airs	One
2 ...	Light breeze	Two
3 ...	Gentle breeze	Three
4 ...	Moderate breeze	Four
5 ...	Fresh breeze	Five
6 ...	Strong breeze	Six
7 ...	Moderate gale	Seven
8 ...	Fresh gale	Eight
9 ...	Strong gale	Nine
9 ...	Whole gale	Ten
9 ...	Storm	Eleven
9 ...	Hurricane	Twelve

When force 10, 11 or 12, figure 9 transmitted, words "gale," "storm" or "hurricane" respectively, added at end of the message.

Weather.

Table VI.

ww.—Present Weather.

00-19 Abbreviated description of sky and special phenomena.

- 00 Cloudless.
- 01 Partly cloudy.
- 02 Cloudy.
- 03 Overcast.
- 04 Fog over the Sea.
- 05 Haze (but visibility greater than 2000 metres).
- 06 Dust devils seen.
- 07 Distant lightning.
- 08 Mist.
- 09 —
- 10 Precipitation within sight.
- 11 Thunder, without precipitation at the station.
- 12 —
- 13 Ugly, threatening sky.
- 14 Squally weather.
- 15 Heavy squalls in last three hours.
- 16 Waterspouts seen
- 17 —
- 18 Signs of tropical storm forming.
- 19 Signs that tropical storm has formed.

20-29 Precipitation in last hour but not at time of observation.

- 20 Precipitation (rain, drizzle, hail, snow or sleet)
 - 21 Drizzle
 - 22 Rain
 - 23 Snow
 - 24 Sleet
 - 25 Rain shower(s).
 - 26 Snow shower(s).
 - 27 Hail or rain and hail shower(s).
 - 28 Slight thunderstorm.
 - 29 Heavy thunderstorm.
- } In last hour but not at time.

30-39 Dust storms and storms of drifting snow (visibility less than 1000 metres).

- 30 Dust or sand storm.
- 31 Dust or sand storm has decreased.
- 32 Dust or sand storm no appreciable change.
- 33 Dust or sand storm has increased.
- 34 Line of dust storms.
- 35 Storm of drifting snow.
- 36 Slight storm of drifting snow } generally low.
- 37 Heavy storm of drifting snow }
- 38 Slight storm of drifting snow } generally high.
- 39 Heavy storm of drifting snow }

40-49 Fog or thick dust haze (visibility less than 1000 metres).

- 40 Fog.
- 41 Moderate fog in last hour.
- 42 Thick fog in last hour.
- 43 Fog, sky discernible } has become thinner during last
- 44 Fog, sky not discernible } hour.
- 45 Fog, sky discernible } no appreciable change during
- 46 Fog, sky not discernible } last hour.
- 47 Fog, sky discernible } has become thick during last
- 48 Fog, sky not discernible } hour.
- 49 Fog in patches.

50-59 Precipitation at time of observation.

- 50-59 Drizzle (precipitation consisting of numerous minute drops).
- 50 Drizzle.
- 51 Intermittent } slight drizzle.
- 52 Continuous }
- 53 Intermittent } moderate drizzle.
- 54 Continuous }
- 55 Intermittent } thick drizzle.
- 56 Continuous }
- 57 Drizzle and fog.
- 58 Slight or moderate } drizzle and rain.
- 59 Thick }

60-69 Rain.

- 60 Rain.
- 61 Intermittent } slight rain.
- 62 Continuous }
- 63 Intermittent } moderate rain.
- 64 Continuous }
- 65 Intermittent } heavy rain.
- 66 Continuous }
- 67 Rain and fog.
- 68 Slight or moderate } rain and snow.
- 69 Heavy }

70-79 Snow.

- 70 Snow or sleet.
- 71 Intermittent } slight snow in flakes.
- 72 Continuous }
- 73 Intermittent } moderate snow in flakes.
- 74 Continuous }
- 75 Intermittent } heavy snow in flakes.
- 76 Continuous }
- 77 Snow and fog.
- 78 Granular snow.
- 79 Ice crystals.

80-89 Shower(s).

- 80 Shower(s).
- 81 Shower(s) of slight or moderate } rain.
- 82 " " heavy }
- 83 " " slight or moderate } snow.
- 84 " " heavy }
- 85 " " slight or moderate } rain and snow.
- 86 " " heavy }
- 87 " " granular snow.
- 88 " " slight or moderate } hail, or rain and hail.
- 89 " " heavy }

90-99 Thunderstorm.

- 90 Thunderstorm.
- 91 Rain at time } thunderstorm during last hour, but
- 92 Snow or sleet at time } not at time of observation.
- 93 Thunderstorm, slight, without hail or soft hail, } but with rain or snow
- 94 " slight, with soft hail }
- 95 " moderate, without hail, but with } rain (or snow)
- 96 " moderate, with soft hail }
- 97 " heavy, without hail, but with } rain (or snow)
- 98 " combined with dust storm }
- 99 " heavy, with hail }

Table VII.

W.—Past Weather.

Code Figure.	Description.
0	Fair (clear or slightly clouded).
1	Variable sky.
2	Mainly overcast.
3	Fog or thick dust haze (visibility less than 5 cables).
4	Drizzle.
5	Rain.
6	Snow or sleet.
7	Showers.
8	Sandstorm or duststorm.
9	Thunderstorm.

Barometer.

Table VIII.

BB.—Decode Table for corrected barometer readings in millibars and inches.

Code Figs.	Mb.	In.	Code Figs.	Mb.	In.	Code Figs.	Mb.	In.	Code Figs.	Mb.	Ins.
25	925	27.32	60	960	28.35	95	995	29.38	25	1025	30.27
26	926	27.35	61	961	28.38	96	996	29.41	26	1026	30.30
27	927	27.38	62	962	28.41	97	997	29.44	27	1027	30.33
28	928	27.41	63	963	28.44	98	998	29.47	28	1028	30.36
29	929	27.44	64	964	28.47	99	999	29.50	29	1029	30.39
30	930	27.46	65	965	28.50	00	1000	29.53	30	1030	30.42
31	931	27.49	66	966	28.53	01	1001	29.56	31	1031	30.45
32	932	27.52	67	967	28.56	02	1002	29.59	32	1032	30.48
33	933	27.55	68	968	28.59	03	1003	29.62	33	1033	30.51
34	934	27.58	69	969	28.62	04	1004	29.65	34	1034	30.53
35	935	27.61	70	970	28.65	05	1005	29.68	35	1035	30.56
36	936	27.64	71	971	28.67	06	1006	29.71	36	1036	30.59
37	937	27.67	72	972	28.70	07	1007	29.74	37	1037	30.62
38	938	27.70	73	973	28.73	08	1008	29.77	38	1038	30.65
39	939	27.73	74	974	28.76	09	1009	29.80	39	1039	30.68
40	940	27.76	75	975	28.79	10	1010	29.83	40	1040	30.71
41	941	27.79	76	976	28.82	11	1011	29.86	41	1041	30.74
42	942	27.82	77	977	28.85	12	1012	29.89	42	1042	30.77
43	943	27.85	78	978	28.88	13	1013	29.92	43	1043	30.80
44	944	27.88	79	979	28.91	14	1014	29.94	44	1044	30.83
45	945	27.91	80	980	28.94	15	1015	29.97	45	1045	30.86
46	946	27.94	81	981	28.97	16	1016	30.00	46	1046	30.89
47	947	27.97	82	982	29.00	17	1017	30.03	47	1047	30.92
48	948	28.00	83	983	29.03	18	1018	30.06	48	1048	30.95
49	949	28.03	84	984	29.06	19	1019	30.09	49	1049	30.98
50	950	28.05	85	985	29.09	20	1020	30.12	50	1050	31.01
51	951	28.08	86	986	29.12	21	1021	30.15	51	1051	31.04
52	952	28.11	87	987	29.15	22	1022	30.18	52	1052	31.07
53	953	28.14	88	988	29.18	23	1023	30.21	53	1053	31.10
54	954	28.17	89	989	29.21	24	1024	30.24	54	1054	31.13
55	955	28.20	90	990	29.24						
56	956	28.23	91	991	29.26						
57	957	28.26	92	992	29.29						
58	958	28.29	93	993	29.32						
59	959	28.32	94	994	29.35						

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

Table IX.

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

Barograph.

Table X.

a.—Characteristic of changes of the Barometer in the last three hours.

(Adapted for British Ships.)

Code Figure.	Description of Changes.	Net result, Barometer same or higher
0	Barometer rising at first, then falling by a smaller or like amount.	higher
1	Barometer rising at first, then steady or rising less quickly.	
2	Barometer unsteady; but generally rising or stationary.	
3	Barometer steady or rising.	
4	Barometer falling or steady at first, then rising by the same or larger amount.	lower
5	Barometer rising, at an increasing rate.	
6	Barometer falling at first, then rising by a smaller amount.	
7	Barometer falling at first, then steady or falling less quickly.	
8	Barometer unsteady, but falling.	lower
9	Barometer falling.	
	Barometer steady or rising at first, then falling by a larger amount.	
	Barometer falling, at an increasing rate.	

NOTE.—These changes are generally only given by ships which have special barographs on board.

For illustration of these characteristic changes and guidance, see MARINE OBSERVERS' HANDBOOK, 5TH EDITION.

Table XI.

bb.—Amount of Rise or Fall of the Barometer in the last three hours. (In fifths of Millibars.)

Code Figs.	Amount of Rise or Fall.		Code Figs.	Amount of Rise or Fall.		Code Figs.	Amount of Rise or Fall.		Code Figs.	Amount of Rise or Fall.	
	Mbs.	Ins.		Mbs.	Ins.		Mbs.	Ins.		Mbs.	Ins.
01	0.2	.01	23	4.6	.14	45	9.0	.27	67	13.4	.40
02	0.4	.01	24	4.8	.14	46	9.2	.28	68	13.6	.41
03	0.6	.02	25	5.0	.15	47	9.4	.28	69	13.8	.41
04	0.8	.02	26	5.2	.16	48	9.6	.29	70	14.0	.42
05	1.0	.03	27	5.4	.16	49	9.8	.29	71	14.2	.43
06	1.2	.04	28	5.6	.17	50	10.0	.30	72	14.4	.43
07	1.4	.04	29	5.8	.17	51	10.2	.31	73	14.6	.44
08	1.6	.05	30	6.0	.18	52	10.4	.31	74	14.8	.44
09	1.8	.05	31	6.2	.19	53	10.6	.32	75	15.0	.45
10	2.0	.06	32	6.4	.19	54	10.8	.32	76	15.2	.46
11	2.2	.07	33	6.6	.20	55	11.0	.33	77	15.4	.46
12	2.4	.07	34	6.8	.20	56	11.2	.34	78	15.6	.47
13	2.6	.08	35	7.0	.21	57	11.4	.34	79	15.8	.47
14	2.8	.08	36	7.2	.22	58	11.6	.35	80	16.0	.48
15	3.0	.09	37	7.4	.22	59	11.8	.35	81	16.2	.49
16	3.2	.10	38	7.6	.23	60	12.0	.36	82	16.4	.49
17	3.4	.10	39	7.8	.23	61	12.2	.37	83	16.6	.50
18	3.6	.11	40	8.0	.24	62	12.4	.37	84	16.8	.50
19	3.8	.11	41	8.2	.25	63	12.6	.38	85	17.0	.51
20	4.0	.12	42	8.4	.25	64	12.8	.38	86	17.2	.52
21	4.2	.13	43	8.6	.26	65	13.0	.39	87	17.4	.52
22	4.4	.13	44	8.8	.26	66	13.2	.40			

Visibility.

Table XII.

Code Figure.	V.—Visibility.
0	Dense fog. Objects not visible at 50 yards.
1	Thick fog. Objects not visible at 1 cable.
2	Fog. Objects not visible at 2 cables.
3	Moderate fog. Objects not visible at 1/2 mile (nautical).
4	Mist or haze, or very poor visibility. Objects not visible at 1 mile (nautical).
5	Poor visibility. Objects not visible at 2 miles (nautical).
6	Moderate visibility. Objects not visible at 5 miles (nautical).
7	Good visibility. Objects not visible at 10 miles (nautical).
8	Very good visibility. Objects not visible at 30 miles (nautical).
9	Excellent visibility. Objects visible at more than 30 miles (nautical).

Clouds.

Table XIII.

C_L.—Form of Low Cloud.

Code Figure.	Form of Cloud.
0	No low clouds.
1	Cumulus of fine weather.
2	Cumulus (Large, without anvil).
3	Cumulo-Nimbus.
4	Strato-Cumulus (spread from Cumulus).
5	Stratus or Strato-Cumulus (in layer).
6	Nimbus.
7	Cumulus and Strato-Cumulus of fine weather.
8	Cumulus, large (or Cumulo-Nimbus) and Strato-Cumulus.
9	Cumulus, large (or Cumulo-Nimbus) and Nimbus.

Table XIV.

C_M.—Form of Middle Cloud.

Code Figure.	Form of Cloud.
0	No middle cloud.
1	Alto-Stratus, typical thin.
2	Alto-Stratus, typical thick (Sun or Moon invisible).
3	Alto-Cumulus or high Strato-Cumulus, single layer.
4	Alto-Cumulus, in bands, decreasing.
5	Alto-Cumulus, in bands, increasing.
6	Alto-Cumulus, spread out from Cumulus.
7	Alto-Cumulus with Alto-Stratus; or Alto-Stratus with parts resembling Alto-Cumulus.
8	Alto-Cumulus Castellatus (Alto-Cumulus in ragged fragments).
9	Alto-Cumulus in several layers, generally with fibrous veils and chaotic appearance of sky.

Table XV.

C_H.—Form of Upper Cloud (Cirrus Cloud).

Code Figure.	Form of Cloud.
0	No upper clouds (cirrus type).
1	Cirrus, fine, not increasing: scarce.
2	Cirrus, fine, not increasing: plentiful, but not a continuous layer.
3	Cirrus, anvil.
4	Cirrus, fine, increasing.
5	Cirrus or Cirro-Stratus increasing, below 45° altitude.
6	Cirrus or Cirro-Stratus increasing, and reaching above 45° altitude.
7	Cirro-Stratus, veil covering whole sky.
8	Cirro-Stratus, not increasing, and not covering whole sky.
9	Cirro-Cumulus predominating, and a little Cirrus.

Table XVI.

C.—Predominating Form of Cloud.	
Code	Form of Cloud.
1	Cirrus.
2	Cirro-Stratus.
3	Cirro-Cumulus.
4	Alto-Cumulus.
5	Alto-Stratus.
6	Strato-Cumulus.
7	Nimbus.
8	Cumulus or Fracto-Cumulus.
9	Cumulo Nimbus.
0	Stratus or Fracto-Stratus.

Table XVII.

N. and N _L .—Amount of Cloud.	
Code	Proportion of Sky covered, in tenths.
0	0.
1	Less than 1.
2	1.
3	2 to 3.
4	4 to 6.
5	7 to 8.
6	9.
7	More than 9, but with openings.
8	10, completely covered.
9	Sky obscured by fog, duststorm or other phenomenon.

Temperatures.

Table XVIII.

t _a .—Difference between Air and Sea Surface Temperatures.	
Code	Air Temperature higher than Sea Temperature.
0	More than 9° Fahrenheit.
1	6° to 9° „
2	3° to 6° „
3	1° to 3° „
4	0° to 1° „

Air Temperature lower than Sea Temperature

5	0° to 1° Fahrenheit.
6	1° to 3° „
7	3° to 6° „
8	6° to 9° „
9	More than 9° „

Swell.

Table XIX.

K.—Swell.

Code	Figure.
0	No swell.
1	Low swell, short or average length
2	Low swell, long.
3	Moderate swell, short.
4	Moderate swell, average length.
5	Moderate swell, long.
6	Heavy swell, short.
7	Heavy swell, average length.
8	Heavy swell, long.
9	Confused swell.

Speed.

Table XX.

f.—Speed of Ship

Code	Figure.	Speed in Knots.
0	0	Ship stopped.
1	1	1 to 3 knots.
2	2	4 to 6 „
3	3	7 to 9 „
4	4	10 to 12 „
5	5	13 to 15 „
6	6	16 to 18 „
7	7	19 to 21 „
8	8	22 to 24 „
9	9	More than 24 knots.

DANGER TO NAVIGATION SIGNALS FOR ALL SHIPS.

The following are extracts from the International Convention for Safety of Life at Sea, to come into force when ratified:—

Article 34.

The master of every ship which meets with dangerous ice, a dangerous derelict, a dangerous tropical storm or any other direct danger to navigation is bound to communicate the information, by all the means of communication at his disposal, to the ships in the vicinity, and also to the competent authorities at the first point of the coast with which he can communicate. It is desirable that the said information be sent in the manner set out in Regulation XLVI.

Each Administration will take all steps which it thinks necessary to ensure that when intelligence of any of the dangers specified in the previous paragraph is received it will be promptly brought to the knowledge of those concerned and communicated to other Administrations interested.

The transmission of messages respecting the dangers specified is free of cost to the ships concerned.

ANNEXE 1.

REGULATION XLVI.

TRANSMISSION OF INFORMATION.

The transmission of information regarding ice, derelicts, tropical storms or any other direct danger to navigation is obligatory. The form in which the information is sent is not obligatory. It may be transmitted either in plain language (preferably English) or by means of the International Code of Signals (Wireless Telegraphy Section). It should be issued **CQ** to all ships, and should also be sent to the first point of the coast to which communication can be made, with a request that it be transmitted to the appropriate authority.

All messages issued under Article 34 of the present Convention will be preceded by the safety signal **TTT**, followed by an indication of the nature of the danger, thus:—**TTT** Ice; **TTT** Derelict; **TTT** Storm; **TTT** Navigation.

INFORMATION REQUIRED.

The following information is desired, the time in all cases being Greenwich Mean Time:—

(a) ICE, DERELICTS AND OTHER DIRECT DANGERS TO NAVIGATION.

- (1) the kind of ice, derelict or danger observed;
- (2) the position of the ice, derelict or danger when last observed;
- (3) the time and date when the observation was made.

(b) TROPICAL STORMS.—(Hurricanes in the West Indies, Typhoons in the China Seas, Cyclones in Indian Waters, and storms of a similar nature in other regions.)

(1) A STATEMENT THAT A TROPICAL STORM HAS BEEN ENCOUNTERED.—This obligation should be interpreted in a broad spirit, and information transmitted whenever the master has good reason to believe that a tropical storm exists in his neighbourhood.

(2) METEOROLOGICAL INFORMATION.—In view of the great assistance given by accurate meteorological data in fixing the position and movement of storm centres, each shipmaster should add to his warning message as much of the following meteorological information as he finds practicable:—

- (a) barometric pressure (millibars, inches or millimetres);
- (b) change in barometric pressure (the change during the previous two to four hours);
- (c) wind direction (true, not magnetic);
- (d) wind force (Beaufort or decimal scale);
- (e) state of the sea (smooth, moderate, rough, high);
- (f) swell (slight, medium, heavy), and the direction from which it comes.

When barometric pressure is given, the word "millibars," "inches" or "millimetres," as the case may be, should be added to the reading, and it should always be stated whether the reading is corrected or uncorrected.

When changes of the barometer are reported the course and speed of the ship should also be given.

All directions should be true, not magnetic.

(3) TIME AND DATE AND POSITION OF THE SHIP.—These should be for the time and position when the meteorological observations reported were made, and not when the message was prepared or despatched. The time used in all cases should be Greenwich Mean Time.

(4) SUBSEQUENT OBSERVATIONS.—When a master has reported a tropical storm it is desirable, but not obligatory, that other observations be made and transmitted at intervals of three hours, so long as the ship remains under the influence of the storm.

EXAMPLES.

ICE.

TTT Ice. Large berg sighted in 4605 N., 4410 W., at 0800 G.M.T. May 15th.

DERELICT.

TTT Derelict. Observed derelict almost submerged in 4006 N., 1243 W., at 1630 G.M.T. April 21st.

DANGER TO NAVIGATION.

TTT Navigation. Alpha lightship not on station. 1800 G.M.T. January 3rd.

TROPICAL STORM.

TTT Storm. Experiencing tropical storm. Barometer, corrected, 994 millibars, falling rapidly. Wind N.W., force 9, heavy squalls. Swell E. Course E.N.E., 5 knots. 2204 N., 11354 E. 0030 G.M.T. August 18th.

TTT Storm. Appearances indicate approach of hurricane. Barometer, corrected, 2964 inches, falling. Wind N.E., force 8. Swell medium from N.E. Frequent rain squalls. Course 035, 9 knots. 2200 N., 7236 W. 1300 G.M.T. September 14th.

TTT Storm. Conditions indicate intense cyclone has formed. Wind S. by W., force 5. Barometer, uncorrected, 753 millimetres, fell 5 millimetres last three hours. Course N.60W., 8 knots. 1620 N., 9302 E. 0200 G.M.T. May 4th.

TTT Storm. Typhoon to south-east. Wind increasing from N. and barometer falling rapidly. Position 1812 N., 12605 E. 0300 G.M.T. June 12th.

BRITISH WEATHER SHIPPING BULLETIN. AMENDMENTS.

THE region covered by the British Weather Shipping Bulletin will be extended to the northward from 1st January, 1932; and instead of this Bulletin including a "General Inference" there will be a "General Statement" of the conditions over the sea region dealt with in the Bulletin, from that date.

The size of the Western and Eastern Areas will be somewhat reduced at their northern extremities, and a Northern Area will be added.

A full description of the amended Bulletin will be published in the February number, due for publication on 6th January, 1932. Meanwhile attention is invited to Board of Trade Notice to Mariners, dated 1st December, 1931.

Special Notices Regarding Personnel.

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

OBITUARY.

The death of Captain F. W. BATE, O.B.E., R.D., R.N.R., a Professional member of Board of Trade (Mercantile Marine Department) which occurred suddenly on October 31st is noted with regret.

On leaving the School Ship *Conway* Captain BATE served his apprenticeship in the ship *Carisbrooke Castle* and remained throughout his whole sea career in the employ of the Union Castle Company in which service he rose to command.

In 1905 he joined the Board of Trade as a nautical surveyor and was promoted to Senior Nautical Surveyor in 1919. From March, 1920, to November, 1921, he acted as agent of the Marine Division of the Meteorological Office at Southampton relinquishing this work on becoming Principal Officer of the Southern District. In 1923 he transferred as Principal Officer of the London District and was made a Professional Member Marine Department at the Board of Trade Headquarters two years later.

The death of Captain W. H. B. REYNOLDS, commander of the Booth liner *Pancras*, which recently took place in the Southern Hospital, Birkenhead, is noted with regret. Captain REYNOLDS has been in the service of the Booth Line for thirty years and had been a member of the Voluntary Corps of Marine Observers since 1924.

The death of Captain E. R. WILLIAMS, commander of the Anchor Brocklebank S.S. *Mahratta* and a member of the Corps of Voluntary Marine Observers, which took place at his home in Liverpool on 17th November, is noted with regret.

The death of Mr. J. T. WILLIAMS, which took place on 15th November, 1931, at the age of 71, is noted with regret.

Mr. WILLIAMS entered the service of the Meteorological Office in 1881, and for the first few years served as an assistant in the Instruments Division.

In 1885 he was transferred to the Marine Division, and served there continuously until his retirement in March, 1925.

He was for some years engaged in the compilation of meteorological averages for coast stations for inclusion in the Admiralty Pilots; but spent the greater part of his time in the Marine Division in assisting in the extraction of marine data for ocean meteorological charts and atlases, exacting work requiring continual concentration.

His patience and devotion to duty were remarkable, and his example was valuable in the work of the Marine Division.

Captain C. R. Jackson.

Captain C. R. JACKSON, commander of the Union Castle R.M.S. *Balmoral Castle* has retired on attaining the age limit after 48 years service afloat.

Captain JACKSON commenced his sea career in 1883 serving his time in the Dale Line of Liverpool, his first ship being the *Ennerdale*. On completing his apprenticeship he served in the same company as an officer for some years. In 1895 he transferred to steam joining the firm of Messrs. Donald Currie and Co. as a junior officer and rising through the several grades was appointed to command in 1915. Since then he has commanded a number of ships in the Union-Castle fleet including the *Gaika*, *Sandown Castle*, *Garth Castle*, *Dunluce Castle*, *Walmer Castle*, *Llanstephan Castle*, *Saxon* and *Balmoral Castle*.

An old member of our Corps, Marine Observers join with the Marine Division in wishing Captain JACKSON long life and happiness in his retirement.

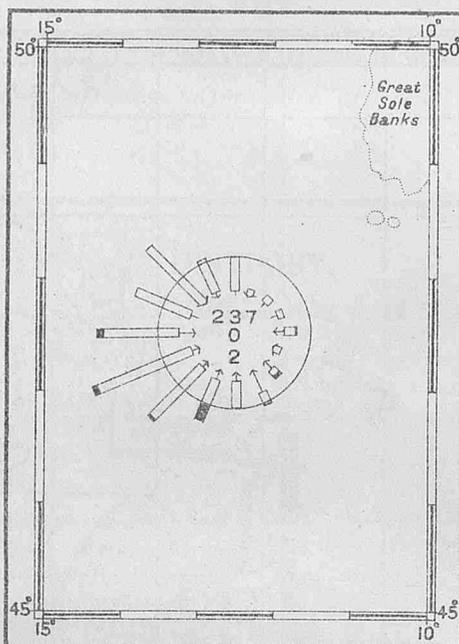
Captain E. C. Wakeman.

Captain E. C. WAKEMAN, commander of the M.V. *Alcantara*, has retired from active service afloat upon reaching the age limit. Joining the Royal Mail Steam Packet Company as a fifth officer in 1895, Captain WAKEMAN obtained his first command in 1912. He has since commanded some of the finest vessels in the R.M.S.P. fleet including *Carmarthenshire*, *Deseado*, *Asturias*, *Almanzora* and *Alcantara*.

A member of our Corps, Marine Observers join with the Marine Division in wishing Captain WAKEMAN long life and happiness in his retirement.

JANUARY.

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



EXPLANATION.

The wind rose is drawn from observations within the 5° square. Arrows fly with the wind, length represents frequency, thickness strength.

GALE	MODERATE	LIGHT
8-12	4-7	1-3

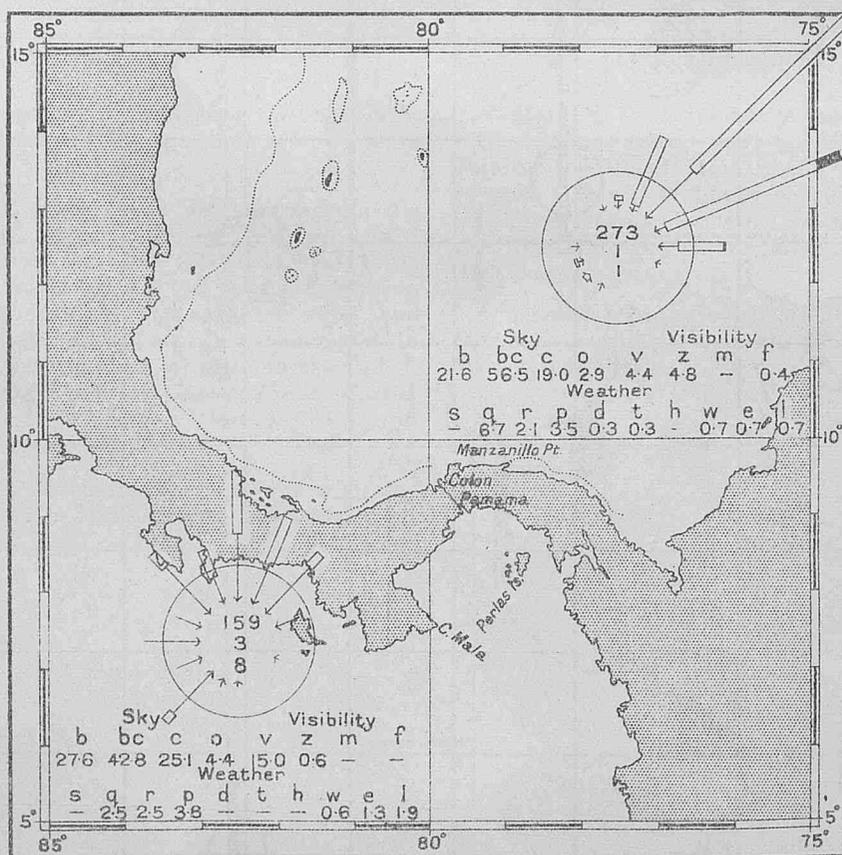
 Distance from head of arrow to circle represents 5%, Scale:-

10%	20%
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 The upper figure in the centre of the rose gives total number of observations; the middle figure, the percentage frequency of calms; the lower figure the percentage frequency of variable winds.

JANUARY.

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



EXPLANATION.

The wind roses are drawn from Sea observations within the 5° squares. Arrows fly with the wind, length represents frequency, thickness strength.

GALES	MODERATE	LIGHT
8-12	4-7	1-3

 Distance from head of arrow to circle represents 5%. Scale:-

10%	20%
-----	-----

 The upper figure in the centre of the rose gives total number of observations, The middle figure the percentage frequency of calms, and the lower figure the percentage frequency of variable winds. The percentage frequency of types of weather are shown in the lower half of each 5° square by the figures beneath each of the letters of the Beaufort weather notation. For example in the 5° square Latitude 5° to 10°N, Longitude 80° to 85°W, c was logged 25 times in every 100 observations while v was logged 15 times.

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

A SPECIAL REQUEST TO COMMANDERS OF SELECTED SHIPS.

The Commanders of "Selected Ships" are asked to have this number of The Marine Observer especially, passed to their observing officers and to their W/T operators for in it is given information which is essential for efficient work throughout the coming year.

In it is published a description of the Selected Ship system with instructions not only for coding and decoding Ships Wireless Weather reports but also instructions for communication, the wave lengths to be used, times when the reports should be sent, to whom they should be addressed, etc.

The attention of W/T operators is especially invited to the schedule for communication, the list of stations to which "A Selected Ships" should send their reports (published each month) and in particular when in the Eastern North Atlantic to the roll call and its proper use. It cannot be emphasized too strongly that routine W/T Weather Reports made by "Selected

Ships" are intended primarily for the use and benefit of shipping to aid navigation and that if these instructions are not adhered to by "Selected Ships" the value of the work is diminished or lost, because if the schedule and roll call are not followed correctly the reports may not be intercepted by ships within range and they will not reach the appropriate Meteorological Centre ashore, punctually.

Owing to the abnormal state of shipping due to depressed trade frequent changes in Selected Ships are necessary to maintain the British complement of 306 and to maintain the best possible distribution.

The expenditure of this number of The Marine Observer is therefore unusually heavy at the present time.

When Selected Ships discontinue as such it will help greatly if they will return spare copies of the January Marine Observer and the Code Card to the Port Meteorological officer or Agent.

ATTENDANCE UPON OBSERVING SHIPS AT THE PORTS.

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

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

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

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

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

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

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

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.

DESPATCH OF INFORMATION REQUIRED IMMEDIATELY FOR THE CONDUCT OF THE WORK AT SEA.

Shipowners, Marine Superintendents and all concerned in the despatch of mails to Ships abroad are asked to kindly facilitate the despatch and delivery of postal matter received at their offices from the Meteorological Office and Air Ministry Publication Depot to their Ships abroad.

This matter addressed to the Commanders of Ships contains information which is required for the Conduct of Marine Meteorological Work at Sea and is most effective if received by the Commanders at the earliest possible date.

Much of the information referred to is published in the Marine Observer and is of a seasonal nature. This journal also contains advice to Regular Observing Ships which enables them to perform voluntary service by Wireless Communication for the benefit of all shipping.

ICE CHART. WESTERN NORTH ATLANTIC.

LETTERS OF TRANSATLANTIC TRACKS INDICATE.

- (C) From 1st July to 10th April, inclusive.
- (E) From 1st December to 14th February, inclusive.

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

ROUTE NOTICES.

For latest information *re* Tracks see pages 87-88 of Vol. VIII, No. 88, April, 1931, Number, and Notice of Changes on the Ice Chart in May, 1931 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.

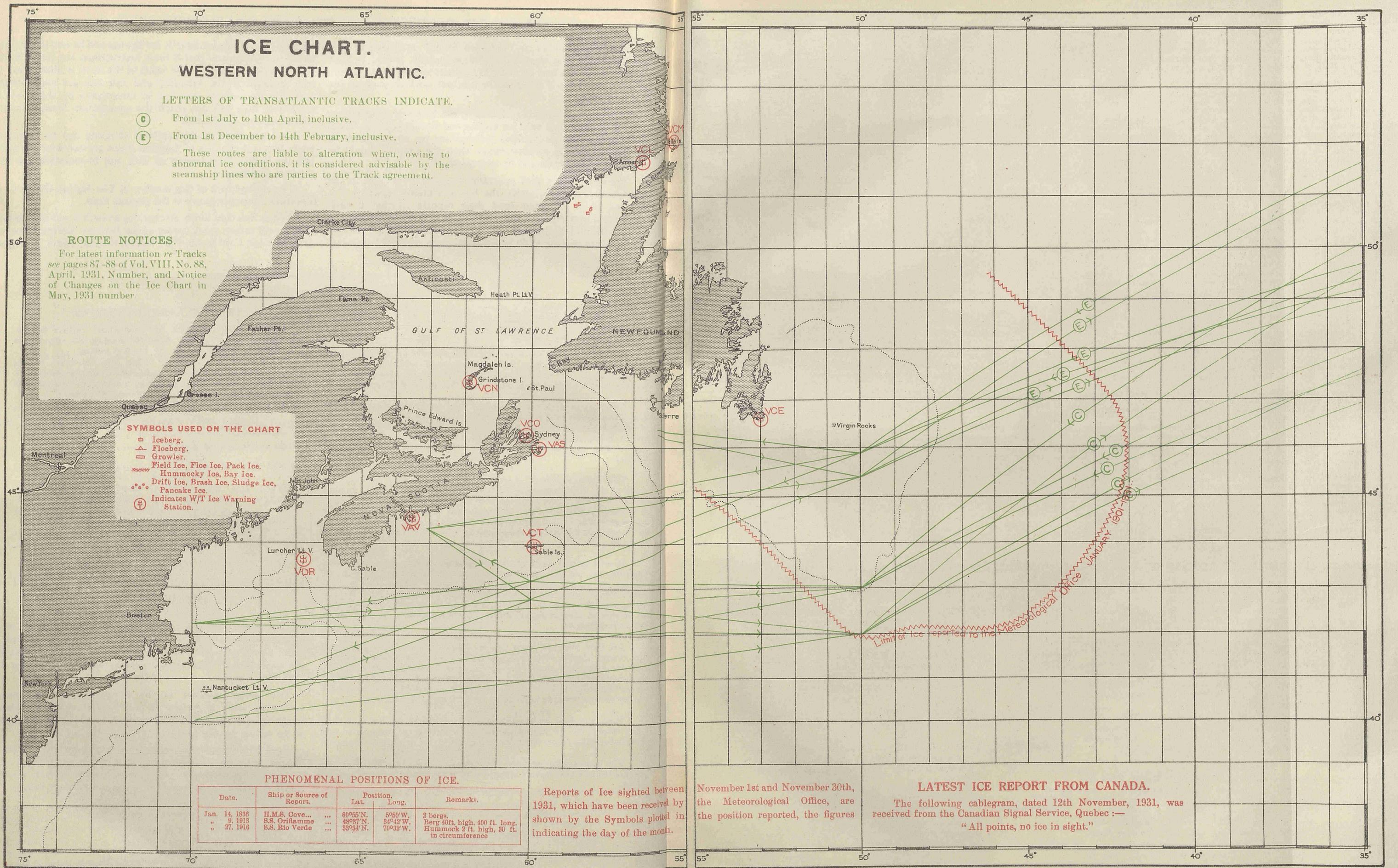
Date.	Ship or Source of Report.	Position.	Remarks.
		Lat. Long.	
Jan. 14, 1836	H.M.S. Cove...	60°55' N. 59°50' W.	2 bergs.
" 9, 1913	S.S. Oriflamme ...	48°37' N. 54°42' W.	Berg 40ft. high, 400 ft. long.
" 27, 1916	S.S. Rio Verde ...	39°34' N. 70°32' W.	Hummock 2 ft. high, 30 ft. in circumference

Reports of Ice sighted between November 1st and November 30th, 1931, which have been received by the Meteorological Office, are shown by the Symbols plotted in indicating the day of the month.

November 1st and November 30th, the Meteorological Office, are the position reported, the figures

LATEST ICE REPORT FROM CANADA.

The following cablegram, dated 12th November, 1931, was received from the Canadian Signal Service, Quebec:—
"All points, no ice in sight."



CO-OPERATION OF SHIPOWNERS, MASTERS AND MATES.

Captains and officers who wish to co-operate regularly with the Meteorological Office should apply to the appropriate Port Meteorological Officers or Agents, a list of these gentlemen with addresses is given below. 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 booksellers, price 2s. 6d.

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.

To decode "Selected Ships" reports the pamphlet M.O. 329, price 3d. may be obtained from H.M. Stationery Office.

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, P.L.A. Building, King George V Dock (south side), London, E.16. (Telephone No.: Albert Docks 2659. Telegraphic Address: Barometric Aldock, London).

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

Agents.

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

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

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

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

LATE PRESS.

DERELICTS AND FLOATING WRECKAGE.

Date.	Position.		Description.
	Latitude.	Longitude.	
NORTH SEA.			
12.11.31	53°51'N.	5°20'E.	Spar, floating at about 8 to 10 ft. above the surface.
12.11.31	8 miles S $\frac{1}{2}$ W.	from Girdleness.	Large tree or spar.
ENGLISH CHANNEL.			
14.11.31	50°36'N.	1°43'W.	Water-logged dinghy, stern section crushed, apparently coloured dark red or black.
NORTH ATLANTIC.			
1.11.31	45°03'N.	8°04'W.	Log, about 40 ft. long, covered with barnacles, probably attached to submerged wreckage.
1.11.31	37°42'N.	74°57'W.	Small lighter with a white house on one end, and a heavy timber lying on deck.
4.11.31	7 miles N. 75°W.	of Longships.	Small red cylindrical buoy.
4.11.31	28°58'N.	48°05'W.	Bell buoy, heavily covered with rust.
8.11.31	33°41'N.	76°18'W.	Large spar, about 2 ft. in diameter, covered with copper sheeting, floating upright.
17.11.31	35°58'N.	38°10'W.	Schooner RIA abandoned; derelict danger to navigation.
20.11.31	46°45'N.	6°21'W.	Drifting wreck, dangerous to navigation.
20.11.31	48°52'N.	6°27'W.	Partly submerged log, 30 ft. long, 3 ft. in diameter, covered with weeds and shells.
21.11.31	44°28'N.	15°20'W.	Black buoy with cross topmark.
22.11.31	48°26'N.	5°20'W.	Conical buoy with ring top and two white painted horizontal bands; dangerous to navigation.
NORTH PACIFIC.			
1.11.31	38°30'N.	131°44'W.	Log, about 20 ft. long and 4 ft. in diameter.
5.11.31	39°38'N.	124°12'W.	Log, about 20 ft. long and 3 $\frac{1}{2}$ ft. in diameter.

Agents (contd.).

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

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

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

SOUTHAMPTON Mr. R. I. T. MCEWAN, Master Mariner, Gilchrist Navigation School, 5, Union Bank Chambers, 1, Bernard Street. (Telephone No. Southampton 4277).

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

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

LIST OF VOLUNTARY OBSERVING SHIPS

Name of Vessel.	Captain.	Observing Officers.	Meteoro-logical Equipment.	Line.	Last Log, Register, or Record Contributed. Received up to 13.11.31.	Date Received.
<i>Clan Macbeth</i> ...	Giles, H. J., R.D. R.N.R.	W. R. Woodriffe, L. W. Gibbins, I. Cape Scott.	No. A.	Clan	Form 911 4.7.31 to 23.8.31 ...	25.9.31
<i>Clan Macfadyn</i> ...	Laird, C.	W. C. Dalzell	" A.	"	" 12.9.31 to 3.10.31 ...	9.11.31
<i>Clan Macfarlane</i> ...	Redford, L. F., Lt- Commr. R.N.R.	W. H. Simpson	" A.	"	" 21.7.31 to 17.10.31 ...	19.10.31
<i>Clan Macindoe</i> ...	Scott-Smith, H. E. G. O.B.E., R.D., Lt- Commr., R.N.R.	J. C. Dunphy	" A.	"	" 5.9.31 to 10.10.31 ...	13.10.31
<i>Clan Mackellar</i> ...	Lyall, A. B.	A. V. Howard, G. S. Bullock, L. B. Sparkes.	W.T.	"	Form 915 25.5.31 to 26.10.31 ...	9.11.31
001 *† <i>Clan Macphee</i> ...	Gourlay, J. B.	E. H. Stone, G. Drake A. Pollock.	"	"	" 13.5.31 to 14.9.31 ...	16.10.31
004 *† <i>Clan MacNair</i> ...	Holman, W. G.	F. H. Petheridge A. Wood- row, J. F. Vooght.	"	"	Forms 911 & 138 18.7.31 to 20.10.31	21.10.31
<i>Clan Macquarrie</i> ...	West, W. F.	J. H. Thorpe	No. A	"	Form 911 14.6.31 to 3.11.31 ...	5.11.31
002 *† <i>Clan Macwhirter</i> ...	Low, A.	M. J. Lewis, H. Whitehead, C. Rodger.	M.L.	"	Form 915 11.6.31 to 30.10.31 ...	7.11.31
003 *† <i>Clan Malcolm</i> ...	George, L. S.	A. Lynch, H. Hind, S. Ewing	No. A.	"	" 17.4.31 to 13.8.31 ...	18.8.31
<i>Clan Morrison</i> ...	Porterfield, W. M., Lt- Commr., R.N.R.	H. W. Peletier, W. Leck ...	No. A.	"	Form 911 16.10.31 to 27.10.31 ...	4.11.31
<i>Clan Murdoch</i> ...	Wynne, R. H.	D. D. Ingram	" A.	"	" 10.10.31 to 19.10.31 ...	28.10.31
<i>Clan Ranald</i> ...	Hawley, F. J.	H. C. Carter	" A.	"	" 25.6.31 to 18.7.31 ...	27.8.31
<i>Clan Sinclair</i> ...	Cater, H.	D. Mc Allister	" A.	"	" 9.9.31 to 3.10.31 ...	26.10.31
<i>Colonial</i> ...	Baird, W.	W. Moore, A. P. Brown, A. Smart.	" M.	Harrison	" 24.8.31 to 20.9.31 ...	12.10.31
298 *† <i>Comedian</i> ...	Cadogan, A.	F. M. Eales	" M.	"	" 6.7.31 to 29.7.31 ...	22.8.31
185 † <i>Comorin</i> ...	Cartright, C. W., D.S.C.	R. E. Tucker	" M.	P. & O.	Forms 911 & 138 21.8.31 to 27.10.31	30.10.31
198 *† <i>Contractor</i> ...	Harraden, W. E.	W. G. Neill, L. Siddon, R. Myles	" M.	Harrison	" 29.8.31 to 19.10.31	26.10.31
049 *† <i>Coptic, M.V.</i> ...	Williams, G.	H. A. Hill, P. Saville, W. Burt.	W.T.	Shaw, Savill & Albion	" 14.5.31 to 21.8.31	10.9.31
100 *† <i>Cornwall</i> ...	Almond, J. G.	W. H. G. Timberlake	M.L.	Federal	Form 911 17.4.31 to 21.5.31 ...	28.5.31
006 † <i>Coronado</i> ...	Thorburn, R. A.	A. Orchard, A. Magill, G. Binks.	W.T.	Elders & Fyffes ...	Forms 911 & 138 3.9.31 to 4.10.31	6.10.31
214 *† <i>Counsellor</i> ...	Jackson, J.	G. C. Heaton, W. A. Short, J. L. Curle.	No. M.	Harrison	" 31.5.31 to 2.9.31	8.9.31
301 *† <i>Culebra</i> ...	Goble, C. J.	H. D. Hooper, T. Davies, H. A. Wright.	M.L.	R.M.S.P. Co.	Form 915 11.5.31 to 29.9.31 ...	14.10.31
036 *† <i>Cumberland</i> ...	Maltby, T. L.	W. H. Corlett, J. L. Williams, J. Glen.	No. M.	Federal	Forms 911 & 138 30.7.31 to 1.11.31	9.11.31
285 *† <i>Custodian</i> ...	O'Connor, T.			Harrison		
<i>Dakarian</i> ...	Brown, W.	A. A. Johnson	No. A.	Leyland		
<i>Dardanus</i> ...	Christie, W.	J. S. Ogilvie	No. A.	A. Holt	Form 911 11.7.31 to 4.8.31 ...	12.8.31
302 † <i>Darro</i> ...	Green, J.	W. Roberts, A. J. Barff ...	W.T.-M.	R.M.S.P. Co.	Forms 911 & 138 19.7.31 to 10.9.31	18.9.31
<i>Davisian</i> ...	Thomas, R.	T. Steventon	No. A.	Leyland	Form 911 10.1.30 to 24.10.31	30.10.31
303 † <i>Demerara</i> ...	Matthews, G. P.	E. N. Gillet, W. Lowe, J. Phillips.	W.T.-M.	R.M.S.P. Co.	Forms 911 & 138 21.6.31 to 13.8.31	20.8.31
<i>Dents</i> ...	Harris, F. C. P.	A. W. Hanchett, J. H. Stoker	M.L.	Booth	" 6.5.31 to 21.5.31	29.5.31
304 † <i>Deseado</i> ...	Buret, J. F. C.	G. B. Medleycott	W.T.-M.	R.M.S.P. Co.	" 21.8.31 to 7.10.31	26.10.31
117 † <i>Desna</i> ...	Huff, G.	G. L. Elliott, H. Lang ...	" M.	"	" 2.3.31 to 23.4.31	14.5.31
252 *† <i>Devon</i> ...	Kinnell, G.	G. Chaplin, J. D. Marks, M. Willinott.	No. M.	Federal	" 7.4.31 to 14.7.31	16.7.31
<i>Dieppe</i> ...	Lidbetter, W.	E. A. Biles	C.C.	Southern Railway ...	Telegraphic Report 4.10.31	4.10.31
284 *† <i>Director</i> ...	Worthington, B.	M. G. O'Brien, A. M. Hughes, A. E. Rogers.	No. M.	Harrison	Forms 911 & 138 27.4.31 to 1.8.31...	8.8.31
138 *† <i>Discovery II, R.R.S</i>	Carey, W. M., Commr., R.N.	R. A. E. Ardley, A. L. Nelson, L. C. Hill.	M.L.	Falkland Is. Govt. ...	Form 915 31.3.31 to 31.5.31 ...	30.9.31
<i>Dorellan</i> ...	Hugan, C.	J. A. Kendall	No. A.	Leyland	Form 911 20.3.31 to 25.5.31 ...	1.6.31
136 *† <i>Doric Star</i> ...	Mills, D. H.	Anderson	No. M.	Blue Star		
275 *† <i>Dramatist</i> ...	Meek, A. J.	G. H. Howard, I. W. Page ...	" M.	Harrison	Forms 911 & 138 16.7.31 to 4.9.31	10.9.31
142 † <i>Duchess of Atholl</i> ...	McQueen, D. S.	G. Mowatt, C. D. Watt, E. Glennie.	W.T.-M.	Canadian Pacific ...	" 18.10.31 to 5.11.31	12.11.31
152 † <i>Duchess of Bedford</i>	Sibbons, H.	J. Roche, A. Antrobus, F. Stell.	"	"	" 27.9.31 to 15.10.31	21.10.31
151 † <i>Duchess of Richmond.</i>	Freer, A., Capt. R.N.R.	W. A. Stanley	"	"	" 11.10.31 to 29.10.31	6.11.31
143 † <i>Duchess of York</i> ...	Stuart, R. N., V.C. D.S.O., Commr., R.N.R.	D. Parsons, J. B. Saunders ...	"	"	" 4.10.31 to 21.10.31	30.10.31
098 † <i>Dunbar Castle, M.V</i>	Vincent, E. S., R.D. Commr., R.N.R.	J. Daziell, T. W. McAllen, P. G. MacIver.	W.T.	Union Castle	" 20.10.31 to 7.11.31	10.11.31
<i>Dunrobin</i> ...	Ramsay, J. D.	W. R. Holt, J. Y. Butt ...	No. A.	Glen & Co.	Form 911 23.7.31 to 20.9.31 ...	15.10.31
052 *† <i>Dunster Grange</i> ...	Wilson, G. F.	J. Allerton	" M.	Houlder	Forms 911 & 138 21.6.31 to 26.8.31	29.8.31
102 *† <i>Duquesa</i> ...	Frost, C. R.	R. Rushton, C. W. Denman, F. D. Jones.	" M.	Furness Withy	" 23.8.31 to 4.11.31	9.11.31
215 *† <i>Durenda, M.V.</i> ...	Moon, J.	H. Stott	" M.	British India	" 11.6.31 to 5.7.31	8.7.31
077 † <i>Edinburgh Castle</i> ...	Linklater, H.	W. Aldous, H. P. Bidwell ...	W.T.	Union Castle	Forms 911 & 138 22.8.31 to 19.10.31	21.10.31
107 *† <i>El Argentino, M.V.</i>	Ellis, F., D.S.C.	W. Findlay, J. Burch, C. G. Adlard.	No. M.	Houlder	" 18.8.31 to 20.10.31	9.11.31
009 *† <i>Elmworth, M.V.</i> ...	Dick, J.	J. M. Whyte	" M.	R. S. Dalgleish	Form 911 3.9.31 to 23.9.31 ...	9.10.31
158 *† <i>Elpenor</i> ...	Wilson, R. J.	E. Roberts, J. Macfarlane, G. Rowlands.	M.L.	A. Holt	Form 915 14.3.31 to 7.7.31 ...	16.7.31
108 *† <i>Elstree Grange</i> ...	Williams, W. E.	P. A. Hawkesworth	No. M.	Houlder	Forms 911 & 138 15.5.31 to 9.8.31	25.8.31
109 *† <i>El Paraguayo</i> ...	Frost, C. R.	G. Fletcher, F. J. G. Rice, R. L. Aldridge.	" M.	"	" 15.6.31 to 6.8.31	11.8.31
110 *† <i>El Uruguayo</i> ...	McNamara, T.	F. E. Hailstone	" M.	"	" 12.9.31 to 13.8.31	5.10.31
088 *† <i>Empire Star</i> ...	Owen, G., R.D., Lt- Commr., R.N.R.		M.L.	Blue Star		
006 † <i>Empress of Australia</i>	Griffiths, E., Lt- Commr., R.N.R.	A. Tippet, A. H. Pigott, R. Newsom.	W.T.	Canadian Pacific ...	Forms 911 & 138 3.10.31 to 23.10.31	27.10.31
034 † <i>Empress of Britain</i>	Latta, R. G.	W. P. Phillips, J. H. Tudor, J. R. Bubb.	"	"	" 22.10.31 to 2.11.31	6.11.31
154 † <i>Empress of Canada</i>	Hailey, A. J., Lt- Commr., R.N.R.	G. O. Baugh, R. H. Foley, H. Kennedy.	M.L.	"	Form 915 28.3.31 to 8.7.31 ...	31.8.31
153 † <i>Empress of Japan</i>	Robinson, S., C.B.E., R.N.R.	R. Goss, R. Wolfenden, A. Le Maistre.	"	"	" 7.8.30 to 13.1.31 ...	16.2.31

Name of Vessel.	Captain.	Observing Officers.	Meteoro-logical Equipment.	Line.	Last Log, Register, or Record Contributed. Received up to 13.11.31	Date Received.
011 †† <i>Euripides</i> ...	Vaughan, P. R., D.S.C. R.D., Commr. R.N.R.	... ..	W.T.—M.	White Star ...	... ..	...
<i>Explorer</i> ...	Allan, J. ...	A. Stout ...	No. A.	Scottish Fishery Brd.	Form 911 7.10.31 to 14.10.31	2.11.31
067 *† <i>Ferndale</i> ...	Beighton, J. N. ...	L. J. Hopkins ...	„ M.	Aberdeen Common-wealth.	Form 911 25.6.31 to 27.7.31	21.9.31
074 *† <i>Fordsdale</i> ...	Avern, J., Commr. R.N.R.	F. H. E. Vaughan ...	„ M.	Aberdeen Common-wealth.	Forms 911 & 138 18.7.31 to 25.8.31	8.9.31
030 †† <i>Franconia</i> ...	Gibbons, G., R.D., Capt., R.N.R.	W. M. Stewart, W. B. Tanner, R. Pollitt.	W.T.	Cunard ...	Form 911 17.9.31 to 1.11.31	3.11.31
<i>Freya</i> ...	Lamont, A. ...	W. Pirrie ...	No. A.	Scottish Fishery Brd.	„ 22.10.31 to 31.10.31	3.11.31
159 ** <i>Gascoyne</i> ...	Johnson, L. ...	J. S. Macbryde, C. O. Melson, W. Uttley,	M.L.	A. Holt & Co... ..	Form 915 12.2.31 to 3.7.31	31.8.31
125 *† <i>Glenamoy, M.V.</i> ...	Ings, W. J. ...	F. Laycock, L. Eccles, A. C. Radley.	W.T.	Glen Line ...	„ 22.6.31 to 27.10.31	2.11.31
126 *† <i>Glenarry, M.V.</i> ...	Angier, J. ...	G. Morgan, I. G. Neill, S. W. Bell.	No. M.	„ ...	Forms 911 & 138 19.6.31 to 4.10.31	9.10.31
<i>Glentworth</i> ...	Aitchison, D.M. ...	... ..	„ A.	R. S. Dalgleish ...	Form 911 20.6.31 to 8.9.31	29.9.31
085 *† <i>Governor</i> ...	Windsor, G. R. ...	A. Watson, J. Stanhope ...	„ M.	Harrison ...	Forms 911 & 138 25.6.31 to 23.8.31	27.8.31
111 *† <i>Hardwicke Grange</i> ...	Fowler, W. H. ...	W. L. Baker, A. W. Seybold, W. E. Ellis.	„ M.	Houlder ...	Forms 911 & 138 2.8.31 to 7.10.31	13.10.31
<i>Harmonides</i> ...	Elwell, F. R. ...	L. Pogson, J. C. Robertson, J. MacLeod.	„ A.	R. P. Houston ...	Form 911 22.7.31 to 28.8.31	10.9.31
262 ** <i>Hauraki, M.V.</i> {	Norton, A. T. ...	D. W. Blacklaws, D. McLeish, H. A. Brockett.	M.L.	Union S.S. Co., N.Z. ...	Form 915 8.12.30 to 16.7.31	28.9.31
<i>Hermintus</i> ...	Hender, W. ...	F. W. Gilroy ...	„	Shaw, Savill & Albion	Form 911 9.7.31 to 1.11.31	9.11.31
253 *† <i>Hertford</i> ...	Burton Davies, J. ...	P. Shakespeare, P. Block, P. M. Devitt.	„	Federal ...	Form 915 14.2.31 to 24.6.31	6.7.31
<i>Hibernia</i> ...	Williams, E. R. ...	C. A. Marsh ...	C.C.	L.M. & S. Railway ...	Telegraphic Report 24.10.31	24.10.31
182 †† <i>Highland Brigade</i> ...	Lloyd, H. ...	W. Stephen, N. Hersee, C. Morgan.	No. M.	Nelson ...	Forms 911 & 138 9.8.31 to 27.9.31	7.10.31
116 †† <i>Highland Chieftain, M.V.</i> ...	Robinson, R. H. ...	W. J. Presland ...	W.T.—M.	„ ...	„ 16.7.31 to 1.9.31	4.9.31
099 †† <i>Highland Monarch, M.V.</i> ...	Ashby Graves, F. ...	R. Polden ...	No. M.	„ ...	„ 7.9.31 to 28.10.31	2.11.31
250 †† <i>Highland Princess, M.V.</i> ...	Collins, D. ...	C. Leech, J. Fitton, D. Seabrook.	„ M.	„ ...	„ 26.7.31 to 13.9.31	19.9.31
<i>Hilary</i> ...	Jones, W. C. H., R.D., Commr., R.N.R.	... ..	M.L.	Booth ...	... ..	...
079 *† <i>Hildebrand</i> ...	Buck, R. H., R.D., Capt., R.N.R.	F. H. Good ...	W.T.	„ ...	Forms 911 & 138 19.7.31 to 24.8.31	1.9.31
075 *† <i>Hobson's Bay</i> ...	Roberts, T. V., R.D., Lt.-Commr., R.N.R.	F. L. Gross, C. Smith, C. Carroll.	No. M.	Aberdeen Common-wealth.	Form 915 9.7.31 to 11.10.31	19.10.31
<i>Hubert</i> ...	Briscoe, W. ...	R. Parry, G. G. Westhorp, L. A. Sterling.	M.L.	Booth ...	„ 17.5.31 to 25.7.31	28.7.31
261 *† <i>Huntingdon</i> ...	Field, H. G. B. ...	P. S. Calcutt, H. F. Wilkinson, M. T. D. Walter.	W.T.	Federal... ..	Forms 911 & 138 26.4.31 to 15.8.31	27.8.31
200 *† <i>Huntsman</i> ...	Russell, H. ...	J. Richardson, D. H. Goddard	No. M.	Harrison ...	Form 911 15.8.31 to 2.11.31	13.11.31
289 *† <i>Inanda</i> ...	Gibbins, W. H. ...	D. C. Brown, R. L. Williams, T. W. Kent.	„ M.	„ ...	Forms 911 & 138 15.8.31 to 24.9.31	5.10.31
<i>Ingoma</i> ...	Richardson, R. ...	D. O. Pucey ...	„ M.	A. Holt ...	„ 12.9.31 to 21.10.31	28.10.31
160 *† <i>Ixion</i> ...	Stewart, J. A. ...	G. L. Oldrich, W. H. Deans, F. G. Brown.	M.L.	„ ...	Form 915 9.10.30 to 18.3.31	29.5.31
<i>Jamaica Merchant</i>	Rach, L. G., R.D., Lt.-Commr., R.N.R.	R. C. Vigurs, B. W. Smith, D. T. Sharrock.	„	Jamaica Direct Fruit	Form 915 10.6.31 to 21.8.31	3.9.31
072 ** <i>Jamaica Planter</i> ...	P. D. Allen ...	G. R. Wortley ...	W.T.	„	Forms 911 & 138 22.9.31 to 25.10.31	9.11.31
<i>Jamaica Producer</i> ...	Allen, P. D. ...	H. C. Braine ...	No. A.	„	Form 911 18.6.31 to 29.6.31	24.7.31
<i>Javanese Prince, M.V.</i>	Smith, J. ...	C. E. Edney ...	„ A.	Prince ...	„ 8.7.31 to 2.10.31	2.10.31
187 *† <i>Jeypore</i> ...	Harris, W. L. ...	A. G. Edwards ...	„ M.	P. & O. ...	Forms 911 & 138 4.9.31 to 2.10.31	26.10.31
188 †† <i>Kaisar-i-Hind</i> ...	Headlam, P. C., R.D., Commr. R.N.R.	T. T. Ferguson, H. Flint, L. Irons.	„ M.	„ ...	Forms 911 & 138 30.8.31 to 7.9.31	21.10.31
041 *† <i>Karamea, M.V.</i> ...	Kenworthy, V. ...	N. S. Milne, C. Sendall, P. Campbell.	M.L.	Shaw, Savill & Albion	Form 915 17.7.31 to 1.11.31	4.11.31
217 *† <i>Karapara</i> ...	White, R. W. ...	J. B. Walker, C. W. Furze ...	No. M.	British India... ..	Forms 911 & 138 17.7.31 to 10.8.31	21.9.31
286 *† <i>Karmala</i> ...	McBryde, A. ...	A. Storr, L. Porter, F. W. J. Pearce.	„ M.	P. & O. ...	„ 28.6.31 to 2.10.31	18.10.31
180 *† <i>Kashgar</i> ...	Sudell, F., R.D., Commr., R.N.R.	R. P. Eddy ...	„ M.	„ ...	„ 4.5.31 to 7.8.31...	11.8.31
191 *† <i>Kashmir</i> ...	Axford, R. G. ...	Cadets — ...	„ M.	„ ...	„ 6.6.31 to 12.7.31	20.8.31
114 †† <i>Kenya</i> ...	Miller, A. C. ...	R. Lord, A. Ralph, H. Evans	„ M.	British India ...	„ 16.7.31 to 20.8.31	14.9.31
218 *† <i>Khandalla</i> ...	Eadie, J. D. ...	D. W. Dix, A. J. Woodcock	„ M.	„ ...	„ 23.9.31 to 6.10.31	2.11.31
186 *† <i>Kidderpore</i> ...	Wright, C. S., R.D., Commr., R.N.R.	J. Collard, G. B. Roche ...	„ M.	P. & O. ...	„ 30.5.31 to 27.8.31	21.9.31
169 ** <i>Kwangchow</i> ...	Stringer, C. B. L. ...	B. C. Finch, E. J. Cox ...	M.L.	China Nav. Co. ...	Form 915 26.11.30 to 1.5.31	29.6.31
147 †† <i>Laconia</i> ...	Hawkes, W. R. D., Capt. R.N.R.	J. D. Archer, R. V. Youd, M. Boston.	W.T.	Cunard... ..	Forms 911 & 138 4.10.31 to 25.10.31	23.10.31
<i>Lagarto, M.V.</i> ...	Kirkwood, J. H. ...	F. Grant ...	No. A.	Pacific S.N. Co. ...	... ..	...
<i>Laguna, M.V.</i> ...	Dunn, R. E., O.B.E. ...	W. Billington ...	„ A.	„ ...	Form 911 16.5.31 to 2.6.31	5.6.31
193 *† <i>Lahore</i> ...	Hollow, J. H. ...	J. G. K. Gregory, F. Hull, S. R. Eva.	„ M.	P. & O. ...	Forms 911 & 138 19.7.31 to 12.10.31	14.10.31
<i>Lalande</i> ...	Symons, P. ...	C. Legg ...	„ A.	Lamport & Holt ...	Form 911 30.1.30 to 24.2.31	4.3.31
<i>Laomedon</i> ...	Davidson, T. W. ...	A. E. Martin ...	„ A.	A. Holt ...	„ 29.9.31 to 24.10.31	26.10.31
082 *† <i>La Paz, M.V.</i> ...	Morgan, D. R. ...	G. Pattison ...	No. M.	Pacific S.N. Co. ...	Forms 911 & 138 2.7.31 to 13.10.31	2.11.31
134 †† <i>Lapland</i> ...	Harvey, H. ...	L. Williams, H. Patterson, R. M. Farmer.	W.T.	Red Star ...	„ 19.16.31 to 24.10.31	10.11.31

LIST OF VOLUNTARY OBSERVING SHIPS

Name of Vessel.	Captain.	Observing Officers.	Meteoro-logical Equipment.	Line.	Last Log, Register, or Record Contributed. Received up to 13.11.31.	Date Received.
076 *† <i>Largs Bay</i> ...	Jermyn, W. M. ...	F. B. Marsden, B. S. Mackenzie.	No. M.	Aberdeen Common-wealth.	Forms 911 & 138 17.5.31 to 28.6.31	28.9.31
112 *† <i>La Rosarina Lassell</i> ...	Webb, C. ...	W. S. Hamblin ...	" M.	Houlder ...	" " 12.7.31 to 17.9.31	22.9.31
064 †† <i>Laurentic</i> ...	Lindsay, J. ...	P. Casey ...	" A.	Lampport & Holt ...	Form 911 11.2.31 to 6.5.31 ...	14.5.31
	Hume, R. ...	F. M. Murphy, R. Conway, G. Harris.	" W.T.	White Star ...	Forms 911 & 138 11.10.31 to 31.10.31	11.11.31
083 *† <i>Lautaro, M.V.</i> ...	Kite, E. ...	J. Lloyd Jones, J. Williams...	No. M.	Pacific S.N. Co. ...	" " 20.8.31 to 12.9.31	25.9.31
254 *† <i>Limerick</i> ...	Molyneux, P. L. ...	J. Trotter, N. A. Thomas ...	" M.	Federal... ..	" " 1.9.31 to 15.10.31	21.10.31
093 *† <i>Llandaff Castle</i> ...	Attwood, J. ...	J. M. Goode ...	" W.T.	Union Castle ...	" " 19.6.31 to 24.8.31	27.8.31
097 †† <i>Llandaff Castle, M.V.</i>	Nicholl, D. ...	H. S. Warren ...	"	" " ...	" " 18.7.31 to 19.9.31	5.10.31
094 *† <i>Llandoverly Castle</i>	Morgan, A. O., R.D., Commr., R.N.R.	T. C. Goldstone, F. R. Pope, R. C. J. Hatt.	"	" " ...	Form 915 21.8.31 to 24.10.31 ...	2.11.31
216 *† <i>Llanstephan Castle</i>	Bickford, C. N. ...	J. B. Duncan, G. H. Pickering, S. Smith.	"	" " ...	Forms 911 & 138 28.6.31 to 28.8.31	3.9.31
084 *† <i>Lobos, M.V.</i> ...	Leyne, R. W. ...	R. H. Sissons ...	No. M.	Pacific S.N. Co. ...	" " 21.4.31 to 10.8.31	14.8.31
<i>Lochgail, M.V.</i> ...	Schlanbusch, O. V. ...	P. Burrell ...	" A.	R.M.S.P. Co. ...	Form 911 27.6.31 to 10.9.31 ...	29.9.31
<i>Lochnonar, M.V.</i> ...	Purvis, A. ...	F. G. Dawson, A. Yeatman	" A.	" " ...	" " 26.1.31 to 24.4.31 ...	7.5.31
137 *† <i>Logician</i> ...	Logician, R. J. ...	T. Winstanley, E. L. Stockley	" M.	Harrison " ...	Forms 911 & 138 2.6.31 to 13.10.31	23.10.31
<i>London Citizen</i> ...	Westgarth, W. A. ...	H. Richardson, E. W. Capper, S. Rylands.	" A.	Furness Withy ...	Form 911 30.8.31 to 2.10.31 ...	5.10.31
<i>London Exchange</i>	Griffiths, J. ...	C. T. V. Rixham ...	" A.	" " ...	" " 13.9.31 to 14.10.31 ...	19.10.31
<i>Loriga, M.V.</i> ...	Grant, F. H. ...	J. D. Richards, W. Horsfall...	" A.	Pacific S.N. Co. ...	" " 15.6.31 to 6.7.31 ...	8.7.31
008 *† <i>Losada</i> ...	Clapham, E. C. ...	D. W. Hutchinson ...	" M.	" " ...	Forms 911 & 138 28.8.31 to 16.9.31	18.9.31
013 *† <i>Macharda</i> ...	Hanna, R. G. ...	C. Lindsay Miller, C. Parry, G. A. Jackson.	No. M.	Brocklebank ...	Forms 911 & 138 1.7.31 to 17.7.31	10.8.31
232 *† <i>Madura</i> ...	Wright, J. A. ...	A. Usher, E. Roberts, T. R. Jackson.	" M.	British India... ..	" " 26.8.31 to 21.10.31	23.10.31
078 *† <i>Magician</i> ...	Bury, E. R. ...	W. E. Shotton, J. Johnson ...	" M.	Harrison ...	" " 18.5.31 to 14.9.31	17.9.31
141 *† <i>Mahia</i> ...	Andrews, C. M. ...	G. Sangwin, M. P. Congdon, J. Jackson.	" W.T.	Shaw, Savill & Albion	" " 1.3.31 to 15.6.31	22.6.31
140 *† <i>Mahratta</i> ...	Williams, E. R. ...	T. C. Eddy, H. F. Scoins, A. McPhee.	No. M.	Brocklebank ...	" " 4.8.31 to 7.9.31	19.9.31
014 *† <i>Mahronda</i> ...	Sharpe, F. W. ...	W. Le Brocq, M. Melville, H. Wellington.	" M.	" " ...	" " 25.9.31 to 22.10.31	27.10.31
015 *† <i>Mahsud</i> ...	Kershaw, R. W. ...	S. Richardson, J. R. Paisley	" M.	" " ...	" " 20.5.31 to 6.8.31	14.9.31
016 *† <i>Maidan</i> ...	Ison, W. A. ...	F. Moore, F. L. Attwood, L. E. Jeans.	" M.	" " ...	" " 26.2.31 to 8.5.31	12.5.31
042 *† <i>Maimoa</i> ...	Johnson, J. W. ...	A. Winton, D. O. V. Pickersgill, W. A. Rogers.	M.L.	Shaw, Savill & Albion	Form 915 19.6.31 to 29.10.31 ...	3.11.31
<i>Maimyo</i> ...	Anderson, C. ...	O. Jones ...	No. A.	Brocklebank ...	Form 911 7.5.31 to 12.8.31 ...	9.9.31
054 †† <i>Majestic</i> ...	Trant, E. L., R.D., Commr., R.N.R.	" " " " " "	" W.T.	White Star ...	" " " " " "	" "
018 *† <i>Makalla</i> ...	Maughan, J. W. ...	E. Williams ...	No. M.	Brocklebank ...	Form 911 25.5.31 to 25.9.31 ...	1.10.31
225 ** <i>Makura</i> ...	MacDonald, D. ...	A. P. Cousin, S. H. Crawford, H. McRae.	M.L.	Canadian-Australasian	Form 915 16.4.31 to 1.8.31 ...	1.10.31
019 *† <i>Malakuta</i> ...	Adamson, F. L. ...	H. Simpson ...	No. M.	Brocklebank ...	Forms 911 & 138 26.11.30 to 4.3.31	1.4.31
020 *† <i>Malancha</i> ...	Whitham, F. ...	R. Humble, J. H. Chadwick, M. Mackenzie.	" M.	" " ...	" " 6.6.31 to 6.7.31	4.8.31
219 *† <i>Malda</i> ...	Denne, G. H. A. ...	D. Latton, K. Male, W. Hirst	" M.	British India ...	Form 911 16.6.31 to 5.9.31 ...	14.10.31
195 †† <i>Maloja</i> ...	Browning, J. B., R.D., Commr. R.N.R.	R. E. Baldwin - Wiseman, C. H. Hand, G. R. Peters.	" M.	P. & O. ...	Forms 911 & 138 28.6.31 to 30.9.31	6.10.31
196 †† <i>Malhoa</i> ...	Britten, P. O. ...	P. G. Lawrence... ..	" M.	" " ...	" " 19.7.31 to 11.9.31	24.9.31
053 *† <i>Manaar</i> ...	Thowless, E. ...	A. L. Harrop, J. Robinson, R. G. Widdon.	" M.	Brocklebank ...	" " 20.7.31 to 9.10.31	21.10.31
<i>Manchester Brigade</i>	Stott, C. H. ...	E. E. Bonnaud, J. Eccles, W. E. Hardman.	M.L.	Manchester Liners ...	Form 915 14.3.31 to 1.8.31 ...	10.8.31
<i>Manchester Hero</i> ...	Mitchell, G. M. ...	R. O. Jones, J. N. Emmitt, M. Barnes.	"	" " ...	" " 27.6.31 to 4.10.31 ...	21.10.31
028 †† <i>Mandala</i> ...	Kinncar, A. D. ...	W. E. F. Powell ...	No. M.	British India... ..	Forms 911 & 138 24.3.31 to 12.6.31	16.6.31
146 *† <i>Mandasor</i> ...	Longhurst, J. H., Richardon, T. ...	H. Fosbrooke, F. C. Madden, J. B. Leigh.	" M.	Brocklebank ...	" " 26.8.31 to 18.9.31	26.10.31
220 *† <i>Manela</i> ...	Maples, S. H. ...	W. F. Solly, T. M. Robertson, P. Vaughan.	" M.	British India ...	" " 26.9.31 to 31.10.31	4.11.31
022 *† <i>Manipur</i> ...	Cochran, G. N. ...	L. F. Dodson, R. Penston, A. Hill.	" M.	Brocklebank ...	" " 4.7.31 to 16.7.31	10.8.31
221 *† <i>Manora</i> ...	Hudson, H. T., R.D., Commr., R.N.R.	A. F. Baber ...	" M.	British India... ..	" " 8.9.31 to 8.10.31	2.11.31
177 *† <i>Mantola</i> ...	James, D. F. ...	M. Sharp, S. Henderson, R. H. Ayres.	" M.	" " ...	" " 6.6.31 to 21.8.31	9.9.31
197 †† <i>Mantua</i> ...	Hignett, R.D., Commr. R.N.R.	J. D. Homidge ...	" W.T.-M.	P. & O. ...	" " 9.8.31 to 21.8.31	14.9.31
299 ** <i>Marella</i> ...	Donaldson, A. ...	A. W. Blane, D. Pemberton, A. G. W. Thomas.	M.L.	Burns Philp ...	Form 915 31.12.30 to 28.5.31 ...	3.9.31
<i>Marengo</i> ...	Sibree, J. S. ...	F. Brown, C. Newton, J. E. Dobson.	"	Ellerman Wilson ...	" " 26.3.31 to 29.10.31 ...	6.11.31
222 †† <i>Margha</i> ...	Kitson, G. A. ...	P. Wright, H. Watkins, L. T. Carter.	" W.T.	British India... ..	Forms 911 & 138 11.10.31 to 5.11.31	9.11.31
104 *† <i>Marquesa</i> ...	Smiles, R. S. ...	J. Wetherall ...	No. M.	Furness Houlder ...	" " 25.5.31 to 31.7.31	6.8.31
021 *† <i>Masula</i> ...	Fitt, W. H. ...	G. P. Price ...	" M.	British India ...	" " 27.8.31 to 16.9.31	29.9.31
251 *† <i>Malakana</i> ...	Gordon, H. R. ...	H. Thompson ...	" M.L.	Shaw, Savill & Albion	Form 911 20.6.31 to 29.9.31 ...	2.10.31
044 †† <i>Mataroa</i> ...	Gaskell, J. H., R.D., Lt.-Commr., R.N.R.	F. Eadon, F. C. Charnley, T. H. Davies.	"	" " ...	Form 915 22.5.31 to 30.8.31 ...	1.10.31
023 *† <i>Matheran</i> ...	Mulcahy, J. J. ...	S. S. Slade, J. F. Butterworth, W. Cowrie.	No. M.	Brocklebank ...	Forms 911 & 138 29.8.31 to 27.9.31	30.9.31
223 *† <i>Matiana</i> ...	Green, F. V. ...	L. A. Bunn, P. M. Wilson ...	" M.	British India... ..	" " 23.9.31 to 10.11.31	13.11.31
024 *† <i>Matra</i> ...	Cornish, N. P. ...	C. Shaw, W. Robertson, J. G. Nuttall.	" M.	Brocklebank ...	" " 30.3.31 to 17.6.31	30.6.31
032 †† <i>Mauretania</i> ...	Peel, R. V., R.D., Capt., R.N.R.	R. H. C. Crawford, H. V. Clarke, G. Duguid.	" W.T.	Cunard ...	" " 13.9.31 to 28.9.31	30.9.31
278 *† <i>Middlesex</i> ...	Almond, J. G. ...	" " " " " "	No. M.	Federal ...	Form 911 2.10.31 to 14.10.31 ...	30.10.31
270 *† <i>Minderoo</i> ...	Macphedran W. J. ...	H. Lancaster ...	" M.	Western Australian S.N. Co.	Forms 911 & 138 26.7.31 to 8.8.31	21.9.31
<i>Minna</i> ...	Mackenzie, G. G. ...	A. M. Campbell ...	" A.	Scottish Fishery Brd.	Form 911 12.10.31 to 27.10.31 ...	2.11.31
068 †† <i>Minnetonka</i> ...	Gates, T. F., C.B.E. ...	H. E. D. McCartney, W. S. Harrison, T. W. Pullan.	" M.	Atlantic Transport ...	Forms 911 & 138 28.9.31 to 18.10.31	21.10.31
069 †† <i>Minnewaska</i> ...	Claret, F. H., C.B.E., Commr., R.N.R.	E. Pengelly, D. Davies, F. Mummery.	" W.T.-M.	" " ...	" " 12.10.31 to 31.10.31	3.11.31
224 *† <i>Modasa</i> ...	Gilchrist, J. W. ...	E. Hale, K. Kirkup, H. C. Pearson.	No. M.	British India ...	" " 6.7.31 to 20.9.31...	24.9.31
194 †† <i>Moldavia</i> ...	Allen, C. H. ...	T. E. Heath ...	" M.	P. & O. ...	Form 911 17.9.31 to 28.9.31 ...	19.10.31
199 †† <i>Mongolia</i> ...	Rhodes, H. R. ...	H. Tee, H. C. Shinn, W. S. Joliffe.	" M.	" " ...	Forms 911 & 138 8.9.31 to 5.11.31	9.11.31
260 †† <i>Monowai</i> ...	Toten, A. T. ...	L. B. Elhert, T. W. Gibson, L. J. Drew.	" M.L.	Union S.S. of N.Z. ...	Form 915 22.1.31 to 9.5.31 ...	4.8.31
148 †† <i>Montcalm</i> ...	Rothwell, A. ...	T. L. Gillette, A. Mackie	" W.T.-M	Canadian Pacific ...	Forms 138 20.8.31 to 10.9.31	14.9.31

LIST OF VOLUNTARY OBSERVING SHIPS

Name of Vessel.	Captain.	Observing Officers.	Meteoro-logical Equipment.	Line.	Last Log. Register, or Record Contributed. Received up to 13.11.31.	Date Received.
133 *† Port Dunedin, M.V.	Mason, W. S., D.S.C.	H. M. Post, C. A. Hodson, R. W. Chamberlain.	M.L.	Commonwealth and Dominion.	Form 915 15.5.31 to 1.9.31 Form 911 12.8.31 to 17.9.31	7.9.31 21.9.31
176 *† Fremantle, M.V. Gisborne, M.V.	Gilling, W. ... Higgs, W. G. ...	A. Naismith ... R. B. Linklater, L. J. Skailies, L. E. Ring.	"	" " "	Form 915 19.7.31 to 24.10.31	30.10.31
135 *† Hunter ...	...	G. T. C. Harris, C. R. Townshend, P. A. Munday.	"	" " "	13.3.31 to 27.6.31	8.7.31
106 *† Wellington ... Princesa ...	Jones, C. N. ... McKellar, A. B. ...	W. B. Hopkins ... F. Poulson, E. C. Aldridge, O. Sheard.	No. A. " M.	Houlder " ...	Form 911 6.4.31 to 13.7.31 Forms 911 & 138 5.7.31 to 10.9.31	26.8.31 14.9.31
163 *† Protesilaus ... Pyrrhus ...	Rundle, G. G. ... Davis, A. L. ...	W. C. McGuigan ... E. M. Robb ...	M.L. No. A.	A. Holt ...	Form 915 28.5.31 to 14.9.31 Form 911 30.8.31 to 22.9.31	23.10.31 19.10.31
205 †† Rajputana ...	Jask, H. M. ...	G. Aspinall, D. Buckley, C. F. Wright.	" M.	P. & O. ...	Form 911 & 138 15.6.31 to 17.9.31	2.10.31
063 *† Rancher ...	McCullum, J. ...	G. Harvey, C. F. Minshull, A. L. Lewis.	" M.	Harrison ...	12.7.31 to 29.9.31	2.10.31
228 †† Ranchi ... 236 †† Rangitane M.V. ...	Hartley, J. W. ... McKellar, A. W. ...	T. A. Sergeant, H. E. Holt ... A. Brown, R. C. Aldridge, C. J. P. Guille.	" M. W.T.-M.	P. & O. ... New Zealand S.S. Co.	8.8.31 to 27.8.31 Form 915 3.7.31 to 15.10.31	29.8.31 22.10.31
257 †† Rangitata M.V. ...	Hunter, J. L. B. ...	J. Oxnard, D. Chadwick, S. Leggett.	"	" " "	Forms 911 & 138 6.6.31 to 16.9.31	28.9.31
240 †† Rangitiki M.V. ...	Barnett, H. ...	H. Hill, L. F. Malcouronne, C. Cruttenden.	"	" " "	13.4.31 to 21.7.31	28.7.31
207 †† Ranpura ...	Furlong, G. H. S., R.D., Capt. R.N.R.	G. M. MacLean, R. A. Perry, H. Toon.	No. M.	P. & O. ...	1.8.31 to 21.9.31	28.9.31
071 †† Rawalpindi ...	Stringer, O. B. E., R.D., Commr., R.N.R.	G. W. du Fosse, E. Cowen ...	W.T. M.	" " "	29.8.31 to 22.10.31	26.10.31
247 *† Recorder ...	Egerton, J. J. ...	G. Morrice, H. C. Blyth, W. Weatherall.	No. M.	Harrison ...	31.5.31 to 16.9.31	23.9.31
306 *† Reina del Pacifico, { M.V. 239 *† Remuera ...	Ross, J. ... Grunt, S. C. ... Wilde, H. J. ...	W. A. Hearle, R. Bridson, J. K. Campbell. A. J. Angell, J. R. Vincent, H. Vernon.	" M. M.L.	Pacific S.N. Co. ... New Zealand S.S. Co.	1.9.31 to 21.10.31 Form 915 31.7.31 to 5.11.31	28.10.31 11.11.31
Rhexenor ... Rhodesian Trans- port.	Stout, G. L. ... Bowen, A. C. ...	J. S. Parry ... H. S. Butler ...	No. A. " A.	A. Holt... Houlder Bros. ...	Form 911 1.6.31 to 26.6.31... 5.4.31 to 5.7.31	11.8.31 30.7.31
Ross, S.T. ... 189 *† Rother ... 241 *† Rotorua ...	Johnson, H. ... Woodhead, T. H. ... Lamb, C. B. ...	... H. Robinson ... L. W. Fuleher, K. L. Jones, J. G. Gould.	" A. W.T. M.L.	W. Grant & Sons ... Goole Steam Shipping ... New Zealand S.S. Co.	Form 911 3.10.31 to 24.10.31 Form 915 3.4.31 to 22.7.31	27.10.31 29.7.31
062 *† Royal Star... 246 *† Ruahine ...	Walsh, W. ... Malthy, T. L. ...	A. F. Day, J. Hoggin ... A. Hocken, R. Warren, L. Mercer.	W.T.	Blue Star ... New Zealand S.S. Co.	Forms 911 & 138 16.12.30 to 10.3.31 7.5.31 to 22.8.31	18.3.31 29.8.31
St. Helier ... St. Julien ... St. Minver, S.T. ...	Pitman, R. ... Richardson, L. ... Hatton, A. ...	A. C. Ricketts ... A. E. Ricketts, H. D. Freeman. ...	C.C. " No. A.	G.W. Railway ... " " " Crampian Steam Fishing Co.	Telegraphic Report 12.11.31 " " 24.10.31 Form 911 28.9.31 to 29.10.31	12.11.31 24.10.31 4.11.31
St. Patrick ... 038 †† Samaria ...	Malin, R. G., Lt- Commr., R.N.R.	F. E. Martin ... A. MacKellar, F. G. Watts, J. A. Myles.	C.C. W.T.	G. W. Railway ... Cunard ...	Telegraphic Report 15.9.31 Forms 911 & 138 1.8.31 to 22.8.31...	15.9.31 26.8.31
291 *† Scholar ... Scotia ... 033 †† Seythia ...	Peterkin, A. G. ... O'Neill, J. ... Oram, B. B., R.D., Commr., R.N.R.	A. Robertson ... W. H. Hughes ... F. P. Collins, A. Bridgewater, H. L. Pryse.	No. M. C.C. W.T.	Harrison ... L.M. & S. Railway ... Cunard ...	20.7.31 to 25.9.31 Telegraphic Report 6.11.31 Forms 911 & 138 21.9.31 to 1.11.31	2.10.31 6.11.31 3.11.31
211 *† Shropshire, M.V. ...	English, G. L. ...	A. D. Quayle, R. Cumming, D. Hetherington	"	Bibby ...	Form 915 24.7.31 to 3.10.31	6.10.31
Silksworth ... Somerset ... 277 *† Spero ... Stephen ...	Blacklock, G. ... Montgomery, H. ... Jones, W. C. H., R.D., Commr., R.N.R.	J. J. Muttitt ... C. Edgecombe ... H. W. Vickers, A. Kirk, J. Whayman, G. H. Daniels	No. A. " A. M.L. "	R. S. Dalgleish ... Federal ... Ellerman Wilson ... Booth ...	Form 911 28.8.31 to 21.10.31 Form 915 28.3.31 to 3.10.31 25.1.31 to 3.6.31	30.10.31 7.10.31 17.6.31
259 *† Surrey ... Sylvafield, M.V. ...	Lettington, A. E. ... MacDonald, W. ...	R. Rees, D. J. Murray, H. H. Mackillican. J. Johnson ...	" No. A.	Federal... Hunting & Son ...	17.5.31 to 16.9.31 Form 911 23.8.31 to 26.9.31	26.9.31 29.9.31
Tacoma City ... 229 *† Taeticlan ... 045 †† Tainui ...	Paul, H. ... Trinick, F., O.B.E. ... McIntosh, A. ...	H. Small ... E. P. Simmons ... G. A. Harvey, A. G. Collins, J. Worrall.	" A. " M. M.L.	Reardon Smith ... Harrison ... Shaw, Savill & Albion	Form 911 19.7.31 to 7.10.31 Form 915 27.6.31 to 9.10.31	10.10.31 11.11.31
081 *† Tairaa ...	Christie, D. ...	G. L. Almond, C. A. Meyer, L. B. Miller.	"	" " "	27.5.31 to 1.10.31	5.10.31
234 *† Talma ...	Harley, G. J. ...	M. H. Vincent, R. Potter, R. H. Weatherseed.	W.T.-M.	British India ...	Forms 911 & 138 17.5.31 to 21.9.31	12.10.31
046 †† Tamaroa ...	Hartman, W. H. ...	L. R. Bull, R. R. Roseman, F. Lutyen.	"	Shaw, Savill & Albion	18.5.31 to 7.6.31	13.6.31
264 ** Tanda ...	Pilcher, E. T., Lt- Commr., R.N.R.	R. Lloyd, G. C. Smith, B. M. Dun.	M.L.	E. & A. S.S. Co. ...	Form 915 30.5.31 to 30.8.31	2.11.31
165 *† Tantalus, M.V. ...	Melling, C. F. ...	A. C. H. Jones, J. J. Daniell, W. C. Angus.	W.T.	A. Holt ...	17.3.31 to 25.10.31	29.10.31
047 *† Taranaki, M.V. ...	Wood, C., D.S.C. ...	R. K. Bolton, R. Bitmead, S. P. Wallis.	M.L.	Shaw, Savill & Albion	Form 915 11.4.31 to 7.7.31	14.7.31
Tarantia ... Tasmania ... Tetresias ... Tekoa ...	Caithness, J. B. ... Williams, J. V. ... Wilkinson, W. H. ... McNish, R. H. L., D.S.O., Lt-Commr., R.N.R.	J. M. Cherry ... R. J. Coffey ... F. Stott ... J. J. Youngs, W. Rodwood, C. W. Roberts.	No. A. " A. " A. " M.	Anchor ... New Zealand S.S. Co. A. Holt & Co. ... New Zealand S.S. Co.	Form 911 23.8.31 to 15.9.31 2.12.30 to 2.5.31 18.3.31 to 6.6.31 11.10.31 to 25.10.31	12.10.31 8.5.31 10.6.31 9.11.31
Tetela ... Teucer ... 048 †† Themistocles ...	Brice, E. H. ... Davies, J. ... Young, A. D. ...	J. D. Paterson ... C. C. L'Estrange	" A. " A. W.T. M.	Elders & Fyffes ... A. Holt... Aberdeen Common-wealth.	7.9.31 to 9.10.31 26.4.31 to 15.8.31	15.10.31 24.8.31
007 *† Thistleglan ...	Whitfield, G.A., O.B.E.	S. B. Davis, H. B. Meek, G. L. Hetherington.	M.L.	Allan Black & Co. ...	Form 915 12.2.31 to 14.5.31	18.5.31
235 *† Tilawa ... 168 *† Tinhow ...	Coleborn, E. ... Scobie, A. ...	E. Cullerne ... G. W. Seth, P. Aydon, C. H. Smith.	No. M. "	British India... A. Weir & Co. ...	Form 911 4.9.31 to 22.9.31... Forms 911 & 138 12.4.30 to 5.7.31	5.11.31 17.8.31
161 *† Titan ...	Elford, W. J. ...	F. B. Smith, A. K. Sanderson, W. H. Deans.	W.T.	A. Holt ...	Form 915 23.5.31 to 29.9.31	7.10.31
244 *† Tongariro ...	Hamilton, F. S. ...	G. Dibley, D. Baldwin, W. M. Glover.	M.L.	New Zealand S.S. Co.	22.2.31 to 17.6.31 ...	24.6.31

Name of Vessel.	Captain.	Observing Officers.	Meteorological Equipment.	Line.	Last Log. Register, or Record Contributed. Received up to 13.11.31.	Date Received
025 † <i>Transylvania</i> ...	Bone, D. W. ...	A. Middleton ...	W.T.	Anchor ...	Forms 911 & 138 15.7.31 to 11.10.31	21.10.31
288 *† <i>Traveller</i> ...	Barrow, W. T. C. ...	R. Ledger ...	No. M.	Harrison ...	" " 4.6.30 to 14.8.31	24.8.31
<i>Trecarrell</i> ...	Old, E. G. ...	W. E. McEwan, G. A. Solly	" A.	Hain S.S. Co. ...	Form 911 26.3.31 to 29.4.31	19.5.31
242 *† <i>Trematon</i> ...	Cundy, F. ...	J. Jenkyn, C. M. Quick, T. M. Meakin.	M.L.	" " ...	" " ...	"
119 *† <i>Trojan Star</i> ...	Griffin, G. A. ...	A. Emerson, L. S. Hassell ...	No. M.	Blue Star ...	Forms 911 & 138 14.6.31 to 30.8.31	4.9.31
245 *† <i>Turakina</i> ...	Laird J. ...	A. Weatherall, E. G. Williams, J. Reeve.	" M.	New Zealand S.S. Co.	" " 4.3.31 to 12.6.31	17.6.31
276 † <i>Tuscania</i> ...	Rome, W. B. ...	D. Blair, G. Noble, E. Richardson.	W.T.	Anchor... ..	" " 11.10.31 to 1.11.31	3.11.31
167 *† <i>Tyndareus</i> ...	McClure, W. ...	J. R. C. Evans, W. F. Loch- head, E. B. Sandon.	M.L.	A. Holt... ..	Form 915 23.12.30 to 25.5.31	4.7.31
<i>Uffington Court</i> ...	Clarke, E. J. ...	T. Glover ...	No. A.	Haldin & Co. ...	Form 911 25.3.31 to 8.6.31	23.6.31
113 *† <i>Upwey Grange, M.V.</i>	Goodrick, H. P. ...	A. Bradbury, G. T. Hurst, P. J. Walker.	" M.	Houlder ...	Forms 911 & 138 8.6.31 to 12.8.31	18.8.31
292 †† <i>Viceroy of India</i> ...	Thornton, E. J., R.D., Capt. R.N.R.	W. R. B. Noall, F. Shute, L. Kingston.	" M.	P. & O. ...	" " 27.9.31 to 3.11.31...	6.11.31
<i>Vigilant</i> ...	Simpson, E. S. S. ...	J. Wilson ...	" A.	Scottish Fishery Brd.	Form 911 1.10.31 to 31.10.31	3.11.31
206 ** <i>Waiotapu</i> ...	Hender, W. H. ...	" " " " " " " "	" M	Union S.S. Co. of N.Z.	" " 16.11.30 to 10.12.30	28.1.31
263 ** <i>Wairuna</i> ...	Stewart, A. R. ...	J. E. Warwick, G. M. Coote, C. T. Robb,	M.L.	" " "	Form 915 14.10.31 to 23.6.31	23.9.31
<i>Warfield</i> ...	Steele, R. ...	J. Gunning ...	No. A.	" " "	Form 911 19.9.31 to 29.9.31	19.10.31
005 †† <i>Winchester Castle</i> ...	Owens, G. ...	P. Clissold, W. Mackenzie ...	W.T.	Union Castle "	Forms 911 & 138 8.8.31 to 23.8.31	29.9.31
060 †† <i>Westernland</i> ...	Doughty, J. H. ...	J. L. McLaren, C. Clark, W. L. Wood.	"	Red Star ...	" " 12.10.31 to 31.10.31	2.11.31
<i>William Scoresby, R.E.S.</i>	Joliffe, T. A., Commr., R.N.	W. A. Ellison, F. E. C. Davies	M.L.	Falkland Islands Government.	Form 915 1.4.31 to 30.7.31...	5.10.31
208 †† <i>Winchester Castle M.V.</i>	Gardner, G. F., O.B.E., Lt.-Commr. R.N.R.	G. F. Moon, A. G. Parey ...	W.T.	Union Castle ...	Forms 911 & 138 5.9.31 to 25.10.31	27.10.31
096 †† <i>Windsor Castle</i> ...	Kerby, J. H. ...	F. Hunter, E. H. Dixey, J. Trayner	M.L.	" " ...	Form 915 28.3.31 to 20.9.31	23.9.31
<i>Worthing</i> ...	Marmery, S. ...	C. Munton, E. Balcombe ...	C.C.	Southern Railway ...	Telegraphic Report 12.11.31	12.11.31
043 ** <i>Zealandic, M.V.</i>	Elford, H. C. ...	P. Horwood, J. Thompson, B. Morris.	W.T.	Shaw, Savill & Albion	Forms 911 & 138 20.8.31 to 22.9.31	26.10.31
<i>Zent</i> ...	Moore, J. A. ...	W. Pearce ...	No. A.	Elders & Fyfes ...	Form 911 24.9.31 to 26.10.31	12.11.31
<i>Conway, H.M.S.</i> ...	Richardson, F. A., D.S.C., Commr., R.N.	The Senior Cadets ...	Cadets' M.L.	" " " " " "	Cadets' Met. Log. 3.5.31 to 24.7.31	1.8.31
<i>Pangbourne Nautical College</i>	Tracy, A. F. G., Commr., R.N.	" " ...	"	" " " " " "	Cadets' Met. Log. 26.4.31 to 23.7.31	28.7.31
<i>Worcester, H.M.S.</i>	Steele, G. C., V.C., Lieut.-Commr., R.N.	" " ...	"	" " " " " "	Cadets' Met. Log. 8.5.31 to 29.7.31	4.8.31
<i>Abaco</i> ...	" " " " " "	The Keepers ...	Lighthouse Register.	" " " " " "	Lighthouse Register 1.7.30 to 31.12.30	22.5.31
<i>Cay Lobos</i> ...	" " " " " "	" " " " " "	"	" " " " " "	Lighthouse Register 1.1.31 to 30.6.31	10.8.31
<i>Double Headed Shot</i>	" " " " " "	" " " " " "	"	" " " " " "	Lighthouse Register 1.1.31 to 30.6.31	10.8.31
<i>Inagua</i> ...	" " " " " "	" " " " " "	"	" " " " " "	Lighthouse Register 26.2.31 to 5.9.31	5.10.31
<i>Sombrero</i> ...	" " " " " "	" " " " " "	"	" " " " " "	Lighthouse Register 1.1.31 to 30.6.31	4.8.31
<i>Watling Island</i> ...	" " " " " "	" " " " " "	"	" " " " " "	Lighthouse Register 1.1.31 to 30.6.31	10.8.31
<i>Cape Pembroke (Falkland Is.)</i>	" " " " " "	" " " " " "	"	" " " " " "	Lighthouse Register 1.1.31 to 30.6.31	13.8.31

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

Name of Vessel.	Captain.	Observing Officer.	Line.	Last Case of Water Samples, Reports, etc., received up to 31.10.31.	Date Received.
<i>Dakarian</i> ...	Brown, W. ...	A. A. Johnson ...	Leyland ...	Water Samples ...	...
<i>Darian</i> ...	Hannaford, W. ...	W. R. Vaughan ...	" " " " " "	" " " " " "	18.9.31
<i>Darro</i> ...	Green, J. ...	A. J. G. Barff ...	R.M.S.P. Co. ...	" " " " " "	18.9.31
<i>Davistan</i> ...	Thomas, R. ...	F. Steventon ...	Leyland ...	" " " " " "	7.8.31
<i>Dorelian</i> ...	Hughan, C. ...	F. C. Sheerhart ...	" " " " " "	" " " " " "	10.10.31
<i>Hildebrand</i> ...	Buck, R. H., R.D., Capt. R.N.R.	F. H. Good ...	Booth ...	" " " " " "	3.9.31

January, M.O., 1932.

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

MARINE METEOROLOGY, ATLASES, BOOKS AND MEMOIRS.

CHARTS:—

ATLANTIC (NORTH AND SOUTH):—

Monthly Current Charts for the Atlantic Ocean, from information collated and prepared in the Meteorological Office. (No. 132, 1897) ($22\frac{1}{2} \times 18$ in.) (Published by the Admiralty.)

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

ATLANTIC (NORTH):—

Atlas of Currents on the Main Trade Routes of the North Atlantic. (No. 323, 1930. 6s. 6d.) ($29\frac{1}{4} \times 19\frac{1}{2}$ in.)

Meteorological Charts of the North Atlantic for each month of the year, giving normals of Pressure, Air and Sea Surface Temperature and Ocean Currents, with Frequencies of Winds, also Ice Limits. (No. 149A, 1923.) 1s. each ($35 \times 22\frac{1}{2}$ in.). Sold by J. D. Potter, 145, Minories, E.1.

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

Charts of Meteorological Data for Square 3, Lat. 0° - 10° N., Long. 20° - 30° W. ($20 \times 13\frac{1}{2}$ in.) and Remarks to accompany the Monthly Charts, which show the Best Routes across the Equator for each Month, &c. ($17 \times 16\frac{1}{2}$ in.) (No. 20, 1874). 20s.

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

ATLANTIC (SOUTH):—

Wind Charts for the Coastal Regions of South America, from information collated and prepared in the Meteorological Office. (No. 159, 1902.) ($27 \times 20\frac{1}{2}$ in.) (Published by the Admiralty.)

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

BAFFIN BAY AND DAVIS STRAIT:—

Monthly Meteorological Charts of Baffin Bay and Davis Strait. (No. 221, 1917.) 8s. ($30 \times 25\frac{1}{2}$ in.)

CHARTS:—*continued.*

INDIAN OCEAN:—

Meteorological Charts of the East Indian Seas for each month of the year, giving Normals of Pressure, Air and Sea Temperatures and Ocean Currents, with Frequencies of Winds. (No. 181A, 1923.) 1s. each. ($35 \times 22\frac{1}{2}$ in.) Sold by J. D. Potter, 145, Minories, E.1.

Monthly Current Charts for the Indian Ocean, from information collated and prepared in the Meteorological Office. (No. 124, 1896.) ($20 \times 24\frac{1}{2}$ in.) (Published by the Admiralty.)

PACIFIC OCEAN:—

Quarterly Current Charts for the Pacific Ocean, from information collated and prepared in the Meteorological Office. (No. 134, 1897.) ($26\frac{1}{2} \times 28\frac{1}{2}$ in.) (Published by the Admiralty.)

Wind Charts for the Coastal Regions of South America, from information collated and prepared in the Meteorological Office. (No. 159, 1902.) ($27 \times 20\frac{1}{2}$ in.) Published by the Admiralty.)

RED SEA:—

Meteorological Charts of the Red Sea. (No. 106, 1895.) 21s. ($22 \times 13\frac{1}{2}$ in.)

SOUTHERN OCEAN:—

Meteorological Charts of the Southern Ocean between the Cape of Good Hope and New Zealand. (No. 123, 1917.) 7s. 6d. ($12\frac{1}{2} \times 9\frac{1}{2}$ in.)

BOOKS:—

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

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

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