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TABLE OF PRINCIPAL CONTENTS

	PAGE		PAGE
Ships' Wireless Weather Telegraphy ... ..	128	Southern Ice Reports :—	
Ocean Currents ... ..	129	<b>October, November and December, 1933</b> ... ..	156
Progress in Extracting Data ... ..	129	Wireless Weather Signals :—	
Ocean Pilotage in the Southern Indian Ocean ... ..	129	Wireless Stations Detailed to receive Routine Coded	
Work done by the British Merchant Navy to assist the John		Weather Reports from " A Selected Ships " ... ..	157
Murray Expedition ... ..	130	Wireless Stations Detailed to intercept Routine Coded	
The Disposition of the British Observing Fleet ... ..	130	Weather Reports from " B Selected Ships " ... ..	159
Tonnage ... ..	131	South and North America, West Indies and Islands of the	
Trinity House ... ..	132	N. Pacific eastward of longitude 180° ... ..	161
Volume XI. ... ..	133	Personnel :—	
Marine Observer's Log :—		Captain J. ATTWOOD	
<b>October, November and December</b> ... ..	134	Captain H. B. HARVEY	
The Trinity House, London, by Vice-Admiral Sir GEORGE		Captain R. G. LATTA	
R. MANSELL, K.C.V.O., C.B.E., Deputy Master ... ..	141	Captain D. R. MORGAN	
The Route from the Cape of Good Hope to Australia, by		Captain A. W. FOXWORTHY, Obituary ... ..	167
Commander J. HENNESSY, R.D., R.N.R. ... ..	146	Lithographic illustrations after page 168 :—	
Currents of the Red Sea and the part of the Indian Ocean		Ships' Wireless Weather Signals, Chart of the World.	
North of Australia, III—The Currents in the half-year Novem-		Currents in the Red Sea— <b>November, December and January.</b>	
ber to April and General Summary, by E. W. BARLOW, B.Sc.	150	Currents in the portion of the Indian Ocean North of Australia—	
The John Murray Expedition—III, by Professor J. STANLEY		<b>November, December and January.</b>	
GARDINER, F.R.S.... ..	155	Ice chart of the Southern Hemisphere— <b>October, November</b>	
		<b>and December.</b>	
		Index to Volume XI ... ..	169
		Errata ... ..	171

## SHIPS' WIRELESS WEATHER TELEGRAPHY.

In "Work of the Year" published in the July number the satisfactory performance of British Selected Ships was indicated by a table giving particulars for regions in different parts of the world for the month of October, 1933, which showed with what regularity routine weather reports are made to all ships and specified stations.

The number of these same reports received by ships at sea within range could not be given, but it was stated that Weather Charts made on board British Ships in these regions indicate that reports are received and used.

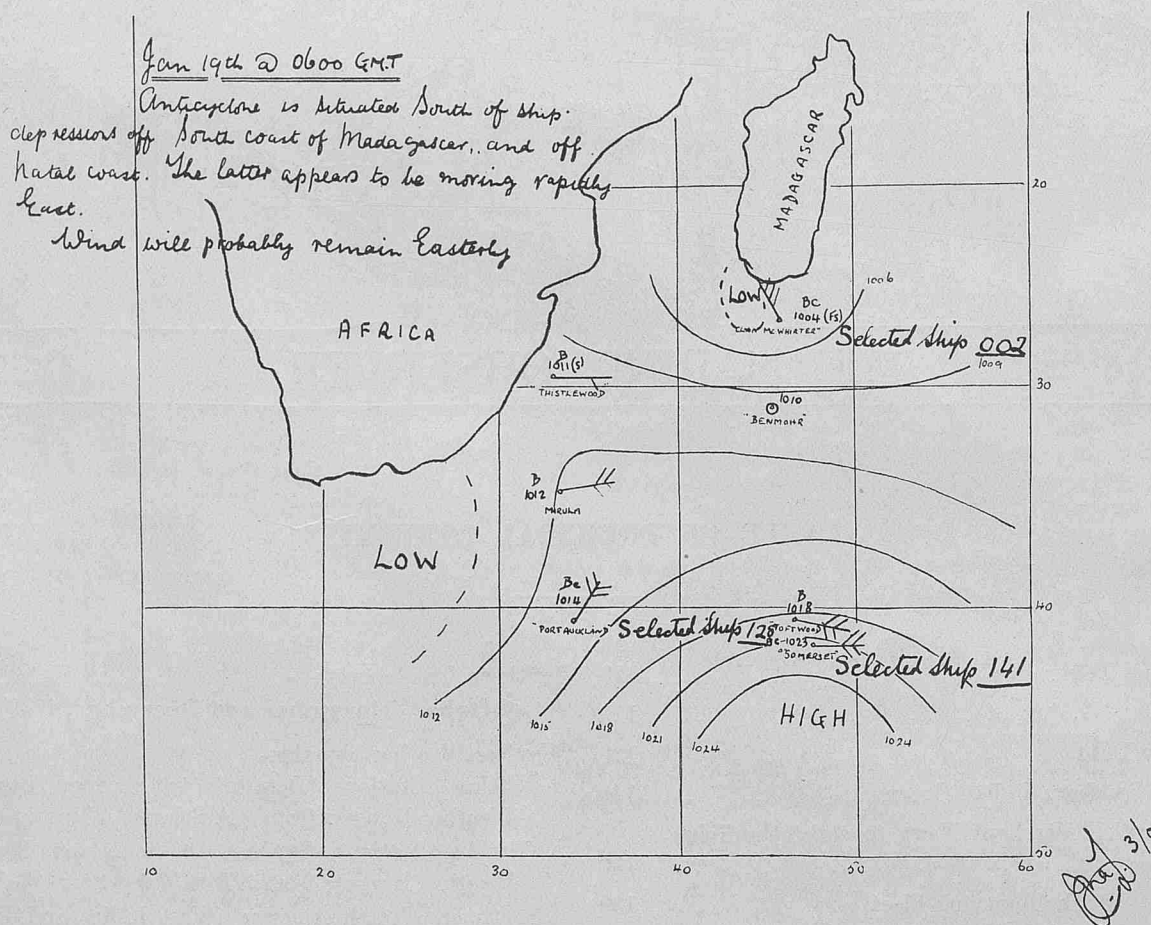
The Chart by Mr. J. N. A. Low, 3rd officer, below made on board S.S. *Somerset* Captain E. R. PILCHER in the Southern Ocean to the eastward of the Cape of Good Hope, is a sample of the evidence which continues to come to hand of the good work of Wireless Weather Telegraphy done by British Ships in all parts of the world.

reliable and better adapted for this purpose, but at present the evidence is strongly in favour of the retention of long wave communication for "Selected Ships" routine Weather Reports.

One hundred and thirteen British "A Selected Ships" are fitted for long wave transmission, but of all British "Selected Ships," both those classed "A" and "B," only 85 are fitted for short wave transmission.

It is not desirable to have more than two periods or two kinds of W/T communication for "Selected Ships" weather reporting—one for "A Selected Ships" and one for "B Selected Ships."

Short waves make communication with a station at great range with which communication is established possible, but communication with ships between or at lesser distances may be impossible owing to skip.



On January 19th at 0600 G.M.T. in the South-Western Indian Ocean when three British "B Selected Ships" took their synchronized routine observations, four other British Ships—we know by this Chart and possibly there were more—also took observations, knowing from previous W/T communication that there were not sufficient "Selected Ships" in the region to provide an adequate service, and in accordance with Section 34 of the instructions made weather reports to all ships at or shortly after 0630 G.M.T.

The reports of six ships, three of them only being "Selected Ships" were received on board *Somerset* and gave her adequate information of the weather.

This Chart indicates the good range under favourable conditions at which "B Selected Ships" and Ships similarly fitted are able to communicate these weather reports. With the growth of the use of short waves for long range communication a few operators in "Selected Ships" fitted for short wave communication have suggested that short waves should be used in preference to long waves by "A Selected Ships" for making routine weather reports and that the schedule and instructions should be accordingly altered.

Maybe in due time short wave communication will become more

Long waves travel more regularly at low level and therefore up to a range of not more than 1,800 miles are the most reliable for communicating with all ships as well as the specified shore stations. Stations suitably disposed in most parts of the world have been detailed in this journal, after much trouble, for receiving Weather Reports from British Selected Ships on long wave.

The range of long wave communication by ships and the disposition of the receiving stations render good management of the system possible.

Even if short wave weather report communication were always reliable, which experience proves it is not, long range would probably beget difficulties in the management of the system for a long time.

In the present circumstances it is best to continue to use Continuous Wave (preferably 2,100 m.) in "A Selected Ships" and I.C.W. 600 m. in "B Selected Ships." And, remember by so doing and as far as possible adhering to the schedule and when in the Eastern North Atlantic also preserving the order of the roll call, the Commanders of British Selected Ships will best assist those who like themselves are responsible for efficient and safe navigation, as well as helping the Meteorological Services ashore.



## OCEAN CURRENTS.

Ships' Wireless Weather Telegraphy can be made more useful to Navigation if by this means information of currents experienced is included in the routine Weather reports of "Selected Ships" to all ships.

A number of "Selected Ships" report the set and drift to all ships by adding the information in the plain language standard form which has been recommended in this journal, and we hope more will do so. The current charts which have been published since 1924 indicate the mean set and drift of the currents in each quarter of the year and their variations, both seasonal and transitory.

Though they indicate the transitory variation—that is changes other than seasonal—which frequently occur they do not and can not indicate when these changes will occur. At present there is no way of foretelling them; hence regular information of the set and drift of the currents along the trade routes broadcast by "Selected Ships" may often be useful to navigators, and this practice may also lead to furthering investigation and possibly the discovery of methods of foretelling changes in the currents.

In our notes in the January, 1933, number we pointed to the fact that the strong currents alleged to set across the Red Sea were probably not strong cross currents at all but the result of errors in fixing the ship's position by solar observation due to excessive refraction.

In this volume new charts of the currents in the Red Sea are published.

The work done during the past year in the construction of these charts from the set and drift reported by observing ships navigating the Red Sea for 24 years from 1910 to 1933 has shown that there can be little doubt that very strong currents setting athwart the central line of the Red Sea seldom if ever occur.

As the Charts indicate the current sets most frequently along the central line North or South according to season and Latitude. Sets are experienced to every point of the compass, but they are less frequent and usually less strong when athwart the central line of the sea. An article on this subject by Mr. BARLOW will be found on page 150.

The atlas of currents of the Indian Ocean under construction is now so nearly complete that it has enabled us to get a very much better idea of the surface current systems of this Ocean, and to provide information to the Hydrographic Department of the Admiralty for revising some of the Pilots and also to make our own publications, we hope, of greater utility to the Merchant Navy.

Next year the currents of the China Sea and of the waters of the East India Archipelago will be charted in *THE MARINE OBSERVER*, and the Atlas completed so that it may be published early in 1936.

Any one able to provide reliable information of current for the regions left blank on the Charts published in Volumes VI to XI and particularly of currents close to the coasts or between the Islands, is invited to send it in so that it may be considered for inclusion in the Atlas, or embodied in the articles on currents to be published in this journal next year.

## PROGRESS IN EXTRACTING DATA.

In the October, 1932, number in these notes, we outlined the work which had to be done in the Marine Division before the purpose for which it was originally established—to chart the climates of the Oceans—could be fulfilled. We showed that there were no less than 1,190,000 sets of observations of wind, temperature, humidity, cloud amount, and weather in Meteorological Logs kept between 1855 and 1920 in the North Atlantic and North and South Pacific to be punched on cards; also some 150,000 complete sets of observations collected in Meteorological Logs between 1921 and 1930 to be prepared for extraction and punched on cards.

In "Work of the Year" in the July number it was shown that since January 1st, 1933, 100,400 sets of observations made in the Pacific and North Atlantic previous to 1920 had been punched on cards from the logs in the Marine Division up to March 31st, 1934, and that from 1932 to 1934 no less than 40,237 sets of observations in arrears of extraction for the years 1925 to 1931 had been recovered.

This in addition to the work of extracting data from all Meteorological Logs returned by 50 ships navigating regions where observations are still required.

logical Logs returned by 50 ships navigating regions where observations are still required.

The progress made which has been shown in the pages of this Volume is ample proof of the wisdom of the reduction made in the number of the observing fleet during 1931 and 1932.

With a voluntary observing fleet of rather less than three-quarters of its number in 1931, i.e. about 350 instead of 500 observing ships **The Work** is much better done because it becomes properly manageable.

There is better supervision ashore and afloat, better distribution of observing ships, better attendance to the wants of Marine Observers by the Port Meteorological Officers and Merchant Navy Agents at the ports, and the staff of the Marine Division not being overloaded are better able to do justice to the work done at sea. Consequently all engaged in the work afloat and ashore are encouraged and the results are as shown.

## OCEAN PILOTAGE IN THE SOUTHERN INDIAN OCEAN.

In our notes under the above heading last October in which we called attention to recently published and improved information of currents, winds and Ice in the Southern Indian Ocean we invited the Captains of Observing ships experienced in navigating the routes between the Cape of Good Hope and the ports of Australia and New Zealand to give us their views. Some eighteen commanders of Steam and Motor ships have done so, and Commander J. HENNESSY, R.N.R., has summarized these, outlined the history of passage making to Australia round the Cape, and given sound reasons for following the recommendations made long ago by the British Admiralty. Ac-

cumulated experience and improved information have proved that, for steam and motor ships (and for sail too if there were still British sailing ships) bound for Melbourne or through Bass Straits, the parallel of 40° S. is probably the most suitable along which to run the easting down. The function of Merchant Ships being the safe, efficient, comfortable, and expeditious carriage of passengers and cargo, the shortening of distance by going far south is not recommended. Whether engaged in the trade to Australasian Ports round the Cape or not navigators will be interested in this article, which is entitled "The Route from the Cape of Good Hope to Australia"—see page 146.

## WORK DONE BY THE BRITISH MERCHANT NAVY TO ASSIST THE JOHN MURRAY EXPEDITION.

On September 30th—four days after the publication of this—water sampling in the Arabian Sea will be discontinued by British Ships. In our notes in the October number last year under the heading of “An Oceanographical Survey of the Arabian Sea” we made known to the British Merchant Navy the desire of the organizers of the JOHN MURRAY Expedition for a collection of Water samples for one year, the arrangements we were making so that this work should be done and done without overlapping, and certain suggestions we had made at the request of the organizers with a view to their research ship furthering the investigation of ocean currents.

The first ship which undertook the work of water sampling for the JOHN MURRAY Expedition, S.S. *Glennearn*, Captain H. T. EVANS, sailed from London early in August, 1933, and was to have commenced water sampling in the Arabian Sea at the beginning of September; but on arrival at Port Said the JOHN MURRAY Expedition's Agent was unable to supply the bottles as arranged. Similar arrangements were made with S.S. *Mundra*, Captain A. E. WILKINSON, and she too could not be provided at Port Said with the necessary gear. We regret any inconvenience which has been occasioned these ships and gladly acknowledge their willingness to do this voluntary work. The first ship to commence water sampling the Arabian Sea in 1933 was S.S. *Carnarvonshire*, Captain W. J. INGS, and the first ship to land water samples at Port Said was S.S. *Britannia*, Captain D. MUNRO.

Twenty ships—their names have been published in a special section of the observing fleet list—have taken water samples along the routes Perim to Bombay and Perim to Colombo or the East. None of these ships made regular returns of observations (logged or recorded) to the

Meteorological Office while doing this work so that there has not been overlapping and the work has been well distributed.

Recently the Secretary of the JOHN MURRAY Expedition, Professor J. STANLEY GARDINER, whose writing is known to readers of THE MARINE OBSERVER, wrote—

“I should like you to know how very deeply grateful my Committee are . . .

“So far as I have heard from Cairo the samples appear to have arrived *carefully taken and in most admirable condition.*

“I am sure my Committee . . . would be grateful if you would express our thanks to the officers concerned . . . they are hoping for results both of scientific and practical importance.”

Some account of the latter part of the cruise of *Mabahiss* is given on page 155.

The greater part of making the arrangements for Water sampling has fallen upon Commander M. CRESSWELL, R.N.R., at Liverpool, and at Port Said, Youzbashi A MAKLAD of the Egyptian Ports and Lights service. We wish to thank the Commanders and Officers of the ships who are indicated in the Fleet List as doing this work for the way they have done it and so upheld the reputation of the British Merchant Navy for good voluntary oceanographical and meteorological work. We hope that this work and that of *Mabahiss* will not only contribute to marine biological knowledge but that it may also assist towards a better knowledge of the currents. From reports which have been published it seems possible that when the soundings obtained by *Mabahiss* have been charted they may throw light upon the lines of demarcation of some of the currents.

## THE DISPOSITION OF THE BRITISH OBSERVING FLEET.

To-day, July 13th, the number of British voluntary observing ships and the oceans which they traverse, and the numbers of those which are detailed as “Selected Ships,” are shown in the following table:—

### Oceanic Distribution of the Voluntary Observing Fleet.

July 13th, 1934.

Ocean.	Form 911.	M.L.	Total.	Selected Ships.
North Atlantic including Home Waters and the Baltic.	70	9	79	60
South Atlantic ... ..	42	1	43	41
North Indian ... ..	68	0	68	59
South Indian ... ..	67	0	67	64
North Pacific ... ..	16	21	37	31
South Pacific ... ..	33	17	50	34
Arctic ... ..	4	0	4	2
Antarctic ... ..	0	1	1	1
Stationary Ships and Stations	0	0	5	0
Totals ... ..	300	49	354	292

The Chart of the world below indicates the number of British observing ships doing all branches of **The Work** on the different trade routes. The total is exact, but the numbers on the different tracks are approximate. Most observing ships commence and end their voyages in ports of Great Britain. For instance the ships indicated as being on the routes Panama to New Zealand and Australia also use the route England to Colon, so that the actual number using the Colon route is 10+4+32, and not only 10. This disposition has been worked up as the best which can be attained with the total number of British ships which can be worked efficiently. About 35 per cent. of observing ships are usually at sea at any time.

The number and disposition of the “Selected Ships” of other countries is not known.

A few days ago and *after* I had written the first part of these notes about Wireless Weather Telegraphy, and shown how some British ships, not detailed as “Selected Ships” were making weather reports to all ships where there were not sufficient “Selected Ships” to provide an adequate service, a Dutch gentleman, whose business is now the management of shipping, called.

He had until some years ago been a sea going officer in the Dutch Merchant Navy and had had experience of this work in the Indian Ocean.

He had received a complaint as to the alleged inadequacy of the service of Wireless Weather Intelligence in the Central South Indian Ocean from the master of one of his Company's ships navigating this region.

He was of course advised to refer the matter to the Meteorological Service of Holland, and assured that within the International Convention of Safety of Life at Sea, every endeavour would be made to improve the service so far as British shipping and the British Meteorological Office are concerned. Now the fact is that there are very few ships now navigating the central part of this ocean to the westward of the Colombo-Fremantle and Cape Leeuwin-Cape Guardafui routes and to the eastward of Madagascar. A few ships navigate the routes Cape of Good Hope to the Straits of Sunda and Mauritius to Aden or Bombay, all of which pass through regions where cyclones form; and from which it is in the common interest of safe navigation that weather reports should be made to all ships and the Observatory, Mauritius, as regularly as can be with the ships available.

The Corps of Voluntary Marine Observers are asked to make this known as widely as possible amongst their brother officers of the Merchant Navy. The fact that the British Meteorological Office invites all British ships fitted with W/T when in regions where there are not sufficient “Selected Ships” to provide an adequate service to make routine weather reports following the procedure of British “Selected Ships,” should be emphasized.



which is now part of the Merchant Shipping Act. By steadily doing their work British "Selected Ships" are leading the Merchant Navies of the world to a more uniform and effective system of weather reports.

1. Antarctic Exploration

**Total 354.**

To this we have added columns giving the number of "Selected Ships" which should be maintained by each maritime country for this voluntary service according to the agreement made through the International Commission for Marine Meteorology, and the approximate number of ships according to the Berne Lists which are fitted for C.W. long range transmission. Comparison of this table with the table published in the January, 1934, number indicates that during the last year Great Britain's tonnage has been reduced by 962,656 tons and our

proportion of the world tonnage has fallen five thousandths and is now only 28·7 per cent. The following countries' proportions of the world's tonnage have also been reduced—Italy, by two thousandths, and France, Germany, Japan and Panama each by one thousandth.

The countries whose tonnage has been increased proportionately during the past twelve months are Greece, three thousandths, Russia, two thousandths, and Canada, South Africa, United States of America, Finland and Norway each one thousandth.

The number of British "Selected Ships" now required is 287. Accordingly on September 26th, 1934, the day this is published the number of British "Selected Ships" will be reduced from 292 to 287.

It cannot be made too widely known or stressed too strongly that, following the Conference on Safety of Life at Sea, and with a view to all maritime countries being enabled to take their proper share in carrying out the services specified by Article 35 of the Convention, the International Meteorological Conference at Copenhagen in 1929 agreed to two guiding principles.

These guiding principles are—

(1) That the International "Selected Ship" service should be regulated by tonnage, each country maintaining a number of "Selected Ships" according to her proportion of the world's tonnage.

(2) That International observation times and code be used; and that requests and communications be sent to the ships only by the

### Total Merchant Tonnage Approximate (Steam and Motor) of the World.

(Vessels over 100 tons, Lloyd's Register Book, 1934-35.)

### 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.	Approximate Number of Ships fitted for C.W. Long Wave Transmission (July, 1934)
	Number.	Gross Tons.			
Great Britain and Ireland.	7,107	17,629,548	28·7	287	163
Australia and New Zealand.	543	619,775	1·0	10	0
Canada (excluding Lakes).	629	892,581	1·5	15	22
Hong Kong ...	120	289,295	0·5	5	5
India and Ceylon...	164	213,693	0·3	3	0
South Africa and Other Colonies*.	549	539,349	0·9	9	5
British Empire Total.	9,112	20,184,241	32·9	329	195

\* Including Dominion of Newfoundland.

Country	Steamers and Motor Vessels.		Percentage of World Tonnage.	Number of Selected Ships required.	Approximate Number of Ships fitted for C.W. Long Wave Transmission (July 1934)
	Number	Gross Tons.			
British Empire Total	9,112	20,184,241	32·9	329	195
America (United States)(excluding Lakes).	2,669	9,874,149	16·1	161	545
Argentina ...	304	316,153	0·5	5	1
Belgium ...	192	413,232	0·7	7	8
Brazil ...	293	494,514	0·8	8	11
Chile ...	98	152,865	0·2	2	0
China ...	252	397,712	0·6	6	0
Danzig ...	41	263,776	0·4	4	0
Denmark ...	686	1,100,778	1·8	18	27
Finland ...	295	402,801	0·7	7	0
France ...	1,459	3,259,594	5·3	53	17
Germany ...	2,032	3,680,353	6·0	60	46
Greece ...	550	1,507,260	2·5	25	0
Holland ...	1,407	2,612,377	4·3	43	22
Italy ...	1,031	2,875,183	4·7	47	117
Japan ...	1,949	4,072,707	6·6	66	269
Jugo-Slavia ...	174	356,831	0·6	6	0
Latvia ...	101	191,140	0·3	3	0
Norway ...	1,904	3,980,101	6·5	65	15
Panama ...	71	271,380	0·4	4	13
Portugal ...	181	240,674	0·4	4	12
Russia (Soviet Union).	489	939,308	1·5	15	0
Spain ...	782	1,164,489	1·9	19	11
Sweden ...	1,309	1,597,314	2·6	26	3
Turkey ...	183	192,683	0·3	3	0
Other Countries ...	683	885,180	1·4	14	9
Total ...	28,247	61,426,795	100·0	1,000	1,321

meteorological institution of the country in which they are registered, so that each country is responsible for the conduct of the voluntary work of its own shipping, and should alone receive written return from them.

The fleet list provides evidence of how regularly written returns are made by British ships, and in "Work of the Year" in our last number, it may be seen what a great volume of observations made and recorded in British ships is being passed on to the British Dominions and to other countries.

All will benefit by this system because by making only one set of returns observational records are made more carefully than if this writing work is multiplied, and our system of registers, Form 138, and Hollerith cards with mechanical printing does the rest at minimum cost.

## TRINITY HOUSE.

Every merchant seaman has some idea, vague or otherwise, that there is an old brotherhood of the sea, housed at Trinity House on the Tower Hill in London, which has had a tremendous influence in the shaping of British seamen; and which sees to the lighting of our coasts, watches the pilotage, and whose Elder Brethren or Trinity Masters have so much to do with the impartiality of, and the high standard of seamanship required by, the English Admiralty Court.

Outside the Younger Brethren and those officers of the Merchant Navy who work for or in close association with the Elder Brethren,

not a great deal of the inner working of the Corporation of Trinity House is known to the merchant service. The Trinity House does not seek publicity.

The Marine Superintendents of the Meteorological Office have been Younger Brethren of the Trinity House for many years, and the association between Trinity House and the Marine Division has been close, whereby the merchant navy and the Meteorological Office have profited.

Only those who are in close association with the Trinity House can realize to the full extent its good and generous work. It does so



much to assist seamen who have fallen by the way, to assist in the education, training and outfitting of suitable British boys for the sea. It does so much to see fair play and to encourage loyal service to the King and Empire.

We are greatly privileged in this number to publish a historical account of Trinity House and its working, by its Deputy Master, Vice Admiral Sir G. ROBERT MANSELL, K.C.V.O., C.B.E.

Some months ago we had the privilege of being invited to a meeting

of The Royal Empire Society, at which Admiral MANSELL lectured upon the Trinity House, followed by the Engineer-in-Chief, Mr. J. P. BOWEN, who briefly described Directional Wireless; and they kindly consented to write for publication in THE MARINE OBSERVER so that the merchant navy should be better informed.

Their hands are very full with the affairs of Trinity House, and so we are particularly grateful to them for contributing these articles. That on Directional Wireless was published in the July number.

## VOLUME XI.

Volume XI will be completed when the December, 1934, Supplement is published on November 28th next, but as the Supplements do not contain permanent information for the purpose of binding, the four quarterly numbers may be conveniently bound after the publication of this number.

As usual we remind all concerned that a binding cover may be purchased from H.M. Stationery Office.

To bind the year's four numbers to the best advantage, it is recommended that in each of the numbers the cover, advertisement page, fleet list and North Atlantic Ice Chart, all containing information which is not permanent or which may be repeated, should be dispensed with.

When these have been removed, there will remain pages numbered in sequence throughout each number, also pages unnumbered containing lithographic charts which follow the numbered pages in the quarterly numbers.

These should be placed in the volume cover and bound.

We thank most heartily all those who have contributed to THE MARINE OBSERVER, and especially the Captains and Officers of ships who have contributed remarks and articles for "The Marine Observer's Log," as well as the routine observations.

We should welcome more accounts of salvages and rescues, and articles upon the use of modern navigational instruments.

On our recent visit to the ports, we were struck by the good use which

is evidently being made of the W.T. Direction Finder, the Gyro Compass, and the Echo Sounder; but of all the recent innovations we saw on board ships, the one which impressed us most as being a desirable improvement, which has long been overlooked, was the arrangements for making fog signals in a foreign ship.

One has unpleasant memories of the trying effect of the steam whistle fitted on the steam pipe on the fore part of the funnel, close abaft the bridge. How, when listening for the fog signal of a ship which might be approaching, one was nearly deafened by one's own steam whistle!

In the foreign ship referred to, this disadvantage seemed to have been as nearly as possible overcome, for in addition to the steam whistle on the fore part of the foremost funnel abaft the bridge, she had an electrically actuated fog signal, emitting its signals from a horn at the foremost head, and another at the stem.

Sounded in clear weather and in harbour, the fog horn at the stem was comparatively little heard on the bridge, but it emitted a loud signal in the directions desired, and with the advantage that in a long ship, the sound had not so far to travel, as from the funnel, to ships ahead.

We hope that in next year's numbers more may be published by those who use them of sound signal apparatus and navigating instruments; and that good accounts from Marine Observers of atmospheric and hydrographic phenomena may enhance THE MARINE OBSERVER.

July 13th, 1934.

MARINE SUPERINTENDENT.



## October, November and December.

It is hoped that these pages will be filled each quarter 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.

### METEOR SHOWER.

#### North Atlantic.

THE following is an extract from the Meteorological Record of M.V. *Britannic*. Captain C. P. FREEMAN. Liverpool to New York. Observer Mr. O. V. LUCAS 4th Officer.

October 9th, 1933, observed a continuous shower of meteors which lasted between 2000 G.M.T. and 2045 G.M.T. Some were quite bright and leaving trails. All seemed to come from our zenith and spread out in all directions as they were falling. Sky b.c., with occasional squalls. Position of ship Latitude 53° 11' N., Longitude 19° 07' W. to Latitude 53° 11' N., Longitude 19° 26' W.

The following is an extract from the Meteorological Record of S.S. *Natia*. Captain E. A. BRIDGES. Liverpool to Rio de Janeiro. Observer Mr. T. DAVIES 2nd Officer.

On October 9th, 1933, at 1900 G.M.T. clear weather with light passing clouds, a very large number of shooting stars were observed. They were so numerous that during a casual glance across the sky of about 3 seconds, it would be quite impossible to count them. They did not fall in any one direction nor did they appear to originate from any one source. This state continued for about 2½ hours, after which no more were seen.

Captain and officers agreed that never before in their careers had they experienced phenomena of this kind to such an extent. The stars varied in brilliancy from quite dull light, barely discernible to the naked eye, to that of the brilliancy of a third magnitude star. No exceptionally bright ones were observed.

Position of ship Latitude 44° 00' N., Longitude 11° 00' W.

#### Bay of Biscay.

The following is an extract from the Meteorological Record of S.S. *Logician*. Captain R. F. HERSCHEL. Liverpool to Port Said. Observer Mr. E. R. STOCKLEY 3rd Officer.

October 9th, 1933, at 1950 G.M.T. the sky, which had been clouded over with Cu.-Nb. and A.-Cu. clouds, suddenly cleared and what we took to be a very fine meteoric shower was observed. Countless meteors were crossing the sky in every conceivable direction, and in such numbers that it was impossible to tell, even with the brightest of them, in what part of the sky they originated, or at what point their flight terminated.

The whole effect was such as if thousands of fire-flies were darting about, with an occasional extra brilliant display, not unlike a bursting rocket. It was certainly a weird and wonderful display, the like of which no one on board had ever seen before. How long it had been on, before we were able to see it, it is of course impossible to say, but for the next hour and a half the sky was a magnificent sight.

At 2115 G.M.T. there were signs that the shower was drawing to a close, as the meteors were not so numerous or so brilliant as when first observed. They gradually got less and less and at 2200 G.M.T., when unfortunately the sky again clouded over, there were just occasional meteors to be seen at rather long intervals. There may of course have been a repetition of this phenomenon at some later period, which owing to the clouds we were unable to observe.

Although we did not know at the time, we afterwards discovered that we had witnessed one of the periodic meteoric showers associated with the Comet Giacobini-Zinner. The display caused much panic and consternation in Oporto and other towns and villages in Portugal. Position of ship Latitude 44° N., Longitude 9° W.

The following is an extract from the Meteorological Record of S.S. *Maimoa*. Captain H. P. THURSTON. Liverpool to Fremantle via Cape of Good Hope. Observer Mr. J. A. MACNAB 3rd Officer.

October 9th, 1933, an unusual number of shooting stars were observed. The phenomenon lasted from approximately 7.00 p.m. to 8.45 p.m. (ship's time), at about which time the moon rose. The stars fell so thick at times that it almost resembled *illuminated* rain or snow. The weather at time of observation was fine.

Position of ship Latitude 44° 20' N., Longitude 9° 30' W. (approximately).

#### Coasts of Spain and Portugal.

The following is an extract from the Meteorological Record of M.V. *Cape of Good Hope*. Captain T. A. JACOBSON. Chile to Santander, Spain. Observer Mr. D. M. TAYLOR 2nd Officer.

Whilst alongside the wharf at Santander, North Spain, on the evening of October 9th, 1933, hundreds of meteors were observed between 1900 and 2045 G.M.T. These meteors fell in a constant shower during this period, although only a small percentage of them were of a brilliant character, the greater number simply appearing for a fraction of a second, and resembling a spark being blown by the wind, before becoming extinguished. They did not appear to radiate from



any fixed constellation, but it was noted that the majority seemed to come from some northerly point of the heavens, and to travel towards the southward, and that the western quadrant of the sky seemed to contain the greater number. The night was calm and cloudless with excellent visibility.

The following is an extract from the Meteorological Record of S.S. *Almanzora*. Captain T. J. C. BURET, D.S.C. Southampton to Rio de la Plata. Observer Mr. A. E. H. RANDLE.

Sailing from the port of Vigo on October 9th, 1933, at 1930, on Altostratus clouds clearing, the entire sky was observed to be streaked with shooting stars.

There appeared to be no regulation in regard to their path but the majority descended in a S.S.W'ly direction.

A continuous stream appeared to strike the atmosphere about 5° east of the star *Vega* and the unusual phenomenon continued with unabated vigour until 2200, when the sky became too cloudy to observe a most wonderful meteoric display.

### Mediterranean.

The following is an extract from the Meteorological Record of S.S. *Llandaff Castle*. Captain C. LE BROcq. Gibraltar to Aden. Observer Mr. R. E. H. PARTINGTON 4th Officer.

October 9th, 1933, commencing approximately one hour after sunset (1812 G.M.T.) and continuing until 2100 G.M.T. a most prolific and continuous shower of meteors was observed; they appeared in a position midway between the Pole Star and Kochab, and their paths radiated from there to all points of the horizon, but the majority appeared to travel in a S.S.E'ly direction.

Most of them were about the same magnitude as Polaris, some however being considerably brighter, and about the magnitude of Capella; these left a faint luminous trail, others were only just visible to the eye.

At times there appeared to be approximately a hundred visible at once, and other times about a dozen were observed.

Position of ship Latitude 36½° N., Longitude 3½° W.

The following report has been received from M.V. *Irania*. Captain J. F. AULD. Observer Mr. E. ALLEN Chief Officer.

A very prolific shower of shooting stars was observed from this vessel on the evening of October 9th, 1933, between the following positions near Sicily: Latitude 36° 35' N., Longitude 15° 30' E., Latitude 36° 34' N., Longitude 16° 24' E. Fine and clear sky. Visibility good. Cu/S.W. 3/10ths.

Position of radiation approximately R.A. 18 hours.

Dec. 50'-60' North.

Observed between 1900 and 2400 G.M.T.

Frequency. Anything between 30 and 60 per minute.

### West Coast of Africa.

The following report has been received from M.V. *Henry Stanley*. Captain E. D. SOWARD. Las Palmas to Freetown, Sierra Leone. Observer Mr. F. J. CROFT 3rd Officer.

October 9th, 1933, shortly after dusk about 6.30 p.m. A.T.S. we observed several meteors gradually increasing in number until at 6.53 p.m. A.T.S. (1940 G.M.T.) in Latitude 10° 03' N., Longitude 15° 42' W. the meteoric shower grew exceptional; at that time no less 10 or 15 meteors were visible simultaneously.

The shower was at its maximum between 7.10-7.30 p.m. A.T.S., when at least 35 or 40 meteors were simultaneously visible and falling continuously, ninety per cent. of the meteors falling in a S.S.E. direction and resembling a slight snow fall in the heavens. The meteors fell from all parts of the heavens, some being very bright and leaving trails. Some reached a magnitude of -5 (i.e. brighter than Venus).

The shower ended, except for a few odd ones, at 8.30 p.m. A.T.S. (2120 G.M.T.) in Latitude 9° 50' N., Longitude 15° 24' W.

The weather at 7.00 p.m. A.T.S. was:—Flat calm with moderate phosphorescence in sea, fine and clear with slight heat haze low on horizon, and completely cloudless.

NOTE.—The meteor shower observed in Western Europe and adjacent waters on October 9th, 1933, was probably the finest seen in any

country since 1885. Cloudy conditions prevented it from being observed over the greater part of the British Isles. On this night the earth passed across the orbit of a comet known as Giacobini-Zinner, discovered by Giacobini in 1900. It is estimated that the earth was only about one million miles from the head of the comet and the brilliant display of meteors was due to matter or debris from the comet entering the earth's atmosphere.

When the comet was discovered in 1900 its orbit did not intersect that of the earth, but it has been altered by planetary perturbations so that in 1926 the two orbits intersected at the point where the earth is on October 9th of each year. A display of meteors was observed on October 9th, 1926, but was greatly inferior to that of 1933, because in the former year the comet itself was very much further from the earth, being about 77 million miles from the point of intersection of the orbits on October 9th.

The accounts above published give a very interesting and accurate impression of the shower. It is noteworthy that the meteors seen by some observers seem to have been markedly brighter than those observed by others in different localities. The radiant point of the meteors was in the constellation of Draco.

### METEOR.

#### Mediterranean Sea.

The following is an extract from the Meteorological Record of S.S. *City of Sydney*. Captain F. MCKAY, Port Said to London. Observer Mr. R. A. JONES, 3rd Officer:—

“October 7th, 1933, at 1726 G.M.T. just prior to moonrise, observed meteor in the sky in close proximity to the ship.

“The meteor appeared at about the height of the foremast head, the forecandle and the navigation bridge being vividly lighted up as if by floodlighting. The meteor had the appearance of a rocket in operation; being pear-shaped, apex downward, and having two or three more small meteors attached to its lower extremity, i.e. the apex.

“The meteor in the course of its downward sweep seemed to merge into one complete piece ere it extinguished at apparently the height of the forecandle-head. The brilliance lasted about five seconds, the lower part of the main body diffusing a bluish or purple light. No detonation was heard.

“Approximate bearing of meteor 285°. Venus bearing 240°. Arcturus bearing 282°.

“Position of ship Latitude 31° 39' N, Longitude 31° 28' E.”

### TORNADO.

#### West Coast of Africa.

The following is an extract from the Meteorological Record of M.V. *Opawa*, Captain F. W. ROBINSON, Auckland to Dakar, Observers Messrs. H. D. HORWOOD, 2nd Officer, and J. C. GROSE, 4th Officer:—

“At 0500 G.M.T. October 18th, 1933 (4.05 A.T.S.) a tornado was experienced. During the previous afternoon we had had light airs and calms, and as soon as darkness set in considerable lightning was observed, mainly in the South-West, which continued throughout the night.

“At midnight the barometer was 29.91 in., sky almost cloudless, wind light variable airs and this weather continued till 3.54 a.m. A.T.S. when a heavy bank of nimbus cloud was observed in the N.E., and the barometer read 29.94 in., showing a cessation of the normal diurnal range.

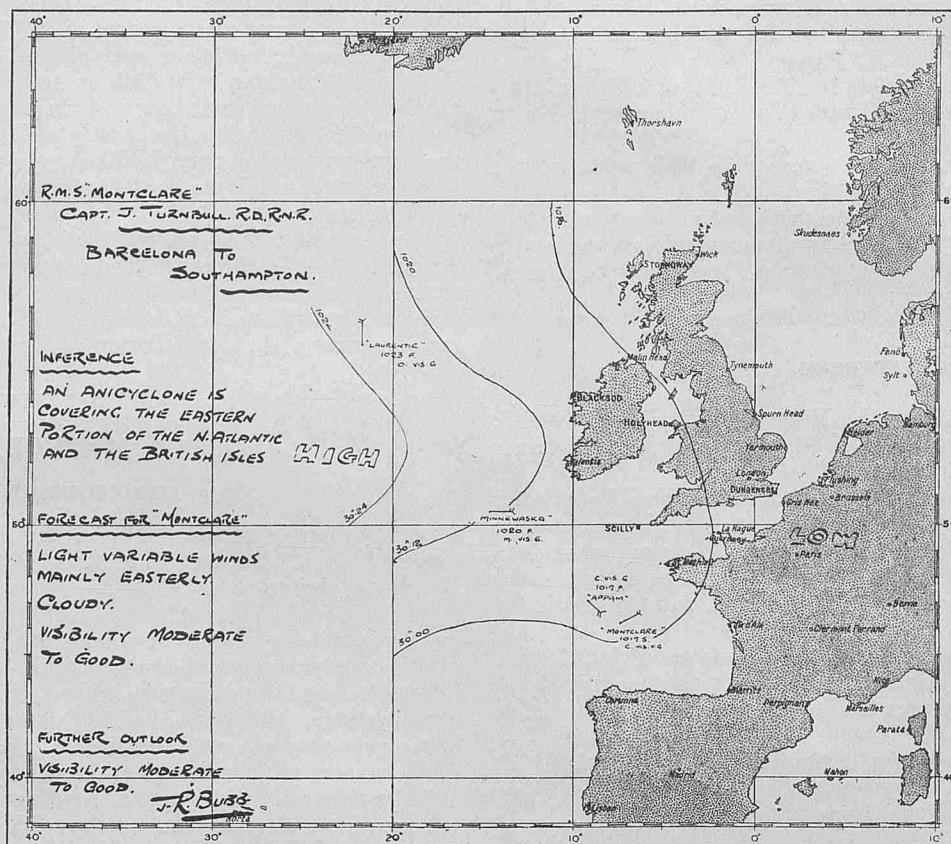
“At 3.59 a.m. the wind became squally, E.N.E., bringing slight rain and sand, the sky became overcast and for the next half-hour there was very vivid incessant lightning.

“At 4.05 A.T.S. the wind had risen to fresh gale force, and heavy rain with considerable sand was experienced till 4.30 A.T.S. when the barometer fell to 29.91 in. and the wind veered to gentle E.S.E. breeze. The rain ceased but was followed by occasional light showers till 6.00 a.m. A.T.S. when weather cleared and the wind fell to calms and light airs.

“Position of ship in the vicinity of Latitude 11° 33' N., Longitude 19° 04' W.”

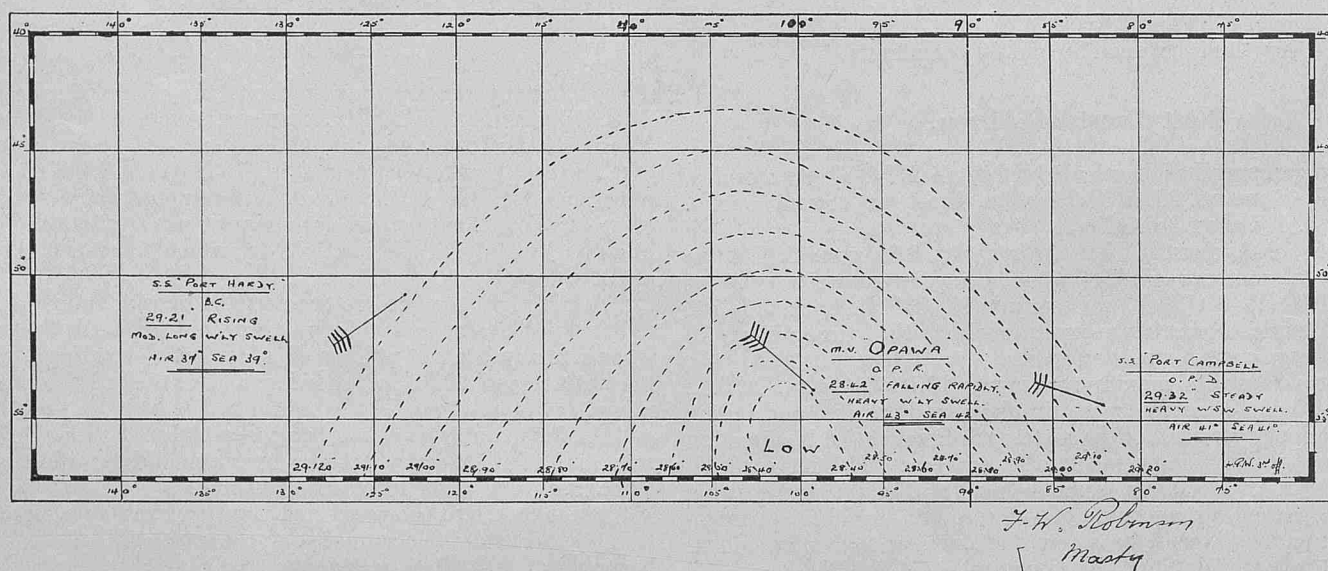
# WEATHER CHARTS MADE AT SEA. Eastern North Atlantic.

Weather Chart made at sea on board S.S. *Montclare*, Captain J. TURNBULL, R.D., R.N.R., Barcelona to Southampton, by Lieutenant J. R. BUBB, R.N.R., on October 6th, 1933, at 0600 G.M.T.



## South Pacific Ocean.

Weather Chart made at sea on board M.V. *Opawa*, Captain F. W. ROBINSON, Auckland, New Zealand to Dakar via Cape Horn, by Mr. H. P. WILLIAMSON, 3rd officer.



M.V. *Opawa* 0000 G.M.T. October 1st, 1933.

INFERENCE: We are situated near the centre of an intense cyclonic system which is gradually overtaking us.

FORECAST: Wind will remain at fresh gale force but will shortly back to the South-West, when weather will clear and visibility become very good. We may expect a considerable drop in temperature and occasional snow squalls.

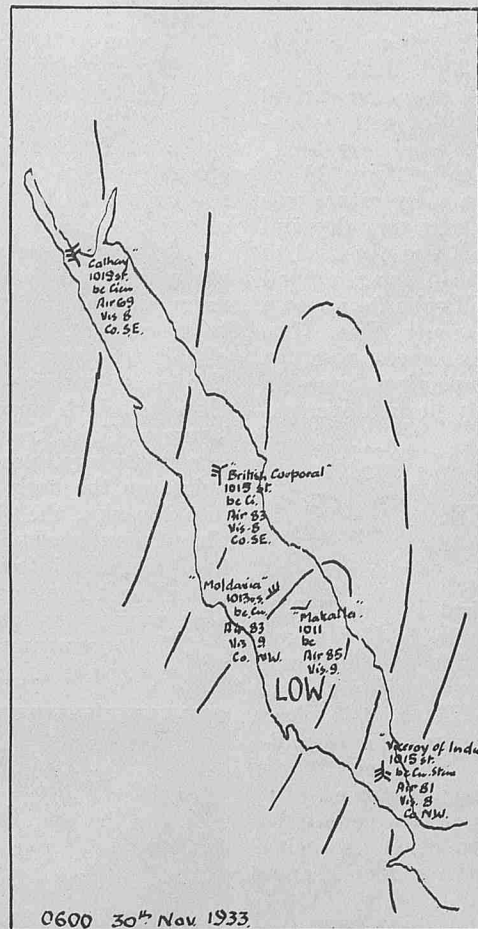
WEATHER EXPERIENCED: As forecast.



## WEATHER CHARTS MADE AT SEA, (continued)

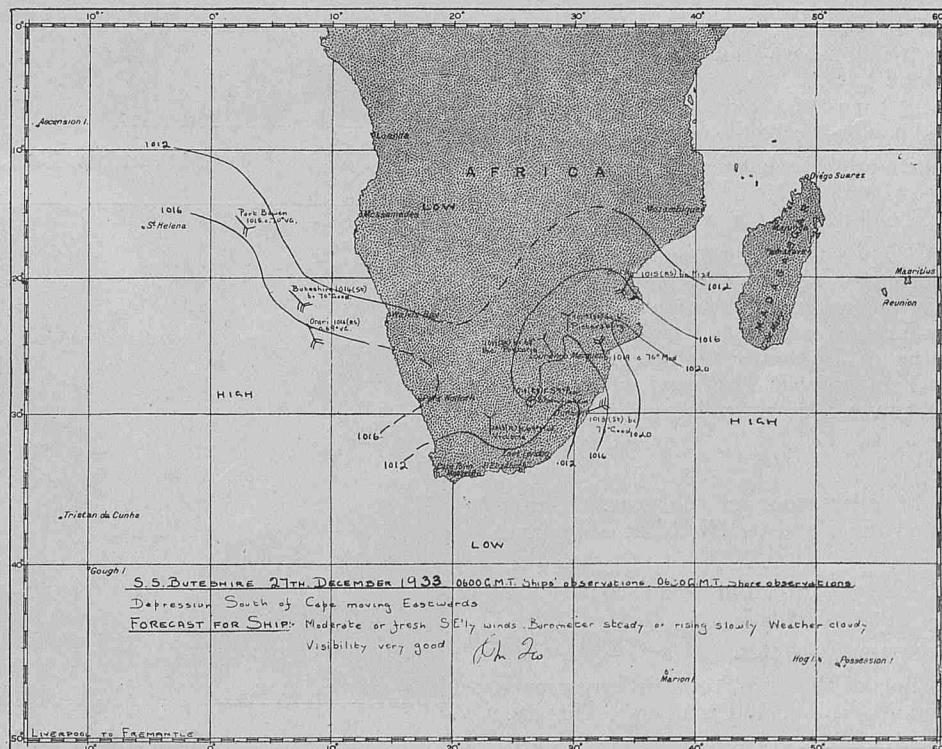
## Red Sea.

Weather Chart made at sea on board S.S. *Moldavia*, Captain C. H. C. ALLIN, Colombo to Port Said, by Mr. J. K. CRONE, 2nd Officer.



## South African Waters.

Weather Chart made at sea on board S.S. *Buteshire*, Captain C. A. I. LAIRD, Liverpool to Fremantle, by Mr. P. MacMILLAN, 2nd Officer.



**BRICKFIELDER.****Melbourne, Australia.**

THE following is an extract from the Meteorological Record of S.S. *Maloja*, Captain J. B. BROWNING, R.D., R.N.R., London to Brisbane. Observer, Mr. J. D. GREEN, 4th Officer :—

"The following weather was experienced while lying alongside Station Pier, Port Melbourne, on Monday, October 23rd, 1933.

"It had been blowing from the North, force 5, since our arrival on Sunday morning, the atmosphere being hot and dry with a temperature of 76° F. and barometer steady at 29.70 in.

"About 1200 S.M.T. the wind freshened, reaching force 11 at about 1345, the barometer fell to 29.50 in. and the temperature was 92° F. The sky was overcast and the atmosphere now very dry and laden with dust. About 1415 a break in the clouds was observed to windward. Within ten minutes it was clear overhead and the wind died away immediately. There was a period of dead calm for about a minute then a light breeze sprang up from the South-West. The temperature dropped 25° in ten minutes and the barometer rose one tenth, the wind freshening to force 4. Our Cargo Supervisor, himself a Master Mariner, said it was the strongest Northerly he had ever experienced in Melbourne."

**CURRENTS AND WEATHER.****Tristan da Cunha.**

THE following is an extract from the Meteorological Log of R.R.S. *Discovery II*. Captain A. L. NELSON. Observer, Mr. L. C. HILL.

"Within two days of arriving at Tristan da Cunha a sudden and complete change of weather conditions was observed. Throughout November 13th, 1933, and until 0700 on November 14th, 1933, clear skies and good visibility prevailed. From then onwards cloud conditions altered and assumed a nimbus formation. Mist and drizzle set in from about 1620 on November 14th, 1933, and continued with intermittent heavy rain until midnight. Throughout this period the air and sea temperatures dropped steadily, a drop of 11° F. being recorded in 48 hrs. This no doubt accounts for the sudden change of weather conditions.

"The following remarks on the meteorological conditions around Tristan Island of the Tristan da Cunha group of islands situated between Latitude 37° 02' and 37° 20' S. and Longitude 12° 12' and 12° 46' W. may be of some interest. The information is in all cases gleaned from the islanders who, although tryingly brief, were quite definite on the following points :—

**Wind.** The prevailing wind is westerly and follows the usual sequence of westerly winds in the Southern Hemisphere, i.e. N.W. wind with mist and rain, changing to S.W. accompanied by clearing skies and good visibility. At all times of the year sudden changes of wind take place when the wind is blowing from a northerly direction.

**Current.** Appears to be north-easterly between the islands but is influenced considerably by wind direction. The islanders use canvas boats of whaler type. The ship's whaler was lowered and its officers reported a strong easterly sea.

**Rollers.** Occur at all seasons. As already stated in the Sailing Directions the islanders say that rollers are most frequent during the winter months, i.e. June, July and August, and when the wind is northerly. During the summer months of December, January, February and March, the percentage of rollers is about 25 of that which occurs during the winter months. When rollers prevail landing is quite impossible.

**Precipitation :**

(1) **Rain :** Is abundant at all seasons of the year. Various waterfalls and streams around the island testify to the abundance of this rain.

(2) **Snow :** Is unknown at sea level but occurs in the high lands.

(3) **Hailstones :** Are common in winter.

"The islands lie close to the region of the Sub-Tropical Convergence. This will account for the abundant rainfall and temperate climate."

**CLOUD FORMATION.****South Atlantic.**

THE following is an extract from the Meteorological Log of R.R.S. *Discovery II*. Captain A. L. NELSON. Tristan da Cunha to South Georgia. Observer, Mr. L. C. HILL.

"November 24th, 1933. Throughout this day conditions had been steadily improving after a fresh N.W. gale. The wind had slowly backed to west and remained steady in direction while the sky remained veiled with a thick film of Cirro-Stratus cloud. About one hour before sunset an arch of hard clear sky commenced to form slowly and to spread from the S.E. to the N.W. quadrants. This arch had assumed a regular outline by 2115 G.M.T. when the following observations were recorded :—

"From two points on the horizon bearing 138° and 304° respectively an area of hard clear sky arched itself to an altitude of 9°. This maximum angular height was approximately above the Sun which set bearing 237½°. Maintaining an almost equal distance with the rim of this arch was another smaller arch with an angular height of 2°. The space between these two arches was packed with Cirro-Cumulus globules which appeared to be closely stowed between well-defined layers of Cirro-Stratus clouds. Another patch of Cirro-Stratus cloud, low in the sky, temporarily dimmed the setting sun. From the two points on the horizon, bands of cloud radiated and passed obliquely into the sky, the Northerly band in both cases being composed of Cirro-Cumulus clouds. These bands became fainter with altitude and finally diffused into the upper sky. With approaching sunset the whole formation became suffused with mixed colorations which faded softly with waning twilight.

"The accompanying photographs taken by Mr. A. SAUNDERS will better describe the cloud formation above the sun, while the following

**November 24th, 1933.****November 24th, 1933.**





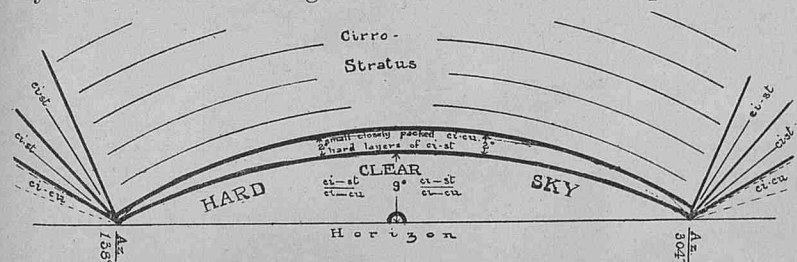
December 6th, 1933.



December 6th, 1933.

small sketch might serve to show the nature of the radiating bands and the completeness of the arch.

"At midnight the arch still persisted with the easterly point still bearing  $138^\circ$ . The Westerly point had closed and bore  $250^\circ$ . With approaching sunrise the lower part of the clear sky became banked up with Stratus clouds, to about  $4^\circ$  altitude. The Eastern convergence still remained very definite and at sunrise radiating bands of Cirro-Cumulus again passed into the upper sky. By 0145 (daylight) the formation commenced to break and by 0215 the whole Southern sky from that  $138^\circ$  bearing had cleared to an overhead point.



"Meteorological observations at 2000 and 2400 were recorded as follows:—

	Barometer.	Wind.	Air Temperature.
2000	998.5	W. by N. force 4	39.8
2400	997.2	N.W. force 3	39.1

Position of ship, Latitude  $49^\circ 25.7' S.$ , Longitude  $27^\circ 05.4' W.$  Further photographs of Cirrus cloud were taken December 6th, 1933, in Latitude  $57^\circ 30' S.$ , Longitude  $48^\circ 23' W.$ "

## WATERSPOUT.

### North Indian Ocean.

THE following is an extract from the Meteorological Record of S.S. *Esperance Bay*. Captain R. MCKENZIE, United Kingdom to Australia via Suez. Observer Mr. A. J. TILLOTT, 3rd Officer:—

"At noon A.T.S. (0700 G.M.T.) on October 29th, 1933, a very clearly defined waterspout was observed at a distance of about four miles to the N.N.E., the main characteristics as first observed being as in FIGURE I, the disturbances on the sea surface being very pronounced. The waterspout persisted in this form for twenty minutes when the base of the spout became diffused and slowly receded into the cloud mass above; but as it did so the disturbance on the sea surface rose higher, and appeared to cover a larger area; while at this time heavy rain began to fall in the vicinity, though there was none immediately in the region of the spout.

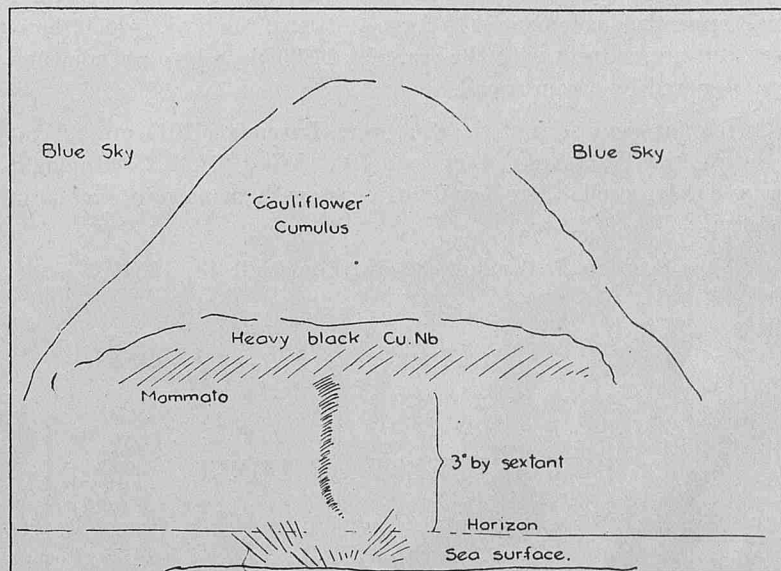


Figure 1.

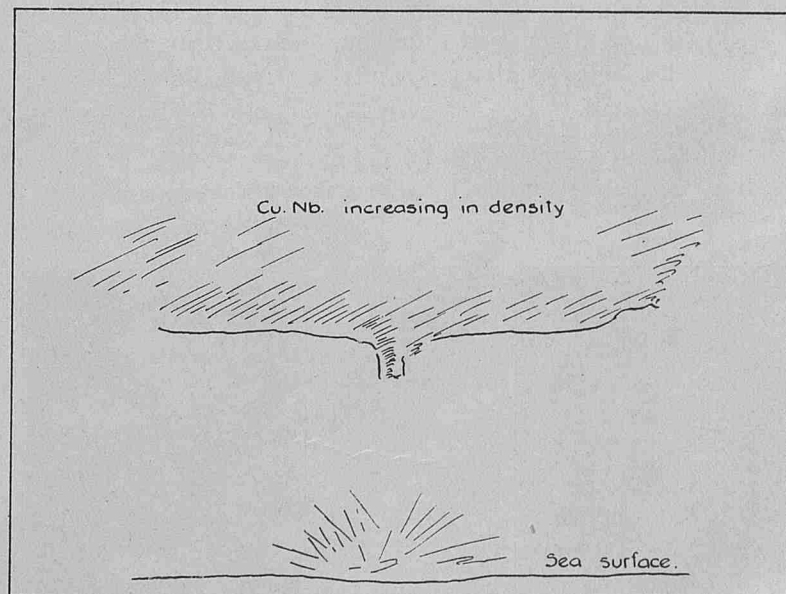


Figure 2.

"The waterspout persisted for a further ten minutes, though gradually shortening in length, and its final phase was as a small protruding piece of ragged Cu.-Nb. (FIGURE 2). Two minutes later, and the waterspout had disappeared in a heavy rain squall.

"Position of ship Latitude  $8^\circ 31' N.$ , Longitude  $70^\circ 22' E.$ , about 160 miles to the Westward of Minikoi Island."

## WATERSPOUTS.

### North Atlantic.

THE following is an extract from the Meteorological Record of M.V. *Orari*. Captain J. G. ALMOND. Liverpool to New Zealand via Dakar. Observer, Mr. N. BADDELEY, 3rd Officer :—

“ December 20th, 1933, from 9.50 a.m. to 11.45 a.m. (A.T.S.) vessel passed through an area of numerous small waterspouts, at times 5 or 6 being in sight at once. During this time the sky was heavily overcast and a succession of very heavy rain storms were encountered, the wind varying from S.W. to E.N.E. (through South) and from calms to force 5. The waterspout described below is typical of all those seen.

“ At 11.17 A.T.S. a spout was observed to be forming from a low, ragged Nimbus cloud to the E.S.E. The sea surface under the spout was disturbed and apparently swirling in an anti-clockwise direction, and at 11.20 A.T.S. the spout had descended to the sea surface; until 11.25 the spout remained approximately in the same form, and a further small appendage commenced to form a little to the S'rd., which, however, did not connect with the sea. At 11.26 the whole phenomenon was obscured by a rain squall.

“ Weather conditions at the time were, Barometer 1011 mb. Temperature Air 79°, Sea 80°, Wet bulb 79°. Wind S.S.W.2, with slight sea and S'ly. swell. Sky heavily overcast with many rain squalls in vicinity.

“ Ship's Position, Latitude 4° 32' N., Longitude 13° 12' W.”

## OUR YOUNGEST OBSERVER.

THE following photographs were taken on board S.S. *Orama* by her commander, Captain E. P. Cameron, R.D., R.N.R., who writes as follows :—

“ Herewith I am enclosing a series of photographs which will enlarge and perhaps find a human place in THE MARINE OBSERVER entitled perhaps ‘ Our Youngest Observer.’

“ They were taken one very hot afternoon in the Red Sea after the children's party—this baby was dressed as Cupid.

“ In taking the photographs, I tried to make a little story of the affair.”



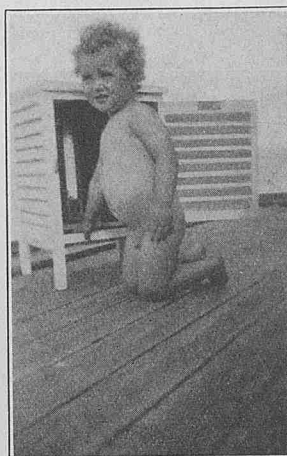
1. Phew ! it's hot in the Red Sea.



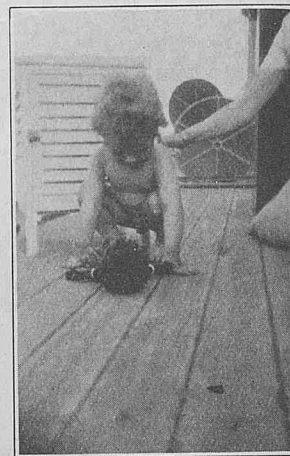
2. Mummy, 90°. Can I undress ?



3. That's better.



4. Much cooler.



5. Now I can play.

## PHOTOGRAPH OF ALBATROSS. Australian Waters.

THE accompanying photograph of an Albatross taken in the Great Australian Bight in December, 1933, has been received from S.S. *Baradine*, Captain W. D. C. SMITH. Observer, Mr. R. G. Wood, 3rd Officer.





## THE TRINITY HOUSE, LONDON.

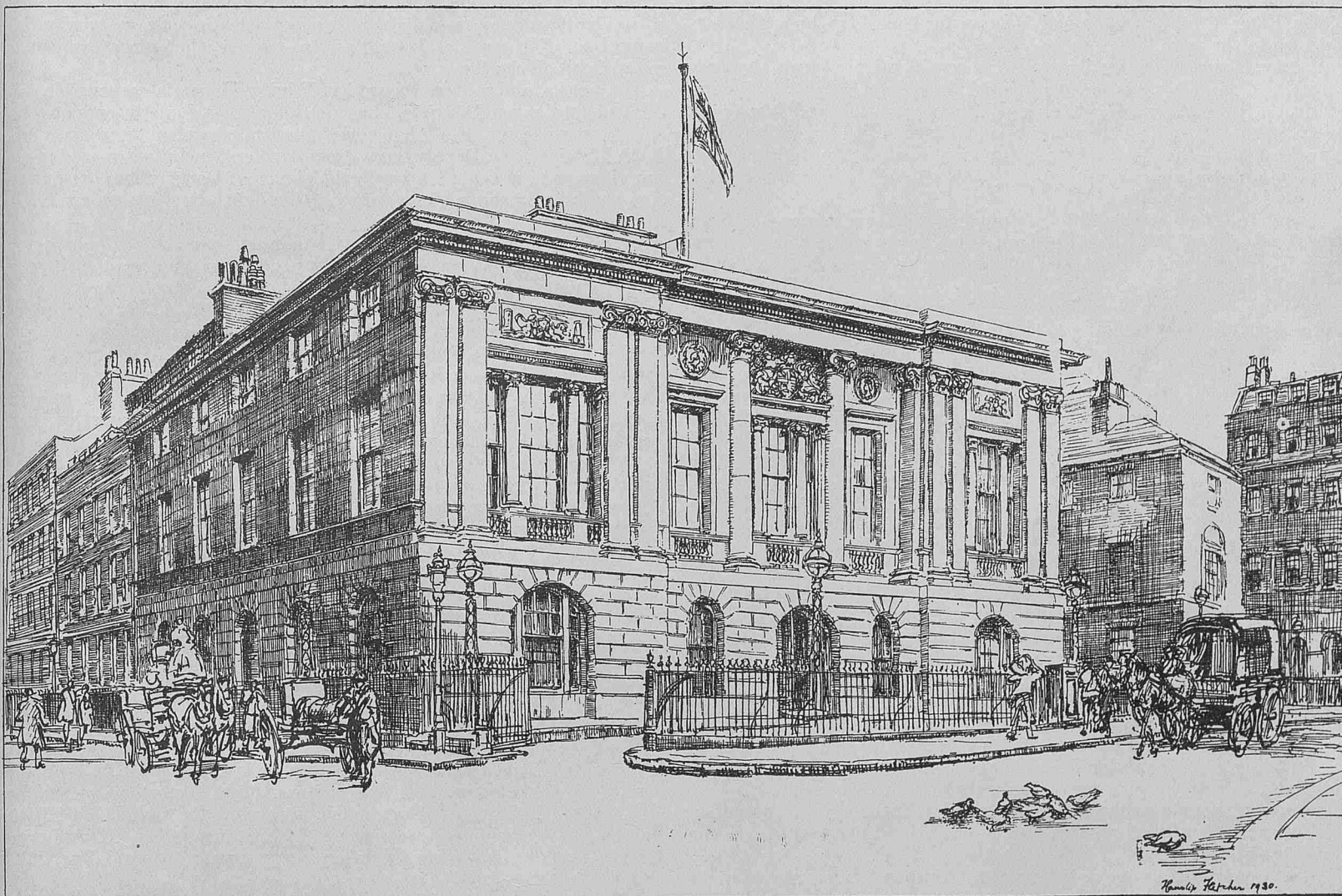
BY VICE-ADMIRAL SIR G. ROBERT MANSELL, K.C.V.O., C.B.E., DEPUTY MASTER.

OF the history of the Corporation which is familiarly known as the Trinity House, London, there is unfortunately no authentic record before the grant of a Charter by KING HENRY VIII in the year 1514, but it is clear from the wording of this Charter that it did but incorporate an existing Guild of Seamen, as evidence of which power is given to continue to hold all the land and tenements then held by the Guild in Deptford-Strond, which evidently referred to the Hall and Almshouses which had probably been erected about one hundred years earlier.

One writer has suggested a connection with a religious and philanthropic institution which is traditionally said to have existed in the days of KING ALFRED and another asserts that the Corporation was founded by STEPHEN LANGTON, Archbishop of Canterbury, in the reign of KING JOHN, but in spite of extensive researches there is no proof to be found in support of either of these statements; any documentary

The Charter of 1514 granted "to our beloved Liege People and Subjects, the Shipmen or Mariners of this our Realm of England" power to establish a "Guild or perpetual Fraternity of themselves. . . as well Men as Women with the power and authority, for ever, of granting and making laws, ordinances and statutes amongst themselves, for the relief, increase and augmentation of the shipping of this our realm of England" and ordained that yearly a Master, four Wardens and eight Assistants were to be elected and provision was made for the appointment of a Chaplain. The part then played by the Sisters in the activities of the Guild is not now known and they are not referred to in the subsequent Charters.

The first Master was Sir THOMAS SPERT, Controller of the Navy, who died in 1541 and to whose memory a monument which was erected by the Corporation may be seen in Stepney Church.



*The Trinity House.*

evidence which may have existed presumably perished in the Great Fire of London, 1666, or in a fire which destroyed another Trinity House in 1714. That the origin was undoubtedly religious is exemplified by the name or title of the Corporation as given in the Charter of 1514, namely, "the Guild or Fraternity of the Most Glorious and Undividable Trinity and St. Clement, in the parish church of Deptford-Strond in the County of Kent"—this title being retained with slight variations in the confirmatory Charters granted by later Monarchs. One thing is perfectly clear and that is that during the whole of its existence the object of the Corporation has always been to protect and further the interests of Mariners in all ways possible, both at sea and in old age and infirmity.

A very important development in the Corporation's powers occurred in 1594, when QUEEN ELIZABETH granted the Corporation the right of Ballastage, Beaconage and Buoyage, and this is the first record of the connection of the Trinity House with Lighthouses.

The right to raise ballast from the bed of the Thames was abandoned in 1893, owing to the introduction of water ballast making it no longer remunerative, but up to that time it provided a considerable revenue which was devoted to the relief of "decayed seamen, their wives, widows and orphans."

The Corporation's Coat of Arms was granted by QUEEN ELIZABETH in 1573, the original parchment issued by the Garter King at Arms being still in our possession.



In the year 1604 KING JAMES I granted a Charter which first conferred on the Corporation the power to appoint Pilots and in 1685 JAMES II granted another Charter which is the principal document on which the constitution of the Corporation is now based.

The latter Charter nominated SAMUEL PEPYS as Master (he had previously been Master in 1676/7) in which capacity he looked well after the interests of Trinity House in addition to his energetic work as Secretary of the Admiralty in placing the Navy on a firm basis.

From the time of HENRY VIII the Trinity House was closely connected with the Navy: STOWE states that the Corporation surveyed all the stores and provisions for the Navy and a Naval Storehouse at Deptford was placed in their charge.

The preamble of an Act of QUEEN ELIZABETH in 1566 refers to the Corporation of Trinity House as being "charged with the conduction of the Queen's Majesties Navye Royall" and throughout the 17th Century the Corporation was consulted by the Crown and the Commissioners of the Navy on various matters such as the construction, manning and arming of men of war and even the making of batteries at Gravesend and Tilbury.

The Elder Brethren examined Masters for the Navy in navigation right up to the year 1874.

Trinity House undoubtedly played a considerable part in the preparation of the Fleet against the Spanish Armada in 1588; the famous Sir JOHN HAWKINS was a Member of the Corporation and it may be safely surmised that all the other famous English Seamen of the time were Members—the Act of ELIZABETH mentioned above describes the Corporation as being composed of "the chiefest and most expert Masters and Governours of ships."

When the Fleet at the Nore mutinied in 1797 and prepared to go over to the enemy the Elder Brethren sailed down the Thames and removed or destroyed all beacons and seamarks to prevent the ships finding their way to sea.

Again in 1803 when NAPOLEON assembled an immense force of men and a fleet of light draught vessels on the coasts opposite the mouth of the Thames with the avowed intention of sacking and destroying London the Elder Brethren volunteered to the Government of the day to undertake the defence of the River. With great expedition ten frigates were equipped, officered and manned and placed in a line across the Thames in the Hope, presenting a battery of nearly two hundred guns to the enemy. A corps of volunteers numbering 1200 were raised under the name of the "Royal Trinity House Volunteer Artillery" which was officered by the Elder and Younger Brethren and maintained for the two years the danger lasted at the expense of the Corporation's Funds and by individual contributions of the Brethren to a total of many thousands of pounds.

Services were also rendered at various times against other aggressors and the Corporation contributed largely in money and ships to the campaign against the Sallee (Algiers) Pirates, who in the reign of JAMES I and CHARLES I harried Mercantile Shipping right into the English Channel.

During the Great War, while the personnel remaining in the Trinity House Service were not, of course, engaged in any belligerent activities, the Corporation co-operated closely with the Admiralty in the buoying etc., of special channels and in the removal of dangers to navigation. Two Lighthouse Tenders were sunk by mines whilst carrying out such special services and a Pilot Steamer was also mined whilst cruising on the Sunk Station, all these fatalities resulting in the lamentable loss of lives.

At the present time the members of the Corporation consist of Elder and Younger Brethren—H.R.H. THE DUKE OF CONNAUGHT is the Master, there are ten honorary Elder Brethren, amongst whom are H.M. THE KING (who was Master until his accession to the Throne in 1910), H.R.H. THE PRINCE OF WALES, H.R.H. PRINCE ARTHUR OF CONNAUGHT, and Statesmen and other gentlemen of eminence, and ten active Elder Brethren who constitute the Board which discharges the practical duties of the Corporation. The Younger Brethren, who number about 300, are either Officers of and above the rank of Lieutenant Commander in the Navy or Masters in the Mercantile Marine—they take no part in the daily work of the Corporation but from amongst them the active Elder Brethren are elected when vacancies occur.

Apart from the duties the Elder Brethren carry out on behalf of the Corporation they are required, by the terms of the Charter, to assist the Judges of the Admiralty Court in trying marine cases and they are also called as Assessors in similar cases in the House of Lords, the High Court of Scotland and the Judicial Committee of the Privy

Council—the English Admiralty Court is held in the highest regard throughout the maritime world for the impartiality and fairness of its judgments and the Elder Brethren may be justifiably proud in remembering the tributes which have been paid by Presidents and Judges of the Court to the assistance rendered by them.

The Corporation is the General Lighthouse Authority for England and Wales and the Channel Islands and the adjacent seas and islands and for Gibraltar. Scotland and Ireland have their own Commissioners, but any additions or alterations in the lighting and marking of their coasts require the approval of Trinity House (this applies to Northern Ireland but not to the Irish Free State). All three Authorities are under the Financial Control of the Board of Trade. The income for the upkeep of the three Lighthouse Services is derived from Light Dues which are levied on vessels on a tonnage basis, the scale being adjusted from time to time to cover the estimated expense.

There are many Port and Harbour Authorities who maintain Lights, Fog Signals and Buoys within their areas of jurisdiction and the approaches thereto but the statutory sanction of Trinity House is required to the establishment, discontinuance or alteration of such aids to navigation and the Elder Brethren's duties include the periodical inspection of these Local Lights, etc., to see that they are being maintained efficiently.

The coasts and waters for which Trinity House is responsible are divided into seven Districts, each in charge of a Superintendent who is a former Master of a Lighthouse Tender, of which there are nine. Each District has a Depot where stores are kept, including spare buoys, moorings, etc., and at Blackwall, the principal Depot, there are extensive engineering shops where many of the lighthouse fittings are made and repairs carried out.

Before giving details of the Lighthouses round the English and Welsh Coasts, it may interest the reader to have a brief account of their development from early times.

The first ones of which there are records were in Egypt, beacon fires being maintained in them by Priests. There is mention of one in Greece in 660 B.C., whilst the famous PHAROS of ALEXANDRIA was erected nearly three centuries before the birth of CHRIST by PTOLEMY PHILADELPHUS. It was one of the wonders of the world, said to have been 600 feet high, built of white marble, and it is believed to have been destroyed by an earthquake in the 13th century.

There is nothing to suggest that the shores of England were lighted prior to the Roman occupation. On the Castle Hill at Dover the ruins still exist of a tower constructed by the Romans on which a fire was burnt in a brazier to help the Roman Galleys. Probably with the decay of the Roman power in England, lighting of the coast disappeared until Christianity became established, and in the 14th century we find that monks and hermits maintained wood fires on the spires and towers of seashore monasteries.

The dissolution of the Monasteries swept away the men who tended these coast lights as a sacred duty, and in the 16th century (1586) a Dutch navigator in a book minutely describing every object on the sea coast of England does not refer to any lights.

In the 17th century the Trinity House, and private persons as well, began to build and maintain lighthouses under patent from the Crown, levying dues on passing vessels to pay their costs, until in 1836 the Lighthouses in England and Wales were transferred to the Corporation by Act of Parliament—large sums were paid for the eleven Lighthouses bought from private owners, for instance, £445,000 was paid for the Skerries, it having produced for its owner an annual profit of over £12,000.

There was great opposition in some localities to the building of lighthouses, as the dwellers on the seashore relied to a great extent on wreck-age for fuel and stores. In 1619 great difficulty was experienced in getting labour to build the lighthouse at the Lizard. Sir JOHN KILLIGREW wrote in regard to this:—

"The inhabitants nearby think they suffer by this erection. They affirm that I take away God's Grace from them. Their English meaning is that now they shall receive no more benefit by shipwreck for this will prevent it. They have been so long used to reap profit by the calamities of the ruin of shipping that they claim it hereditary and heavily complain on me." In Cornwall, notices of wrecks if occurring during divine service were at once given out in church by the parson and all left for the shore.

This shows that Trinity House has not always been popular with other people in its efforts to help the Mariner.

As regards the illuminant, the earliest was probably wood, followed by coal, both being burnt in a brazier. Towards the close of the 17th



century these fires were enclosed in a lantern with a chimney at the top. This saved fuel but did not improve the light as the lantern glass got fouled by smoke, so after a time the lanterns were removed, but coal or wood fires were used in some lighthouses as late as 1822.

Simultaneously with the use of coal fires, and subsequently superseding them, candles were the illuminants in Lighthouses. A good example of their use was SMEATON'S Chandelier at the Eddystone on which 24 candles burnt. These candles required snuffing at intervals and Smeaton installed a clock which rang a gong every half-hour to warn the Keepers to carry out this operation.

After candles came wick lamps burning whale oil at first and then vegetable oil followed by paraffin or mineral oil.

In 1673 the first endeavour was made to increase the intensity of the light by means of a circular reflector, the concave surface of which consisted of a kind of mosaic of hundreds of small silvered glass particles, and it proved to be a success in connection with a rudely constructed flat wick oil lamp.

This type of reflector was superseded later by a silvered copper reflector used in conjunction with cylindrical wick lamps. These reflectors, besides increasing the intensity, concentrate the rays of light in a certain direction and thus enable what is called "Character" to be given to the light—that is, instead of a fixed light showing all round the horizon, by grouping the reflectors and revolving them flashes are produced at intervals, with periods of darkness between and the period between the flashes and the number per minute enable the Mariner to determine which particular light he is observing.

On our most modern Light Vessels and at all except a few of the less important Lighthouses instead of the light being reflected it is refracted by means of what is known technically as Dioptric apparatus—that is the light from a centrally placed gas mantle or electric lamp passes through panels composed of lenses and segments of lenses which, in effect, bend the rays into the concentrated beam observed from seaward, at the same time enormously magnifying the power of the original light—in some cases from 5,000 to over a million candles. The number and arrangement of panels, and the speed at which the apparatus is revolved round the central lamp determine the character of the light.

The means of giving warning to Mariners during thick weather likewise began in a primitive manner—the earliest signal of which we have record was a drum at the Dudgeon Light Vessel, later on bells were used and then gongs of Chinese fashion, which in turn were followed by guns.

At the present time Guns, Explosive Signals, Reed Horns, Sirens and Diaphones are in use; some countries use Whistles, but owing to the liability of confusion with steamers' whistles they are not used by Trinity House. Submarine signalling apparatus is also fitted to a number of Light Vessels. Explosive signals are used at rock lighthouses, where of course there is no room to install bulky air compressing machinery, and at certain other Lighthouses, and consist of charges of Tonite, which is a very safe explosive to handle—the charges are fixed in a kind of gallows which is then elevated above the lantern roof

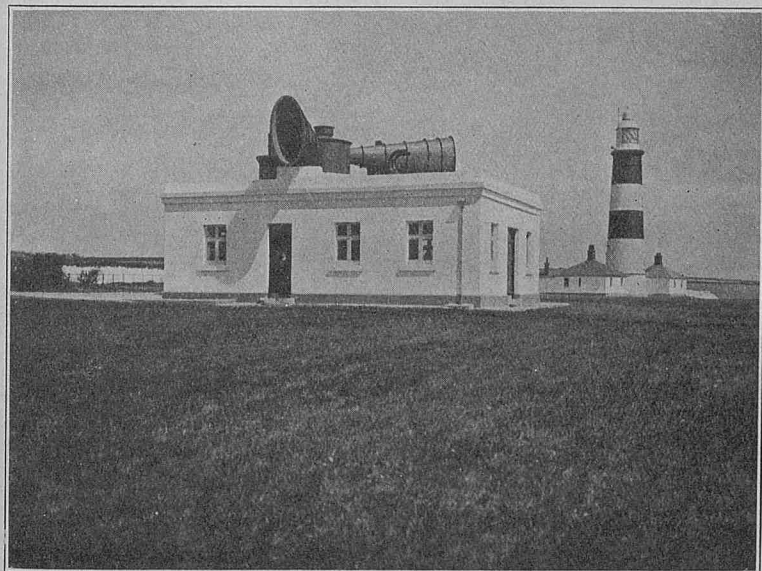
and exploded at the specified intervals by current from an electric battery. Reed Horns, the air for which is compressed by manual labour or by a small engine, are installed on board a number of the smaller in-lying Light Vessels.

Elsewhere Sirens and Diaphones are installed; both these are sounded by compressed air, and are powerful instruments of somewhat similar characteristics, but the latter, a Canadian invention, gives a more constant pitch than the former and also gives a "grunt" at the end of its blast which distinguishes it from any other sound signal. These instruments are quite formidable in size and noise, the largest horn is at Trevoise Lighthouse and is 36 feet long with an oval mouth the maximum diameter of which is 18 feet. The air is compressed by oil engines which take about fifteen minutes to get under way, but sounding can be commenced immediately it is necessary as compressed air which will last for that time is kept available in air receivers.

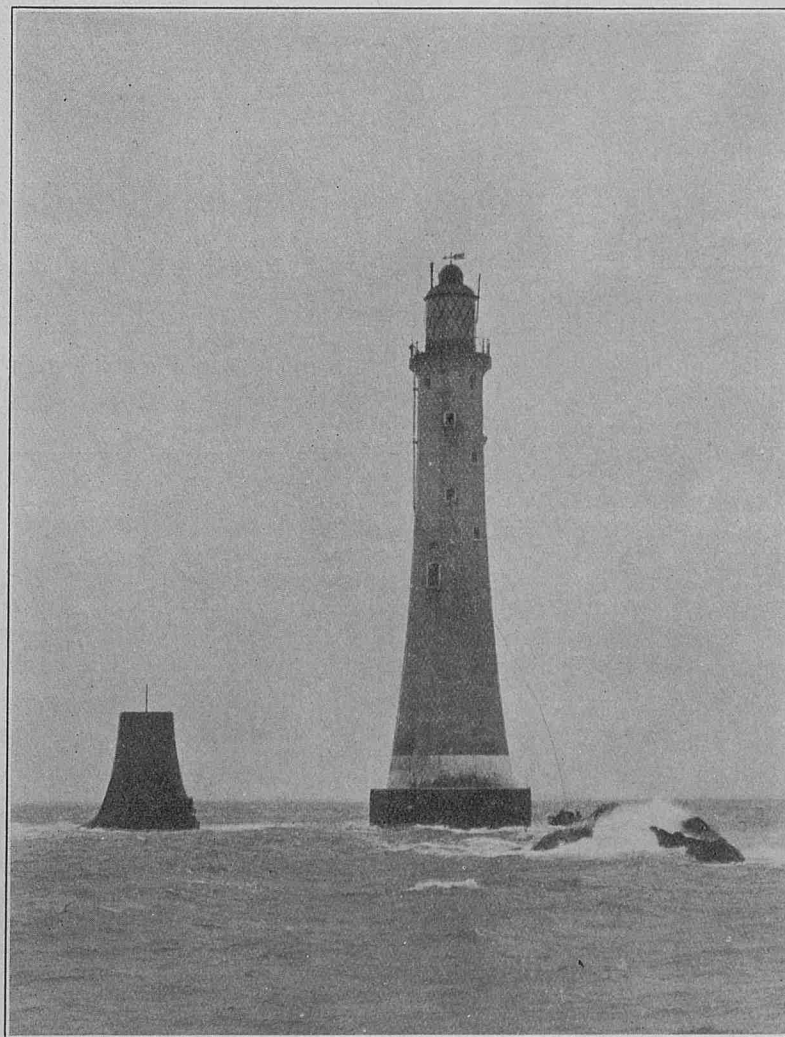
In spite of the power of these fog signals it is always impressed that they should be looked upon as warning signals, and not to be approached nearer than is necessary by a vessel. Owing to the vagaries of sound absolute reliance cannot be placed on hearing the most powerful sound signal even when fairly close though it may be heard far off. In one experiment which was carried out a very powerful signal was heard at a distance of 12 miles, not heard at 8, heard again from 4 to 2 miles and not heard at three-quarters of a mile. The sound waves appear to strike air of different densities and to be diverted upwards or downwards in curves.

It is this limitation in the dependance which may be placed on sound signals that makes Radio Beacons so extremely valuable and these the reader will have seen described in the last number of THE MARINE OBSERVER by the Corporation's Engineer-in-Chief, under whose able direction the whole of the Trinity House Radio Beacons have been designed and installed.

The Corporation have 96 Lighthouses under their control, of which number 62 are manned and the remainder either semi-watched or unwatched, that is to say, they are not constantly attended during the



Nash Point Lighthouse showing Fog Horns.



Eddystone.



night. The principal Lighthouses are, of course, all manned and may be divided into two classes, Rock or Island Stations and Land Stations. The former have each a complement of four Keepers of whom three are always at the Station and the other one on shore, the reliefs being effected monthly—each Keeper has two months at the Lighthouse and then one month on duty at the District Depot.

The shore Lighthouses are usually manned by two Keepers except those stations which also have a power Fog signal when three Keepers form the complement. The Keepers and their families live in cottages adjacent to the Lighthouse.

Lighthouse Keepers enter as Supernumeraries between the ages of 19 and 28, preference being given to artisans.

Throughout the Service the employees find their own food, but at rock lighthouses the Corporation maintain a stock of reserve provisions in case the relief, owing to bad weather, cannot be carried out punctually.

The usual form of illuminant is petroleum which is vapourised and burnt with a mantle, but there are also 4 electric lighthouses. The semi-watched and unwatched lights are in most cases acetylene, in

some the lights are lighted at night and extinguished in the morning by part-time Attendants, in others this operation is performed by means of a sun-valve or a specially designed clock.

The first attempt adequately to guard the extensive shoals existing round our coasts was made some two hundred years ago when a vessel exhibiting a light was placed at the Nore—this was possibly the first Light Vessel in the world. The early Light Vessels differed very considerably in structure and illuminant from the present ones; before the introduction of flashing and occulting lights the Vessels were distinguished one from the other by the number of lanterns carried and great difficulty must have been experienced in keeping the Lights functioning efficiently, especially in the days of candles.

The majority of our Light Vessels are wooden, the hulls of some still in service being up to ninety-five years old and on all except the latest Vessels the lantern is suspended round a mast, being raised and lowered as necessary with the aid of winches. Our most modern Light Vessels are built of steel with a lantern permanently fixed at the top of a hollow military mast up which access is readily obtainable to the light at all



Light Vessel with Hoisting Lantern.



Modern Electric Light Vessel.



times; they have powerful electric lights, the current for which is generated by semi-diesel engines which also compress the air for the Diaphone Fog Signals fitted on board.

Gas Boats are in position at two stations and these are entirely unmanned, the light being turned on and off at sunset and sunrise respectively by means of a clock; one has a bell operated by the motion of the vessel and the other a bell mechanically operated, the motive power being CO<sub>2</sub> stored under high compression in cylinders.

Marks in the shape of moored spars, barrels, etc., have probably been used from time immemorial to mark channels and in due course these developed into properly constructed wooden buoys which were later made of iron and now of steel—experiments are at the moment being carried out with air-inflated rubber buoys.

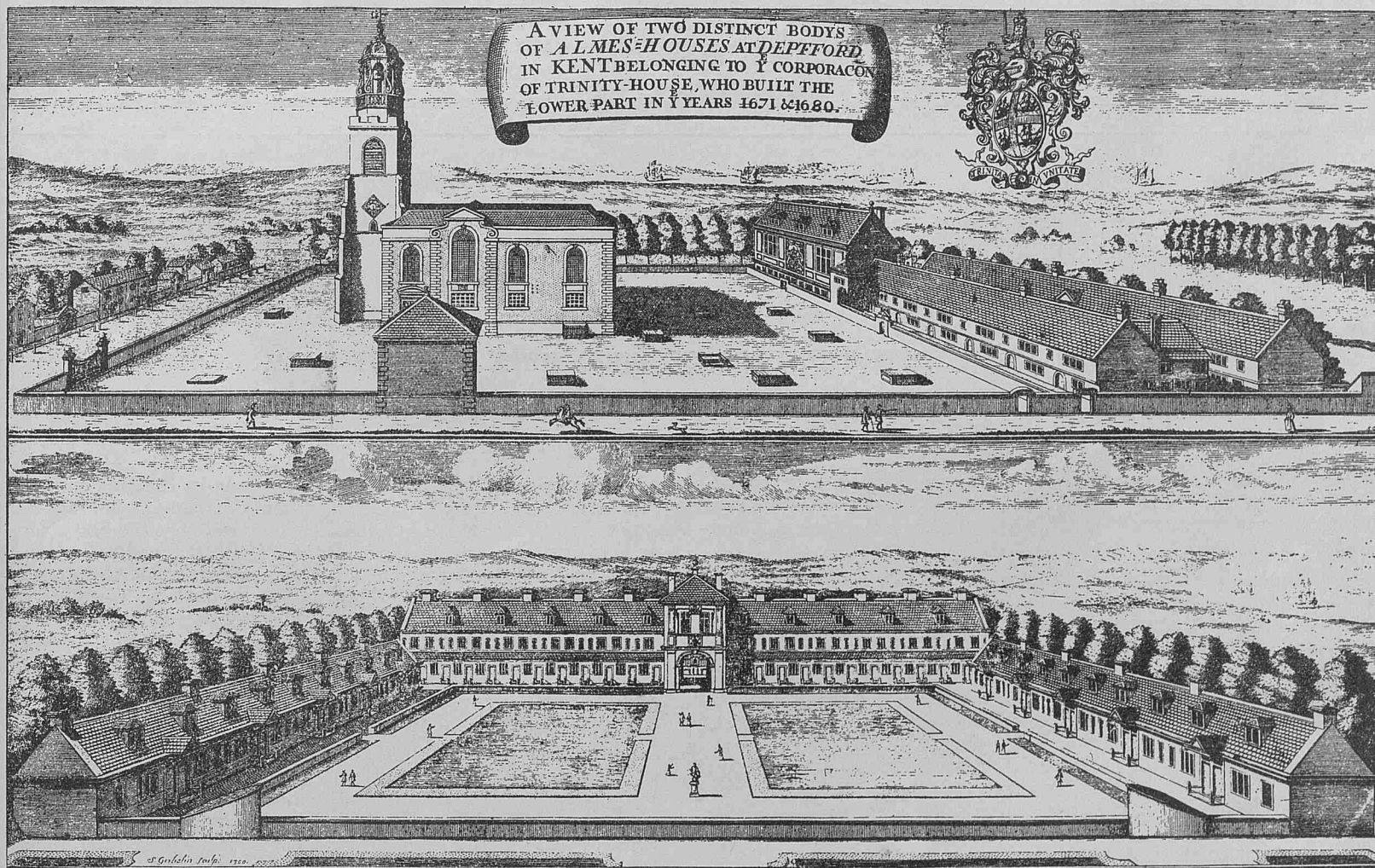
Trinity House maintains over 600 navigational buoys, nearly 150 of which are lighted, the Thames Estuary with its sandbanks and many channels accounting for a large number of them. The buoys are of three main shapes—can, spherical and conical—and are painted in characteristic colours. Some of them are very large, for instance, an oil-gas lighted whistle buoy weighs about 9½ tons, has a diameter of 10 feet, the light is 15 to 20 feet above water level and a tube extends 23 feet below the buoy—the air pumping through this tube as the buoy lifts and falls with the motion of the sea actuates the whistle. It may readily be imagined that buoys of this size are somewhat formidable objects for the Steam Tenders to deal with, especially when there is any lop on. The source of illuminant is either oil-gas or acetylene; with the first the buoy itself is the container, the gas being pumped in from gas receivers carried by the Tender at intervals of about three months, but the acetylene is stored in steel accumulators or

“bottles” placed in pockets constructed in the buoy and a sufficient number can be carried by a buoy to last twelve months before renewal.

The positions of the buoys are constantly checked by the Steam Tenders, whose other duties include carrying Reliefs and stores to Light Vessels and rock Lighthouses, buoy changing, surveying shoals, etc., and the marking and dispersing of wrecks.

Besides being the General Lighthouse Authority, Trinity House is also the principal Pilotage Authority of the United Kingdom in which capacity the Corporation controls the Pilotage Services for the River Thames and its Estuaries and the approaches from Orfordness to Selsey Bill, as well as certain Outport Districts round the coast such as the Isle of Wight with Southampton, Plymouth, Falmouth and many others. There are over 600 Pilots holding Trinity House Licences and the Corporation directly maintain eleven Pilot Steamers and Motor Cutters although the necessary craft in most of the smaller Districts are run by the Pilots themselves.

The Elder Brethren have another duty—I should, perhaps have mentioned it earlier, for it is certainly our most ancient privilege—and that is the administration for the benefit of seafarers and their dependants of Charities largely comprised of Legacies and Gifts from former Elder and Younger Brethren. At Mile End the Corporation have a group of sixty Almshouses occupied by aged or infirm former Master Mariners or by the aged Widows or spinster Daughters of such men and in addition nearly 400 pensions are paid to similar kinds of men and women who live in their own homes. Altogether the yearly charitable disbursements of the Corporation amount to about £25,000 but, especially in these difficult times, we wish that it could be considerably increased.



In these ALMES-HOUSES Fifty nine decay'd MASTERS of SHIPS, and PILOTS, or the Widows of such, are by the Corporation of TRINITY-HOUSE maintain'd; As are Twenty Eight more in other their Almshouses at Mile end near London. Besides, upwards of Two thousand poor Aged Seamen, or their Widows, do receive constant monthly Pensions from the Corporation. and Six in their Almshouses at the Dogrow.





## THE ROUTE FROM THE CAPE OF GOOD HOPE TO AUSTRALIA.

BY COMMANDER J. HENNESSY, R.D., R.N.R.

It has for long been a debatable point amongst seamen as to which parallel of latitude is the most advantageous for a ship to run her easting down through the Roaring Forties between the Cape of Good Hope and Australia.

Prior to the discovery and opening up of the gold fields in Victoria in 1851 the Australian trade was considered as unimportant. The ships employed in it, frequently overcrowded with the early settlers, were small, ill-found, and poorly manned. They rarely made a passage under 130 days, during which time the lot of the emigrant was a very unenviable one.

With the discovery of gold, the Australian trade took on a new aspect. Melbourne was then a town with little over 20,000 population but, in the years 1852-1857, over a quarter of a million people landed on the shores of Port Phillip of whom over 200,000 were emigrants from the United Kingdom. Such conditions caused a great demand for first-class ships to enter the Australian trade, which resulted in the building of a fleet of the finest and swiftest passenger carrying clipper ships the world has known.

In addition to this fine new fleet of clipper ships, the first regular

steamship service to Australia via the Cape was in 1852 inaugurated by the Australian Royal Mail Navigation Company, who ran the service with five new auxiliary vessels. These were not the first steam vessels to run the easting down for, in 1831, the paddle steamer *Sophia Jane*, a vessel of about 500 tons register, made the voyage from England to Sydney via Pernambuco and Cape Town. The *Sophia Jane* had originally been built to run between London Bridge and Gravesend. Also in 1852 the S.S. *Phœnix*, a vessel of 405 tons burden, brigantine rigged, which had for ten years been employed on the South African coast, made the voyage from the Cape to Melbourne with passengers for the gold diggings.

In the same year as the Australian Royal Mail Navigation Company commenced their service so great was the demand for transport that many steamers of other lines were taken off their ordinary voyages and placed in the Australian trade via the Cape. Chief of these was the renowned *Great Britain*, an iron auxiliary three-masted screw steamer of 3,448 tons burden, at that time the largest vessel afloat. The *Great Britain* remained in the Australian trade for the remainder of her career, except for a short time when she was requisitioned as a transport during the Crimea war.



With the advent of the fast Colonial clipper a new route to Australia was advocated by Lieutenant MATTHEW FONTAINE MAURY, who since his appointment in 1841 as Superintendent of Charts and Instruments Depot, U.S.N., had undertaken the laborious task of collecting ships' observations with which to publish meteorological charts of the winds and currents over the oceans.

Up to this time the recommended route to Australia was that known as the Admiralty route. In 1847 Mr. TOWSON, of Liverpool, published TOWSON'S TABLES to facilitate the practice of Great Circle Sailing and introduced what is known as Composite Great Circle Sailing. The Admiralty route based on this system was laid down as follows :—

"After rounding the Cape of Good Hope, vessels bound to the south coast of Australia may safely run down their longitude or limit the southern curve of their Great Circle to the parallel of 39° S. where the wind blows almost constantly from some western point and seldom with more strength than will admit of carrying sail. In a higher latitude the weather is frequently boisterous and stormy and sudden changes of wind with squally wet weather are to be expected especially in the winter season after passing the islands of St. Paul and Amsterdam. Islands of ice have also been encountered in those regions as was almost fatally proved by H.M. Ship *Guardian* striking against one in 46° or 47° S. in the beginning of summer and nearly foundering."

MAURY maintained that if not calling in at a South African port it was disadvantageous for a vessel to go within 600 miles of the Cape of Good Hope, and considered that the parallel of 39° S. recommended in the Admiralty route for ships to run their easting down was unnecessarily far north, thereby unduly increasing the distance.

He had previously shown that to a well-handled ship outward bound there was little difficulty in weathering Cape San Roque by crossing the equator in about Longitude 30° W. and thereby avoiding the delay caused by working through the "belt of doldrums" further to the eastward.

MAURY'S recommended route from Europe to Australia was to follow a composite Great Circle track from the Equator in Longitude 30° W. to port of destination and was laid down in his sailing directions as follows :—

"Australian bound vessels are advised after crossing the equator near the meridian of 30° W.—say between 25° and 32° W. as the case may be—to run down through the S.E. trades with topmast studding sails set, if they have sea room, aiming to cross 25° or 30° S. as the winds will allow, which will be generally somewhere about 28° or 30° W. and so on, shaping their course, after they get the winds steadily from the westward more and more to the eastward, until they cross the meridian of 20° E. in about Latitude 45° reaching 55° S., if at all, in about 40° E. Thence the best course if ice, etc., will allow, is onward still to the southward of east, not caring to get to the northward again of your greatest southern latitude before reaching 90° E. The highest latitude should be reached between the meridians of 50° and

80° E. The course is then north of east gradually hauling up more and more to the north as you approach Van Diemens land."

Then followed the undermentioned qualifications to the above route :—

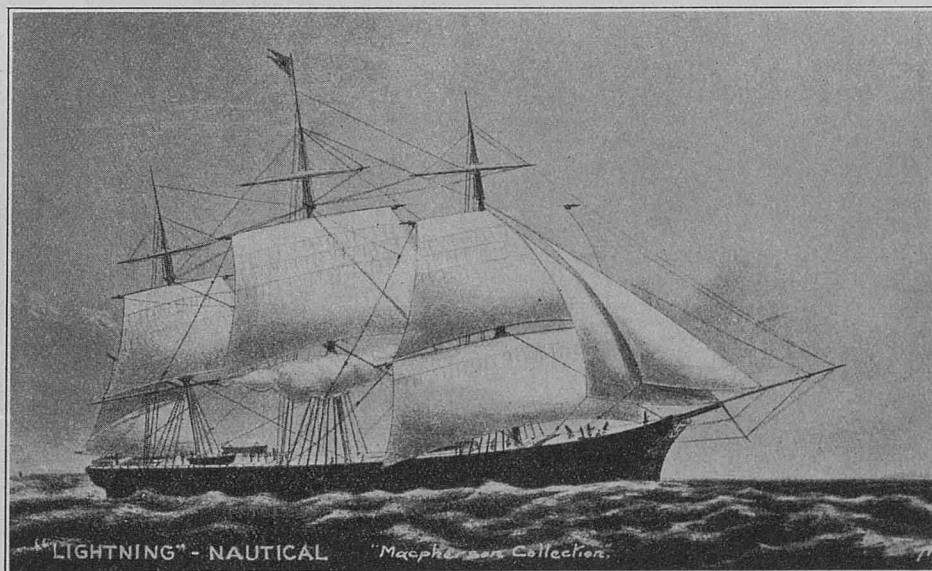
"Such is the best route to Australia, the highest degree of south latitude (and, as a rule, the farther you go south the shorter the distance) which it may be prudent to touch depending mainly on the season of the year and the winds, the state of the ship and the well being of the passengers and crew. If the winds are not good and strong, bear south to look for them."

At first there was some diffidence on the part of commanders to abandon the Admiralty route for that recommended by MAURY, but the unusual conditions created by the gold rush gradually induced many commanders in their efforts to set up record passages to take MAURY'S route with the result that he was able to compile tables showing that the passage to Australia which by the old Admiralty route took on the average 124 days was, by adopting his recommendations, reduced to an average of 97 days.

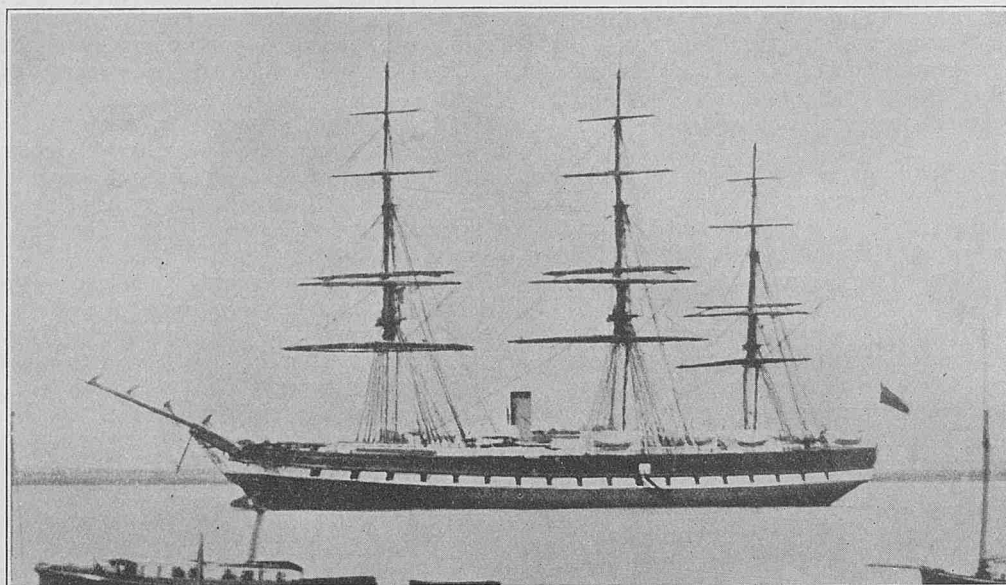
Unlike their predecessors in the trade the new wooden clippers were large, staunchly built vessels of upwards of 2,000 tons register; heavily rigged and maintained in the highest state of efficiency. With their tween-decks fitted out for the carriage of emigrants, they always sailed with a high freeboard and being well and efficiently manned, were driven in heavy weather under a large press of canvas. Following MAURY'S route some of these ships when running their easting down would maintain a speed of over sixteen knots for hour after hour. It is recorded that the *James Baines* on one occasion logged 21 knots with main skysail set. The *Lightning*, when crossing the Atlantic for delivery to her owners, sailed 436 miles in twenty-four hours, and the same ship, whose picture is reproduced here, logged 430 miles in one day when running her easting down in 1857. This run was closely approached on several occasions by the other clippers but never equalled.

The clipper ships showed that they had little to fear from the auxiliary steamers now competing with them on the Australian run by beating their time on several occasions. The first ship to considerably shorten the Australian voyage was the Black Baller *Marco Polo*, whose first voyage astounded the shipping world. Sailing from Liverpool under the command of the renowned Captain JAMES NICOL FORBES, this ship, in 1852, made the passage to Melbourne in 68 days, beating the S.S. *Australia* by over a week. Returning from Melbourne to Liverpool in 76 days, the *Marco Polo* completed the round voyage in 5 months 21 days—only a little longer than that previously taken for the outward passage alone.

The *Marco Polo* was soon followed by such fliers as the *Lightning*, *Red Jacket* and *James Baines*, all of whom when following MAURY'S route made fast or record passages. In 1854 the *James Baines* made the record voyage to Melbourne from Liverpool in 63 days which was unbeaten for many years.



"Lightning."



**"Great Britain."**

*Reproduced by kind permission of the Nautical Photo Agency, Mill Hill, London.*

The auxiliary steamers (as will be observed from the photograph of the *Great Britain* reproduced here) depending more upon sail than upon steam for their speed, also abandoned the Admiralty route and after rounding the Cape of Good Hope, ran far down into high latitudes in search of strong winds.

Thus was the passage to Australia, which hitherto had taken anything from 120 to 150 days, shortened to little over half by the Liverpool Emigrant Clippers of the 'fifties. That this was due as much to the sailing qualities of the ship and the splendid crews that manned them as to the shortened route which they followed there can be no doubt.

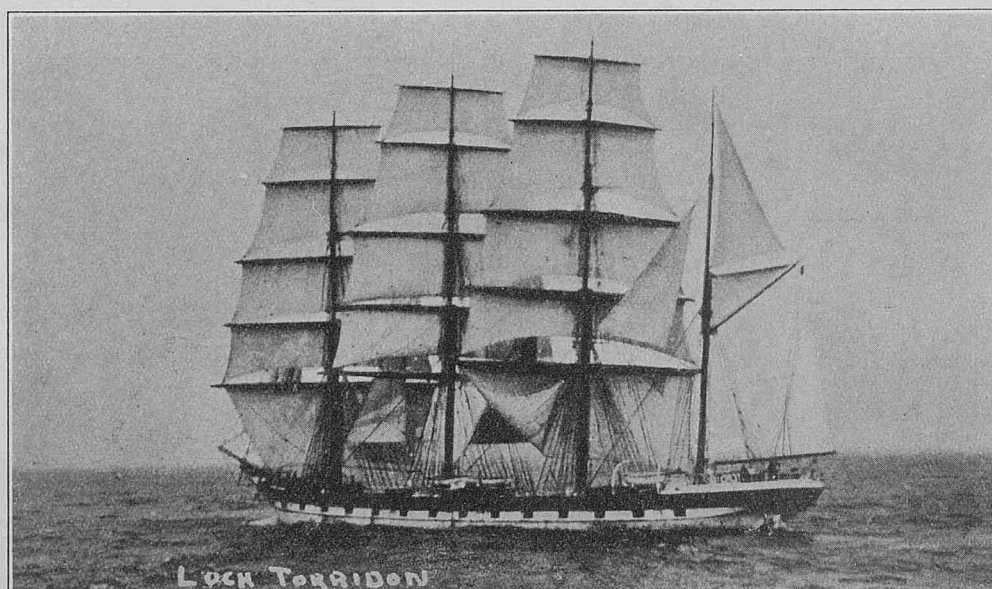
Strain to ship, wear and tear of gear, and discomfort to passengers, were all of secondary importance to that of making a fast passage, and these ships, built of soft wood, were so strained and waterlogged when the gold fever had died down as to unfit them for the carriage of wool. They were replaced by hard teak or composite built clippers and later by iron built ships forming the Wool Fleet.

The early ships of the Wool Fleet were much smaller than the Emigrant Clippers, and though, in order to get the wool cargoes home in time for the wool sales, quick voyages were of paramount importance, they did not so generally follow MAURY'S route when running their easting down as did their predecessors. Each commander held his own opinion as to the best parallel on which to run between the Cape

of Good Hope and Australia and logs in the possession of the Meteorological Office, which had commenced collecting ships' observations in 1854, show that while some ships followed MAURY'S route as closely as possible, others limited their southernmost latitude to the 48th parallel, but the majority of ships ran their easting down between the parallels of 40° and 45° S. and made passages quite comparable with those of the earlier clippers.

The composite Aberdeen White Star Clipper *Thermopylae* of 948 tons originally built for the China tea trade lowered the record for the outward voyage to Australia set up by the *James Baines* in 1854 when she made the passage from London to Melbourne in 1869 and again in 1870 in 60 days, pilot to pilot. Another Aberdeen White Star Clipper, the *Samuel Plimsoll*, an iron ship of 1,444 tons, demonstrated that it was not always necessary to go far south in search of wind when running the easting down for in 1876, when in Latitude 41° S. she ran 2,502 miles in eight days, her best day's run being 348 miles. Similarly, the well-known four-masted barque *Loch Torridon*, 2,000 tons, one of the last sailing ships engaged in the Australian wool trade, sailed 2,376 miles in eight days, when running her easting down in 1892 in Latitude 43° S.

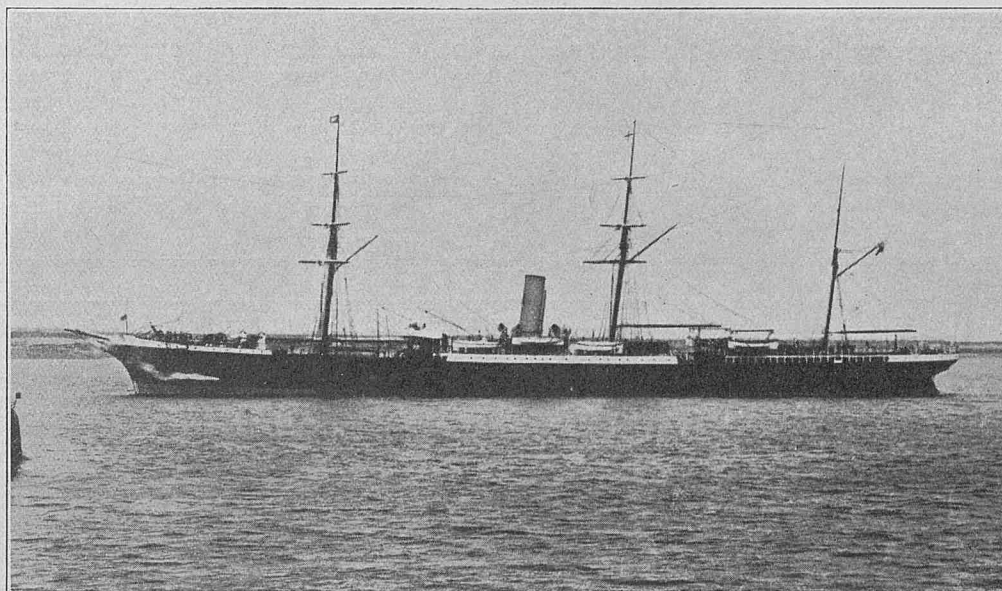
The auxiliary steamers which inaugurated the first regular steamship service from England to Australia via the Cape did not prove a success



**"Loch Torridon"**

*Reproduced by kind permission of the Nautical Photo Agency, Mill Hill, London.*





"Kaikoura"

*Reproduced by kind permission of the Nautical Photo Agency, Mill Hill, London.*

and several were converted into sailing ships, but in the late 'seventies and early 'eighties there were several large steamers engaged on the Australian and New Zealand run, voyaging by way of the Cape.

They were fine screw steamers, generally barque rigged, such as the *Kaikoura*, one of the early steamers of the New Zealand Shipping Company's fleet, whose photograph is given here. They made the passage from the United Kingdom to Adelaide in about 40 days and to Auckland in 43 days.

Here, as in the case of the Wool Clippers, their commanders differed in their chosen routes when running the easting down. On rounding the Cape of Good Hope those steamers bound for Adelaide generally followed the Admiralty composite track, limiting their southernmost latitude to 40° S., while those bound direct to New Zealand kept between the 40th and 45th parallel.

In response to an invitation published in the October 1933 *MARINE OBSERVER*, Vol. X, No. 112, under the heading "Ocean Pilotage in the Southern Indian Ocean" many commanders of the Observing Fleet who have had experience in navigating modern steamers or motor vessels on the run between the Cape and Australia or New Zealand have communicated their views as to the best route to follow. The following is a summary of their opinions.

Most commanders favour keeping close in when rounding the Cape of Good Hope in order to avoid the confused sea often encountered on the Agulhas Bank, and in order to quickly pick up the S.E. trend of the Agulhas current when leaving soundings some steer east as far as Cape St. Francis before taking their departure.

But with one exception all commanders favour following the old Admiralty route keeping to the north of Latitude 40° S. during the winter season and many keep to this route throughout the year. During the summer season however a few prefer to shorten the distance by running the easting down in a higher latitude varying between Latitude 42° S. and 45° S. according to whether bound to Perth or to ports further east. One commander when bound to Adelaide or to ports further east during the summer season limits his southern latitude to 50° S.

**Depressions and Winds.** The average weather conditions experienced in that belt of the Southern Ocean situated between Latitude 40° and 50° S. known as the Roaring Forties were described in detail in an article "General Meteorological Conditions in the South Indian Ocean," published in the April 1933 *MARINE OBSERVER*, Vol. X, No. 110.

In that article it was shown that in high southern latitudes a low pressure area encircles the globe wherein intense depressions centred on the average in about Latitude 60° S. move eastward in quick succession throughout the year at an average rate of about 13 knots.

Thus with the passage of centres of depressions situated in about Latitude 60° S. the pressure gradient gradually decreases northward from the centres with a corresponding decrease in the force of wind and

height of sea. The percentage frequency of gales experienced within the Roaring Forties increases greatly during the half year from May to October but throughout the whole year their intensity increases with increased Latitude. During the passage of a depression the winds to the north of its centre will blow from a N.Wly direction backing to West and S.W. after the trough has passed.

**Cloud and Fog.** Clouded skies are general in the greater part of the belt of the Roaring Forties, increasing in density from north to south. Fog may be experienced in all months of the year but especially during the summer months when south of the 45th parallel.

**Icebergs.** The danger of meeting ice is present throughout the whole year in the Roaring Forties. Bergs become more prevalent during the summer months and greatly increase in number when south of the 45th parallel.

**Currents.** Results of recent research into the currents within the region of the Roaring Forties were fully dealt with in an article "Currents in the Southern Indian Ocean," published in the October 1933 *MARINE OBSERVER*, Vol. X, No. 112.

In that article it was shown that within a belt of the South Indian Ocean between Latitudes 38° S. and 48° S. the general set of the current is in an easterly direction and is slightly stronger in the western than in the eastern half of the belt. Between Longitudes 20° E. and 60° E. the current attains its mean maximum strength of 7.5 miles per day between Latitudes 40° S. and 42° S. then gradually decreases in strength with increased Latitude and between Latitudes 46° S. and 48° S. is 5 miles per day.

Between Longitudes 60° E. and 108° E. the current gradually increases in strength with Latitude until it attains its mean maximum strength of 6 miles per day between Latitudes 44° S. and 46° S., then decreases to 4 miles per day in the belt between Latitudes 46° S. and 48° S.

A steamer is designed to attain her maximum speed for any given consumption of fuel when steaming on a comparatively even keel in smooth water. These conditions will not generally be fulfilled in the higher southern latitudes so that the only advantage to be gained in choosing such a route will be the saving of distance and this must be sufficient to outweigh all other considerations.

The Great Circle routes and distances between the Cape of Good Hope and Perth, Adelaide, and Melbourne together with the composite Great Circle routes and distances for limiting latitudes 40° S., 42° S., 45° S. and 50° S. are shown on the Chart below.

Ships rarely run further south than the 50th parallel when running their easting down so that the Great Circle route which reaches Latitude 58° S. need not be considered. In the case of a ship bound to Melbourne, the greatest distance to be saved by following the composite track to Latitude 50° S. is 306 miles, which is approximately a day's steaming for a 12½ knot ship.

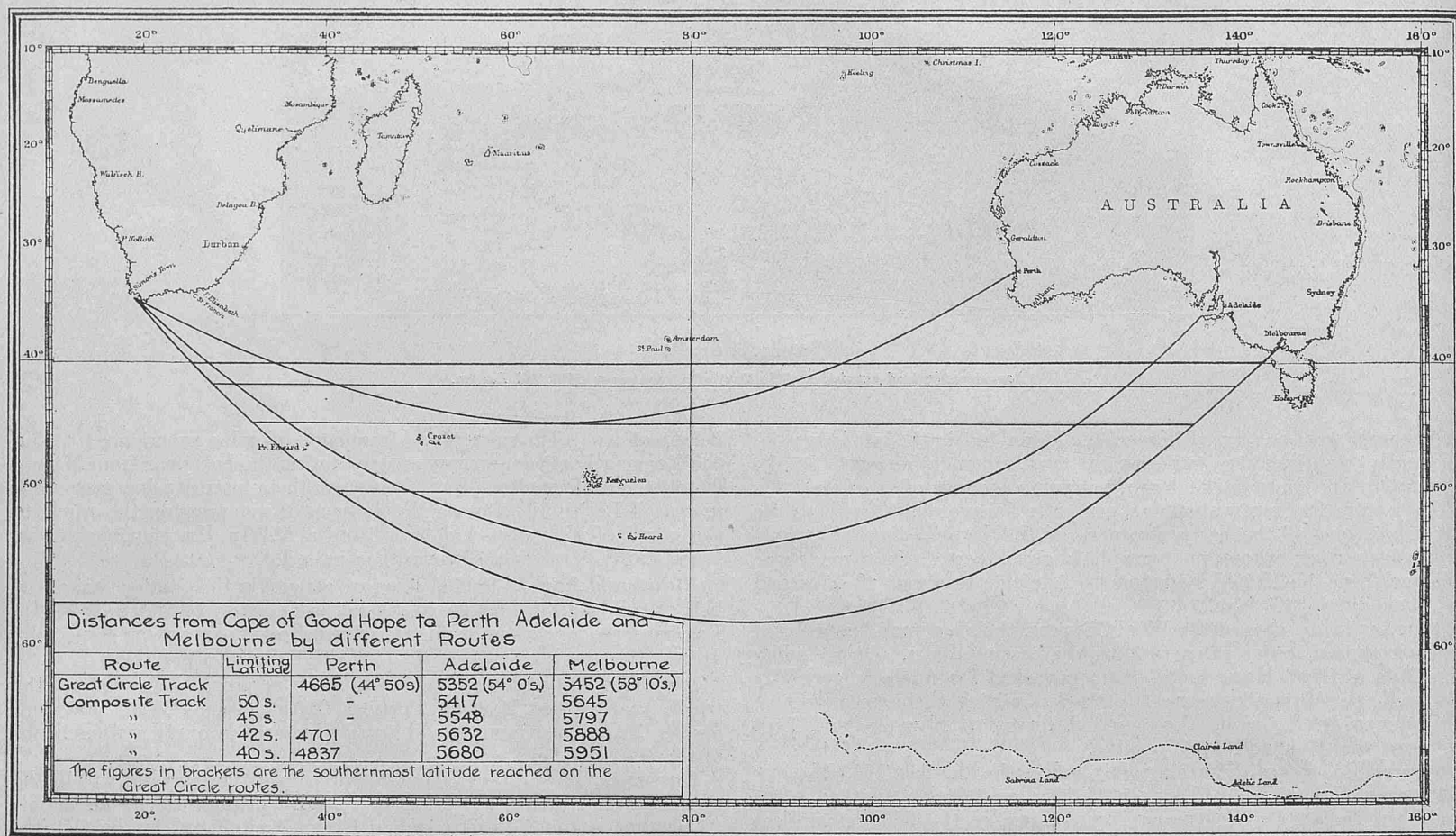
In summarizing the average weather conditions existing within the



Roaring Forties a ship taking this route must expect the weather to deteriorate steadily as southing is made, gales to become more violent and less steady, and the accompanying sea to become higher and more confused. Fog will become more prevalent and at the same time the danger of meeting ice will increase. The currents are favourable on all routes, but no definite increase of strength in the current will be found in the higher latitudes.

When taking the above into consideration it does not appear that

any advantage will be gained by running the easting down between the Cape of Good Hope and Australia in a latitude lower than 40° S. When taking a higher latitude much greater strain will be imposed on hull and engines in addition to greater risk of damage to light structure and deck fittings. The distance saved in mileage may easily be offset by the loss of time occasioned in having to Heave To, or reduce speed during heavy weather, and to the reduction of speed necessitated by fog, or when amongst ice, especially during the dark hours.



## CURRENTS OF THE RED SEA AND THE PART OF THE INDIAN OCEAN NORTH OF AUSTRALIA.

PREPARED IN THE MARINE DIVISION BY E. W. BARLOW, B.Sc.

### III.—The currents in the half-year, November to April, and General Summary.

**Currents of the Red Sea, November to April.** This period constitutes the Winter and Spring seasons in the Red Sea. The currents charted are mainly those experienced on the track from Suez to Perim, down the centre of the Red Sea, and coastal currents are therefore mostly excluded. In both seasons currents flowing in any direction may be experienced throughout the whole extent of the Red Sea, but currents with sets between N. and N.W. predominate. The mean set of surface water in the Red Sea is therefore northward, up the Sea, throughout the six months. The mean drifts are weak because of the frequency of currents flowing in all directions.

On the average, out of every three currents, one has a drift of 13 miles a day or more, one is between 6 and 12 miles a day and one is less than 6 miles a day. The strongest current observed during the period

1910 to 1933, in November to January, was that logged by the Cable Steamer *Stephan* on December 4th, 1921, at the rate of 43 miles per day, N. 70° W., in the northern part of the Red Sea, in the mid-position, Latitude 23° 29' N., Longitude 36° 17' E. In February to April the strongest currents observed during the period 1910 to 1933 were in the southern part of the Red Sea, the greatest drift being at the rate of 49 miles per day, N. 20° W., recorded by S.S. *Arracan*, in the mid-position, Latitude 13° 16' N., Longitude 43° 07' E.

When writing of the currents in the half-year May to October the similarity of the roses in the northern and southern parts of the Red Sea and in the two quarters was remarked. The same thing applies to the two quarters now under discussion. All four roses are very similar, the only slight difference being the somewhat greater frequency



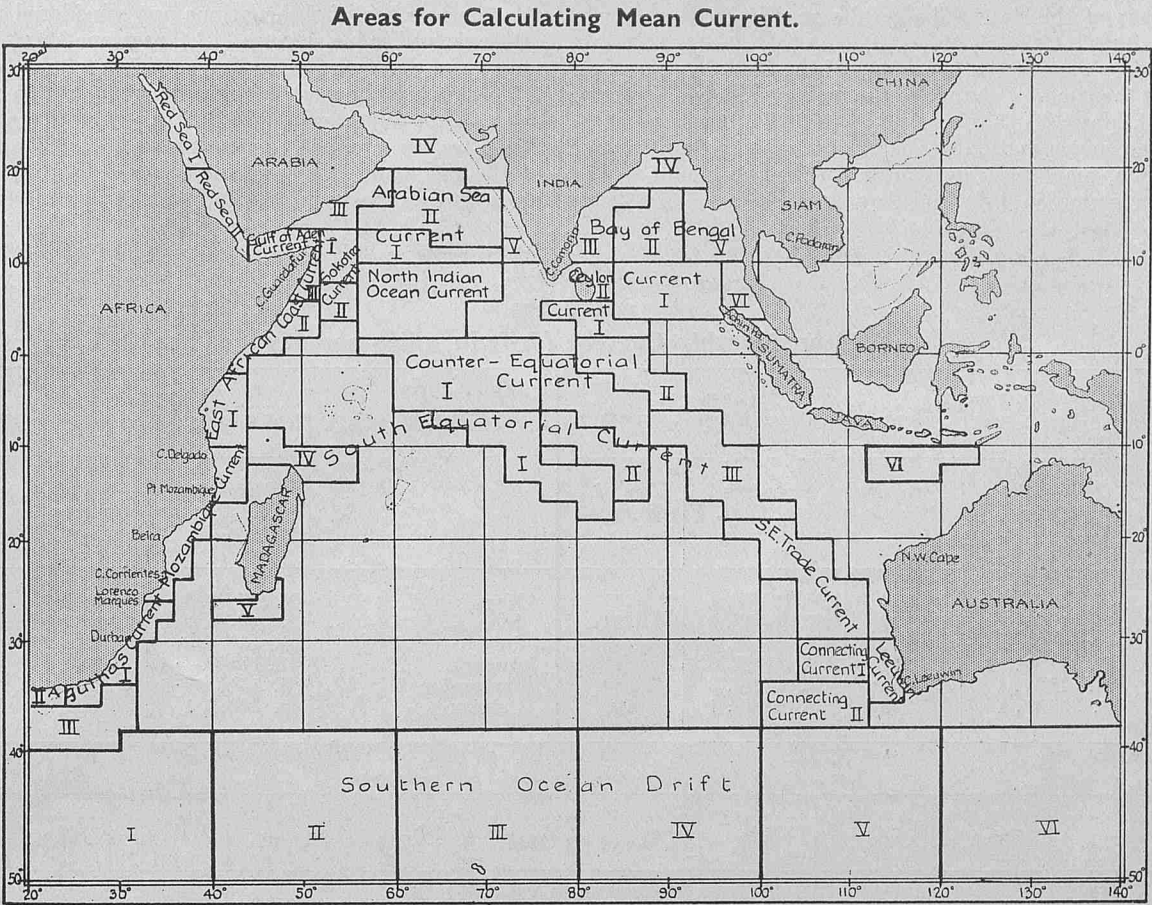


Figure 1.

**Table 1.**  
**Red Sea.**  
**Mean Quarterly Currents (drift in miles per day).**

Current	November to January.		February to April.		May to July.		August to October.	
	Mean Set and Drift.	No. of Observations.	Mean Set and Drift.	No. of Observations.	Mean Set and Drift.	No. of Observations.	Mean Set and Drift.	No. of Observations.
Red Sea I—Latitude 20° to 28° N. ... ..	N. 22° W. 1	950	N. 67° W. 1	748	S. 4° W. 1·5	771	S. 17° E. 2	853
Red Sea II—Latitude 12° to 20° N. ... ..	N. 3	818	N. 16° W. 2	689	S. 18° E. 3	550	S. 25° E. 3	721

of sets between N.W. and N. in the southern part of the sea in November to January. This is accounted for by the strength of the southerly wind, and hence of the northerly current through the Straits of Bab-el-Mandeb, in November to January, the mean drift of which is 12 miles a day. In February to April the mean drift through the Straits is reduced to 7 miles a day. In the extreme north of the Sea, Latitude 26° to 28° N., there is a slight preponderance of southerly sets in both quarters; also between Latitudes 18° N. and 20° N. in February to April.

An interesting fact is that between Latitudes 14° and 16° N., immediately to the north of the strong northerly current through the Straits, the mean set is north-easterly in both quarters, with a mean drift of 3 or 4 miles a day. The charts thus confirm the statement made in the first article of the present series, from the older information, that easterly currents set towards the Avocet Rock.

**Seasonal Variation of the Red Sea Currents.** As stated in previous years, the Indian Ocean is being divided into sections for the purpose of computing mean seasonal currents. Three sections have been added in this year's work, as shown in **Figure 1**. The

mean quarterly set and drift for the Red Sea sections is given in Table 1.

**Red Sea Currents, General Summary.** The currents of the Red Sea are drift currents depending on the wind over the Red Sea which varies with the monsoon blowing in the Arabian Sea, but other factors may have some influence upon them. During the south-west monsoon season the wind in the Red Sea is mainly from between N. and N.W. and the mean direction of the current is S.S.E. During the north-east monsoon season the wind is mainly from between S. and S.E. in the Red Sea south of Latitude 20° N. and the average direction of the current is N. or N. by W. North of Latitude 20° N., during this season, the average direction of the current is north-westerly, against the wind, which blows mainly from N. and N.W. This is the only period in the year, therefore, that the mean set of current flows in opposition to the prevailing wind and TABLE 1 shows that the corresponding mean drifts are the weakest of all.

**Monthly Variation of Red Sea Currents.** The seasonal investigation of the Red Sea currents has been carried a stage further by computing the mean set and drift for each month, for the northern

and southern sections of the Sea. The results so obtained are given in TABLE 2 and FIGURE 2.

FIGURE 2 shows very clearly the character of the Red Sea currents. They are weakest at the times of change of the monsoon in the Northern Indian Ocean, April, May and October. Except during these months, the mean drift in the southern Red Sea is always greater than that of the northern Red Sea, reaching a maximum during the height of the south-west monsoon period in July and August.

above a number of observations not considered reliable owing to short intervals and other reasons. At least one-third of all the observations of set and drift used were determined by land fixes and stellar fixes.

To sum up the matter, cross currents up to, or slightly exceeding, one knot may be experienced in any part of the central channel of the Red Sea, the number of easterly and westerly currents for the whole of the Sea being approximately equal. Cross currents exceeding 30 miles a day are very rare. The most probable explanation of cross

**Table 2.**  
**Red Sea.**  
**Mean Monthly Current (drift in miles per day).**

Month	Red Sea I. Latitude 20° to 28° N.		Red Sea II. Latitude 12° to 20° N.		Month	Red Sea I. Latitude 20° to 28° N.		Red Sea II. Latitude 12° to 20° N.	
	Mean Set and Drift.	No. of Observa- tions.	Mean Set and Drift.	No. of Observa- tions.		Mean Set and Drift.	No. of Observa- tions.	Mean Set and Drift.	No. of Observa- tions.
November ...	N. 4° W. 1	326	N. 2° W. 4	281	May ...	N. 39° W. 1	244	N. 27° W. 1	182
December ...	N. 41° W. 1	347	N. 3° W. 3	294	June ...	S. 9° W. 3	285	S. 18° E. 3	212
January ...	N. 19° W. 2	277	N. 9° E. 3	243	July ...	S. 16° E. 3	242	S. 19° E. 7	156
February ...	N. 11° W. 1	247	N. 1° E. 3	221	August ...	S. 11° E. 1.5	260	S. 23° E. 6	209
March ...	N. 71° W. 1	253	N. 22° W. 3	269	September ...	S. 15° E. 4.5	292	S. 13° E. 3	247
April ...	S. 33° W. 1	248	N. 52° W. 1	199	October ...	S. 32° E. 1	301	N. 19° E. 1	265

Month	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
Red Sea-I Lat. 20° to 28° N.	↑	↖	↖	↑	↖	↖	↖	↓	↓	↓	↓	↓
Red Sea-II Lat. 12° to 20° N.	↑	↑	↑	↑	↖	↖	↖	↓	↓	↓	↓	↑

**Figure 2.—Mean Monthly Set and Drift of Current, Red Sea.**

**Strength of Red Sea Currents.** 6100 observations of currents during the period 1910-1933 have been used in the construction of the present charts of the Red Sea. Of these only 90 currents had drifts equalling or exceeding 30 miles per day, the maximum being one of 50 miles per day referred to in the previous article. Of the 90 currents, 60 were observed south of Latitude 20° N., and 30 north of Latitude 20° N. Of the 60 strong currents observed south of Latitude 20° N. the majority were south of Latitude 16° N., near or not far from the Straits of Bab-el-Mandeb.

**Cross Currents of the Red Sea.** The current roses of the charts clearly show that no very strong currents set across the central channel of the Red Sea in easterly or westerly directions. Of the 6100 total observations of current, only 17 easterly or westerly currents equalled or exceeded 30 miles a day. For the purpose of this calculation all currents setting between N. 60° W. and S. 60° W. are regarded as westerly and all those setting between N. 60° E. and S. 60° E. are regarded as easterly. The total of 17 comparatively strong cross currents comprises 10 westerly ones and 7 easterly ones. Only 5 of these exceeded 40 miles a day, 4 of which were westerly, the maximum being 44 miles a day.

In the past there is no doubt that alleged heavy cross sets in the central channel of the Red Sea have been due to false fixes by solar observation caused by refraction. In this connection it may be remarked that only 5 current observations were rejected in the course of the present charting owing to evidence of considerable refraction, over and

currents is that they are due to eddies. With wind-driven current running up or down the narrow Red Sea, such eddies would be caused by the irregularities of the coast line, also by islands and other obstructions.

**Counter-currents along the Red Sea Coasts.** The current observations used for constructing the present charts are almost wholly confined to the central channel of the Red Sea. The information concerning coastal currents in the Red Sea given by the Red Sea and Gulf of Aden Pilot does not indicate that there are counter-currents of any extent up or down the coasts. It has not been possible to obtain further evidence on this point by enquiry of local authorities.

**Currents in the Indian Ocean North of Australia, November to April.** Between the parallels of 10° S. and 12° S., to the eastward of Christmas Island, the Equatorial Current sets to the westward during the months of November to April, but is weaker than during the remainder of the year. During the quarter November to January the current is shown to flow also between Latitude 12° S. and 14° S., Longitude 112° E. to 120° E., but as in the charts for the other quarters there are several areas without any observations, so that the limits of the Equatorial Current in this part of the ocean are difficult to define. In November to January the mean set of the Equatorial Current is north-westerly. During the months November to April, in the period 1910 to 1933, only two drifts experienced in the Equatorial Current exceeded 30 miles a day.



In November to January a current flows south-easterly and easterly between the Equatorial Current and the south coasts of Java, Sumbawa, Flores and other islands, in Latitude 8° S. to 10° S. This current is considerably stronger than the Equatorial Current during this quarter; between Longitude 116° E. and 120° E. its mean drift is 21 miles a day. There is not much information for the region of this easterly current in February to April, but it flows south of Java at this time. On December 12th, 1911, S.S. *Waipara* logged a current of 50 miles per day, S. 83° E., in the mid-position Latitude 9° 05' S., Longitude 116° 07' E., but no other drift observed in the easterly current during the period 1910 to 1933 has exceeded 35 miles per day.

South of the Equatorial Current, from Latitude 14° S. to the Australian coast, between Longitudes 112° E. and 120° E., the mean set of current is N.N.W. or N.W., outwards from the land, in February to April.

In the Arafura Sea currents are variable but sets between W. and S. predominate throughout November to April.

**Seasonal Variation of the Currents in the Indian Ocean North of Australia.** The mean quarterly set and drift for the section of the Equatorial Current to the north of Australia is shown in TABLE 3, but the total number of observations is small.

Table 3.

Indian Ocean, North of Australia.

Mean Quarterly Currents (drift in miles per day).

Current	November to January.		February to April.		May to July.		August to October.	
	Mean Set and Drift.	No. of Observations.	Mean Set and Drift.	No. of Observations.	Mean Set and Drift.	No. of Observations.	Mean Set and Drift.	No. of Observations.
Equatorial Current VI. ... ..	N. 53° W. 7	23	N. 82° W. 7	36	S. 75° W. 13.5	26	S. 86° W. 13.5	19

Indian Ocean.  
General Flow of Main Current during the S.W. Monsoon Season (Northern Summer) charted in 1929 to 1934.  
(To be completed as the investigation proceeds.)

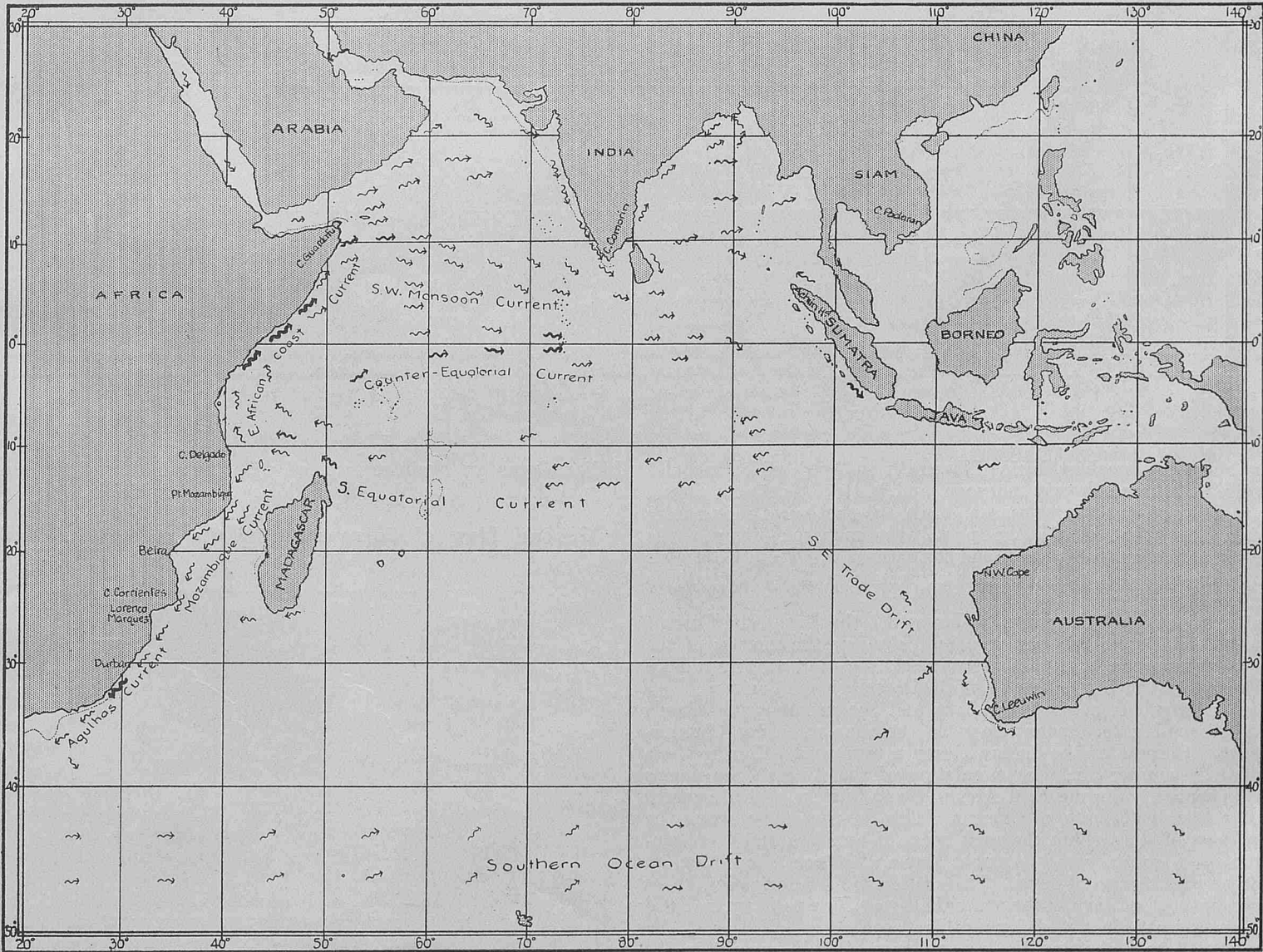


Figure 3.

## Indian Ocean.

General Flow of Main Current during the N.E. Monsoon Season (Northern Winter) charted in 1929 to 1934.  
(To be completed as the investigation proceeds.)

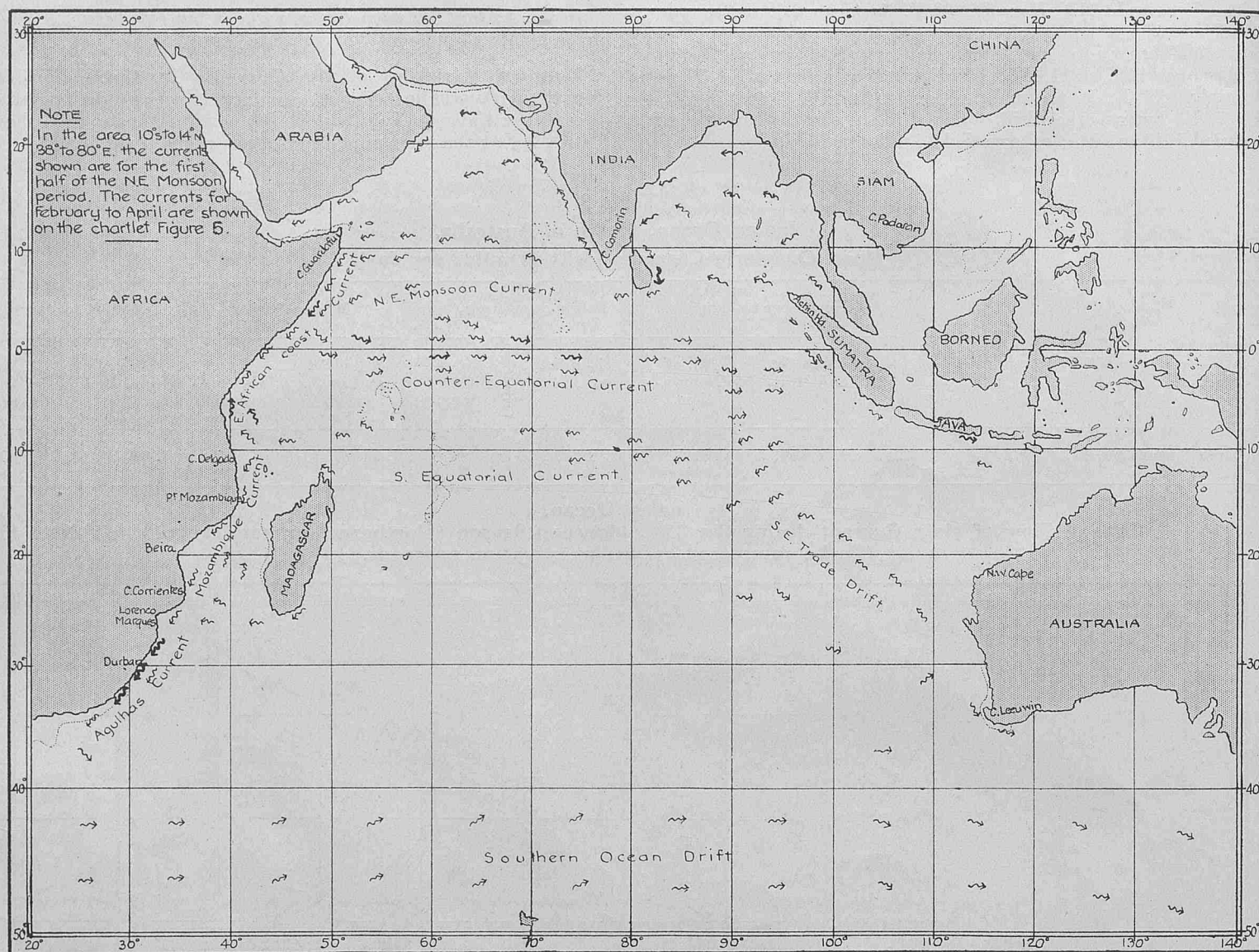


Figure 4.

The current is weakest during November to April, which includes the period of the north-west monsoon, and is twice as strong during May to October, the winter season, when the south-east monsoon is blowing. In other words the north-west monsoon opposes the current and the south-east monsoon strengthens it. From November to April the mean set is to the north of west, from May to October to the south of west.

An examination of the currents shows that the Equatorial Current is weakest in December, January and February, the months of the north-west monsoon, and that easterly sets may temporarily replace the Equatorial Current in this region in December and January.

The easterly current south of Java and the neighbouring islands during November to January flows at the time when the Counter-Equatorial Current of the Indian Ocean is strongest. During these months the counter-clockwise circulation of the Arabian Sea passes into the southerly-flowing East African Coast Current, which recurves into the Counter-Equatorial Current. This flows easterly across the ocean, part of it reaching the west coast of Sumatra and then continuing as a south-easterly current down the coast, becoming an easterly current south of Java. There is not much information about the region south of Java in the winter half-year, May to October, but a westerly current is indicated during this season.

FIGURES 3 to 5 showing the general-flow of main current in the

Indian Ocean are again reproduced, with the addition of the general flow in the Red Sea and in the region north of Australia.

#### General Flow of Current during the months February to April.

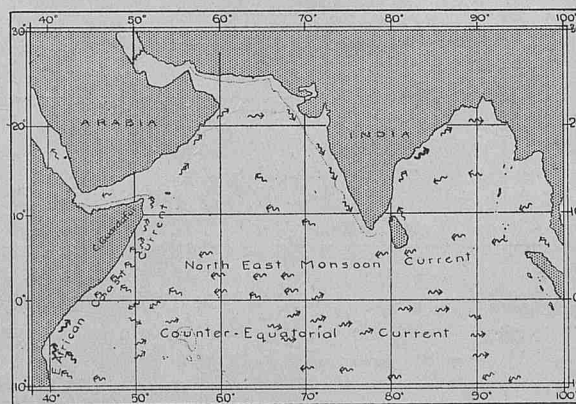


Figure 5.



## THE JOHN MURRAY EXPEDITION—III.

BY PROFESSOR J. STANLEY GARDINER, F.R.S.

LEAVING Colombo on March 17th, 1934, a straight course was set to the Chagos Archipelago, and thence a line of echo-soundings was run to Addu Atoll, the most southern group of the Maldives. These confirmed the soundings of H.M.S. *Sealark* in 1905, proving the existence of a channel of 2,000 fathoms separating the two archipelagos. A hydrographic station was put down about the middle of the channel. Anchorage was obtained in the almost enclosed Addu Atoll, and here Lieut.-Com. FARQUHARSON and Major GLENNIE carried out a series of magnetic and pendulum observations, which were subsequently repeated on the rim of the much larger Kolumadalu Atoll. Advantage was taken of the delay to investigate the lagoon deposits of Addu. The grab was used, so as to obtain a sample in magnitude many times the size of that brought up by the snapper or valved leads. A chalky mud was obtained that smelled strongly of sulphuretted hydrogen—and this perhaps explains the barrenness of life found in places in the lagoon floors of atolls by the Maldivian and the *Sealark* (Percy Sladen) expeditions of 1899 and 1905; here it can only have been produced by the decay of recent organic matter, a different phenomenon to that of the Gulf of Oman.

On the way north the *Mabahiss* put into the capital Malé, where the expedition was received by the Sultan attended by his wazeers. This island keeps intact most of the walls built by the Portuguese in the 17th century, some of the guns still lying in position. The Sultan gave the use of a boat, which greatly facilitated the work of Lieut.-Com. FARQUHARSON and Major GLENNIE in running lines of observations across Mahlosmadulu and Ihavandifulu atolls, which are separated by a deep trench of 600 fathoms that continues between that double chain of atolls which forms the central part of the Maldivian Archipelago. The *Mabahiss* meantime went down to Goidu (Horsburgh) Atoll, where observations were made in the entrance passage and in the lagoon on the currents. It would seem to us clear from these that every atoll is a rule unto itself, so that navigators are advised to use every precaution in passing through passages in coral reef regions, for even with a rising tide the surface current may set strongly outwards. However, in our experience, a man at the masthead is able to see any danger of upgrowing shoals since such shine up clearly in daylight, even if covered by 5 or 6 fathoms of water.

The western end of Kardiva channel was investigated from Goidu, where it forms a broad gap across the western chain of atolls, two hydrographic stations being taken here. The use of the echo-sounder showed almost in the centre of the channel midway between Toddu and Goidu the presence of a submarine bank, rising steeply from deep water to nearly 100 fathoms, its centre a dead flat at about 125 fathoms with a raised rim around the greater part of the margin. This bank, which it is proposed to call Fuad Bank, in topography resembles an atoll, but, if so, it has been drowned subsequent to its formation, since it could not be built at this depth, the builders of coral reefs not living below 50 fathoms. In addition, many dredgings and trawlings were made, but these were not always successful, since strong under-currents at times twisted dredge and trawl so that the wire warp got into an inexpressible tangle, a similar result to that which we experienced in between the Chagos atolls in 1905, the bottom there at all depths up to 1,000 fathoms being hard, apparently current-swept. Finally, in returning to Colombo, a visit was made to Minikoi, to complete the series of magnetic and pendulum observations.

Colombo was again left on April 19th, the Maldives being traversed through the Kardiva Channel, whence a course was set along the parallel of 7° N. Latitude to the south of Socotra, turning between Socotra and Guadafui into the Gulf of Aden. The object was to fill in the hydrographic gap between the north and southern traverses.

From the Maldives the soundings varied from 2,800 to 2,000 fathoms, three folds succeeding each other regularly. Then the eastern part of the Chagos-Socotra ridge was encountered, and again this proved to continue as a double ridge with a deep narrow valley between similar to that further south, described in *THE MARINE OBSERVER* (p. 109, 1934); the ridges on either side of the central valley reached 1,200 and 1,300 fathoms, the floor of the valley about 1,850 fathoms. The *Mabahiss* was then put on a course along the ridge, the soundings over which about 250 miles further along dropped somewhat abruptly

to 2,500 fathoms, an area with the usual bottom flat separating its termination from Socotra. Dredgings were made in this area at various depths to 2,600 fathoms, but the deep sea is a barren area and the resulting catches were small. In the Gulf of Aden more intensive biological work was carried out, beam and otter trawls, dredges and grabs, and midwater trawls, all being employed to the greatest depths, as well as bottom samplers which in sand or mud gave cores of several feet.

Still more important here and further west to the entrance of the Red Sea was the carrying out of a long series of hydrographic stations. While some were new, others were "repeat" stations where observations and samples had been taken in the previous year. Clearly conditions were very different in May from those met with in October—and furthermore, with regard to the surface currents, temperatures and salinities, the conditions found approximated to those that in normal years are prevalent a month later. Throughout there were many sudden changes of salinity, often with a fall of temperature, these possibly due to the rising of low salinity deeper waters from the Bay of Bengal. The outflow of Red Sea water through the Straits of Bab-el-Mandeb proved to be very large, the inflow extremely small. It is, however, not possible to anticipate the results of the chemical analysis which will have to be made of the water samples taken in the 128 hydrographic stations of the Murray Expedition. There are here perhaps 2,000 samples to examine and analyse by the chemists of the *Mabahiss*, while the kindness of the British Mercantile Marine has added a like number of surface samples that have been sent to the Egyptian University at Cairo for analysis by Egyptian chemists. The value of the collection of these surface samples cannot be overestimated, but it must not be supposed that this analysis is going to upset our preconceived ideas of the currents and water movements, which affect navigation, and which have been recently so ably summarised in *THE MARINE OBSERVER*. They certainly will not, but we all in practice seek knowledge for its own sake and the idea of four currents moving below our planks in reversed directions allows us to speculate as to how surface currents affect deep currents, and the reverse, which is so much more important to us. The "silly" researches of the pure mathematician led to wireless, that most important of navigational instruments. We now think less of currents and water mixation, but obviously even to-day any knowledge of these matters may, as in the Aden region, be of help to navigation, while they are all important in any consideration of life in the sea.

The south-west monsoon was approaching so that a course was set to Suez and Alexandria, where the *Mabahiss* was handed back to the Egyptian Coastguard Service. She was met by Mr. J. C. MURRAY, who distributed commemorative medals to all, and her officers were received in Cairo by King Fuad whose intellectual interests are mainly concentrated in the sea. Capt. MACKENZIE assisted by Lieuts. BADR Effendi and SAWAT Effendi and by Chief Engineer GRIGGS with MUKTAR Effendi and EDWARD Effendi had carried out a job the difficulties of which in 9 months, mostly well off trade routes, will be readily appreciated. Lieut.-Commander FARQUHARSON, besides acting as navigator throughout the cruise, had successfully kept the Hughes-Admiralty echo-sounder almost continuously running, so that he was enabled to map over 22,000 miles of the sea floor, no small feat, for he had to be his own mechanic on this delicate machinery. Colonel SEWELL, now F.R.S., carried the responsibility throughout, altering course and work to meet the conditions found day by day, but his bigger job, the arrangement for the working out of 123 collecting hauls of various nets and 100 bottom samples, now commences. On the biological side he was ably assisted by Mr. T. T. MACAN and Dr. FAOUZI, Director of the Egyptian Fisheries service, who also acted as medical officer. On the chemical side, Mr. E. F. THOMPSON was in charge assisted by Mr. H. C. GILSON and ABDU MAHOMET; the black hole in which they made over 1,000 accurate analyses, in spite of *mal-de-mer*, requires to be seen for their labours to be thoroughly appreciated; their job, too, is only now commencing. The crew were all Egyptians and the cheerful and rapid way they learned what was required of them added materially to the success of what must have been a most trying and anxious expedition.

## SOUTHERN ICE REPORTS.

During the Year 1933.

October.

None Received.

November.

Year.	Day.	Position.		Description.	Remarks.	Name of Ship reporting.
		Latitude.	Longitude.			
1933	11	48° 40' S.	41° 02' E.	Berg ... ..	...	S.S. <i>Anna Knudsen</i> .
	12	49° 44' S.	45° 58' E.	2 bergs ... ..	...	do.
	13	50° 57' S.	51° 15' E.	4 bergs ... ..	...	do.
	19	55° 52' S.	75° 45' E.	7 bergs ... ..	...	do.
	20	56° 38' S.	77° 50' E.	Pack ice and many bergs	...	do.
	20	From 57° 05' S.	82° 08' E.	Pack ice and many bergs	...	do.
	To	59° 25' S.	93° 33' E.	...	As many as 100 bergs sighted at one time	do.

## December.

21	44° 52' S.	34° 30' E.	Large berg ... ..	About one mile long, 300 ft. high with two distinct peaks...	S.S. <i>Dalemoor</i> .
22	45° 45' S.	40° 11' E.	Large bergs and 7 growlers	Berg about 200 feet high, growlers of varying size within 10 miles radius of berg.	do.
22	45° 55' S.	41° 46' E.	Huge berg ... ..	700 to 800 feet high and 1½ to 2½ miles long with high overhanging peaks.	do.
3	At entrance to Cumberland Bay, S. Georgia.		7 small growlers	Irregularly shaped	R.R.S. <i>Discovery</i> .
3	2 miles East of Jason I.		1 berg ... ..	Irregular—Estimated about 50 feet high	do.
4	54° 04' S.	38° 37' W.	1 berg ... ..	Low tabular about 100 feet high and 300 feet long. Probably aground off Willis Island.	do.
6	56° 39' S.	46° 46' W.	Small and irregular berg	...	do.
6	56° 53' S.	47° 13' W.	Growlers ... ..	Several and mostly waterlogged	do.
6	56° 53' S.	47° 13' W.	1 berg ... ..	Irregular and much sea worn	do.
6	57° 20' S.	48° 02' W.	1 Tabular berg...	Height by sextant angles, 185 feet. Estimated length ½ mile. Weathered with many arches and caves. Brash and loose ice drifting windward.	do.
6	57° 28' S.	48° 06' W.	2 irregular bergs	About 50 feet high	do.
6	57° 40' S.	48° 20' W.	3 bergs. 2 growlers	1 tabular about 100 feet high with numerous caves, two small and irregular. Fairly large. Bottle green colour.	do.
7	From 58° 15' S.	49° 57' W.	Heavy loose pack. 41 bergs	A large belt of heavy loose pack ice was observed about 5 miles distant to port. This ice stretched to the S.W. between the two given positions. The ship's course took her clear of the main belt but through a sea which was studded with growlers and mostly the fragments of old and hummocked floes.	do.
	To	58° 38' S.	Numerous growlers	The ice was in several cases stained with diatoms. About 41 bergs were observed during this period, most of which were irregular and medium sized.	
7	From 58° 37' S.	50° 50' W.	Loose pack ... ..	Stream of heavy loose pack to starboard	do.
	To	59° 25' S.	21 bergs. Numerous growlers	Passing between numerous growlers on edge of main pack ice. This ice was again old, stained with diatoms and very hummocked. Strong blink from E.S.E. to W.S.W. The bergs observed during this period were mostly small and irregular and in some cases pinnacled.	do.
7	59° 25' S.	53° 16' W.	1 berg. 2 growlers	Within 6 miles of track. 1 medium sized tabular	do.
8	From 59° 40' S.	53° 48' W.	Heavy loose pack. 11 bergs	Skirting pack ice edge running from E.S.E. to W.S.W. The sea within a 5 miles radius was studded with the fragments of heavy hummocked floes in some cases about 20 feet high. The ice tapered away to the S.W. at the second position.	do.
	To	59° 47' S.	...	Pack ice was again observed of a similar nature to the previous. The ship hauled to the N.W. and W. to clear and in so doing passed through numerous growlers and hummocky floes.	
8	From 59° 52' S.	54° 48' W.	1 berg. Pack ice and numerous growlers	The vessel again skirted loose hummocky pack between these positions.	do.
	To	59° 52' S.	...	Within 7 miles of track, mostly irregular and weathered of medium size.	do.
8	From 60° 00' S.	56° 14' W.	Loose hummocky pack	Within 8 miles of track. Two medium sized tabular bergs, the remainder irregular.	do.
	To	60° 20' S.	...	Between the first two positions, while the ship was approaching and while passing through Nelson Strait about 45 grounded bergs were observed. These were mostly irregular with numerous caves and in several cases showed signs of cracking, due probably to the continued strain of grounding. From this position to that of Deception Island about 40 bergs were observed. About 25 of these were within 2 miles of the coast of Livingstone Island. The remainder were within 10 miles of track to the S.E. Two were medium sized tabular bergs, one being 215 feet high by sextant angle.	
8	From 60° 23' S.	56° 37' W.	24 bergs. 16 growlers	Within 12 miles of track. Eight of these were medium sized tabular bergs with an average estimated height of 100 feet. The remainder were irregularly shaped. Several small growlers were also observed.	do.
	To	61° 36' S.	...	Within 10 miles of track. Three medium sized tabular bergs. Remainder irregular.	do.
9	From 61° 36' S.	58° 34' W.	20 bergs, several growlers	Several growlers and light brash ice within 200 yards of ship. A heavy belt of loose pack ice was observed stretching through the Southern Quadrant from S.E. to N.W. Vessel pushed through the pack emerging into clear water at the second position. The pack was composed of new ice floes with much snow and in several cases as much as 10 feet above water.	do.
	To	62° 05' S.	...	Streams tapering away to the N.W.	do.
9	From 62° 05' S.	59° 21' W.	Ice bergs ... ..	It is suggested that this originated from the direction of the Bismarck Strait—being pushed by wind and current to the North.	
	To	62° 24' S.	Irregular and tabular	...	
9	From off Deception Island.	...	29 bergs and growlers...	...	do.
	To	63° 28' S.	...	...	
10	From 63° 28' S.	62° 10' W.	8 bergs ... ..	...	do.
	To	64° 11' S.	...	...	
10	From 64° 11' S.	64° 40' W.	Growlers and bergs	...	do.
	To	64° 16' S.	Heavy loose pack	...	do.
10	From 64° 15' S.	65° 03' W.	Streams of ice ... ..	...	do.
	To	64° 24' S.	...	...	
13	65° 59' S.	75° 57' W.	Growler, small	...	do.
	66° 06' S.	76° 10' W.	Berg, small and irregular	...	
	67° 02' S.	77° 00' W.	Growler...	...	
	67° 38' S.	77° 40' W.	Berg. Irregular	...	
	67° 48' S.	77° 50' W.	Streams of pack	Strong blink had been observed for some hours to the South. At this position light streams of ice were encountered which appeared to become closer packed to the Southward. The vessel turned North from this position.	do.

Reports of Ice previous to October, November and December, 1933, will be found in the Marine Observer, Volume X, No. 112, pp. 137 to 140.



## WIRELESS WEATHER SIGNALS.

## I.—SHIPS' WIRELESS WEATHER SIGNALS.

A full description of the world wide system of voluntary "Selected Ships" routine weather reports with instructions was given on pp. 27-38 of the January number of this volume of THE MARINE OBSERVER.

The list which follows contains the latest information of stations to which "A Selected Ships" should report in accordance with those instructions, and stations detailed to intercept reports from "B Selected Ships" also in accordance with those instructions.

To decode these reports, and for ships other than "Selected Ships" to have information of the system of communication of "Selected Ships", all concerned are referred to the PAMPHLET, M.O. 329, concerning which special notice to the masters of British ships will be found on p. 30, paragraph (27), and p. 31, paragraph (34) of the January 1934 number of THE MARINE OBSERVER.

### 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 27 OF VOL. XI, No. 113, JANUARY 1934  
MARINE OBSERVER.

Ocean.	Station.	Position.	Call Sign.	Frequency and Wave Length.		Area and limits covered by Station.	Telegraphic address of Meteorological Centre.	Information required—Limit of Groups.	Notes.
				For Station to call up "Selected Ships."	For "Selected Ships" to report to Station.				
North Atlantic and North Sea.	Portishead.	Lat. 51° 28' 41" N. Long. 2° 47' 30" W.	<b>GKU.</b>	149 kc/s. (2013 metres).	143 kc/s. (2100 metres).	North Sea and Eastern North Atlantic East of Longitude 40° W. and North of Latitude 38° N., but not within 300 miles of station. (see Chart of the World.)	Weather London.	Weather only, up to seven groups, preferably No. 3 Supplementary Groups.	Control system. "Selected Ships" chosen to report in given order notified by station daily at 2230, 0330, and 1030 G.M.T. Roll call thus—Weather London—call sign of chosen "Selected Ships" to report through GKU at schedule times on 2100 m.
	Chatham Mass., Sayville N.Y. Rockland. West Palm Beach. Palm Beach.	Lat. 41° 42' N. Long. 70° 00' W. Lat. 40° 45' N. Long. 73° 06' W. Lat. 44° 09' N. Long. 69° 13' W. Lat. 26° 42' N. Long. 80° 02' W. Lat. 26° 42' N. Long. 80° 02' W.	<b>WCC.</b> <b>WSL.</b> <b>WAG.</b> <b>WMR.</b> <b>WOE.</b>	142.9 kc/s. (2098 metres).		North Atlantic West of Longitude 40° W.	Observer Washington	Weather only. First four groups of observations taken at 0000 and 1200 G.M.T. only required.	No control. All British "A Selected Ships" within area to address their 0000 and 1200 G.M.T. observations to Observer Washington and their 1800 G.M.T. observations to CQ in accordance with schedule.
Mediterranean and Red Sea.									
South Atlantic.	Slangkop (Cape Town)	Lat. 34° 08' 46" S. Long. 18° 19' 18" E.	<b>ZSC</b>	—	143 kc/s. (2100 metres).	South Atlantic Westward of 25° E. and within a range of about 2,000 miles of station.	Met.	Weather only. Four universal groups and first group of No. 6 Supplementary groups.	No control. Only 0600 G.M.T. observation required. All British "A Selected Ships" within area should report, commencing at 0618 G.M.T.

# 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.				
Indian Ocean.	Jacobs (Durban).	Lat. 29° 55' 51" S. Long. 30° 58' 38" E.	<b>ZSD</b>	—	143 kc/s. (2100 metres).	Indian Ocean S. of 20° S. and Eastward of 25° E. and within a range of about 2,000 miles of station.	Met.	Weather only. Four universal groups and first group of No. 6 Supplementary groups.	No control. Only 0600 G.M.T. observations required. All British "A Selected Ships" within area should report, commencing at 0618 G.M.T.
	Bombay.	Lat. 19° 04' 55" N. Long. 72° 49' 54" E.	<b>VWB</b>	—	143 kc/s. (2100 metres).	Arabian Sea N. of line C. Comorin to Ras Fartak.	Weather.	Weather only. No. 6 Supplementary groups.	All British "A Selected Ships" are requested, when convenient, to report 0000 G.M.T. observations commencing at 0018 G.M.T. in addition to schedule times.
	Madras.	Lat. 12° 59' 17" N. Long. 80° 10' 56" E.	<b>VWM</b>	—	143 kc/s. (2100 metres).	Bay of Bengal N. of line C. Comorin to Achin Head.	Weather.	Weather only. No. 6 Supplementary groups.	All British "A Selected Ships" are requested, when convenient, to report 1200 G.M.T. observations commencing at 1218 G.M.T. in addition to schedule times.
	Colombo.	Lat. 6° 55' 14" N. Long. 79° 52' 46" E.	<b>VPB</b>	130 kc/s. (2300 metres).	143 kc/s. (2100 metres).	Indian Ocean South of a line Ras Fartak, C. Comorin and Achin Head, and within a range of about 1500 miles.	Weather.	Weather only. No. 6 Supplementary groups preferred.	No control—all British "A Selected Ships" within area should report in accordance with Schedule.
	Mombasa.	Lat. 4° 03' 11" S. Long. 39° 39' 51" E.	<b>VPQ</b>	—	125 kc/s. (2400 metres).	From Ras Hafun to Lat. 26° S. when westward of the Colombo area.	Weather Nairobi	Weather only. No. 6 Supplementary groups.	No control—all British "A Selected Ships" within area should report 0600 G.M.T. observations.
	Perth.	Lat. 32° 01' 51" S. Long. 115° 49' 31" E.	<b>VIP</b>	125 kc/s. (2400 metres).	143 kc/s. (2100 metres).	Indian Ocean and Southern Ocean between Long. 105° and 135° E.; but not within 100 miles of the coast.	Weather.	Weather only. No. 6 Supplementary groups.	No control—all British "A Selected Ships" within area should report in accordance with Schedule. Reports not required for observation times not starred on Chart, p. 29, of the January 1934 number.
North Pacific and China Sea.	Cape d'Aguilar, Hong Kong.	Lat. 22° 12' 39" N. Long. 114° 15' 11" E.	<b>VPS.</b>	8330kc/s. (36 metres) or 500 kc/s. (600 metres).	143kc/s.* (2100 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. *Alternatively see particulars on p. 160 and use wavelength and times for "B Selected Ships."
South Pacific.	Sydney.	Lat. 33° 46' 00" S. Long. 151° 03' 09" E.	<b>VIS</b>	125 kc/s. (2400 metres).	143 kc/s. (2100 metres).	S. Pacific Coral and Tasman Seas and Southern Ocean between Long. 135° and 160° E.; but not within 100 miles of the coast.	Weather.	Weather only. No. 6 Supplementary groups.	No control—all British "A Selected Ships" within area should report in accordance with Schedule. Reports not required for observation times not starred on Chart, p. 29, of the January 1934 number.
	New Zealand.	—	—	—	—	—	Weather Wellington.	Weather only, four universal groups.	The Meteorological Office Wellington, will be glad to receive routine reports from British Selected Ships within range of New Zealand W/T Stations through the normal commercial channels.



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

In cases where routine weather reports made to CQ might not be received by the appropriate station within range, indicated in this list, they should be made to that station by call sign, but so that they may be readily intercepted by all ships. 600 m. is used throughout.

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

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

*(Continued.)*

In cases where routine weather reports made to CQ might not be received by the appropriate station within range, indicated in this list, they should be made to that station by call sign, but so that they may be readily intercepted by all ships. 600 m. is used throughout.

Ocean.	Station.	Position.	Call Sign.	Telegraphic address of Meteorological Centre desiring information.	Information desired.	Notes.
North Pacific and China Sea.	Cape d'Aguilar, Hong Kong.	Lat. 22° 12' 39" N. Long. 114° 15' 11" E.	VPS.	Royal Observatory.	Weather only, preferably No. 6 Supplementary Groups.	
South Pacific.	Auckland.	Lat. 36° 50' 36" S. Long. 174° 46' 08" E.	ZLD.	Weather Wellington.	Weather only, four universal groups.	The Meteorological Office, Wellington, will be glad to receive routine reports from British Selected Ships within range of New Zealand W/T Stations through the normal commercial channels.
	Wellington.	Lat. 41° 16' 26" S. Long. 174° 45' 55" E.	ZLW.			
	Awarua.	Lat. 46° 30' 27" S. Long. 168° 22' 21" E.	ZLB.			
	Chatham Island.	Lat. 43° 57' 02" S. Long. 176° 31' 04" W.	ZLC.			
	Rarotonga.	Lat. 21° 11' 54" S. Long. 159° 48' 51" W.	ZKR.			
	Apia.	Lat. 13° 15' 17" S. Long. 170° 49' 42" W.	ZMA.			
	Thursday I.	Lat. 10° 35' 14" S. Long. 142° 12' 43" E.	VII	Weather.	Weather only, including No. 6 Supplementary Groups.	
	Townsville	Lat. 19° 16' 09" S. Long. 146° 49' 47" E.	VIT			
	Brisbane	Lat. 27° 25' 34" S. Long. 153° 07' 19" E.	VIB			
	Melbourne	Lat. 37° 46' 56" S. Long. 144° 52' 09" E.	VIM			
	Adelaide	Lat. 34° 51' 14" S. Long. 138° 31' 55" E.	VIA			



**CHILE.****II.—WEATHER SHIPPING BULLETINS.**

**Santiago Central W/T Station**, approximate position Latitude 33° 26' S., Longitude 70° 38' W.

Call sign **C C S**.

Wavelengths 3,000 metres and 25 metres C.W.

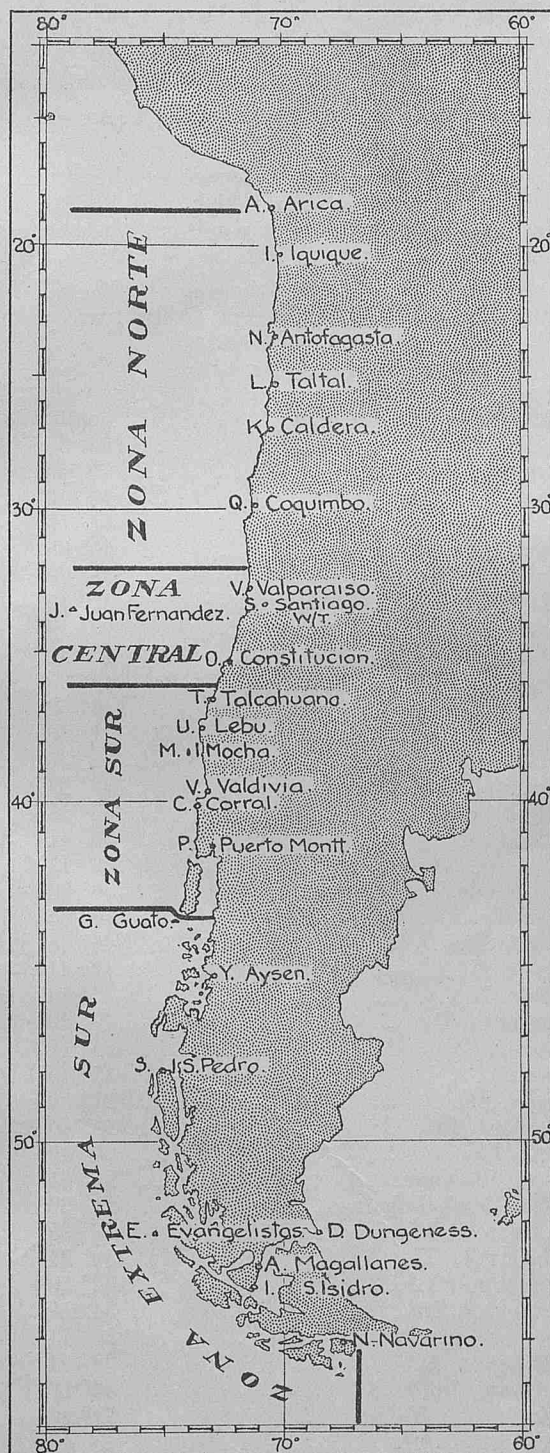
Times of transmission 0130, 1430 and 2030 G.M.T.

The messages are based upon observations taken at 2300, 1200 and 1800 G.M.T. respectively.

They consist of three parts:—

**Part I.**—General statement of weather conditions *en clair* (Spanish).

**Chart showing Stations for Weather Shipping Bulletin for coast of Chile.**



The sea areas for forecasts are indicated on the chart from information supplied by a British Selected Ship.

**Part II.**—Weather Report in code giving actual observations at stations shown on the chart on this page.

**Part III.**—Forecast of weather in plain language.

The stations are sent in groups of five, the distinguishing letters of the stations, which are shown alongside each station, on the chart, forming the initial group of each eleven groups. The stations are transmitted in the order from North to South.

The station reports are made in the International Ships Wireless Weather Telegraphy Code.

To decode these reports the tables given in the Decode M.O. 329 are required. The Key letters are fully described on p. 35 of the January, 1934, number and in M.O. 329.

Key letters used for station reports—DDFww BBVTT.

**WIRELESS STORM WARNINGS.**

**Valparaiso W/T Station**, call sign **CCE**, broadcasts storm warnings when necessary, on a wavelength of 600 metres (I.C.W.)

**III.—WIRELESS TIME SIGNALS.**

W/T Station.	Call Sign.	Wavelength Metres.	G.M.T. of Time Signal.
<b>Valparaiso</b> Lat. 33° 01' 03" S. Long. 71° 39' 25" W.	<b>CCL</b>	2,150 (C.W.)	h m s h m s 00 55 00-01 00 00

**SYSTEM.**—The Time Signal commences at 00h. 55m. 00s. G.M.T. and continues for 5 mins., and consists of a series of dots which represent each second, except that the dots at the 29th, 51st, 52nd, 53rd, 54th, 55th, 56th, 57th, 58th and 59th seconds of each of the five minutes are omitted. The dot at the 60th second of each minute is the time signal.

**NOTES.**—

Time Signal controlled by the Hydrographic Office.

In the event of failure or irregularities in the Time Signal the word "Señal nula" (Signal annulled) will be made three times in succession, one minute after 0100 G.M.T.

**ARGENTINA.****II.—WIRELESS WEATHER BULLETINS.**

The following W/T Stations broadcast a weather forecast, for 24 hours, for the coast of Argentina *en clair* in Spanish.

W/T Station.	Position.		Call Sign.	Time of transmission.	Wavelength.
	Latitude.	Longitude.			
Comodoro Rivadavia.	45° 52' S.	67° 28' W.	<b>LOX</b>	G.M.T. 2000	600 metres C.W.
Buenos Aires —Darsena Norte.	34° 36' S.	58° 22' W.	<b>LOL</b>	0230	1053 „ „
Buenos Aires —General Pacheco.	34° 28' S.	58° 38' W.	<b>LPD</b>	1700	600 „ I.C.W.
Parana ...	31° 44' S.	60° 27' W.	<b>LPE</b>	1830	600 „ C.W.

## BRAZIL.

## II.—WIRELESS WEATHER BULLETINS.

The Brazilian W/T coast stations given in the list below transmit, **every four hours** the state of weather and sea, and force and direction of the wind. The observations are made at the W/T Stations. They are sent in Portuguese *en clair*.

W/T Station.	Position (approx.).		Call Sign.	Times of Sending. G.M.T.
	Latitude.	Longitude.		
Salinas ... ..	0° 37' S.	47° 23' W.	<b>PPL</b>	0245, 0645, etc., etc.
S. Luiz (Maranhão)	2° 31' S.	44° 17' W.	<b>PXM</b>	0300, 0700, etc., etc.
Natal Norte...	5° 47' S.	35° 16' W.	<b>PXN</b>	0330, 0730, etc., etc.
Olinda (Pernambuco)	8° 01' S.	34° 51' W.	<b>PPO</b>	0000, 0400, etc., etc.
Amaralina (Bahia)...	13° 01' S.	38° 28' W.	<b>PPA</b>	0315, 0715, etc., etc.
Santos ... ..	23° 59' S.	46° 18' W.	<b>PPS</b>	0245, 0645, etc., etc.
Florianopolis ...	27° 35' S.	48° 34' W.	<b>PPF</b>	0315, 0715, etc., etc.
Juncão (Rio Grande do Sul) ... ..	32° 03' S.	52° 08' W.	<b>PPJ</b>	0345, 0745, etc., etc.

The wave-length used by the above stations for the transmission of the messages is 600 metres.

## III.—WIRELESS TIME SIGNALS.

W/T Station.	Call Sign.	Wavelength Metres.	G.M.T. of Time Signal.
<b>Rio de Janeiro—</b> Lat. 22° 59' 19" S. Long. 43° 11' 26" W.	<b>PPR</b>	1,000 (I.C.W.)	h m s 14 00 00 and 24 00 00

The Time Signals are relayed from Rio de Janeiro Observatory in accordance with the New International system of W/T Time Signals.

The procedure is as follows :—

G.M.T.			Signal.	Meaning.
h	m	s	h m s	
13	56	05	to {13 23} 56 50	— — — every alternate 5 seconds.
23	57	00	„ 57 49	— — — — — etc.
	57	55	„ 58 00	55 56 57 58 59 60
	58	08	„ 58 10	Time Signal.
	58	18	„ 58 20	— — —
	58	28	„ 58 30	— — —
	58	38	„ 58 40	— — —
	58	48	„ 58 50	— — —
	58	55	„ 59 00	55 56 57 58 59 60
	59	06	„ 59 10	Time Signal.
	59	16	„ 59 20	— — —
	59	26	„ 59 30	— — —
	59	36	„ 59 40	— — —
	59	46	„ 59 50	— — —
13	59	55	„ {14 24} 00 00	55 56 57 58 59 60
23				Time Signal.

The duration of the dash is one second, and that of the dot 0.2 of a second. The final dot, therefore, terminates at

14h } 00m 00.2s, G.M.T.  
24h }

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

NOTE.—Sent daily except Sundays and public holidays.

## UNITED STATES OF AMERICA, WEST INDIAN ISLANDS, AND BERMUDA.

## Atlantic Coast.

## II.—WIRELESS WEATHER BULLETINS.

**Washington—Arlington W/T Station**, approximate position Latitude 38° 52' N., Longitude 77° 05' W.

Call sign **NAA**.

Times of Transmission—0300 and 1500 G.M.T.

Wavelengths—2653 m. and 4690† metres C.W. simultaneously.

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

**Part I** is a summary in plain language of the general pressure distribution, including the location of high and low areas, and the barometric readings at their centres; wind and weather forecasts for the areas shown on the chart, p. 163.

**Part II**—Actual weather observations in the United States code taken at 0100 and 1300 G.M.T. respectively from a number of stations in the list below.

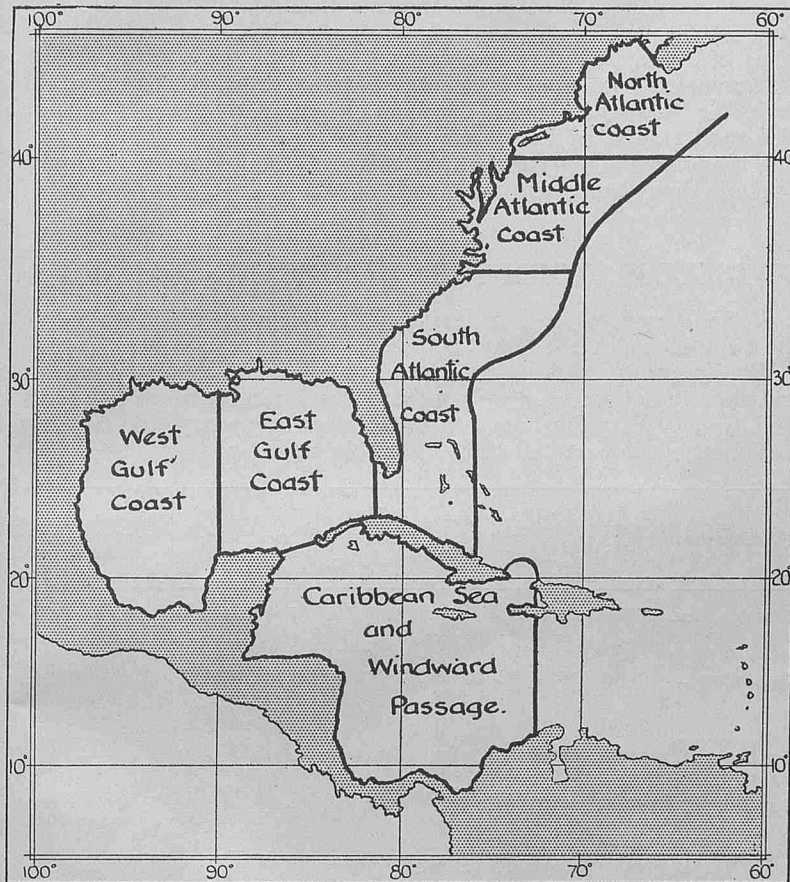
Indicator letters	Name of station	Latitude north	Longitude west
TP	The Pas. Man ... ..	53° 35'	101° 12'
WG	Winnipeg, Man ... ..	49° 55'	97° 10'
BK	Bismarck, N. Dak ... ..	46° 49'	100° 49'
O	Omaha, Nebr. ... ..	41° 16'	95° 58'
KC	Kansas City, Mo. ... ..	39° 05'	94° 35'
OK	Oklahoma City, Okla ... ..	35° 29'	97° 31'
DA	Dallas, Tex. ... ..	32° 45'	96° 48'
GV	Galveston, Tex. ... ..	29° 19'	94° 50'
DU	Duluth, Minn. ... ..	46° 49'	92° 09'
M	Marquette, Mich....	46° 33'	87° 26'
LC	La Crosse, Wis. ... ..	43° 50'	91° 12'
CH	Chicago, Ill. ... ..	41° 50'	87° 40'
SL	St. Louis, Mo. ... ..	38° 39'	90° 13'
CN	Cincinnati, Ohio ... ..	39° 07'	84° 30'
NV	Nashville, Tenn. ... ..	36° 11'	86° 50'
LR	Little Rock, Ark. ... ..	34° 41'	92° 15'
VK	Vicksburg, Miss. ... ..	32° 17'	90° 50'
NO	New Orleans, La. ... ..	30° 00'	90° 05'
P	Pensacola, Fla. ... ..	30° 25'	87° 12'
L	Alpena, Mich. ... ..	45° 05'	83° 25'
D	Detroit, Mich. ... ..	42° 21'	83° 03'
F	Buffalo, N.Y. ... ..	42° 53'	78° 50'
PB	Pittsburgh, Pa. ... ..	40° 26'	79° 57'
CT	Charlotte, N.C. ... ..	35° 13'	80° 51'
AT	Atlanta, Ga. ... ..	33° 45'	84° 21'
TA	Tampa, Fla. ... ..	27° 59'	82° 29'
K	Key West, Fla. ... ..	24° 40'	81° 48'
MI	Miami, Fla. ... ..	25° 46'	80° 12'
NU	Nassau, Bahamas ... ..	25° 05'	77° 23'
TI	Turks Island, Bahamas ... ..	21° 20'	71° 10'
SJ	San Juan, P.R. ... ..	18° 29'	66° 06'
JA	Jacksonville, Fla. ... ..	30° 21'	81° 40'
C	Charleston, S.C. ... ..	32° 50'	79° 58'
WL	Wilmington, N.C. ... ..	34° 18'	77° 59'
H	Cape Hatteras, N.C. ... ..	35° 14'	75° 32'
WA	Washington, D.C. ... ..	38° 54'	77° 03'
BAL	Baltimore, Md. ... ..	39° 18'	76° 38'
AC	Atlantic City, N.J. ... ..	39° 22'	74° 27'
NY	New York, N.Y. ... ..	40° 43'	74° 01'
T	Nantucket, Mass. ... ..	41° 15'	70° 00'

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



Indicator letters	Name of station	Latitude north	Longitude west
BN	Boston, Mass. ... ..	42° 22'	71° 02'
N	Northfield, Vt. ... ..	44° 08'	72° 40'
E	Eastport, Me. ... ..	44° 54'	67° 00'
CK	Cochrane, Ont. ... ..	49° 04'	80° 58'
DC	Doucet, Que. ... ..	48° 17'	76° 40'
PN	Parry Sound, Ont. ... ..	45° 20'	80° 01'
ML	Montreal, Que. ... ..	45° 31'	73° 34'
FP	Father Point, Que. ... ..	48° 30'	68° 30'
BC	Port Aux Basques, N.F. ... ..	47° 33'	59° 10'
CR	Cape Race, N.F. ... ..	46° 40'	53° 04'
SAB	Sable Island, N.S. ... ..	43° 56'	60° 00'
HX	Halifax, N.S. ... ..	44° 38'	63° 35'
B	Bermuda (St. George's) ... ..	32° 18'	64° 42'
HT	Horta, Azores ... ..	38° 32'	28° 29'

Chart showing Forecast and Storm Warning Areas for Atlantic and Gulf Coasts of United States.



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

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

W/T Station.	Call Sign.	Position (approx.).		Time. G.M.T.	Wave length. Metres.
		Latitude.	Longitude.		
Tuckerton, N.J.	WSC	39° 33' N.	74° 23' W.	1400, 2200	650 } (I.C.W. and 2256 C.W.)
Chatham, Mass.	WCC	41° 43' N.	70° 46' W.	1400, 2200	2326 (C.W.)
Thomaston, Me.	WAG	44° 09' N.	69° 13' W.	1400, 2200	720 } (I.C.W. and 2420 C.W.)
Sayville	WSL	40° 45' N.	73° 06' W.	1400, 2200	765 } I.C.W. and 2500 C.W.

### WIRELESS STORM WARNINGS.

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

W/T Station.	Call Sign.	Position (Approx.) Latitude, Longitude.	Time. G.M.T.	Wave-length. (Metres).	Area (see Chart).
Jupiter, Fla.	NAQ	26° 57' N. 80° 05' W.	1630, 2300	1,621 (I.C.W.).	Middle and South Atlantic and E. Gulf coasts.
Savannah, Ga.	WSV	32° 05' N. 81° 06' W.	1600, 2330	735 (C.W.).	Do.
Charleston, S.C.	NAO	32° 52' N. 79° 58' W.	1530, 2300	2,458 (C.W. and I.C.W.).	Do.
Baltimore	WMH	39° 17' N. 76° 36' W.	1530	720 (C.W. and I.C.W.).	Do.
Washington (Arlington)	NAA	38° 52' N. 77° 05' W.	0300* 1500*	2,653, 4,690 C.W. simultaneously.	N. Atlantic and Gulf coasts.
New York	NAH	40° 28' N. 74° 00' W.	1530, 2200	2,939 (C.W.).	N. middle and S. Atlantic coasts, Gulf and Caribbean Sea.
Boston, Mass.	NAD	42° 21' N. 70° 57' W.	1630	2,941 (C.W.).	N. Atlantic Coast.

\* In Part II of the Weather Bulletin.

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

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

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

### III.—WIRELESS TIME SIGNALS.

Time Signals are broadcast according to the United States System (See Diagram of Washington—Annapolis W/T Time Signals p. 164), from the following W/T Stations :—

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

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

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

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

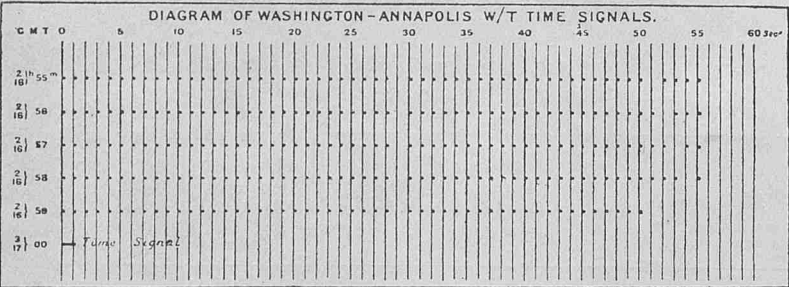
**Washington—Annapolis**, Latitude 38° 59' 00" N., Longitude 76° 27' 00" W., call sign **NSS**, on a wavelength of 16,840 metres (C.W.), at 3h. 00m. 00s., 5h. 00m. 00s., 8h. 00m. 00s., 17h. 00m. 00s., and 21h. 00m. 00s., G.M.T.

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

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

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

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



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

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

IV.—WIRELESS ICE WARNINGS.

North Atlantic International Ice Patrol.

The North Atlantic International Ice Patrol commences in March, continuing during April, May and June and longer if necessary. The Patrol vessels, call sign **NIDK**, transmit wireless warnings giving the limits and position of the ice in the neighbourhood of the regular Transatlantic Lane Routes.

The warnings are broadcast daily at 0100 and 1300 G.M.T. on a wavelength of 1713m. C.W. and at 1100 and 2300 G.M.T. on a wavelength of 706m. C.W.

Ice information will also be sent on request at all times to any ship with which the Patrol Vessel can communicate, without charge.

The following W/T Stations broadcast messages received from the Patrol Vessel :—

W/T Station.	Call Sign.	Times of Transmission. G.M.T.	Wavelength. Metres.
Washington ...	NAA	0500, 1700	2653 C.W.
Boston ...	NAD	1600, 2200	2939 C.W.
New York ...	NAH	1530, 2130	2939 C.W.
Norfolk ...	NAM	0900, 1600, 2100	2458 C.W.

CARIBBEAN SEA, GULF COAST AND WEST INDIAN ISLANDS.

II.—WIRELESS WEATHER BULLETINS.

Weather forecasts are issued for the following stations at the times and for the areas given :—

W/T. Station.	Position.		Call Sign.	Times of Trans- mission, G.M.T.	Wave- length.	Area affected (see chart, p. 163).
	Latitude.	Longitude.				
Limon	10° 00' N.	83° 03' W.	TIM	1630	750 m.	E. Gulf, W. Gulf, Caribbean Sea, Windward pas- sage.
New Orleans	30° 00' N.	90° 06' W.	WFB	0430, 1630	3333 m. C.W.	E. Gulf, W. Gulf, Caribbean Sea, Windward passage.

W/T Station.	Position.		Call Sign.	Times of Trans- mission, G.M.T.	Wave- length.	Area affected (see chart, p. 163).
	Latitude.	Longitude.				
Key West	24° 33' N.	81° 48' W.	NAR	0400 1800	2828 m. C.W. 2828 m. C.W.	Jacksonville to Florida Strait, E. Gulf, W. Gulf, Car-ibbean Sea, Wind-ward passage. Florida, E. Gulf.

Barbados.

**Bridgetown W/T Station**, approximate position latitude 13° 06' N., longitude 59° 37' W., call sign **VPO**, wavelength 600m. I.C.W., broadcasts the following weather information, received from the Meteorological Station, Codrington (latitude 13° 07½' N., longi- tude 59° 36' W.), when unsettled weather conditions prevail or indica- tions of stormy weather are observed :—

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

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

WIRELESS STORM AND HURRICANE WARNINGS.

Storm Warnings are broadcast by the following W/T Stations for the areas shown on the Chart, p. 163.

When a storm exists that is likely to affect the area, the location and expected direction of movement of the storm centre will be given.

Hurricane Warnings are broadcast when necessary and repeated at the intervals as stated in the last column below.

W/T Station.	Call Sign.	Position (approx.) Latitude. Longitude.	Wave- length. Metres.	Time (G.M.T.) of Storm Warnings.	Area (see Chart, p. 163).	Intervals at which hurricane warn- ings are repeated.
Galveston, Tex.	WGQV	29° 19' N. 94° 47' W.	720 (C.W.)	1400 and when issued.	West Gulf Coast	—
Port Arthur ...	WPA	29° 52' N. 93° 56' W.	600 and 720 (C.W.)	When issued.	E. and W. Gulf Coasts, Caribbean Sea, S. Atlantic Coast of U.S.A.	—
New Orleans ...	WFB	30° 00' N. 90° 06' W.	3333 (C.W.)	0300, 0430 1500, 1630	E. and W. Gulf Coasts, Caribbean Sea, S. Atlantic Coast and E. and W. Gulf Coasts.	—
Key West ...	NAR	24° 33' N. 81° 48' W.	2828 (C.W.)	0400, 1800	S. Atlantic Coast and E. and W. Gulf Coasts.	Hourly after each silent period for 12 hours. About 4 hourly.
Guantanamo (Cuba.)	NAW	19° 55' N. 75° 09' W.	600 (I.C.W.)	—	—	—
Santo Domingo	HIA	18° 28' N. 69° 53' W.	600 (Spk.)	—	—	4 hourly.
Ensenada (Porto Rico.)	WPR	17° 58' N. 66° 56' W.	600	—	—	4 hourly.

III.—WIRELESS TIME SIGNALS.

Panama.

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

W/T Stations.	Call Sign.	Wavelength. Metres.	Time of Signal being made G.M.T.	
Balboa ... Lat. 9° 07' 12" N. ... Long. 79° 45' 24" W.	NBA	6,518 (C.W.).	h. m. s. h. m. s. 3 55 00—4 00 00 17 55 00—18 00 00	Sent daily.



## BERMUDA.

## II.—WIRELESS WEATHER BULLETIN.

**Bermuda W/T Station**, approximate position Latitude 32° 23' N., Longitude 64° 40' W.

Call sign, **VRT**.

Times of Transmission—0100 and 1300 G.M.T. on wavelength of 665m. I.C.W. and 0130 and 1330 G.M.T. on wavelength of 2250m. C.W. giving 0000 and 1200 G.M.T. observations respectively at Bermuda of Barometer, Barometric tendency, wind direction and force, past weather, and visibility when it reaches 5 or less.

SAMPLE MESSAGE—"Barometer 30.03 falling, wind N.E. 4. Weather cloudy."

A brief weather forecast for the area 30° to 40° N., 60° to 70° W. (20° to 40° N., 60° to 70° W. during August and September), and 30° to 40° N., 50° to 60° W. when conditions are exceptional, is broadcast at 2100 G.M.T. on a wavelength of 665m. I.C.W. repeated at 2118 G.M.T. on 2250m. C.W.

CANADA, NOVA SCOTIA, NEWFOUNDLAND,  
LABRADOR, ETC.

## II.—WIRELESS WEATHER BULLETINS.

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

Country.	W/T Station.	Call Sign.	Position (approx.).		Time, G.M.T.	Wave-length.
			Lat. N.	Long. W.		
Canada (Nova Scotia).	Lurcher Lt. Vsl.	VDR	43° 49'	66° 32'	—	600 m.
	Yarmouth ...	VAU	43° 46'	66° 07'	0430, 1630	720 m.
	Chebucto Head	VAV	44° 30'	63° 31'	0440, 1640	750 m.
	North Sydney	VCO	46° 13'	60° 15'	—	600 m.
	Sable Island ...	VCT	43° 56'	60° 02'	—	600 m.
	Louisburg ...	VAS	46° 09'	59° 57'	0400, 1600	2804 m.
	Grindstone ...	VCN	47° 23'	61° 54'	—	600 m.
Canada ...	Island					
	*Fame Point, Que.	VCG	49° 07'	64° 36'	0430, 1630	660 m.
	*Clarke City, Que.	VCK	50° 11'	66° 37'	—	600 m.
	*Father Point, Que.	VCF	48° 31'	68° 28'	0420, 1620	600 m.
	*Quebec ...	VCC	46° 48'	71° 12'	0410, 1610	600 m.
Canada (New Brunswick).	*Montreal ...	VCA	45° 34'	73° 38'	0400, 1600	600 m.
	St. John ...	VAR	45° 14'	66° 03'	0400, 1600	650 m.
Newfoundland and Labrador.	St. John's ...	VON	47° 34'	52° 41'	0400, 1600	600 m.
	Belle Isle ...	VCM	51° 53'	55° 22'	0440, 1640	620 m.
	Cape Race ...	VCE	46° 39'	53° 04'	0420	660 m.
	Point Amour ...	VCL	51° 27'	56° 50'	—	600 m.
Hudson Bay and Strait.	†*Port Churchill	VAP	58° 47'	94° 09'	1600	600 m.
	†*Cape Hopes	VAY	61° 05'	69° 33'	—	600 m.
	Advance					
	†*Nottingham Is.	VCB	63° 06'	77° 56'	—	600 m.
	†*Resolution Is.	VAW	61° 20'	64° 50'	1620	600 m.

† Forecast and weather conditions for Hudson Bay and Strait and N. Atlantic adjacent thereto.

## Wireless Telephony R/T Issues.

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

Country.	Station.	Call Sign.	Position (approx.).		Time G.M.T.	Wave-length R/T.
			Lat. N.	Long. W.		
Canada (New Brunswick).	St. John...	CFBO	45° 14'	66° 03'	1000, 1200	337 m.
Canada (Nova Scotia).	Sambro Outer Bank Lt.-V.	VGX	44° 22'	63° 26'	1200, 1730	435 m.
	Louisburg ...	VAS	46° 09'	59° 57'	0800, 1700	438 m.

## III.—WIRELESS TIME SIGNALS.

**Chebucto Head D/F Station**, Latitude 44° 30' 01" N., Longitude 63° 31' 20" W., call sign **VAV** broadcasts a time signal daily (Sundays excepted) at 14h. 00m. 00s., G.M.T., on a wavelength of 750 metres (spark).

The procedure is as follows:—

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

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

## IV.—WIRELESS ICE WARNINGS.

The following W/T stations broadcast ice warnings:—

W/T Station.	Latitude N. (approximate.)	Longitude W.	Call Sign.	Wavelength (Metres).	G.M.T. of issue.
<b>Lurcher Lt.-V....</b>	43° 49'	66° 32'	<b>VDR</b>	600 (Spk.)	On request.
<b>*Chebucto Head..</b>	44° 30'	63° 31'	<b>VAV</b>	750 (I.C.W.)	On request.
<b>Sable Island ...</b>	43° 56'	60° 02'	<b>VCT</b>	600 (Spk.)	On request.
<b>*North Sydney ...</b>	46° 13'	60° 15'	<b>VCO</b>	600 (Spk.)	On request.
<b>*Louisburg ...</b>	46° 09'	59° 57'	<b>VAS</b>	2804 (C.W.)	0400, 1600.
<b>*Grindstone Island</b>	47° 24'	61° 51'	<b>VCN</b>	600 (Spk.)	On request.
<b>Fame Point ...</b>	49° 07'	64° 36'	<b>VCG</b>	660 (I.C.W.)	0430, 1630.
<b>Clarke City ...</b>	50° 11'	66° 37'	<b>VCK</b>	600 (Spk.)	On request.
<b>*Cape Race ...</b>	46° 39'	53° 04'	<b>VCE</b>	660 (I.C.W.)	0420, 1620.
<b>St. John's ...</b>	47° 34'	52° 41'	<b>VON</b>	600	0400, 1600.
<b>Pt. Amour ...</b>	51° 27'	56° 52'	<b>VCL</b>	600 (Spk.)	On request.
<b>Belle Island ...</b>	51° 53'	55° 22'	<b>VCM</b>	620 (I.C.W.)	0440, 1640.
<b>Port Churchill...</b>	58° 47'	94° 11'	<b>VAP</b>	600 (I.C.W.)	On request.
<b>Cape Hopes</b>	61° 05'	69° 33'	<b>VAY</b>	600 (I.C.W.)	On request.
<b>Advance</b>					
<b>Nottingham Is...</b>	63° 06'	77° 56'	<b>VCB</b>	600 (I.C.W.)	On request.
<b>Resolution ...</b>	61° 19'	64° 53'	<b>VAW</b>	600 (I.C.W.)	On request.

\* Broadcasts Gulf of St. Lawrence Ice Patrol report as explained below.

## THE GULF OF ST. LAWRENCE ICE PATROL.

The Gulf of St. Lawrence Ice Patrol commences from the opening of navigation in the Gulf and continues until the route is clear of ice.

The Patrol Vessel, call sign **VCQP**, transmits wireless warnings of ice conditions from Cape Race to Quebec and recommendations as to route to be followed.

The warnings are broadcast at 0100 and 1300 G.M.T. on a wavelength of 705 m. I.C.W. preceded by the general call C.Q. on a wavelength of 600 m., and 0130 and 1330 on a wavelength of 1621 m. I.C.W.

The warnings will also be sent on request to any ship, ships should call **VCQP** on 600 m.

The above warnings are also transmitted by the stations marked\* in the list above.

## PACIFIC COAST.

## II.—WIRELESS WEATHER BULLETIN.

**San Francisco, California, W/T station,** approximate position  
Latitude 38° 06' N., Longitude 122° 17' W.

Call sign **NPG.**

Times of Transmission—0330 G.M.T. and 1530 G.M.T.

Wavelengths—7000 and 2776 metres (CW) simultaneously.

The bulletins commence with "Weather Bureau Bulletin" and are in two parts.

**Part I**—In plain language giving summary of general pressure distribution and forecasts of wind and weather for the off-shore areas—N. of Cape Blanco; between Cape Blanco and Point Conception; and S. of Point Conception.

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

**Part II**—Actual weather observations in United States code for stations in the list below, taken at 0100 G.M.T. for the 0330 G.M.T. bulletin and 1300 G.M.T. for the 1530 G.M.T. bulletin, except as follows, where the observations do not synchronise:—

Observations at Alaskan stations are taken at Midnight and Noon G.M.T.

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

Guam, Manila, China and Japan observations taken at 1400 G.M.T.

Observations taken at Midway at 0630 G.M.T.

## Indicator Letters and Stations.

Indicator Letters.		Station.		Position (approx.).	
				Latitude.	Longitude.
<i>Alaska.</i>					
NM	...	Nome	...	64° 30' N.	165° 24' W.
SPI	...	St. Paul	...	57° 15' N.	170° 10' W.
DH	...	Dutch Harbour	...	53° 55' N.	166° 30' W.
TN	...	Tanana	...	65° 10' N.	152° 06' W.
EA	...	Eagle	...	64° 46' N.	141° 12' W.
KD	...	Kodiak	...	57° 47' N.	152° 22' W.
CV	...	Cordova	...	60° 32' N.	145° 42' W.
JU	...	Juneau	...	58° 18' N.	134° 24' W.
<i>Canada.</i>					
ED	...	Edmonton, Alberta	...	53° 33' N.	113° 30' W.
KA	...	Kamloops, B.C.	...	50° 41' N.	120° 29' W.
CY	...	Calgary, Alberta	...	51° 02' N.	114° 02' W.
SC	...	Swift Current, Sask.	...	50° 19' N.	108° 02' W.
PR	...	Prince Rupert, B.C.	...	54° 18' N.	130° 18' W.
<i>United States, etc.</i>					
TAT	...	Tatoosh I, Wash.	...	48° 23' N.	124° 44' W.
SE	...	Seattle, Wash.	...	47° 38' N.	122° 20' W.
NH	...	North Head, Wash.	...	46° 16' N.	124° 04' W.
PD	...	Portland, Oreg.	...	45° 32' N.	122° 41' W.
RO	...	Roseburg, Oreg.	...	43° 13' N.	123° 20' W.
EUR	...	Eureka, Calif.	...	40° 48' N.	124° 11' W.
RB	...	Red Bluff, Calif.	...	40° 10' N.	122° 15' W.
SM	...	Sacramento, Calif....	...	38° 35' N.	121° 30' W.
SF	...	San Francisco, Calif.	...	37° 48' N.	122° 36' W.
FN	...	Fresno Calif.	...	36° 43' N.	119° 49' W.
SPE	...	San Pedro, Calif.	...	33° 44' N.	118° 16' W.
PAR	...	Point Arguello, Calif.	...	34° 35' N.	120° 39' W.
LA	...	Los Angeles, Calif.	...	34° 03' N.	118° 15' W.
DI	...	San Diego, Calif.	...	32° 43' N.	117° 10' W.
SPO.	...	Spokane, Wash.	...	47° 40' N.	117° 25' W.
WW	...	Walla Walla, Wash.	...	46° 02' N.	118° 20' W.
BA	...	Baker, Oreg.	...	44° 46' N.	117° 50' W.
HL	...	Helena, Mont.	...	46° 34' N.	112° 04' W.
BS	...	Boise, Idaho	...	43° 37' N.	116° 13' W.
LD	...	Lander, Wyo.	...	42° 50' N.	108° 45' W.
WM	...	Winnemucca, Nev.	...	40° 58' N.	117° 43' W.
R	...	Reno, Nev....	...	39° 32' N.	119° 49' W.
SLC	...	Salt Lake City, Utah	...	40° 46' N.	111° 54' W.
MD	...	Modena, Utah	...	37° 48' N.	113° 54' W.

Indicator Letters.					Position (approx.).	
	Station.				Latitude.	Longitude.
<i>United States, etc.—cont.</i>						
DV	...	Denver, Colo.	...	...	39° 45' N.	105° 00' W.
GJ	...	Grand Junction, Colo.	...	...	39° 04' N.	108° 34' W.
SA	...	Santa Fe, N. Mex....	...	...	35° 41' N.	105° 57' W.
PH	...	Phoenix, Ariz.	...	...	33° 28' N.	112° 00' W.
YU	...	Yuma, Ariz.	...	...	32° 45' N.	114° 36' W.
HO	...	Honolulu, Hawaii	...	...	21° 19' N.	157° 52' W.
MDI	...	Midway Island	...	...	28° 12' N.	177° 22' W.
FMA	...	Manila P.I....	...	...	14° 35' N.	120° 59' E.
FGM	...	Guam.	...	...	13° 27' N.	144° 45' E.

*China and Japan, etc.*

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

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

## WIRELESS STORM WARNINGS.

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

W/T Station and position (approx.).	Call Sign.	Wave-length. Metres.	Broad-casting Time G.M.T.	Particulars.
Puget Sound ... Lat. 47° 42' N. ... Long. 122° 37' W.	NPC	2,941 (C.W.)	0100, 0300 0400, 1300 1700, 2100	Storm Warnings.
Eureka, Calif. ... Lat. 40° 42' N. ... Long. 124° 16' W.	NPW	600 2,776 (C.W.)	0900, 1900 0018, 0433 0818, 1218 1633, 2018	
San Francisco, Calif. Lat. 38° 06' N. ... Long. 122° 17' W.	NPG	7000 (C.W.) 2,776 (C.W.)	0330, 1530	
" " ...	"	2,776 (C.W.)	0000, 0430 0800, 1200 1630, 2000	Storm Warnings. In Second part of weather bulletin.
San Diego, Calif. Lat. 32° 42' N. ... Long. 117° 15' W.	NPL	600	When issued and repeated after the first silent period.	

## III.—WIRELESS TIME SIGNALS.

For method of transmission of the undermentioned Time Signals see diagram, p. 164.

W/T Station.	Call Sign.	Wavelength. Metres.	Time of Signal being made G.M.T.	
San Francisco, Calif. Lat. 38° 05' 55" N. Long. 122° 16' 37" W.	NPG	2,776 and 7,005 (C.W.)	h. m. s. h. m. s. 2 55 00—3 00 00 7 55 00—8 00 00 16 55 00—17 00 00	Sent daily.

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



## HAWAIIAN ISLANDS.

## II.—WIRELESS WEATHER BULLETIN.

**Honolulu-Pearl Harbour W/T Station** approximate Latitude  $21^{\circ} 12' N.$ , Longitude  $157^{\circ} 58' W.$ , call sign **NPM**, broadcasts weather forecasts daily (except Sundays and holidays), for the Hawaiian Islands and neighbouring ocean areas at 2230 G.M.T., on a wavelength of 600 metres (I.C.W.). The station also broadcasts the barometric reading, wind direction and force and state of weather at Honolulu at 0230, 0630, 1830, 2230 G.M.T. on a wavelength of 600 metres (I.C.W.).

## III.—WIRELESS TIME SIGNALS.

For method of transmission of the undermentioned Time Signals see diagram, p. 164.

			h. m. s. h. m. s.	
Honolulu, Pearl Hbr. Lat. $21^{\circ} 20' 45'' N.$ Long. $157^{\circ} 57' 56'' W.$	<b>NPM</b>	2,828 (I.C.W.)	23 55 00-0 00 00	Sent daily.

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

## PERSONNEL.

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

## Captain J. Attwood.

Captain JOHN ATTWOOD commander of the R.M.S. *Balmoral Castle* has retired from active service afloat after 47 years at sea.

Born at Colchester in 1871 Captain ATTWOOD began his seafaring career with Messrs. Shaw, Savill and Albion and served in eight of their sailing vessels including the *Dunedin*, *Merope*, *Lady Jocelyn* and *Invercargill*. On obtaining his master's certificate he transferred to the steamers of the same company.

In 1897 he joined the Union Steamship Company which later amalgamated with the Castle Line and has since commanded several vessels of their fleet including the *Gordon Castle*, *Berwick Castle*, *Kenilworth Castle*, *Llandaff Castle*, *Guildford Castle* and *Balmoral Castle*.

## Captain H. B. Harvey.

Captain HENRY BRODERICK HARVEY, commander of the R.M.S. *Edinburgh Castle*, has retired from active service afloat after 50 years service, of which 36 years were spent with the Union Castle Line.

At the age of 14, Captain HARVEY joined the school ship *Conway* and on completing his training there, joined the Liverpool barque *Red Gauntlet* and later the *Rhoderick Dhu*. He then made a voyage in steam, but returned to and remained in sail until 1898 when he joined the Union Castle Line as a junior officer, his first ship being the *Norman*. Promoted to command of the *Crawford Castle* in 1917 Captain HARVEY has since had charge of several of the Union Castle Fleet including the *Polglass Castle*, *War Soldier*, *Dromore Castle*, *Carlou Castle*, *Llandovery Castle*, *Llangibby Castle*, *Armadale Castle*, *Carnarvon Castle* and *Edinburgh Castle*.

## Captain R. G. Latta.

Captain R. G. LATTA commander of the R.M.S. *Empress of Britain* and commodore of the Canadian Pacific Steam Ship Company's Fleet has retired from the sea.

Commencing his sea career in the sailing ship *Arden Craig* in 1886 Captain LATTA obtained experience in all classes of ships before joining the Canadian Pacific steamships in 1904 as a junior officer.

He obtained command of the *Metagama* in 1917 and shortly after was appointed Marine Superintendent at Antwerp. On reappointment to the Fleet he commanded the *Monmouth* since when he has had charge of the *Sicilian*, *Grampian*, *Scandinavian*, *Minnedosa*, *Montclare*, *Empress of Britain* (old), *Montroyal*, *Empress of Scotland*, *Empress of Australia*, *Duchess of Atholl*, *Duchess of Richmond* and the new *Empress of Britain*.

## Captain D. R. Morgan.

Captain D. R. MORGAN, commander of the R.M.S. *Orduna*, has retired from the sea after 48 years service afloat.

Commencing his sea career in 1886, he at first served in schooners sailing out of Portmadoc and later in the barque *Norfolk Island* of Glasgow.

On obtaining his master's certificate, he for some time commanded the barquentine *Patia* of Brixham before transferring to the Pacific Steam Navigating Company, as a junior officer in 1902.

Rising through the different grades, he was appointed master in 1920, since then he has commanded many vessels of the Pacific Steam Navigating Company's fleet, including the *Alvarado*, *Sorato*, *Legarto*, *Loreto*, *Lapaz*, *Laguna*, *Essequibo*, *Orbita* and *Orduna*.

## OBITUARY.

The death of Captain A. W. FOXWORTHY which occurred on 13th July last after a long illness is noted with regret.

Captain FOXWORTHY, who was in his 61st year, entered the service of Messrs. Furness Withy and Company in 1896 as Third Officer of S.S. *Halifax City*, after some years service in sailing ships. He attained command in May 1907, when he was appointed to S.S. *Gulf of Anecd*, and up to the time he left S.S. *Newfoundland* in February 1933, had commanded no fewer than 15 ships in Furness Withy's fleet.

He first became a member of the corps of voluntary marine observers in 1920, and while in command of S.S. *Newfoundland* contributed no fewer than nine "excellent" meteorological logs.

**Captain C. I. H. Speerschneider, Royal Danish Navy (Retired).**

Captain SPEERSCHNEIDER, the well known Danish writer on Ice in the Arctic, retired from his post as Marine Superintendent of the Danish Meteorological Service at Copenhagen on August 31st last.

CHRISTIAN JULIUS HANSEN, son of Admiral VICTOR HANSEN, of the Royal Danish Navy, was born on August 20th, 1864. At the age of 14, he went to sea as an apprentice in the Frigate *Sjoellond*, bound for the Danish West Indies; and three years later became a midshipman. He was promoted to Lieutenant in 1885.

For one year he served in cargo steamers of the Danish merchant service.

In 1887 he served as Lieutenant in the cruiser *Diana* in Greenland waters, and during 1892-1893 was employed in fishery investigation in those waters.

His first command was the schooner *Argus*, engaged in the suppression of smuggling off the Danish coast.

In 1898, he entered the torpedo service, and after commanding several torpedo boats, and the torpedo boat flotilla, became Chief of the Torpedo School of the Danish Navy.

In 1906, whilst still on the active list of the Danish Navy, he became Head of the Marine Division of the Danish Meteorological Office, retiring from the Navy in 1911.

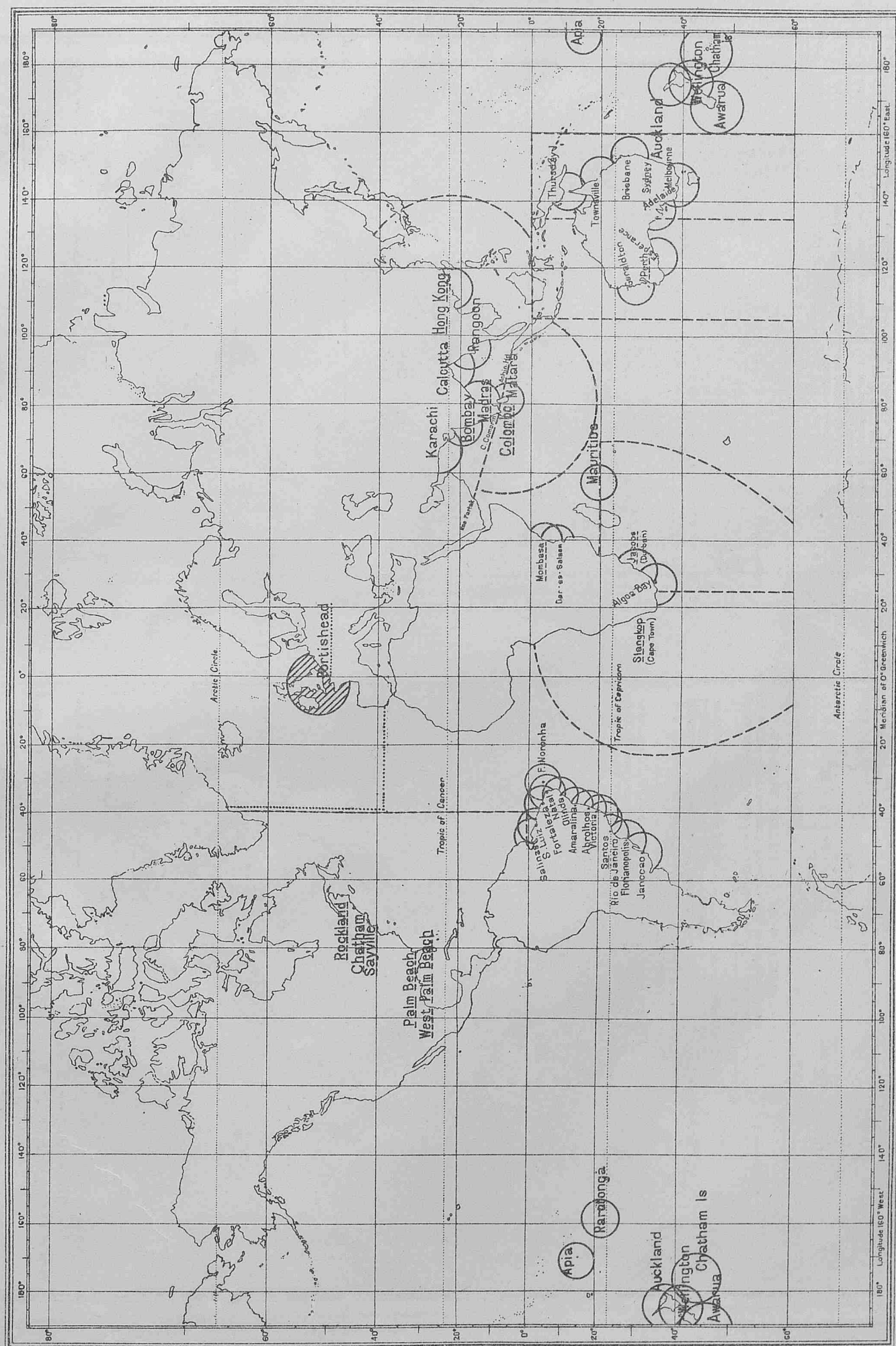
In 1903, Captain C. I. HANSEN married Magrethe SPEERSCHNEIDER, taking her name.

For 28 years he has been author of the Danish reports of Arctic ice conditions, and ice in Danish waters; and he was organizer of the ice signal service of Denmark.

Captain SPEERSCHNEIDER is a very old friend of the British Marine Division. His work in connection with ice especially has assisted seamen of all nations. We wish him many years of happiness in his well earned retirement.



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

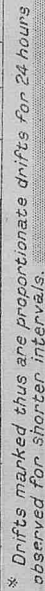


The dotted line indicates the area in which British "A Selected Ships" report under control to Portishead.

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

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

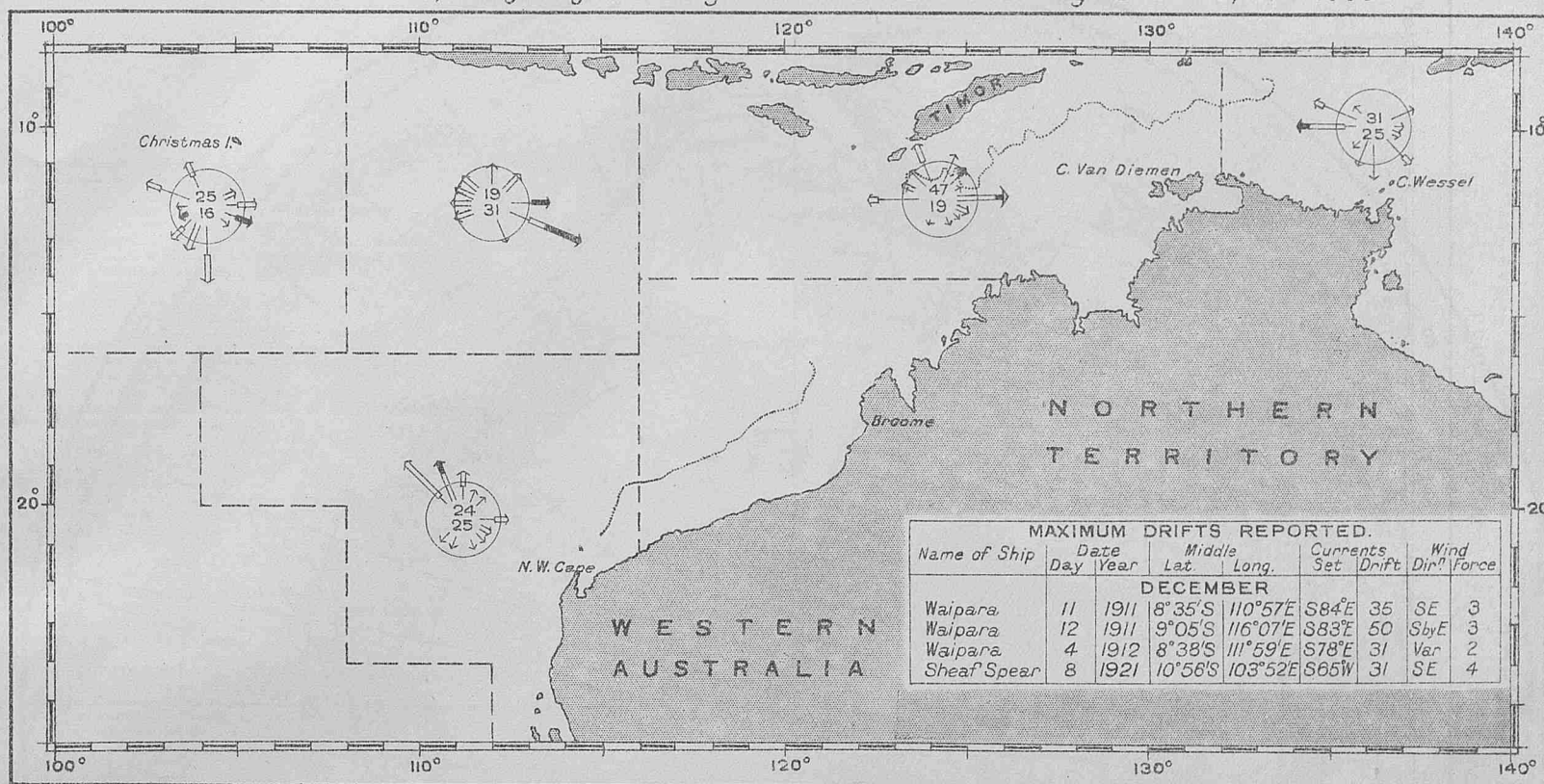
*The full circles indicate the areas round islands and coast stations which are detailed to intercept "B Selected Ships" reports made to G.Q. on 600 metres*





CURRENTS IN THE PORTION OF THE INDIAN OCEAN NORTH OF AUSTRALIA.  
NOVEMBER DECEMBER and JANUARY.



*Observations of ships regularly observing for the British Meteorological Office, 1910-1933.*



MAXIMUM DRIFTS REPORTED.									
Name of Ship	Date		Middle		Currents		Wind		
	Day	Year	Lat	Long.	Set	Drift	Dir <sup>n</sup>	Force	
DECEMBER									
Waipara.	11	1911	8°35'S	110°57'E	S84°E	35	SE	3	
Waipara	12	1911	9°05'S	116°07'E	S83°E	50	SbyE	3	
Waipara.	4	1912	8°38'S	111°59'E	S78°E	31	Var	2	
Sheaf Spear	8	1921	10°56'S	103°52'E	S66°W	31	SE	4	

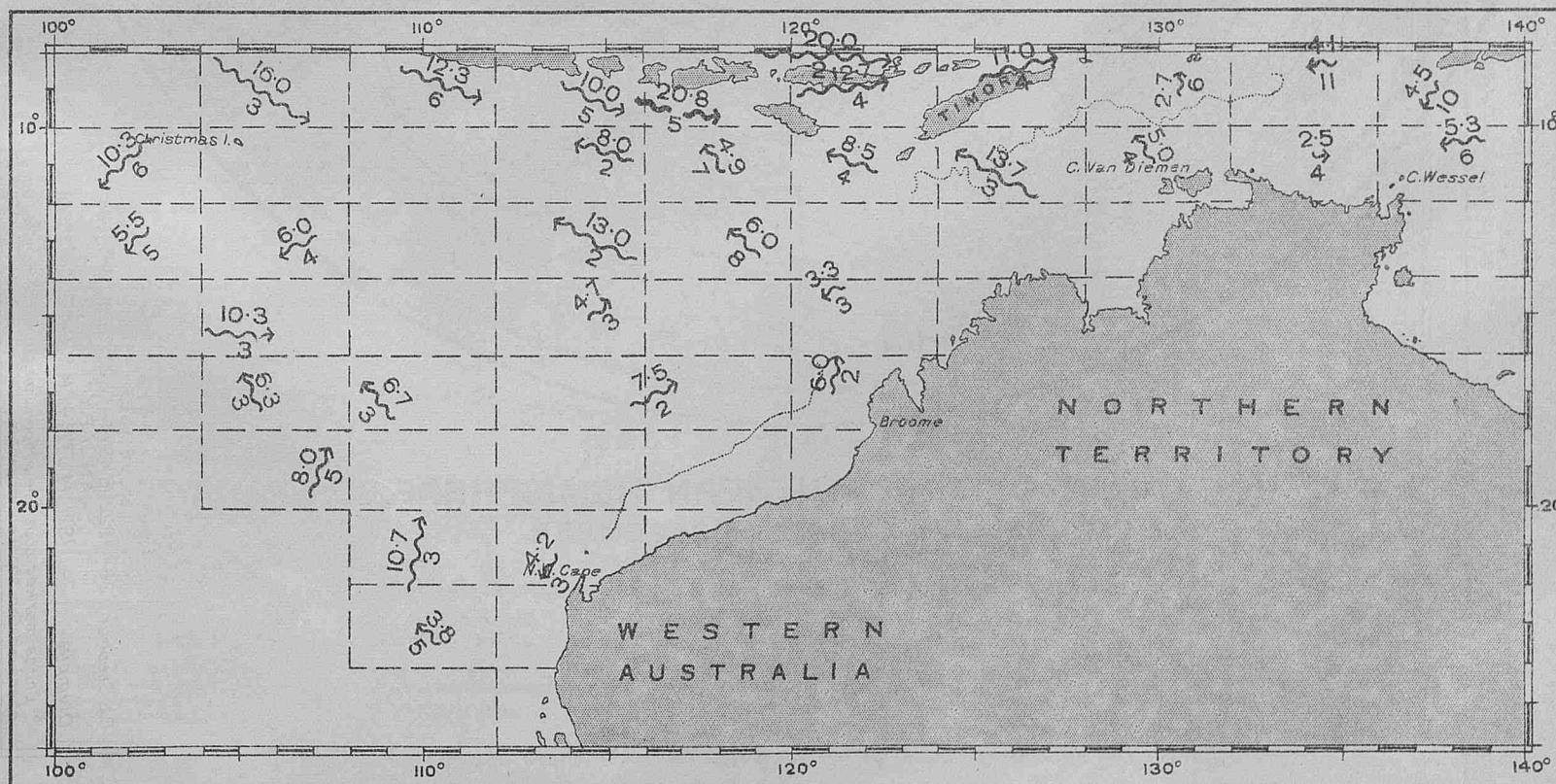
### EXPLANATION OF CURRENT ROSES.

The current roses are drawn from observations within the pecked lines. Arrows flow with the current, length represents frequency, thickness strength, -

6-12 miles per day, , 13-24 miles per day   
25-48 " " " , 49-72 " " "   
73 miles per day and above 

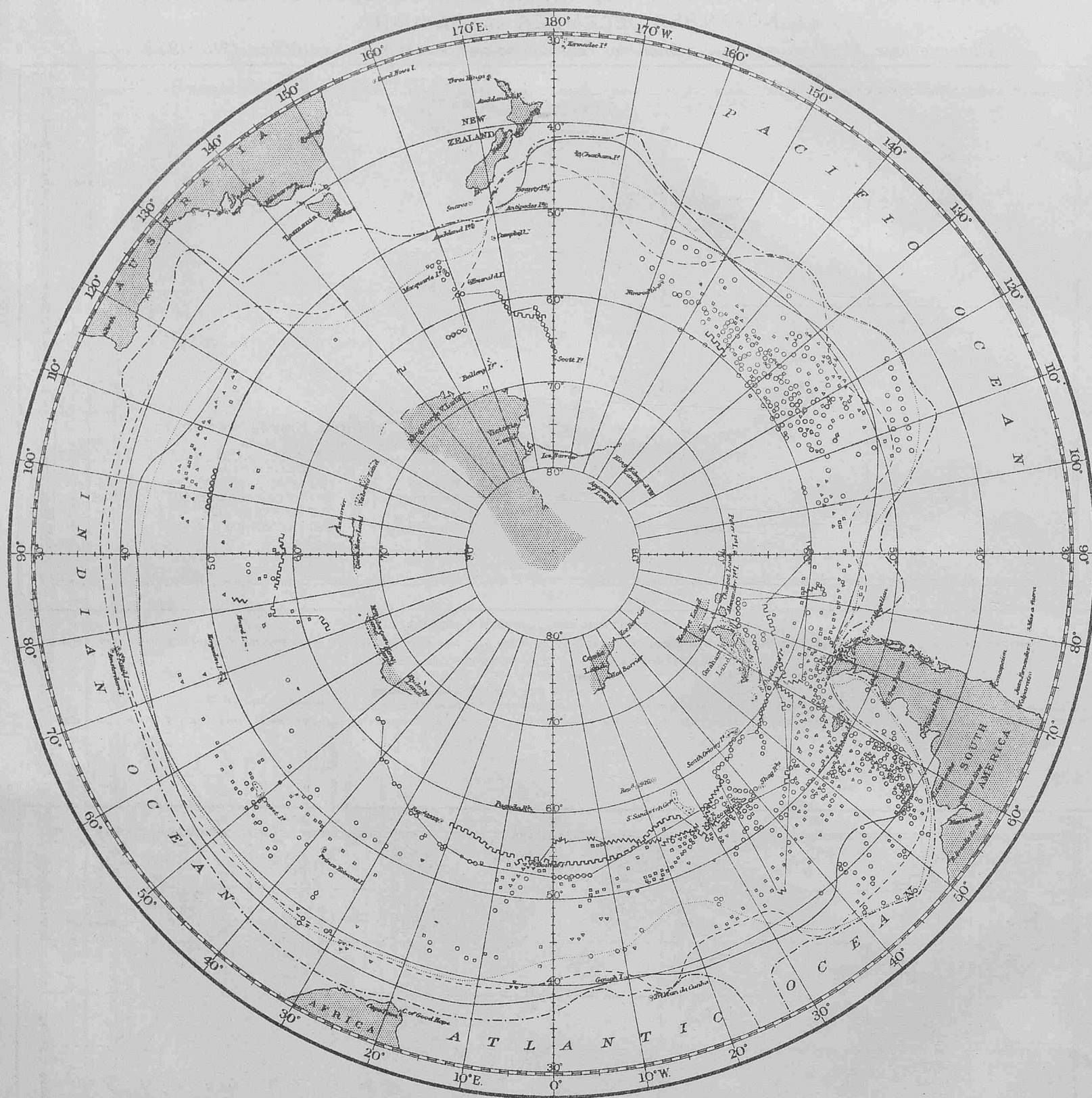
Distance from tail of arrow to circle represents 5%. Scale. 0 10 20 30 40 50%

The upper figure in centre of rose gives total number of observations, the lower figure the percentage frequency of currents less than 6 miles per day.



EXPLANATION OF CURRENT ARROWS.

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



# ICE CHART OF THE SOUTHERN HEMISPHERE, OCTOBER NOVEMBER and DECEMBER EXPLANATION.

The symbols used to distinguish the ice of each of the three months are as follows:—

	Bergs, 1902-1933	Position of northernmost ice actually observed 1885-1933.	Extreme limit of all ice, 1772-1933.
October	△	~~~~~	---
November	□	~~~~~	---
December	○	~~~~~	---
		Extreme limit of all ice, all months.	---

NOTE — The symbols for pack ice are joined by hair line where desirable.

The coast line of the Antarctic continent as shown on this chart is not completely corrected to accord with the latest survey information. It is intended in a later volume of *The Marine Observer*, after the Admiralty Ice chart of the Southern Hemisphere No 1241 has been revised, to again publish this chart in *The Marine Observer* with coast lines as complete as possible and to bring the ice information up to date annually.



## INDEX TO VOLUME ELEVEN.

A.		F.	
Subject.	PAGE.	Subject.	PAGE.
<i>Aeneas</i> , S.S.—Mirage, Red Sea ... ..	50	Fiji Islands, Wireless Weather Signals ... ..	124
Aeroplane, Catapulting from a Liner ... ..	15	Finland, Wireless Weather Signals ... ..	80
Africa, Portuguese East, Wireless Weather Signals ... ..	116	Fog ... ..	62
Africa, S.W. and Union of S., Wireless Weather Signals ... ..	115	Fog in the Gulf of Tehuantepec, N. Pacific, M.V. <i>Pacific Enterprise</i> ... ..	6
Aguilhas Current, The—M.V. <i>Clan Macdougall</i> ... ..	4	Forecasting in London, Weather, for those at Sea in Home Waters ... ..	59
Albatross, Photograph of, Australian Waters, S.S. <i>Baradine</i> ... ..	140	FOXWORTHY, Captain A.W.—Obituary ... ..	167
<i>Almanzora</i> , S.S.—Meteor Shower, Coasts of Spain and Portugal ... ..	135	Formosa, Wireless Weather Signals ... ..	118
Appointment—ARDLEY, Lieutenant, R.A.B., R.N.R. ... ..	39	France, Wireless Weather Signals ... ..	80
Arctic Rescues, Recent ... ..	99	FREER, Captain A., R.N.R., Retirement ... ..	125
ARDLEY, Lieutenant, R.A.B., R.N.R., Appointment ... ..	39	French Indo-China, Wireless Weather Signals ... ..	118
Argentina, Wireless Weather Signals ... ..	161	French Oceania, Wireless Weather Signals ... ..	124
<i>Arlanza</i> , S.S.—Pampero, East Coast of South America ... ..	5		
<i>Armada Castle</i> , S.S.—Cloud Arch, S. Atlantic ... ..	6		
Astronomical Phenomena Observed at Sea, Notes on ... ..	22		
<i>Atlantis</i> , S.S.—A call at Tristan da Cunha ... ..	96		
Atmospheric Obscurity, Duration of, in the Irish Sea ... ..	53		
Atmospheric Obscurity in the English Channel and Thames Approaches ... ..	102		
ATTWOOD, Captain J.—Retirement ... ..	167		
Aurora Australis—			
S. Indian Ocean, M.V. <i>Opawa</i> ... ..	7		
S. Indian Ocean, S.S. <i>Port Adelaide</i> ... ..	7		
Australia, Wireless Weather Signals ... ..	120		
Awards—List of Captains, and Principal Observing Officers to whom the Meteorological Committee have made Excellent ... ..	87		
Azores, Wireless Weather Signals ... ..	81		
B.		G.	
Subject.	PAGE.	Subject.	PAGE.
<i>Balmoral Castle</i> , S.S.—Squall, S. African Waters ... ..	48	<i>Gaelic Star</i> , S.S.—Meteors, N. Atlantic ... ..	50
<i>Baradine</i> , S.S.—Photograph of Albatross, Australian Waters ... ..	140	Germany, Wireless Weather Signals ... ..	77
Barbados, Wireless Weather Signals ... ..	164	GILBERT, Captain E. F., Retirement ... ..	82
Bermuda, Wireless Weather Signals ... ..	165	Green Rays at Sunset, Arabian Sea, S.S. <i>Tuscania</i> ... ..	48
<i>Berwickshire</i> , S.S.—		Gulf of St. Lawrence Ice Patrol ... ..	165
Drift of Native Canoe ... ..	5		
St. Paul's Island, S. Indian Ocean ... ..	5		
Brazil, Wireless Weather Signals ... ..	162		
Brickfielder, Melbourne, Australia, S.S. <i>Malaja</i> ... ..	138		
<i>Britannic</i> , M.V.—Meteor Shower, North Atlantic ... ..	134		
British Isles—			
Special Services by Payment ... ..	77		
Weather Shipping Bulletin ... ..	74		
Wireless Gale Warnings ... ..	76		
Wireless Time Signals ... ..	76		
British New Guinea ... ..	124		
BRITTEN, Commander Sir Edgar T., Kt., R.D., R.N.R. ... ..	82		
Burma ... ..	117		
<i>Buteshire</i> , S.S.—Weather Charts made at Sea, S. African Waters, 27. 12. 33. ... ..	137		
C.		H.	
Subject.	PAGE.	Subject.	PAGE.
Canada, Wireless Weather Signals ... ..	165	Halo, Lunar, Unusual, N. Indian Ocean—S.S. <i>Mantua</i> ... ..	95
<i>Cape of Good Hope</i> , M.V.—Meteor Shower, Coasts of Spain and Portugal ... ..	134	Halo, Solar, N. Indian Ocean—S.S. <i>Tactician</i> ... ..	8
Catapulting of an Aeroplane from a Liner ... ..	15	Halo Phenomena, N. Atlantic, S.S. <i>Orduna</i> ... ..	95
Caribbean Sea, Wireless Weather Signals ... ..	164	<i>Harmonides</i> , S.S.—Mirage, Bristol Channel ... ..	94
Ceylon, Wireless Weather Signals ... ..	117	HARVEY, Captain H. B.—Retirement ... ..	167
Chile, Wireless Weather Signals ... ..	161	Hawaiian Is., Wireless Weather Signals ... ..	167
China, Wireless Weather Signals ... ..	120	<i>Henry Stanley</i> , M.V.—Meteor Shower, West coast of Africa ... ..	135
<i>City of Sidney</i> , M.V.—Meteor, Mediterranean Sea ... ..	135	Holland, Wireless Weather Signals ... ..	80
<i>Clan Macdougall</i> , M.V.—The Aguilhas Current ... ..	4	Hong Kong, Wireless Weather Signals ... ..	119
<i>Clan Sinclair</i> , S.S.—Meteor, Red Sea ... ..	96	Hurricane, South Pacific, S.S. <i>Tekoa</i> ... ..	5
Clarity ... ..	42		
Cloud Arch, S. Atlantic, S.S. <i>Armada Castle</i> ... ..	6		
Cloud Formation—			
Bay of Bengal, S.S. <i>Manela</i> ... ..	49		
S. Atlantic, R.R.S. <i>Discovery II</i> ... ..	138		
Cloud, Mountain—S. coast of Spain—S.S. <i>Moldavia</i> ... ..	6		
<i>Cumberland</i> , S.S.—Pampero off Bahia Blanca ... ..	46		
Current, The Aguilhas—M.V. <i>Clan Macdougall</i> ... ..	4		
Current Rips, Caribbean Sea, S.S. <i>Inanda</i> ... ..	89		
Currents and Sea Temperature, Cape of Good Hope, S.S. <i>Deebank</i> ... ..	5		
Currents and Weather, Tristan da Cunha, R.R.S. <i>Discovery II</i> ... ..	138		
Currents, Ocean ... ..	129		
Currents of the Arabian Sea and Bay of Bengal—A further investigation into their Seasonal Variation ... ..	19		
Currents of the Red Sea and the part of the Indian Ocean N. of Australia—			
I. Meteorological conditions which affect the Currents, with summary of Current Information previous to the present charting ... ..	67		
II. Currents in the half-year, May to October ... ..	110		
III. The Currents in the half-year, November to April, and General Summary ... ..	150		
Currents on the W. and N.W. coasts of Australia, Captain J. J. AIREY. ... ..	89		
D.		I.	
Subject.	PAGE.	Subject.	PAGE.
<i>Danmark</i> —sighted by S.S. <i>El Uruguayo</i> ... ..	44	Ice Conditions, Summary of, Western N. Atlantic 1933 ... ..	56
<i>Deebank</i> , S.S.—Currents and Sea Temperature, Cape of Good Hope ... ..	5	Ice Patrol, Gulf of St. Lawrence ... ..	165
Denmark, Wireless Weather Signals ... ..	79	Ice Patrol, International, N. Atlantic ... ..	164
Direction Finder, Radio ... ..	12	Ice Reports, Southern, during the year 1933—	
Directional Wireless ... ..	100	January, February and March ... ..	24
<i>Director</i> , S.S.—Phosphorescence, S. Atlantic ... ..	90	April, May and June ... ..	69
<i>Discovery II</i> , R.R.S.—		July, August and September ... ..	110
Cloud Formation, S. Atlantic ... ..	138	October, November and December ... ..	156
Currents and Weather, Tristan da Cunha ... ..	138	Icebergs in the S. Atlantic (R.R.S. <i>Discovery II</i> ). ... ..	51
Icebergs in the South Atlantic ... ..	51	<i>Inanda</i> , S.S.—Current Rips, Caribbean Sea ... ..	89
The Second Voyage of ... ..	8	India, Wireless Weather Signals ... ..	117
Disposition of the Observing Fleet, The ... ..	130	International Ships' Wireless Weather Telegraphy Code ... ..	35
Diurnal Variation of Wind at Sea During the S.W. monsoon ... ..	104	International Ships' Wireless Weather Telegraphy Code Tables ... ..	36
Drift of Native Canoe, S.S. <i>Berwickshire</i> ... ..	5	<i>Irania</i> , M.V.—Meteor Shower, Mediterranean ... ..	135
		Irish Sea, Duration of Atmospheric Obscurity in the ... ..	53
E.		J.	
Subject.	PAGE.	Subject.	PAGE.
Earthquake Tremors, S. Pacific, S.S. <i>Northumberland</i> ... ..	45	JAMES, Mr. W. G., Obituary ... ..	39
Echo Sounding ... ..	13	Japan, Wireless Weather Signals ... ..	120
Eclipse of the Sun, Partial, Mediterranean, S.S. <i>Mongolia</i> ... ..	95	John Murray Expedition—I, The ... ..	66
<i>El Uruguayo</i> , S.S.—Four sailing ships sighted on passage— <i>Juan Sebastian de Elcano</i> , <i>Ponape</i> , <i>Penang</i> , <i>Danmark</i> ... ..	44	John Murray Expedition—II, The ... ..	109
English Channel and Thames Approaches, Atmospheric Obscurity in the ... ..	102	John Murray Expedition—III, The ... ..	155
<i>Erata</i> ... ..	171	John Murray Expedition, Work done by the British Merchant Navy to assist the <i>Juan Sebastian de Elcano</i> sighted by S.S. <i>El Uruguayo</i> ... ..	130
<i>Esperance Bay</i> , S.S.—Waterspout, N. Indian Ocean ... ..	139		
Estonia, Wireless Weather Signals ... ..	80		
Extraction of Data for last eleven years, Summary of, and Details of Voluntary Observing Fleet ... ..	88		
Extracting Data, Progress in ... ..	129		
F.		K.	
Subject.	PAGE.	Subject.	PAGE.
Fiji Islands, Wireless Weather Signals ... ..	124	<i>Kemmendine</i> , S.S.—Thunderstorm, Majorca ... ..	93
Finland, Wireless Weather Signals ... ..	80	KERSHAW, Captain F. W., O.B.E., Obituary ... ..	82
Fog ... ..	62		
Fog in the Gulf of Tehuantepec, N. Pacific, M.V. <i>Pacific Enterprise</i> ... ..	6		
Forecasting in London, Weather, for those at Sea in Home Waters ... ..	59		
FOXWORTHY, Captain A.W.—Obituary ... ..	167		
Formosa, Wireless Weather Signals ... ..	118		
France, Wireless Weather Signals ... ..	80		
FREER, Captain A., R.N.R., Retirement ... ..	125		
French Indo-China, Wireless Weather Signals ... ..	118		
French Oceania, Wireless Weather Signals ... ..	124		
G.		L.	
Subject.	PAGE.	Subject.	PAGE.
<i>Gaelic Star</i> , S.S.—Meteors, N. Atlantic ... ..	50	Labrador, Wireless Weather Signals ... ..	165
Germany, Wireless Weather Signals ... ..	77	LATTA, Captain R. G.—Retirement ... ..	167
GILBERT, Captain E. F., Retirement ... ..	82	Latvia, Wireless Weather Signals ... ..	79
Green Rays at Sunset, Arabian Sea, S.S. <i>Tuscania</i> ... ..	48	LINKLATER, Captain H. Obituary ... ..	125
Gulf of St. Lawrence Ice Patrol ... ..	165	<i>Llandaff Castle</i> , S.S.—Meteor Shower, Mediterranean ... ..	135
		<i>Logician</i> , S.S.—Meteor Shower, Bay of Biscay ... ..	134
		Lunar Ray, North Atlantic, S.S. <i>Transylvania</i> ... ..	49
H.		M.	
Subject.	PAGE.	Subject.	PAGE.
Halo, Lunar, Unusual, N. Indian Ocean—S.S. <i>Mantua</i> ... ..	95	MCQUEEN, Captain D. S., Retirement ... ..	125
Halo, Solar, N. Indian Ocean—S.S. <i>Tactician</i> ... ..	8	Madagascar, Wireless Weather Signals ... ..	116
Halo Phenomena, N. Atlantic, S.S. <i>Orduna</i> ... ..	95	<i>Maimoa</i> , S.S.—Meteor Showers, Bay of Biscay ... ..	134
<i>Harmonides</i> , S.S.—Mirage, Bristol Channel ... ..	94	<i>Makura</i> , S.S.—Meteor, S. Pacific ... ..	51
HARVEY, Captain H. B.—Retirement ... ..	167	<i>Malaja</i> , S.S.—Brickfielder, Melbourne, Australia ... ..	138
Hawaiian Is., Wireless Weather Signals ... ..	167	<i>Manela</i> , S.S.—	
<i>Henry Stanley</i> , M.V.—Meteor Shower, West coast of Africa ... ..	135	Cloud formation, Bay of Bengal ... ..	49
Holland, Wireless Weather Signals ... ..	80	Sand deposit, Mediterranean ... ..	48
Hong Kong, Wireless Weather Signals ... ..	119	<i>Mantua</i> , S.S.—Unusual Lunar Halo, N. Indian Ocean ... ..	95
Hurricane, South Pacific, S.S. <i>Tekoa</i> ... ..	5	Marine Meteorology and Safe Navigation, Extract from Merchant Shipping Act, 1932. ... ..	25
		Marine Observer, 1934, The ... ..	2
		MASON, Captain W., D.S.O., Retirement ... ..	82
		Mauritius, Wireless Weather Signals ... ..	117
		Meteor—	
		Mediterranean Sea, S.S. <i>City of Sidney</i> ... ..	135
		New Zealand Waters, M.V. <i>Port Fremantle</i> ... ..	50
		North Atlantic, S.S. <i>Ruahine</i> ... ..	95
		Red Sea, S.S. <i>Clan Sinclair</i> ... ..	96
		South Atlantic, S.S. <i>Port Hunter</i> ... ..	8
		South Pacific, S.S. <i>Makura</i> ... ..	51
		Meteor Shower—	
		Bay of Biscay, S.S. <i>Logician</i> ... ..	134
		Bay of Biscay, S.S. <i>Maimoa</i> ... ..	134
		Coasts of Spain and Portugal S.S. <i>Almanzora</i> ... ..	135
		Coasts of Spain and Portugal M.V. <i>Cape of Good Hope</i> ... ..	134
		Mediterranean, M.V. <i>Irania</i> ... ..	135
		Mediterranean, S.S. <i>Llandaff Castle</i> ... ..	135
		North Atlantic, M.V. <i>Britannic</i> ... ..	134
		North Atlantic, S.S. <i>Natia</i> ... ..	134
		West coast of Africa, M.V. <i>Henry Stanley</i> ... ..	135
		Meteors, N. Atlantic, S.S. <i>Gaelic Star</i> ... ..	50
		Mirage—	
		Bristol Channel, S.S. <i>Harmonides</i> ... ..	94
		Red Sea, S.S. <i>Aeneas</i> ... ..	50

Subject.	PAGE.
<i>Moldavia</i> , S.S.—	
Mountain Cloud, S. coast of Spain	6
Pumping of Barometer, N.W. coast of Spain	93
Smoke from a Bush Fire, S.W. coast of Australia	6
Weather Chart made at Sea—Red Sea 30. 11. 33.	137
<i>Mongolia</i> , S.S.—Partial Eclipse of the Sun, Mediterranean	95
Monsoon, S.W., Diurnal Variation of Wind at Sea during the	104
<i>Montclare</i> , S.S.—Weather Chart made at Sea, Eastern N. Atlantic. 6. 10. 33	136
Morocco, Wireless Weather Signals	81
Murray, John Expedition—I The	66
Murray, John Expedition—II The	109
Murray, John Expedition—III The	155
Murray, John Expedition—Work done by the British Merchant Navy to assist the	130

## N.

<i>Natia</i> S.S., Meteor shower, North Atlantic	134
New Britain, Wireless Weather Signals	124
New Zealand, Wireless Weather Signals	123
Newfoundland, Wireless Weather Signals	165
North Atlantic International Ice Patrol	164
<i>Northumberland</i> , S.S.—Earthquake Tremors, S. Pacific	45
Norway, Wireless Weather Signals	79
Nova Scotia, Wireless Weather Signals	165

## O.

Obituary—	
FOXWORTHY, Captain A. W.	167
JAMES, Mr. W. G.	39
KERSHAW, Captain, F. W., O.B.E.	82
LINKATER, Captain H.	125
Observing Fleet, Details of Voluntary, and Summary of Collection and Extraction of	
Data for last eleven years	88
Observing Fleet, The Disposition of the	130
Ocean Currents	129
Ocean Pilotage in the Southern Indian Ocean	129
OHLSON, Commander B. J., D.S.O., R.D., R.N.R.—Retirement	82
<i>Opawa</i> , M.V.—	
Aurora Australis, S. Indian Ocean	7
Tornado, West coast of Africa	135
Weather chart made at Sea, S. Pacific 1. 10. 33	136
<i>Orama</i> , S.S.—Our Youngest Observer	140
<i>Orari</i> , S.S.—	
Waterspouts, N. Atlantic	140
White Water, Timor Sea	90
<i>Orduna</i> , S.S.—	
Halo Phenomena, N. Atlantic	95
Zodiacal Light, N. Atlantic	7
Our Youngest Observer, S.S. <i>Orama</i>	140

## P.

<i>Pacific Enterprise</i> , M.V.—Fog in the Gulf of Tehuantepec, N. Pacific	6
Pampero—	
East coast of South America, S.S. <i>Arlanza</i>	5
Off Bahia Blanca, S.S. <i>Cumberland</i>	46
Panama, Wireless Weather Signals	164
Penang sighted by S.S. <i>El Uruguayo</i>	44
Phosphorescence—	
New Zealand Waters, S.S. <i>Tasmania</i>	45
N. Atlantic Ocean, S.S. <i>Princesa</i>	45
South Atlantic, S.S. <i>Director</i>	90
South Pacific, S.S. <i>Rotorua</i>	45
Pilotage, Ocean, in the Southern Indian Ocean	129
<i>Ponape</i> sighted by S.S. <i>El Uruguayo</i>	44
<i>Port Adelaide</i> , S.S.—Aurora Australis, S. Indian Ocean	7
<i>Port Fremantle</i> , M.V.—Meteor, New Zealand Waters	50
<i>Port Hunter</i> , S.S.—Meteor, S. Atlantic	8
Portugal, Wireless Weather Signals	81
<i>Princesa</i> , S.S.—Phosphorescence, N. Atlantic Ocean	45
Progress in Extracting Data	129
Pumping of Barometer, N.W. coast of Spain, S.S. <i>Moldavia</i>	93

## R.

Radio Direction Finder	12
REILLY, Captain, J. V.—Retirement	125
<i>Remuera</i> , S.S.—	
Weather Charts made at Sea, S. Pacific, 9 to 12. 5. 33	46
Weather Charts made in W. Indian Hurricane Region	90-93
Rescues, Recent Arctic	99
Retirement—	
ATTWOOD, Captain J.	167
FREER, Captain A., R.N.R.	125
GILBERT, Captain E. F.	82
HARVEY, Captain H. B.	167
LATTA, Captain R. G.	167
MCQUEEN, Captain D. S.	125
MASON, Captain W., D.S.C.	82
OHLSON, Commander B. J., D.S.O., R.D., R.N.R.	82
REILLY, Captain J. V.	125
SIBBONS, Captain H.	39
SPEERSCHNEIDER, Captain C. I. H.	168
<i>Rotorua</i> , S.S.—Phosphorescence, S. Pacific	45
Route from the Cape of Good Hope to Australia, The	146
<i>Ruahine</i> , S.S.—Meteor, N. Atlantic	95

## S.

Sailing Ships, Four, Sighted on passage, <i>Juan Sebastian de Elcano</i> , <i>Ponape</i> , <i>Penang</i> , <i>Danmark</i> , by S.S. <i>El Uruguayo</i>	44
St. Paul's Island, South Indian Ocean, S.S. <i>Berwickshire</i>	5
Samoa, Wireless Weather Signals	124
Sand deposit, Mediterranean Sea, S.S. <i>Manela</i>	48
Sea and Swell Observations, Notes on	105
Sea Signals, Notes on History of	16
Sea Temperature and Currents, Cape of Good Hope, S.S. <i>Deebank</i>	5
Ships' Wireless Weather Telegraphy	128
SIBBONS, Captain H., Retirement	39
Smoke from a Bush Fire, S.W. coast of Australia, S.S. <i>Moldavia</i>	6
<i>Somerset</i> , S.S.—Weather Chart made at Sea, Southern Ocean to the eastward of Cape of Good Hope, 19. 1. 33.	128
Sounding, Echo	13
South Pacific Ocean Islands, Wireless Weather Signals	124
SPEERSCHNEIDER, Captain C. I. H., Retirement	168
Squall—S. African Waters, S.S. <i>Balmoral Castle</i>	48
Sweden, Wireless Weather Signals	78

## T.

<i>Tactician</i> , S.S.—Solar Halo, N. Indian Ocean	8
<i>Tasmania</i> , S.S.—Phosphorescence, New Zealand Waters	45

Subject.	PAGE.
<i>Tekoa</i> , S.S.—Hurricane, South Pacific	5
Thames Approaches and English Channel, Atmospheric Obscurity in the	102
Thunderstorm, Majorca, S.S. <i>Kemmendine</i>	93
Tonnage	131
Tonnage, Total Merchant approximate (Steam and Motor) of the World	28
Tornado, West coast of Africa, M.V. <i>Opawa</i>	135
<i>Transylvania</i> , S.S.—Lunar Ray, N. Atlantic	49
Trinity House	132
Trinity House, The London	141
Tristan da Cunha—	
A call at, S.S. <i>Atlantis</i>	96
Currents and Weather, R.R.S. <i>Discovery II</i>	138
<i>Tuscania</i> , S.S.—Green Rays at Sunset, Arabian Sea	48

## U.

United States of America, Wireless Weather Signals—	
Atlantic coast	162
Gulf coast	164
Pacific coast	166

## V.

Volume XI.	133
------------	-----

## W.

Waterspout, N. Indian Ocean, S.S. <i>Esperance Bay</i>	139
Waterspouts, N. Atlantic, M.V. <i>Orari</i>	140
Weather and Currents, Tristan da Cunha—R.R.S. <i>Discovery II</i>	138
Weather Charts made at Sea—	
<i>Buteshire</i> , S.S.—South African Waters, 27. 12. 33.	137
<i>Moldavia</i> , S.S.—Red Sea, 30. 11. 33.	137
<i>Montclare</i> , S.S.—Eastern North Atlantic, 6. 10. 33.	136
<i>Opawa</i> , M.V.—S. Pacific, 1. 10. 33.	136
<i>Remuera</i> , S.S.—South Pacific, 9 to 12. 5. 33.	46
<i>Somerset</i> , S.S.—Southern Ocean to the eastward of Cape of Good Hope, 19. 1. 33.	128
Weather Charts made in W. Indian Hurricane Region, R.M.S. <i>Remuera</i> , 31. 8. 33 and 1 to 4. 9. 33.	90-93
Weather Forecasting in London, for those at Sea in Home Waters	59
West Indian Islands, Wireless Weather Signals	164
White Water, Timor Sea, S.S. <i>Orari</i>	90
Wind, Diurnal Variation of, at Sea during the S.W. Monsoon	104
Wireless, Directional	100
Wireless Stations detailed to receive Routine Coded Weather Reports from "A Selected Ships"	31, 70, 111, 157
Wireless Stations detailed to intercept Routine Coded Weather Reports from "B Selected Ships"	33, 72, 113, 159
Wireless Weather Signals (including I-Ships' W/T Weather Signals, II-W/T Weather Signals, III-W/T Time Signals, IV-W/T Ice warnings)—	
Africa, S.W. and Union of S.	115
Africa, Portuguese East	116
Argentina	161
Australia	120
Azores	81
Barbados	164
Bermuda	165
Brazil	162
British Isles—	
Special Service by payment	77
Weather Shipping Bulletin	74
Wireless Telegraphy Gale Warnings	76
Wireless Telegraphy Time Signals (Rugby)	76
British New Guinea	124
Burma	117
Canada	165
Caribbean Sea	164
Ceylon	117
Chile	161
China	120
Denmark	79
Estonia	80
Fiji Islands	124
Finland	80
Formosa	118
France	80
French Indo-China	118
French Oceania	124
Germany	77
Gulf of St. Lawrence Ice Patrol	165
Hawaiian Islands	167
Holland	80
Hong Kong	119
India	117
International Ships' Wireless Weather, Telegraphy Code	35
International Ships' Wireless Telegraphy Code, Tables	36
Japan	120
Labrador	165
Latvia	79
Madagascar	116
Mauritius	117
Morocco	81
New Britain	124
New Zealand	123
Newfoundland	165
North Atlantic International Ice Patrol	164
Norway	79
Nova Scotia	165
Panama	164
Portugal	81
Samoa	124
Ships' W/T Weather Signals—	
World-Wide System of Voluntary Selected Ships' Routine Wireless Weather Reports	27
Chart—International Observation Times for Weather Telegraphy at Sea	29
Schedule of times of observation and reporting	29
South Pacific Ocean Islands	124
Sweden	78
United States of America—	
Atlantic Coast	162
Gulf Coast	164
Pacific Coast	166
West Indian Islands	164
Wireless Weather Telegraphy, Ships'	128
Work of the Year, April 1st, 1933, to March 31st, 1934	84

## Z.

Zodiacal Light, North Atlantic, S.S. <i>Orduna</i>	7
--	---



## LIST OF ILLUSTRATIONS APPEARING IN THE TEXT.

	PAGE.		PAGE.
Diagram of Smoke from a Bush Fire, South West Coast of Australia, S.S. <i>Moldavia</i> ...	6	Graphs illustrating the Diurnal Variation of Wind at Sea during the S.W. Monsoon ...	104
Sketch of Cloud Arch, South Atlantic, S.S. <i>Armada Castle</i> ...	6	Figures 1 to 3 illustrating Sea and Swell Observation ...	106-108
Sketches of Aurora Australis, South Indian Ocean, M.V. <i>Opawa</i> ...	7	Chart showing Stations and Forecast Areas for Weather Shipping Bulletins, South West Africa and Union of South Africa and Stations for Portuguese East Africa ...	115
Photographs, Second Voyage of R.R.S. <i>Discovery II</i> ...	9-11	Chart showing Stations and Forecast Areas for Weather Bulletins, India and Ceylon ...	117
Photographs, Radio Direction Finder ...	12-13	Weather Chart made at Sea, Southern Ocean to the Eastward of Cape of Good Hope, 19.1.33, S.S. <i>Somersel</i> ...	128
Diagrams, Echo Sounding ...	14	Chart of the World indicating the Number of British Observing Ships using the different Trade Routes ...	131
Chart showing Mean Current, N.E. Monsoon Season, Arabian Sea and Bay of Bengal ...	19	Weather Chart made at Sea, Eastern North Atlantic, 6.10.33, S.S. <i>Montelara</i> ...	136
Chart showing International Observation Times for Weather Telegraphy at Sea ...	29	Weather Chart made at Sea, South Pacific Ocean, 1.10.33—M.V. <i>Opawa</i> ...	136
Photograph of Finnish Four Masted Barque <i>Pomape</i> , 3rd November, 1933 ...	44	Weather Chart made at Sea, Red Sea, 30.11.33—S.S. <i>Moldavia</i> ...	137
Photograph of Danish Ship <i>Danmark</i> , Tenerife, 5th November, 1933 ...	45	Weather Chart made at Sea, South African Waters, 27.12.33—S.S. <i>Buteshire</i> ...	137
Weather Charts made at Sea—South Pacific, 9 to 12.5.33, S.S. <i>Remuera</i> ...	46-48	Photographs of Cloud Formation, South Atlantic, 24.12.33—R.R.S. <i>Discovery II</i> ...	138-139
Sketch of Lunar Ray, S.S. <i>Transylvania</i> ...	49	Sketch of Cloud Formation, South Atlantic, 24.12.33—R.R.S. <i>Discovery II</i> ...	139
Sketch of Cloud Formation, S.S. <i>Manela</i> ...	49	Sketches of Waterspout, North Indian Ocean, 29.10.33—S.S. <i>Esperance Bay</i> ...	139
Sketches of Meteors, North Atlantic, S.S. <i>Gaelic Star</i> ...	50	Photographs of Our Youngest Observer—S.S. <i>Orama</i> ...	140
Chart of positions of Ice in the Region of the Weddell Sea, R.R.S. <i>Discovery II</i> ...	52	Photograph of Albatross, Australian Waters, December, 1933—S.S. <i>Baradine</i> ...	140
Figures 1 to 5, Duration of Atmospheric Obscurity, Irish Sea ...	53-56	Engraving of Trinity House ...	141
Weather Charts illustrating Weather Forecasting in London for those at Sea in Home Waters ...	60-61	Photograph of Nash Point Light House showing Fog Horns ...	143
Figures 1 to 3, Fog ...	62-63	Photograph of Eddystone Light House ...	143
Charts showing average Pressure and Wind, January and July ...	68-69	Photograph of Light Vessel with Hoisting Lantern ...	144
Chart showing Stations, Forecast Areas and Districts for British Weather Shipping Bulletin ...	74	Photograph of Modern Electric Light Vessel ...	144
Chart showing Stations and Zones for Azores' Weather Bulletin ...	81	Engravings of Alms Houses at Deptford belonging to Trinity House ...	145
Chart of Estimated Noon Positions of "A Selected Ships" on Wednesday, 28th March, 1934 ...	85	Engraving of Alms House at Mile End belonging to Trinity House ...	146
Weather Charts made in West Indian Hurricane Region, 31.8.33 to 4.9.33, R.M.S. <i>Remuera</i> ...	91-93	Photograph of Clipper <i>Lightning</i> ...	147
Plan of Ship's Bridge illustrating Pumping of Barometer, S.S. <i>Moldavia</i> ...	94	Photograph of Auxiliary Steamer <i>Great Britain</i> ...	148
Sketches of Mirage, Bristol Channel, S.S. <i>Harmonides</i> ...	94	Photograph of Four Masted Barque <i>Loch Torridon</i> ...	148
Sketches of Partial Eclipse of the Sun, Mediterranean, S.S. <i>Mongolia</i> ...	95	Photograph of S.S. <i>Kaikoura</i> ...	149
Sketch of Halo Phenomena, North Atlantic, S.S. <i>Orduna</i> ...	95	Chart showing Great Circle Routes and Distances between Cape of Good Hope and Perth, Adelaide and Melbourne ...	150
Sketch of Meteor, Red Sea, S.S. <i>Clan Sinclair</i> ...	96	Currents of the Red Sea and the part of the Indian Ocean North of Australia, Figures 1 to 5 ...	151-154
Photographs of Tristan da Cunha, S.S. <i>Atlantis</i> ...	96-98	Chart showing Stations for Weather Shipping Bulletin for Coast of Chile ...	161
Chart illustrating Recent Arctic Rescues ...	99	Chart showing Forecast and Storm Warning Areas for Atlantic and Gulf Coasts of United States ...	163
Photograph of S.S. <i>Baychimo</i> ...	100		
Chart and Graphs illustrating Atmospheric Obscurity in English Channel and Thames Approaches ...	102-103		

## LIST OF PLATES PRODUCED BY LITHOGRAPHIC PROCESS, INCLUDING CHARTS AND OTHER LARGE DIAGRAMS WHICH APPEAR IN EACH NUMBER.

Lithographic illustrations after page 40 in January number :—  
Ships' Wireless Weather Signals, Chart of the World.  
Currents in the Red Sea, February, March and April.  
Currents in the Portion of the Indian Ocean North of Australia, February, March and April.  
Ice Chart of the Southern Hemisphere, January, February and March.

Lithographic illustrations after page 82 in April number :—  
Ships' Wireless Weather Signals, Chart of the World.  
Currents in the Red Sea, May, June and July.  
Currents in the Portion of the Indian Ocean North of Australia, May, June and July.  
Chart of Limits of Ice, Western North Atlantic.  
Ice Chart of the Southern Hemisphere, April, May and June.

Lithographic illustrations after page 126 in July number :—  
Ships' Wireless Weather Signals, Chart of the World.

Marsden Charts Nos. I and II, showing number of sets of observations extracted between April 1st, 1920, and March 31st, 1934, and recovery of arrears of extraction of observations from logs received prior to 1920 for North Atlantic and Pacific Oceans.  
Chart III., Chart of the World, showing position of British Selected Ships at Sea on June 1st, 1933.

Currents in the Red Sea, August, September and October.  
Currents in the Portion of the Indian Ocean North of Australia, August, September and October.

Ice Charts of the Southern Hemisphere, July, August and September.

Lithographic illustrations after page 168, in October number :—  
Ships' Wireless Weather Signals, Chart of the World.  
Currents in the Red Sea, November, December and January.  
Currents in the Portion of the Indian Ocean North of Australia, November, December and January.  
Ice Charts of the Southern Hemisphere, October, November and December.

## INTERNATIONAL SHIPS' WIRELESS WEATHER TELEGRAPHY CODE.

	PAGE.		PAGE.
I.—Day	36	XI.—Barograph	bb.
II.—Position	36		
III.—Compass	36	XII.—Visibility	V.
IV.—do.	36	XIII.—Clouds	CL.
V.—Wind	36	XIV.—do.	CM.
VI.—Weather	36	XV.—do.	CH.
VII.—do.	37	XVI.—do.	C.
VIII.—Barometer	37	XVII.—do.	N and (N)
		XVIII.—Temperature	td.
IX.—do.	37	XIX.—Swell	K.
X.—Barograph	37	XX.—Speed	f.
P.	Day of the week ...		Amount of rise or fall of the Barometer in the last three hours (Adapted for British Ships) ...
Q.	Octant of the Globe ...		37
DD.	Compass Table for Wind direction to points ...		37
d and ds.	Compass Table to half cardinal points ...		38
F.	Wind Force, Beaufort Scale ...		38
ww.	Present Weather (Abridged for British Ships) ...		38
W.	Past Weather ...		38
BB.	Code Table for corrected barometer readings in millibars and inches (Adapted for British Ships) ...		38
A.	Change of Barometer in last 2, 3 or 4 hours (Adapted for British Ships) ...		38
a.	Characteristic of changes of the Barometer in the last three hours ...		38

## ERRATA.

Volume VII, No. 84 (December 1930), page 262 :—  
Errata—For No. 83 substitute No. 81.

Volume VII, No. 84 (December 1930), page 246 :—  
Indian Ocean Currents.

Table I.  
Indian Ocean.

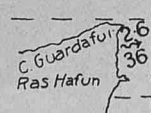
Current.	November to January N.E. Monsoon.	
	Mean Set and Drift.	Number of Observations.
	for S. 47° E. 1	43
East African Coast Current ...	Substitute S. 85° W. 11	43

Volume VII, No. 84 (December 1930) :—

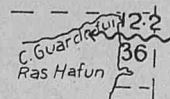
Currents on the Tracks from Cape Leeuwin to Perim, Direct and via Colombo (Western Portion), November, December and January.

## CHART SHOWING CURRENT ARROWS.

In the area, Latitude 10° N. to 12° N., from the African coast to Longitude 52° E., the current given thus :—



should be



(N. 87° W. 12.2 miles per day, 36 observations.)

**ERRATA** (*continued*).

Volume XI, No. 114 (April 1934), page 57 :—

North Atlantic Lane Routes.

United States.

Track "A" (Extra Southern).

Westbound.

*For 43° 30' North, substitute 40° 30' North.*



# MARINE METEOROLOGY.

## Co-operation of Shipowners, Masters and Mates.

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

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

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

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

At present the observing fleet is limited to a number not exceeding 360 observing ships. The number of British "Selected Ships" is determined upon the British proportion of world tonnage, on the assumption that there should be a total of 1,000 "Selected Ships" of all nations.

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

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

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

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

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

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

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

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

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

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

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

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

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

All ships fitted with W/T are advised to procure the DECODE for use with the International Code for Wireless Weather Messages from Ships, M.O. Pubn. 329, which can be obtained from H.M. Stationery Office, price 3d. This gives a description of the system of communication of "Selected Ships," as well as the DECODE.

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

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HUMBER...	Captain A. M. BROWN, Ellerman Wilson Line Office, Hull. (Telephone No.: Central 16180).
SOUTHAMPTON	Captain Sir BENJAMIN CHAVE, K.B.E. Room 35 Royal Mail Buildings.
SYDNEY, New South Wales.	Commander G. D. WILLIAMS, D.S.O., R.D., R.N.R. Captain G. B. MERCER. Customs House. (Telephone No.: B6421).
TYNE ..	Captain J. J. MCEWAN, Marine School, South Shields.

## DERELICTS AND FLOATING WRECKAGE.

Date.	Position		Description.	Date.	Position.		Description.
	Latitude.	Longitude.			Latitude.	Longitude.	
NORTH SEA.				Buoy marked <i>wreck</i> . Abandoned fishing vessel <i>Quo Vadis</i> , on fire, dangerous to navigation. Fishing vessel <i>B.K. 29 Fife's Own</i> , on fire, burning to water's edge, dangerous to navigation.	NORTH ATLANTIC.		
6.9.34	52°30'N.	2°32'E.	4.9.34		41°50'N.	30°40'W.	Iron bell buoy, apparently American, with red or rusty collar, Red buoy with upper structure for light partly destroyed. Log covered with barnacles, about 25 feet long, dangerous to navigation. Drifting buoy, dangerous to navigation. Rusty iron buoy. Conical buoy adrift, dangerous to navigation.
11.8.34	51°25'N.	2°11'E.	10.9.34		49°45'N.	11°23'W.	
12.9.34	56°04'N.	1°53'W.	11.9.34		46°47'N.	9°39'W.	
ENGLISH CHANNEL.			14.9.34		55°06'N.	14°40'W.	
15.9.34	48°58'N.	4°40'W.	14.9.34	48°51'N.	6°28'W.	Conical buoy marked <i>BIS Artiglio No. 3</i> .	
MEDITERRANEAN.			16.9.34	51°38'N.	7°16'W.		
10.9.34	37°11'N.	11°12'E.	Conical buoy marked <i>No. 4</i> adrift.	CARIBBEAN SEA.			
				3.9.34	19°10'N.	74°20'W.	Large tree, about 50 feet long, partly submerged.



# CHART OF THE WESTERN NORTH ATLANTIC.

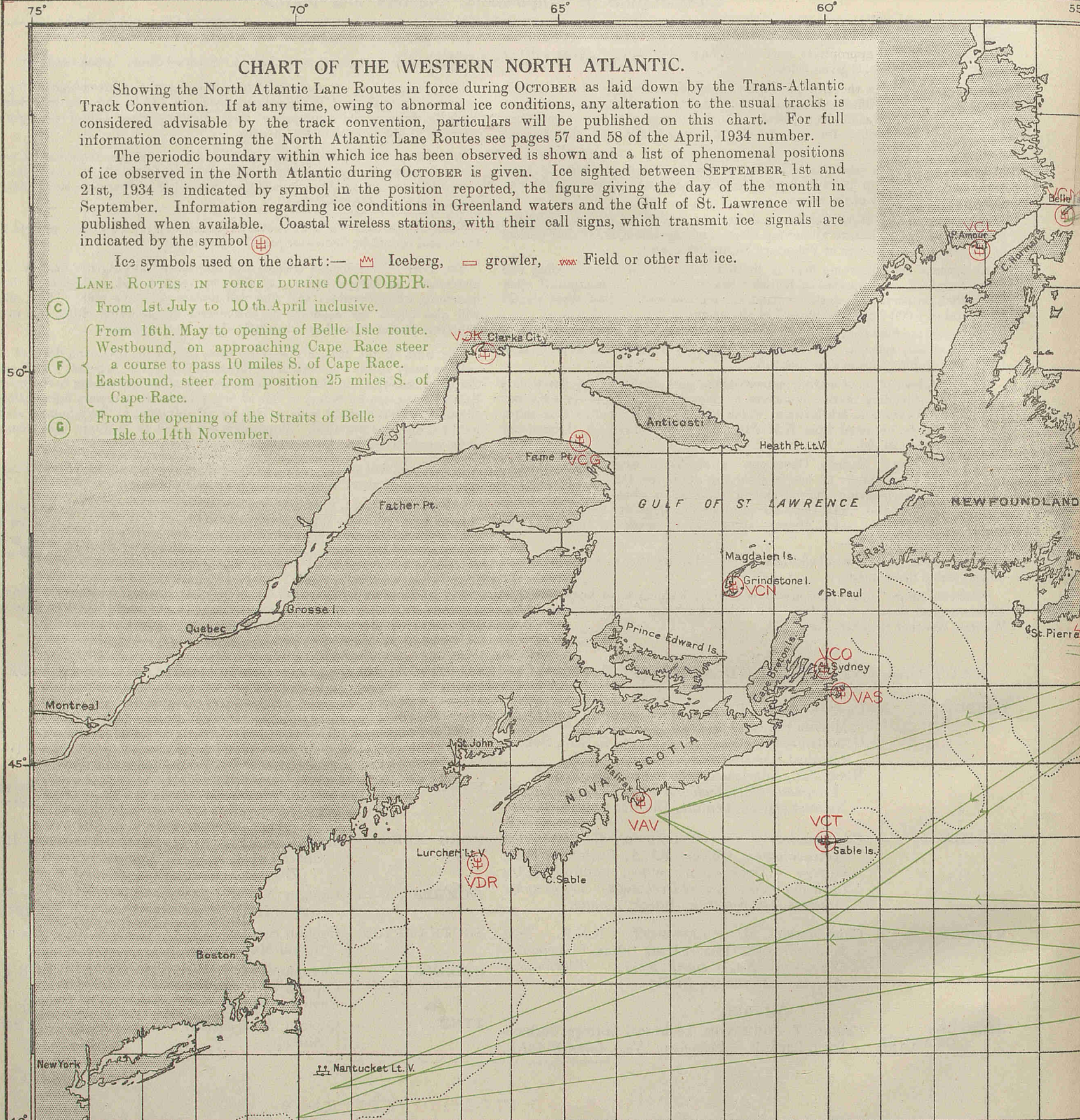
Showing the North Atlantic Lane Routes in force during OCTOBER as laid down by the Trans-Atlantic Track Convention. If at any time, owing to abnormal ice conditions, any alteration to the usual tracks is considered advisable by the track convention, particulars will be published on this chart. For full information concerning the North Atlantic Lane Routes see pages 57 and 58 of the April, 1934 number.

The periodic boundary within which ice has been observed is shown and a list of phenomenal positions of ice observed in the North Atlantic during OCTOBER is given. Ice sighted between SEPTEMBER 1st and 21st, 1934 is indicated by symbol in the position reported, the figure giving the day of the month in September. Information regarding ice conditions in Greenland waters and the Gulf of St. Lawrence will be published when available. Coastal wireless stations, with their call signs, which transmit ice signals are indicated by the symbol ⊕

Ice symbols used on the chart: — Iceberg, growler, Field or other flat ice.

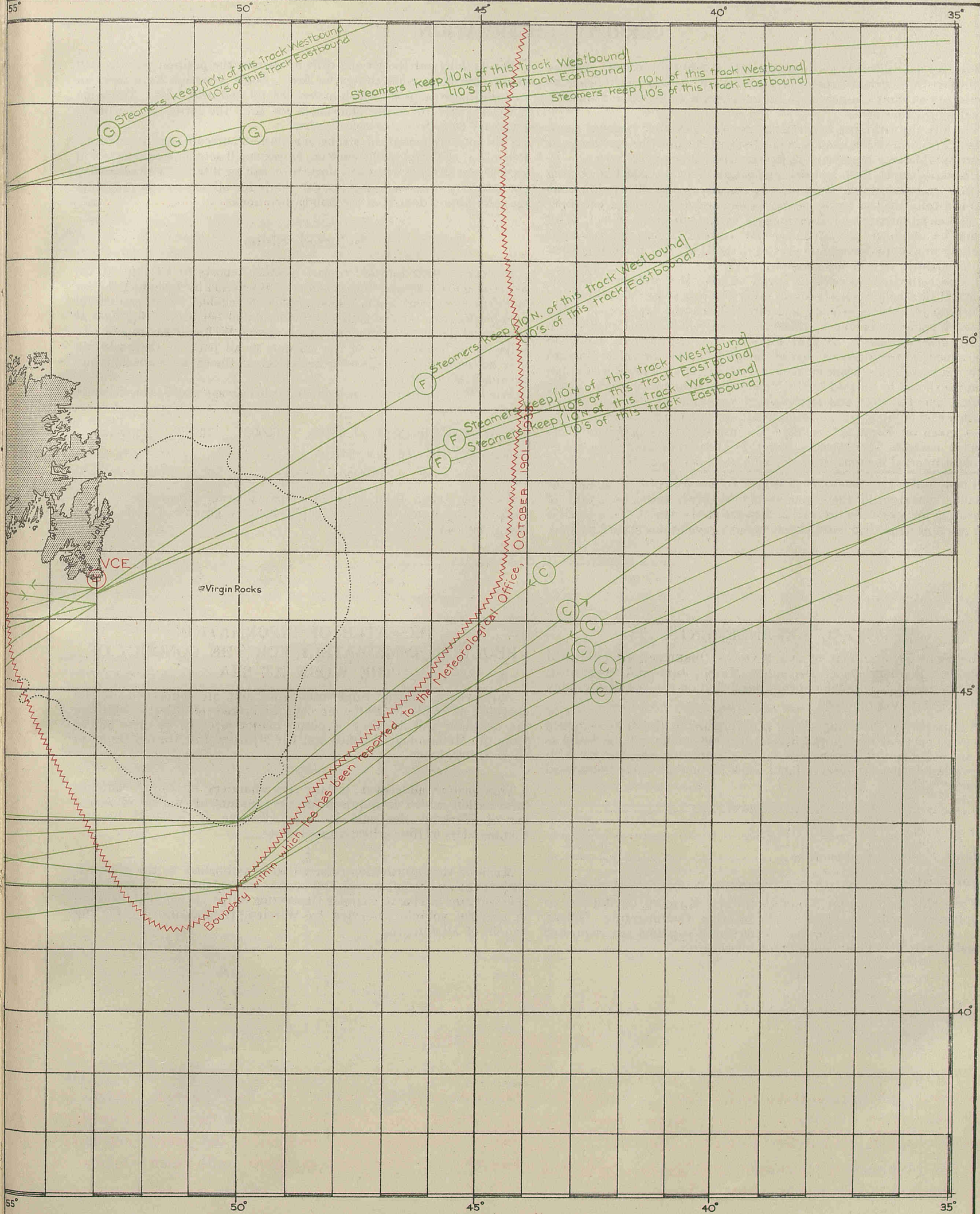
## LANE ROUTES IN FORCE DURING OCTOBER.

- (C) From 1st July to 10th April inclusive.
- (F) From 16th May to opening of Belle Isle route. Westbound, on approaching Cape Race steer a course to pass 10 miles S. of Cape Race. Eastbound, steer from position 25 miles S. of Cape Race.
- (G) From the opening of the Straits of Belle Isle to 14th November.



## PHENOMENAL POSITIONS OF ICE.

Date.	Ship or Source of Report.	Position. Lat. Long.	Remarks.
Oct. 15, 1883	S.S. Elenora ...	37°00' N. 18°00' W.	Piece ice.
" 8, 1912	S.S. Putney Bridge...	35°15' N. 44°50' W.	Small berg 35 ft. long, 6 ft. high.
" 27, 1916	S.S. Montreal ...	51°17' N. 41°17' W.	Small berg.
" 2, 1918	U.S. Hyd., Bulletin	50°10' N. 40°50' W.	Large berg.
" 19, 1920	Do.	45°22' N. 40°00' W.	Berg.
" 17, 1921	S.S. Mt. Vernon ...	45°24' N. 40°07' W.	Berg.
" 6, 1922	S.S. Christian Krogh	48°23' N. 42°19' W.	Berg about 70 ft. high, 400 ft. long.
" 7, 1923	S.S. Eastern Dawn...	50°43' N. 40°42' W.	Large growler about 100 ft. square.
" 23, 1927	Trawler, Grecian Empire.	30 mls. E.S.E. of Outer Skerries, Shetland Is.	Piece of ice 100 ft. long, 6 ft. above water.





# NOTICES TO MARINE OBSERVERS.

## CURRENT OBSERVATION.

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

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

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

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

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

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

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

It is not only records of strong or abnormal currents that are desired. Records of the state of the current, no set, small sets, moderate sets and great sets at all times when the information can be obtained with reliability are necessary for completing current charts for all oceans and providing the information desired in the sailing directions.

## Selected Ships.

In making their routine wireless weather reports to all ships (C.Q.) Selected ships may give material aid to navigation by including the set and drift of current found when considered reliable. This practice of broadcasting the set and drift of current found between Stellar fixes at sunset and dawn twilight in the next routine W/T weather report also helps in our investigation of the currents in all parts of the world and may be the means of improving knowledge of the causes, variations and peculiarities of currents.

When the set and drift is included the code message may be conveniently shortened thus:

C Q WEATHER 13167 55106 00000 16979 Current  
From 15N 52E To 16N 54E.  
58° one knot Dalgoma

Example taken from Selected Ships' Register Form 138 of M.V. *Dalgoma* for March 5th, 1933. supplementary groups of code figures being omitted.

## POSTAL ARRANGEMENTS.

The quarterly numbers of the MARINE OBSERVER are published on the last Wednesdays of December, March, June and September, while the monthly supplements are published on the last Wednesday of the intervening months.

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 or supplement with appropriate forms for observational work 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 or Supplement will be 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 Supplements, 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.

## LATE NOTICES

### COVER FOR MARINE OBSERVER.

Marine observers, regular recipients and subscribers to this Journal are informed that a binding cover for Volume XI of "The Marine Observer" may be obtained from H.M. Stationery Office, through any bookseller, price 2s.

The arrangements for assembling the numbers for binding is described in this number page 133.

It should be clearly understood that this cover is not the cover used for binding "Excellent" awards, which is far superior; but it will be found to be of good quality and a useful means of preserving the yearly numbers, for which a title page is issued with each October number.



## FLEET LIST.

### VOLUNTARY OBSERVING SHIPS.

The following is a complete list of British observing ships regularly carrying out voluntary services of marine meteorology with the guidance of the Marine Division of the Meteorological Office.

The names of the Captains and observing officers of observing ships, and the Senior Wireless Operators of Selected Ships are given, as ascertained from the last written return received.

Meteorological Logs, Records, and W/T Weather Registers received between the dates specified at the head of the seventh column are acknowledged by Form number, with commencing and ending dates of period covered by the returns; the date when the last return was received being given in the eighth column.

The Captains of observing ships are requested to take this acknowledgment in cordial thanks and grateful recognition to them and their observing officers and wireless operators for the returns made and the voluntary service rendered in all parts of the world.

The classification of meteorological logs and Selected Ships' records and registers will be notified to the Captains by post card Form 1343. Only in exceptional cases will individual letters be sent to the Captains of observing ships.

The Port Meteorological Officers and Merchant Navy Agents at the ports are advised as necessary, and they will, as necessary, communicate such advice verbally by personal call upon the Captain.

Excellent Awards will be made at the end of the financial year. The names of the Captains and Principal Observing officers gaining these awards will be published in a special list in the Marine Observer.

It is requested that prior notification of changes of service, probable periods of lay up, transfer of Captains, or other circumstances which may prevent the continuance of voluntary meteorological service at sea, may be made to the appropriate Port Meteorological Officer or Merchant Navy Agent.

Ships not making the appropriate written returns within a reasonable period will be removed from the list, steps taken to recover any instruments lent, and the free issue of the Marine Observer discontinued.

The number of voluntary observing ships is limited to a maximum total of 360.

The number of Selected Ships detailed to carry out the voluntary service provided for in Clause (C) of Article 35 of the Convention for Safety of Life at Sea, Merchant Shipping (Safety and Load Line Conventions) Act, 1932, is determined by the British proportion of the world's tonnage; and is at present 287.

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

#### *Explanation of Abbreviations.*

The number appearing before the name of an observing ship in this list is her number for the time being as a British Selected Ship.

†† indicates fitted with wireless telegraphic apparatus for long range, long wave, continuous wave transmission and reception.

\*† indicates fitted with wireless telegraphic apparatus for transmission and reception; fitted for reception only of long range, long wave, continuous wave.

\*\* indicates fitted with wireless telegraphic apparatus for transmission and reception; but not fitted for long range, long wave, continuous wave transmission or reception.

M.V. = Motor Vessel.

S.T. = Steam Trawler.

Ships having no such letters after their names are steamships.

M.L. = Equipped with a complete set of tested instruments lent by the Meteorological Office for keeping the meteorological log.

M = Ships' own mercurial barometer, found to be sufficiently accurate and reliable for the purpose of observation for making wireless weather reports.

S. = Partly or wholly equipped with tested instruments lent by the Meteorological Office for the purpose of carrying out the duties of a Selected Ship, when detailed to do so.

A. = Ships' own aneroid.

Name of Vessel.	Captain.	Observing Officers.	Senior Wireless Operator.	Meteorological Instrument Equipment.	Line.	Logs, Registers, or Records Contributed. 7.6.34 to 6.9.34.	Date Last Return Received.
122 †† <i>Accra</i> , M.V. ...	J. C. Shooter ...	O. E. Jones, L. Collings ...	G. Arrowsmith...	M.-S.	Elder Dempster...	Fms. 911 & 138 31.5.34 to 6.7.34	10.7.34
055 *† <i>Actor</i> ...	J. Bellett ...	E. Pearce, C. C. Heaton, L. Frost.	P. Cormack ...	M.	Harrison ...	" " 3.6.34 to 7.8.34	11.8.34
123 †† <i>Adda</i> , M.V. ...	J. H. Lawson ...	E. Moors, H. L. Papworth ...	A. L. J. Edwards	M.-S.	Elder Dempster...	" " 28.6.34 to 5.8.34	8.8.34
273 *† <i>Adrastus</i> ...	H. Goodacre ...	R. Blakey, R. T. Harries, T. A. Kent.	S. R. Purkiss ...	M.L.	A. Holt ...	Fm. 915 18.2.34 to 9.7.34	15.8.34
129 †† <i>Adriatic</i> ... ..	C. P. Freeman, R.D., Commr., R.N.R.	J. C. Boyce, G. T. Kavanagh, J. Farrell.	H. G. Warren ...	S.	Cunard White Star	Fms. 911 & 138 5.8.34 to 17.8.34	20.8.34
090 *† <i>Aeneas</i> ... ..	J. Hatfield ...	F. H. Barley, G. Edge, G. Drake.	I. E. Jones ...	"	A Holt ...	" " 26.3.34 to 13.7.34	27.7.34
166 *† <i>Agamemnon</i> , M.V.	J. G. Reynard ...	B. Baths, T. R. Phillips, F. Fisher.	A. C. Nevin ...	"	" ...	" " 6.5.34 to 24.7.34	28.7.34
<i>Aidan</i> ... ..	F. C. P. Harris ...	H. O. Williams, S. Pollock, C. W. Smethurst.	" ...	M.L.	Booth ...	Fm. 915 13.9.33 to 5.5.34	1.6.34
065 †† <i>Akaroa</i> ... ..	W. G. Summers ...	H. R. Dunnet, J. L. Stolls, — Wood.	H. A. McGaskill	S.	Shaw Savill ...	Fms. 911 & 138 26.2.34 to 3.6.34	30.6.34
032 †† <i>Alaunia</i> ... ..	H. A. L. Bond, R.D., Capt., R.N.R.	L. N. MacMillan, H. L. Pryse, J. O. Chambers.	R. L. Ottley ...	"	Cunard White Star	Fm. " 11.6.34 to 24.8.34	30.8.34
<i>Alban</i> ... ..	L. Evans ...	F. R. Holman, R. Parry, A. S. Richardson.	" ...	M.L.	Booth ...	Fm. 915 11.6.34 to 29.6.34	5.7.34
135 †† <i>Alcantara</i> , M.V.	E. Clarke, R.D., Commr., R.N.R.	W. Dovell, J. W. Stephens, E. Drake.	W. Smith ...	S.	Royal Mail ...	Fms. 911 & 138 3.6.34 to 16.7.34	25.7.34
178 *† <i>Alipore</i> ... ..	E. F. Hannan, R.D., Commr., R.N.R.	W. T. C. Lethbridge, K.P. Naire, G. D. Copeland.	E. T. Hutchings	M.	P. & O. ...	" " 20.4.34 to 2.8.34	5.9.34
175 †† <i>Almanzora</i> ...	T. J. C. Buret ...	A. E. H. Randle, G. M. Fletcher, M. Hay.	J. Cadwell ...	S.	Royal Mail ...	" " 23.5.34 to 27.8.34	29.8.34



## THE MARINE OBSERVER

Name of Vessel.	Captain.	Observing Officers.	Senior Wireless Operator.	Meteoro-logical Instrument Equip-ment.	Line.	Logs, Registers, or Records Contributed. 7.6.34 to 6.9.34.	Date Last Return Received.
012 †† <i>Almeda Star</i> ...	H. C. Howard ...	R. White, H. Austen, S. W. Lane.	R. N. Austin ...	M.	Blue Star ...	Fms. 911 & 138 14.5.34 to 29.8.34	1.9.34
022 *† <i>Alynbank</i> ...	D. Gillies ...	S. Morris, A. Hunter, E. Binfield.	... ..	M.L.	A. Weir ...	Fm. 915 ...23.4.33 to 10.10.33	13.12.33
103 †† <i>Amarapoora</i> ...	W. C. C. Plage ...	J. D. Graham ...	F. E. Ash ...	S.	Henderson ...	Fm. 911 8.5.34 to 7.6.34	12.6.34
103 †† <i>Andalucia Star</i> ...	R. Vernon ...	G. G. McPherson, B. Ball, J. H. Mortimer.	... ..	M.	Blue Star ...	Fms. 911 & 138 29.4.34 to 9.8.34	10.8.34
209 †† <i>Aorangi</i> , M.V. ...	J. F. Spring-Brown ...	D. H. Richards, L. P. Bourke, E. M. Anderson.	C. F. G. Taylor ...	M.L.	Canadian- Australasian.	Fm. 915 1.3.34 to 14.6.34	27.8.34
120 †† <i>Apapa</i> , M.V. ...	A. Faith ...	C. V. Evans, B. White ...	J. Rea ...	M.-S.	Elder Dempster ...	Fms. 911 & 138 2.5.34 to 17.8.34	23.8.34
029 †† <i>Appam</i> ...	J. M. Draper ...	R. K. Palmer, B. C. Haigh, T. R. Walker.	R. J. Dowling ...	S.	" " ...	" " 17.5.34 to 2.9.34	4.9.34
017 †† <i>Aquitania</i> ...	G. Gibbons, R.D., Capt., R.N.R.	L. R. Sharp, E. A. Divers, W. L. P. Cox.	A. H. Farman ...	"	Cunard White Star ...	" " 3.6.34 to 30.8.34	1.9.34
115 †† <i>Arandora Star</i> ...	E. W. Moulton ...	L. S. Hassell, J. Brunton, E. Huntley Smith.	J. T. Williams ...	M.-S.	Blue Star ...	" " 27.5.34 to 2.8.34	7.8.34
114 *† <i>Ariguani</i> ...	J. H. H. Seudamore, D.S.C., R.D., Commr., R.N.R.	W. J. Maxwell, T. Crane ...	E. M. Evans ...	S.	Elders & Fyffes ...	" " 16.5.34 to 29.7.34	1.8.34
144 †† <i>Arlanza</i> ...	B. Shillito, R. D., Commr., R.N.R.	G. D. Bonner, M. J. Morton, C. R. Brown.	G. Hunt ...	"	Royal Mail ...	" " 20.6.34 to 30.7.34	1.8.34
091 †† <i>Armadale Castle</i> ...	A. O. Morgan, R.D., Commr., R.N.R.	W. R. Andrews, A. E. Payne.	E. P. Haslam ...	"	Union Castle ...	" " 16.6.34 to 5.8.34	8.8.34
127 *† <i>Arracan</i> ...	N. Wiles ...	J. A. C. MacCall ...	... ..	"	Henderson ...	Fm. 911 20.11.33 to 11.4.34	18.5.34
095 †† <i>Arundel Castle</i> ...	G. J. Whitfield ...	J. A. Ferguson, P. G. McIver ...	W. A. Brown ...	"	Union Castle ...	Fms. 911 & 138 21.4.34 to 12.8.34	15.8.34
233 †† <i>Ascania</i> ...	J. G. P. Bissett, R.D., Commr., R.N.R.	E. J. R. Pollitt, J. A. Myles, J. G. Bradley.	A. R. Tripp ...	"	Cunard ...	Fm. 912 " 28.5.34 to 10.8.34	14.8.34
280 *† <i>Astronomer</i> ...	J. Richards ...	A. S. Rogers ...	... ..	M.	White Star Harrison ...	Fms. 911 & 138 25.6.34 to 10.8.34	14.8.34
061 †† <i>Atlantis</i> ...	A. Purvis ...	J. Smith, J. Chamberlain, N. Millais.	T. Bradfield ...	M.-S.	Royal Mail ...	" " 20.5.34 to 1.8.34	4.8.34
133 †† <i>Avelona Star</i> ...	G. E. Hopper ...	J. Coldwell, P. A. P. Clark, J. Davis.	S. J. J. Scott ...	"	Blue Star ...	" " 19.4.34 to 9.7.34	12.7.34
124 †† <i>Avila Star</i> ...	R. J. Thomas ...	F. N. Johnson, E. Lowndes, J. Heggen.	B. King ...	M.	" " ...	" " 10.6.34 to 25.7.34	28.7.34
068 †† <i>Balmoral Castle</i> ...	J. Attwood ...	A. C. G. Price, H. Bunn, N. Willock.	J. Sharp ...	S.	Union Castle ...	" " 19.5.34 to 8.7.34	14.7.34
179 *† <i>Balranald</i> ...	H. Williams ...	D. C. Swahey, L. Cook, R. D. W. McKay.	E. Whitby ...	M.	P. & O. Branch ...	" " 5.5.34 to 21.7.34	7.8.34
248 *† <i>Banffshire</i> ...	A. W. P. Gibb ...	R. F. Buckley, F. H. Petherbridge, H. T. Peletier.	W. M. Ewing ...	"	Turnbull Martin ...	" " 28.3.34 to 16.6.34	2.7.24
180 *† <i>Baradine</i> ...	W. D. C. Smith ...	R. G. Wood, A. E. Clay, R. S. Kerridge.	E. Howard ...	"	P. & O. Branch ...	" " 12.3.34 to 19.6.34	25.6.34
037 *† <i>Baronesa</i> ...	R. W. Compton ...	F. J. Kent, J. R. Faulkner, J. G. Freeman.	E. W. Robson ...	"	Houlder ...	" " 15.4.34 to 14.6.34	18.6.34
181 *† <i>Barrabool</i> ...	J. S. Sheepwash ...	J. D. Strike, A. Gething, T. Watkins.	C. T. Seaton ...	"	P. & O. Branch ...	" " 16.5.34 to 11.8.34	20.8.34
070 *† <i>Bayano</i> ...	A. W. Legge ...	W. Sumner, W. Butcher, A. Crone.	R. E. Blizzard ...	S.	Elders & Fyffes ...	" " 24.5.34 to 3.8.34	14.8.34
183 †† <i>Bendigo</i> ...	F. N. Wyatt ...	H. P. Mallet, H. T. Rigden, D. West.	J. Kimminmouth ...	M.-S.	P. & O. Branch ...	" " 18.2.34 to 24.5.34	28.5.34
237 †† <i>Berengaria</i> ...	Sir E. T. Britten, R.D., Commr., R.N.R.	M. Boston, J. D. Archer, J. V. Locke.	J. N. Cragg ...	S.	Cunard White Star ...	" " 10.6.34 to 23.8.34	25.8.34
145 *† <i>Berwickshire</i> ...	E. H. Evans ...	E. Coulthart, J. C. Robertson, E. J. Brittain.	F. Smith ...	"	Turnbull Martin ...	" " 6.5.34 to 15.8.34	17.8.34
<i>Birchbank</i> ...	R. B. Ellis ...	J. Llewellyn, F. A. Munday, J. Mountain.	... ..	M.L.	A. Weir ...	Fm. 915 18.9.33 to 24.2.34	12.3.34
007 *† <i>Bradfyne</i> ...	J. O'Neill ...	P. Evans, F. W. Burn, O. E. Brown.	C. K. Castle ...	S.	Reardon Smith ...	Fm. 911 23.5.33 to 26.10.33	21.11.33
<i>Brighton</i> ...	W. Lidbetter ...	E. Balcombe ...	S. Wood ...	"	Southern Rly. ...	Telegraphic Report 3.9.34	3.9.34
057 †† <i>Britannic</i> , M.V. ...	P. R. Vaughan, D.S.C., R.D., Commr., R.N.R.	O. V. Lucas, A. E. Harvey, A. J. Fisher.	T. F. Alton ...	"	Cunard White Star ...	Fms. 911 & 138 21.5.34 to 3.9.34	6.9.34
269 *† <i>British Admiral</i> ...	H. Faulkner ...	H. Munn, T. L. Hill, R. M. Shaw.	H. B. Nisbet ...	M.	British Tankers ...	" " 9.4.34 to 26.8.34	4.9.34
038 *† <i>British Corporal</i> ...	J. H. Sloan ...	A. E. Undery, W. C. Wall...	J. E. Peachy ...	"	" " ...	" " 18.5.34 to 14.8.34	25.8.34
<i>British Enterprise</i> ...	A. Scorah ...	J. T. Hamlyn ...	... ..	"	" " ...	Fm. 911 12.5.34 to 27.6.34	3.7.34
249 *† <i>Buteshire</i> ...	C. A. I. Laird ...	J. D. Elvish, P. McMillan, P. H. Hill.	E. B. Place ...	S.	Turnbull Martin ...	Fms. 911 & 138 17.1.34 to 24.3.34	16.4.34
031 †† <i>Caledonia</i> ...	A. Collie ...	R. Blake, T. K. McMillan, — White.	J. F. Reid ...	"	Anchor ...	Fm. 912 31.5.34 to 25.8.34	28.8.34
139 †† <i>California</i> ...	R. W. Smart ...	J. F. Adams, R. L. Robertson, A. Crain.	W. Thompson ...	"	" " ...	Fms. 911 & 138 31.5.34 to 25.8.34	28.8.34
<i>Cambria</i> ...	E. B. Turner ...	V. A. Phillips ...	J. Pritchard ...	M.L.	L.M. & S. Rly. ...	Telegraphic Report ... 25.8.34	25.8.34
<i>Cambridge</i> ...	R. Williams ...	P. Shakespeare, J. Trotter, V. Canton.	... ..	"	Federal ...	Fm. 915 8.4.34 to 9.8.34	15.8.34
266 †† <i>Cameronia</i> ...	W. Gemmel ...	E. Stormont, L. Taylor, A. Martin.	J. Harvey ...	S.	Anchor ...	Fms. 911 & 138 20.5.34 to 20.8.34	22.8.34
086 *† <i>Camito</i> ...	S. Browne ...	J. C. Morgan, A. E. Leech, G. M. Roberts.	L. H. Fudge ...	"	Elders & Fyffes ...	Fm. 912 20.5.34 to 8.7.34	12.7.34
259 *† <i>Canonesa</i> ...	W. H. Brodie ...	H. L. Sherwell, F. F. Flint, E. J. L. Stone.	C. J. Woolway... ..	M.	Houlder ...	Fms. 911 & 138 9.11.33 to 3.3.34	5.3.34
117 *† <i>Cape of Good Hope</i> ...	T. A. Jacobson ...	A. Peacock ...	F. Groves ...	S.	Lyle S.S. Co. ...	Fm. 911 6.5.34 to 16.6.34	20.6.34
190 †† <i>Carinthia</i> ...	A. T. Brown, R.D., Capt., R.N.R.	J. Chapman, H. Hudson, G. S. Hutchison.	J. Harvey ...	"	Cunard White Star ...	Fms. 911 & 138 30.1.34 to 30.5.34	6.6.34
092 †† <i>Carnarvon Castle</i> , M.V. ...	C. E. Stuart, R.D., Capt., R.N.R.	G. L. Clarke, E. T. Tamlyn...	D. Blow ...	"	Union Castle ...	" " 12.5.34 to 27.6.34	3.7.34
155 †† <i>Carthage</i> ...	H. M. Jack ...	H. J. Cholerton, H. J. Mann, J. L. Dunkley.	G. Bailey ...	M.-S.	P. & O. ...	" " 25.5.34 to 15.7.34	17.7.34
184 †† <i>Cathay</i> ...	C. B. Roche ...	A. J. McHattie, E. Cowell, G. L. Farnfield.	H. Dawson ...	"	" " ...	" " 19.2.34 to 23.5.34	29.5.34
011 †† <i>Ceramic</i> ...	W. J. Saunders ...	R. G. Roberts, J. Collins ...	W. M. Ross ...	S.	White Star ...	" " 10.5.34 to 13.6.34	15.6.34
191 *† <i>Chindwin</i> ...	G. Paterson ...	J. G. Aitken, A. R. McPherson, P. McCabe.	A. C. Headley ...	"	Henderson ...	" " 27.1.34 to 13.5.34	16.5.34
067 *† <i>Chinese Prince</i> ...	W. Irvine ...	B. J. Jenkins, J. Hennessey, E. G. Jones.	D. T. Roberts ...	M.L.	Furness Withy ...	" " 4.6.34 to 17.8.34	27.8.34
192 †† <i>Chitral</i> ...	O. Siggers, R.D., Commr., R.N.R.	G. L. Bateman, F. D. Shaw, J. Stansfield.	S. Norwood ...	M.-S.	P. & O. ...	Fm. 915 9.3.34 to 3.6.34	26.7.34
051 *† <i>City of Auckland</i> ...	W. Rowlands ...	A. G. Freeman, J. W. Cubbon, A. H. Horan.	L. C. Cullimore...	S.	Ellerman ...	Fms. 911 & 138 23.4.34 to 23.8.34	29.8.34
<i>City of Barcelona</i> ...	W. Hill ...	J. McK. Annot, R. S. Conway ...	... ..	M.	" " ...	" " 19.12.33 to 14.4.34	30.4.34
						Fm. 911 ... 27.5.34 to 12.8.34	21.8.34



## FLEET LIST

iii

Name of Vessel.	Captain.	Observing Officers.	Senior Wireless Operator.	Meteoro-logical Instrument Equip-ment.	Line.	Logs, Registers, or Records Contributed. 7.6.34 to 6.9.34.	Date Last Return Received.
265 *† City of Baroda	H. Percival ...	H. G. Williams, R. E. Hannaford, J. L. Robertson.	J. McMurran ...	S.	Ellerman...	Fms. 911 & 138 14.4.34 to 24.6.34	9.7.34
158 *† City of Cuiro ...	E. G. Hoppins...	J. H. Brown, H. Laird, D. M. Williams.	T. O. Sandham...	M.	" ...	Fm. 911 13.5.34 to 10.8.34	28.8.34
013 *† City of Cambridge	R. E. Teague ...	W. Garrick, E. W. Nelson, J. Wood.	R. O. Garret ...	S.	" ...	" 6.5.34 to 27.7.34	8.8.34
City of Canton ...	J. H. Rutter ...	J. N. Pulford, P. J. Byrne, L. Boundy.	" ...	M.	" ...	" 20.5.34 to 30.7.34	2.8.34
157 *† City of Delhi ...	J. Wyper ...	P. R. Winship, W. N. Piercy, J. Muir.	P. T. Dwane ...	S.	" ...	Fms. 911 & 138 16.4.34 to 25.8.34	1.9.34
City of Dieppe	H. Cartwright ...	J. Hudson, J. P. A. Arthur, N. F. Ayres.	" ...	"	" ...	Fm. 915 5.12.33 to 25.3.34	28.4.34
049 *† City of Evansville	D. O. Evans ...	G. V. Conolly, W. Barnet, G. Eyre.	" ...	M.	" ...	Fm. 911 10.6.34 to 12.8.34	5.9.34
220 †† City of Exeter ...	D. M. Bremner ...	W. S. Jackson, N. Groundwater, E. Gillies.	T. Fleetwood ...	S.	" ...	Fms. 911 & 138 8.5.34 to 6.7.34	11.7.34
089 *† City of Hereford	C. V. Avery ...	R. S. Webber, J. F. Lindell, W. S. Doidge.	B. P. Dalglish	M.	" ...	" 24.4.34 to 20.8.34	31.8.34
028 †† City of London ...	J. G. Brown ...	W. H. Matheson, B. E. Hooper, J. G. G. Fyfe.	C. Smith ...	S.	" ...	" 28.3.34 to 28.5.34	1.6.34
256 *† City of Lyons ...	H. Johnston ...	A. Potter, J. E. Barclay, A. Cran.	P. J. Ahearn ...	M.	" ...	" 10.6.34 to 23.8.34	31.8.34
066 †† City of Nagpur...	N. McNeill, O.B.E.	H. A. Hazee, W. Kerr, W. V. Highton.	A. R. Beynon ...	S.	" ...	" 9.4.34 to 9.6.34	12.6.34
074 †† City of Paris ...	D. H. Lloyd ...	A. Hamilton, A. Macfie, T. Stewart.	A. Forbes ...	"	" ...	" 22.2.34 to 30.4.34	2.5.34
City of Perth ...	D. H. Metcalf ...	A. M. Westlake, J. Owen, R. F. Henry.	" ...	M.L.	" ...	Fm. 915 14.4.33 to 8.9.33	9.10.33
271 *† City of Roubaix	W. Gray ...	C. Collard, W. H. Dalton, J. H. Owen.	J. W. Alexander	M.	" ...	Fms. 911 & 138 20.5.34 to 28.6.34	15.8.34
272 *† City of Singapore	T. Cooper ...	G. T. Mathias, D. Pattison, S. Ayles.	W. E. Gilbert ...	"	" ...	" 26.4.34 to 26.5.34	1.6.34
035 *† City of Sydney ...	F. McKay ...	J. Kinley, S. Brett, P. G. A. King.	E. R. Bloom ...	"	" ...	" 7.5.34 to 11.8.34	20.8.34
167 *† City of Tokio ...	H. G. Booth ...	C. F. Clarke ...	W. Connell ...	S.	" ...	" 1.3.34 to 8.4.34	30.5.34
City of Winchester	— Burton ...	" ...	" ...	M.L.	" ...	" 19.5.34 to 11.8.34	18.8.34
125 *† City of Windsor	T. G. Hammersley ...	A. P. Sydney, E. H. Lynes, J. T. Wills.	E. L. Hume ...	S.	" ...	" 29.4.34 to 21.8.34	25.8.34
160 *† City of Winnipeg	R. J. Ricketts ...	F. Tibbett, G. Longfield, D. W. Penberthy.	F. H. Portess ...	"	" ...	" 2.11.33 to 18.2.34	7.3.34
City of Yokohama	J. A. Singleton...	F. J. R. Roore ...	" ...	"	" ...	Fm. 911 29.5.34 to 21.7.34	13.8.34
027 *† Clan Farquhar ...	R. M. Robertson ...	J. Browne ...	" ...	M.	Clan ...	" 19.5.34 to 11.8.34	18.8.34
050 *† Clan Macalister	F. J. Stenson, R.D., A.D.C., Capt., R.N.R.	H. Duncan ...	E. Hervey ...	S.	" ...	Fms. 911 & 138 10.5.34 to 24.6.34	11.7.34
241 *† Clan Macbeth ...	H. Andrews ...	H. Whitehead, A. V. Howard, P. N. Colepeper.	G. Barrett ...	"	" ...	" 1.4.34 to 16.7.34	9.8.34
222 *† Clan Macdougall	R. F. Redford, Lieut.-Commr., R.N.R.	T. W. Ellis, D. F. Sutton, S. G. Cresswell.	A. V. Saunders	"	" ...	" 27.12.33 to 4.4.34	7.5.34
287 *† Clan Macfarlane	W. J. Hughes ...	J. H. Wright, J. R. Moss, C. D. B. Mitchell.	A. G. Olson ...	"	" ...	" 1.5.34 to 14.6.34	20.6.34
118 *† Clan Macindoe...	H. E. G. Scott-Smith, O.B.E., R.D., R.N.R.	J. B. Sparkes, T. N. Soane, C. R. Wheat.	W. C. Munro ...	"	" ...	" 12.4.34 to 3.7.34	4.8.34
Clan Macnair ...	W. G. Holman...	R. Armstrong, B. V. Brown, C. A. Thomas.	" ...	"	" ...	Fm. 911 7.5.34 to 28.7.34	2.8.34
255 *† Clan Macneil ...	A. Low ...	H. F. Town, B. H. Magill, E. Coultas.	A. Haslam ...	"	" ...	Fms. 911 & 138 6.4.34 to 21.8.34	29.8.34
001 *† Clan Macphee ...	A. R. Cossar ...	J. Dulsan, R. G. Bagnall, H. Hind.	J. D. Marshall...	"	" ...	" 20.4.34 to 3.8.34	23.8.34
168 *† Clan Macquagart	W. F. West ...	H. R. Crosscombe, R. D. Helme.	G. L. Brown ...	"	" ...	" 17.1.34 to 1.5.34	8.5.34
002 *† Clan Macwhirter	R. Hinton Browne	L. W. Evans, H. T. Watkins, J. O. O'Hellier.	C. A. Kerr ...	"	" ...	" 29.5.34 to 9.7.34	11.8.34
003 *† Clan Malcolm ...	J. Pollock ...	D. H. Brewer...	A. P. Goodman	"	" ...	" 3.6.34 to 4.9.34	6.9.34
283 *† Clan Morrison ...	R. P. Galer, R.D., Commr., R.N.R.	A. Hamblly, E. Croucher, J. Brodie.	A. R. Cox ...	"	" ...	" 27.4.34 to 12.8.34	17.8.34
279 *† Clan Urquhart ...	G. Young ...	W. M. Graham, J. Millar	A. Butcher ...	M.	" ...	Fms. 911 & 138 29.4.34 to 7.6.34	15.6.34
041 *† Clydebank M.V.	G. Sutherland ...	W. Mendus, F. J. Law, E. Needham.	A. Hastings ...	S.	A. Weir ...	" 3.5.34 to 9.7.34	25.7.34
016 *† Comliebank, M.V.	S. Currie ...	C. R. Aitken, L. St. J. French, W. A. McMoreland.	M. Timlin ...	"	" ...	" 12.5.34 to 13.6.34	16.7.34
185 †† Comorin ...	C. W. Cartwright, D.S.C.	D. Meikle, D. S. Charles, G. W. du Fosse.	R. V. Gregory ...	M.-S.	P. & O. ...	" 23.4.34 to 26.7.34	10.8.34
198 *† Contractor ...	D. L. Whyte ...	A. L. Cottier, J. H. Roberts, R. L. Bryde.	J. Lee ...	M.	Harrison ...	" 13.4.34 to 2.8.34	27.8.34
187 *† Coptic, M.V.	D. Christie ...	R. H. Barnes, S. Wallis, R. R. L. Rosoman.	" ...	S.	Shaw Savill & Albion.	Fm. 915 4.2.34 to 10.5.34	17.5.34
258 †† Corfu ...	F. E. French, R.D., Capt., R.N.R.	C. S. Cooke, D. M. F. Lombard, J. T. Sheffield.	A. S. Fraser ...	M.-S.	P. & O. ...	Fms. 911 & 138 19.4.34 to 28.7.34	27.8.34
Cornwall ...	H. E. Reilly ...	G. Dibley, A. Brown, W. W. Wakeford.	" ...	M.L.	Federal ...	Fm. 915 28.3.34 to 7.7.34	21.7.34
006 *† Coronado ...	R. A. Thorburn, R.D., Commr., R.N.R.	A. Magill, W. Ireland	R. Oakley ...	S.	Elders & Fyffes	Fms. 911 & 138 11.5.34 to 1.9.34	4.9.34
214 *† Counsellor ...	J. Jackson ...	E. B. Stephens, A. J. Turner, A. A. Johnson.	H. Edwin ...	M.	Harrison ...	" 17.6.34 to 25.8.34	29.8.34
036 *† Cumberland ...	T. L. Maltby ...	N. A. Thomas, N. A. Blount, R. A. Bellfield.	E. Slater ...	S.	Federal ...	" 14.2.34 to 16.5.34	24.5.34
285 *† Custodian ...	T. O'Connor ...	H. Fitzsimmons, W. Pemberton, F. Bryant.	W. H. Golds-worthy.	M.	Harrison ...	" 22.5.34 to 12.8.34	28.8.34
169 *† Dalgoma ...	P. H. Beeching ...	J. Marsland, F. J. Ellis, T. A. Robinson.	W. G. Ellison ...	"	British India ...	" 7.5.34 to 15.8.34	4.9.34
Dearne ...	T. H. Woodhead ...	H. Robinson, F. Sherwood, E. E. Lea.	" ...	M.L.	Goole Stm.Shipping	Fm. 915 3.3.34 to 12.8.34	25.8.34
Deebank ...	J. Robertson ...	J. Edward, S. Eperon, T. C. Cormack.	" ...	"	A. Weir ...	" 18.12.33 to 15.5.34	10.8.34
138 *† Desimer ...	W. A. Hansen ...	G. J. Crispin ...	H. Raw ...	M.	Harrison ...	Fms. 911 & 138 7.6.34 to 2.7.34	30.7.34
Diplomat ...	W. E. Harraden ...	F. W. Page ...	" ...	"	" ...	Fm. 911 25.3.34 to 6.5.34	19.6.34
284 *† Director ...	B. Worthington ...	O. H. Goddard, J. R. Cowell, A. Robertson.	W. Hayes ...	"	" ...	Fms. 911 & 138 28.3.34 to 8.6.34	18.6.34
Discoverer ...	W. Rowberry ...	E. P. Simmons ...	" ...	"	" ...	Fm. 911 29.4.34 to 17.7.34	23.7.34
251 *† R.R.S. Discovery II.	A. L. Nelson ...	R. Walker, H. Kirkwood, L. C. Hill.	A. Morriss ...	M.L.	Falkland Is. Govt.	Fm. 915 11.2.34 to 27.5.34	16.7.34
221 *† Domala M.V. ...	J. Endersby ...	W. R. Day ...	" ...	M.	British India ...	Fm. 911 11.5.34 to 26.7.34	31.7.34



## THE MARINE OBSERVER

Name of Vessel.	Captain.	Observing Officers.	Senior Wireless Operator.	Meteoro-logical Instrument Equip-ment.	Line.	Logs, Registers, or Records Contributed. 7.6.34 to 6.9.34.	Date Last Return Received.
064 †† <i>Doric</i> ...	J. McRostie ...	R. Hawkins, R. Conway, F. E. Patchett.	G. H. Thomas ...	S.	Cunard White Star	Fms. 911 & 138 24.6.34 to 27.8.34	29.8.34
136 †† <i>Doric Star</i> ...	S. N. Capon ...	G. L. Evans, M. C. O'Hare, E. A. Irvine.	G. A. Dobson ...	M.	Blue Star ...	" " 6.2.34 to 16.5.34	28.5.34
275 †† <i>Dramatist</i> ...	A. J. Meek ...	B. P. Longster, C. V. Watts, R. L. Williams.	R. Cramborne ...	"	Harrison ...	" " 15.5.34 to 9.8.34	28.8.34
142 †† <i>Duchess of Atholl</i>	G. F. McCombie ...	R. Walgate, C. E. Duggan, E. V. Glennie.	E. Murphy ...	M.-S.	Canadian Pacific	Fm. 912 " 27.5.34 to 1.9.34 5.9.34	
152 †† <i>Duchess of Bedford.</i>	J. Turnbull, C.B.E., R.D., Commodore, R.N.R.	L. Outram, E. J. Oatridge, R. Hyland.	S. H. Sinclair ...	"	" " }	Fms. 911 & 138 3.6.34 to 16.8.34 20.8.34	
151 †† <i>Duchess of Richmond.</i>	A. Rothwell ...	A. Massey, W. P. P. Phillips, N. Scallan.	J. F. Yorstan ...	"	" " }	Fms. 911 & 138 20.5.34 to 16.7.34 27.7.34	
143 †† <i>Duchess of York</i>	W. B. Coyle, R.D., Commr., R.N.R.	C. D. Watt, J. Stewart, A. Mackie.	J. Potts... ..	"	" " }	Fms. 911 & 138 20.5.34 to 6.7.34 9.7.34	
253 †† <i>Dumana</i> ...	H. T. Hudson, R.D., Commr., R.N.R.	W. M. Bain, A. H. Usher, A. W. Willis.	A. W. Davey ...	M.	British India ...	Fm. 912 10.6.34 to 23.8.34 29.8.34	
098 †† <i>Dunbar Castle, M.V.</i>	C. N. Bickford ...	L. H. Farrow, D. McKenzie	P. P. Williams...	S.	Union Castle ...	Fms. 911 & 138 6.3.34 to 16.8.34 23.8.34	
052 †† <i>Dunster Grange, M.V.</i>	G. F. Wilson ...	E. G. Raynor, R. G. Williams, E. Monckton.	W. Guthrie ...	M.	Houlder ...	" " 11.5.34 to 14.7.34 18.7.34	
102 †† <i>Duquesa</i> ...	C. R. Frost ...	A. McEwan, R. F. Martin, D. Murray.	H. Croker ...	"	Furness Withy ...	" " 22.4.34 to 28.6.34 30.6.34	
215 †† <i>Durenda, M.V....</i>	A. A. Parker ...	M. C. Williams, J. W. Douglas, T. E. Hardy.	T. F. Alexander ...	"	British India ...	" " 27.5.34 to 26.7.34 28.7.34	
<i>Eastern Coast</i> ...	W. Quirk ...	C. E. Martin, F. Darby, J. T. Williams.	... ..	M.L.	Coast Lines ...	Fm. 915 25.2.34 to 15.5.34 23.5.34	
077 †† <i>Edinburgh Castle</i>	H. B. Harvey ...	H. Close ...	G. Seurr ...	S.	Union Castle ...	Fms. 911 & 138 13.1.34 to 3.7.34 17.7.34	
107 †† <i>El Argentino, M.V.</i>	F. Ellis, D.S.C.	G. Brighton, C. G. Adlard, J. L. Murray.	E. Lovelock ...	M.	Houlder ...	" " 3.6.34 to 19.7.34 24.7.34	
009 †† <i>Elmworth, M.V.</i>	A. W. Gofton ...	L. Lidguard, P. McFarlane, A. H. Compton.	L. Cushion ...	"	R. S. Dalgleish ...	" " 21.5.34 to 8.7.34 14.7.34	
108 †† <i>Elstree Grange</i> ...	W. E. Williams ...	C. Feather, W. F. Heritage ...	A. E. George ...	"	Houlder ...	" " 20.4.34 to 12.6.34 28.6.34	
109 †† <i>El Paraguayo</i> ...	R. Owen ...	G. Fletcher, F. G. Rice, R. L. Aldridge.	J. Hunt... ..	"	" " ...	" " 8.5.34 to 5.8.34 10.8.34	
110 †† <i>El Uruguayo</i> ...	T. McNamara ...	F. E. Hallstone ...	R. C. Smith ...	"	" " ...	" " 11.6.34 to 9.8.34 18.8.34	
088 †† <i>Empire Star</i> ...	G. Owen, R.D., Commr., R.N.R.	J. L. Dawson, F. W. B. Gaubert, J. N. Wilson.	A. H. Walley ...	S.	Blue Star ...	" " 30.4.34 to 22.6.34 26.6.34	
282 †† <i>Empress of Australia.</i>	E. Griffith, R.N.R.	S. W. Keay, E. Roberts, F. Falconer.	P. J. Rosney ...	"	Canadian Pacific	" " 21.11.33 to 18.2.34 9.3.34	
034 †† <i>Empress of Britain.</i>	R. N. Stuart, V.C., D.S.O., R.D., Commr., R.N.R.	D. Dunn, N. W. Duck, A. C. Harrison.	L. B. Cleary ...	"	" " }	Fm. 912 " 24.5.34 to 4.9.34 6.9.34	
154 †† <i>Empress of Canada.</i>	A. J. Hailey, R.N.R. ...	W. C. Halliday, G. E. Morrell, J. Marshall.	R. D. Thomas ...	M.L.	" " }	Fms. 911 & 138 24.5.34 to 27.6.34 28.6.34	
153 †† <i>Empress of Japan</i>	L. D. Douglas, R.D., R.N.R.	A. Kennedy, J. S. Clarke, T. Macduff.	J. McLure ...	"	" " }	Fm. 912 10.6.34 to 22.8.34 27.8.34	
134 †† <i>Esperance Bay</i>	R. McKenzie ...	H. P. Last, R. Grant, A. E. Smith.	A. Stander ...	M.	Aberdeen Commonwealth.	" " 18.6.34 to 22.8.34 27.8.34	
<i>Fordsdale</i> ...	J. Avern, Commr., R.N.R.	M. Bennett, L. B. Miller, D. Ashley-Emile.	P. H. Smythe ...	M.L.	Shaw Savill ...	Fm. 915 2.12.33 to 27.3.34 5.6.34	
239 †† <i>Foylebank</i> ...	C. D. Logie ...	H. Ingledew, R. N. Wilkie, J. MacCallum.	J. McAlease ...	S.	A. Weir ...	" " 6.4.34 to 25.7.34 29.8.34	
030 †† <i>Franconia</i> ...	J. C. Townley, R.D., Capt., R.N.R.	R. A. J. Owlett, W. B. Tanner, P. O. Davis.	... ..	"	Cunard White Star	" " 17.7.34 to 22.8.34 27.8.34	
159 †† <i>Fresno City</i> ...	B. D. Thomas ...	B. E. Duffield, F. W. P. Davies, C. S. Whitticombe.	T. Prenton ...	"	Reardon Smith ...	" " 30.4.34 to 2.6.34 26.7.34	
186 †† <i>Georgie, M.V.</i> ...	F. F. Summers ...	W. G. B. Jones, J. H. Walker, B. Harrison.	A. Schofield ...	"	Cunard White Star	" " 4.6.34 to 18.8.34 21.8.34	
234 †† <i>Glaucus</i> ...	W. B. Ewan ...	O. Thomas, F. O. Browning, T. R. Walker.	J. C. Wilson ...	M.L.	A. Holt ...	" " 11.1.34 to 29.5.34 19.7.34	
026 †† <i>Glenbank, M.V.</i>	E. N. K. Blackmore ...	C. Sherwood, W. McBean, W. Thorne.	W. Williamson...	S.	A. Weir ...	Fms. 911 & 138 10.5.34 to 1.6.34 2.7.34	
126 †† <i>Glengarry, M.V.</i>	J. Angier ...	R. W. Brooks, P. G. Neill, S. W. Bell.	J. E. Kemp ...	M.	Glen ...	" " 21.5.34 to 2.9.34 5.9.34	
085 †† <i>Governor</i> ...	J. Davidson ...	A. Watson, G. Greaves ...	G. F. Peel ...	"	Harrison ...	" " 10.6.34 to 21.8.34 27.8.34	
111 †† <i>Hardwicke Grange</i>	W. H. Fowler ...	W. L. Baker, A. O. Seybold, W. E. Ellis.	A. Turner ...	"	Houlder ...	" " 20.8.33 to 6.2.34 21.2.34	
218 †† <i>Harmonides</i> ...	F. R. Elwell ...	E. E. Avery, C. Hare, L. C. Higgins.	W. S. Armstrong	S.	R. P. Houston ...	" " 27.4.34 to 10.7.34 14.7.34	
262 †† <i>Hauraki, M.V.</i>	A. T. Norton ...	A. Cousin, H. J. P. Weston, H. Brockett.	... ..	M.L.	Union S.S. Co., N.Z. Federal ...	Fm. 915 10.2.34 to 5.5.34 11.7.34	
<i>Hertford</i> ...	E. R. Kemp ...	H. K. Cockerill, N. L. Warren, A. B. Goord.	P. Moroney ...	"	" " ...	" " 10.3.34 to 23.6.34 27.6.34	
<i>Hibernia</i> ...	J. R. Bulmer ...	R. Woodall ...	... ..	S.	L.M. & S. Railway	Telegraphic Report 4.9.34 4.9.34	
182 †† <i>Highland Brigade</i>	C. A. Cocks, D.S.C., R.D., Capt., R.N.R.	W. Wrake, S. Woolley, J. I. James.	A. Reynolds ...	M.S.	Royal Mail ...	Fms. 911 & 138 3.5.34 to 26.8.34 1.9.34	
116 †† <i>Highland Chieftain, M.V.</i>	D. Collings ...	P. R. Burrell, F. B. Collinson, W. L. Irving.	J. Malcolm ...	"	" " ...	" " 14.6.34 to 28.7.34 4.8.34	
099 †† <i>Highland Monarch, M.V.</i>	R. G. Clayton, D.S.C., R.D., Commr., R.N.R.	R. N. Fletcher, E. V. Scullard, J. H. Fitton.	E. F. Weatherhead.	"	" " ...	" " 28.5.34 to 17.7.34 20.7.34	
230 †† <i>Highland Patriot</i>	R. A. Robinson ...	P. Yeatman, F. Dawson ...	J. Hylton ...	"	" " ...	" " 16.5.34 to 1.7.34 6.7.34	
250 †† <i>Highland Princess, M.V.</i>	O. V. Schlanbusch ...	F. E. C. Cox, L. J. Peterson, H. Davies.	H. Morgan ...	"	" " ...	" " 19.4.34 to 12.8.34 18.8.34	
075 †† <i>Hobson's Bay</i> ...	T. V. Roberts, R.D., Commr., R.N.R.	F. Charnley, W. Williams, R. Hamilton.	A. R. Porter ...	M.	Aberdeen Commonwealth.	" " 10.5.34 to 11.8.34 16.8.34	
235 †† <i>Homeric</i> ...	F. A. Frank, D.S.O., R.D., Commr., R.N.R.	J. Wairtore, L. Thompson, H. Morgan.	F. Bradley ...	S.	Cunard White Star	" " 17.6.34 to 4.9.34 6.9.34	
261 †† <i>Huntingdon</i> ...	H. G. B. Field ...	C. Cremin, C. W. Roberts, E. R. Rae.	A. R. Mugridge	"	Federal ...	" " 8.6.34 to 13.7.34 6.9.34	
200 †† <i>Huntsman</i> ...	H. Russell ...	J. Richardson, D. Goddard...	J. Taylor ...	M.	Harrison ...	" " 22.11.33 to 14.2.34 21.2.34	
260 †† <i>Inanda</i> ...	W. H. Gibbings ...	T. E. Steele, W. S. Eustance, W. R. Jones	E. J. Cook ...	"	" " ...	" " 27.5.34 to 25.8.34 28.8.34	



## FLEET LIST

V

Name of Vessel.	Captain.	Observing Officers.	Senior Wireless Operator.	Meteoro-logical Instrument Equip-ment.	Line.	Logs, Registers, or Records Contributed. 7.6.34 to 6.9.34.	Date Last Return Received.	
189 †† <i>Ionic</i> ... <i>Ixion</i> ...	W. H. P. Jackson ... C. J. Watson ...	N. E. Banks ... B. Kelly, H. H. Sanderson, J. D. Auld.	S. A. Sorrell ... F. C. Wall ...	S. M.L.	White Star ... A. Holt ...	Fms. 911 & 138 Fm. 915	19.5.34 to 2.9.34 18.4.34 to 5.7.34	5.9.34 15.8.34
226 *† <i>Javanese Prince</i> , M.V.	J. Smith ...	W. M. Henry, J. H. King, L. W. Cooper.	J. Everitt ...	"	Prince ...	"	10.1.34 to 24.7.34	29.8.34
188 †† <i>Kaisar-i-Hind</i> ...	W. A. Cotching ...	J. Travis, F. M. Squire, H. Williamson.	W. Stevenson ...	M.-S.	P. & O. ...	Fms. 911 & 138	29.4.34 to 2.8.34	4.8.34
206 *† <i>Karama</i> , M.V.... <i>Kemmendine</i> ...	W. Dawson ... R. B. Reid ...	W. Hill, N. S. Milne, R. J. McKenzie. C. R. Roy ...	A. Strachan ... ... ..	S. M.	Shaw Savill & Albion. Henderson ...	Fm. 915 Fm. 911	19.2.34 to 14.5.34 16.6.34 to 30.8.34	28.5.34 5.9.34
147 †† <i>Laconia</i> ...	B. B. Oram, R.D., Commr., R.N.R.	J. Ashcroft, E. W. Connell, N. Kingscote.	K. Greenall ...	S.	Cunard White Star	Fms. 911 & 138	28.5.34 to 11.8.34	14.8.34
193 *† <i>Lahore</i> ...	A. E. Salway ...	F. Hull, D. I. Spencer, S. R. Eva.	H. Olding ...	M.	P. & O. ...	" "	20.3.34 to 6.6.34	13.6.34
062 †† <i>Lancastria</i> ...	G. R. Dolphin, R.D., Commr. R.N.R.	J. C. Dawson, J. McKie, J. Cawna.	R. M. Shore ...	S.	Cunard White Star	" "	21.5.34 to 18.7.34	23.7.34
082 *† <i>La Paz</i> , M.V. ...	W. J. Good ...	G. Pattison, S. E. Ayland ...	F. Tunnard ...	M.	Pacific S.N. Co. ...	" "	3.1.34 to 4.4.34	10.4.34
076 *† <i>Largs Bay</i> ...	W. M. Jermyn ...	C. Meyer, N. Miller, H. Clark	S. P. Lewis ...	"	Aberdeen Com- monwealth.	" "	1.3.34 to 2.6.34	13.6.34
112 *† <i>La Rosarina</i> ...	L. Bearpark ...	T. C. Townsend, S. W. Howell, H. Powell.	H. Delve ...	"	Houlder ...	" "	13.5.34 to 20.7.34	23.7.34
267 *† <i>Lassell</i> ...	E. R. Williams ...	J. L. Boyd, R. L. Hagley ...	S. Foster ...	S.	Lamport & Holt	" "	11.12.33 to 5.3.34	13.3.34
100 †† <i>Laurentic</i> ...	W. S. Quinn ...	J. Dray, A. Thompson, F. W. Laws.	W. Davies ...	"	Cunard	" "	10.6.34 to 27.7.34	28.7.34
083 *† <i>Lautaro</i> , M.V. ...	F. D. Cox ...	J. Williams, E. C. Hicks ...	W. Findlay ...	M.	White Star { Pacific S.N. Co. ...	Fm. 912 Fms. 911 & 138	10.6.34 to 27.7.34 25.4.34 to 24.8.34	28.7.34 28.8.34
254 *† <i>Limerick</i> , M.V....	A. J. Angell ...	W. H. Timberlake, J. Small- wood, J. E. Clarke.	J. Gillespie ...	"	Federal ...	" "	11.2.34 to 11.6.34	5.7.34
093 *† <i>Llandaff Castle</i> ...	H. L. Scholefield ...	W. E. Clark ...	G. S. Lewis ...	S.	Union Castle ...	" "	21.6.34 to 19.8.34	22.8.34
094 *† <i>Llandovery Castle</i>	J. MacMahon, R.D., Commr., R.N.R.	A. G. Bidwell, H. S. Warren	A. E. Hunter ...	"	" "	" "	5.3.34 to 29.4.34	7.5.34
097 †† <i>Llangibby Castle</i> , M.V.	H. R. Northwood ...	H. L. Hollands ...	J. Gilbert ...	"	" "	" "	21.4.34 to 23.6.34	12.7.34
216 *† <i>Llanstephan</i> <i>Castle</i>	W. Weller ...	S. S. Smith, J. A. Wilson ...	H. W. Langshaw	"	" "	" "	24.6.34 to 18.8.34	29.8.34
084 *† <i>Lobos</i> , M.V. ...	J. H. Kirkwood ...	E. F. Potter, A. C. Taylor, J. D. Richards.	R. H. Taff ...	M.	Pacific S.N. Co. ...	" "	1.5.34 to 10.8.34	13.8.34
137 *† <i>Logician</i> ...	R. J. Herschel ...	L. Seddon, T. W. Kent ...	W. Cain ...	"	Harrison ...	" "	22.5.34 to 4.7.34	30.7.34
008 *† <i>Losada</i> , M.V. ...	R. E. Dunn, O.B.E.	D. W. Hutchison ...	R. Pickering ...	"	Pacific S.N. Co. ...	" "	22.4.34 to 3.6.34	7.6.34
232 *† <i>Madura</i> ...	J. A. Wright ...	C. W. Allerton, A. W. Willis, K. R. C. Letts.	H. O. Francis ...	"	British India ...	" "	7.6.34 to 15.8.34	18.8.34
078 *† <i>Magician</i> ...	A. G. Peterkin ...	W. E. Shotton, J. Haycocks	L. Sharland ...	"	Harrison ...	" "	12.6.34 to 8.8.34	14.8.34
231 *† <i>Mahana</i> ...	J. M. Cameron...	H. M. Thompson, C. C. Good, C. L. Carroll.	... ..	S.	Shaw Savill & Albion.	Fm. 915	3.12.33 to 9.4.34	16.4.34
101 *† <i>Mahia</i> ...	C. M. Andrews...	R. A. Costa, B. D. Atkin, R. K. Bolton.	R. Bell ...	"	" "	Fms. 911 & 138	13.3.34 to 22.6.34	4.7.34
140 *† <i>Mahratta</i> ...	W. Hill ...	H. F. Scolls, N. Grayson, W. Couling.	P. F. Dunford ...	M.	Brocklebank ...	" "	3.5.34 to 19.7.34	23.7.34
014 *† <i>Mahrona</i> ...	R. G. Hanna ...	J. B. Leigh, H. Willington, M. R. Melville.	W. Ritch ...	"	" "	" "	1.6.34 to 5.7.34	26.7.34
242 *† <i>Mahseer</i> ...	T. A. Tyson ...	E. Williams ...	G. D. Plant ...	"	" "	" "	30.1.34 to 12.4.34	25.4.34
015 *† <i>Mahsud</i> ...	R. W. Kershaw ...	H. Gillespie, J. R. Paisley, C. A. Jackson.	... ..	"	" "	" "	7.4.34 to 21.6.34	25.6.34
042 *† <i>Maimoa</i> ...	H. P. Thurston ...	J. A. McNab, A. Turnbull, A. S. Anthes.	R. Small ...	S.	Shaw Savill & Albion.	" "	14.3.34 to 9.7.34	18.7.34
054 †† <i>Majestic</i> ...	E. L. Trant, R.D., Commr., R.N.R.	R. B. O'Brien, E. A. Stuart, W. T. Fitzgerald.	J. R. Thomson...	"	Cunard White Star	" "	14.6.34 to 21.8.34	23.8.34
018 *† <i>Makalla</i> ...	L. T. Owen ...	J. Richardson, A. Hill, A. G. Gorham.	H. Barwix ...	M.	Brocklebank ...	" "	7.5.34 to 30.7.34	1.8.34
225 *† <i>Makura</i> ...	D. MacDonald ...	N. H. Pearson, S. H. Craw- ford, J. N. Collins.	E. J. Gough ...	M.L.	Canadian- Australasian	Fm. 915	18.1.34 to 14.5.34	11.7.34
236 *† <i>Malayan Prince</i>	E. Harcastle ...	C. S. Smith, W. R. Harries, J. Baird.	A. A. Lees ...	"	Prince ...	"	14.12.33 to 27.3.34	2.5.34
219 *† <i>Malda</i> ...	F. Caffyn ...	V. R. Christmas, R. A. Crozin, L. A. Wintle.	— Littlecot ...	M.	British India ...	Fms. 911 & 138	5.5.34 to 26.7.34	30.7.34
195 †† <i>Maloja</i> ...	E. A. J. W. Carter, R.D., Commr., R.N.R.	J. D. Green, P. Howarth, H. M. Askin.	A. Macbeth ...	M.-S.	P. & O. ...	" "	7.4.34 to 11.7.34	23.7.34
<i>Manchester</i> <i>Brigade</i> <i>Manchester</i> <i>Commerce</i>	F. D. Struss ... J. E. Riley ...	J. F. Whitby ... ... ..	... .. ... ..	M.L. "	Manchester Liners " "	Fm. 912 "	8.6.34 to 5.8.34 11.8.34	13.8.34 6.9.34
146 *† <i>Mandasor</i> ...	L. C. Shore ...	G. C. Cullen, E. Williams, A. Horspool.	R. H. Jones ...	M.	Brocklebank ...	Fms. 911 & 138	18.5.34 to 12.6.34	9.7.34
177 *† <i>Mantola</i> ...	D. F. James ...	J. Small, J. Duncan, L. J. Kew.	G. Jones ...	"	" "	" "	11.4.34 to 2.7.34	11.7.34
197 †† <i>Mantua</i> ...	J. M. Legg ...	J. Paice, N. W. Leach, W. Joliffe.	F. Harvey ...	M.-S.	P. & O. ...	" "	19.4.34 to 26.6.34	30.7.34
<i>Maron</i> , M.V. ...	J. A. Stewart ...	P. Purkis, D. W. Strond, M. Turner.	... ..	M.L.	A. Holt ...	" "	... ..	...
104 *† <i>Marquesa</i> ...	R. Smiles ...	J. Wetherall ...	W. H. Jarvis ...	M.	Furness Houlder	" "	21.3.34 to 25.5.34	29.5.34
213 †† <i>Mashobra</i> ...	W. A. J. Welsh ...	W. D. L. Reves, L. W. Scott	F. Rose ...	M.-S.	British India ...	" "	1.4.34 to 21.6.34	20.7.34
021 *† <i>Masula</i> ...	H. Dawes, D.S.O., O.B.E.	D. Gooding ...	R. J. Pyper ...	M.	" "	" "	2.5.34 to 18.7.34	24.7.34
217 *† <i>Matakana</i> ...	W. G. West ...	W. A. Sims-Reeves, E. Johan- sen, G. Hawley.	W. L. T. Ellison	S.	Shaw Savill & Albion.	" "	17.1.34 to 12.5.34	17.5.34
023 *† <i>Matheran</i> ...	H. D. Fulcher ...	W. Spencer, R. Penston, T. Johnston.	J. Heathcote ...	M.	Brocklebank ...	" "	28.6.34 to 23.7.34	13.8.34
223 *† <i>Matiana</i> ...	L. D. Patterson ...	A. H. Baird ...	... ..	"	British India ...	" "	1.5.34 to 1.6.34	30.6.34
024 *† <i>Matra</i> ...	N. P. Cornish ...	W. Robertson, A. E. Austin, T. F. Eggleston.	H. W. Forster ...	"	Brocklebank ...	" "	26.2.34 to 26.6.34	5.7.34
281 †† <i>Mauretania</i> ...	R. V. Peel, R.D., Com- modore, R.N.R.	D. M. MacLean, J. O. Arm- strong, H. V. Clarke.	G. H. Sellars ...	S.	Cunard White Star	" "	1.7.34 to 3.8.34	16.8.34



## THE MARINE OBSERVER

Name of Vessel.	Captain.	Observing Officers.	Senior Wireless Operator.	Meteoro-logical Instrument Equip-ment.	Line.	Logs, Registers, or Records Contributed. 7.6.34 to 6.9.34.	Date Last Return Received.
278 *† <i>Middlesex</i> ...	H. T. Wilde ...	E. G. Williams, C. Coraran, H. I. Phillips.	J. McCarthy ...	S.	Federal ...	Fms. 911 & 138 30.1.34 to 19.4.34	27.6.34
194 †† <i>Moldavia</i> ...	C. H. C. Allin ...	H. Toon, W. Alexander, R. Perry.	J. W. Quain ...	M.-S.	P. & O. ...	" " 11.6.34 to 2.9.34	4.9.34
199 †† <i>Mongolia</i> ...	H. R. Rhodes ...	H. M. Flint, G. Aspinall, T. Hopkins.	A. Morris ...	"	" ...	" " 25.3.34 to 2.8.34	11.8.34
148 †† <i>Montcalm</i> ...	H. A. Moore, R.D., Commr., R.N.R.	R. Antrobus, D. Parsons, F. W. Roberts.	J. Biggins ...	"	Canadian Pacific {	Fm. 912 " 17.6.34 to 29.8.34	1.9.34
149 †† <i>Montclare</i> ...	M. F. Murray ...	J. Soames, W. Thorburn, A. Tibbett.	H. A. Bowman ...	"	" "	Fms. 911 & 138 17.6.34 to 4.8.34	8.8.34
150 †† <i>Montrose</i> ...	A. H. Hall ...	E. F. Aikman, W. J. Roberts	A. G. Hill ...	"	" "	" " 3.6.34 to 31.8.34	3.9.34
164 †† <i>Mooltan</i> ...	E. P. Lyndon, R.D., Lt.-Commr., R.N.R.	J. M. Sinclair, A. D. Dennis, M. A. Trenfield.	J. E. Marsh ...	"	P. & O. ...	" " 5.5.34 to 8.8.34	13.8.34
196 †† <i>Mulbera</i> ...	L. W. Leaske, R.D., Lt.-Commr., R.N.R.	P. M. Wilson, E. J. Studart, P. Marsden.	J. D. Lovelock...	"	British India ...	" " 10.6.34 to 22.8.34	27.8.34
073 *† <i>Nagara</i> ...	S. Weller ...	H. A. Wright, F. Fraser, J. L. Smith.	E. G. Blackburn ...	M.	Royal Mail ...	" " 15.4.34 to 22.8.34	28.8.34
201 †† <i>Naldera</i> ...	R. C. Dene ...	E. J. R. North, F. W. J. Pearce, E. R. Physic.	R. Soans ...	S.	P. & O. ...	" " 17.5.34 to 20.7.34	27.8.34
<i>Nankin</i> ...	T. H. Scott-White ...	E. L. Birrell, A. H. Krummel, B. W. Dun.	E. Boul... ..	M.L.	Eastern and Aus-tralian.	Fm. 915 30.1.34 to 26.4.34	17.7.34
227 *† <i>Nardana</i> ...	J. V. Reilly ...	T. Warland, H. Goater, W. Clarke.	R. Rawcliffe ...	M.	British India ...	Fms. 911 & 138 5.2.34 to 20.4.34	25.4.34
202 †† <i>Narkunda</i> ...	F. Sudell, R.D., Commr., R.N.R.	H. C. Slinn, G. Randall, P. G. Lawrence.	C. Hurbert ...	M.-S.	P. & O. ...	" " 10.2.34 to 16.5.34	22.5.34
<i>Nascopie</i> ...	T. F. Smellie ...	T. O. Josh ...	... ..	S.	Hudson Bay Co.	Fm. 911 10.8.33 to 26.9.33	17.10.33
286 *† <i>Natia</i> ...	E. W. Bridges ...	T. Davies, F. S. Davison ...	G. A. Doreing ...	M.	Royal Mail ...	Fms. 911 & 138 20.5.34 to 12.7.34	17.7.34
<i>Nellore</i> ...	C. H. G. Lorriard, M.C.	G. E. Smith, A. A. Stevenson, H. E. Nuzum.	C. E. Robinson ...	M.L.	Eastern and Aus-tralian.	Fm. 915 11.2.34 to 30.5.34	10.8.34
019 *† <i>Nerbudda</i> ...	J. Blencowe ...	K. H. Goodman, H. C. Turner, B. C. Brooking.	R. O. Shaugh-nessy.	M.	British India ...	Fms. 911 & 138 1.5.34 to 3.6.34	16.7.34
162 *† <i>Nestor</i> ...	F. Adcock ...	R. Singleton, W. Pearce, T. Silcock.	C. F. Townsend ...	S.	A. Holt ...	" " 25.1.34 to 3.5.34	8.5.34
210 *† <i>Niagara</i> ...	T. V. Hill ...	G. H. Kime, D. A. Menlove, J. W. S. Madden.	G. M. Power ...	M.L.	Canadian-Australasian.	Fm. 915 1.2.34 to 19.5.34	11.7.34
<i>Norfolk</i> ...	R. L. H. McNish, D.S.O., Lt.-Commr., R.N.R.	H. Williamson, T. Windus, P. A. Block.	... ..	"	Federal ...	" 21.2.34 to 8.6.34	23.6.34
<i>Northern Coast</i> ...	H. Cameron ...	H. E. Thomson, B. C. Carlett	... ..	"	Coast Lines ...	" 29.3.34 to 27.8.34	3.9.34
<i>Northumberland</i> ...	A. E. Lettington ...	J. Marshall, D. Lyver, H. S. Cashmore.	... ..	"	Federal ...	" 24.3.34 to 20.7.34	24.7.34
<i>Observer</i> ...	J. Lowe ...	W. Wearing, F. Harnden, C. A. Daly.	... ..	M.	Harrison ...	Fm. 911 3.5.34 to 2.8.34	7.8.34
004 †† <i>Olympic</i> ...	J. W. Binks, R.D., R.N.R.	G. Brooks, H. S. Law, R. H. Shaw.	N. Clarke ...	S.	Cunard	Fms. 911 & 138 31.5.34 to 4.9.34	6.9.34
243 *† <i>Opaua</i> , M.V. ...	F. W. Robinson ...	J. McCulloch, J. C. Grose, H. S. Dawson.	F. W. Fowler ...	M.	White Star {	Fm. 912 3.8.34 to 4.9.34	6.9.34
170 †† <i>Orama</i> ...	E. P. Cameron, R.D., Capt., R.N.R.	C. H. Denton, L. Sly, W. L. Mackay.	... ..	S.	New Zealand Shipping.	Fms. 911 & 138 20.1.34 to 15.4.34	20.4.34
080 *† <i>Orari</i> ...	J. G. Almond ...	E. D. Gregory, F. A. Wilson, A. T. H. Weatherall.	W. E. Fordham ...	M.	Orient ...	Fms. 911 & 138 5.3.34 to 4.6.34	12.6.34
246 †† <i>Orbita</i> ...	D. R. Morgan ...	G. Gerety, A. Sissons ...	S. W. Mitchell ...	M.-S.	New Zealand Shipping.	Fm. 911 2.5.34 to 27.8.34	4.9.34
087 †† <i>Orduna</i> ...	D. R. Morgan ...	W. Vickers, R. D. Eckford, D. I. Jones.	S. O'Neill ...	"	Pacific S.N. Co.	Fms. 911 & 138 27.12.33 to 24.5.34	31.5.34
171 †† <i>Orford</i> ...	A. L. Owens, R.D., Capt., R.N.R.	P. Sargent, K. M. Morrison, W. H. Barker.	A. F. Edwards...	"	" "	" " 12.5.34 to 25.8.34	28.8.34
174 †† <i>Ormonde</i> ...	M. J. Sarson ...	C. E. Coles, J. M. Swanson, B. Paul.	B. Baxter ...	S.	Orient ...	" " 14.5.34 to 2.9.34	4.9.34
172 †† <i>Oronsay</i> ...	C. G. Matheson, D.S.O., R.D., Commadore, R.N.R.	C. W. Pinckney, G. B. M. Jones, E. M. Mackay.	K. Alston ...	"	" "	" " 1.4.34 to 3.7.34	5.7.34
173 †† <i>Orontes</i> ...	F. R. O'Sullivan ...	F. S. Gray, R. W. Roberts, J. K. Johnson.	S. G. Boon ...	M.-S.	" "	" " 19.2.34 to 22.5.34	6.6.34
105 †† <i>Orsova</i> ...	R. L. F. Hubbard, R.D., Commr., R.N.R.	J. C. Dowding, R. Galpin, W. A. Ellison.	R. B. Knights ...	S.	" "	" " 25.1.34 to 5.3.34	5.4.34
156 †† <i>Otranto</i> ...	L. V. James, D.S.C. ...	G. R. Grandage, J. Birch, L. L. Lloyd Jones.	H. R. Cheese ...	M.-S.	" "	" " 5.2.34 to 7.5.34	25.5.34
044 *† <i>Pacific Exporter</i> ...	C. E. Holland, Commr., R.N.R.	E. A. Tyrrell, C. Fryer ...	C. North ...	S.	" "	" " 30.4.34 to 31.7.34	4.8.34
277 *† <i>Pakeha</i> ...	W. J. Williams ...	T. H. Davies, C. A. Knox, M. J. Caws.	H. Ridgeway ...	"	Furness Withy ...	" " 20.3.34 to 14.6.34	20.6.34
<i>Paris</i> ...	B. Shaw ...	E. W. Smith ...	A. H. Jones ...	"	Shaw Savill & Albion.	" " 3.5.34 to 7.6.34	12.6.34
058 †† <i>Pennland</i> ...	J. Doughty ...	F. Good, J. Cross ...	R. E. Hammond ...	"	Southern Rly. ...	Telegraphic Report ... 9.7.34	9.7.34
<i>Penola</i> , Schooner	R. E. D. Ryder, Lieut., R.N.	... ..	... ..	M.L.	Red Star...	Fms. 911 & 138 3.6.34 to 18.8.34	20.8.34
204 *† <i>Peshawur</i> ...	E. P. Parfitt ...	T. C. Triscott, G. V. Legas-sick, J. H. Anderson.	A. H. Garbett ...	M.	British Graham Land Expedition.	Fm. 912 3.6.34 to 23.6.34	26.6.34
<i>Phemius</i> ...	C. A. Lakin ...	G. W. Best ...	... ..	S.	P. & O. ...	Fms. 911 & 138 28.5.34 to 1.7.34	5.7.34
039 *† <i>Planter</i> ...	A. H. Brown ...	J. C. Sinclair, F. R. Hill ...	D. O. Edwards...	"	A. Holt ...	Fm. 911 2.3.34 to 13.4.34	4.6.34
040 *† <i>Port Adelaide</i> ...	R. Williams ...	E. G. Jones, W. E. Dingle, G. Puttick.	... ..	"	Harrison ...	Fms. 911 & 138 29.1.34 to 22.5.34	9.6.34
238 *† <i>Port Alma</i> ...	W. Gilling ...	T. L. Kidwell, W. B. Hopkins, A. L. Walton.	... ..	"	Commonwealth & Dominion.	" " 29.12.33 to 9.5.34	25.6.34
128 *† <i>Port Auckland</i> ...	C. A. Robinson ...	W. Easton, C. E. Midwinter, P. Bradnell.	S. Adams ...	"	" "	Fm. 915 13.1.34 to 1.5.34	14.5.34
268 *† <i>Port Bowen</i> ...	A. H. Brown ...	R. Bettess, W. Craig, E. N. Howard.	... ..	"	" "	Fms. 911 & 138 27.7.33 to 14.11.33	9.12.33
130 *† <i>Port Caroline</i> ...	G. S. Hall ...	J. S. Moate, R. Nicholl ...	J. P. B. Jeffery ...	"	" "	" " 14.12.33 to 12.4.34	1.6.34
131 *† <i>Port Darwin</i> ...	J. J. Hudson ...	P. Howe, H. Duckling, W. Wakefield.	J. S. Kinnaird...	"	" "	" " 23.2.34 to 18.6.34	25.6.34
072 *† <i>Port Denison</i> ...	H. C. Jeffery ...	E. Wheeler, H. B. Walker, A. G. Russell.	V. T. Cole ...	"	" "	" " 20.2.34 to 22.5.34	2.6.34
<i>Port Dunedin</i> , M.V.	G. W. Hearn ...	L. C. Asser, F. W. Elgar, V. N. Ford.	W. B. Craig ...	M.L.	" "	" " 4.3.34 to 11.7.34	23.7.34
						" " 8.3.34 to 6.7.34	11.7.34



## FLEET LIST

vii

Name of Vessel.	Captain.	Observing Officers.	Senior Wireless Operator.	Meteorological Instrument Equipment.	Line.	Logs, Registers, or Records Contributed. 7.6.34 to 6.9.34.	Date Last Return Received.
010 *† Port Fremantle, M.V.	W. J. Enright, R.D., Commr., R.N.R.	A. Young, A. Holloway, G. Garner.	H. Lothian ...	S.	Commonwealth & Dominion	Fm. 915 31.3.34 to 15.7.34	17.8.34
Port Gisborne, M.V.	W. G. Higgs ...	R. B. Linklater, D. Watson, A. McClounan.	... ..	M.L.	" " "	Fm. 912 16.2.34 to 6.6.34	13.6.34
252 *† Port Hardy ...	J. Jack ...	D. F. Morgan, J. G. Thorn, W. D. Henderson.	K. H. Bond ...	S.	" " "	Fms. 911 & 138 2.12.33 to 31.3.34	18.4.34
Port Hunter ...	R. S. Durham, D.S.C....	G. M. B. Lovegrove, L. E. Ring, P. Beaham.	... ..	M.L.	" " "	Fm. 915 22.4.34 to 31.7.34	8.8.34
Port Wellington	R. Needham ...	A. J. Knell, E. Rogerson, R. R. Russel.	... ..	S.	" " " {	Fm. 912 10.3.34 to 24.6.34	7.7.34
106 *† Princessa ...	A. B. Friend ...	E. Lougheed, O. S. Sheard, F. Poulson.	R. Shackleton ...	M.	Houlder ...	Fms. 911 & 138 23.7.34 to 11.8.34	3.9.34
063 *† Queen City ...	R. V. Arkwright ...	J. W. Botterill ...	... ..	S.	Reardon Smith ...	Fm. 911 27.2.34 to 13.5.34	9.6.34
205 †† Rajputana ...	P. C. Headlam, R.D., Commr., R.N.R.	G. A. Webb S. H. Baldwin, K. W. Richardson.	W. Banbury ...	M.-S.	P. & O. ...	Fms. 911 & 138 13.5.34 to 15.8.34	20.8.34
228 †† Ranchi ...	A. H. Hignett, R.D., Commr., R.N.R.	T. T. Ferguson, J. P. McArthur, K. King.	H. Home ...	"	" " "	" " 27.5.34 to 29.8.34	5.9.34
224 †† Rangitane ...	A. W. McKellar, R.D., Capt., R.N.R.	G. E. Law, S. R. Leggett, C. B. Cathie.	W. Smith ...	"	New Zealand Shipping	" " 11.2.34 to 16.5.34	14.6.34
257 †† Rangitatu, M.V.	J. L. B. Hunter ...	R. S. Miller, R. S. Frost, V. Glassborow.	C. E. Terry ...	"	" " "	" " 11.3.34 to 12.6.34	27.8.34
240 †† Rangitiki, M.V.	H. Barnett ...	T. M. Devitt, C. A. Jones, R. Vincent.	L. V. Horn ...	"	" " "	" " 13.1.34 to 17.4.34	25.4.34
207 †† Ranpura ...	G. H. S. Furlong, O.B.E., R.D., Capt., R.N.R.	G. Maclean, J. Peter, M. G. Morris.	J. S. Skinner ...	"	P. & O. ...	" " 24.3.34 to 14.6.34	22.6.34
071 †† Rawalpindi ...	B. B. Beck ...	E. G. May ...	S. W. Sharp ...	"	" " "	" " 18.4.34 to 15.7.34	24.7.34
247 *† Recorder ...	J. J. Egerton ...	W. P. Baker, A. S. Milne, A. H. Howard.	T. Williamson ...	M.	Harrison ...	" " 31.3.33 to 17.6.34	26.6.34
132 *† Reina del Pacifico, M.V.	J. Ross ...	R. Bridson, J. K. Campbell, W. A. Hearle.	W. G. Sutherland	"	Pacific S.N. Co. ...	" " 17.4.34 to 15.8.34	20.8.34
Remuera ...	E. A. Holland ...	H. Hill, D. H. Clegg, J. C. Baker.	... ..	M.L.	New Zealand Shipping	Fm. 915 8.4.34 to 15.7.34	21.7.34
Rhexenor ...	C. F. Melling ...	W. G. Smith, C. T. Morgan, W. F. Lockead.	... ..	"	A. Holt ...	" 8.10.33 to 4.3.34	11.4.34
Rotorua ...	C. B. Lamb ...	H. N. Lawson, J. Knott, R. H. Carter.	... ..	"	New Zealand Shipping	" 25.2.34 to 26.6.34	1.8.34
203 *† Royal Star ...	W. Walsh ...	N. Clarkson, R. E. Winnall, H. Arton.	J. Walker ...	M.	Blue Star ...	Fms. 911 & 138 23.10.33 to 10.1.34	6.2.34
Ruahine ...	G. Kinnell ...	A. Hocken, N. Baddeley, D. Martin.	... ..	M.L.	New Zealand Shipping	Fm. 915 5.5.34 to 21.8.34	27.8.34
St. Helier ...	R. Pitman ...	G. Cartwright ...	... ..	S.	G.W. Railway ...	Telegraphic Report 23.8.34	23.8.34
St. Julien ...	T. Richardson ...	T. D. Thomas, F. E. Martin	... ..	"	Bunch Steam ...	" 4.9.34	4.9.34
St. Keerne, S.T.	A. Hatton ...	... ..	... ..	A.	Fishing Co. ...	Fm. 911 3.6.34 to 6.8.34	13.8.34
St. Patrick ...	C. W. Sanderson ...	T. D. Thomas ...	... ..	S.	G.W. Railway ...	Telegraphic Report 1.9.34	1.9.34
046 †† Samaria ...	R. G. Malin, R.D., R.N.R.	J. H. Kenworthy ...	... ..	"	Cunard White Star	" " " " "	"
Scotia ...	W. Hughes ...	W. H. Hughes ...	... ..	"	L.M. & S. Railway	Telegraphic Report 3.9.39	3.9.34
033 †† Scythia ...	W. A. Hawkes, R.D., Capt., R.N.R.	W. M. Stewart, A. B. Fasting, A. D. McCallum.	F. H. Williams...	"	Cunard White Star	Fms. 911 & 138 11.6.34 to 25.8.34	28.8.34
211 *† Shropshire, M.V.	R. P. Mann ...	D. Hetherington, J. K. Gemmel, H. B. Peate.	D. McLellan ...	"	Bibby ...	" " 31.3.34 to 7.6.34	11.6.34
121 *† Siamese Prince, M.V.	E. E. Litchfield ...	W. A. Niven, H. J. Steele ...	W. Childs ...	M.L.	Prince ...	Fm. 915 7.12.33 to 18.4.34	1.6.34
Silverwalnut, M.V.	J. Smith, R.N.R. ...	H. Rowe, G. F. West, W. J. Law.	... ..	"	Thompson ...	" 1.12.33 to 3.4.34	8.5.34
141 *† Somerset ...	E. R. Pilcher ...	H. M. Knight, B. C. Hamilton, J. N. A. Low.	A. E. Howard ...	S.	Federal ...	Fms. 911 & 138 25.12.33 to 6.5.34	22.5.34
Spero ...	W. A. Dossor ...	A. Kirk, G. Hodgson ...	... ..	M.L.	Ellerman Wilson	Fm. 915 27.1.34 to 7.7.34	16.7.34
Stephen ...	F. S. Furner ...	H. Sapworth, H. W. Taggart, P. B. Smeaton.	... ..	M.L.	Booth ...	Fm. 915 24.3.34 to 11.7.34	21.7.34
020 *† Stirlingshire ...	F. T. Mee ...	R. E. Smallbone, E. G. G. Mobbs.	P. B. Allison ...	S.	Turnbull Martin...	Fms. 911 & 138 27.3.34 to 23.8.34	28.8.34
270 †† Strathaird ...	W. P. Townshend, R.D., Capt., R.N.R.	R. H. Hand, L. T. Brown, R. A. B. Kimpton.	L. J. Hadler ...	"	P. & O. ...	" " 16.6.34 to 23.8.34	25.8.34
059 †† Strathnaver ...	R. Harrison, D.S.O., R.D., A.D.C., Capt., R.N.R.	C. W. Mayne, C. B. Holmes, G. E. Owen.	P. R. Hobbs ...	M.-S.	" " "	" " 13.5.34 to 6.7.34	14.7.34
274 *† Sultan Star ...	W. Bevan ...	J. Lewis ...	J. J. Winsor ...	M.	Blue Star ...	" " 24.2.34 to 10.5.34	17.5.34
Tacoma Star ...	W. Walsh ...	D. G. Russell ...	... ..	S.	" " "	Fm. 911 29.1.34 to 17.4.34	20.4.34
229 *† Tactician ...	F. Trinick, O.B.E. ...	A. Frew, S. Leyland, L. J. Sharman.	A. Temple ...	M.	Harrison ...	Fms. 911 & 138 1.3.34 to 15.5.34	17.5.34
045 †† Tainui ...	A. McIntosh ...	H. Winyard, D. Pickersgill, L. R. Bull.	... ..	S.	Shaw Savill & Albion	Fm. 915 23.3.34 to 6.7.34	16.7.34
081 *† Tairoa ...	S. Oswald ...	W. Thowless, E. T. Durrant, H. D. Pim.	H. Baylis ...	"	" " "	Fms. 911 & 138 8.12.33 to 7.4.34	21.3.34
264 *† Tanda ...	E. T. Pilcher, R.N.R....	E. Norquay, W. B. Williams, F. O. Colvin.	W. Harris ...	M.L.	E. & A. S.S. Co....	Fm. 915 13.1.34 to 9.4.34	19.6.34
165 *† Tantalus, M.V....	R. Brown ...	J. H. Brown, J. MacArthur, J. A. MacGregor.	J. Nicholas ...	S.	A. Holt ...	Fms. 911 & 138 2.4.34 to 30.7.34	1.9.34
047 *† Taranaki, M.V.	— Williams ...	T. B. Marsdon, B. M. Norris, C. Stewart.	P. Budge ...	"	Shaw Savill & Albion	" " 31.3.34 to 12.7.34	18.7.34
069 *† Tekoa ...	J. Howell Price, D.S.O., D.S.C.	L. W. Fulcher, S. A. Jarvis, A. Kirk.	F. Gardiner ...	M.	New Zealand Shipping	" " 16.1.34 to 26.1.34	16.5.34
048 †† Themistocles ...	C. Wood, D.S.C. ...	E. Johanson, G. Manley, A. Blewett.	J. P. Carey ...	M.-S.	Aberdeen	" " 1.6.34 to 5.7.34	13.8.34
161 *† Titan ...	G. G. Rundle ...	G. Roberts, J. R. McCarthy, C. B. L. Wren.	S. Wingfield ...	S.	Commonwealth	" " 4.1.34 to 1.4.34	10.4.34
244 *† Tongariro ...	P. B. Clarke, D.S.C. ...	G. W. Pring, L. Mercer, J. W. Leslie.	E. G. Stride ...	"	New Zealand Shipping	" " 26.11.34 to 6.4.34	16.4.34
025 †† Transylvania ...	D. W. Bone ...	T. O. Dunn, A. Middleton, B. S. Leiper.	J. McDonald ...	"	Anchor ...	" " 3.6.34 to 15.7.34	31.7.34
						Fm. 912 3.6.34 to 15.7.34	31.7.34



Name of Vessel.	Captain.	Observing Officers.	Senior Wireless Operator.	Meteorological Instrument Equipment.	Line.	Logs, Registers, or Records Contributed. 7.6.34 to 6.9.34.	Date Last Return Received.
119 *† <i>Trojan Star</i> ...	D. H. Mills ...	W. A. G. Curphey, W. L. Hall, J. B. Thompson.	L. Waterhouse...	M.	Blue Star ...	Fms. 911 & 138 3.3.34 to 10.7.34	14.7.34
245 *† <i>Turakina</i> ...	J. Laird ...	G. E. Mason, R. H. Browne, C. S. Thomas.	N. Hallett ...	"	New Zealand Shipping	" " 23.3.34 to 6.7.34	11.7.34
276 †† <i>Tuscania</i> ...	W. B. Rome ...	J. Noble, J. Gibson, D. Barclay.	J. Fleming ...	S.	Anchor ...	Fm. "12 " 10.6.34 to 1.7.34	3.7.34
<i>Tuscan Star</i> , M.V.	G. Wilson ...	R. T. Hales, L. Mates, J. H. Bayne.	" " "	M.L.	Blue Star ...	Fm. 915 13.5.34 to 7.8.34	14.8.34
113 *† <i>Upwey Grange</i> , M.V.	H. P. Goodrick ...	A. Bradbury, G. T. Hurst, P. J. Walker.	F. W. Miller ...	M.	Houlder ...	Fms: 911 & 138 20.6.34 to 20.8.34	23.8.34
176 *† <i>Vancouver City</i> , M.V.	H. E. Egerton ...	J. K. Robson, H. David, L. A. Harvey.	S. W. Sloan ...	S.	Reardon Smith ...	Fm. 911 19.5.34 to 3.7.34	21.7.34
163 †† <i>Vandyck</i> ...	P. Symons ...	J. A. Baragwanath ...	F. Slater ...	"	Lampport & Holt	Fms. 911 & 138 19.5.34 to 30.8.34	4.9.34
079 †† <i>Viceroy of India</i> ...	E. J. Thornton, R.D., Capt., R.N.R.	F. E. Cox, D. Buckley, K. Tee	J. Kidson ...	M.-S.	P. & O. ...	" " 2.7.34 to 11.8.34	20.8.34
053 †† <i>Voltaire</i> ...	V. Gore-Hickman ...	F. J. Durrant...	W. Burnett ...	S.	Lampport & Holt	" " 19.5.34 to 23.8.34	28.8.34
263 *† <i>Wairuna</i> ...	F. L. G. Jauney ...	N. Liepen, R. Brebnee, D. C. N. Champion.	J. Rae ...	M.L.	Union S.S. Co. of N.Z.	Fm. 915 22.12.33 to 16.4.34	29.6.34
212 †† <i>Waiwera</i> , M.V.	J. H. Gaskell, Lt.-Commr., R.N.R.	R. G. James ...	" " "	S.	Shaw, Savill & Albion	" " " " " "	"
005 †† <i>Warwick Castle</i> ...	W. M. Betts ...	T. C. Goldstone, P. Clissold, J. Oakley.	A. Maunder ...	"	Union Castle ...	Fms. 911 & 138 12.5.34 to 2.9.34	4.9.34
060 †† <i>Westernland</i> ...	V. L. Making ...	C. Otterson, L. A. Williams, W. Hesketh.	J. C. R. Eustice...	"	Red Star...	Fm. "12 " 20.5.34 to 31.8.34	3.9.34
056 *† <i>Westmoreland</i> ...	E. A. Burton ...	R. Coin, F. T. Renny, H. Forster.	R. Glover ...	"	New Zealand Shipping	Fms. 911 & 138 20.5.34 to 9.6.34	11.6.34
208 †† <i>Winchester Castle</i> , M.V.	J. H. Kerbey ...	R. F. Pembry, M. S. Hodson	W. A. Smith ...	"	Union Castle ...	" " 21.4.34 to 22.7.34	30.7.34
096 †† <i>Windsor Castle</i> ...	A. Barrow ...	F. Norfolk, G. Mayhew, J. D. Fisher.	J. Hodgson ...	"	" " "	" " 9.6.34 to 29.7.34	31.7.34
<i>Worthing</i> ...	W. Lidbetter ...	H. Smith ...	C. Kelley ...	"	Southern Railway	Telegraphic Report 5.9.34	5.9.34
<i>Yoma</i> ...	J. A. Wilson ...	J. Crawford, P. D. Barr, A. Driscoll.	" " "	M.	Henderson ...	Fm. 911* 5.5.34 to 18.7.34	21.7.34
043 *† <i>Zealandic</i> , M.V.	H. R. Gordon ...	G. Sangwin, T. Chapman, E. Vaughan.	W. Latimer ...	S.	Shaw Savill & Albion	Fms. 911 & 138 23.4.34 to 6.8.34	11.8.34
<i>Conway</i> , H.M.S.	M. G. Douglas, R.D., Commr., R.N.R.	The Senior Cadets ...	" " "	Cadets M.L.	" " "	Cadets' Met.Log. 29.4.34 to 23.7.34	31.7.34
<i>Pangbourne Nautical College</i> .	A. F. G. Tracy, Commr., R.N.	" " "	" " "	"	" " "	" " 26.4.34 to 21.7.34	25.7.34
<i>Worcester</i> , H.M.S.	G. C. Steele, V.C., Commr., R.N.	" " "	" " "	"	" " "	" " 4.5.34 to 25.7.34	30.7.34
<i>Watling Island</i>	" " "	The Keepers ...	" " "	Lighthouse Register	" " "	Lighthouse Register 1.1.34 to 30.6.34	28.7.34
<i>Cape Pembroke</i> ... (Falkland Is.)	" " "	" " "	" " "	"	" " "	Lighthouse Register 1.1.34 to 30.6.34	8.8.34

## SHIPS WATER SAMPLING THE NORTH ATLANTIC. FISHERIES LABORATORY, LOWESTOFT.

Name of Vessel.	Captain.	Observing Officer.	Line.	Received at Government Chemist, London.
<i>Dakarian</i> ...	W. Baird ...	A. A. Heaton ...	Leyland ...	{ 30 Water Samples, 2.6.34.
<i>Darian</i> ...	T. Chapman ...	F. R. Hicken ...	" " "	30 " " 24.8.34.
<i>Davision</i> ...	T. J. Higson ...	W. Lawton ...	" " "	30 " " 26.7.34.
<i>Dorelian</i> ...	A. Collins ...	W. Parry ...	" " "	24 " " 20.6.34.
<i>Hilary</i> ...	L. Evans ...	G. E. Freeman ...	Booth ...	30 " " 12.6.34.
				{ 60 " " 1.6.34.
				60 " " 26.7.34.

## SHIPS WATER SAMPLING THE ARABIAN SEA, JOHN MURRAY EXPEDITION.

Name of Vessel.	Captain.	Observing Officer.	Line.	Received at Port Office, Port Said.
<i>Britannia</i> ...	D. Munro ...	G. S. Sinclair ...	Anchor ...	2 cases of Water Samples, 5.7.34.
<i>Castalia</i> ...	G. B. Kelly ...	H. D. Campsie ...	" " "	2 " " 13.3.34.
<i>Cheshire</i> ...	J. E. Cullen ...	A. Beharrel ...	Bibby ...	2 " " 8.8.34.
<i>Clan Macbean</i> ...	S. Lofthouse ...	C. M. Powell ...	Clan ...	2 " " 8.8.34.
<i>Clan Macgillivray</i> ...	H. J. Giles, R.D., Capt., R.N.R.	J. H. Thorpe ...	" " "	" " "
<i>Clan Macvicar</i> ...	M. H. Jones ...	L. S. Jones ...	" " "	2 " " 14.5.34.
<i>Clan Ronald</i> ...	H. Evans ...	R. W. Mayo ...	" " "	" " "
<i>Elysia</i> ...	F. M. Henderson ...	R. B. Clements Mitchell	Anchor ...	2 " " 16.8.34.
<i>Gloucestershire</i> ...	C. A. Griffiths ...	I. D. Minto ...	Bibby ...	2 " " 2.4.34.
<i>Hesperia</i> ...	F. H. Houghton ...	C. F. Paul ...	Clan ...	" " "
<i>Oxfordshire</i> ...	H. Lyon ...	C. Powrie ...	Bibby ...	2 " " 7.3.34.
<i>Sagaing</i> ...	E. Esslemont ...	C. Fergusson ...	Henderson ...	2 " " 18.2.34.
<i>Staffordshire</i> ...	W. L. Forster ...	W. B. Boyer ...	Bibby ...	2 " " 18.3.34.
<i>Tarantia</i> ...	J. B. Caithness ...	J. M. Cherry ...	Anchor ...	2 " " 30.7.34.
<i>Worcestershire</i> ...	F. W. Beckett ...	A. Thomson ...	Bibby ...	2 " " 27.7.34.
<i>Yorkshire</i> ...	F. W. L. Midgeley ...	J. F. Reed ...	" " "	2 " " 22.8.34.

September, M.O., 1934.



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

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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  $10^\circ$  Squares of the Atlantic which lie between  $20^\circ$  N. and  $10^\circ$  S., and extend from  $10^\circ$  to  $40^\circ$  W., with accompanying Remarks, ending with the Best Routes across the Equator. (No. 27, 1876) 24s. ( $17 \times 20$  in.)

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