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A REQUEST FOR PROMPT DESPATCH.

WHEN THE MARINE OBSERVER was established, the day of publication, the first Wednesday of the month previous to the month it deals with, was fixed with a view to receipt by homeward bounders at the most distant ports possible; mail day from London to many distant ports being Friday.

Recently the Secretary of a shipping company whose ships are in the Australian trade notified us that THE MARINE OBSERVER addressed to captains of observing ships did not reach his office until too late on Thursday to catch the outgoing mail to Fremantle, which resulted in it being sent to Colombo, thus depriving Captains and officers of seasonal information concerning an important passage.

Arrangements have now been made for THE MARINE OBSERVER to be posted from the Air Ministry not later than the Wednesday night of publication, so that those copies addressed to Captains of

ships, care of their owners at Home ports, will be delivered before noon on the Thursday.

Captains of ships who wish to have THE MARINE OBSERVER posted direct from the Air Ministry to ports abroad have only to comply with the request made in the Notice, "Postal Arrangements" which frequently appears on the reverse page of the Ice Chart, Western North Atlantic, and this will be done. As ships' movements are sometimes uncertain, the majority of Captains evidently prefer that THE MARINE OBSERVER should be addressed to them care of their Owners, and we invite all concerned to co-operate in the prompt despatch of THE MARINE OBSERVER to the Captains of regular observing ships at the earliest port possible.

MARINE SUPERINTENDENT.

## THE MARINE OBSERVER'S LOG.

It is hoped that these pages will be filled each month with a selection of the contributions of Mariners in manuscript, or remarks from the Logs and Reports of regular Marine Observers.

Responsibility for statements rests with the Contributor.

## THE JAPANESE EARTHQUAKE OF SEPTEMBER 1st, 1923.

BY COMMANDER S. ROBINSON, C.B.E., R.D., R.N.R.

"THE following account of my personal experiences in the great earthquake of September 1st, 1923, in Japan has been written in response to a suggestion of Captain Brooke Smith that it would be of interest to seamen generally:—

"On that fateful Saturday the S.S. *Empress of Australia*, of which I was Master, a passenger vessel of 21,850 tons gross register and 615 feet long, with twin screws driven by turbines and Dr. Fottinger's patent gear, burning oil fuel and carrying a crew of approximately 80 Europeans and 470 Chinese, with 450 passengers of all classes on board, and mails and a full valuable cargo of silk and merchandise, was made fast on the easterly side of the Customs Pier at Yokohama that ran out some four cables in an N.N.E. direction from what was known as the English Hatoba.

"The pier, roughly speaking, was 150 feet wide and built with two strips of concrete on the outside and a great deal of wood planking in the centre, the whole supported on iron piles. There was berthage for two vessels on the outer part of each side of the pier, the *Empress of Australia* being in the berth nearer to the shore, starboard side to the wharf, heading in. A large cargo steamer being in the outer berth astern of us, also heading in. On the part of the pier abreast of the *Empress of Australia* there was a large two-storey wooden warehouse about 400 feet long, and 20 feet or so in from the edge of the wharf, and opposite the outer berth a concrete shed was in course of construction.

"The weather that morning was fine and hot—I don't remember the temperature, but we were wearing whites. The sun was shining, but dulled by a steely haze. There was a depression reported passing to the westward of us over Japan, and the wind was about force 6 from S. by E. I was on shore after breakfast for an hour, to our office on the Bund, and doing a little shopping. It was very dusty and close, but nothing abnormal for that time of the year and the weather conditions, there having been no rain for some time.

"We were to leave for Vancouver at noon, and as the wind was blowing obliquely on to the wharf we had towboats standing by ahead and astern to tow us out so that we could back clear of the steamer astern and the pier, and then swing to go head out through the entrance between the breakwaters, which was nearly astern of us, and about 6 cables from the end of the pier.

"All hands were at stations, the moorings singled up to a manila aft and a manila and a wire forward, and the gangway was landed at 11.57 a.m. A minute or so afterwards I was just about to give the order to 'let go aft' when there was a peculiar roar and the vessel began to shake. My first thought was that something had happened to the windlass and that both anchors had been let go, but a glance forward assured me they were all right, and I then saw by the land that it was an earthquake. The shaking of the ship increased to such an extent that I thought the masts and funnels must come down, and I was much afraid for the main steampipe. Fortunately, nothing disastrous occurred at the time, although afterwards we found several bad cracks and breaks in numerous castings and pipes. The vibrations appeared to be mostly vertical, something the same as when passing at high speed over shoal water, but magnified to an alarming extent. I did not look directly over the side at the water, but there does not appear to have been any disturbance on the surface in the way of waves, or any definite tidal wave, although I understood the waters in the harbour were in a state of turmoil for some time, very heavy swirls and eddies being set up.

"The view of the shore and the wharf from our bridge, 65 feet above water level, was terrifying and agonizing to an extent beyond my powers of description. I saw half a mile of large buildings, mostly

brick and stone, along the waterfront, fall together as though a giant hand had been swept through the lower storeys. A most horrible compound of roar and scream came from the land. This I thought at first was the earthquake, but in all probability it was the simultaneous crashing of tens of thousands of buildings, combined with the shrieks and groans of tens or even hundreds of thousands of terrified and wounded people. The whole land seemed in a state of upheaval and commotion, as though it were fluid and not solid. I clearly saw several ripples followed by three distinct waves come out over the land and along the part of the pier near the shore. The statements in my official report sent to the Company that these were from 6 to 8 feet high, trough to crest, has been questioned. I naturally had no means of measuring them—I can only say that they appeared to me to be about the same size and distance apart as the waves or swells made by the ordinary sharp passenger vessel going about 19 knots, and I should judge they were travelling at about double that speed. As they passed along that part of the pier, it crumbled down into the water.

"The outer part of the pier at which we were laid was of more solid structure. Its movements were the same as if it had been a vessel alongside us pitching and rolling in a heavy sea, and it seemed to strike us and bump us off some distance. The warehouse alongside us, in some miraculous way, after swaying about at all angles, remained upright after the shocks, and practically intact.

"There were probably between three and four hundred people on the pier seeing the vessel off and saying good-bye to friends on board. These were tossed about in all directions, and, as large fissures opened and closed all over the wharf owing to the violent movements, many were thrown down them and crushed to death in the concrete or disappeared into the waters beneath the pier. It was a most distressing sight. It seemed as though it lasted ages, but the longest and worst continued shock probably only lasted about forty seconds, and the first series of shocks about five minutes, that is, there would be quiet for a few seconds and then more shocks. There were many bad shocks at longer intervals afterwards, but nothing approaching in violence the first five minutes.

"During the first series of shocks the wind seemed to drop, but shortly after it increased to a fresh gale. An immense pall of dust rose up hundreds of feet above the ruined city, and this, swept along by the gale, blinded everyone and added to the confusion. Mingled with this dust, after a few minutes came smoke and sparks, and as the wind and the fire on shore increased, large masses of burning matter and dense volumes of smoke, borne with great velocity by the gale, and blinding and half-suffocating everyone, made conditions an absolute inferno.

"After the worst shocks were over, we found the vessel had been bumped off some 15 or 20 feet from the wharf. Our lines and the posts they were on had not carried away, as the hands were standing by them and I had ordered the lines slacked away at the first shake, and we hove the vessel back alongside, opened up the side doors and ports, and put down ladders. A number of the people on the pier came on board, many of them wounded, and others began scrambling over the wrecked portion of the pier, parts of which were just showing at water level, toward the land.

"As we hove in alongside, ropes were thrown down by passengers and others from the upper decks, and people—mostly Japanese—tried to swarm up these, but the vessel was too high; and, as I saw several become exhausted and drop off into the water between the ship and the wharf, I ordered the ropes to be taken up until the side doors could be opened or proper ladders put down. This, I heard some time afterwards, gave rise to a report that I had refused to allow people on board, which was absolutely untrue. Everyone, both then and after, was taken on board who wished to come.

"We soon realised that our position was one of extreme danger owing to the practical certainty of the warehouse alongside us



catching fire. The wind at that time was blowing between 60 and 70 miles an hour on our port bow, binding us into the wharf, and we could not get astern on account of the large steamer there. She had parted all her moorings or torn out the posts during the first shock, and had bumped and drifted some distance out from the wharf, and there let go her port anchor. When the wind freshened and she set in again, the starboard anchor was let go, but she was laying to her port anchor, and the cable was well out on our port quarter.

"I tried to get the people on board her to slack astern or pay out cable, but they were too busy fighting the fire on their own ship, and in that gale and confusion I could not attract their attention. I heard afterwards that a number of their crew were on shore, among whom was the Captain, who was killed in their agent's office, at the first shock.

"Several large steamers were careering wildly about the harbour, trying to swing and get out through the entrance, one of which, in ballast, came into us, once on the quarter, damaging our bulwarks and rails, and once amidships. Fortunately for us, the second time she came in, a large blazing lumberladen lighter that had drifted alongside us acted as a fender. This was crushed to splinters and saved us from certain serious injury. The steamer then backed off and disappeared for a while in the smoke, but I think she afterwards came back and had a shot at the vessel astern. The waters around us seemed covered with numbers of fiercely blazing lighters drifting down with the wind. They passed along our high sides without giving much trouble, but the vessel astern, being lower in the water, seemed much bothered by them.

"We had, of course, started our fire service, and covered all ventilators, as soon as the first sparks appeared, and at this time we had forty nozzles pouring water on all exposed parts of the ship, and numerous saloon boys, aided by volunteers among the passengers, with wet blankets, beating out and smothering the large masses of burning matter, some of which were as large as a man's head, that the gale brought on board.

"Our two tugs had left at the first shock. We tried to work our stern out with our engines, aided by a spring on the wharf, but they had not the slightest effect, so with our pilot's motor sampan we ran a wire out to a buoy some distance ahead and to port, with the hope of heaving out head to wind so that we could swing our stern out clear, but we had only got a little distance out and our quarter was still hard on the pier, when we brought up forward in shoal water, and had to heave back alongside.

"By this time the warehouse on the wharf was well ablaze, and after a last effort personally to attract the attention of the steamer astern, I determined to back down on her, taking the risk of 'above water' damage to both ships, and force her astern. I felt I was completely justified in this as we had over three thousand tons of fuel oil in side bunkers, and we could not have remained, even for a short time, alongside the warehouse, or this oil unquestionably would have caught fire or exploded and probably both vessels and all on board would have gone. So I ordered both engines 'full astern,' but as we gathered way a number of blazing lighters that had drifted into the wharf, under our stern, jammed between our counter and the wharf and forced us out so that the round of our quarter (the *Empress of Australia* has the old-fashioned overhanging quarters and stern) just cleared the other steamer's stem. As soon as I saw this was likely to happen I stopped both engines and we slid along her bow and side until our after docking bridge was up to her 'midship bridge. As I was afraid of some of our overhanging upperworks fouling her and bringing us up, and I thought our screws must be well clear of her cables by then, I went ahead on the port engine, with the helm aport, to try to throw our stern out a little, but we must have carried her port cable along on our rudder, for after a couple of turns our propeller brought up on something that afterwards turned out to be that cable.

"We carried the other steamer some distance along with us before we brought up, and our stem was then abreast of the outer or nearer end of the now fiercely burning warehouse. The lighters mentioned before had, as the ship went along and they came nearer amidships, forced the whole vessel bodily out from the wharf, so that the bow was some sixty feet or so from the flames. The heat was intense, even on the bridge, but we brought the most of the fire hoses forward, and nothing caught except the outside of the motor-boat, which we carried on the starboard side abreast of the foremast, and this

was kept under by the staff captain and some of the Chinese sailors, who had to have water continuously playing on them as they stood out in the heat in order to play the hose on the outside of the boat.

"A number of glass side-scuttles were splintered by the heat, and the paint on the ship's sides scorched, but nothing caught inside. We had hoses ready, and wherever we could, playing on the woodwork in case of this happening. Fortunately the most exposed part of the bow was opposite steerages and storerooms, and not cargo holds.

"After about an hour of great anxiety, the warehouse collapsed, and although the ruins and the wooden part of the pier continued burning fiercely for a couple of hours, the greatest danger was over for the time.

"The wind by this time had dropped, and as soon as we could, we ran wires out to the posts on the wharf that still were intact, and hove ahead and made fast alongside again. We had to use our fire hose several times during the night on the remains of the fire on the wharf, and also on blazing lighters that drifted alongside, but otherwise the night was free from alarms.

"As soon as we could we put out gangways on both sides and lowered our boats to assist in the work that had been begun some time before by boats from other steamers more fortunately circumstanced, of picking up the unfortunate inhabitants of the town from parts of the foreshore and beach where they had gathered. Most of them were almost naked and so covered with caked blood and dirt as to be unrecognisable. Many were half blinded and had been badly burnt or crushed by falling buildings, and numbers had been standing for hours up to their necks in the shoal water with the remains of their clothing wrapped around their heads to protect them from the heat. These came or were carried on board to the extent of a couple of thousand of all nationalities during the night, and the sights and sounds on our decks and alleyways at midnight, with the groaning wounded stretched along in rows, the weeping of children, and the sobs and cries of half hysterical people searching frantically for relatives, I shall never forget. I wondered and wonder still how any of the people who had passed through that terrible ordeal on shore kept their reason at all.

"Everyone on board, passengers, crew and unwounded residents, worked hard all through the night in actual rescue work, and in bathing the wounded, dressing wounds, improvising clothing and coverings, and making everyone as comfortable as possible. Fortunately the ship was well provided with spare mattresses and bedding, and well stocked with water and provisions of all kinds.

"I myself was practically blind from about five o'clock until nine. At the beginning I had foolishly tried to clear from my eyes the smoke, cinders and salt spray from the hoses, with which I think was mixed fuel oil from the harbour, with a small handkerchief, and it was not until my eyes became painful and my eyelids began to swell and close up that I had sense to get a foot-bath of fresh water and a supply of clean towels on the bridge, and to make everyone there wash their eyes instead of rubbing them. My left eye became completely closed, and the right I could just open enough to see objects close to, in a blur. By constant applications of boracic solution the right eye opened by nine o'clock, and the left became practically normal later on in the night, but they both continued very inflamed and painful for days. Many of the officers and crew were troubled in the same way, but we had no casualties.

"All on board, passengers and crew, behaved marvellously well in the, I may say, unprecedented circumstances. There was not the faintest sign of trepidation or excitement. Conditions were awe-inspiring enough on deck, where we could see in some degree what was happening, but what must it have meant for the engineers and their department, at their duty down below in the midst of that heated, shaking mass of machinery and boilers and steampipes under high pressure? Yet every order, both below and on deck, was carried out as promptly and efficiently as if everything had been normal, and to that, and the gracious mercy of Providence, I attributed our coming out, on that and the succeeding day, as safely as we did.

"In this appreciation I would also include CAPTAIN TAKEUCHI, the Japanese harbour pilot, and the crew of his motor sampan, who performed, coolly and capably, the tasks they were asked to do, and stayed with us all through the first day.

"As for Yokohama, it was simply wiped out of existence. At a few minutes to twelve on that day, Yokohama had been a thriving city of over three hundred thousand people. At three p.m. it was literally nothing but a heap of smoking ruins—what the earthquake had not destroyed the fire had consumed. This was equally the case



in the foreign residential quarter on the Bluff, and in the business and Japanese parts of the town. During those three hours approximately 120,000 Japanese and 280 Europeans had been burnt or crushed to death. By great good fortune the majority of the foreign community happened to be out of town on account of a holiday, or the casualties among them would certainly have been much greater than they were.

"I must say that I felt and feel great admiration for the conduct of the Japanese people generally in this tremendous catastrophe. Their calm and stoical attitude in the face of the appalling blow that Fate had dealt them was worthy of all respect, and everything that we were able to do for the hundreds of them of all classes that came on board the ship and were supplied with water, food, shelter and medical aid was most gratefully, quietly and politely received and acknowledged. The officers in the boats on shore reported on the same conduct. The wounded and the children were the first consideration—the Japanese men and women making no attempt to board the boats unless asked.

"I think I have now said enough of the actual earthquake and fire of September 1st. To go into the events of the next days and the relief operations in detail would be too long a yarn to spin here.

"Briefly, after feeling that we had safely passed through as many perils as could reasonably be expected for one voyage—we had already, a few days before, ridden out one of the worst typhoons of recent years, in Hongkong, and in the height of it had seen vessels smashed up and sinking with their crews a couple of ship's lengths away—we found at daybreak on Sunday, September 2nd, that the fuel oil, about 75,000 tons of which, on a rough estimate, mixed with several thousand tons of kerosene, had escaped into the harbour by the wrecking of the storage tanks on shore in the earthquake, and which was floating thickly on the surface of the water, had caught fire along the Bund and foreshore, and was spreading out along the sides of the pier at which we were laying.

"At my request, the steamer whose port cable was foul of our port propeller, after slipping the cable at the 75 fathom shackle, towed us astern a ship's length clear of the pier. I asked this as I did not like to use our starboard propeller there and run the risk of fouling it in the mess of sunken lighters, etc., that was under our stern.

"After we had anchored (which I had to do to bring both vessels up, as the other steamer's stern was getting near a mooring buoy) and the other steamer had cast off and left the harbour, the flames from the burning oil were seen to be spreading out from the shore and piers into the harbour and advancing over the water directly towards us in several huge blazing masses, hundreds of feet in diameter and height—a most fearsome sight. We hove up our anchor and, as there was no time to try to swing the ship there in our circumstances, at full speed on our starboard engine, charged diagonally across the harbour close past the nearest mass of flames and up to windward of them all—dragging of course, on our port propeller, the two-inch cable, which I am fairly certain that we had parted and broken away from its anchor when we fouled it in coming astern the day before. We then managed to turn completely round little by little, and worked slowly back clear of the flames and out through the entrance between the breakwaters. This took several hours. Finally, after more anxiety in the evening on account of the proximity of more blazing oil, with our immense crowd of refugees and wounded on board, we came to a safe anchorage well out in the bay at midnight.

"On Tuesday we found we had three riding round turns of the cable on the shaft casing just forward of our port propeller, and this was cleared by our own crew aided by a very efficient diver lent from the Japanese flag-ship which had arrived from Kure, and the propeller and engines were found to be intact and working properly. But as there were no means of feeding or sheltering anyone on shore, and no other suitable vessel was in port, we stayed on, acting as headquarters to the relief committees and shore expeditions, and 'receiving ship' for the foreign refugees from the districts round Yokohama, transferring them to various steamers as they left port.

"By Saturday these districts had all been cleared and the people either brought in or accounted for, and we sailed for Kobe to land the balance of 670 refugees left on board. From there we continued our badly interrupted voyage to Vancouver, arriving safely there with all our passengers, mails and cargo undamaged, without further incident, on September 24th.

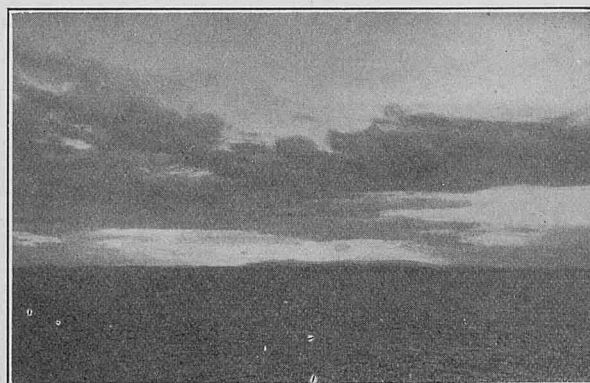
"I hope in all this I have made myself clear and not been too long-winded, and that this account will be of interest to my fellow mariners."

## CLOUD PHOTOGRAPHS TAKEN AT PORT MELBOURNE, AUSTRALIA.

THE accompanying photographs have been received from Captain T. V. ROBERTS, S.S. *Euripides*, taken while at Port Melbourne.



Sunset, 8th September, 1925.



Sunrise, 15th September, 1925.



Sunset, 15th September, 1925.



Sunset, 25th September, 1925.



## PECULIAR CLOUD FORMATION.

## Off East Coast of Australia.

THE following is an extract from the Meteorological Log of S.S. *Tanda*, Captain E. T. PILCHER, Brisbane to Sydney, Observer, Mr. R. LLOYD HARRY, 3rd Officer :—

"26th September, 1925, approaching Sydney, at 0900 (S.T.), with wind S.W. force 1, 7/10 of sky was covered by three large banks of cloud, the Northern end of each being Ci-Cu, centre A-Cu, and Southern end Ci-St, all of perfect formation and moving swiftly from S.W. One large bank, extending S.E.—N.W. 3/4 across sky, was caught up by a smaller bank, which latter took the formation of six waves of perfect whiteness and regularity parallel to main bank.

"About ten minutes later these waves became rippled and gradually formed in a white sheet, before merging, and, half an hour later, dispersing with the main bank. With the exception of 1/10 Ci-St to N.E. and S.E. and a few tiny "lumps" of Cu to Westward, the remainder had a very windy Cirrus formation. Later in the day the wind backed N.E. force 3/4."

## SANDSTORM.

## PERSIAN GULF.

THE following report from H.M.S. *Cyclamen*, Commander A. B. A. BAKER, R.N., Observer, Lieutenant C. H. DUFFETT, R.N., has been received from the Hydrographer of the Navy :—

"On 19th September, 1925, at 1705 (M.T.P.), a very heavy sand-storm was experienced at Henjam. For about half an hour before this time the sky assumed a very threatening aspect, similar to heavy rain clouds though of a lighter colour.

"The storm broke quite suddenly, the wind changing from a light Southerly breeze, force 1 to a force of 5-6 from the Eastward.

"The air at once became thick with sand and the visibility closed rapidly to about 150 yards. The storm lasted at this force for about 15 minutes and then the visibility became greater and the wind decreased, though there were still occasional squalls. By 1815 (M.T.P.) the wind had dropped to a force 3 and the visibility cleared to about one mile. At 1900 (M.T.P.) the wind dropped and then blew from the Westward.

"After this storm the air became drier and at midnight the wet and dry bulb thermometers differed by 8° as compared with 2° or 3° before the storm.

"During the evening very vivid lightning was observed.

"This storm took place one day after the new moon, and the natives state that it marks the end of the hot weather for the year."

## LINE SQUALL.

## Off East Coast, South America.

THE following is an extract from the Meteorological Report of S.S. *Lassell*, Captain V. G. HICKMAN, New York to Montevideo, Observer, Mr. F. J. DURRANT, 3rd Officer :—

"September 18th, 1925, about 9 a.m. in Latitude 33° 00' S., Longitude 51° 40' W. light overcast sky, squall approaching indicated by a dark cloud edged with a clear white line, rising above horizon from S.W. in shape of regular ellipse, gradually covering whole sky and passing north was clear in short space of five minutes, retaining at each end its regular rainbow-like shape.

"Barometer steady about 29.80 (uncorrected), wind increased from force 3 to 6 and subsided again. No rain, but during passage of squall sea surface pitted as though by heavy hail."

## TYPHOONS IN THE CHINA SEA.

## 2nd to 9th September, 1925 ; 13th to 16th September, 1925.

THE following account has been received from S.S. *Empress of Russia*, Captain A. J. HOLLAND, Vancouver to China Sea Ports :—

"A record of our experiences during the typhoon which crossed over the China Sea between the 2nd and the 9th September, 1925, would, I venture to suggest, be of some interest to you.

"Our first interest in the storm was on the 2nd September, when the centre was reported in Latitude 21° N. and Longitude 135° E., depth 29.00, direction being uncertain N.W. or N.E. We left Yokohama on that date bound for Kobe, experiencing beautiful weather *en route*. In Kobe on the 3rd with the centre in Latitude 24° N., Longitude 129° E., depth 28.96 in., travelling N.N.W. very slowly, we experienced fresh to strong E.N.E. winds with heavy rain, glass however, steady. I thought perhaps we were in the outside edge of the storm in the first quadrant, and that it was recurving to the E.N.E.

"We left Kobe at 4.00 p.m. on the 4th, centre at noon being Latitude 25° N., Longitude 129° E., heavy rain and fresh to moderate N.E. winds were met with in our passage through the Inland Sea. We cleared Shimonoseki Straits at 9.00 a.m. on the 5th, centre reported at that time Latitude 27° N., Longitude 125° E., depth 28.15 in., travelling N.N.W. During the day our glass fell from 29.81 in. at 4.00 a.m. to 29.74 in. at noon and 29.62 in. at 4.00 p.m. with a fresh E.N.E. wind and heavy southerly swell, but fine clear weather. Centre at 6.00 p.m. being reported Latitude 28° N. and Longitude 127° E. travelling N. We reached Nagasaki at 6.00 p.m., remaining in harbour for the night. At 8.00 a.m. on the 6th the glass having remained steady all night at 29.61 in., the wind having shifted to S.E. at that time and the centre being reported in Latitude 29° N., Longitude 126° E., travelling N., I believed the centre would have passed our track to Shanghai before we reached the open sea.

"We left Nagasaki at 8.00 a.m., wind S.E. force 5, barometer steady at 29.60 in., weather fine; at 10.00 heavy squalls of wind and rain appeared, glass 29.58 in., and the wind shifted to S.S.E. At noon the reported position of the centre was Latitude 32° N., Longitude 126° E., glass 28.66 in., travelling N. With us the glass was 29.45 in., wind increasing to moderate gale.

"Our position at noon was Latitude 32° 31' N., Longitude 128° 55' E. I altered course to South (true), wind increased to force 10. At 3.00 p.m. our glass stood 29.33 in. Mountainous sea, driving rain and overcast, speed was reduced to 7 knots. At this hour the wind shifted to S. by E. and our lowest glass 29.27 in. was read at 6.00 p.m., wind remaining S. by E., force 10. Reported position of centre at 6.00 p.m. Latitude 32° N., Longitude 125° E., travelling N.W. At 8.00 p.m. our glass was 29.32 in. the wind shifted to S. At 10.00 p.m. with glass 29.40 in. wind shifted to S. by W., force 9. At midnight glass 29.47 in. wind shifted to S.S.W., force 8. Sea still very high and mountainous. The ship was gradually brought back to her course S.W. (true) at 2.00 a.m. on the 7th, when the glass was 29.50 in., wind S.W., force 7, at 4.00 glass 29.55 in., wind W.S.W., force 7, at 8.00 glass 29.68 in., wind W., force 6. And at noon our glass stood at 29.79 in., wind W.N.W. force 5, fine weather, sea rapidly decreasing in strength. Our position by observation being Latitude 31° 23' N., Longitude 126° 51' E.

"From this time until our arrival at Shanghai the next day, light breeze, smooth sea and fine clear weather was experienced.

Reported positions of centre :—

		Time.	Latitude.	Longitude.	Direction.
Sept. 7th	-	6.00 a.m.	34° N.	124° E.	N.N.W.
" 7th	-	Noon	35° N.	128° E.	N.E.
" 7th	-	6.00 p.m.	36° N.	130° E.	N.E.
" 8th	-	Noon	42° N.	138° E.	N.E.
" 8th	-	6.00 p.m.	53° N.	145° E.	N.E.
" 9th	-	6.00 a.m.	53° N.	152° E.	E.N.E.

The following extract from a report of H.M. Submarine *L.19*, Hong Kong to Wei Hai Wei, has been received from the Hydrographer of the Navy :—

"September 13th, 1925.—Wind and sea were both rising during the

afternoon and speed was reduced to 8 knots at 1700.

\* \* \* \* \*

The only weather forecast indicated moderate N. to N.E.'ly winds in the Formosa Channel. The existence of a typhoon was not apparently known.

"September 14th.—Wind and sea worse, but still Northerly. By 2000 wind had attained a force of 8-9 with a sea of 6-7. There were no indications of any sort of the existence of a typhoon.

"September 15th.—Wind and sea still worse, wind inclined to back during the afternoon. At noon wind was 9-10, and it increased to 11 during the dog watches and was backing. Sea 8 and very heavy rain was experienced. The increase in wind and rain seemed to keep the sea down slightly, but it was logged as 7-8 and became confused with very high pyramids and cones forming. During the night the wind backed fast and after midnight the wind moderated.

"September 16th.—By 0800 the wind and sea had moderated.

\* \* \* \* \*

"September 18th.—Arrived at Hong Kong and secured alongside *Ambrose*.

It is interesting to note that a weather forecast timed 0500 on the 16th was passed to *L.19* by the S.S. *Hector*, indicating the probability of Northerly gales in the Formosa Channel and the existence of a typhoon crossing the North of Formosa. It is considered that *L.19* must therefore have weathered the gale forecasted and passed thence into extremely close proximity to the centre of the typhoon."

### EXCEPTIONAL VISIBILITY.

#### Vicinity Kangaroo Island, off South Australian Coast.

In forwarding the following report Captain L. J. BOLGER, Marine Agent to the Meteorological Office at Melbourne, makes the following remarks:—

"An interesting example of the atmospheric effects occasionally experienced on the South Coast of Australia, and frequently noticeable in Spencer and St. Vincent Gulfs in the summer months during calms or light Easterly winds with accompanying high temperatures.

"Cape Willoughby Light is 247 feet above High Water, and the height of eye of an observer on the bridge of the *Zealandia* would be about 45 feet, so that the normal distance at which the light would be visible would not exceed 26 miles, whereas the report states it was first seen at a distance of 70 miles and remained constantly visible when the ship was within a distance of 40 miles."

REPORT BY CAPTAIN G. C. ENTWISTLE, S.S. *Zealandia*.

"On September 10th, at 4.48 p.m., Margaret Brock light beacon was abeam (N.E.) dist. 9½ miles. Ship averaging 13.3 knots from there to Cape Willoughby, which was abeam at 0.2 a.m., September 11th. At 6.45 p.m., when Cape Willoughby was 70 miles off, a flashing light was faintly visible bearing N.W. At 7.30 p.m. the light was as bright as on normal occasions when it first shows above the horizon.

"The flashes were timed and found to be three flashes every 15 sec. The light disappeared at 7.45 p.m. and again became visible at 9 p.m., and then remained in sight constantly. The unusual visibility of Cape Willoughby light must have been caused by exceptional atmospheric conditions."

### REMARKS ON MIRAGE, DISCOLORATION OF SEA, VISIBILITY AND CURRENT EXPERIENCED APPROACHING TABLE BAY.

THE following is an extract from the Meteorological Log of S.S. *Wangaratta*, Captain W. SCUTT, Liverpool to Australia via Cape of Good Hope, Observer, Mr. S. R. MILLARD, 2nd Officer:—

"Friday, September 18th, 1925:—The noon position was 31° 31' S. Latitude, 16° 18' E. Longitude, which was verified by an observation of Venus, taken at 11.50 a.m., with an hour angle of 2 hrs. 28 mins. East of the meridian, which gave a result of 16° 17' E. Longitude at

observation, and 16° 18' E. for noon. The course was S. 37° E.(T), the vessel steaming 12.5 knots.

"At 0.40 p.m., A.T.S. land was observed to port bearing between N. 66° E.(T) and N. 88° E.(T), which, from the vessel's position, proved to be LOUIS FONTEIN (1859) and KRAKEEL KLIP (1131), together with the ranges between them, and was considered to be about 90 miles distant.

"It had quite the ordinary appearance of being low lying land, observed at a distance of perhaps some ten miles. The horizon was well defined all round, and the sky was clear, except for a small proportion of Cirrus and Ci-Stratus.

"Shortly after 2 p.m. it had completely gone; its disappearance being gradual, as though being slowly enveloped in horizontal haze.

"During the afternoon watch a remarkable colouring of red was observed in the sea, the vessel steaming through lanes which appeared to extend a mile or so on either side of about 200 feet in width, and bore great resemblance to the ordinary formation of fish spawn, except in the matter of colouring.

"Samples were taken where the phenomena was in greatest evidence, and tested for density and temperature, which resulted in Temp. 61°·5 F. Density 1025.

"At 6.22 p.m. stellar observations were taken, and results were as follows:—

"By VEGA. Latitude, 32° 45' S.

"By ARCTURUS. Longitude, 17° 21' E.

"By SATURN. Longitude, 17° 21½' E., the D.R. Position being 32° 36½' S., 17° 16' E.

"The current experienced for 6 hrs. 22 mins. being S. 26° E. (T)—9½ miles.

"At 9.00 p.m. DASSEN IS. LT. was observed bearing S. 37° E. (T) right ahead; the course was then altered to S. 23° E. (T).

"At 10.50 p.m. ROBBIN IS. LT. was observed bearing S. 42° E. (T) with DASSEN IS. LT. bearing S. 81° E. (T). This fix gave a position of 33° 25' S.—17° 56' E. and showed a current of North (T) 8.4 miles from 6.22 p.m. to 10.50 p.m.

"ROBBIN IS. LT. was then visible at a distance of 32 miles, or 14 miles outside its estimated range, and, working back, it was estimated that DASSEN IS. LT. when observed at 9 p.m. was showing at a distance of 27 miles.

"During the 8 p.m. to midnight watch, the sea water was noticed as very phosphorescent; the sky was cloudless, and the stars were exceptionally brilliant.

"At midnight, GREEN POINT LT. was observed, a distance of 29 miles, and at 1.00 a.m. on the 19th the shore lights of Cape Town were plainly visible at a distance of 17 miles. A drop in the sea temperature from 62° F.—58° F. was noticed. At 2.43 a.m. the anchor was dropped in Table Bay.

"During the whole of the time from noon till arrival in Cape Town the wind was variable; Force 0-1, Sea 0, Swell S.S.E. very slight."

### CURRENT.

#### Approaching Gulf of Aden.

THE following is an extract from the Meteorological Log of S.S. *Newby Hall*, Captain T. P. EDGE, Bombay to Aden, Observer, Mr. R. H. STEWART:—

"Current experienced between noon, 12th September, 1925, Latitude 13° 43' N., Longitude 53° 29' E., and noon 13th September, Latitude 13° 46' N., Longitude 51° 23' E., was N.69° E. 71 miles.

"With regard to this abnormal current, a latitude by Venus at 2.15 p.m. on the 12th put the ship 2½' to the Northward of the D.R. Latitude. A subsequent observation at 3.38 p.m. put the ship 19½ miles to the Eastward of the D.R. position, so that it is most probable that the current was first felt between observations at 8.0 a.m. and noon of the 12th."

### WATERSPOUTS.

#### In the North Atlantic.

THE following is an extract from the Meteorological Report of S.S. *Minnetonka*, Captain T. F. GATES, C.B.E., New York to Cherbourg, Observer, Mr. H. E. MCCARTNEY, 4th Officer:—

"September 1st, 1925, 2.15 p.m., A.T.S. 17h. 25m. G.M.T. Ship in approximately Latitude 41° 05' N., Longitude 46° 08' W. Observed a series of well defined and unusually large waterspouts, apparently



stationary, bearing N.W. (True) from ship and appeared to be about five miles distant.

Wind, South, force 4. Barometer, 1018.3 mb. Steady.

Air Temperature, 77°. Sea, Temperature 77°.

Cloud, Cu., Cu-Nb., Amount 7.

Sea, South, disturbance 4. Weather c. q.

Swell Confused, rather rough.

"A single spout first appeared as a finger from low mass of Cu-Nb. This extended perpendicularly until it reached the sea in an unbroken straight line. A mass of spray surrounded the foot of spout.

"Soon a fainter spout developed parallel to the first but behind and a little East.

"The two then began to waver against a background of rain, and after assuming a waving and leaning position disappeared, by fading away.

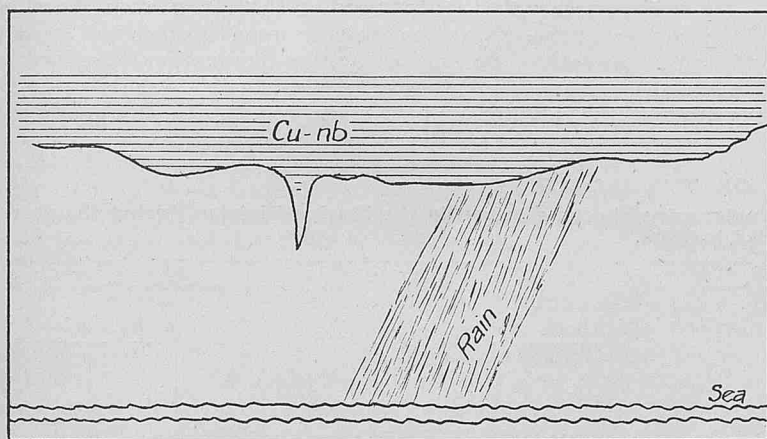
"Soon after other fingers assumed the first mentioned position from the cloud, but only one was seen to develop until it reached the sea.

"Another then formed and leaned towards it until they met midway between sea and cloud.

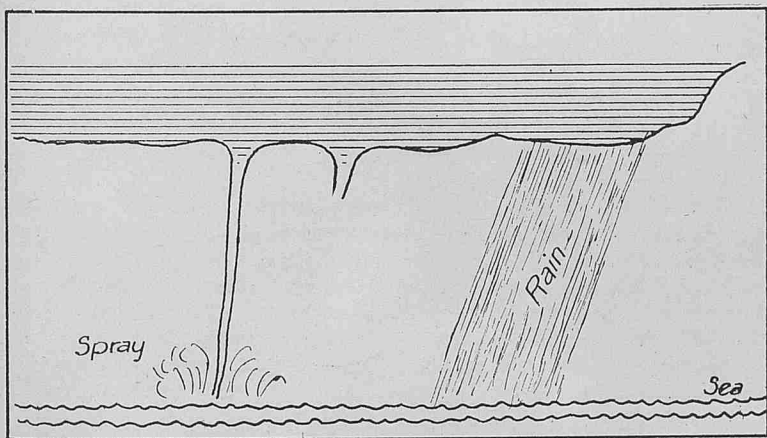
"They then broke from the sea and faded.

"The phenomena was in view for about fifteen minutes."

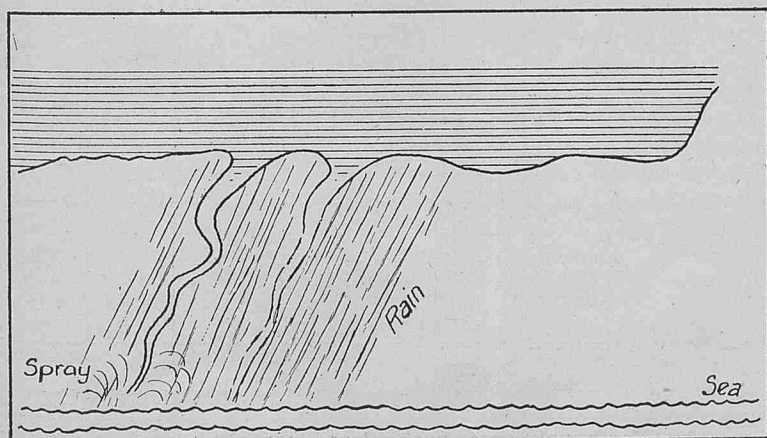
Waterspouts, September 1st, 1925, 2.15 p.m. to 2.30 p.m.



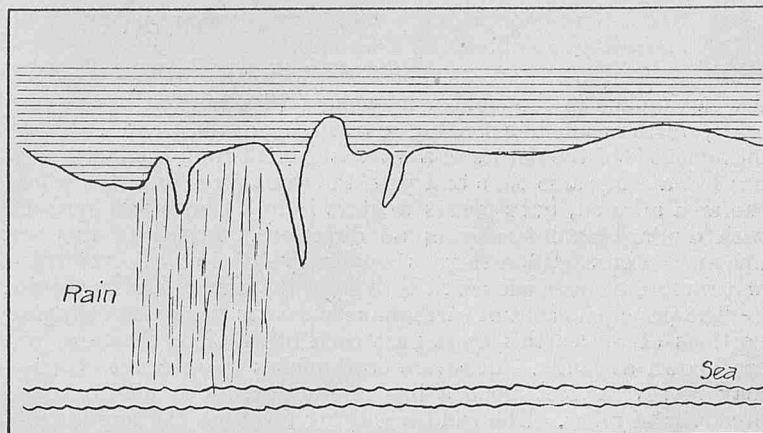
1st Formation.



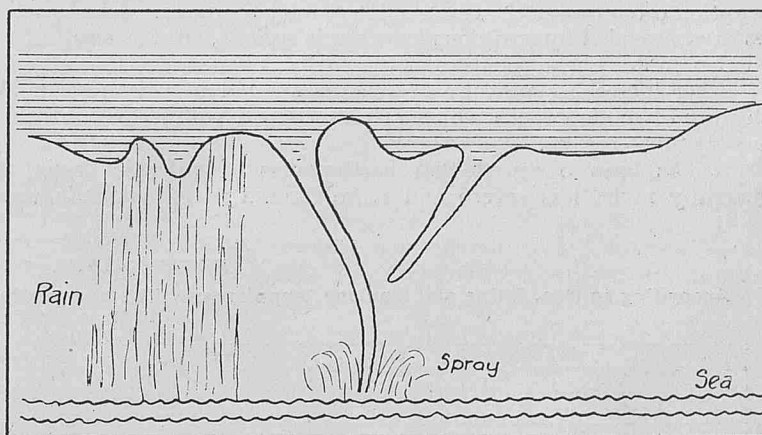
2nd Formation.



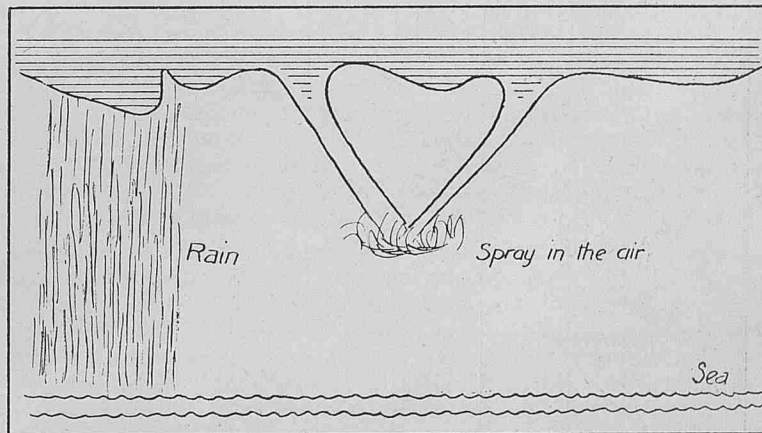
3rd Formation.—Fading very quickly.



4th Formation.



5th Formation.



6th Formation.—The disappearance was now very quick and no more were seen.

#### STRONG EBB TIDE AS INDICATION OF APPROACH OF S.W. GALE IN FIRTH OF CLYDE.

THE following remarks have been received from Captain E. S. S. SIMPSON, Fishery Cruiser *Vigilant*, West coast of Scotland:—

"All Firth of Clyde fishermen agree with me that from 12 to 24 hours before a S.W. gale (although the sea is calm, no swell, and Barometer steady) they (the fishermen) experience a *very strong* ebb tide in the Kilbrennan Sound, Firth of Clyde. They take this as a sure warning of a S.W. gale of wind approaching."

## SUBMARINE EARTHQUAKE PHENOMENA.

PREPARED IN THE MARINE DIVISION BY W. G. WILLIAMS, CLERICAL ASSISTANT.

AN earthquake is the sudden movement of a portion of the earth's crust, which results in a shaking or trembling of the ground. That the movement is of the nature of a wave is evident from the fact that it is not felt at the same time and with the same force over the whole of the area affected, but appears to start from a centre and spread out with diminishing intensity in all directions. Added to this wave-like motion or vibration there is usually a vertical uplifting movement, and rumbling noises are heard both from the ground and in the air.

The principal cause of earthquake shocks is the sudden slipping of portions of the earth's crust past each other along fractures which are known as faults. In severe earthquakes the amount of slipping may be several feet along a line of fracture which may extend for hundreds of miles. The sudden shifting furnishes the impulse which sends out the vibrations or waves into the surrounding portions of the earth.

Another cause of earthquakes is volcanic activity. A violent eruption often causes the earth in its vicinity to quake. Earthquakes, not accompanied by eruptions in volcanic regions, are the result of the sudden subterranean yielding of the earth's crust under the influence of either increasing pressure of gases generated in volcanoes or the shifting of molten rocks which are imprisoned within the earth and are trying to escape.

It has been observed that earthquakes of volcanic origin are generally much less severe and more limited in extent than those

which result from the fracturing of the earth's crust. Small shocks may be due either to the sudden falling in of immense cavities in the earth's crust or to the force of the collision when a great landslide or avalanche strikes relatively flat land at the base of a mountain.

Submarine slides also cause earthquakes.

**Signs of approaching earthquakes.**

The first sign of a coming earthquake is generally a low rumbling sound, so low that to many observers it is quite inaudible. The sound grows rapidly louder, and with it the first tremors become perceptible. Both continue to increase in strength until the principal vibrations are felt, when deep explosive crashes are often heard in the midst of the rumbling sound. The sound and shock then die away together, the former often continuing for a few seconds after the vibrations have become insensible.

Earthquake waves travel ordinarily at the rate of approximately two to three miles per second.

**Submarine Shocks.**

Submarine earthquakes are the result of the falling down of portions of the bottom of the sea as the pressure upon them is too great to withstand. As each section moves, a wave-like motion is transmitted through the earth. The intensity of the shock depends upon the magnitude of the subsidence of the ocean bed. Such shocks originate

**EARTHQUAKE CHART OF THE WORLD.**

According to Drs. Milne and Davison, supplemented by observations of submarine shocks received in the Marine Division during the years 1861 to 1907 and 1922 to 1925.

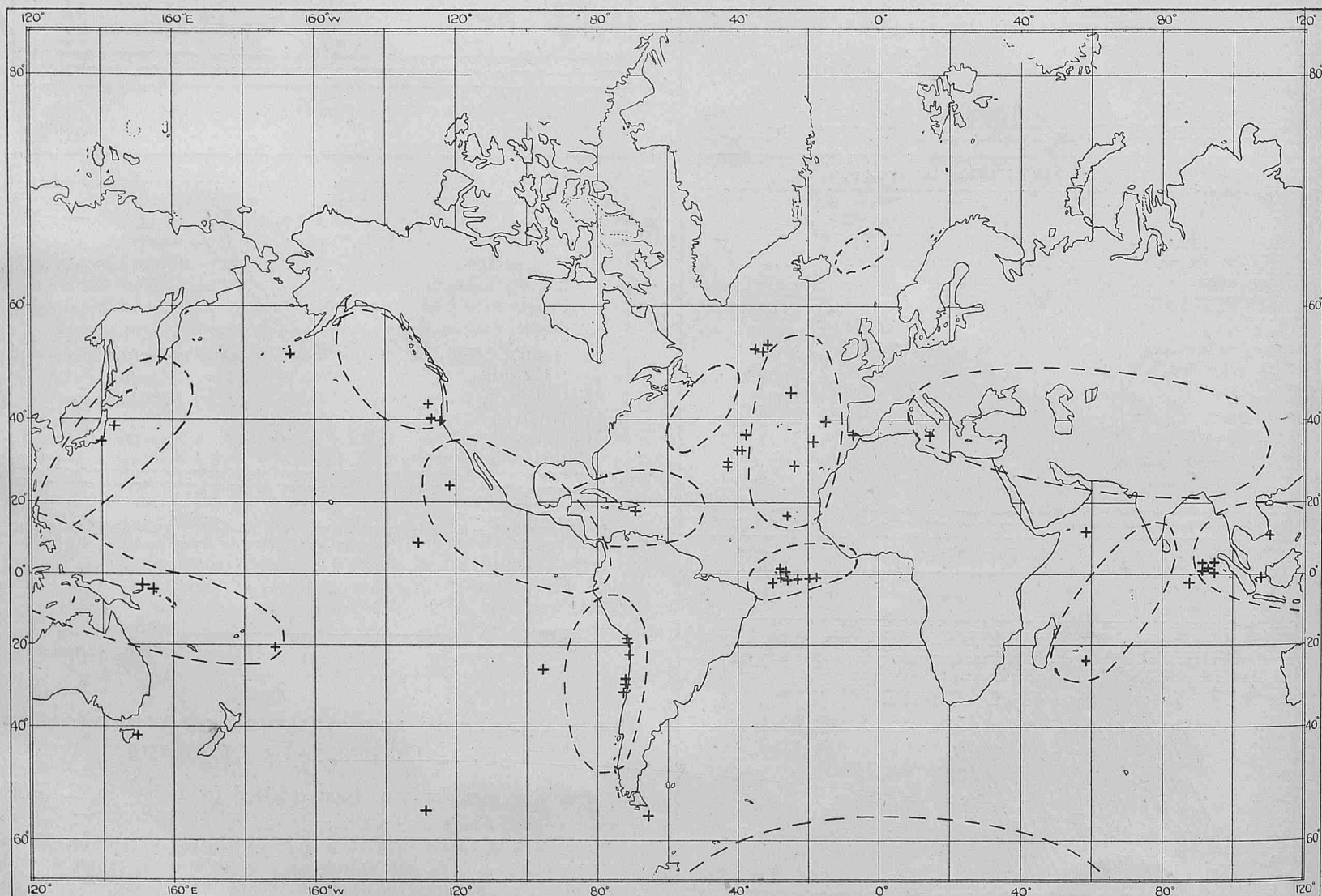


Figure 1. + denotes ship's position when submarine shock was felt. Earthquake areas are enclosed by dashed lines.



in regions where the ocean bed does not rise gradually as it approaches the shore line, but sinks to form a trough parallel to the coast line and then rises gradually, terminating in a plateau or as a range of mountains where volcanic activity is frequent. Submarine earthquakes and the accompanying landslides occur on the portions which are at the foot of the great slopes. An example of such a region is off the coast of Valparaiso and Iquique. Within 50 or 60 miles of the coast lies a trough with depths of over 4,000 fathoms. The sea bed rises gradually between the trough and the shore and culminates in the high mountain range of the Andes. Similar regions are near the Aleutian, Kurile and Japanese Islands and the East Indies. In the great depths of the ocean just off the eastern part of the Aleutian chain lies the breeding ground of some of the greatest earthquakes. It is a region where a small basin in the ocean bed, with depths of nearly 4,000 fathoms, is reached by a steep downward gradient. The depth of water increases at the rate of 1,000 fathoms in 25 miles until the 4,000 fathom line is reached.

Great subsidences of the bottom of the sea occur during submarine disturbances.

After the Filiatra shock in 1886, it was discovered, whilst searching for a broken cable 30 miles from shore, that a depth of 900 fathoms existed where previously there had been only 700 fathoms. About 4 miles of the cable was covered with the "landslip."

At 7.45 a.m., 30th May, 1909, the cable (Patras to Corinth No. 1) in Latitude 38° 10' N., Longitude 22° 21' E., was broken. Report from cable ship stated "Break due to seismic disturbance." Strong shock was felt at Patras on day of interruption.

During the evening of 1st August, 1913, a short but severe shock was felt at Mollendo, on the west coast of South America, and cable failed. The cable (at depth 300 to 325 fathoms) was broken in several places, and great difficulty was experienced in hooking in some sections owing to the mutilated state of cable as result of earthquake shocks.

Submarine shocks or marine disturbances are also the result of volcanic activity under the sea. When an eruption takes place on the ocean bed, gigantic, gently sloping cones, sometimes towering above sea level, are built up. The Hawaiian Islands, together with the chain of Aleutian Islands, Alaska (which is over 1,000 miles long), have been built up out of the sea. Other examples of islands of submarine volcanic origin are the Azores, Cape Verde and Canary Islands, the eastern portion of the West Indies, the East Indies and several islands of the South Pacific Ocean. The majority of these volcanoes (submarine) occur within areas, shown on FIGURE 1, where earthquakes are most active.

In FIGURE 1 is shown the main earthquake regions of the world, together with reports of submarine shocks received at the Meteorological Office during the years 1861 to 1907 and 1922 to 1925.

When a volcano is active under the sea there is certain to be a corresponding movement in the surrounding district. Several shocks have been felt by vessels in that portion of the Atlantic between Cape Palmas, on the west coast of Africa, and Cape St. Roque on the east coast of South America. This region lies in the line of Iceland—the west coast of Scotland—the Azores—Canaries—St. Helena, all of which, if not at present in volcanic activity, show evidence of having been active within recent years.

From the rattling sound which has accompanied some of these submarine shocks, though they had not been recorded as earthquakes upon the neighbouring shores, it seems not improbable that they are the result of the sudden condensation of volumes of steam produced by submarine volcanic eruptions.

The following is an account of an Atlantic earthquake encountered by Captain C. H. STOTT, of S.S. *Manchester Brigade* :—

"On September 30th, 1923, at 1.20 (G.M.T.), when in Latitude 52° 42' N., Longitude 35° 05' W., the vessel began to vibrate heavily from stem to stern for about 20 seconds. Thinking we had struck some submerged wreckage, I was just on the point of stopping when the vessel began to vibrate again, more heavily than the first shock. This lasted for about 30 seconds; then I put it down to earth vibration or earthquake shock.

"While working out position to send out by wireless we got a message from S.S. *Lady Brenda* : 'Fear struck submerged wreckage.' Sent out my message : '1.20 (G.M.T.), Latitude 52° 42' N., Longitude 35° 05' W., felt two severe shocks, causing ship to vibrate heavily; think must be earthquake shocks. Stott.'

"Received another message from S.S. *Lady Brenda* : '1.20 (G.M.T.), Latitude 52° 10' N., Longitude 33° 30' W., felt two distinct shocks making vessel vibrate heavily for periods of 30 and 10 seconds respectively which resembled contact with submerged wreckage, but must have been earthquake shocks as ships in vicinity also report similar experience.' At 2.7 (G.M.T.) had another shock, causing ship to vibrate heavily, but only for a few seconds. Again at 11.18 (G.M.T.), September 30th, had another shock causing ship to vibrate for about 10 seconds, position then being Latitude 53° 28' N., Longitude 31° 53' W. The distance between the ships when first shocks were felt was about 70 miles. A little to the north of our position at 1.20 (G.M.T.) are three peaks with 630, 730 and 833 fathoms of water over them. One of these may have been in eruption."

The following report of a submarine shock has been received from the Barquentine *S. F. Tolmie*, Captain J. C. STEWART :—

"February 21st, 1924, 4.35 a.m., in Latitude 40° 32' N., Longitude 126° 38' W., approx., calm, clear weather, full moon, heavy W.S.W. swell running. Experienced a violent earthquake tremor accompanied by a roar similar to that caused by a heavy squall of wind.

"The vessel was shaken from stem to stern, masts and rigging jumping, lamp glasses and crockery rattling, those below could hear the ship's timbers creaking and straining.

"Sea surface very much disturbed.

"The tremor was variously estimated to last from 15 to 20 seconds.

"10.10 a.m. Another tremor of less force and accompanied by noise as before.

"1.46 p.m. Another slight tremor lasting 10 seconds.

"5.25 p.m. Another tremor, more severe than last, same noise.

"9.50 p.m. Slight shocks felt, three in succession, sea surface disturbed.

"A good lookout was kept for any heavy sea or seismic wave, but none was observed."

On June 28th, 1831, when passing over the Graham Shoal in the Mediterranean, H.M. Sloop *Rapid*, Commander SWINBURNE, felt several earthquake shocks. On July 19th after an eruption of a high column of water and smoke, a tract of land with a crater mouth rose a few feet above the level of the sea. It was in great activity. Vast volumes of steam and ashes were being emitted. From then on the crater gradually increased in dimensions and magnificent eruptions of cinders with white vapours rose to heights of from 400 to 1,000 feet, accompanied by a noise like thunder. At night constant shootings of small columns of fire were visible with occasional flashes of lightning. Towards the end of August its circumference was about 1,080 yards, height from 107 to 180 feet. Following various changes, it gradually subsided and had disappeared by December. By January, 1832, there was from 2½ to 3 feet of water over the spot.

On February 28th, 1877, a slight earthquake shock was felt at Kaawaloa (Hawaiian Islands). Steam was observed rising from the sea off Keel Point and lumps of porous lava, some nearly 1 cubic foot in size, were also rising to the surface and sinking again when the contained gas escaped. At the time of the earthquake a crack opened in the ground from Keel Point in an E.S.E'y direction extending for more than a mile, in some places 4 inches wide and 50 feet deep.

The following extract and chart, FIGURE 2, from H.M.S. *Carlisle*, Captain R. S. MACFARLANE, R.N., has been received from the Hydrographer of the Navy :—

"At 1650, March 22nd, 1925, in a position Latitude 0° 58' S., Longitude 107° 25' E., the ship passed close to a patch of discoloured and disturbed water, full of sediment and what appeared to be white particles of shell or coral, rising from the bottom. Two miles further east, several similar small patches were passed two or three cables north of the ship; course being altered to avoid one right ahead.

"A great deal of mud appeared in these patches, the water becoming brown and turgid, and appearing to seethe violently. One such patch actually commenced to boil up while the ship was passing, with crowds of sea birds collected over it apparently picking up fish. The disturbances appeared to be of very short duration—the most violent agitation lasting only a few minutes—but leaving the water considerably discoloured.

"The ship's position given was obtained by an observation of the sun at the time—and checked back for Latitude from Star Sights at 1815."

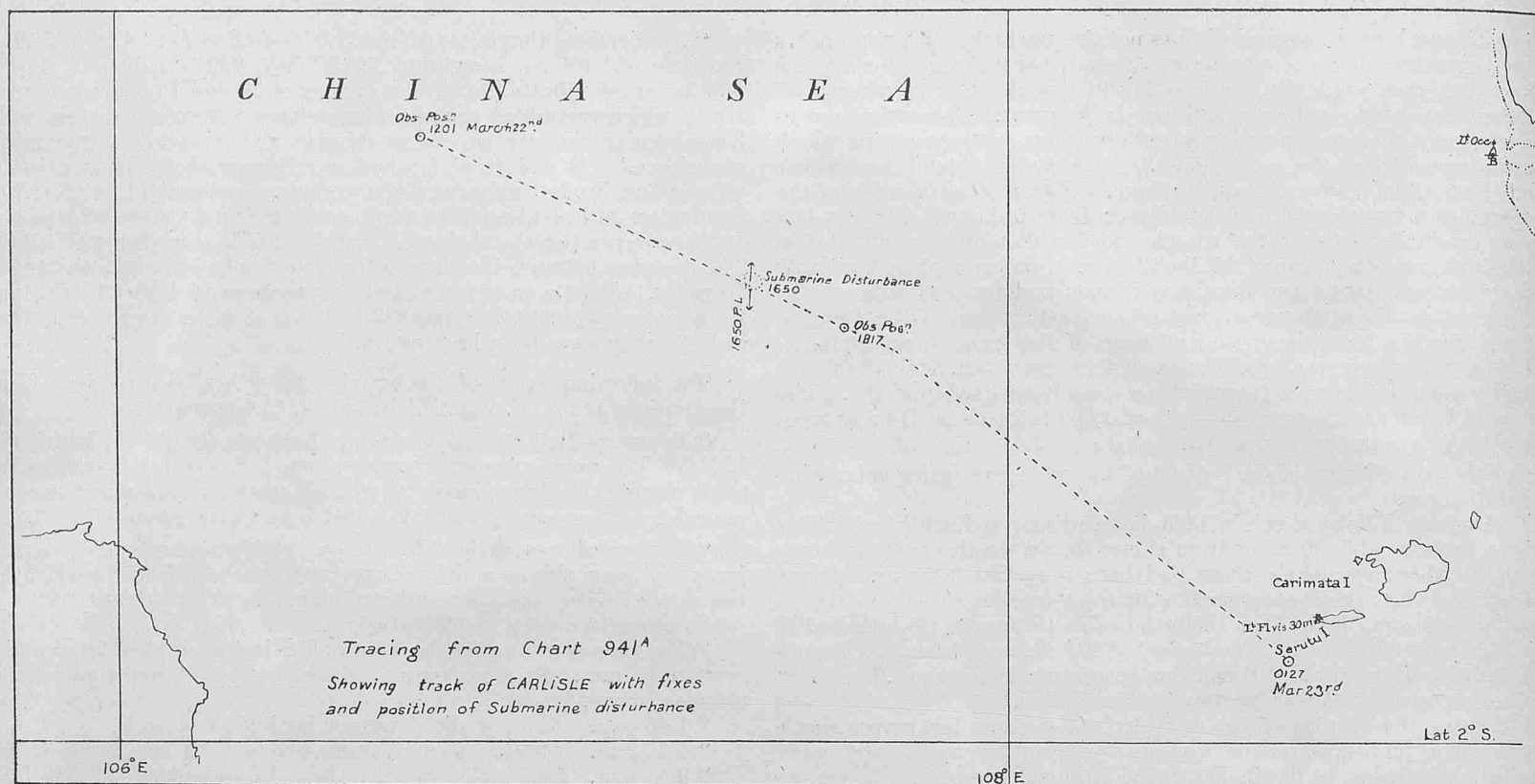


Figure 2.

### Seismic Sea Waves.

Severe earthquakes have been accompanied by waves of an enormous size, which, if the earthquake has originated beneath the sea near to a coast line, have, subsequently to the shaking, rolled in upon the land and caused more destruction than the actual earthquake.

Such sea waves are called seismic sea waves and are often mis-called "tidal waves."

One class of seismic sea waves is due to the sinking of the bottom of the sea. When a large area has subsided, water will drain away from the shore to fill up the gap that has been made. The result is that when the waters meet at the centre they are forced upwards by the impact and, when this column of water collapses under gravity, the first great sea wave comes ashore. When the remaining volume of water has subsided into the depression again, the sea flows into the gap once more and forces the level up a second time. The next wave is sent ashore on the second collapse of the elevation produced. This process is capable of continuing for days.

The second class of seismic sea waves is the result of the uplifting of the bottom of the ocean. It is characterised by the sudden rising of the sea without any previous withdrawal from the shore. If the upheaval took place slowly, the first result would be that the water situated over the centre of the disturbance would flow away radially in all directions from above the disturbed area. On the other hand, some upheavals take place with great rapidity due to the sudden emission of large volumes of steam generated during the entry of water into the crater of an active volcano.

It is the first class of seismic sea wave that is usually experienced. The phenomena generally noted are first the earthquake, followed shortly afterwards by the sea draining away from the shore. After an interval, which varies from an hour to a day, the sea returns as a mighty wave washing everything before it. Having swept the coast, the sea withdraws, returning, some time later, as a second seismic sea wave. This process may continue for a day or two.

In 1868 an American ship was lost by being swept a quarter of a mile inland by the great sea wave which inundated Arica, on the west coast of South America. She was moved still further inland by the great sea waves of 1877.

Great destruction was wrought at Lisbon in 1755 by a series of sea waves of this class. The first indication of the phenomena was the withdrawal of the water sufficient to uncover completely the bar at the mouth of the Tagus. Half an hour after the most severe shocks had occurred, a series of sea waves 30 to 60 feet high broke on the shore and swept over the land, causing the death of 100,000 persons and enormous destruction to property. The shock was felt at Oporto,

Cadiz, and Madeira. At Cadiz the wave rose 60 feet, at Madeira 12 feet, and the sea was so disturbed 120 miles west of Cape St. Vincent that vessels were violently shaken and men standing on deck were thrown down.

On October 28th, 1724, during the Lima earthquake, after the withdrawal of the sea, Callao was swept by a wave which was 80 feet in height.

At Manahiki (Latitude 10° 21' S., Longitude 161° 01' W.) a seismic sea wave was seen approaching, having the appearance of a black wall of water.

The greatest seismic sea wave recorded is one which on October 6th, 1737, broke on the coast of Lupatka 210 feet in height.

The extent to which the sea will retreat varies. At Caldera, near Copiapo, on May 9th, 1877, the time when Iquique was devastated, the sea silently drew back for over 200 feet.

In 1696, at time of Catanian earthquake, the sea retreated 2,000 fathoms.

The time taken by the sea to flow back also varies. At the earthquake of Santa on June 17th, 1678, the sea retreated as far as the eye could see, and did not rise again for twenty-four hours, when it flooded everything.

In 1690, at Pisco, the sea went back 2 miles, and did not return for three hours. When Acapulco was destroyed on December 4th, 1854, the sea returned as gently as it went out.

On September 1st, 1923, a great earthquake occurred in Japan, of which Captain Robinson of the *Empress of Australia* has given his experiences in "THE MARINE OBSERVER'S LOG," the centre of the disturbance being Sagami Bay. As full details of this disturbance are now available, it will be of interest, in view of the facts given for the first class of seismic sea wave.

The sea quake that accompanied this great earthquake was not very strong. At 11.58 a.m. on September 1st, when in Latitude 35° 1' 45" N., Longitude 139° 37' 15" E., the S.S. *Takasago Maru*, Captain S. ONO, felt a severe shock lasting one and a half minutes, as if her propeller raced. Fishing motor boats which were also in the bay felt a severe shock, as if their engines were out of order, but they did not suffer any damage.

Large quantities of dead fish known as "shige," which live at the bottom of the central part of Sagami Bay at a depth of about 500 fathoms, were picked up by fishermen. They had been killed by the hammering action of the water during shock off the north-east coast of Oshima Island.

During this earthquake there was a great upheaval of the land at



Plan showing upheaval and subsidence of the shore and sea bed of Sagami Bay, Japan, and the height of seismic sea wave during the Earthquake of 1st September, 1923.

Adapted from "Memoir No. 4, Vol. I," of August, 1924, of the Imperial Marine Observatory, Kobe, Japan.

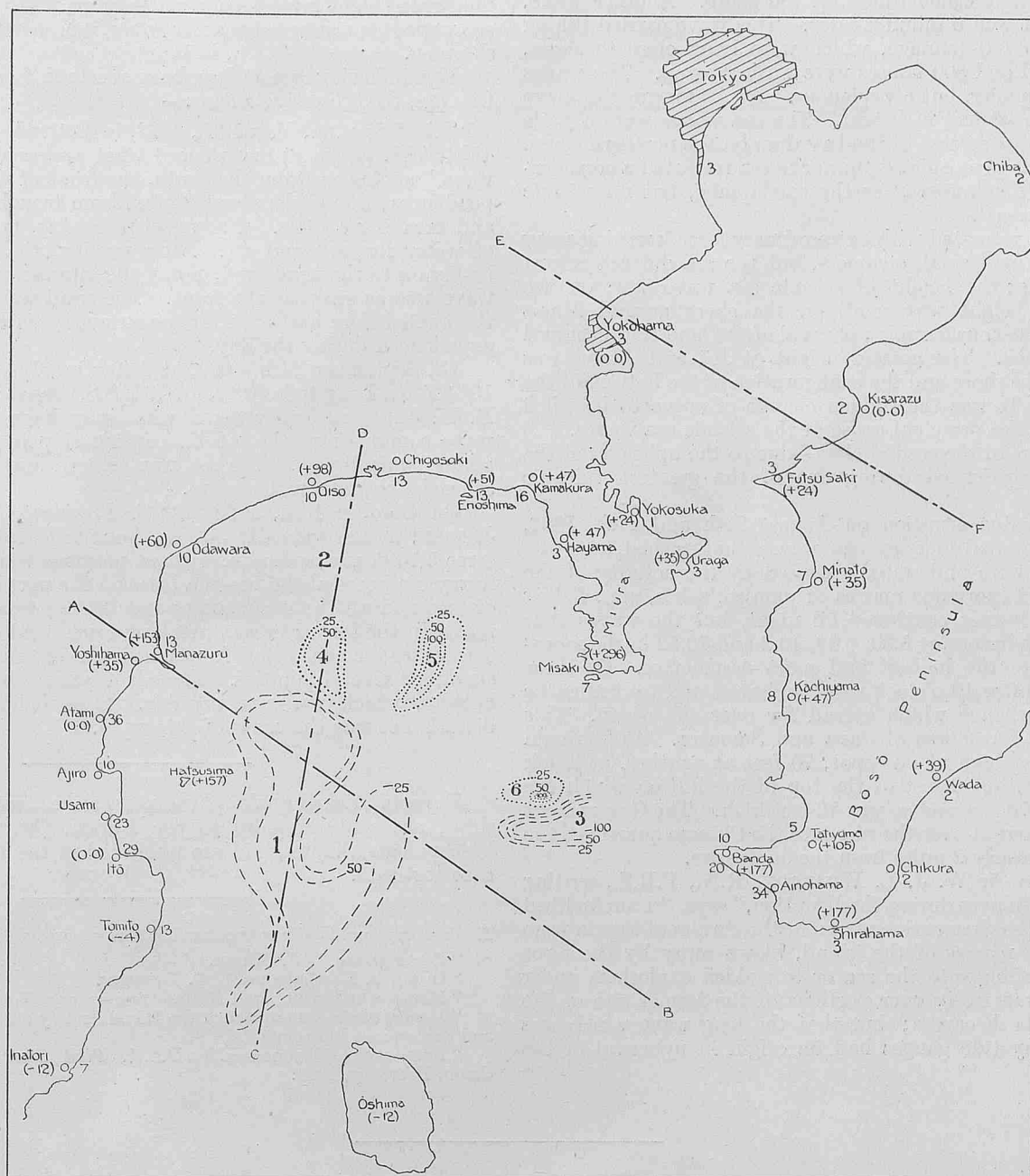


Figure 3.

#### EXPLANATION OF PLAN.

Area of upheaval of sea bed is indicated by contour lines for each 25 fathoms thus .....

Area of subsidence of sea bed is indicated by contour lines for each 25 fathoms thus - - - - -

Amount of { upheaval of shore line } in inches shown to landward { (+ 34)  
 { subsistence of shore line } of coast line thus { (- 12)

Figures to seaward of the coastline indicate the height of seismic sea wave in feet thus, 10.

various points. At Hatsushima the amount of upheaval was 157 inches, at Yoshihama 35 inches, at Cape Manazuru the amount at time of earthquake was 153 inches, and the sea between the Cape and Mitsuishi, a small rocky isle near the Cape, was pushed away by the upheaval. The northern coast of the Bay suffered similar upheaval.

FIGURE 3 shows area of upheaval of sea bed enclosed by dotted lines, area of subsidence is enclosed by pecked lines, and the amount of the upheaval of shore line is shown by figures in parenthesis with plus sign, subsidence minus sign. The land south of line AB subsided but not to a great extent. Hatsushima is the only exception.

Between AB and EF there was upheaval. Above and along EF there was no change.

For years prior to the earthquake, the land on the eastern part of the Bay had been gradually subsiding, but after the earthquake this land heaved up.

On the bottom of Sagami Bay, however, there were much greater upheavals and subsidences. In the FIGURE, regions 1, 2 and 3 are areas where subsidences occurred; regions 4, 5 and 6 are areas of upheaval. Region 1 had as much as 50 or 60 fathoms subsidences and was, undoubtedly, a fault, and the principal cause of the earthquake. Region 2 belonged to the same fault. Region 3 had a steep slope towards 6 before the earthquake, at some places the angle of slope was 40°, so a landslip towards 6 occurred.

The seismic sea wave which accompanied this earthquake was

small, though the disturbance occurred in the Bay. The figures on shore line denote height of sea wave in feet. Itō experienced a sea wave about 5 minutes after the earthquake. The sea first of all retreated over 300 feet from the shore. This occurrence was followed by a wave 10 feet high which rolled on the shore. Another wave, 29 feet in height, followed 5 minutes later. This wave carried fishing boats of from 70 to 100 tonnage, which were lying close to shore, about 800 feet inland and 300 houses were washed away. The waves that followed were smaller, but conspicuous. At Atami great damage was done by a wave 36 feet in height. The sea waves were a little higher on the north-east section of the bay than on the northern coast.

On the shore of the peninsula of Miura the sea retreated a considerable distance about 5 minutes after the earthquake, but no seismic sea wave was experienced.

At Misaki the sea retreated with extraordinary force, carrying away with it fishing boats and small steamers, but the sea did not return to former shore line; the height of seismic sea wave was, on the whole, small. The height was small on the shore around Miura peninsula owing to the considerable upheaval of the land that occurred during the earthquake. The greater height at Itō and Atami was due to the shape of the shore and the configuration of the bottom of the sea near the shore. It was the sudden change of space to be filled with water that was the principal cause of the seismic sea waves.

A seismic sea wave of the second class—due to the upheaval of the sea bottom—was experienced during one of the greatest volcanic eruptions on record.

During the Krakatoa eruption on August 26th and 27th, 1883, the greatest damage was done by sea waves that rushed over the land. These waves were undoubtedly caused by the activity of the volcano aided by the enormous masses of pumice, ashes, etc., falling into the sea. Such waves continued all night, but the waves that followed the great explosions at 5.30, 6.44, 10.2 and 10.52 in the morning of the 27th were the highest and most destructive. Of these waves the one soon after 10 o'clock was the largest and to it must be attributed the disturbance which spread far over the ocean. This wave inundated the foreshores of Java and Sumatra. At Tyingin this wave was 50 feet high at one spot, 70 feet at another, at Telok Betong it reached within 6 feet of the top of the hill on which the Residence stands at 78 feet and so was 72 feet high. The Government steamer *Berouw* was swept over the pier into the Chinese quarter of the town, a distance of nearly 2 miles from the anchorage.

The late Admiral Sir W. J. L. WHARTON, R.N., F.R.S., writing on the "Seismic Sea Waves during the Eruption," says, "I am inclined to the opinion that the destructive waves in the Straits of Sunda were mainly due to large masses of the island, blown away by the force of the explosions, falling into the sea or to sudden explosions under the sea after it flowed freely over portions of the former site of the island, possibly to both causes; but that the long wave which was recorded on so many tide gauges had its origin in upheaval of the sea bottom."

## Seismic Sea Waves in the Ocean.

In the open sea seismic waves are scarcely noticeable, except when encountered near their place of origin, as their period is very much longer than that of ordinary sea waves and their great length and moderate height gives them a gentle slope. When, however, a seismic sea wave is encountered near its origin, it is steep and causes damage to shipping.

The following report has been received from Captain F. ASHBY GRAVES, S.S. *Highland Rover* :—

"At 9.25 p.m., May 10th, 1922, in Latitude 29° 23' S., Longitude 48° 05' W. (approx.) experienced what appeared to be a small 'tidal wave' coming up from the south, the front of which was almost perpendicular, the height about 30 feet from trough to crest curling over and breaking a little. The vessel rose to it, but shipped a quantity of water forward and aft. After passing, the ship seemed to drop bodily on to the next swell, giving the impression that the back of the wave was as steep as the front. The wind was light from S.W. and the swell before and after the occurrence was the same as had been experienced during the day."

On September 24th, 1923, at 2.40 a.m., L.A.T., when in Latitude 13° 32' N., Longitude 94° 18' W., U.S.S. *Dorothy Luckenbach*, Captain R. H. JOHNSON, encountered what may have been a small seismic wave coming from the S.S.E., causing ship to heel 10° and roll for about two minutes. The sea was smooth and oily both before and after the passage of this wave.

On October 16th, 1923, U.S.S. *President Grant*, Captain M. M. JENSEN, in Latitude 41° 50' N., Longitude 151° 43' E., wind S.E., force 5 to 6, sea moderate, without previous warning or indications, a heavy sea boarded the vessel a little on the port bow and carried away or loosened all the steam pipes and fittings from the windlass to the house on the forward deck, breaking some windows in the pilot house. The water seemed to fall from under the vessel and she quivered and shook for several minutes. The effect was as though she had touched bottom, which was not possible. It is believed some submarine disturbance was the cause of this wave.

Reports of earthquake phenomena at sea, received from observing ships, are sent annually to the Bureau Central Internationale de Volcanologie, Naples, and are published in the Bulletin Volcanique of that institute.

The following publications were used in the preparation of the above article :—

- "Earthquakes." J. MILNE.
- "Origin of Earthquakes." C. DAVISON.
- "Memoirs of the Imperial Marine Observatory, Kobe, Japan," August, 1924.
- "Report of the Committee of the Royal Society on the Eruption of Krakatoa and Subsequent Phenomena."
- "Earthquake Phenomena." U.S.A. Pilot Chart of the North Atlantic Ocean, February, 1923.

## TROPICAL CYCLONES OF THE EASTERN NORTH PACIFIC.

PREPARED IN THE MARINE DIVISION BY H. KEETON, PRINCIPAL CLERICAL ASSISTANT.

THAT portion of the North Pacific lying to the westward of the Mexican coast is perhaps the least known of the cyclone regions of the world, and information of the storms that are known to occur there is very incomplete and widely scattered.

The first important investigation of these storms was made in 1856 by W. C. REDFIELD, one of the pioneers of marine meteorology, who published a description and tracks of 13 storms which occurred up to 1855 (see FIGURE 1). Since that time, until recently, no serious attempt appears to have been made to investigate them, except that a list of 40 storms between 1832 and 1892 appeared in the "Segelhandbuch für den Stillen Ozean" in 1897, but no mention was made therein of those described by REDFIELD.

The area affected by these storms lies approximately between Latitude 10° and 30° N., extending eastward from Longitude 130° W. to the coasts of Lower California, Mexico, and Central America. In the south-eastern portion of this area, situated between the southern boundary of the N.E. trade and the northern boundary of the S.W.

monsoon, conditions during the summer and autumn months are very unsettled, with variable winds and calms, interspersed with squalls and gales. It is here that the greater number of the cyclonic storms develop.

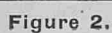
As in other tropical cyclone areas, the occurrence of these storms shows a marked seasonal variation. The season extends from July to October, the month of maximum frequency being September. They sometimes occur in June and November, but are unknown during the remaining months of the year. The monthly distribution of 78 recorded cyclones between the years 1832 and 1922 is as follows :—

June	-	-	-	-	-	-	-	5
July	-	-	-	-	-	-	-	10
August	-	-	-	-	-	-	-	14
September	-	-	-	-	-	-	-	28
October	-	-	-	-	-	-	-	18
November	-	-	-	-	-	-	-	3



to 1922. This suggests that an average of two or more tropical cyclones occur off the Mexican coast each year.

FIGURES 1 and 2 show the tracks of a number of recorded storms, from which it will be seen that the majority take a N.W. to W.N.W. course, roughly parallel to the coast; and that a number of them recurve and disappear inland. Others, especially those which originate at a distance from the land, move due westward or even west-south-



westward, although how far these travel before dying out or recurving is not known. Generally it appears that during the early part of the season the storms occur at some distance from the coast, while from September onwards their tracks are much closer to the coast.

The rate of progression of these storms varies considerably. REDFIELD reported that some move slower than any he knew of in the Atlantic. On the other hand, some of the recent storms, for which the information is more complete, travelled nearly 300 miles per day. The rate of travel is probably not often more than 12 to 15 miles an hour, nor less than 5 miles an hour; the speed of the storms of small dimensions being more rapid than those covering a larger area.

There seems no doubt that the majority of the storms are of small diameter, as compared with those of other cyclone regions; and that they do not influence the weather at any great distance from their centres. For example, on the 20th September, 1888, the German barque *Parnass*, while in the harbour of Mazatlan, was blown from her anchorage, and suffered considerable damage from hurricane winds; while a steamer only 50 miles distant reported at that time a fresh S.W. wind, with a steady barometer.

In another case the diameter of the storm field was noted as 800 miles. This does not mean to say that violent or even strong winds were experienced in the outer zones of this area, but that the existence of the disturbance was recognised by the indications of the barometer, changes of wind, and other characteristic signs.

The average extent of the storm field may be taken as between 100 and 200 miles in diameter.

The duration of a cyclone depends of course upon its speed of travel at the particular spot where the observer is situated, and upon its extent; also, at sea, the *apparent* duration depends upon the course and speed of the ship relative to the storm's movement. The average duration of these storms is undoubtedly shorter than those of other tropical seas, and may be taken as from 12 to 20 hours. The shortest time recorded for the passage of a storm is 2 hours, and the longest 60 hours, but the circumstances of these are not stated.

The cyclones of this region, as in all others, vary in intensity. The area of the storm is no guide to its violence, and a storm of small extent may nevertheless be most violent in character. In more than half of the 40 cyclones recorded in the "Segelhandbuch" the wind is reported as reaching storm or hurricane force (Force 11 or 12); while it reached the same force in seven out of the 26 cyclones recorded by HURD, 1912 to 1922.

The usual timely indications of the approach of tropical cyclones are frequently lacking in the case of storms of this region. If the storm is of large dimensions, it is preceded by the usual signs; but if of small dimensions and of rapid progression it may give little or no preliminary warning of its onset. This handicap is accentuated by the fact that during the rainy season, June to November, along the whole of the Mexican coast the weather is very bad. The following extract from an article in the April, 1926, Number describes the conditions on this coast:—

"Gales and strong breezes from S.E. to S.W. constantly occur, whilst squalls, associated with thunder and lightning, with heavy and almost incessant rain, characterise the season throughout.

"Violent and dangerous hurricanes, known as 'Cordonazos,' occasionally visit this coast, usually at intervals of several years, and generally in early October, but they may occur at any time from the middle of June until early in November. These hurricanes, which are of short duration, usually commence from S.E. The wind quickly veers to S.W., reaching a maximum force, accompanied by heavy rain, thunder, and lightning, and bringing a very high sea. The wind then gradually veers to N.W., and decreases, while the weather clears.

"Owing to the generally threatening appearance of the weather on this coast every evening during the bad season, it is almost impossible to foretell the coming of these hurricanes, unless they occur late in the season, when the weather has already commenced to clear."

These "Cordonazos," a name given to the storms by the Spaniards in early days, are the tropical cyclones whose tracks lie closely parallel to the coast or pass inland.

The most recent report received in this Office of a cyclone in these waters is the interesting one of S.S. *Kathlamba*, Captain J. ALLAN MORDUE, who experienced a cyclone of extreme violence in October, 1925, while on a passage from Panama to Vancouver.

According to the U.S. Monthly Weather Review, this storm appears to have originated not far from Latitude 13° 30' N., Longitude 96° W., where the centre was situated at 5 p.m. on October 22nd, 1925. It

travelled W.N.W. until the 24th, when at 6 a.m. it was central in Latitude 16° 20' N., Longitude 104° 30' W. During that day its course must have curved rapidly through N.W. and N., the centre passing to eastward of *Kathlamba*, in approximate Latitude 18° 45' N., Longitude 106° 20' W., at 1.30 p.m. of that day. During the night of the 24th–25th, it crossed the coast at Cape Corrientes, and passed inland. The approximate track of this storm is given in FIGURE 3.

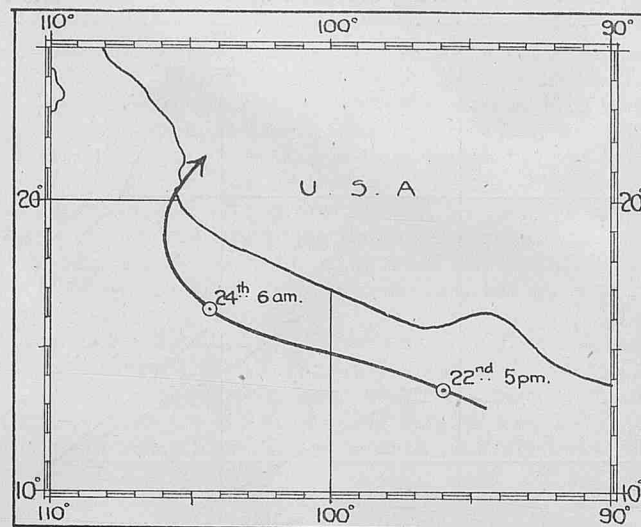


Figure 3.

Captain MORDUE's account is as follows:—

"From noon till midnight of October 22nd, the wind was light and variable, interspersed after 8 p.m. with short, hard squalls, with heavy rain and much lightning. In the early hours of the 23rd, the wind settled down to N.E. and E.N.E., and by 8 a.m. to a fresh breeze from E. Position at noon on the 23rd—Latitude 16° 56' N., Longitude 102° 25' W. The barometer, which till noon of the 23rd remained steady (at about 29.84 in.), then began to fall slowly, and continued to do so at the rate of about .04 in. a watch until 8 a.m. of the 24th. The wind all this time remained steady at east, but gradually increasing, and was accompanied by hard rain squalls, ever increasing in intensity and violence.

"I am quite unacquainted with this coast, and as the Sailing Directions refer to the region in general as being subject to much bad weather, violent gales and so forth, and make no mention whatever of cyclones, hurricanes, or any storms of that breed, the likelihood of encountering such a disturbance had not entered into my calculations. During the forenoon, however, the whole appearance and behaviour of the weather became so cyclonic in character that all doubt as to the nature of the gale was dispelled.

"We had been steering N. 63° W. (True) since noon of the 22nd (Latitude 14° 58' N., Longitude 97° 51' W.), altering to N. 55° W. at 4 a.m. on the 24th.

"Between 8 a.m. and 10.30 a.m. the barometer fell .15 of an inch, and in the next hour another .15, the wind backing to E.N.E.

"Figuring that the storm centre had been following almost in our track for two days, and was now approaching us and probably turning more to the northward, I altered our course to west.

"The wind continued to back steadily to N.E. and N., increasing to force 12, and as the wind shifted, I kept the ship away to S.W. and S.S.W.

"Our estimated position at noon was Latitude 18° 53' N., Longitude 106° 05' W., and barometer readings as follows:—

Noon	-	-	-	-	-	29.12 in.
12.15	-	-	-	-	-	29.05
12.30	-	-	-	-	-	28.97
12.45	-	-	-	-	-	28.85
1.00	-	-	-	-	-	28.65
1.15	-	-	-	-	-	28.63
1.30	-	-	-	-	-	28.63

"During this time the wind was shrieking overhead. Canvas weather screens and dodgers and light awning decks over the bridge and poop were torn from their fastenings and whirled away to leeward. One of the starboard boats was blown adrift from its chocks, and some idea of the force of the wind can be formed from the fact that the pressure on the steam whistle lanyard was sufficient to cause the



whistle to sound full blast at frequent intervals.

"The ship was swept by a continuous blinding smother of rain and spray, through which the dim loom of the white painted foremast could just be discerned from the bridge—the limit of our vision forward; forecastle head and all on it being completely obliterated.

"At 1.30 p.m. the barometer started to rise, and I consider the centre of the storm must have crossed astern of our track at no great distance about this time, the wind backing to the N. Westward.

"Barometer readings were:—

1.45	-	-	-	-	28.79 in.
2.00	-	-	-	-	28.92
2.15	-	-	-	-	29.04
2.30	-	-	-	-	29.14
2.45	-	-	-	-	29.18

"At 4 p.m. barometer 29.47 in., wind W.N.W. and a high, confused sea running from W.-N.W.-N.N.E., I kept up to S.W., and at 5 p.m. the barometer showing 29.54 in. and our estimated position being Latitude 18° 30' N., Longitude 106° 35' W. we resumed our course—N. 55° W.

"The wind remained steady at W.N.W. till 6 o'clock the following morning, gradually decreasing to a moderate breeze, and the sea

showing no sign of the recent disturbance.

"The S.S. *City of Stockholm* which was going up the coast ahead of us, appears never to have been nearer than the outskirts of the storm. Her position at noon of the 24th was Latitude 20° 38' N., Longitude 107° 11' W., about 120 miles N.W. by N. of the *Kathlamby*, and her weather at that time, fresh N.E. wind with rain, and heavy southerly swell; barometer 29.86 in. (? uncorrected).

"The S.S. *Invergordon*, also bound up the coast, was close to us, and kept her course throughout.

"Captain MURCHISON gave the following particulars:—

"Estimated noon position, Latitude 18° 51' N., Longitude 105° 54' W.; wind, E.S.E., shifting to N.E. at 2 p.m., N. at 4 p.m. and N.W. at 5 p.m., at which time the storm reached its maximum, the barometer recording 28.10 (? uncorrected) and her estimated position being Latitude 19° 04' N., Longitude 106° 25' W."

The following publications have been used in the preparation of the above article:—

"Tropical Cyclones in the North East Pacific," by STEPHEN S. VISHER, *U.S. Monthly Weather Review*, June, 1922.

"Tropical Cyclones of the Eastern North Pacific Ocean," by WILLIS E. HURD, *Pilot Chart of North Pacific Ocean*, May, 1923 (U.S. Hydrographic Office).

## THE BEAUFORT SCALES.

BY COMMANDER L. G. GARBETT, R.N. (RETIRED), SUPERINTENDENT NAVAL METEOROLOGICAL SERVICES.

THE Beaufort Scales of Wind and Weather are well known to all seamen and therefore a few remarks on their history may be of interest to the readers of THE MARINE OBSERVER.

The first mention of these scales is to be found in ADMIRAL BEAUFORT's private log of 1806, which he kept in H.M.S. *Woolwich* when in command of that ship. A facsimile of the page facing January 13th in this log is shown in FIGURE 1.

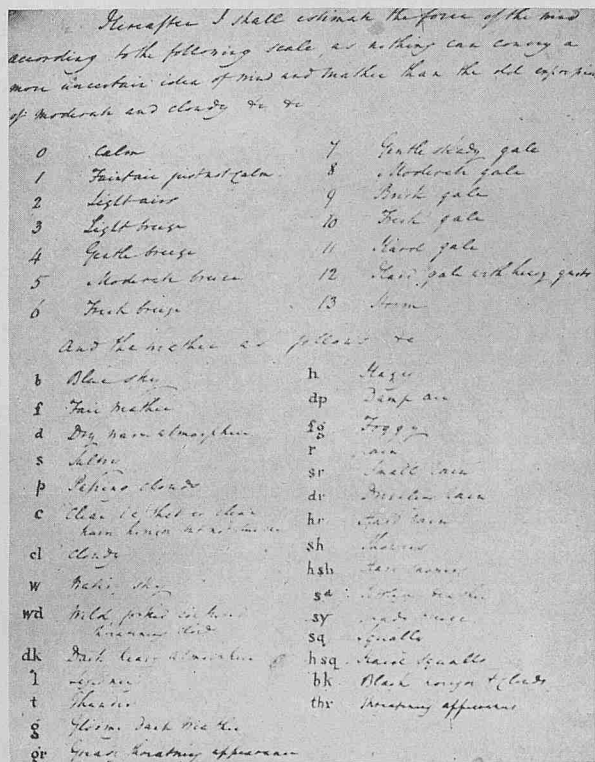


Figure 1.—The original sheet is four times this size.

From 1806 onward BEAUFORT used these scales modified from time to time but they do not appear to have been adopted for use in the official logs of any other of H.M. ships prior to 1838.

The scales were officially introduced into the Navy in 1838 as recorded in a Memorandum issued by the Admiralty in that year. A copy of this memorandum is shown in FIGURE 2, p. 164.

## BEAUFORT'S WEATHER NOTATION

1805 - 1807	1807 - 1810	1810 - 1812	1820 - 1822	1820 - 1832	1832 - 1838	MET. OFFICE 1856 - 1875	MET. OFFICE 1906
b Blue sky	b Blue sky	b Blue sky	b Blue sky	b Blue sky	b Blue sky whether clear or hazy atmosphere	b Blue sky whether clear or hazy atmosphere	b Blue sky whether clear or hazy atmosphere
bk Black horizon and clouds							
c Clear or clear horizon for blue sky	c Clear or clear horizon for blue sky	c Clear or clear horizon for blue sky	c Clear or clear horizon for blue sky	c Clear or clear horizon for blue sky	c Clear or clear horizon for blue sky	c Clear or clear horizon for blue sky	c Clear or clear horizon for blue sky
cl Cloudy	cl Cloudy	cl Cloudy	cl Cloudy	cl Cloudy	cl Cloudy	cl Cloudy	cl Cloudy
d Dry warm atmosphere							
dk Dark heavy atmosphere	dk Dark heavy atmosphere	dk Dark heavy atmosphere	dk Dark heavy atmosphere	dk Dark heavy atmosphere	dk Dark heavy atmosphere	dk Dark heavy atmosphere	dk Dark heavy atmosphere
dp Damp or drizzling rain	dp Damp or drizzling rain	dp Damp or drizzling rain	dp Damp or drizzling rain	dp Damp or drizzling rain	dp Damp or drizzling rain	dp Damp or drizzling rain	dp Damp or drizzling rain
fg Foggy	fg Foggy	fg Foggy	fg Foggy	fg Foggy	fg Foggy	fg Foggy	fg Foggy
g Gloomy dark weather	g Gloomy dark weather	g Gloomy dark weather	g Gloomy dark weather	g Gloomy dark weather	g Gloomy dark weather	g Gloomy dark weather	g Gloomy dark weather
gr Greasy threatening appearance	gr Greasy threatening appearance	gr Greasy threatening appearance	gr Greasy threatening appearance	gr Greasy threatening appearance	gr Greasy threatening appearance	gr Greasy threatening appearance	gr Greasy threatening appearance
h Hazy	h Hazy	h Hazy	h Hazy	h Hazy	h Hazy	h Hazy	h Hazy
hr Hard rain	hr Hard rain	hr Hard rain	hr Hard rain	hr Hard rain	hr Hard rain	hr Hard rain	hr Hard rain
hs Hard showers	hs Hard showers	hs Hard showers	hs Hard showers	hs Hard showers	hs Hard showers	hs Hard showers	hs Hard showers
hsq Hard squalls	hsq Hard squalls	hsq Hard squalls	hsq Hard squalls	hsq Hard squalls	hsq Hard squalls	hsq Hard squalls	hsq Hard squalls
l Lightning	l Lightning	l Lightning	l Lightning	l Lightning	l Lightning	l Lightning	l Lightning
m Misty	m Misty	m Misty	m Misty	m Misty	m Misty	m Misty	m Misty
p Passing clouds	p Passing clouds	p Passing clouds	p Passing clouds	p Passing clouds	p Passing clouds	p Passing clouds	p Passing clouds
r Rain	r Rain	r Rain	r Rain	r Rain	r Rain	r Rain	r Rain
sa Saturated weather	sa Saturated weather	sa Saturated weather	sa Saturated weather	sa Saturated weather	sa Saturated weather	sa Saturated weather	sa Saturated weather
sh Showers	sh Showers	sh Showers	sh Showers	sh Showers	sh Showers	sh Showers	sh Showers
sr Steady breeze	sr Steady breeze	sr Steady breeze	sr Steady breeze	sr Steady breeze	sr Steady breeze	sr Steady breeze	sr Steady breeze
s Small rain	s Small rain	s Small rain	s Small rain	s Small rain	s Small rain	s Small rain	s Small rain
sq Squally	sq Squally	sq Squally	sq Squally	sq Squally	sq Squally	sq Squally	sq Squally
t Thunder	t Thunder	t Thunder	t Thunder	t Thunder	t Thunder	t Thunder	t Thunder
thr Threatening appearance	thr Threatening appearance	thr Threatening appearance	thr Threatening appearance	thr Threatening appearance	thr Threatening appearance	thr Threatening appearance	thr Threatening appearance
u Ugly threatening appearance	u Ugly threatening appearance	u Ugly threatening appearance	u Ugly threatening appearance	u Ugly threatening appearance	u Ugly threatening appearance	u Ugly threatening appearance	u Ugly threatening appearance
v Visible	v Visible	v Visible	v Visible	v Visible	v Visible	v Visible	v Visible
w Watery sky	w Watery sky	w Watery sky	w Watery sky	w Watery sky	w Watery sky	w Watery sky	w Watery sky
wet Wet	wet Wet	wet Wet	wet Wet	wet Wet	wet Wet	wet Wet	wet Wet
wt White	wt White	wt White	wt White	wt White	wt White	wt White	wt White
z Dust haze	z Dust haze	z Dust haze	z Dust haze	z Dust haze	z Dust haze	z Dust haze	z Dust haze

Figure 3.

It is of interest to note that designations for winds of different strengths were in common use at sea at least for half a century before

Admiralty, Dec. 28th, 1838.

# MEMORANDUM.

THE Lords Commissioners of the Admiralty having had under consideration the general utility of recording with clearness and precision, in the Log Books of all Her Majesty's Ships and Vessels of War, the actual State of the Winds and Weather, have thought fit to order that henceforward in each page of the Log Book two columns should be introduced, wherein the force of the Wind and the appearance of the Atmosphere shall be every hour registered according to the annexed scheme, a copy of which shall be pasted into each book, and painted on the back of every Log Board or Log Slate: and two more columns shall likewise be given for the purpose of entering the heights of the Barometer, or Sympiesometer, and Thermometer, when such instruments may be on board.

By Command of their Lordships,

C. WOOD.

To all Captains, and Commanding Officers  
of Her Majesty's Ships and Vessels.

## FIGURES TO DENOTE THE FORCE OF THE WIND.

0	denotes Calm.	
1	Light Air	just sufficient to give Steerage way.
2	Light Breeze	1 to 2 knots.
3	Gentle Breeze	3 to 4 knots.
4	Moderate Breeze	5 to 6 knots.
5	Fresh Breeze	Rouals, &c.
6	Strong Breeze	Single-reefs and top-gallant sails.
7	Moderate Gale	Double-reefs, jib, &c.
8	Fresh Gale	Triple-reefs, courses, &c.
9	Strong Gale	Close-reefs, & courses.
10	Whole Gale	Close-reefs of main top-sail and reefed foresail.
11	Storm	Storm staysails.
12	Hurricane	No canvas.

## LETTERS TO DENOTE THE STATE OF THE WEATHER.

b	denotes Blue Sky—whether with clear or hazy atmosphere.
c	Cloudy—i. e. Detached opening clouds.
d	Drizzling Rain.
f	Fog—f Thick Fog.
g	Gloomy Dark Weather.
h	Hail.
i	Lightning.
m	Misty or Hazy—So as to interrupt the view.
o	Overcast—i. e. The whole sky covered with one impenetrable cloud.
p	Passing Showers.
q	Squally.
r	Rain—i. e. Continuous rain.
s	Snow.
t	Thunder.
u	Very threatening appearance in the Weather.
v	Visibility of Distant Objects—Whether the sky be cloudy or not.
w	Wet Dew.
x	Under any letter denotes an Extraordinary Degree.

### EXAMPLES.

b c m. Blue sky, with detached opening clouds, but hazy round the horizon.  
g f. Gloomy dark weather, but distant objects remarkably visible.  
q d i t. Very hard squalls, and showers of drizzle, accompanied by lightning with very heavy thunder.

Figure 2.

BEAUFORT introduced his scale. In a publication dated 1769 entitled "An historical account of the Great Storm of 1703," the following designation of wind is given with notes appended.

Stark calm.	A topsail gale.
Calm weather.	Blows fresh.
Little wind.	A hard gale of wind.
A fine breeze.	A fret of wind.
A small gale.	A storm.
A fresh gale.	A tempest.

In pointing out the contrast between what a ship could stand in his time, 1769, and in 1703, the writer of the book made the following remarks:—"What our sailors call a topsail gale would have driven the navigators of those days into harbour. When our hard gale blows they would have cried a tempest, and about the fret of wind they would be all at their prayers."

It will be noted that no numbers are allocated to the above terms. The use of BEAUFORT'S numbers 0-12 has persisted at sea, but his method of specification shown in FIGURE 2 has ceased to have its original meaning and has been modified to meet present

day requirements.

Since 1806 the Beaufort Scale of Weather Notation has also been modified from time to time and the consecutive revision of this scale is shown in FIGURE 3, p. 163.

The revisions all tend in the direction of simplification of the symbols, so much so that the original scale of 29 symbols of which 16 contain two or three letters is finally reduced to 17 symbols, each of one letter. Of the 29 symbols in the original scale, only five, b, blue sky, g, gloom, l, lightning, r, rain, t, thunder, still retain their original meaning. But c, originally denoting "clear hard horizon, not blue sky" now indicates "cloud"; f, which originally denoted "fair weather" now means "fog," while p, originally "passing clouds" now indicates "passing showers." Others of the notation, such as hsh., indicating "hard showers with threatening appearance" no longer appear in the scale.

NOTE.—A paper entitled "Admiral Sir Francis Beaufort and the Beaufort Scales of Wind and Weather," by Commander L. G. GARBETT, R.N. (retired), is to be found in the April number of the *Quarterly Journal of the Royal Meteorological Society*.

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



## WEATHER SIGNALS.

## II.—WIRELESS WEATHER SIGNALS.

## WIRELESS WEATHER BULLETINS.

CANADA, NOVA SCOTIA, NEWFOUNDLAND AND  
LABRADOR, ETC.

## (Spark Issues.)

THE following stations transmit the weather forecasts issued by the Canadian Meteorological Service, the wavelength used being 600 metres (spark) in all cases. Where the times of transmission are omitted forecasts are sent on request without charge. Stations marked with an asterisk (\*) are open during the season of navigation only.

Country.	W/T Station.	Call Sign.	Position (approx.)		Time, G.M.T.
			Lat. N.	Long. W.	
Canada (Nova Scotia).	†Lurcher Lt. Vsl.	VDR	43 49	66 32	—
	Yarmouth	VAU	43 46	66 07	0200, 1400
	Chebucto Head	VAV	44 30	63 31	—
	North Sydney	VCO	46 13	60 15	—
Canada	Sable Island	VCT	43 56	60 02	—
	Grindstone Island	VCN	47 23	61 54	—
	*Fame Point, Que.	VCG	49 07	64 36	0145, 1345
	*Clarke City, Que.	VCK	50 11	66 37	—
	*Father Point, Que.	VCV	48 31	68 28	—
	Grosse Island, Que.	VCD	47 02	70 40	—
	Quebec	VCC	46 48	71 12	—
	*Montreal	VCA	45 34	73 38	—
	*Heath Point Lt. Vsl. (Anticosti I.)	VCI	49 03	61 30	—
	St. John	VAR	45 14	66 03	—
Canada (New Brunswick).	Belle Isle	VCM	51 53	55 22	0230, 1430
Newfoundland and Labrador.	Cape Race	VCE	46 39	53 04	0215, 1415
	Point Amour	VCL	51 27	56 50	—
St. Pierre and Miquelon Is.	St. Pierre	HYS	46 46	56 11	1100, 1600 2300

† The station keeps watch for the first half of every odd hour from 1200 to 0000, and from 0300 to 0330, G.M.T.

UNITED STATES OF AMERICA (PACIFIC COAST, ETC.)  
(C. W. Issues.)

San Francisco, California, W/T Station, approximate Latitude 37° 39' N., Longitude 122° 23' W., call sign NPG, broadcasts weather bulletins twice daily as follows:—

At 0330 G.M.T. on a wavelength of 7,005 metres (C.W.) and 2,776 metres (C.W.) and 1700 G.M.T. on a wavelength of 7,005 metres (C.W.).

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

Part I, in code, consists of surface weather conditions and upper air data, the former being based upon observations taken at 0100 and 1300 G.M.T. at the undermentioned stations, except as follows, where the observation times do not synchronise.

Alaskan observations are taken at 0500 and 1700 G.M.T.

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

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

Weather reports from ships in the North Pacific Ocean follow the reports from land stations in Part I. Ship's observations taken at 0000 G.M.T. being broadcast in the 1700 G.M.T. bulletin and those taken at Noon G.M.T. being broadcast in the 0330 G.M.T. bulletin.

## First Part.

## Indicator Letters and Stations.

Indicator Letters.	Station.						Position (approx.).	
							Latitude.	Longitude.
<i>Alaska.</i>								
*NM	-	Nome	-	-	-	-	64° 50' N.	167° 20' W.
*SP1	-	St. Paul	-	-	-	-	57° 02' N.	170° 30' W.

Indicator Letters.	Station.	Latitude.	Position (approx.) Longitude.
Alaska—cont.			
*DH	- Dutch Harbour - - - -	53° 53' N.	166° 32' W.
*TN	- Tanana - - - -	65° 00' N.	151° 40' W.
*EA	- Eagle - - - -	64° 50' N.	140° 50' W.
*KD	- Kodiak - - - -	57° 40' N.	152° 30' W.
*CV	- Cordova - - - -	60° 35' N.	145° 40' W.
*JU	- Juneau - - - -	58° 18' N.	134° 25' W.
*SK	- Sitka - - - -	57° 03' N.	135° 20' W.
Canada.			
*ED	- Edmonton, Alberta - - - -	53° 32' N.	113° 05' W.
*KA	- Kamloops, B.C. - - - -	50° 48' N.	120° 03' W.
*CY	- Calgary, Alberta- - - -	51° 00' N.	114° 00' W.
*SC	- Swift Current, Sask. - - - -	50° 30' N.	107° 45' W.
*PR	- Prince Rupert, B.C. - - - -	54° 15' N.	130° 21' W.
United States, etc.			
TAT	- Tatoosh I, Wash. - - - -	48° 23' N.	124° 44' W.
†SE	- Seattle, Wash. - - - -	47° 38' N.	122° 25' W.
NH	- North Head, Wash. - - - -	46° 18' N.	124° 05' W.
PD	- Portland, Oreg. - - - -	45° 31' N.	122° 31' W.
RO	- Roseburg, Oreg. - - - -	43° 11' N.	123° 10' W.
EUR	- Eureka, Calif. - - - -	40° 42' N.	124° 16' W.
RB	- Red Bluff, Calif. - - - -	40° 10' N.	122° 10' W.
SM	- Sacramento, Calif. - - - -	38° 32' N.	121° 30' W.
†SF	- San Francisco, Calif. - - - -	37° 50' N.	122° 30' W.
FN	- Fresno, Calif. - - - -	36° 10' N.	119° 50' W.
SLO	- San Luis Obispo, Calif. - - - -	35° 08' N.	120° 43' W.
*PAR	- Point Arguello, Calif. - - - -	34° 35' N.	120° 38' W.
LA	- Los Angeles, Calif. - - - -	33° 42' N.	118° 15' W.
†DI	- San Diego, Calif. - - - -	32° 42' N.	117° 15' W.
SPO	- Spokane, Wash. - - - -	47° 40' N.	116° 41' W.
*WW	- Walla Walla, Wash. - - - -	46° 08' N.	118° 50' W.
BA	- Baker, Oreg. - - - -	45° 00' N.	117° 30' W.
HL	- Helena, Mont. - - - -	46° 10' N.	111° 50' W.
BS	- Boise, Idaho - - - -	43° 40' N.	116° 00' W.
LD	- Lander, Wyo. - - - -	41° 40' N.	108° 40' W.
WM	- Winnemucca, Nev. - - - -	40° 50' N.	118° 10' W.
R	- Reno, Nev.- - - -	39° 20' N.	119° 50' W.
SLC	- Salt Lake City, Utah - - - -	40° 45' N.	111° 40' W.
MD	- Modena, Utah - - - -	37° 30' N.	113° 50' W.
*DV	- Denver, Colo. - - - -	39° 48' N.	105° 05' W.
GJ	- Grand Junction, Colo. - - - -	39° 10' N.	108° 20' W.
SA	- Santa Fe, N. Mex. - - - -	35° 39' N.	106° 02' W.
*PH	- Phoenix, Ariz. - - - -	33° 00' N.	112° 00' W.
YU	- Yuma, Ariz. - - - -	32° 46' N.	114° 38' W.
*HO	- Honolulu, Hawaii - - - -	21° 18' N.	157° 52' W.
*MDI	- Midway Island - - - -	28° 15' N.	177° 22' W.
*FMA	- Manila P.I.- - - -	14° 35' N.	120° 52' E.
*FGM	- Guam. - - - -	13° 32' N.	144° 53' E.

*China and Japan, etc.*

*FHO	Hong Kong, China	22° 13' N.	114° 16' E.
*FSH	Shanghai, China	31° 15' N.	121° 30' E.
*FBI	Bonin Island	27° 05' N.	142° 11' E.
*FKO	Koshun, Formosa	25° 08' N.	121° 45' E.
*FNA	Naha, Japan	26° 13' N.	127° 41' E.
*FKA	Kagoshima, Japan	31° 34' N.	130° 33' E.
*FTO	Tokio, Japan	35° 39' N.	139° 45' E.
*FNE	Nemuro, Japan	43° 20' N.	145° 35' E.

\* Cloud reports not included.

† Upper air observations from these stations included in bulletins.

The observations from land stations which are preceded by the indicator letters of the station are contained in two or more 5 figure groups for each station. Groups one and two give surface observations, group three, cloud; and the remainder, upper air data.

The letter "X" will be substituted for any missing or unavailable data.

Code used—Special (United States Meteorological).

Explanation of first and second groups.

First Group.—1st three figures give the barometer reading corrected, in inches and hundredths, the first figure (2 or 3) being omitted. (To convert to millibars, see Table XLI, p. 148, Vol. III, No. 32.)

4th figure gives the wind direction.

(Table XXXVII, p. 147, Vol. III, No. 32.)

5th figure gives the wind force by Beaufort Scale. The letters W (Whole gale), S (Storm), H (Hurricane), being used for forces 10, 11 and 12 respectively.

**Second Group.**—1st figure gives the present weather (State of weather at surface). (Table XXXVIII, p. 147, Vol. III, No. 32.)

2nd figure gives barometric change in hundredths of an inch during the two hours preceding observation. (Table XXXIX, p. 147, Vol. III, No. 32.)

3rd figure gives the past weather during the preceding 12 hours. (Table XL, p. 147, Vol. III, No. 32.)

4th and 5th figures give the air temperature in degrees F.

Ship reports are included in the first part of the bulletin immediately following the land stations. They are included in two groups, preceded by the call letters identifying the ship. The first group consists of five numerals, signifying the ship's position, and the second group of five numerals expressing the barometric pressure, wind direction and force. In the group giving the ship's position (to the nearest degree), the first two numerals express the latitude (north) and the last three the longitude (west).

#### Second Part.

The second part of the bulletin is in plain language and consists of a summary of general pressure distribution; wind and weather forecasts for ocean zones (see CHARTLET below); storm warnings (see p. 168), and flying weather forecasts by zones (see CHARTLET below).

#### Period covered by Forecasts.

In 0330 G.M.T. bulletins:

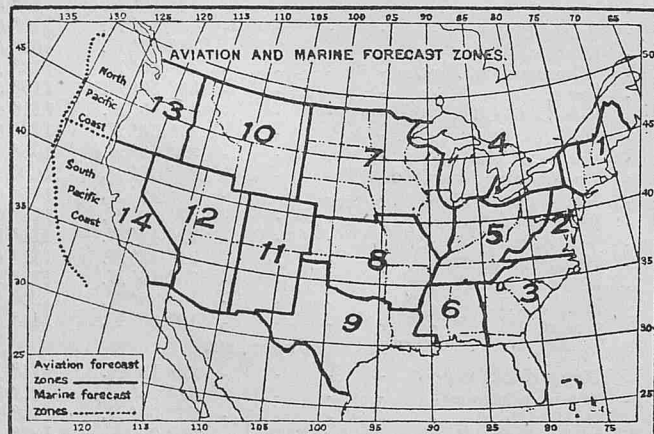
Wind and weather forecasts; 24 hours, beginning at 0800 G.M.T.

Flying weather forecasts; 12 hours, 0800 G.M.T., until 2000 G.M.T.

In 1700 G.M.T. bulletins:

Wind and weather forecasts; 24 hours beginning at 2000 G.M.T.

Flying weather forecasts; 12 hours, 2000 G.M.T., until 0800 G.M.T.



San Francisco W/T Station also transmits a report of the weather conditions in the Bonita Channel, every four hours, commencing with 0000 G.M.T. The report is sent *en clair*. Wavelength, 2,776 metres (C.W.).

#### Weather Bulletins from Light Vessels, U.S.A. Pacific Coast. (Spark Issues.)

The W/T stations on board the following light vessels broadcast reports pertaining to existing weather conditions in the immediate vicinity at the times stated.

The wavelength used is 600 metres (spark) in each case.

W/T Station.	Position (approx.).		Call Sign.	Times of
	Latitude.	Longitude.		G.M.T.
Umatilla Reef Lt. V. - -	48° 10' N.	124° 51' W.	WWBP	0000, 0400 1600, 2000
Blunts Reef Lt. V., Calif. -	40° 26' N.	124° 30' W.	WWBU	0400, 1600 2000
San Francisco, Lt. V. - -	37° 45' N.	122° 42' W.	WWBV	0400, 1600 2000

The information is also transmitted on request.

NOTE.—Weather reports will not be furnished when the W/T fog signal is in operation at Blunts Reef and San Francisco Light Vessels. Ships are requested not to ask for weather reports during such periods.

#### UNITED STATES OF AMERICA, CARIBBEAN SEA, GULF COAST AND WEST INDIAN ISLANDS.

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

#### Explanation of bulletins.

**Part I** contains reports in code of barometer pressure, wind direction and force at certain stations each of which is denoted by one or more indicator letters, and using a group of five figures to represent the data contained in the report, viz. :—

1st, 2nd and 3rd figures of group give the corrected barometer reading in inches and tenths, the first figure (2 or 3) being omitted. (See Table XLI, p. 148, Vol. III, No. 32, for conversion of ins. to mbs.)

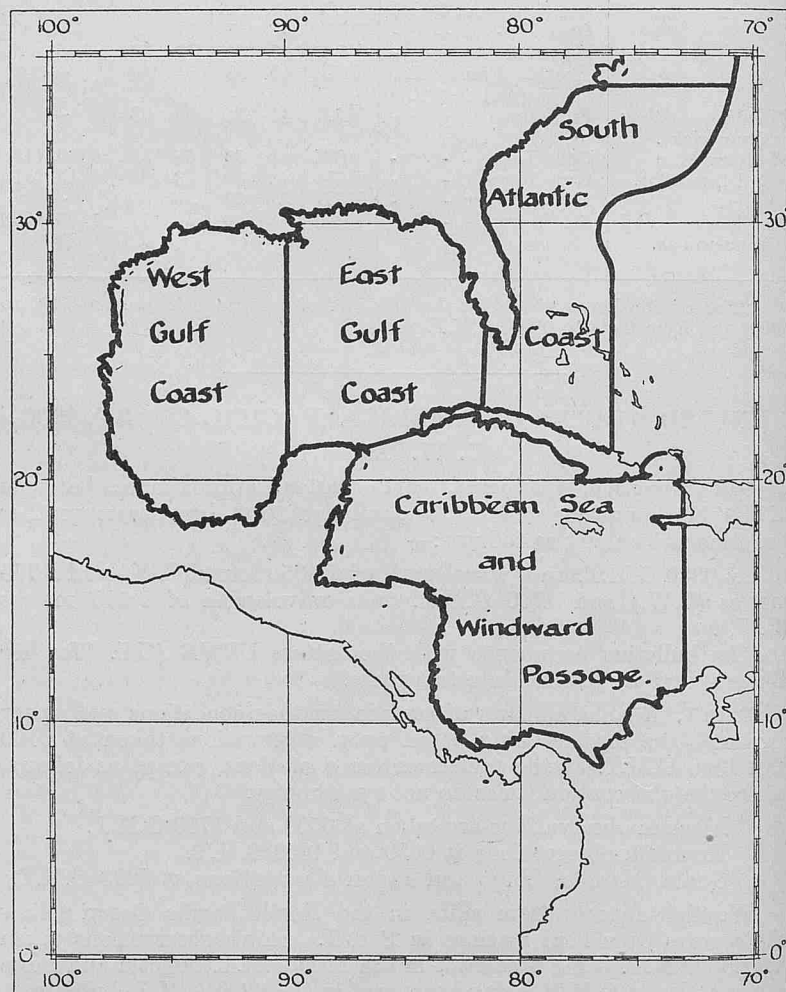
4th figure of group gives the wind direction true. (Table XXXVII, p. 147, Vol. III, No. 32.)

5th figure of group gives the wind force. Forces above 9 sent as 9.

NOTE.—If observations from any station cannot be supplied, the indicator letters and data figures will be omitted altogether. If only a portion of the observations are missing, the letter "X" will be sent in lieu.

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

#### Chartlet of U.S. Marine Forecast Areas.



#### W/T Stations from which the Bulletins are Broadcast.

##### Caribbean Sea (C.W. Issues.)

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

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

Call Sign UB. Wavelength, 4,075 metres (C.W.).



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

At 1730 G.M.T. Part I, observations from following stations broadcast *only during the hurricane season*, June to November inclusive. Part II broadcast *daily throughout the year*.

Observation Stations in Part I. of Bulletin.			Part II. of Bulletin.	
Indicator Letters.	Station.	Position (approx.) Lat. Long.		
SI	Swan Island	17° 24' N. 83° 57' W.	Storm and Hurricane Warnings, <i>see</i> p. 168.	
DZ	Belize, Honduras	18° 00' N. 88° 20' W.		
BFD	Bluefields, Nicaragua	12° 00' N. 83° 45' W.		
W	Willemstadt, Curaçao	12° 10' N. 69° 00' W.		
SJ	San Juan, P.R.	18° 28' N. 66° 06' W.	Wind and Weather forecasts for West Gulf of Mexico.	
PP	Port au Prince, Haiti	18° 37' N. 72° 17' W.		
CFG	Cienfuegos, Cuba	22° 11' N. 80° 33' W.		
GUE	Guane, Cuba	- - - -		
KN	Kingston, Jamaica	18° 10' N. 76° 48' W.	Wind and Weather forecasts for Caribbean Sea and Windward Passage. <i>See</i> Chartlet, p. 166.	
TI	Turks I., Bahamas	21° 31' N. 71° 08' W.		

At 0445 G.M.T. Part II only of bulletin as above, broadcast *daily throughout the year*.

The above bulletins are sent by W/T to Almirante and Swan Island W/T stations from the Tropical Radio Telegraph Station at New Orleans La., call sign WNU at 0430 and 1630 G.M.T. on a wavelength of 3,331 metres (C.W.) and ships are invited to intercept them and repeat them to other ships should they so desire.

Ships failing to obtain the weather bulletins from Almirante W/T Station are permitted to call the Swan Island W/T Station, approximate Latitude 17° 24' N., 83° 57' W., call sign US, at any time for the latest weather forecasts.

#### Gulf Coast and Islands. (C.W. Issues).

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

Call sign NAR. Wavelengths 5,766 metres (C.W.) and 2,939 metres (C.W.). Time of broadcast, 0300 and 1700 G.M.T. 1700 G.M.T. broadcast made on 2,939 metres (C.W.) only.

Observation Stations in Part I. of Bulletin.			Part II. of Bulletin.	
Indicator Letters.	Station.	Position (approx.) Lat. Long.		
H	Hatteras, N.C.	35° 14' N. 75° 32' W.	Wind and Weather forecasts for South Atlantic Coast.	
C	Charleston, S.C.	32° 43' N. 79° 52' W.		
JA	Jacksonville, Fla.	30° 19' N. 81° 51' W.		
MI	Miami, Fla.	30° 35' N. 84° 13' W.		
K	Key West, Fla.	24° 33' N. 81° 48' W.	Wind and Weather forecasts for West Gulf of Mexico.	
P	Pensacola, Fla.	30° 21' N. 87° 19' W.		
BW	Burwood, La.	28° 57' N. 89° 23' W.		
GV	Galveston, Tex.	29° 19' N. 94° 48' W.		
BV	Brownsville, Tex.	25° 53' N. 97° 26' W.	Wind and Weather forecasts for Caribbean Sea and Windward Passage. <i>See</i> Chartlet, p. 166.)	
FW	Fortworth, Tex.	32° 30' N. 97° 40' W.		
KN	Kingston, Jam.	18° 01' N. 76° 48' W.		
TI	Turks Island	21° 31' N. 71° 08' W.		
HA	Havana, Cuba	23° 10' N. 82° 22' W.	Storm and Hurricane Warnings ( <i>see</i> p. 168.). ( <i>See</i> Chartlet, p. 166.)	
GO	Guantanamo Bay (Cuba).	19° 54' N. 75° 12' W.		
SI	Swan Island	17° 24' N. 83° 57' W.		
SJ	San Juan, P.R.	18° 28' N. 66° 06' W.		

#### West Indian Islands. (C.W. Issue).

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

Call sign, NAU.

Time of broadcast, 0200 G.M.T.

Wavelength, 4,836 metres (C.W.).

Observation Stations in Part I. of Bulletin.			Part II. of Bulletin.	
Indicator Letters.	Station.	Position (approx.) Lat. Long.		
SJ	San Juan, P.R.	18° 28' N. 66° 06' W.	Hurricane Warnings ( <i>see</i> p. 168).	
ST	St. Thomas, Virgin Is.	18° 23' N. 64° 55' W.		
BT	Basseterre, St. Kitts	17° 18' N. 62° 43' W.		
RS	Roseau, Dominica	15° 17' N. 61° 24' W.		
BB	Bridgetown, Barbados	13° 09' N. 59° 35' W.		
SD	Santo Domingo, S.D.	18° 28' N. 69° 53' W.		
SL	Puerto Plata, S.D.	19° 49' N. 70° 42' W.		
LU	Castries, St. Lucia	14° 01' N. 61° 00' W.		
W	Willemstadt, Curaçao	12° 10' N. 69° 00' W.		
PS	Port of Spain, Trinidad	10° 40' N. 61° 30' W.		
SM	St. Martins, D.W.I.	- - - -		

NOTE.—This bulletin is re-broadcast by Guantanamo, Cuba, W/T station call sign NAW, on a wavelength of 2,541 metres (C.W.) at 0200 G.M.T. *during the hurricane season*, July 1 to November 15 inclusive.

## MEXICO.

### (Spark Issue.)

**Chapultepec W/T station** approximate Latitude 19° 25' N. Longitude 99° 11' W. call sign XDA, broadcasts a weather bulletin at 1900 G.M.T. on a wavelength of 2,000 metres (spark).

The bulletin is in two parts.

Part I., in special code, contains the observations of 1300 G.M.T. from the following stations:—

		Position approx.	
Station.		Latitude.	Longitude.
Acapulco	- - -	16° 52' N.	99° 50' W.
Chihuahua	- - -	28° 32' N.	106° 28' W.
Frontera	- - -	18° 35' N.	92° 38' W.
Guaymas	- - -	27° 58' N.	110° 48' W.
Leon	- - -	21° 01' N.	101° 15' W.
Lerdo	- - -	- - -	- - -
Manzanillo	- - -	19° 00' N.	104° 20' W.
Islas Marias	- - -	21° 40' N.	106° 30' W.
Matamoros	- - -	25° 53' N.	97° 33' W.
Mazatlan	- - -	23° 10' N.	106° 22' W.
Monterrey	- - -	25° 34' N.	100° 20' W.
Payo Obispo	- - -	18° 29' N.	88° 22' W.
La Paz	- - -	24° 10' N.	110° 18' N.
Progreso	- - -	21° 16' N.	89° 36' W.
Salina Cruz	- - -	16° 17' N.	95° 15' W.
Tacubaya	- - -	19° 24' N.	99° 12' W.
Tampico	- - -	22° 11' N.	97° 53' W.
Tapachula	- - -	15° 10' N.	92° 27' W.
Vera Cruz	- - -	19° 12' N.	96° 10' W.

#### Explanation of Part I.

Commencing with the word "Meteorologico," the name of the observation station is sent, followed by two groups of figures, there being five figures in each group.

**First Group.**—1st, 2nd and 3rd figures give the corrected barometer reading in millimetres and tenths, initial 7 omitted. To convert to mbs., *see* Table XV, p. 50, Vol. III, No. 27.

4th figure gives the wind direction on scale 0–8, Table XXXVII, p. 147, Vol. III, No. 32.

5th figure gives the wind force by Beaufort scale, 9 being used for forces 9 and above.

**Second Group:** 1st figure gives the state of the weather at the time of observation. Table XXXVIII, p. 147, Vol. III, No. 32.

2nd figure gives the barometric tendency in millimetres for the 2 hours previous to the time of observation. Table XLII.

3rd figure gives the cloud amount (number of tenths of sky obscured). Table XLIII.

4th figure gives the cloud form and speed. Table XLIV.

5th figure gives the direction of movement of the clouds on scale 0–8; 0 = no appreciable movement, etc. Table XXXVII, p. 147, Vol. III, No. 32. When both upper and lower clouds are observed, only the amount, kind, and direction of the lower clouds will be sent. In such cases the amount of the upper clouds, if any, can be determined, approximately, by taking the difference between the tenths of cloudiness interpreted from the figures showing "present weather" and "amount of clouds."

NOTES.—(1) Missing observations replaced by letter "X."

(2) When all the data for a station cannot be supplied, the name of the station will be omitted.

**Part II.** sent *en clair* (Spanish) gives information concerning the general weather situation, position of centres of High or Low pressure areas, and weather forecasts for 24 hours.

#### Special Weather Telegraphy Tables.

##### Not New International Code.

##### Table XLII. Barometer Tendency.

Code figure.

0 = Steady (rise or fall less than 1 mm.).

1 = Rising 1 mm. (1.4 mb.).

2 = Falling 1 mm. (1.4 mb.).

## Code figure.

- 3 = Rising 1.5 mm. (2.0 mb.).  
 4 = Falling 1.5 mm. (2.0 mb.).  
 5 = Rising 2 mm. (2.7 mb.).  
 6 = Falling 2 mm. (2.7 mb.).  
 7 = Rising 2.5 mm. (3.4 mb.).  
 8 = Falling 2.5 mm. (3.4 mb.).  
 9 = Rise or fall 3 mm. (4.1 mb.) or more. (Whether it is an increase or decrease can be determined by the tendency at surrounding stations.)

Table XLIII.

**Cloud Amount—Number of Tenths of the Sky obscured  
(10 Tenths is Total Cloudiness).**

## Code figure.

- 0 = 1 tenth or less of sky covered.  
 2 = 2 to 3 tenths of sky covered.  
 4 = 4 to 5 tenths of sky covered.  
 6 = 6 to 7 tenths of sky covered.  
 8 = 8 to 10 tenths of sky covered.

Table XLIV.

**Cloud Form and Speed.**

## Code figure.

- 0 = 1 tenth clouds or less (kind not indicated).  
 1 = upper clouds (cirrus, cirro-stratus, cirro-cumulus, alto-cumulus, or alto-stratus), rapidity not indicated.  
 2 = strato-cumulus moving slowly.  
 3 = strato-cumulus moving rapidly.  
 4 = cumulus moving slowly.  
 5 = cumulus moving rapidly.  
 6 = stratus moving slowly.  
 7 = stratus moving rapidly.  
 8 = nimbus or cumulo-nimbus moving slowly.  
 9 = nimbus or cumulo-nimbus moving rapidly.

**WIRELESS STORM WARNINGS.**

**United States of America. (Pacific Coast.)  
(C.W. and Spark Issues.)**

THE following W/T Stations broadcast storm warnings at the times stated or as necessary. 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.
Seattle, Wash. - Lat. 47° 24' N. - Long. 122° 37' W.	NPC	2,541 (C.W.)	0100, 0300 0400, 1300 1700, 2100	Storm Warnings.
Tatoosh, I., Wash. - Lat. 48° 23' N. - Long. 124° 44' W.	NPD	600	0100, 0400 1300, 1700 2100	
North Head, Wash. - Lat. 46° 18' N. - Long. 124° 05' W.	NPE	2,677 (Spk.)	0130, 0430 1330, 1730 2130	Storm Warnings.
Eureka, Calif. - Lat. 40° 41' N. - Long. 124° 16' W.	NPW	2,883 (C.W.)	1700	
" " -	"	2,883 (C.W.)	0130, 2200	Storm Warnings.
San Francisco Calif. - Lat. 37° 39' N. - Long. 122° 23' W.	NPG	7,005 (C.W.)	0330, 1700	Storm Warnings. In second part of weather bulletin, see p. 166.
" " -	"	2,776 (C.W.)	0000, 0400 0800, 1200 1600, 2000	
San Diego, Calif. - Lat. 32° 42' N. - Long. 117° 15' W.	NPL	2,939 (C.W.)	0600, 1600 2000	Storm Warnings. Broadcast on receipt and at times stated.

**UNITED STATES OF AMERICA (CARIBBEAN SEA, GULF COAST) AND WEST INDIAN ISLANDS.**

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

STORM and hurricane warnings are broadcast by the following W/T Stations for the areas shown on the CHARTLET, p. 166, at the times stated or when necessary. When a storm exists that is likely to affect an area, the location and expected direction of movement of the storm centre will be given, followed by any storm or hurricane warnings and advices to shipping that have been issued.

**Almirante, Panama.**—Call sign UB. Wave length 4,075 metres (C.W.). Times, G.M.T. 0445 and 1730.

**Storm Warnings** for Gulf of Mexico and Caribbean Sea precede the wind and weather forecasts in Part II of the weather bulletins. The warnings will also contain information regarding "northers" during the winter months.

**Hurricane Warnings.**—Location, direction, progress and intensity of the hurricane broadcast every 2 hours.

**Swan Island.**—Call sign US. Approximate Latitude 17° 24' N., Longitude 83° 57' W.

Ships are permitted to call this W/T Station for weather information regarding hurricanes or "northers."

**Key West, Fla.**—Call sign NAR. Wave lengths, 5,766 metres (C.W.) and 2,939 metres (C.W.). Time, G.M.T. 0300.

**Storm Warnings** broadcast for S. Atlantic Coast (Hatteras to Key West), and east and west Gulf Coasts, see CHARTLET, p. 166.

**Hurricane Warnings and advices.**—

**San Juan P.R.**—Call sign NAU. Wave length, 4,836 metres (C.W.).

**Hurricane Warnings** and advisory messages relating thereto are broadcast when necessary, and repeated at 2 hour intervals until midnight. In the absence of a tropical storm the words "Weather Normal" will be sent each day.

**Guantanamo (Cuba)**—NAW—2,541 (C.W.)  
**Port au Prince (Haiti)** NSC.—2,271 (spk.)  
**St. Croix** } Virgin NNI — 425 (spk.)  
**St. Thomas** } Islands NBB — 2,271 (spk.)

Transmit hurricane warnings when necessary and repeat them every 4 hours.

**III. WIRELESS TIME SIGNALS.**

**UNITED STATES OF AMERICA.**

For method of transmission of the undermentioned Time Signals see diagram, p. 148, Vol. III, No. 32.

**Hawaiian Islands (C.W. and Spark Issues.)**

W/T Station.	Call Sign.	Wavelength metres.	Time of Signal being made G.M.T.	—
Honolulu, Pearl Hbr. - Lat. 21° 20' 45" N. - Long. 157° 57' 56" W.	NPM	2,828 (Spk.) and 11,490 (C.W.)	h m s h m s 23 55 00—0 00 00	Sent daily.

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

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

North Head, Wash. - Lat. 46° 17' 58" N. - Long. 124° 04' 30" W.	NPE	2,677 (Spk.)	19 55 00—20 00 00	Sent daily.
Eureka, Calif. - Lat. 40° 41' 22" N. - Long. 124° 16' 10" W.	NPW	2,883 (C.W.)	19 55 00—20 00 00	
San Francisco, Calif. - Lat. 38° 05' 03" N. - Long. 122° 15' 57" W.	NPG	2,776 (C.W.)	5 55 00—6 00 00	Sent daily.
San Diego, Calif. - Lat. 32° 42' 28" N. - Long. 117° 14' 49" W.	NPL	2,776 (C.W.) and 2,939 (C.W.)	19 55 00—20 00 00 16 55 00—17 00 00	



**Panama.**  
(C.W. and Spark Issues.)

W/T Station.	Call Sign.	Wavelength metres.	Time of Signal being made G.M.T.	
Balboa - - - Lat. 9° 07' 15" N. Long. 79° 46' 20" W.	NBA	6,518 (C.W.)	h m s h m s 3 55 00-4 00 00	Sent daily.
Colon - - - Lat. 9° 22' 09" N. Long. 79° 54' 07" W.	NAX	2,271 (Spk.)	17 55 00-18 00 00 3 55 00-4 00 00 17 55 00-18 00 00	

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

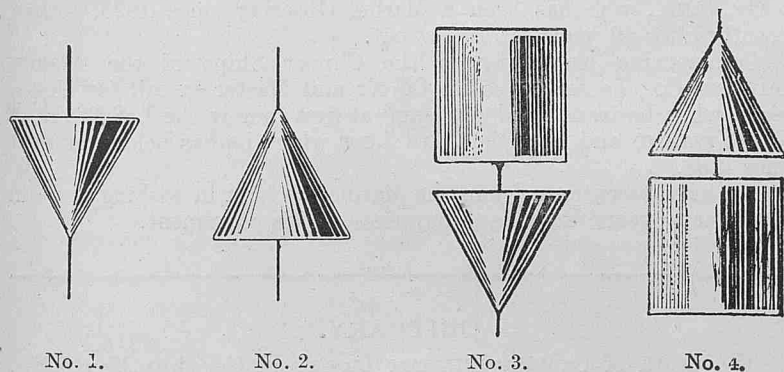
(C.W. Issues.)

New Orleans - - Lat. 29° 56' 50" N. Long. 90° 02' 18" W.	NAT	2,828 (C.W.)	16 55 00-17 00 00	Sent daily
Key West - - - Lat. 24° 33' 22" N. Long. 81° 48' 21" W.	NAR	2,939 (C.W.)	16 55 00-17 00 00	"Lag" of Key West time signal is 0.28 second.

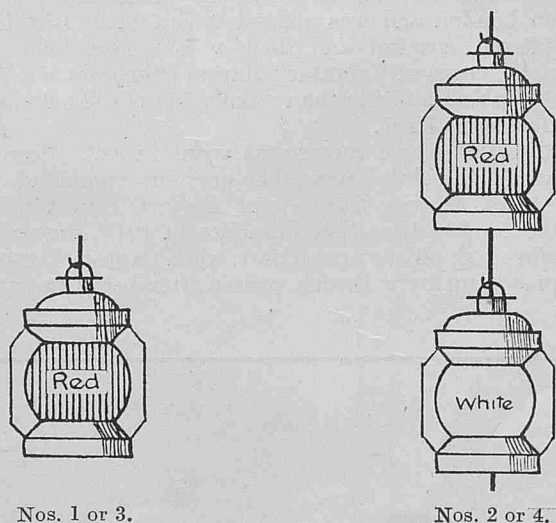
**IV. VISUAL STORM WARNINGS.**

**Canada.**

**By Day.**



**By Night.**



Storm signals are hoisted on warning being received from the Meteorological Office, Toronto, at Camperdown (Halifax), Canso,

Digby, Halifax, Liscomb, Liverpool, and Yarmouth, Westport (Brier island) in Nova Scotia; at Point Lepreau, St. Andrews, St. John in New Brunswick; Eastport (State of Maine), at several places on the coasts of Cape Breton island, New Brunswick, Prince Edward island, Quebec, Newfoundland and British Columbia.

**Signification ; Day or Night Signals.**

No. 1, hoisted to indicate the probability of a gale; at first, from an easterly direction.

No. 2, hoisted to indicate the probability of a gale; at first, from a westerly direction.

No. 3, hoisted to indicate the probability of a *heavy* gale; at first, from an easterly direction.

No. 4, hoisted to indicate the probability of a *heavy* gale; at first, from a westerly direction.

It must be borne in mind that the storm signals do not necessarily mean that a storm will occur at the place where the signal is displayed, but that one is expected either there or within such a distance that vessels leaving port would be liable to be caught in it.

**United States of America (Pacific and Gulf Coasts) and West Indian Islands.**

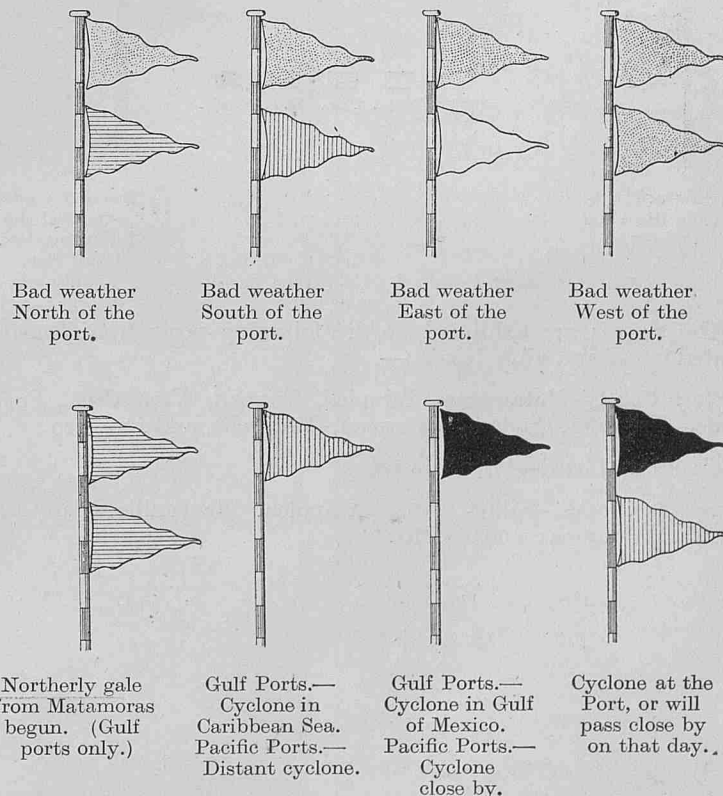
The United States system of Visual Small-craft, Storm, and Hurricane Warnings as explained on p. 148 of Vol. III, No. 32, is in operation at a number of stations on the Pacific and Gulf Coasts of the United States.

These warnings are also displayed at certain places in the following West Indian Islands:—St. Kitts, Porto Rico, Jamaica (Kingston), Vieques Island, Santa Domingo, Haiti, Dominica, St. Thomas, Virgin Islands of the U.S.A., Grand Turk Island, Swan Island, Turks Island and Cuba.

**MEXICO.**

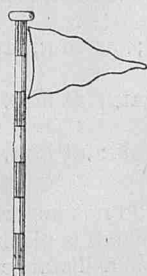
The following system of visual storm and wind signals has been established at ports on the coasts of Mexico.

(1) Storm signals are used to give warning of the existence of cyclonic disturbances whether distant or near, or, of the existence of bad weather outside the port. These storm signals which consist of pennants only and their meanings, are as follows:—

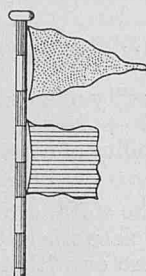


**Night Signals.**—Two red lights, vertical, are hoisted to indicate that navigation may be dangerous.

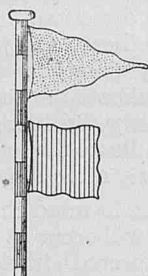
(2) The following signals consisting of pennants, denoting the strength, and flags the direction of the wind, are used to indicate its probable strength and direction from the time of hoisting the signal until the following 0600. They will be lowered, if necessary, to hoist a storm signal and in the evening when no longer visible :—



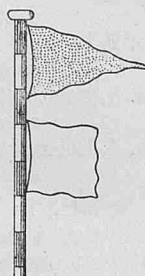
Light or moderate winds.



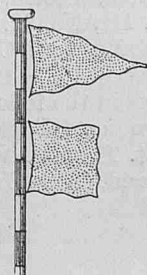
Moderate or strong North-easterly winds.



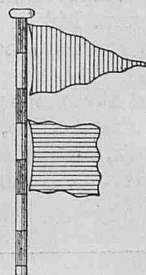
Moderate or strong South-easterly winds.



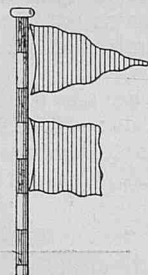
Moderate or strong Easterly winds.



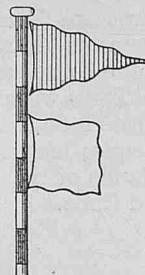
Moderate or strong Westerly winds.



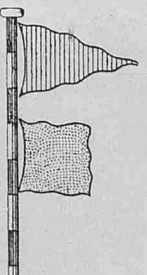
Gale or hurricane from the North.



Gale or hurricane from the South.

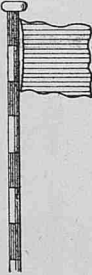


Gale or hurricane from the East.



Gale or hurricane from the West.

Yellow White. Blue. Red. Black.



Northerly gale expected the following day. (Gulf Ports only.)

The signals are exhibited at the following ports from flagstaffs painted in red and white bands :—

**Gulf Coast.**—Matamoras, Tampico, Tuxpan, Vera Cruz, Puerto Mexico, Frontera, Ciudad del Carmen, Campeche, and Progreso.

**Caribbean Coast.**—Payo Obispo.

**Pacific Coast.**—Salina Cruz, Acapulco, Manzanilla, San Blas, Mazatlan, Guaymas, and La Paz.

### Special Notices regarding Personnel.

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

#### Captain A. H. Rostron, C.B.E., R.D., R.N.R.

THE KING has been pleased to confer the Order of Knight of the British Empire (civil) upon the occasion of HIS MAJESTY's birthday, upon Captain ROSTRON, commanding R.M.S. *Mauretania*, a member of the Corps of Marine Observers since 1914.

#### Dr. G. C. Simpson, C.B.E., LL.D., D.Sc., F.R.S.

DR. G. C. SIMPSON, Director of the British Meteorological Office, has received the honour of Companion of the Bath (civil) on the occasion of HIS MAJESTY THE KING's birthday.

#### Captain C. M. Redhead, D.S.O., R.D., R.N.R.

On the occasion of HIS MAJESTY's birthday THE KING has been pleased to confer the C.B.E. (Military Division) upon Captain C. M. REDHEAD of the P. & O.S.N. Co. who has been a member of the Corps of Marine Observers since 1922.

#### Captain J. Bradshaw.

Captain J. BRADSHAW of R.M.S. *Belgenland*, RED STAR LINE, a member of the Corps of Marine Observers since 1909, has recently retired from active service. Marine Observers will join with the Marine Division in wishing Captain BRADSHAW many years of good health and happiness in his retirement.

#### Captain J. N. Gray.

Captain J. N. GRAY of S.S. *Clan Macartagart*, CAYZER, IRVINE & Co., LTD., who has been a Marine Observer since 1923, retired recently after 49 years' service afloat.

Commencing his career in the Clipper Ships of the ALBION SHIPPING Co., he served as an Officer and Master in sail for eleven years, when he transferred to steam, at first joining the U.S.S. Co. of NEW ZEALAND and later the CLAN LINE where he has held command since 1893.

Marine Observers will join the Marine Division in wishing Captain GRAY many years' health and happiness in his retirement.

### OBITUARY.

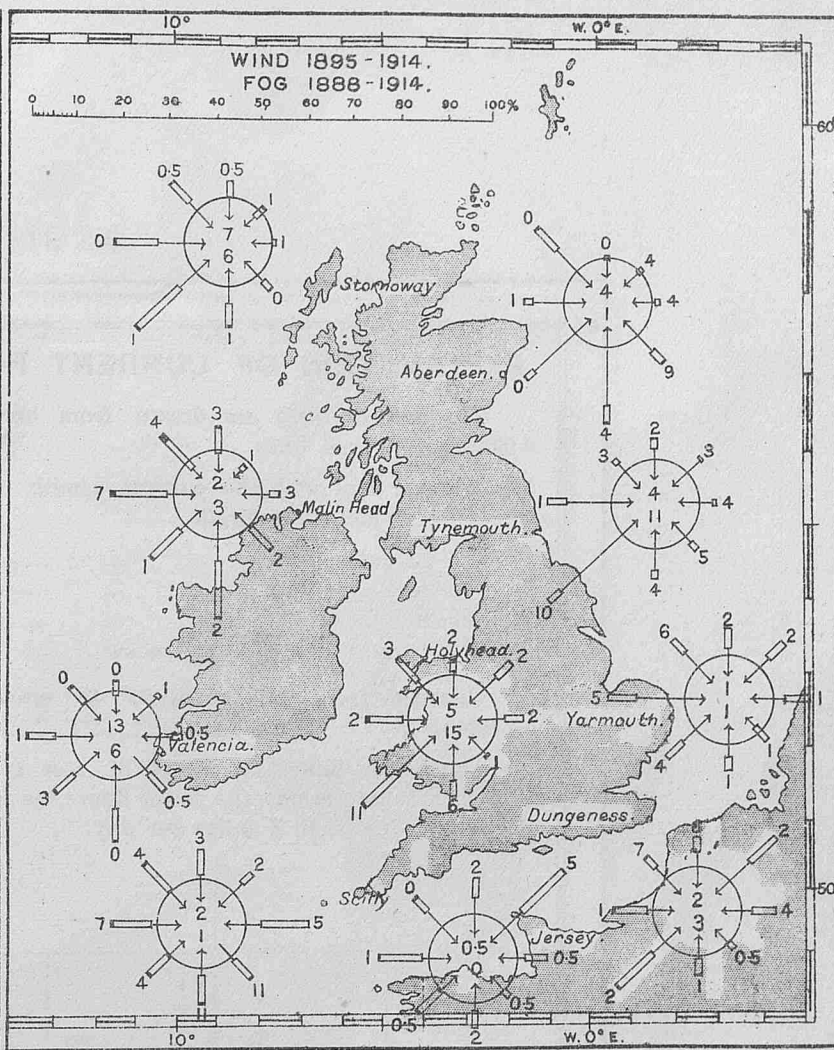
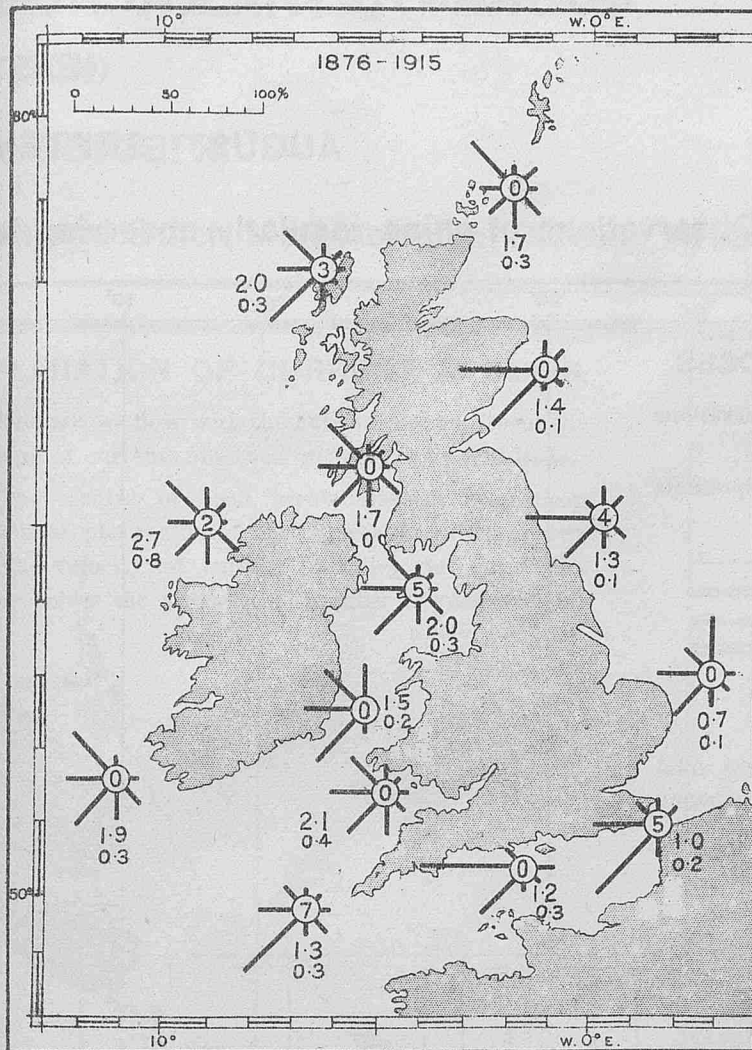
The death of Captain WILLIAM DAVIES of the ship *Monkbarns*, which took place at Rio de Janeiro on March 30th, is noted with deep regret.

Captain DAVIES was taken ill on his homeward passage from Valparaiso to London and was obliged to put in to Rio de Janeiro, where he entered hospital and died a few days later. He was a member of the corps of Voluntary Marine Observers since 1923 and his ship the *Monkbarns* (other than auxiliaries) is the only sailing ship left in the Observing Fleet.

Captain DAVIES' whole career was spent in sail. Since 1919 he had commanded the *Monkbarns*, his previous command being the *Gwytheyon Castle*, *Gwydyr Castle*, and *Bedford*. On the homeward voyage of the *Bedford* from San Francisco in 1917, she was sunk by a German submarine off the Irish Coast, when Captain DAVIES and his crew were picked up by a British cruiser after being twelve hours in the boats.



WIND AND FOG AT COAST STATIONS. GREAT BRITAIN AND IRELAND



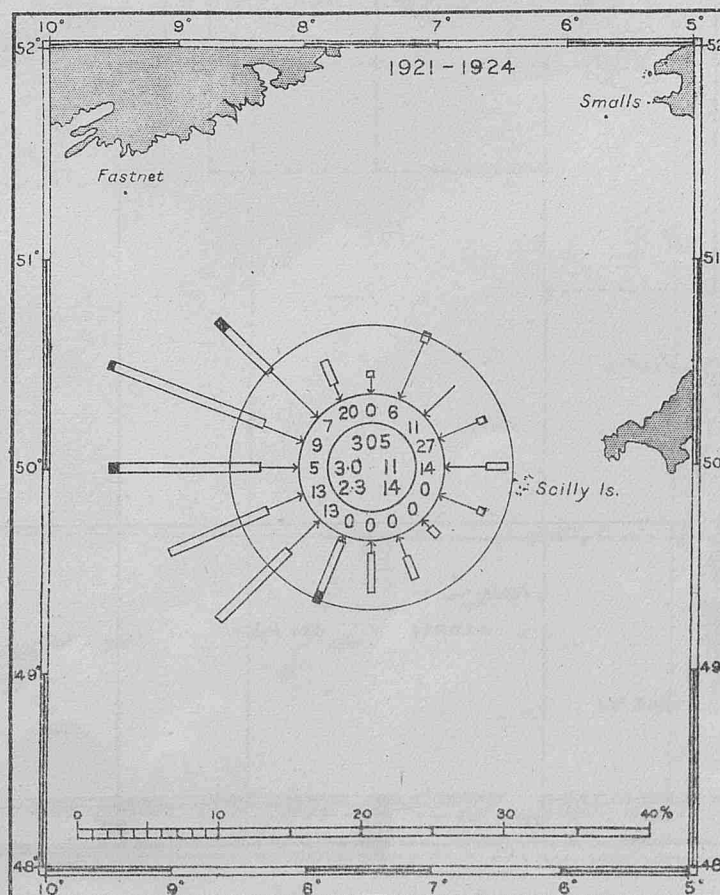
WIND, FOG AND MIST.

S.W. APPROACHES TO GREAT BRITAIN AND IRELAND.

Frequency of fog per thousand observations for each 2 points of compass 1921-1924.  
Latitude 48°-52°N.  
Longitude 5°-10°W.

Direction.	Frequency.
N	0
NNE	3
NE	3
ENE	10
E	7
ESE	0
SE	0
SSE	0
S	0
SSW	0
SW	13
WSW	13
W	7
WNW	13
NW	7
NNW	7
Calm	3
Var	3
Total	89

Percentage frequency of fog and mist for area = 9%.

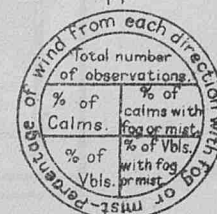


Mean and Maximum number of days with fog during the month at the different stations.

Station.	Mean.	Max.
Stornoway	0.7	7
Malin Head	1.5	7
Valencia	0.5	2
Holyhead	3.7	10
Scilly	3.8	8
Jersey	1.5	5
Dungeness	3.6	7
Yarmouth	1.8	6
Tynemouth	3.3	9
Aberdeen	2.0	9

For explanation of charts see Vol. III, No 25, page 10, of this Journal.

Key to numbers in rose, S.W. Approaches.



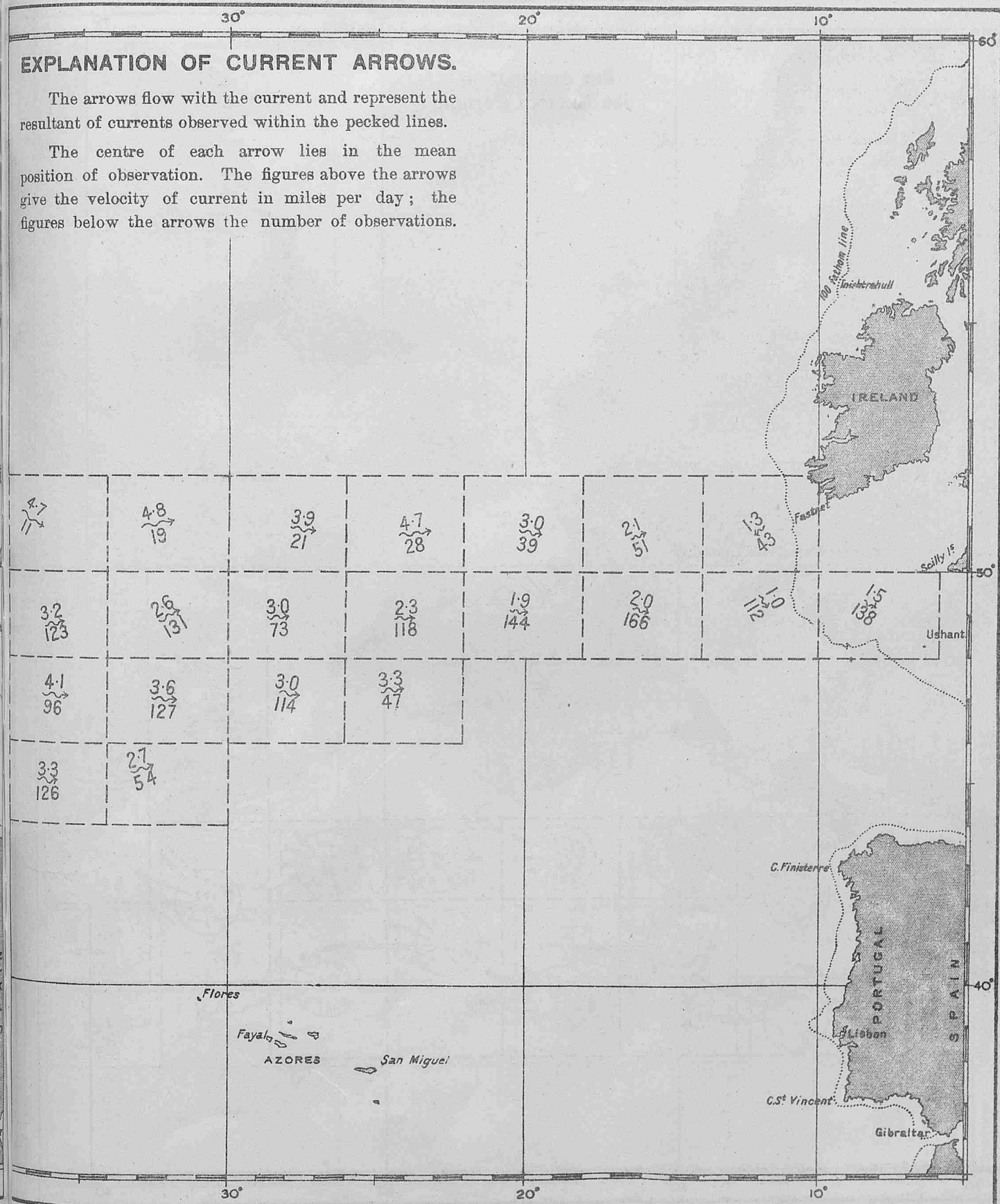
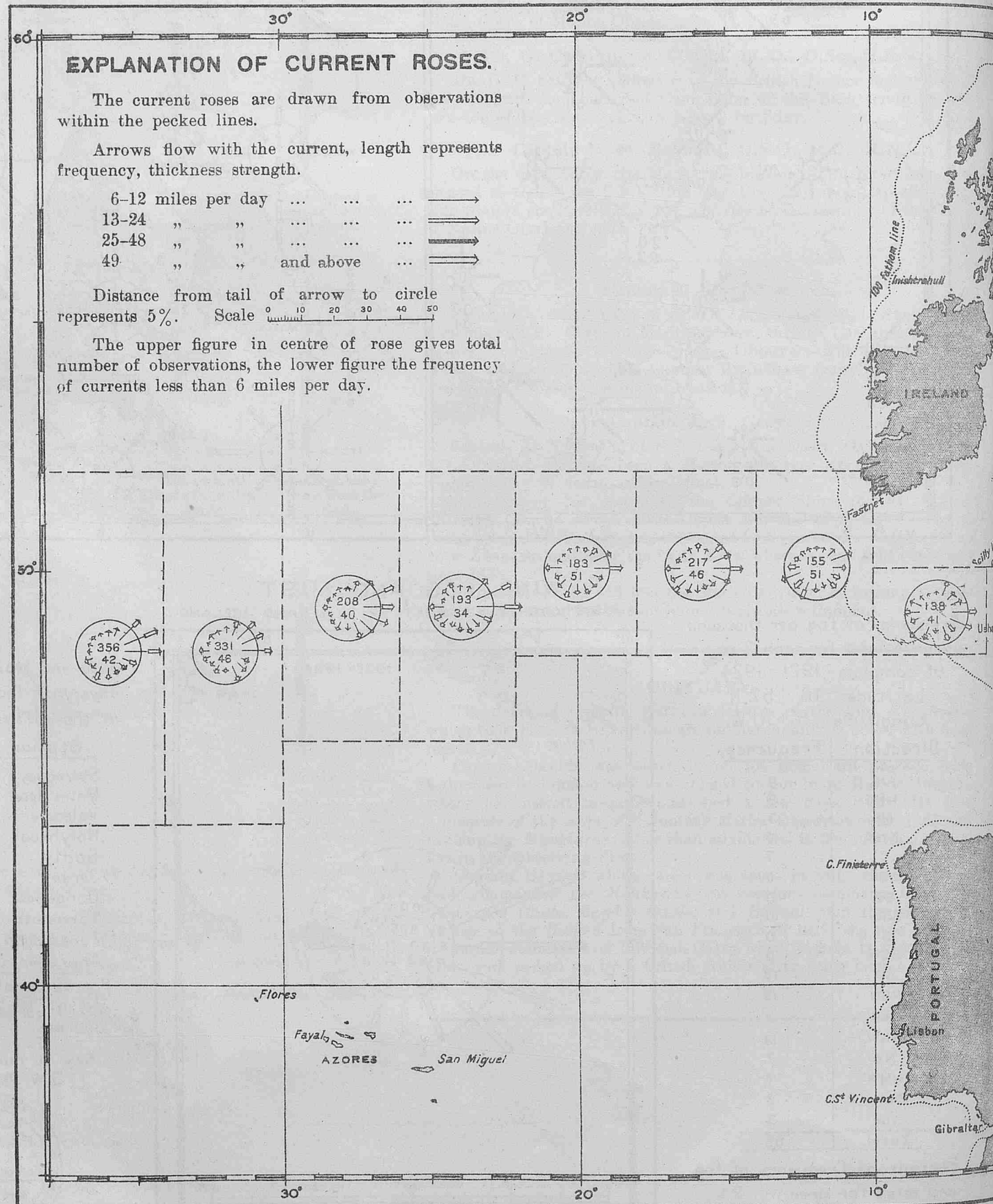


## CURRENTS ON THE TRANS NORTH ATLANTIC TRACKS

(EASTERN PORTION)

AUGUST, SEPTEMBER AND OCTOBER.

Observations of ships regularly observing for the British and Dutch Meteorological Offices, 1910-1924.

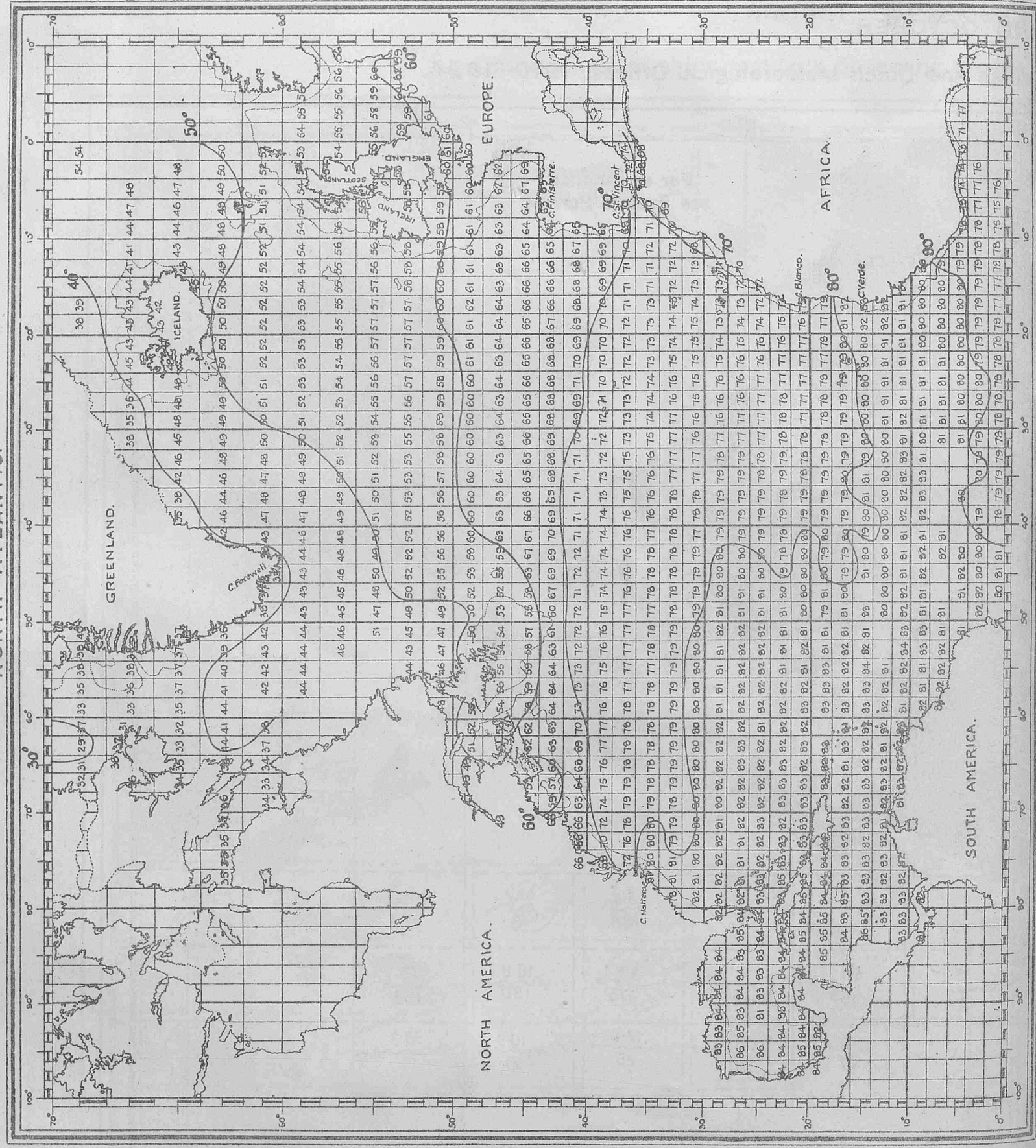








MEAN SEA SURFACE TEMPERATURES FOR MONTH OF SEPTEMBER COMPUTED FROM ALL AVAILABLE SOURCES DURING THE PERIOD 1855 TO 1917.  
NORTH ATLANTIC.





## TROPICAL REVOLVING STORMS. OBSERVATIONS.

Marine Observers are requested to bring to the notice of Commanders and Officers of ships who are not on the Meteorological Office list, Form 905 which was reproduced in the June Number of this year, and to request those who encounter Tropical Revolving Storms to send in observations set out in this form, which may be obtained from the Marine Agents.

Observations of Hurricanes, Cyclones and Typhoons are required from as many ships as possible in the vicinity of these storms for the development of the "Laws of Storms."

## SEA AND SWELL MEASUREMENTS.

Marine Observers are invited to make special efforts to obtain measurements of Seas and Swells in all parts of the Oceans and under all conditions of weather. These observations are required for completing scales for routine observation and for many other purposes including information upon which to base form of ship's hull and construction.

An article will be found in Volume II, No. 19, upon "Sea and Swell" giving suggestions as to how to take these observations and Form 684 has been circulated to all regular observing ships for the purpose. Further supplies of Form 684 may be had on request.

## POSTAL ARRANGEMENTS.

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

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

S.S..... Captain.....

Port of Call.....

Date of Homeward Departure.....

Postal Address.....

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

## CHARTS OF NORMALS AND FREQUENCIES.

Captains of observing ships upon our list can be supplied with reprints of the North Atlantic and East Indian Seas Meteorological Charts, free of charge, upon application. These Charts provide normals which are essential for the practical application of Marine Meteorology at sea.

Applications should state that it is intended to preserve the Charts in the ship.

These Charts may be purchased through the Admiralty Chart Agents.

(See "Aims and Objects," Volume I, No. 1 of this Journal.)

## THE BAROMETER.

Before barometer readings are compared with the normal isobars shown on the Meteorological Ocean Charts, transmitted by W/T or plotted on Weather Charts, mercurial barometers should be corrected for height, gravity, temperature and index error, for which tables are given on pp. 80 to 83 and 84 to 86 of the Marine Observer's Handbook; see also pp. 177-8, Vol. II, No. 23, of this Journal. A table for converting inches to millibars is also given below.

Aneroids require to be corrected for height and index error only. They should be frequently compared, as the mechanism is liable to get out of adjustment without detection.

Readings of the barometer should be entered in the Meteorological Log as read—i.e., uncorrected—and the attached thermometer should also be recorded. A column is now given for the corrected reading, and it will be of great assistance if this is also completed.

While a difference from the pressure values shown on the charts does not necessarily mean unusual weather, when there is a divergence the mariner should be on the alert, particularly within cyclone regions.

It is strongly urged that Marine Observers, whether using Official or Ship's Barometers, for W/T reports, Meteorological Logs or Forms 911, will complete and send in the Blue Post Card, at least once every voyage, so that an effectual check may be kept on the index error.

## CONVERSION TABLE.

To Convert Inches into Millibars.

Inch.	mb.	Inch.	mb.	Inch.	mb.
27.50	931.2	28.65	970.2	29.85	1,010.8
27.55	932.9	28.70	971.9	29.90	1,012.5
27.60	934.6	28.75	973.6	29.95	1,014.2
27.65	936.3	28.80	975.3	30.00	1,015.9
27.70	938.0	28.85	976.9	30.05	1,017.6
27.75	939.7	28.90	978.6	30.10	1,019.3
27.80	941.4	28.95	980.3	30.15	1,021.0
27.85	943.1	29.00	982.0	30.20	1,022.7
27.90	944.8	29.05	983.7	30.25	1,024.4
27.95	946.5	29.10	985.4	30.30	1,026.1
28.00	948.2	29.15	987.1	30.35	1,027.7
28.05	949.9	29.20	988.8	30.40	1,029.4
28.10	951.6	29.25	990.5	30.45	1,031.1
28.15	953.2	29.30	992.2	30.50	1,032.8
28.20	954.9	29.35	993.9	30.55	1,034.5
28.25	956.6	29.40	995.6	30.60	1,036.2
28.30	958.3	29.45	997.3	30.65	1,037.9
28.35	960.0	29.50	999.0	30.70	1,039.6
28.40	961.7	29.55	1,000.7	30.75	1,041.3
28.45	963.4	29.60	1,002.4	30.80	1,043.0
28.50	965.1	29.65	1,004.0	30.85	1,044.7
28.55	966.8	29.70	1,005.7	30.90	1,046.4
28.60	968.5	29.75	1,007.4	30.95	1,048.1
		29.80	1,009.1		



# ICE CHART. WESTERN NORTH ATLANTIC.

- LETTERS OF TRANSATLANTIC TRACKS INDICATE.
- (C) From 1st September to 31st January, inclusive.
  - (F) From 16th May to Opening of Belle Isle route, and to 30th November when not using the Belle Isle route.
  - (G) Westbound, from position off Fastnet or Bishop (10' N. of Great Circle) to 46°27'N. 53°05'W.
  - (G) Eastbound, from 46°12'N. 53°05'W. (10' S. of Great Circle) steer to position off Fastnet or Bishop.
  - (G) From opening of Belle Isle route to 14th November.

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

**ROUTE NOTICES.**  
For latest information re Tracks see Board of Trade "Supplementary Notices to Mariners," 19th July, 1926. pp. 20 and 21.

- SYMBOLS USED ON THE CHART.**
- Iceberg.
  - Floeberg.
  - Growler.
  - Field Ice, Floe Ice, Pack Ice, Hummocky Ice, Bay Ice.
  - Drift Ice, Brash Ice, Sludge Ice, Pancake Ice.
  - Indicates W/T Ice Warning Station.

## PHENOMENAL DRIFTS OF ICE.

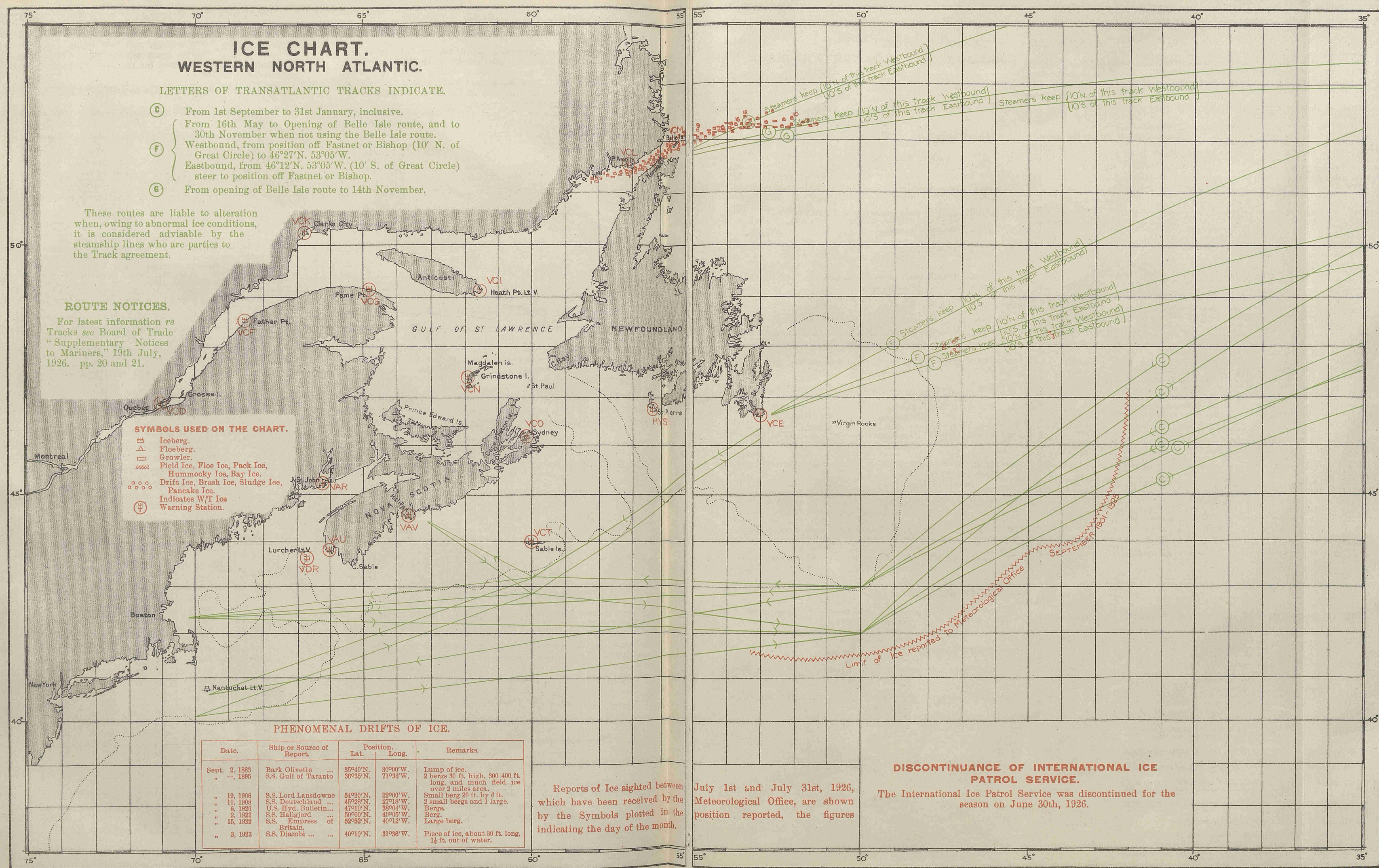
Date.	Ship or Source of Report.	Lat.	Long.	Remarks.
Sept. 2, 1883	Bark Olivette ...	35°40'N.	30°00'W.	Lump of ice.
" - , 1895	S.S. Gulf of Taranto	38°35'N.	71°38'W.	2 bergs 30 ft. high, 300-400 ft. long, and much field ice over 2 miles area.
" 19, 1906	S.S. Lord Lansdowne	54°20'N.	22°00'W.	Small berg 20 ft. by 6 ft.
" 10, 1908	S.S. Deutschland ...	45°28'N.	27°18'W.	2 small bergs and 1 large.
" 6, 1920	U.S. Hyd. Bulletin...	47°10'N.	38°04'W.	Berg.
" 2, 1922	S.S. Hallgierd ...	50°00'N.	40°05'W.	Berg.
" 15, 1922	S.S. Empress of Britain.	52°52'N.	40°12'W.	Large berg.
" 3, 1923	S.S. Djambi ...	40°10'N.	31°38'W.	Piece of ice, about 30 ft. long, 1 1/2 ft. out of water.

Reports of Ice sighted between which have been received by the by the Symbols plotted in the indicating the day of the month.

## DISCONTINUANCE OF INTERNATIONAL ICE PATROL SERVICE.

July 1st and July 31st, 1926, Meteorological Office, are shown position reported, the figures

The International Ice Patrol Service was discontinued for the season on June 30th, 1926.





## MARINE METEOROLOGY.

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

The Director of the Meteorological Office is authorised to lend tested Instruments to Captains of British-owned ships who under take to make 4 hourly observations and keep Meteorological Logs for the Office.

The instruments supplied for this purpose are one barometer, four thermometers with screen, two hydrometers and in some cases a Barograph and rain gauge is added to the equipment.

Tested instruments are also lent to a number of British Atlantic Liners which make special coded W/T weather reports to the Office.

The number of ships co-operating with the M.O. using official tested instruments on loan is limited.

Vessels observing regularly for the Meteorological Office to which office instruments are not lent, keep Form 911, Ship's Meteorological Report, using the ship's instruments, the barometer being compared with Standards. The number of ships regularly contributing approved forms of all descriptions to the Marine Division is limited to 500.

Captains and Officers who wish to co-operate with the Meteorological Office should apply *by letter* to The Director, Meteorological Office, Air Ministry, Kingsway, London, W.C.2; or *in person* between the hours of 10 a.m. and 4 p.m., to the Marine Superintendent at the same address or to any of the gentlemen whose names and addresses are given below acting as agents at the respective ports. A waiting list is kept of the names of ships whose commanders have offered to regularly co-operate.

Marine Observers (*i.e.*, Captains and Officers who regularly observe for the Meteorological Office) will greatly assist if they will send in Meteorological Logs immediately on completion through the Port Meteorological Officer or Agent, at the same time notifying him of any possible instrumental defects.

Defective instruments will then be replaced and new Log Books, etc., provided.

In London and at base ports where there is not an Agency, notification of defects should be sent to headquarters on arrival, with the Meteorological Log.

Vessels making voyages of less than two months' duration are requested to retain their logs until nearly filled up, but the log should be returned in all cases at least twice yearly.

W/T Registers and Forms 911 should in all cases be sent directly to the Meteorological Office, London. The Port Meteorological Officer at Liverpool and the Visiting Officer in London board vessels co-operating with the Meteorological Office, and the agents visit ships at their ports when circumstances permit.

Postage abroad incurred on behalf of the Meteorological Office in returning logs will be refunded. Postage from British Empire ports need not be prepaid, if the envelope is marked O.H.M.S., and addressed to the Director, Meteorological Office, London.

Captains and Officers whether they observe regularly for the Meteorological Office or not are urged to report exceptional phenomena in air or sea. Reports of weather experienced in or near Tropical Cyclones or hurricanes, also abnormal currents are specially desired.

Marine Observers who wish to assist in developing the rapid interchange of Meteorological information and Weather Forecasting at sea can do so by using the standard form, not in code, of W/T Weather Report suggested in "Weather Signals," given in Vol. III, No. 25, pages 14 and 15. For this purpose a mercurial barometer of which the index error has been ascertained is essential.

THE MARINE OBSERVER is sent monthly to all ships regularly contributing Logs, Forms and W/T Registers to the Meteorological Office. It is hoped that each ship will preserve *all* her copies. Personal copies of Numbers are sent to those whose special contributions are published in them. A suitable cover may be obtained from H.M. Stationery Office, price 2s.

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## LATE PRESS.

## DERELICTS AND FLOATING WRECKAGE.

Date.	Position.		Description.
	Latitude.	Longitude.	
NORTH SEA.			
3.7.26	6 m. S. of Humber		Whistle buoy.
NORTH ATLANTIC.			
1.7.26	40°55'N.	63°12'W.	Spar attached to submerged wreckage.
3.7.26	48°50'N.	10°51'W.	Bell buoy.
5.7.26	40°07'N.	49°25'W.	Large red spherical buoy, lower part covered with marine growth.
6.7.26	50°14'N.	12°55'W.	Red spherical unlighted buoy, with red and white flag on top.
8.7.26	38°36'N.	71°45'W.	Wreckage, apparently bottom of barge or schooner with ribs projecting about 5 feet out of water.
8.7.26	37°49'N.	71°44'W.	Derelict, apparently bottom of small schooner burned to water's edge.
8.7.26	41°30'N.	67°04'W.	Can buoy painted black and rusty, part of mooring buoy attached.
9.7.26	48°56'N.	10°40'W.	Whistling buoy, covered with marine growth.
11.7.26	49°10'N.	11°55'W.	Red light buoy marked <i>H—ELE</i> , light still burning.
12.7.26	33°30'N.	77°07'W.	Waterlogged scow with deckload of timber and number of cylindrical pontoons.
17.7.26	15 m. NNW. of Mygnaes, Faroe Island.		Derelict steel lifeboat painted white, 25 to 30 feet long.
19.7.26	49°26'N.	6°32'W.	Red spherical buoy surmounted with tripod, dangerous to navigation.
24.7.26	45°52'N.	16°49'W.	Spar, apparently attached to wreckage, dangerous to navigation.
7.7.26	35°55'N.	43°25'W.	Mast about 30 feet long, 2 feet diameter.
GULF OF MEXICO.			
4.7.26	27°31'N.	88°20'W.	Deck of a vessel about 50 feet long, 15 feet wide, awash.
NORTH PACIFIC.			
1.7.26	14°30'N.	112°36'W.	Floating beacon consisting of oil drums showing 3 flags, red, black and red, from a tripod.
4.7.26	28°21'N.	146°16'W.	Log 20 feet long, 4 feet diameter, covered with marine growth.



# LIST OF VOLUNTARY OBSERVING SHIPS.

i

The following is a complete list of ships regularly contributing observations to the Meteorological Office.

The names of the Captains and Officers, as ascertained from logs and reports received, are given with the date and description of last log, register or report received up to the time of going to press.

Marine Observers are requested to take this as complete and grateful acknowledgment for the work they have contributed, as it has been found necessary to reduce as far as possible the correspondence of the Marine Superintendent, which was largely composed of letters acknowledging logs and reports, in order that more time may be devoted to obtaining results from the data received.

Only in special cases will individual letters be sent.

Excellent awards will be made at the end of the financial year. The names of Commanders and Officers gaining these awards will be published in a special list in THE MARINE OBSERVER.

Ships not contributing logs or reports within a reasonable period will automatically be removed from the list and the free issue of THE MARINE OBSERVER discontinued; it is, therefore, earnestly requested that changes of service, probable periods of lay up or transfer of Commanders may be notified whenever possible.

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

The number of voluntary observing ships is limited to a maximum total of 500.

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

Unless otherwise stated, vessels on the following list are s.s.

M.L. = Equipped with tested Instruments for keeping Meteorological Log.

W.T. = Equipped with tested Instruments for making coded W/T reports to the Meteorological Office, London.

No. = Keeps Ship's Meteorological Report Form 911 with ship's instruments. Letter M after No. indicates ship's barometer Mercurial; A. ship's barometer Aneroid.

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

The numbers which appear before the names of ships equipped for making coded W/T reports to the Meteorological Office, London, are used for the purpose of identification when the observations are re-transmitted in synoptic messages by Wireless or Cable.

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 16.7.26.	Date Received.
<i>Aba</i> ...	Hughes, J. ...	R. A. Roberts, R. A. Downes, L. B. Silvester, S. J. Bristowe.	M.L.	Elder Dempster ...	Met. Log. 11.11.25 to 11.4.26...	23.4.26.
<i>Abinsi</i> ...	Wright, J. B. ...	H. C. Roberts ...	No. A.	" ...	Form 911 26.5.26 to 2.7.26 ...	5.7.26.
<i>Achilles</i> ...	Hill, R. ...	D. MacTavish ...	" A.	A. Holt ...	" 8.10.25 to 19.10.25...	18.11.25.
<i>Actor</i> ...	Haylett, E. ...	A. Frew, J. McKay, G. Penston.	M.L.	Harrison ...	Met. Log. 28.1.26 to 4.4.26 ...	12.4.26.
<i>Adda</i> ...	Toft, J. T. ...	E. C. Davis ...	No. M.	Elder Dempster ...	" 20.5.26 to 26.6.26 ...	28.6.26.
50 <i>Adriatic</i> ...	Beadnell, F. E., Capt., R.N.R.	R. G. Roberts, H. J. Yates ...	W.T.	White Star ...	W.T. Reg. 30.5.26 to 19.6.26 ...	24.6.26.
<i>Aeneas</i> ...	Wallace, W. K. ...	J. M. Anderson ...	No. A.	A. Holt ...	Form 911 30.5.26 to 20.6.26 ...	24.6.26.
<i>Agapenor</i> ...	Ramsay, J. ...	S. G. Ellams ...	" A.	" ...	" 21.3.26 to 9.4.26 ...	17.5.26.
<i>Aidan</i> ...	Buck, R. H. ...	" ...	No.	Booth ...	" 8.5.26 to 27.5.26 ...	22.6.26.
<i>Alban</i> ...	Whayman, W. ...	C. D. Lane, A. T. Douglas ...	" A.	" ...	" 6.12.25 to 22.12.25...	4.1.26.
<i>Albania</i> ...	Gronow, S. ...	L. Harper ...	" A.	Cunard ...	" 29.8.25 to 22.9.25 ...	24.9.26.
<i>Alipore</i> ...	Harrison, R., D.S.O., R.D., Commr., R.N.R.	D. N. Stafford ...	" M.	P. and O. ...	" 2.3.26 to 11.5.26 ...	1.6.26.
<i>Almanzora</i> ...	Mackenzie, G. A. ...	J. Clark ...	" A.	R.M.S.P. ...	" 30.5.26 to 12.7.26 ...	15.7.26.
<i>Alondra</i> ...	Prendergast, J. J. ...	H. Peters ...	" A.	Yeoward ...	" 19.6.26 to 10.7.26 ...	14.7.26.
<i>Ampetco</i> ...	Vandenkerckhove, A. ...	A. Aspeslagh ...	" A.	American Petroleum... ..	" 28.4.26 to 12.5.26 ...	7.6.26.
<i>Antiochus</i> ...	Wilkinson, H. ...	E. T. Bayes ...	" A.	A. Holt ...	" 10.11.25 to 31.3.26...	6.4.26.
<i>Aorangi</i> ...	Crawford, R. ...	A. Lansey, J. W. Bray, G. H. Kime, H. A. Titchfield.	M.L.	Canadian-Australasian	Met. Log. 13.1.26 to 29.4.26 ...	29.5.26.
<i>Appam</i> ...	Yardley, H. A., D.S.C.	Prendergast, Dutton, W. Page	"	Elder Dempster ...	" 23.12.25 to 23.5.26...	5.6.26.
30 <i>Aquitania</i> ...	Charles, Sir J. T., W., K.B.E., C.B., R.D., Commodore, R.N.R.	J. L. Croasdaile, J. Locke, D. MacLean.	W.T.	Cunard ...	W.T. Reg. 6.6.26 to 21.6.26 ...	24.6.26.
<i>Arabic</i> ...	Davies, J. ...	R. Walker, H. G. Morgan, W. Clements.	No.	White Star ...	" 27.6.26 to 12.7.26 ...	14.7.26.
<i>Arafura</i> ...	Gordon, A. S. ...	J. T. Heddlie, G. C. Smith, O. B. Godfrey, F. O. Colvin.	M.L.	Eastern and Australian	Form 911 21.4.26 to 13.5.26 ...	17.5.26.
<i>Archimedes</i> ...	Downs, E. B. ...	J. M. Edgar ...	No. A.	Lampport & Holt ...	Met. Log. 20.4.26 to 14.5.26 ...	17.5.26.
<i>Ariguaní</i> ...	Seudamore, J. H. H., D.S.C., R.D., Commr. R.N.R.	G. Dobson ...	M.L.	Elders & Fyffes ...	Met. Log. 6.1.26 to 4.4.26 ...	14.5.26.
<i>Armada Castle...</i>	Millard, L. A., Knight, A.	" ...	M.L.	Union Castle ...	Form 911 22.3.26 to 9.6.26 ...	16.7.26.
<i>Arracan</i> ...	Willis, M. ...	R. McInnes, M. S. Stuart, C. O. Weir.	"	P. Henderson ...	" 28.2.26 to 3.4.26 ...	8.4.26.
<i>Arundel</i> ...	Short, H. ...	Mr. Hill ...	C.C.	Southern Rly. ...	" 4.1.26 to 11.4.26 ...	26.4.26.
<i>Arundel Castle</i> ...	George, J., O.B.E. ...	C. S. Keen ...	No.	Union Castle ...	Telegraphic Report 6.7.26	6.7.26.
<i>Assyria</i> ...	Donald, D. R. ...	A. Middleton ...	No. A.	Anchor ...	Met. Log. 26.2.26 to 20.6.26 ...	13.7.26.
<i>Astronomer</i> ...	Richards, J. ...	H. Thomas, J. Glen, — Winstanley.	M.L.	Harrison ...	Form 911 16.8.25 to 7.9.25 ...	9.9.25.
<i>Athenic</i> ...	Davies, E. ...	W. Hill ...	No. A.	White Star ...	Met. Log. 18.2.26 to 16.6.26 ...	24.6.26.
<i>Atrous</i> ...	Salter, G. H. ...	J. C. Podmore ...	" A.	A. Holt ...	Form 911 3.5.26 to 17.5.26 ...	19.5.26.
<i>Atsuta Maru</i> ...	Saito, B. ...	K. Murazumi ...	" A.	Nippon Yusen Kaisha	" 21.4.26 to 5.7.26 ...	10.7.26.
<i>Auditor</i> ...	Owen, W. T. ...	T. E. Steel ...	" M.	Harrison ...	" 23.2.26 to 8.3.26 ...	15.3.26.
<i>Ausonia</i> ...	Gibbons, G., R.D., Commr. R.N.R.	E. R. B. Freeman...	" A.	Cunard ...	" 11.3.26 to 25.4.26 ...	10.5.26.
<i>Author</i> ...	Kinloch, R. ...	" ...	" M.	Harrison ...	" 17.4.26 to 11.7.26 ...	13.7.26.
<i>Avon</i> ...	Adam, C., R.D., Commr., R.N.R.	E. S. Munch ...	" M.	R.M.S.P. ...	Form 911 27.1.26 to 12.3.26 ...	17.3.26.



Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 16.7.26.	Date Received.
<i>Balfour</i> ...	Dott, J. ...	S. W. Keay ...	No. A.	Canadian Pacific ...	Form 911 26.5.26 to 23.6.26 ...	30.6.26.
<i>Balrarnald</i> ...	Townshend, W. P., Commr., R.N.R.	... ..	M.L.	P. & O. Branch ...	... ..	...
51 <i>Baltic</i> ...	White, E. R., Commr., R.N.R.	H. R. Wilkinson, H. C. Gray, D. K. Crawford.	W.T.	White Star ...	W.T. Reg 14.6.26 to 2.7.26 ...	8.7.26.
<i>Bambra</i> ...	Turner, J. E. ...	H. W. Norris, J. E. Turner, F. Humble.	M.L.	State Service, Australia	Form 911 13.6.26 to 4.7.26 ...	8.7.26.
<i>Bampton Castle</i> ...	Hutchings, A. H. ...	J. W. S. Brooks ...	No.	Union Castle ...	Met. Log. 25.11.25 to 3.5.26 ...	15.6.26.
<i>Banbury Castle</i> ...	Singeisen, E. A., D.S.C., R.D., Capt., R.N.R.	... ..	"	" ...	" 12.3.26 to 3.7.26 ...	16.7.26.
<i>Banffshire</i> ...	Wynne, R. H. ...	J. M. Bowie ...	No. A.	Turnbull Martin ...	Form 911 23.3.26 to 27.4.26 ...	6.5.26.
<i>Barpeta</i> ...	Denne, G. A. ...	B. M. W. Knight ...	" M.	British India ...	" 5.5.26 to 3.6.26 ...	22.6.26.
<i>Baychimo</i> ...	Cornwall, S. A. ...	S. Jackson ...	" A.	Hudson's Bay Co. ...	" 18.11.25 to 9.1.26 ...	13.1.26.
<i>Beaufort</i> ...	Rice, W. V., D.S.C., D.S.C., Commr., R.N.	J. Taylor ...	M.L.	His Majesty's Ship ...	Met. Log. 14.8.25 to 13.11.25...	11.1.26.
59 <i>Belgentland</i> ...	Howell, T. ...	J. M. Appleby, F. Clitty. ...	W.T.	Red Star ...	W.T. Reg. 14.6.26 to 2.7.26 ...	8.7.26.
<i>Benabier</i> ...	Cole J. H., D.S.C. ...	T. S. Rawlinsong ...	No. A.	Ben Line ...	Form 911 13.6.26 to 3.7.26 ...	8.7.26.
<i>Bendigo</i> ...	Nicholl, R. N. C. ...	C. E. Arundel ...	" M.	P. & O. Branch ...	" 26.5.26 to 7.6.26 ...	17.6.26.
<i>Benloe</i> ...	McCorquodale, A. ...	G. M. Duff ...	" A.	Ben Line ...	" 7.1.26 to 25.1.26 ...	15.3.26.
31 <i>Berengaria</i> ...	Diggle, E. G., R.D., Capt., R.N.R.	J. A. Myles, W. C. A. Robson	W.T.	Cunard ...	W.T. Reg. 13.6.26 to 28.6.26 ...	30.9.25.
<i>Berrima</i> ...	Townshend, W. P., R.D., Commr., R.N.R.	T. Ferguson ...	No. M.	P. & O. Branch ...	Form 911 29.4.26 to 21.6.26 ...	1.7.26.
<i>Bintang</i> ...	Morzer Bruyns, M. F.	A. A. H. Blankestyn ...	" M.	Nederland ...	" 23.3.26 to 13.6.26 ...	24.6.26.
<i>Bogota</i> ...	Dunn, R. E., O.B.E.	T. R. Thomas ...	" A.	R.M.S.P. Co. ...	" 8.10.25 to 28.10.25...	22.6.26.
<i>Bolingbroke</i> ...	Jones, D. C. ...	C. A. Mott ...	M.L.	Canadian Pacific ...	Met. Log. 30.6.25 to 16.1.26 ...	5.11.25.
<i>Borda</i> ...	Dott, J. F. ...	... ..	No. M.	P. & O. Branch ...	Form 911 9.5.26 to 28.6.26 ...	20.1.26.
<i>Bothwell</i> ...	Jones, D. J. C. ...	G. Mowatt ...	" A.	Canadian Pacific ...	" 3.6.26 to 3.7.26 ...	30.6.26.
<i>Brandon</i> ...	Henderson, W. ...	T. Beck ...	" A.	" ...	" 15.2.26 to 17.3.26 ...	9.7.26.
<i>Brecon</i> ...	McCombie, G. ...	F. E. Bevis ...	" A.	" ...	" 14.5.26 to 17.6.26 ...	20.3.26.
<i>Brenda</i> ...	Lamont, A. ...	F. R. Ness ...	" A.	Scottish Fishery Board	Form 911 1.6.26 to 30.6.26 ...	22.6.26.
<i>Brighton</i> ...	Hill, A. ...	Mr. Munton ...	C.C.	Southern Railway ...	Telegraphic Report 1 7.26 ...	3.7.26.
<i>British Advocate</i> ...	Taylor, R. J. ...	G. H. Wylie ...	No. M.	British Tankers ...	Form 911 20.4.26 to 9.6.26 ...	1.7.26.
<i>British Engineer</i> ...	Joures, T. W. ...	E. L. W. Evans ...	" M.	" ...	" 26.1.26 to 9.3.26 ...	14.6.26.
<i>British Soldier</i> ...	Putt, R. O. ...	H. J. Crangle ...	" A.	" ...	" 25.5.26 to 27.6.26 ...	12.4.26.
<i>Bronte</i> ...	Crappier, J. S. ...	... ..	No.	Lampot & Holt ...	" ...	8.7.26.
<i>Browning</i> ...	Connorton, W. A. ...	A. B. Murray ...	No. A.	" ...	Form 911 29.3.26 to 1.7.26 ...	5.7.26.
<i>Bruyere</i> ...	Denson, W. ...	R. Mowbray ...	" A.	" ...	" 20.1.26 to 12.2.26 ...	22.3.26.
<i>Burma</i> ...	Cattanach, J. C. ...	... ..	" A.	Henderson ...	" ...	...
<i>Cambria C.S.</i> ...	Sherwood, C. A. ...	H. Selby, A. J. English, B. C. Farrow.	M.L.	Eastern Tel. Co. ...	Met. Log. 14.7.25 to 21.11.25 ..	26.1.26.
<i>Cambria</i> ...	Telfer, J. E. ...	V. S. Phillips ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report 2.7.26 ...	2.7.26.
<i>Cameronia</i> ...	Smart, R. W. ...	C. Paton ...	No. A.	Anchor ...	Form 911 6.6.26 to 26.6.26 ...	30.6.26.
<i>Camito</i> ...	Forrester, W. T., O.B.E.	W. T. Broome, H. J. Perrett, P. C. Congdon, F. Dudgeon.	M.L.	Elders & Fyffes ...	Met. Log. 25.1.26 to 14.6.26 ...	16.6.26.
<i>Canada</i> ...	Jones, T. ...	G. T. Kavanagh ...	No. M.	White Star-Dominion	Form 911 24.4.26 to 17.5.26 ...	19.5.26.
<i>Canadian Inventor</i> ...	Boulton, F. W. ...	T. Edgar ...	" A.	Canadian Govt. Mercantile Marine.	" 21.11.25 to 9.12.25...	1.2.26.
<i>Canadian Miller</i> ...	McConechy, W. T. ...	C. E. Moore, H. Ruegg ...	" A.	" ...	" 14.3.26 to 23.6.26 ...	15.7.26.
<i>Canadian Scottish</i> ...	Wallace, C. ...	P. D. Angus ...	" A.	" ...	" 14.2.26 to 19.3.26 ...	28.5.26.
<i>Canadian Skirmisher</i> ...	Millar, W. H. ...	R. J. Watson ...	" A.	" ...	" 3.8.26 to 15.4.26 ...	5.5.26.
<i>Canadian Winner</i> ...	Hocking, N. P. ...	R. Girling ...	" M.	Union Castle ...	" 15.3.26 to 28.4.26 ...	4.5.26.
35 <i>Carnania</i> ...	Brown, F. G., R.D., Capt., R.N.R.	M. Boston, L. R. Simpson, D. E. Sibson.	W.T.	Cunard ...	W.T. Reg. 31.5.26 to 18.6.26 ...	25.6.26.
<i>Carnarvon Castle</i> ...	Hague, J. W., Commr., R.N.R.	... ..	M.L.	Union Castle ...	Form 911 30.5.26 to 19.6.26 ...	25.6.26.
34 <i>Caronia</i> ...	Hossack, W. H., R.D., Capt., R.N.R.	R. F. Bovey, T. Ashcroft, D. Butler.	"	Cunard ...	W.T. Reg. 13.6.26 to 2.7.26 ...	7.7.26.
52 <i>Cedric</i> ...	Hickson, V. W., Lt.-Commr. R.N.R.	E. A. Crowley, J. J. Farrell	"	White Star ...	Form 911 13.6.26 to 2.7.26 ...	7.7.26.
53 <i>Celtic</i> ...	Berry, G. ...	J. W. Peters, F. E. Patchett, L. Thompson.	"	" ...	W.T. Reg. 7.6.26 to 27.6.26 ...	1.7.26.
<i>Centaur</i> ...	Rose, A. F. ...	L. Johnstone, E. Potts ...	No. M.	A. Holt & Co. ...	Form 911 6.6.26 to 27.6.26 ...	30.6.26.
<i>Ceramic</i> ...	Roberts, J., C.B.E., D.S.O., R.D., Capt., R.N.R.	D. W. Chamberlain ...	" A.	White Star ...	W.T. Reg. 21.6.26 to 11.7.26 ...	15.7.26.
<i>Change</i> ...	Gambrell, F. C. ...	J. Thomas, Tyer, J. A. Allan	M.L.	Yuill & Co. ...	Form 911 20.6.26 to 12.7.26 ...	16.7.26.
<i>China</i> ...	Cossey, W. F. ...	D. A. C. Butler ...	No. M.	P. & O. ...	" 2.4.26 to 6.6.26 ...	5.7.26.
<i>Chindwara</i> ...	Briseley, P. L. ...	W. Welch ...	" M.	British India ...	" 20.4.26 to 24.5.26 ...	26.5.26.
<i>City of Baroda</i> ...	Houghton, W. ...	A. Beaton, J. Cook, W. H. Dalton.	M.L.	Ellerman ...	Met. Log. 2.2.26 to 28.3.26 ...	19.6.26.
<i>City of Benares</i> ...	Spencer, H. ...	C. G. Inglis ...	No. A.	" ...	Form 911 30.4.26 to 23.6.26 ...	25.6.26.
<i>City of Brisbane</i> ...	Seaborne, F. O., D.S.C.	R. W. Watkin ...	" A.	" ...	Met. Log. 29.8.25 to 17.12.25...	11.1.26.
<i>City of Canterbury</i> ...	Bremner, D. M. ...	E. Garner ...	" A.	" ...	" 19.9.25 to 31.5.26 ...	4.6.26.
<i>City of Chester</i> ...	Letton, F. W. ...	F. C. Wilson, H. Asher, W. Speakman.	M.L.	" ...	Form 911 27.3.26 to 13.4.26 ...	22.4.26.
<i>City of Edinburgh</i> ...	Wyper, J. ...	N. G. Fraser ...	No. M.	" ...	" 24.5.26 to 4.6.26 ...	18.6.26.
<i>City of Hong Kong</i> ...	Walton, H. L., O.B.E., R.D., Commr. R.N.R.	Westlake ...	" A.	" ...	Met. Log. 15.11.25 to 3.3.26 ...	8.3.26.
<i>City of London</i> ...	Martin, D. ...	J. J. McTigue ...	" A.	" ...	Form 911 15.6.26 to 2.7.26 ...	12.7.26.
<i>City of Marseilles</i> ...	Brown, G. ...	W. A. MacAdams, G. F. L. Coates.	" A.	" ...	" ...	...
<i>City of Rangoon</i> ...	Dunning, T. W. J. ...	A. Gibb, V. S. Turner, A. H. Cosker, G. Lawrey.	M.L.	" ...	Form 911 8.3.26 to 2.4.26 ...	12.4.26.
<i>City of Yokohama</i> ...	McDonald, W. D. ...	R. A. Fulton ...	No. A.	" ...	" 25.2.26 to 18.3.26 ...	22.3.26.
<i>Clan Lamont</i> ...	McCornish, A. B. ...	C. W. Banbury, A. F. Martin	" A.	Clan ...	Met. Log. 14.12.25 to 4.6.26 ...	28.6.26.
<i>Clan Lindsay</i> ...	Worthington, J. H. ...	T. E. Woodall ...	" A.	" ...	Form 911 12.2.26 to 5.4.26 ...	26.5.26.
<i>Clan Macbeth</i> ...	Young, A. H., R.D., Lieut.-Commr., R.N.R.	W. Hurst ...	" A.	" ...	" 31.1.26 to 8.3.26 ...	6.4.26.
<i>Clan Macfadyen</i> ...	Stenson, T. J., R.D., Capt., R.N.R.	J. W. Charles ...	" A.	" ...	" 13.6.26 to 24.6.26 ...	3.7.26.
<i>Clan Macgillivray</i> ...	West, W. F. ...	P. G. de Gruchy ...	" A.	" ...	" 18.4.26 to 11.5.26 ...	10.6.26.
<i>Clan Macindoe</i> ...	Law, A. ...	J. G. Baillie ...	" A.	" ...	" 14.3.26 to 10.5.26 ...	14.6.26.
<i>Clan Mackellar</i> ...	Scotland, A. ...	D. McAllister ...	" A.	" ...	" 18.12.25 to 17.1.26...	11.2.26.
<i>Clan Mackinnon</i> ...	McLean, J. G. ...	W. F. Isaac, S. Y. Strange, J. E. Clayton,	M.L.	" ...	" 24.2.26 to 19.6.26 ...	28.6.26.
					Met. Log. 30.4.26 to 19.5.26 ...	7.6.26.
					" 5.11.25 to 16.2.26 ...	22.3.26.

## LIST OF VOLUNTARY OBSERVING SHIPS

iii

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 16.7.26.	Date Received
<i>Clan Macphee</i> ...	Gourlay, J. B. ...	D. S. Rae, J. O. Woodall, J. J. Millar.	M.L.	Clan ...	Met. Log. 6.9.25 to 14.5.26 ...	24.6.26.
<i>Clan Macnaughton</i> ...	Thomson, W. ...	A. J. Storkey, D. MacDiarmid	No. A.	" ...	Form 911 25.5.26 to 18.6.26 ...	12.7.26.
<i>Clan Macnagart</i> ...	Gray, J. N. ...	W. J. Henderson ...	" A.	" ...	" 19.4.26 to 23.5.26 ...	26.5.26.
<i>Clan MacTavish</i> ...	Higgins, C. J. ...	" ...	" A.	" ...	" ...	" ...
<i>Clan Macvicar</i> ...	Phillips, G. P. ...	L. S. Murrin ...	" A.	" ...	Form 911 14.7.25 to 2.8.25 ...	24.8.25.
<i>Clan Macwhirter</i> ...	Waterhouse, J. ...	R. W. Roberts ...	" A.	" ...	" 4.6.26 to 12.6.26 ...	17.6.26.
<i>Clan Macwilliam</i> ...	Williamson, A. ...	" ...	" A.	" ...	" ...	" ...
<i>Clan Malcolm</i> ...	Neill, G. A. ...	S. M. Werrey Easterbrook, N. MacLeod.	M.L.	" ...	Met. Log. 18.10.25 to 5.4.26 ...	13.4.26.
<i>Clan Morrison</i> ...	Porterfield, W. M. ...	L. C. Higgins ...	No. A.	" ...	Form 911 20.6.26 to 26.6.26 ...	5.7.26.
<i>Clan Murdoch</i> ...	Miller, W. ...	P. McMillan ...	" A.	" ...	" 24.3.26 to 14.4.26 ...	17.5.26.
<i>Clan Ranald</i> ...	Laird, C. ...	T. O. Marr ...	" A.	" ...	" 7.5.26 to 10.6.26 ...	5.7.26.
<i>Clan Ross</i> ...	Jones, R. C. ...	G. Short ...	" A.	" ...	" 28.4.26 to 19.5.26 ...	25.5.26.
<i>Clan Sinclair</i> ...	Neill, G. A. ...	J. Brittain ...	" A.	" ...	" 10.3.25 to 29.7.25 ...	5.8.25.
<i>Clan Urquhart</i> ...	Gibb, A. F. W. ...	T. G. Mitchell ...	" A.	" ...	" 29.3.26 to 4.4.26 ...	10.5.26.
<i>Colonia, C.S.</i> ...	Campos, V., O.B.E., Lt. - Commr.	S. A. Garnham, C. A. Bullock, L. J. Hegarty, W. R. Matthews, W. Anderson.	M.L.	Telegraph Construction & Maintenance.	Met. Log. 16.1.26 to 29.4.26 ...	25.5.26.
<i>Colonian</i> ...	Gittins, R. P. ...	T. A. Schofield-Miller ...	No. A.	Leyland ...	Form 911 21.3.26 to 31.3.26 ...	3.7.26.
<i>Comerin</i> ...	Borland, J. Mc. L., C.B., D.S.O., R.D., Capt. R.N.R.	E. A. O. Chambers ...	No. M.	P. & O. ...	" 19.6.26 to 30.6.26 ...	15.7.26.
<i>Concordia</i> ...	Morris, J. ...	T. Philip, J. McIntosh, J. Davies, H. A. Hartley.	M.L.	Anchor Donaldson ...	Met. Log. 7.8.25 to 8.2.26 ...	19.2.26.
<i>Corinthic</i> ...	Hart, F. ...	F. Kean, M. Bennett, F. G. Rogers.	M.L.	White Star ...	" ...	" ...
<i>Cornish City</i> ...	James, D. P. ...	T. Hains ...	No. A.	Reardon Smith ...	" ...	" ...
<i>Cornwall</i> ...	Haines, F. P. ...	J. E. R. Wilford ...	" A.	Federal ...	Form 911 10.4.26 to 25.5.26 ...	28.5.26.
<i>Crawford Castle</i> ...	Morgan, A. O., R.D., Commr. R.N.R.	" ...	" A.	Union Castle ...	" 26.3.26 to 1.5.26 ...	26.5.26.
<i>Cristales</i> ...	Isaacson, J. M. ...	P. Cooper, H. V. Todd, C. A. Mackay, A. S., R.D., Commr. R.N.R.	M.L.	Elders & Fyffes ...	" ...	" ...
<i>Culebra</i> ...	Davies, B. J. ...	Payne, F. G. Dawson.	"	R.M.S.P. Co. ...	Met. Log. 11.1.26 to 14.6.26 ...	22.6.26.
<i>Cumberland</i> ...	Deith, G. T. ...	E. F. Hopkins ...	No. A.	Federal ...	Form 911 18.2.26 to 19.6.26 ...	22.6.26.
<i>Cuthbert</i> ...	Barlow, F. P. ...	S. E. Adams ...	" A.	Booth ...	" 12.3.26 to 23.5.26 ...	22.6.26.
<i>Cyclops</i> ...	Cosker, W. ...	H. L. Cole ...	" A.	A. Holt ...	" 4.3.26 to 16.3.26 ...	8.4.26.
<i>Dardanus</i> ...	Williams, D. T. ...	C. F. Morgan ...	" M.	" ...	" 29.4.26 to 13.5.26 ...	14.6.26.
<i>Darian</i> ...	Masters, W. ...	A. S. Holland ...	" A.	Leyland ...	" 17.1.26 to 8.3.26 ...	10.3.26.
<i>Darro</i> ...	Matthews, G. P. ...	R. S. Holland, A. Barff ...	" M.	R.M.S.P. Co. ...	" 4.4.26 to 29.5.26 ...	1.6.26.
<i>Demerara</i> ...	Willan, F. C. L. ...	J. J. C. Blake ...	" M.	" ...	" 21.3.26 to 14.5.26 ...	20.5.26.
<i>Demosthenes</i> ...	Orriss, F. A. ...	J. F. Cruickshank ...	" M.	Aberdeen ...	" 2.5.26 to 23.5.26 ...	28.6.26.
<i>Deseado</i> ...	Hannam, F. S. ...	C. C. Dingle, L. D. Jennings ...	" M.	R.M.S.P. Co. ...	" 19.4.26 to 13.6.26 ...	17.6.26.
<i>Desna</i> ...	Huff, G. F. ...	J. W. Smith ...	" M.	" ...	" 1.5.26 to 27.6.26 ...	3.7.26.
<i>Deucalion</i> ...	Findlay, J. ...	L. E. Brown ...	" A.	A. Holt ...	" 16.1.26 to 5.4.26 ...	12.4.26.
<i>Dieppe</i> ...	Warmery, S. ...	Mr. Parsons ...	" C.C.	Southern Railway ...	Telegraphic Report 16.7.26 ...	16.7.26.
<i>Dinboola</i> ...	Roy, C. M. ...	G. A. Molyneux ...	No. A.	Melbourne S.S. Co. ...	Form 911 16.4.26 to 11.5.26 ...	14.6.26.
<i>Discoverer</i> ...	Ling, J. T. ...	C. C. Heaton ...	" M.	Harrison ...	" 28.3.26 to 16.6.26 ...	24.6.26.
<i>Discovery, R.R.S.</i> ...	Stenhouse, J. R., D.S.O., D.S.C., O.B.E., R.D., Commr. R.N.R.	T. W. Goodchild ...	M.L.	Discovery Expedition ...	Met. Log. 24.7.25 to 7.1.26 ...	19.2.26.
<i>Domala, M.V.</i> ...	Buswell, W. ...	C. E. Merchant ...	No. M.	British India ...	Form 911 20.2.26 to 21.4.26 ...	6.5.26.
<i>Doric</i> ...	S. Bolton, D.S.C., R.D., Commr. R.N.R.	W. F. Dennison ...	No. A.	White Star ...	" 10.6.26 to 4.7.26 ...	5.7.26.
<i>Doric Star</i> ...	Thomas, R. T. ...	L. McDermott ...	No. M.	Blue Star ...	" 22.4.26 to 16.5.26 ...	3.7.26.
<i>Dorington Court</i> ...	Isaacs, W. A. ...	E. D. A. Gibbs ...	" A.	Haldin & Co. ...	" 12.9.25 to 6.11.25 ...	20.11.25.
<i>Dorset</i> ...	Kettlewell, C. R. ...	E. Smith, H. S. Rogers, S. T. Woodhouse.	M.L.	New Zealand S.S. Co. ...	Met. Log. 13.6.25 to 29.12.25 ...	6.1.26.
<i>Dromore Castle</i> ...	Vincent, E. S., R.D., Commr. R.N.R.	D. H. McDougall ...	No. A.	Union Castle ...	Form 911 11.4.26 to 17.5.26 ...	31.5.26.
<i>Dryden</i> ...	Major, T. W. ...	G. W. Major ...	" M.	Lampart & Holt ...	" 3.5.26 to 29.5.26 ...	3.7.26.
<i>Duendes</i> ...	Cox, F. D. ...	H. Jones ...	" M.	P.S.N. Co. ...	" 15.2.26 to 3.3.26 ...	8.3.26.
<i>Dundrum Castle</i> ...	Weller, H. E. ...	W. S. Byles ...	" A.	Union Castle ...	" 5.5.26 to 7.6.26 ...	28.6.26.
<i>Dunrobin</i> ...	Ramsay, J. D. ...	M. M. Ramsay ...	" A.	Glen & Co. ...	" 18.6.26 to 5.7.26 ...	7.7.26.
<i>Duquesa</i> ...	Ellis, F., D.S.C. ...	W. Myerscough ...	" M.	Furness Withy ...	" 6.2.26 to 2.4.26 ...	12.4.26.
<i>Durenda</i> ...	Wilson, W. ...	K. G. Pullman ...	" M.	British India ...	" 1.1.26 to 9.1.26 ...	1.2.26.
<i>Edinburgh Castle</i> ...	Wilford, T. H. ...	" ...	No.	Union Castle ...	Met. Log. 8.1.26 to 24.1.26 ...	29.5.26.
<i>Egyptian Prince</i> ...	Ord, T. ...	" ...	No.	Prince ...	" ...	" ...
<i>El Cordobes</i> ...	Noton, F. G. ...	S. C. N. Burridge ...	No. A.	British & Argentine S.N. Co. ...	Form 911 15.4.26 to 14.5.26 ...	25.5.26.
<i>Elmina</i> ...	Millson, H. E. ...	H. Readman, J. M. Stuart, D. S. Mackenzie, J. A. McGough.	M.L.	Elder Dempster ...	Met. Log. 2.12.25 to 19.4.26 ...	25.5.26.
<i>El Paraguay</i> ...	Smith, F. C. ...	J. Allerton ...	No. M.	Houlder Bros. ...	Form 911 18.4.26 to 9.7.26 ...	12.7.26.
<i>Elpenor</i> ...	T. W. Hannay ...	M. Robertson ...	M.L.	A. Holt ...	Met. Log. 1.11.25 to 1.3.26 ...	4.3.26.
<i>Elusia</i> ...	Duncan, A. R. ...	" ...	"	Anchor ...	" ...	" ...
<i>Empress of Asia</i> ...	Douglas, L. D., R.D., Lt. - Commr., R.N.R.	R. H. Foley, L. Johnston, L. C. Hogg, T. M. W. Golby.	"	Canadian Pacific ...	" 8.2.26 to 16.5.26 ...	23.6.26.
<i>Empress of Australia</i> ...	Halley, A. J. ...	R. Leicester, J. Downes ...	"	" ...	" 21.3.25 to 17.12.25 ...	12.1.26.
<i>Empress of Canada</i> ...	Robinson, S., C.B.E., R.D., Commr., R.N.R.	W. S. Halliday, L. C. Barry, J. W. Thomas.	"	" ...	" 20.2.26 to 30.5.26 ...	28.6.26.
<i>Empress of France</i> ...	Griffiths, E. ...	E. Roberts, F. Chodzko, W. Ewens.	"	" ...	" 27.1.26 to 13.4.26 ...	19.4.26.
<i>Empress of Russia</i> ...	Hosken, A. J. ...	G. R. Newell, H. B. Metcalfe, J. S. Clark, J. H. Reid.	"	" ...	" 17.10.25 to 22.2.26 ...	29.3.26.
<i>Empress of Scotland</i> ...	Latta, R. G. ...	B. Grant, W. Bacon, F. G. Hutchings.	"	" ...	" 14.11.25 to 20.4.26 ...	26.4.26.
<i>Endeavour</i> ...	Commr. S. A. Geary-Hill, D.S.O., R.N.	G. S. Norrington, E. V. B. Baker, E. H. B. Baker, J. Torlesse.	"	His Majesty's Ship ...	" 7.11.25 to 2.3.2 ...	23.3.26.
<i>Essequibo</i> ...	Duncan, E. E. ...	A. Lyall ...	No. M.	R.M.S.P. Co. ...	Form 911 21.5.26 to 5.7.26 ...	16.7.26.
<i>Eumaeus</i> ...	Read, J. W. ...	W. J. Ryan ...	" A.	A. Holt ...	" 15.5.26 to 22.5.26 ...	14.7.26.
<i>Euripides</i> ...	Roberts, T. V. ...	H. S. Cox, G. R. Fisher, G. Perry.	M.L.	Aberdeen ...	Met. Log. 17.7.25 to 16.4.26 ...	23.4.26.
<i>Eurybates</i> ...	Carnon, C. G. ...	C. Napier ...	No. A.	A. Holt ...	Form 911 9.4.26 to 28.4.26 ...	31.5.26.
<i>Explorer</i> ...	Lamont, A. ...	Scientific Staff ...	M.L.	Scottish Fishery Board ...	Met. Log. 2.3.25 to 17.10.25 ...	29.12.25.
<i>Ferndale</i> ...	Daniel, F. ...	D. Jones, A. Murdoch ...	No. M.	Commonwealth Govt. ...	Form 911 14.5.26 to 17.6.26 ...	22.6.26.



Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 16.7.26.	Date Received.
<i>Fitzroy</i> ...	Silk, H. V., Lt.-Commr. R.N.	M. E. Welby ...	M.L.	His Majesty's Ship ...	Met. Log. 25.8.25 to 16.11.25...	21.11.25.
<i>Flandria</i> ...	Veldkamp, G. J. ...	T. Doornbosch ...	No. M.	Holland Lloyd ...	Form 911 14.5.26 to 1.7.26 ...	3.7.26.
<i>Flinders</i> ...	Henderson, D. A., Lt.-Commr., R.N.	H. E. Turner ...	M.L.	His Majesty's Ship ...	Met. Log. 23.8.25 to 20.11.25...	2.12.25.
<i>Francisco</i> ...	Collins, F. ...	C. Walker ...	No. A.	Ellerman Wilson ...	Form 911 23.1.26 to 5.2.26 ...	15.2.26.
<i>Freya</i> ...	Angus, W. ...	A. S. Currie ...	" A.	Scottish Fishery Board ...	" 1.5.26 to 30.5.26 ...	7.6.26.
<i>Garoe</i> ...	Visser, C. W. ...	C. J. Vandenboom ...	" M.	Rotterdam Lloyd ...	" 20.1.26 to 20.2.26 ...	12.4.26.
<i>Gascoyne</i> ...	Rutt, W. N. ...	R. Simpson ...	" A.	Dalgely & Co. ...	" 19.1.26 to 24.2.26 ...	30.3.26.
<i>Gelria</i> ...	Bakker, T. J. ...	K. H. Schilp ...	" M.	Holland Lloyd ...	" 26.3.26 to 13.5.26 ...	17.5.26.
<i>Glenamoy, M.V.</i> ...	Angier, J. ...	R. H. Bishop ...	" A.	Glen Line ...	" 7.5.26 to 20.5.26 ...	28.5.26.
<i>Glenapp, M.V.</i> ...	Roberts, W. E. ...	S. W. Bell ...	" A.	" ...	" 14.11.25 to 27.12.25 ...	4.1.26.
<i>Glenashane</i> ...	Beer, E. ...	R. A. Dale ...	" A.	" ...	" 22.3.26 to 8.7.26 ...	12.7.26.
<i>Gloucestershire</i> ...	Robin, E. ...	M. W. Simmons ...	" A.	Bibby ...	" 30.1.26 to 9.4.26 ...	12.4.26.
<i>Gorgon</i> ...	Hughes, J. W. ...	E. W. Powell ...	" A.	A. Holt & Co. ...	" 5.5.26 to 24.5.26 ...	22.6.26.
<i>Gourko</i> ...	Aspinall, A. E. ...	G. B. Bray, S. N. Stokes, J. D. Birch.	No.	Ellerman Wilson ...	Met. Log. 16.5.25 to 1.11.25 ...	10.12.25.
<i>Haliartus</i> ...	Marsh, L. V. ...	W. H. Upton ...	No. A.	R. P. Houston ...	Form 911 11.4.26 to 8.5.26 ...	7.6.26.
<i>Harmony, Auxy.</i> ...	Jackson, J. C. ...	A. W. Bush ...	" A.	Moravian Mission ...	" 1.12.25 to 18.12.25...	29.12.25.
<i>Hatarana</i> ...	Denne, G. H. A. ...	F. Wells, C. Parkes, W. T. Barnes.	M.L.	British India ...	" 12.6.25 to 27.2.26 ...	29.3.26.
<i>Hauraki, M.V.</i> ...	Davey, A. H. ...	J. A. Pearson ...	No. M.	Union S.S. Co. N.Z. ...	" 12.1.26 to 17.3.26 ...	29.4.26.
<i>Henry Holmes, C.S.</i> ...	Bicker Caarten, A. ...	R. J. M. Pearce ...	" M.	W. I. & Panama Telegraph Co. ...	" 6.9.25 to 4.4.26 ...	28.6.26.
<i>Herald</i> ...	Harvey, J. R., O.B.E., Commr., R.N.	W. C. Jenks ...	M.L.	His Majesty's Ship ...	Met. Log. 25.9.25 to 25.12.25	24.2.26.
<i>Herefordshire</i> ...	Mann, R. P. ...	H. R. Mackay ...	No. A.	Bibby ...	Form 911 25.4.26 to 3.7.26 ...	12.7.26.
<i>Herschel</i> ...	Davies, G. W. ...	J. M. Edgar ...	No. A.	Lampart & Holt ...	" 14.10.25 to 15.12.25	29.12.25.
<i>Hertford</i> ...	Urquhart, D. ...	A. Robertson ...	No. A.	Federal ...	" ...	"
<i>Hibernia</i> ...	Tanner, E. B. ...	R. Woodall ...	C.C.	L.M. & S. Rly. ...	Telegraphic Report, 14.7.26 ...	14.7.26.
<i>Highland Enterprise</i> ...	Pond, R. H. ...	J. H. Tilton ...	No. A.	Nelson ...	Form 911 12.12.25 to 11.2.26...	10.3.26.
" <i>Glen</i> ...	Jones, T. J. ...	W. Jealous ...	" A.	" ...	" 29.3.26 to 26.5.26 ...	31.5.26.
" <i>Heather</i> ...	Powell, G. A. ...	J. H. Pitton, J. Hardy ...	No. A.	" ...	" 13.12.25 to 24.6.26 ...	14.7.26.
" <i>Laddie</i> ...	Alford, C. ...	E. F. Smart ...	No. A.	" ...	" 15.3.26 to 8.5.26 ...	19.5.26.
" <i>Piper</i> ...	Collings, D. ...	A. S. Jones, J. S. Collins, W. T. Breen, E. F. Smart.	M.L.	" ...	Met. Log. 20.6.25 to 3.11.25 ...	18.11.25.
" <i>Pride</i> ...	Davies, G. A. ...	F. Falconer, R. R. Soanes, G. E. Leech.	No.	" ...	" 5.12.25 to 31.1.26 ...	4.2.26.
" <i>Prince</i> ...	Brown, J. ...	" ...	No.	Prince ...	" ...	"
" <i>Rover</i> ...	Ashby Graves, F. ...	G. J. Evans ...	No. A.	Nelson ...	Form 911 1.3.26 to 24.4.26 ...	17.5.26.
" <i>Warrior</i> ...	Robinson, R. H. ...	J. O. Simons ...	" M.	" ...	" 25.3.26 to 19.5.26 ...	26.5.26.
<i>Hildebrand</i> ...	Maddrell, J. ...	A. Allan ...	" A.	Booth ...	" 22.5.26 to 8.7.26 ...	13.7.26.
<i>Hobsons Bay</i> ...	Kydd, O. J. ...	Morrison, Henty, Grantham, M. P. Pearce.	M.L.	Commonwealth Govt. ...	Met. Log. 24.11.25 to 12.3.26...	18.3.26.
<i>Holbein</i> ...	Gough, W. A. ...	H. L. Rudd ...	No. A.	Lampart & Holt ...	Form 911 13.2.26 to 28.4.26 ...	5.5.26.
<i>4 Homeric</i> ...	Holme, A. ...	A. E. Dyer, A. Griffiths, J. W. Best.	W.T.	White Star ...	W.T. Reg. 3.6.26 to 18.6.26 ...	21.6.26.
<i>Honorius</i> ...	Samuels, C. ...	J. E. Martin, W. G. Idles ...	No. A.	R. P. Houston ...	Form 911 24.6.26 to 8.7.26 ...	10.7.26.
<i>Hororata</i> ...	Holland, E. ...	H. J. Wilde ...	" A.	New Zealand S.S. Co. ...	" 27.7.25 to 27.8.25 ...	31.8.25.
<i>Hubert</i> ...	Pym, J. H. ...	S. G. Edwards ...	" A.	Booth ...	" 16.7.25 to 27.1.26 ...	2.2.26.
<i>Hurunu</i> ...	Burton Davies, J. ...	J. C. Tuckett, F. G. Capon, F. Pover, G. R. Hogg.	M.L.	New Zealand S.S. Co. ...	Met. Log. 21.6.25 to 6.7.26 ...	14.7.26.
<i>Ingoma</i> ...	Barrow, R. K. ...	O. Stanhope ...	No. M.	Harrison ...	Form 911 10.4.26 to 20.5.26 ...	26.5.26.
<i>Intaba</i> ...	Gibbins, W. A. ...	A. M. Hughes ...	" A.	" ...	" 11.3.26 to 25.4.26 ...	30.4.26.
<i>Iris, C.S.</i> ...	Hughes, H. R. ...	" ...	" M.	Pacific Cable Board ...	" ...	"
<i>Iroquois</i> ...	Jackson, A. L., Commr. R.N.	A. K. Baxendell ...	"	His Majesty's Ship ...	Met. Log. 17.8.25 to 30.11.25...	27.1.26.
<i>Ixion</i> ...	Williams, R. J. ...	A. S. Brotherton ...	No. A.	A. Holt ...	Form 911 21.3.26 to 22.5.26 ...	7.6.26.
<i>Javanese Prince</i> ...	Naylor, E. ...	F. Armstrong ...	" A.	Prince ...	" ...	"
<i>Jervis Bay</i> ...	Chaplin, W. R. ...	R. W. Laycock ...	" M.	Commonwealth Govt. ...	Form 911 16.5.26 to 18.6.26 ...	24.6.26.
<i>John Pender, C.S.</i> ...	Smythe, T. W. ...	A. E. Everall ...	" A.	Eastern Tel. Co. ...	" 18.5.26 to 11.6.26 ...	29.6.26.
<i>Justin</i> ...	Evans, L. ...	A. R. Fasting ...	" A.	Booth ...	" ...	"
<i>Kaikoura</i> ...	McNish, R. ...	C. A. H. Landfield, F. Cooke, C. H. Tilston	M.L.	New Zealand S.S. Co. ...	Met. Log. 19.9.25 to 19.6.26 ...	29.6.26.
<i>Kaisar-i-Hind</i> ...	Manley, G. ...	G. R. Baker ...	No. M.	P. & O. ...	Form 911 16.5.26 to 3.6.26 ...	5.7.26.
<i>Kamo Maru</i> ...	Shiratori, S. ...	Heysaki ...	" A.	Nippon Yusen Kaisha	" 21.3.26 to 11.4.26 ...	10.5.26.
<i>Kangaroo</i> ...	Norris, H. C. ...	R. J. Sinclair, V. J. Denton, J. Egglestone.	M.L.	State Service Australia	Met. Log. 21.9.25 to 27.2.26 ...	14.6.26.
<i>Kashmir</i> ...	Stringer, R.H., O.B.E., Commr. R.N.R.	H. Aubrey ...	No. M.	P. & O. ...	Form 911 10.4.26 to 18.4.26 ...	20.4.26.
<i>Kathamba</i> ...	Mordue, J. A. ...	" ...	" A.	Ellerman Bucknall ...	" 28.3.26 to 25.6.26 ...	5.7.26.
<i>Kellett</i> ...	Maxwell, P. S. E., Commr. R.N.	D. G. V. Williams...	M.L.	His Majesty's Ship ...	Met. Log. 27.7.25 to 16.11.25...	18.11.25.
<i>Kenilworth Castle</i> ...	Chave, Sir B., K.B.E., Attwood, J. ...	H. L. Idles, T. M. Gordon ...	"	Union Castle ...	" 17.1.26 to 11.7.26 ...	15.7.26.
<i>Kent</i> ...	Owen, S. ...	" ...	"	" ...	" ...	"
<i>Khyber</i> ...	Downton, M. M. ...	F. M. Knight ...	No. A.	New Zealand, S.S. Co. ...	Form 911 26.4.26 to 17.5.26 ...	24.6.26.
	Browning, J. B., R.D., Commr., R.N.R.	C. B. Roche ...	No. M.	P. & O. ...	" 5.5.26 to 15.6.26 ...	12.7.26.
<i>Kia Ora</i> ...	McIntosh, A. ...	E. A. Hickling ...	M.L.	Shaw Savill & Albion	" 27.2.26 to 9.4.26 ...	13.4.26.
<i>Kildonan Castle</i> ...	Imlah, C. B. ...	G. H. Pickering ...	No. A.	Union Castle ...	" 2.1.26 to 21.2.26 ...	1.3.26.
<i>Kitano Maru</i> ...	Gotoh, M. ...	M. Hara ...	" A.	Nippon Yusen Kaisha	" 12.9.25 to 6.10.25 ...	13.11.25.
<i>Knight Companion</i> ...	Reed, G. C. ...	J. J. Daniel ...	" M.	A. Holt ...	" 29.4.26 to 15.5.26 ...	26.5.26.
<i>Kovno</i> ...	Dossor, W. A. ...	J. J. Collier, H. Redfern, S. Duckells, A. Snowden, J. C. Nettleship, C. Williams.	M.L.	Ellerman Wilson ...	Met. Log. 7.11.25 to 4.4.26 ...	3.6.26.
<i>Kweiyang</i> ...	Byers, G. ...	" ...	" A.	China Nav. Co. ...	" ...	"
<i>Kyogle</i> ...	Coalstad, C. ...	C. B. Odman, E. W. Hughes	No. A.	Commonwealth Light-house Service. Eastern Tel. Co. ...	Form 911 17.8.25 to 9.11.25 ...	14.12.25.
<i>Lady Denison Pender, C.S.</i> ...	West, G. W. ...	F. Lawrence ...	" A.	" ...	" 22.3.26 to 10.4.26 ...	10.5.26.
<i>Laguna</i> ...	Pape, E. R. ...	W. P. Boon ...	" A.	Pacific S.N. Co. ...	" 29.3.26 to 7.5.26 ...	13.5.26.
<i>Lahore</i> ...	Gordon, L. M., R.D., Commr. R.N.R.	A. D. Dennis ...	" M.	P. & O. ...	" 26.2.26 to 27.4.26 ...	17.5.26.
<i>Lalande</i> ...	Hamill, H. ...	R. S. Hagley ...	" A.	Lampart & Holt ...	" 30.3.26 to 12.4.26 ...	15.6.26.
<i>Lancashire</i> ...	Beckett, F. W. ...	W. M. S. Higginson ...	" A.	Bibby ...	" 27.2.26 to 6.5.26 ...	26.5.26.
<i>36 Lancastria</i> ...	Malin, R. G., Lt.-Commr. R.N.R.	P. J. Robinson, R. P. Campbell, L. R. Sharp.	W.T.	Nunard ...	W.T. Reg. 23.5.26 to 13.6.26 ...	18.6.26.
<i>Laomedon</i> ...	Beswick, W., D.S.C., Lt.-Commr. R.N.R.	A. Yarwood ...	No. A.	A. Holt ...	Form 911 23.5.26 to 13.6.26 ...	18.6.26.
<i>La Paz, M.V.</i> ...	Dunn, R. E. ...	F. T. Gale ...	" M.	Pacific S.N. Co. ...	" 25.4.26 to 22.5.26 ...	22.6.26.

## LIST OF VOLUNTARY OBSERVING SHIPS

v

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 16.7.26.	Date Received
<i>Laplace</i> ...	Shaw, W. ...	R. B. Langley ...	No. A.	Lamport & Holt ...	Form 911 6.5.26 to 31.5.26 ...	10.6.26.
55 <i>Lapland</i> ...	Howell, T. ...	E. Cornelli, F. Good, Flett ...	W.T.	Red Star ...	Met. Log. 1.1.26 to 8.5.26 ...	17.5.26.
<i>Lassell, M.V.</i> ...	Hickman, V. T. ...	F. J. Durrant ...	No. A.	Lamport & Holt ...	W.T. Reg. 30.5.26 to 19.6.26 ...	23.6.26.
<i>Leicestershire</i> ...	English, G. L. ...	J. Cullen, W. A. Kent, D. Y. Sharrock, J. Logan.	M.L.	Bibby ...	Form 911 17.10.25 to 7.11.25 ...	9.11.25.
<i>Leighton, M.V.</i> ...	Lindesay J. M. ...	H. A. Bolding ...	No. A.	Lamport & Holt ...	Met. Log. 20.2.26 to 9.3.26 ...	29.3.26.
<i>Leitrim</i> ...	Robertson, A. ...	H. G. Letts ...	" A.	" ...	Met. Log. 9.4.26 to 19.6.26 ...	1.7.26.
<i>Loch Katrine</i> ...	Shillito, B. ...	K. Whitaker ...	" M.	R.M.S.P. Co. ...	Form 911 2.3.26 to 3.4.26 ...	19.4.26.
<i>London Commerce</i> ...	Young, H. J., D.S.C.	H. P. Longland ...	" A.	Furness Withy ...	" 14.3.26 to 22.4.26 ...	31.5.26.
<i>London Importer</i> ...	Williamson, J. M. ...	J. S. Williams, A. B. Gloyne	M.L.	" ...	" 9.3.26 to 30.5.26 ...	7.6.26.
<i>Loriga, M.V.</i> ...	Barkley, E. ...	W. N. Anders ...	No. A.	Pacific S.N. Co. ...	" 13.3.26 to 16.4.26 ...	22.4.26.
<i>Losada, M.V.</i> ...	Meldrum, G. W. ...	E. Baxter ...	" M.	" ...	Met. Log. 8.2.26 to 26.4.26 ...	28.5.26.
					Form 911 22.5.25 to 6.8.25 ...	25.8.25.
					" 23.11.25 to 15.2.26 ...	18.2.26.
<i>Macedonia</i> ...	Potter, H. W., R.D., Commr., R.N.R.	E. R. Bodley ...	" M.	P. & O. ...	" 1.5.26 to 22.5.26 ...	31.5.26.
<i>Macharda</i> ...	Richardson, T. ...	D. M. Fulton ...	" M.	Brocklebank ...	" 3.6.26 to 18.6.26 ...	12.7.26.
<i>Mahana</i> ...	Kershaw, W. A. R.	F. M. Smith, J. C. K. Rogers	M.L.	Shaw, Savill & Albion	" 13.1.26 to 20.2.26 ...	1.3.26.
<i>Maharaja</i> ...	Elliott, G. F. ...	T. E. Turner ...	No. M.	Asiatic S.N. Co. ...	" 18.4.26 to 25.5.26 ...	14.6.26.
<i>Mahia</i> ...	Williams, G. ...	R. Naef ...	No.	Shaw, Savill & Albion	" ...	"
<i>Mathar</i> ...	Rowe, J. P. ...	C. Shaw, H. T. Scoins, G. Henshaw.	M.L.	Brocklebank ...	Met. Log. 20.3.26 to 23.6.26 ...	15.7.26.
<i>Maimyo</i> ...	Scurr, T. W. ...	H. M. Drummond ...	No. A.	Burns Philp ...	Form 911 25.4.26 to 4.6.26 ...	6.7.26.
<i>Maitava</i> ...	Brown, T. M. ...	" ...	M.L.	White Star ...	" ...	"
58 <i>Majestic</i> ...	Metcalfe, G. R. ...	W. Pearson, J. Paine, A. Young, W. T. Fitzgerald.	W.T.	" ...	W.T. Reg. 17.6.26 to 30.6.26 ...	2.7.26.
<i>Makambo</i> ...	Brown, T. M. ...	A. Blair, F. C. Vogelmann, T. R. Lang.	M.L.	Burns Philp ...	Met. Log. 8.8.25 to 19.2.26 ...	7.4.26.
<i>Makura</i> ...	McLean, J. ...	O. C. Bray, J. M. Hood, A. Foster.	"	Canadian-Australasian	" 11.3.25 to 19.2.26 ...	4.5.26.
<i>Malakuta</i> ...	Adamson, F. L. ...	J. H. Round ...	No. M.	Brocklebank ...	Form 911 28.2.26 to 12.4.26 ...	26.4.26.
<i>Malancha</i> ...	Whitham, F. ...	E. A. Randall ...	" M.	" ...	" 30.3.26 to 13.4.26 ...	3.5.26.
<i>Malda</i> ...	Gray, T. N. ...	J. McLean Brown ...	" M.	British India ...	" 24.5.26 to 28.6.26 ...	3.7.26.
<i>Mamari</i> ...	Falconer, H. ...	" ...	No.	Shaw, Savill & Albion	" ...	"
<i>Manchester Brigade</i> ...	Stott, C. H. ...	E. Hale ...	" A.	Manchester Liners ...	Form 911 3.6.26 to 1.7.26 ...	6.7.26.
<i>Manchester Corporation</i> ...	Everest, J. E. ...	W. L. Lavers ...	" A.	" ...	" 5.6.26 to 18.6.26 ...	24.6.26.
<i>Manchester Hero</i> ...	Riley, J. E. ...	" ...	M.L.	" ...	" ...	"
<i>Manchester Merchant</i> ...	Struss, F. D. ...	E. W. Jeffries ...	No. A.	" ...	Form 911 2.5.26 to 16.6.26 ...	22.6.26.
<i>Manchester Shipper</i> ...	Dormer, A. E. ...	" ...	M.L.	" ...	Met. Log. 19.9.25 to 8.5.26 ...	31.5.26.
<i>Manipur</i> ...	Cochran, G. N. ...	R. Penston ...	No. M.	Brocklebank ...	Form 911 2.3.26 to 16.5.26 ...	17.6.26.
<i>Mantua</i> ...	Randell, G. G. ...	J. Paice ...	" M.	P. & O. ...	" 5.5.26 to 19.5.26 ...	14.6.26.
<i>Manzanar</i> ...	Maxwell Brown, W. E.	G. S. Gracie ...	" M.	Elders & Fyffes ...	" 10.11.25 to 25.11.25 ...	4.1.26.
<i>Marburn</i> ...	Stewart, A. ...	R. H. W. Jackson ...	" M.	Canadian Pacific ...	" 24.4.26 to 17.5.26 ...	20.5.26.
<i>Marella</i> ...	Mortimer S. ...	J. A. Street ...	M.L.	Burns Philp ...	Met. Log. 2.4.25 to 25.8.25 ...	1.12.25.
<i>Marengo</i> ...	Collins, T. ...	F. Eglin, J. E. Stott, J. Donovan, B. Bryon, J. Ford	"	Elberman Wilson ...	" 19.9.25 to 8.3.26 ...	16.3.26.
<i>Margha</i> ...	Brown, A. M. ...	J. Strachan, P. Wright, J. Ball.	"	British India ...	" 21.2.26 to 2.5.26 ...	4.6.26.
	Milne, R. A., R.D., Commr. R.N.R.					
<i>Matakana</i> ...	Thurston, H. P. ...	A. Chrystal ...	M.L.	Shaw, Savill & Albion	" 26.7.25 to 3.1.26 ...	8.1.26.
<i>Mataran</i> ...	Hutchison, W. ...	K. L. Thompson ...	No. A.	Burns Philp & Co. ...	Form 911 12.3.26 to 28.5.26 ...	12.7.26.
<i>Matheran</i> ...	Williams, J. D. ...	R. E. Gartside, S. W. Barker, H. B. Kelly.	M.L.	Brocklebank ...	Met. Log. 14.11.25 to 27.3.26 ...	23.6.26.
<i>Mathura</i> ...	Bacon, A. E. ...	H. H. Armstrong ...	No. M.	" ...	Form 911 1.2.26 to 3.3.26 ...	8.3.26.
<i>Matiana</i> ...	Langlands, D. H. ...	G. Earl ...	" M.	British India ...	" 29.4.26 to 27.5.26 ...	31.5.26.
<i>Maunganui</i> ...	Davey, A. H. ...	T. A. MacPherson ...	" M.	Union S.S. Co. of N.Z.	" 22.5.26 to 31.5.26 ...	12.7.26.
32 <i>Mauretania</i> ...	Rostron, Sir A. H., K.B.E., R.D., Capt. R.N.R.	E. R. Taylor, A. Mackellar, L. L. Harper.	W.T.	Cunard ...	W.T. Reg. 20.6.26 to 5.7.26 ...	8.7.26.
<i>Media</i> ...	Mallett, R. ...	S. C. Cramb ...	No. A.	T. & J. Brocklebank ...	Form 911 2.5.26 to 28.6.26 ...	7.7.26.
56 <i>Megantic</i> ...	Trant, E. L., Commr. R.N.R.	F. A. Billiald, J. Clarke, N. E. Banks.	W.T.	White Star ...	W.T. Reg. 6.6.26 to 26.6.26 ...	28.6.26.
22 <i>Melita</i> ...	Notley, A. H. ...	J. Shearer, H. Lewis ...	"	Canadian Pacific ...	Form 911 3.6.26 to 23.6.26 ...	2.7.26.
<i>Memnon</i> ...	Evans, D. L. ...	L. S. Evans ...	No. A.	A. Holt ...	" 30.11.25 to 17.12.25 ...	21.12.25.
<i>Menominee</i> ...	Pollard, W. F., D.S.O., R.D., Capt. R.N.R.	R. Day ...	" A.	Atlantic Transport ...	" 16.11.25 to 3.3.26 ...	13.3.26.
					" 15.10.25 to 21.11.25 ...	25.11.25.
<i>Mercian</i> ...	Gardner, J. ...	R. Hughes ...	" A.	Leyland ...	" 12.9.25 to 20.9.25 ...	23.9.25.
21 <i>Metagama</i> ...	Freer, A., Commr. R.N.R.	R. Walker, A. Mansey ...	W.T.	Canadian Pacific ...	W.T. Reg. 6.6.26 to 25.6.26 ...	28.6.26.
<i>Miami</i> ...	Makepeace, S. ...	A. F. Woodhouse, J. W. Kendall.	No. A.	Elders & Fyffes ...	Form 911 20.10.25 to 21.11.25 ...	24.11.25.
<i>Minderoo</i> ...	Richardson, E. ...	B. J. Bennie, W. J. McPhedran, J. H. Oxtan.	M.L.	West Australia Nav. Co.	Met. Log. 10.11.25 to 1.5.26 ...	6.7.26.
<i>Minna</i> ...	Mackenzie, G. G. ...	J. H. Hennessey ...	No. A.	Scottish Fishery Board	Form 911 2.6.26 to 21.6.26 ...	3.7.26.
23 <i>Minnedosa</i> ...	Griffiths, J. N. ...	L. Hammersley, F. W. Roberts, W. F. MacGowan.	W.T.	Canadian Pacific ...	W.T. Reg. 23.5.26 to 9.6.26 ...	11.6.26.
<i>Minnetonka</i> ...	Gates, T. F., C.B.E.	H. E. McCartney ...	No. M.	Atlantic Transport ...	" 21.6.26 to 10.7.26 ...	13.7.26.
<i>Minnewaska</i> ...	Claret, F. H., C.B.E., Commr., R.N.R.	J. W. Grier ...	" M.	" ...	" 6.6.26 to 26.6.26 ...	3.7.26.
<i>Mirror, C.S.</i> ...	Gibson, L. ...	A. G. Watts ...	" M.	Eastern Tel. Co. ...	" 5.5.26 to 17.5.26 ...	22.6.26.
<i>Moldavia</i> ...	Burleigh, C. W., D.S.O., R.D., Capt. R.N.R.	G. E. Owen ...	" M.	P. & O. ...	" 7.4.26 to 23.5.26 ...	10.6.26.
<i>Mongolian Prince</i> ...	Durrant, G. D. ...	M. Gibson ...	" A.	Prince ...	" 13.9.25 to 15.10.25 ...	26.10.25.
<i>Monkbarns, Ship</i> ...	Davies, W. ...	R. Baise ...	" A.	J. Stewart & Co. ...	" 23.10.25 to 16.11.25 ...	29.12.25.
24 <i>Montcalm</i> ...	Hamilton, G. ...	H. McFadyen ...	W.T.	Canadian Pacific ...	" 19.6.26 to 9.7.26 ...	12.7.26.
25 <i>Montclare</i> ...	Webster, G. S., R.D., Lt.-Commr., R.N.R.	R. Fegan, H. S. Knight, A. Harrison.	"	" ...	" 30.5.26 to 18.6.26 ...	22.6.26.
<i>Montferland</i> ...	Van Noppen, C. D.	W. Slooten ...	No. M.	Holland Lloyd ...	Form 911 30.5.26 to 18.6.26 ...	22.6.26.
27 <i>Montmairn</i> ...	Turnbull, J., C.B.E., R.D., Capt. R.N.R.	F. E. Williams, T. H. Carter, T. Jones.	W.T.	Canadian Pacific ...	" 1.4.26 to 26.6.26 ...	3.7.26.
<i>Montoro</i> ...	Donaldson, A. ...	K. Morris ...	No. A.	Burns, Philp & Co. ...	Form 911 2.9.25 to 19.10.25 ...	14.12.25.
26 <i>Montrose</i> ...	Landy, E. ...	A. Watt, R. Woods, J. Patrick.	W.T.	Canadian Pacific ...	W.T. Reg. 21.3.26 to 4.6.26 ...	17.6.26.



Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 16.7.26.	Date Received.
20 Montroyal ...	Sibbons, H. ...	J. H. Tudor, W. P. Hains ...	W.T.	Canadian Pacific	W.T. Reg. 5.6.26 to 24.6.26 ...	28.6.26.
Moresby ...	Edgell, J. A., O.B.E., Capt. R.N.	C. F. Mills ...	M.L.	His Majesty's Australian Ship.	Form 911 9.5.26 to 28.5.26 ...	2.7.26.
Morvada ...	Mills, T. L., O.B.E., R.D., Commr., R.N.R.	A. J. Norris ...	No. M.	British India	Met. Log. 5.6.26 to 25.6.26 ...	29.6.26.
Mulbera ...	Steadman W. R. ...	F. Broomhead ...	No. M.	"	Form 911 4.7.25 to 13.12.25	10.2.26.
Nagara ...	Buret, T. J. C. ...	F. A. C. Thacker ...	No. M.	R.M.S.P. Co.	Form 911 14.3.26 to 4.6.26	8.6.26.
Nagoya ...	Davis, H. C. ...	P. Haworth ...	" M.	P. & O.	" 22.5.26 to 6.7.26 ...	8.7.26.
Nardana ...	Moth, F. L. ...	S. C. T. Smith ...	" M.	British India	" 16.1.26 to 19.3.26 ...	26.3.26.
Nellore... ..	Hignett, A. H., R.D., Lt. Commr. R.N.R.	S. H. Baldwin ...	" M.	P. & O.	" 23.1.26 to 14.2.26 ...	8.3.26.
Nestor ...	Owen, R. D., O.B.E.	D. Rees, F. J. Silva, D. W. Stroud.	M.L.	A. Holt	" 15.9.25 to 25.10.25...	31.10.25.
Newby Hall ...	Edge T. P. ...	R. H. Stewart, G. E. M. Jenkins, R. M. Redhead, D. F. Galloway.	M.L.	Ellerman	" 20.3.26 to 12.6.26 ...	14.7.26.
Niagara ...	Showman, A. C. ...	J. Dawson, A. P. Cousin, D. McKenzie, T. Haulton.	"	Canadian-Australian...	Met. Log. 24.1.26 to 30.5.26 ...	4.6.26.
Ningchow ...	Wilson, C. A. ...	G. H. Oldridge ...	No. A.	A. Holt	Met. Log. 18.12.25 to 15.5.26...	10.6.26.
Norna ...	Wright, J. ...	T. Mather ...	" A.	Scottish Fishery Board	" 14.1.26 to 28.5.26 ...	23.6.26.
Norseman, C.S. ...	Barter, H. O., R.N., Commr., R.N.R.	E. Pearce ...	No. M.	Western Tel. Co.	Form 911 17.3.26 to 2.4.26 ...	31.5.26.
Northwestern Miller	Nuttall, E. L. ...	"	No.	Furness Withy	" 1.6.26 to 20.6.26 ...	28.6.26.
Nubian ...	Watmough, T. M. ...	H. R. Gaskill ...	No. A.	Leyland	" 6.5.26 to 16.6.26 ...	13.7.26.
Oaklands Grange... ..	Routledge, R. ...	E. J. Longheed ...	No. A.	Houlder Bros.	Form 911 23.12.25 to 24.1.26	28.1.26.
42 Ohio ...	Parker, W. H., C.B.E., R.D., Capt. R.N.R.	D. R. Miller, H. Baylis, E. A. E. Littlewood.	W.T.	R.M.S.P. Co.	Form 911 15.4.26 to 15.5.26 ...	25.5.26.
57 Olympic ...	Marshall, W., C.B., D.S.O., R.D., Capt., R.N.R.	H. J. C. Day, A. Fisher, J. Law.	W.T.	White Star ...	W.T. Reg. 30.5.26 to 19.6.26 ...	25.6.26.
Orama... ..	Staunton, H. G., C.B.E., R.D., Commr. R.N.R.	T. L. Shurrock, T. Fox Russell, C. K. Blake.	M.L.	Orient	Form 911 28.5.26 to 21.6.26 ...	25.6.26.
Oranian ...	Hoskins, W. ...	R. H. Theaker ...	No. A.	Leyland	Form 911 10.6.26 to 24.6.26 ...	28.6.26.
Orari ...	Robinson, F. W. ...	F. Longheed, C. Wilkinson, W. Tarr.	M.L.	New Zealand S.S. Co.	Met. Log. 7.3.26 to 8.6.26 ...	21.6.26.
40 Orbita ...	Warner, G. E., R.D., Capt. R.N.R.	C. V. Fletcher, H. H. Treweeks.	W.T.	R.M.S.P. Co.	Form 911 16.8.25 to 3.9.25 ...	17.9.25.
Orcoma ...	Dominy, R. H., C.B.E., Commr. R.N.R.	R. Griffiths, W. Billington ...	M.L.	Pacific S.N. Co.	Met. Log. 15.9.25 to 9.6.26 ...	17.6.26.
41 Orduna ...	Smith, W. E., D.S.O., R.D., Capt. R.N.R.	H. G. Whittle, S. Robbins, R. W. Sumpton, J. E. P. Matthews.	W.T.	R.M.S.P. Co.	W.T. Reg. 10.6.26 to 11.7.26 ...	14.7.26.
Orestes ...	Hanney, T. W. ...	T. Berry ...	No. A.	A. Holt	Met. Log. 18.2.26 to 4.5.26 ...	14.5.26.
Oriana... ..	Ross, J. ...	W. Pearce, R. D. Eckford, T. H. McGill.	M.L.	Pacific S.N. Co.	W.T. Reg. 13.6.26 to 4.7.26 ...	8.7.26.
Orita ...	Splatt, W. A. ...	T. R. Scott, D. W. Hutchinson, R. W. Hanson, G. R. Bubb.	"	"	Form 911 12.6.26 to 5.7.26 ...	8.7.26.
Ormonde ...	Knowles, C. H., D.S.O., Commr., R.N.	A. M. Hughes ...	"	His Majesty's Ship	Met. Log. 10.2.26 to 24.4.26 ...	3.5.26.
Ormonde ...	Shelford, W. S., Lt.-Commr., R.N.R.	B. Winsor, H. Petit Dan, J. F. Thompson.	"	Orient	" 17.2.26 to 29.5.26 ...	9.6.26.
Ormuz ...	O'Sullivan, F. R. ...	F. J. L. Butler, W. Wickham, — Addison.	"	"	" 4.9.25 to 4.12.25 ...	22.12.25.
Oronsay ...	Owens, A. L., R.D., Lt. Commr., R.N.R.	— Hatch, — Rice, W. Elliot	"	"	" 7.2.26 to 11.5.26 ...	17.5.26.
Oroya ...	Pearce, A. ...	G. Lewis ...	No. M.	Pacific S.N. Co.	" 21.3.26 to 25.6.26 ...	30.6.26.
Orsova ...	Matheson, C. G., D.S.O., R.D., Capt. R.N.R.	G. E. Martin, A. J. Croft Cohen, H. Petit Dann.	M.L.	Orient	" 21.2.26 to 25.5.26 ...	31.5.26.
Orvieto... ..	James, L. V., D.S.C.	L. E. Fordham, J. Goldsworthy, A. Hawker, A. H. Dyer.	M.L.	"	Form 911 27.4.26 to 5.7.26 ...	12.7.26.
Osterley ...	Sarson, M. J. ...	H. Tanner, N. A. Winfield, S. Burnnand.	No.	"	Met. Log. 26.7.25 to 12.1.26 ...	20.1.26.
Otira ...	Elford H. E. ...	E. J. Riccard ...	No. M.	Shaw, Savill & Albion	" 24.8.25 to 17.3.26 ...	23.3.26.
Otranto ...	Sinner, G. L., R.D., Commr., R.N.R.	R. H. Rogerson ...	" M.	Orient	" 24.1.26 to 27.4.26 ...	20.5.26.
Ovid ...	Groom, A. C. B. ...	"	" A.	Shakespear Shipping Co.	Form 911 19.3.26 to 7.4.26 ...	7.5.26.
Oxfordshire ...	Crumplin, W. E. ...	"	" A.	Bibby Bros.	" 29.1.26 to 10.4.26 ...	15.4.26.
Pacific Shipper, M.V. Pakeha ...	Newman, G. W. A.	G. Davis ...	" A.	Furness Withy	" 10.5.26 to 19.5.26 ...	26.5.26.
Parsora ...	W. P. Clifton Mogg	E. T. Baker, A. Black, A. Lockhart	M.L.	Shaw, Savill & Albion	" 25.3.26 to 23.4.26 ...	4.5.26.
Paris ...	Evans, J. O. ...	N. Turner ...	No. A.	Hain S.S. Co.	Met. Log. 26.9.25 to 28.2.26 ...	8.3.26.
Patia ...	Cook, C. L. ...	Mr. Biles... ..	C.C.	Southern Rly.	Form 911 28.3.26 to 8.5.26 ...	7.7.26.
Patrician ...	Bostock, R. J. ...	W. McIlwaine ...	No. A.	Elders & Fyffes	Telegraphic Report. 14.4.26	14.4.26.
Patrol C.S. ...	Pugh, —	H. F. P. Albrecht ...	No. M.	Harrison	Form 911 4.7.25 to 8.8.25 ...	12.8.25.
Persic ...	Bulman, J. B. ...	R. Conway ...	No. A.	White Star	Met. Log. 8.7.25 to 3.2.26 ...	1.4.26.
Peshawar ...	Hester, C. W., R.D., Commr., R.N.R.	D. G. Baillie, J. K. Crone, R. D. Whyte-Mackay.	M.L.	P. & O.	Form 911 27.9.25 to 4.11.25 ...	17.3.26.
Pharos ...	Ewing, T. N. ...	A. McLachlan ...	No. A.	Northern Lighthouse Board.	Met. Log. 16.1.26 to 2.7.26 ...	9.7.26.
Philadelphun ...	Baker, J. A. ...	W. T. Godwin ...	" A.	Leyland	Form 911 29.6.25 to 14.8.25 ...	18.8.25.
Polycarp ...	Evans, T. G. ...	C. W. Smethurst ...	" A.	Booth	" 9.10.25 to 1.11.25 ...	16.11.25.
Port Adelaide ...	Hayter, S. W. ...	R. W. Linklater, G. Lovegrove, J. L. Porter.	M.L.	Commonwealth & Dominion.	" 21.4.26 to 7.5.26 ...	17.5.26.
Port Albany ...	Robinson, C. A. ...	E. A. Leavett, A. G. Newbury, W. Eastoe, N. A. Crowe.	"	"	Met. Log. 6.2.26 to 11.6.26 ...	21.6.26.

## LIST OF VOLUNTARY OBSERVING SHIPS

vii

Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 16.7.26.	Date Received.
<i>Port Auckland</i> ...	Durham, R. S. ...	R. B. Stannard ...	No. A.	Commonwealth & Dominion.	Form 911 25.11.25 to 5.1.26 ...	20.1.26.
" <i>Bowen</i> ...	Gilling, W. ...	W. R. Johnston ...	" A.	" " "	" 7.4.26 to 11.5.26 ...	6.7.26.
" <i>Caroline</i> ...	Renaut, F. A. ...	H. H. Smith, E. Fenton, C. Chamberlin, A. T. C. Cooper.	" M.L.	" " "	Met. Log. 3.10.25 to 11.4.26 ...	19.4.26.
" <i>Darwin</i> ...	Sawbridge, I. R. ...	E. T. N. Lawrey, G. F. Pannett.	No. A.	" " "	Form 911 23.4.26 to 6.6.26 ...	24.6.26.
" <i>Denison</i> ...	Ferris, J. ...	W. H. Sadler, J. C. Goddard	" M.	" " "	" 15.6.25 to 14.8.25 ...	21.9.25.
" <i>Dunedin</i> ...	Lea, W. H. ...	E. G. Jones ...	" M.L.	" " "	" 7.1.26 to 1.5.26 ...	19.5.26.
" <i>Hacking</i> ...	Hoad, A. C. ...	C. Newton ...	"	" " "	" 1.2.26 to 10.7.26 ...	12.7.26.
" <i>Hobart</i> ...	Craven, R. ...	G. Langford ...	"	" " "	" 6.3.26 to 25.6.26 ...	8.7.26.
" <i>Hunter</i> ...	Cottell, S. C. ...	A. Cooper, C. F. Post, J. T. Weldie.	"	" " "	Met. Log. 30.10.25 to 2.4.26 ...	14.4.26.
" <i>Kembla</i> ...	Van den Bergh, C. ...	W. A. C. Sadler ...	No. A.	" " "	" 17.10.25 to 1.4.26 ...	7.4.26.
" <i>Melbourne</i> ...	Kearney, F. J. ...	D. G. H. Bradley, J. A. Fairbairn, A. G. Starkey.	" M.L.	" " "	Met. Log. 17.10.25 to 1.4.26 ...	7.4.26.
" <i>Napier</i> ...	Jones, C. N. ...	M. E. Craven, A. R. Martin...	No. A.	" " "	Form 911 15.4.26 to 17.5.26 ...	25.6.26.
" <i>Nicholson</i> ...	Jack, J. ...	H. C. Jeffery, W. G. Jones, N. M. Muzzill, S. Hearn.	" M.L.	" " "	" 4.4.26 to 22.6.26 ...	11.6.26.
" <i>Pirie</i> ...	Higgs, W. G. ...	G. L. H. Dean, K. D. Morgan, H. G. Boys Smith.	"	" " "	Met. Log. 26.8.25 to 27.2.26 ...	2.3.26.
" <i>Sydney</i> ...	Lea, W. H. ...	W. Howe, W. Renouf, W. J. Watson.	"	" " "	" 8.5.26 to 8.6.26 ...	11.6.26.
" <i>Victor</i> ...	Swan, L. H. ...	R. J. Whitley ...	"	" " "	" 6.9.25 to 2.6.26 ...	7.6.26.
" <i>Wellington</i> ...	Farmer, F. ...	B. Christensen ...	No.	" " "	" 12.3.26 to 9.4.26 ...	17.5.26.
<i>President Jackson</i> ...	Griffith, J. ...	C. H. Moen ...	No. A.	Pacific Mail S.S. Co. ...	Form 911 4.4.26 to 22.6.26 ...	22.4.26.
<i>President Jefferson</i> ...	Nichols, F. R. ...	A. M. Quinlan ...	No.	Admiral Oriental Line	" 24.3.26 to 14.5.26 ...	3.7.26.
<i>President Wilson</i> ...	Nelson, H. ...	R. J. Whitley ...	No. M.	Dollar ...	" 15.4.26 to 4.5.26 ...	29.6.26.
<i>Protea</i> , H.M.S.A.S. ...	Woodhouse, A. F. B., Lt.-Commr., R.N.	J. L. Millar ...	"	South African Naval Service.	" 25.3.26 to 20.6.26 ...	22.6.26.
<i>Pyrrhus</i> ...	Elford, W. J. ...	"	" A.	A. Holt ...	"	
<i>Ranpura</i> ...	King, A. M., D.S.C.	R. H. Hand ...	No. M.	P. & O. ...	" 20.3.26 to 13.5.26 ...	18.5.26.
<i>Regina</i> ...	Smith, R. G. ...	G. W. Couch, R. H. Shaw, C. Cochrane.	" M.L.	White Star-Dominion	W.T. Reg. 5.4.26 to 20.4.26 ...	22.4.26.
<i>Reindeer</i> ...	Langdon, C. ...	"	C.C.	G.W. Railway	Form 911 5.4.26 to 20.4.26 ...	26.4.26.
<i>Remuera</i> ...	Cameron ...	P. McCullum ...	No.	New Zealand S.S. Co.	Telegraphic Report 15.5.26 ...	15.5.26.
<i>Rhodesian Transport</i> ...	Fowler, W. H. ...	W. Heritage ...	No. A.	Houlder Bros.	Form 911 14.11.25 to 12.3.26 ...	18.3.26.
<i>Rimutaka</i> ...	Hemming, F. A. ...	F. Bishop ...	" M.L.	New Zealand S.S. Co.	Met. Log. 31.5.25 to 29.3.26 ...	1.4.26.
<i>Risaldar</i> ...	Park, G. ...	A. J. Cavallo, H. Hardwick, C. M. Knight.	"	Asiatic S.N. Co. ...	" 11.10.25 to 9.4.26 ...	11.5.26.
<i>Romney</i> ...	Syms, G. ...	H. Trodden ...	No. A.	Lamport & Holt	Form 911 9.10.25 to 21.10.25 ...	30.11.25.
<i>Rotorua</i> ...	Hunter, J. B. ...	D. F. Clegg, E. Lawrence, R. H. Cockerill.	" M.L.	N.Z.S. Co. ...	Met. Log. 13.2.26 to 29.5.26 ...	8.6.26.
<i>Royal Fusilier</i> ...	Dawson, J. ...	J. Fraser ...	No. A.	London & Edinburgh S.S. Co.	Form 911 9.6.26 to 17.6.26 ...	22.6.26.
<i>Royal Transport</i> ...	Dove, J. ...	R. Martin ...	" A.	Houlder Bros. ...	" 17.11.25 to 17.12.25	21.12.25.
<i>Ruapehu</i> ...	McKellar, A. W., R.D., Capt., R.N.R.	- Lettington, J. D. Tooms, A. J. Webb, R. Russel.	" M.L.	New Zealand S.S. Co.	Met. Log. 20.11.25 to 22.3.26 ...	27.3.26.
<i>St. Albans</i> ...	Smith, G. L. ...	J.W. Kavanagh, J. F. Heddlie, H. J. Jeans, W. McIntyre.	"	Eastern and Australian	" 5.8.25 to 2.12.25 ...	24.3.26.
<i>St. Helier</i> ...	Mulhall, W. ...	C. Bell ...	C.C.	G.W. Railway	Telegraphic Report 14.7.26 ...	14.7.26.
<i>St. Julien</i> ...	Langdon, C. H. ...	C. Joy ...	"	"	" 15.7.26 ...	15.7.26.
<i>St. Patrick</i> ...	Bearpark, E. W. ...	J. Hill ...	No. A.	Rankin Gilmour	Form 911 15.1.26 to 1.2.26 ...	15.2.26.
<i>Salaga</i> ...	Sola, P., D.S.O.	G. E. Dutton ...	" A.	Elder Dempster	" 12.1.26 to 9.2.26 ...	15.2.26.
<i>Samaria</i> ...	McNeil, S. G. S. ...	H. L. Pryse ...	" A.	Cunard	" 29.5.26 to 21.6.26 ...	24.6.26.
<i>Samdoun Castle</i> ...	Jackson, C. R. ...	P. G. MacIver ...	" A.	Union Castle	" 16.12.25 to 23.2.26 ...	26.2.26.
<i>Saxoleine</i> ...	Rodgers, C. S. ...	B. Johnson ...	" A.	Hunting & Son	" 18.2.26 to 9.3.26 ...	29.3.26.
<i>Saxon</i> ...	Knight, A. ...	T. M. Lockwood ...	" A.	Union Castle	" 19.2.26 to 11.4.26 ...	18.4.26.
<i>Scindia</i> ...	Matthews, W. ...	R. S. Paton ...	" A.	Anchor	" 28.11.25 to 1.3.26 ...	8.3.26.
<i>Scotia</i> ...	Prichard, S.D. ...	O. W. L. Jones ...	" C.C.	L.M. & S. Rly.	Telegraphic Report 13.7.26 ...	13.7.26.
<i>Scottish Bard</i> ...	McDonnell S. ...	J. W. Lilley ...	No. A.	Tankers Ltd. ...	Form 911 31.1.26 to 15.2.26 ...	9.3.26.
<i>33 Seythia</i> ...	Prothero, W. ...	A. Nicholson, J. C. Munro, J. W. Caunce.	" W.T.	Cunard ...	W.T. Reg. 1.6.26 to 27.6.26 ...	1.7.26.
<i>Sheaf Lance</i> ...	Earl, C. ...	"	No.	W. A. Souter ...	Form 911 6.6.26 to 27.6.26 ...	29.6.26.
<i>Sheaf Mount</i> ...	Groves, C. V. ...	C. A. Goold ...	No. A.	"	"	
<i>Sheaf Spear</i> ...	Whitfield, G. A., O.B.E.	W. H. Grisewood, N. Thompson.	" M.L.	"	Form 911 26.3.26 to 28.5.26 ...	22.6.26.
<i>Socrates</i> ...	Taylor, F. C. ...	W. E. Jordan ...	No. A.	Lamport & Holt	Met. Log. 18.3.26 to 20.6.26 ...	26.6.26.
<i>Soekaboemi</i> ...	Z. W. Flach ...	C. van Reenen ...	" M.	Rotterdam Lloyd	Form 911 21.2.26 to 10.5.26 ...	28.5.26.
<i>Somerset</i> ...	Barnett, H. ...	J. J. Youngs ...	" M.	N.Z.S. Co. ...	" 19.12.26 to 28.3.26 ...	19.4.26.
<i>Somersetshire</i> ...	Leitch, R. C. ...	P. Hawkins, R. C. Leitch, H. G. Walton.	" M.L.	Bibby ...	" 15.12.25 to 21.1.26 ...	26.1.26.
<i>Somme</i> ...	Miles, F. R., Commr., R.N.R.	H. Chamberlain, A. P. Portsmouth.	No.	R.M.S.P. Co. ...	Met. Log. 14.12.25 to 18.3.26 ...	8.4.26.
<i>Spectator</i> ...	Harding, C. H. J. ...	D. Fraser, J. G. F. Betson ...	No. A.	Harrison ...	" 22.11.24 to 29.8.25 ...	10.2.26.
<i>Spero</i> ...	Norton, W. J. ...	T. E. Fea ...	" M.L.	Ellerman Wilson	Form 911 20.11.25 to 20.2.26 ...	26.2.26.
<i>Stockwell</i> ...	Thowless, E. ...	W. Gibson ...	No. A.	Brocklebank	Met. Log. 12.12.25 to 14.6.26 ...	1.7.26.
<i>Stuart Prince</i> ...	Kemp, E. J. ...	W. Venn ...	" A.	Prince ...	Form 911 2.5.26 to 17.5.26 ...	14.6.26.
<i>Suwa Maru</i> ...	Okuno, Y. ...	T. Nosaka ...	" A.	Nippon Yusen Kaisha	" 18.2.26 to 6.3.26 ...	26.4.26.
<i>Sylviafield</i> ...	Biddick, E. ...	"	No.	Hunting & Son	" 21.3.26 to 4.4.26 ...	5.5.26.
<i>Tainui</i> ...	Hartman, W. H. ...	P. S. Horwood ...	No. A.	Shaw, Savill & Albion	"	
<i>Tairoa</i> ...	Summers, W. G. ...	S. A. Bannister ...	" A.	"	Form 911 17.3.26 to 22.4.26 ...	26.4.26.
<i>Tahiti</i> ...	Aldwell, B. L. ...	W. Gould ...	" M.L.	Union S.S. Co. of N.Z.	" 30.3.26 to 12.5.26 ...	17.5.26.
<i>Taipung</i> ...	Hamilton, H. E. ...	"	"	Yull & Co. ...	" 25.2.26 to 16.4.26 ...	26.5.26.
<i>Taihybius</i> ...	Ireland, T. R. ...	P. Elder ...	No. A.	A. Holt	"	
<i>Tanda</i> ...	Pilcher, E. ...	R. Lloyd Harry, B. Dun, H. Jeans, F. Colvin.	" M.L.	E. & A. S.S. Co. ...	Form 911 19.9.25 to 26.10.25 ...	2.11.25.
<i>Tambora</i> ...	Huisman, N. ...	H. Van Manen ...	No. M.	Rotterdam Lloyd	Met. Log. 3.3.26 to 30.5.26 ...	10.7.26.
<i>Tetresias</i> ...	Dodds, R. ...	W. H. Newby ...	No. A.	A. Holt & Co. ...	Form 911 15.2.26 to 31.3.26 ...	15.4.26.
<i>Tekoa</i> ...	Barnett, H. ...	"	No. M.	New Zealand S.S. Co.	" 13.12.25 to 14.1.26 ...	28.1.26.
					" 17.3.26 to 8.4.26 ...	13.5.26.



Name of Vessel.	Captain.	Observing Officers.	Official Meteorological Equipment.	Line.	Last Log, Register, or Report Contributed. Received up to 16.7.26.	Date Received.
<i>Telamon</i> ...	Duggan, C. ...	G. Bevan ...	No. A.	A. Holt ...	Form 911 20.4.26 to 21.6.26 ...	3.7.26.
<i>Teucer</i> ...	Hodgson, R. N. ...	A. Lightbody ...	" A.	" ...	" 27.5.26 to 13.6.26 ...	25.6.26.
<i>Themistocles</i> ...	Jernyn, W. M. ...	R. J. Buckland ...	" M.	Aberdeen ...	" 18.4.26 to 7.5.26 ...	14.6.26.
<i>Theseus</i> ...	Jones, E. ...	W. A. Fyffe ...	" A.	A. Holt ...	" 20.3.26 to 30.3.26 ...	8.4.26.
<i>Titan</i> ...	Wilkinson, T. G. ...	S. C. Tinnmouth, J. Morris, N. L. Thompson.	M.L.	" ...	Met. Log. 20.10.25 to 11.3.26...	18.3.26.
<i>Tongariro</i> ...	White Parsons, V.C.	G. B. H. Jones ...	No. M.	New Zealand S.S. Co.	Form 911 2.4.26 to 9.5.26 ...	25.5.26.
<i>Transylvania</i> ...	Bone, D. W. ...	A. Middleton ...	No. A.	Anchor ...	" 13.6.26 to 3.7.26 ...	8.7.26.
<i>Traveller</i> ...	Worthington, B. ...	" ...	No.	T. & J. Harrison ...	" ...	" ...
<i>Trematon</i> ...	Evans, B. ...	R. Gregory, J. Toms, J. Bell.	M.L.	Hain S.S. Co. ...	Met. Log. 2.9.25 to 8.2.26 ...	2.3.26.
<i>Turakina</i> ...	Hamilton, E. S. ...	A. N. Marshall, G. S. Shepherd	No. M.	New Zealand S.S. Co.	Form 911 9.2.26 to 4.5.26 ...	26.5.26.
<i>Tuscama</i> ...	Gemmell, W. J. ...	J. Hamilton ...	No. A.	Anchor ...	" 6.6.26 to 28.6.26 ...	6.7.26.
<i>Tyndareus</i> ...	Slater, H. N. ...	C. Broad, A. C. H. Jones, S. A. Beith.	M.L.	A. Holt ...	Met. Log. 16.7.25 to 16.12.25...	12.1.26.
<i>Ulimaroa</i> ...	Wylie, W. J. ...	J. Gilbertson ...	No. M.	Huddart Parker, Ltd.	" ...	" ...
<i>Ulysses</i> ...	McHutcheon, W. ...	H. A. Standfield ...	No. A.	A. Holt ...	Form 911 28.1.26 to 11.3.26 ...	16.3.26.
<i>Umvolosi</i> ...	Barnes, E. W. ...	R. I. B. Ryde ...	" A.	Bullard King ...	" 27.5.26 to 19.6.26 ...	13.7.26.
<i>Valacia</i> ...	Doyle, M. ...	N. Grayson ...	" M.	Cunard ...	" 8.1.26 to 19.5.26 ...	31.5.26.
<i>Vardulia</i> ...	Hughes, W. ...	A. Watts ...	" A.	" ...	" 3.11.25 to 14.11.25...	8.2.26.
<i>Vasconia</i> ...	Inch, F. ...	G. Watts ...	" A.	" ...	" 22.1.26 to 15.3.26 ...	26.3.26.
<i>Verbania</i> ...	Pooley, T. S. M. ...	W. Bradley ...	" A.	" ...	" 4.4.26 to 7.5.26 ...	11.5.26.
<i>Verentia</i> ...	Wray, C. M. ...	F. H. Wood ...	" A.	" ...	" 11.1.26 to 24.3.26 ...	6.4.26.
<i>Vigilant</i> ...	Simpson, E. S. S. ...	J. Hunter ...	" A.	Scottish Fishery Board	" 1.6.26 to 30.6.26 ...	6.7.26.
<i>Waimana</i> ...	Andrews, C. M. ...	" ...	" A.	Shaw, Savill & Albion	" 21.4.26 to 1.6.26 ...	8.6.26.
<i>Waioapu</i> ...	Norton, A. ...	W. Johnson ...	" A.	Canadian-Australasian	" 19.3.26 to 16.4.26 ...	17.5.26.
<i>Walmer Castle</i> ...	Chave, Sir B., K.B.E.	H. A. Deller ...	" A.	Union Castle ...	" 7.5.26 to 23.5.26 ...	7.6.26.
<i>Wangaratta</i> ...	Scutt, W. ...	T. W. Worthingham, G. R. Millard, K. M. Morrison, N. A. Pope.	M.L.	British India ...	Met. Log. 30.8.25 to 19.1.26 ...	26.1.26.
<i>Warfield</i> ...	Steel, R. ...	H. Coffey ...	No. A.	" ...	Form 911 16.6.26 to 2.7.26 ...	12.7.26.
<i>War Nizam</i> ...	Moncrieff ...	" ...	No.	British Tankers ...	" ...	" ...
<i>Welshman</i> ...	Rollerson, W. ...	W. A. Fletcher ...	No. M.	White Star-Dominion	" 29.4.26 to 25.5.26 ...	31.5.26.
<i>Westmoreland</i> ...	Upton, H. C. ...	R. G. Kers ...	M.L.	Federal ...	" 18.9.25 to 3.4.26 ...	3.5.26.
<i>White Heather, Ketch</i> ...	Glenister, S. L. ...	F. R. Smith ...	No.	S. L. Glenister ...	" ...	" ...
<i>William Scoresby, R.S.S.</i> ...	Mercer, G. M., D.S.C., Lt.-Commr., R.N.R.	" ...	M.L.	Falkland Islands Government.	" ...	" ...
<i>Windsor Castle</i> ...	Strong, H., R.D., Commr., R.N.R.	F. Wilbraham ...	M.L.	Union Castle ...	Form 911 26.3.26 to 16.5.26 ...	26.5.26.
<i>Winifredian</i> ...	Harrocks, W. ...	A. Crone ...	No. M.	Leyland ...	" 22.5.26 to 21.6.26 ...	29.6.26.
<i>Woodarra</i> ...	Reilly, J. V. ...	L. D. Graham, G. Hyland ...	M.L.	British India ...	Met. Log. 27.9.25 to 13.2.26 ...	22.2.26.
<i>Yorkshire</i> ...	Adamson, B. W. ...	L. C. Comber, J. Wallace.	"	" ...	" ...	" ...
<i>Zeeland</i> ...	Harvey, H. ...	E. E. Jones ...	M.L.	Bibby ...	Form 911 11.12.25 to 17.2.26...	19.2.26.
<i>Conway H.M.S.</i> ...	Broadbent, H. W., R.D. Capt., R.N.R.	The Senior Cadets...	Cadets' M.L.	" ...	" 20.6.26 to 12.7.26 ...	13.7.26.
<i>Pangbourne Nautical College.</i> ...	Tracy, A. F. G., Commr., R.N.	" ...	"	" ...	Cadets' Met. Log. 24.1.26 to 3.4.26	12.4.26.
<i>Worcester, H.M.S.</i> ...	Sayer, M. B., O.B.E., R.D., Capt., R.N.R.	" ...	"	" ...	Cadets' Met. Log. 18.1.26 to 26.3.26	1.4.26.
<i>Abaco</i> ...	" ...	" ...	"	" ...	Cadets' Met. Log. 22.1.26 to 14.4.26	16.4.26.
<i>Cay Lobos</i> ...	" ...	The Keepers ...	Lighthouse Register.	" ...	Lighthouse Register 20.7.25 to 31.12.25	9.3.26.
<i>Double Headed Shot</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.7.25 to 31.12.25	8.3.26.
<i>Inagua</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.7.25 to 31.12.25	21.4.26.
<i>Sombrero</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.7.25 to 31.12.25	9.3.26.
<i>Walling Island</i> ...	" ...	" ...	"	" ...	Lighthouse Register 1.7.25 to 31.12.25	9.2.26.
<i>Cape Pembroke (Falkland Is.).</i> ...	" ...	" ...	"	" ...	Lighthouse Register 18.7.25 to 16.1.26	8.3.26.
					Lighthouse Register 1.7.25 to 31.12.25	24.2.26.

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

Name of Vessel.	Captain.	Observing Officer.	Line.	Last Case of Water Samples, Reports, etc., Received up to 30.6.26.	Date Received.
<i>Herschel</i> ...	Carey, J. J. ...	T. Lester Guy ...	Lampport & Holt	Water Samples ...	23.6.26.
<i>Hildebrand</i> ...	Maddrell, J. ...	A. Allan ...	Booth ...	" ...	17.5.26.
<i>Holbein</i> ...	Gough, W. A. ...	H. L. Rudd ...	Lampport & Holt	" ...	19.5.26.
<i>Manzanares</i> ...	Edwards, H. ...	A. F. Moss ...	Elders & Fyffes	" ...	12.3.26.
<i>Miami</i> ...	Makepeace, S. ...	H. E. Lees ...	"	" ...	14.6.26.

September M.O., 1926.