

(No. 158.)

“MAROA” (S.S.).

In the matter of an Inquiry before Commander WARREN FREDERICK CABORNE, C.B., R.N.R., Inspector for the Board of Trade, into the nature and causes of the accident alleged to have been sustained by the above-named vessel, which left Cardiff for Colombo on the 7th of February, 1912, was said to have been spoken 40 miles north-west of Cape Trafalgar on the 16th of February, 1912, and has not since been heard of.

Report.

SIR,

I HAVE the honour to inform you that, in virtue of my appointment from the Board of Trade, under Section 728 of the Merchant Shipping Act, 1894, dated the 17th day of August, 1912, I held an Inquiry into the above casualty at the Sheriff's Jury Court, St. George's Hall, in the City of Liverpool, on the 2nd and 3rd days of September, 1912.

Mr. Henry A. Thew (Messrs. Avison, Morton, and Paxton) represented the Solicitor to the Board of Trade (Sir Robert Ellis Cunliffe), and Mr. George M. Magee (Messrs. Hill, Dickinson, and Company) appeared on behalf of the owners of the vessel.

The “Maroa,” Official Number 102134, was a British single-screw steamship, built of steel at Sunderland, in 1894, by Messrs. William Doxford and Sons, Limited, and was registered at the port of Liverpool.

She had two masts, was rigged as a fore-and-aft schooner, and was of the following dimensions:—Length, from fore part of stem to the aft side of the head of the stern post, 445 feet; main breadth to outside of plank, 52.1 feet; depth in hold, from tonnage deck to ceiling at midships, 31.7 feet; and depth from top of deck at side amidships to bottom of keel, 34.93 feet. The round of beam was 1.05 feet. Her gross tonnage was 6,802.50 tons, and her registered tonnage, 4,451.30 tons.

She was classed \* 100 A1 at Lloyd's, was built to the “Spar Deck Rule,” was constructed on the cellular double-bottom principle, had two decks—the upper deck of iron and the main deck of steel, and a tier of lower beams—and was provided with six steel watertight bulkheads, carried to the upper deck.

No calculations for stability were made; but her co-efficient of fineness was .804, which would show her to have been a very full-built vessel.

She had a topgallant fore-castle, 53 feet long; a bridge, 94 feet long; and a poop, 34 feet long. The bulwarks, between the fore-castle and bridge and the bridge and poop, were 3 feet 9 inches high, and they were fitted with 10 wash-ports on either side, namely, five forward of and five abaft the bridge, their dimensions being 26 inches by 18 inches.

There was one hinged iron door on the forward bulk-head of the enclosed under-bridge space, and the after end of the bridge on both sides could be secured by means of boards.

The engine-room skylight, which was about 10 feet above the bridge deck and about 17 feet 9 inches above the upper or spar deck, was made of iron, with iron flaps fitted with bullseyes.

The fidley casing was 7 feet high, and had iron doors on either side. The gratings had an iron cover.

The master's and officers' accommodation was in a house on the fore part of the bridge deck, and in the space under the fore part of the bridge, the chart room and wheel house being above the house. The engineers occupied a house on the bridge deck on either side of the engine-room casing; the petty officers were berthed under the topgallant fore-castle; and the sailors' and firemen's quarters were under the poop deck.

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The “Maroa” was propelled by triple-expansion engines of 600 nominal horse-power and 2,800 indicated horse-power, designed to give her a speed of 10½ knots per hour, and was fitted with three steel boilers, having a working pressure of 160 lbs. to the square inch. She also had two donkey boilers, but neither of them were in use, as they were not in good condition.

She had a circulating (sea or bilge) pump, two bilge pumps, a ballast donkey pump of a capacity of about 250 tons per hour, and a general donkey pump, equal to about 200 tons per hour. The pumps had all necessary connections to ballast tanks and all compartments. The vessel was also provided with deck hand pumps. Sluices were fitted to some of the bulkheads.

The engines and boilers were manufactured by Messrs. William Doxford and Sons, Limited, at the same time that the vessel was built.

The ship had a full electric-light installation by Messrs. Clarke, Chapman, and Company, a condition being that it was in every respect to conform with the suggestions made by Lloyd's in their circular on installations on board ship.

She was furnished with Messrs. Fawcett, Preston, and Company's hydraulic steering gear, fitted aft under the poop, the steam pumps being in the engine room, and its movements being controlled from the bridge. Hand steering gear was also provided aft.

She had six cargo hatchways, measuring as follows:—

- No. 1—14 feet 7 inches by 18 feet.
- No. 2—33 feet 4 inches by 18 feet.
- No. 3—22 feet 11 inches by 18 feet.
- No. 4—20 feet 10 inches by 18 feet.
- No. 5—33 feet 4 inches by 18 feet.
- No. 6—20 feet 10 inches by 18 feet.

These hatchways, the coamings of which were 33 inches high, were provided with suitable webs, three fore and afters, 3-inch redwood hatches, hatch batten bars, and iron wedges for securing the tarpaulins, of which latter she had three sets when she last sailed.

There was a small hatchway under the topgallant fore-castle, leading to the fore peak; two coal shoots on the bridge, fitted with hinged iron covers; six coaling hatchways on the bridge, each measuring 4 feet by 3 feet; and a hatchway through the poop (4 feet by 3 feet 9 inches), leading to the after peak.

The following was the ventilation:—Fore peak, one 12-inch ventilator (coaming, 6½ inches) to between decks, with an 8-inch tube to the lower hold; No. 1 hold, two 24-inch ventilators (coamings, 2 feet) with 16-inch tubes, and half of two 30-inch ventilators (coamings, 2 feet 9 inches) with 22-inch tubes; No. 2 hold, half of two 30-inch ventilators (coamings, 2 feet 9 inches) with 22-inch tubes, and two 24-inch ventilators (coamings on bridge deck, 2 feet) with 16-inch tubes; No. 3 hold, two 24-inch ventilators (coamings on bridge deck, 2 feet) with 16-inch tubes, one 22-inch ventilator (coaming, 2 feet 6 inches) with a 10-inch tube, and half of two 30-inch ventilators (coamings, 2 feet 9 inches) with 22-inch tubes; No. 4 hold, half of two 30-inch ventilators (coamings, 2 feet 9 inches) with 22-inch tubes, and two 24-inch ventilators (coamings on the poop, 2 feet) with 16-inch and 10-inch tubes. There were also the usual ventilators to the engine room and stokehold, and various small cowl ventilators to cabins, storerooms, tunnel, &c. Canvas covers and wooden plugs were provided.

The six watertight bulkheads were as follows:—No. 1, the collision bulkhead; No. 2, between No. 1 and No. 2 holds; No. 3, separating No. 2 hold from the stokehold, having two watertight doors (each 27 inches by 18 inches), worked by a rod and screw from the upper platform of the stokehold; No. 4, the engine-room bulkhead, having a watertight door to the tunnel, worked by a rod and screw from the upper platform of the engine room; No. 5, separating Nos. 3 and 4 holds; and No. 6, the after-peak bulkhead. No. 2 and No. 5 bulkheads were run up in positions to divide the centre of No. 2 and No. 5 hatchways.

No shifting-boards were provided, but the hold stanchions were so arranged that such boards could be inserted, if required, at any time.

The following were the capacities of the ballast tanks:—

	Tons.
Fore-peak ... ..	105
No. 1 tank ... ..	270
" 2 " ... ..	327
" 3 " (port) ... ..	74½
" 4 " (starboard) ... ..	74½
" 5 " ... ..	99
" 6 " ... ..	387
Deep tank ... ..	180
After-peak ... ..	516
" 67	67
Total ... ..	2,100

The cubical capacities of the cargo spaces were as under:—

	Cubic Feet.
No. 1 between decks ... ..	27,883
" hold ... ..	89,452
No. 2 between decks ... ..	25,822
" hold ... ..	76,970
Reserve cross bunker, between decks	8,251
" hold ... ..	21,202
No. 3 between decks ... ..	28,100
" hold ... ..	82,045
No. 4 between decks ... ..	29,700
" hold ... ..	62,302
" deep tank ... ..	13,900
Bridge ... ..	17,890
Forecastle (open) ... ..	7,590
Fore-peak ... ..	7,410
After-peak ... ..	2,800
Total ... ..	501,317

The capacities of the bunkers were as follows:—

	Cubic Feet.	Tons.
Engine - room lower bunker (port) ... ..	3,718	88½
Engine - room lower bunker (starboard) ... ..	5,176	123½
Boiler - room lower between decks (port) ... ..	1,563	37½
Boiler - room lower between decks (starboard) ... ..	1,563	37½
Boiler-room pocket (port) ... ..	542	13
" (starboard) ... ..	542	13
Engine - room upper between decks (port) ... ..	1,972	47
Engine - room upper between decks (starboard) ... ..	3,206	76½
Boiler - room upper between decks (port) ... ..	3,679	87½
Boiler - room upper between decks (starboard) ... ..	3,679	87½
Bridge space (port) ... ..	9,411	224
" (starboard) ... ..	7,706	183½
" passage ... ..	773	18½
Coal shoot in way of engine casing ... ..	881	21
Coal shoot in way of boiler casing ... ..	937	22½
Reserve bunker, ceiling to main deck ... ..	21,202	504½
Reserve bunker, between decks	8,251	196½
" trunk hatch... ..	1,398	34
Total ... ..	76,199	1,815½

Note.—The bridge and reserve bunker spaces have also been included in the cargo spaces; and the tonnage for coal in the bunkers has been calculated by the builders at 42 cubic feet per ton.

The vessel was built to carry 9,560 tons of deadweight on a summer mean draught of 25 feet 11 inches, and with a freeboard of 9 feet 2 inches.

On the 14th of July, 1899, the Committee of Management of the British Corporation for the Survey and Registry of Shipping (in whose books the "Maroa" was entered) approved, on behalf of the Board of Trade, of the centre of the load-line disc being placed 8 feet 10 inches below the statutory deck line marked under the provisions of the Merchant Shipping Act, 1894, the maximum load line in winter being six inches below the centre of the disc; but on the 23rd of May, 1906, the freeboard was decreased by the same authority to 8 feet 7½ inches, the maxi-

mum load line in winter to remain six inches below the centre of the disc. This latter alteration would permit of approximately 120 tons more deadweight being carried; the total increase amounting to roughly about 300 tons since she was first launched, allowing 48 tons to the inch. The top of the statutory deck line was to be two inches above the iron deck at side.

The vessel carried four steel lifeboats, two of them each measuring 28 feet by 7 feet 9 inches by 3 feet 6 inches, and two of them each measuring 21 feet 6 inches by 6 feet 1½ inches by 2 feet 5½ inches. These boats, which were provided with their proper equipment, were suspended to patent davits on either side of the bridge deck. She also had two smaller wooden boats, suitably supplied with gear, respectively measuring 17 feet 4 inches by 5 feet 7 inches and 16 feet 4 inches by 5 feet 7 inches. These latter boats were under davits on either side of the poop.

For other life-saving appliances, she had six or eight lifebuoys and about one hundred lifejackets. The officers and engineers were each in possession of a lifejacket, and the remainder of them were kept under the poop, where the crew's quarters were.

She was supplied with three compasses, the standard being a "White-Thomson," and the other two spirit compasses. She also had Lord Kelvin's sounding apparatus, Walker's "Cherub" log, the necessary charts and sailing directions, and the requisite day and night signals.

Lastly, she was owned by the Cobridge Steamship Company, Limited, of 10, Rumford Place, Liverpool, Mr. Charles Alfred Adams, of the same address, being designated the person to whom the management of the vessel was entrusted by and on behalf of her owners, according to advice received on the 1st of February, 1905.

The "Maroa" was purchased by her owners in November, 1904, for the sum of £32,500, and the following is a list of the principal amounts expended upon her in the way of repairs during subsequent years:—

	£	s.	d.
March, 1905. Barry repairs ... ..	33	5	6
June, 1905. Barry repairs ... ..	239	6	2
December, 1905. Barry repairs (stranding on Bassein Bar) ... ..	2,053	15	5
June, 1906. Barry repairs (ashore close to Perim) ... ..	4,511	13	9
March, 1907. Damage, dock wall Havre (temp.) ... ..	128	0	0
April/May, 1907. Cardiff repairs	2,516	1	5
September/October, 1907. Barry repairs ... ..	337	0	3
May, 1908. New York repairs ... ..	67	3	0
March, 1909. Cardiff repairs ... ..	573	8	2
September, 1909. Barry repairs... ..	204	6	6
November, 1909. New York repairs	97	0	0
March, 1910. Sabang ... ..	210	18	3
April, 1910. Hong Kong ... ..	189	18	0
May, 1910. Sabang ... ..	16	15	4
June/July, 1910. Calcutta repairs, ashore Hooghly (temp.) ... ..	889	13	4
October, 1910. Bombay repairs ... ..	83	6	8
January, 1911. Four new bronze blades to propeller ... ..	385	2	11
January, 1911. Barry repairs (Hooghly stranding) ... ..	7,174	7	3
January, 1911. Special No. 1 Survey (not complete) ... ..	2,018	11	6
August, 1911. Completing survey and repairs ... ..	1,176	13	6
January, 1912. Cardiff repairs ... ..	778	7	11
	£23,684	14	10

From the foregoing statement, it will be seen that during 1911 no less a sum than £10,754 15s. 2d. was spent in putting the vessel into a good condition.

In January, 1912, that is immediately before she sailed upon the voyage that formed the subject of this Inquiry, she was dry-docked at Cardiff, her tail-end shaft shifted, and other repairs effected, at a cost of £778 7s. 11d.

Under the above circumstances, it cannot be said that she was not in good and seaworthy condition as regards hull and equipments.

The managing owner stated that he put the value of the "Maroa" when she last left Cardiff at £40,000, the increase of value over cost price being due to the appreciation in steam shipping.

The insurances effected upon her were as follows:—

	£
On hull, materials, &c., all risks ...	24,000
On machinery, boilers, &c., all risks	11,000
	£35,000

This value of £35,000 was fixed by the owners, and of that amount £34,300 were insured at £7 7s. per cent., and £700 at £8 8s. per cent.; but in the event of total loss, and/or constructive total loss, the underwriters were only liable in the sum of £30,000; and the owners covenanted to remain uninsured for 3 per cent. of the declared value in the event of particular average.

There was a policy for £1,600 on the outward freight from Cardiff to Colombo, amounting to £4,800, of which two-thirds, or £3,200, had been paid in advance. The rate of premium on this policy was 10s. per cent.

There were also policies for £2,850 on the homeward freight from Calcutta, which was estimated at about £14,000. The premium on these policies was 20s. per cent., and this insurance was effected some days after the departure of the vessel—apparently on the 22nd of February.

There were no insurances upon disbursements or insurance premiums.

On the 9th of January, 1912, the "Maroa" was chartered by Messrs. James Burness and Sons, of London and Cardiff, to convey a full and complete cargo of coal, not exceeding 8,500 tons, from Cardiff to Colombo, the agreed freight being 12s. per ton of 20 hundredweights.

On the 13th of February, 1912, that is six days after the ship left Cardiff to fulfil the above engagement, she was chartered by the Deutsche Dampfschiffahrts-Gesellschaft "Hansa," of Bremen, to carry a cargo from Calcutta to Hamburg, Dundee, Hull, or Antwerp, as ordered, the average freight being at the rate of £1 10s. per ton.

In compliance with the first-mentioned charter party, the "Maroa" commenced to load in the Queen Alexandra Dock, Cardiff, on the 30th of January, 1912, and completed her lading on the morning of the 7th of February.

She then had on board 5,972 tons of Dowlais-Merthyr large steam coal and 2,150 tons of Cambrian navigation steam coal; the former from the Dowlais-Merthyr and Dowlais-Cardiff pits, and the latter from the Clydach Vale Colliery.

Both these descriptions of coal give off a certain amount of gas, and they were distributed as follows:—

Place.	Tons.	Description.
No. 1 hold ... ..	1,744	Dowlais.
" 2 " ... ..	2,466	Do.
" 3 " ... ..	330	Do.
" 3 " ... ..	2,150	Cambrian.
" 4 " ... ..	1,432	Dowlais.
Total ... ..	8,122	

In addition, she had 1,473 tons of bunker coal, obtained from the Lancaster Steam Coal Colliery, Limited, of which 669 tons were in the cross bunker, about 704 tons in the side bunkers, and about 100 tons in the bridge space.

The draught of water, according to the official record made by Mr. T. M. Cawsey, Board of Trade boatman at Cardiff, was 26 feet 1½ inches forward and 25 feet 11 inches aft, she at the same time having the required freeboard (in salt water) for the voyage and season. The density of the water at the time of taking the draught was 1.018.

According to the owner, the draught forward and aft should have been reversed, his contention being that the vessel would have been 2½ inches by the stern and not 2½ inches by the head; but Mr. Cawsey, who personally took the figures, was positive as to the correctness of the observation, and I have accepted his statement.

However, the matter is not material, the more, that in days gone by some ships were advisedly trimmed a little by the head, and this was the case with the frigate-built East Indiaman "Hotspur" on board which I commenced my seafaring career in 1865.

Soon after 10 a.m. of the 7th of February, 1912, the "Maroa" left the Cardiff Sea Locks, bound for Colombo, manned by a crew consisting of 14 Europeans (including the master's wife, who signed the agreement nominally as stewardess) and 66 Lascars, making a total of 80 persons, and under the command of Mr. George A. Adams (brother of the managing owner), who held a certificate of competency as master, numbered 017707, and whose name had been on the ship's register (with the exception of eight days in 1909) since the 21st of March, 1905.

The vessel, which was perfectly upright, was in pilotage charge of Mr. Thomas Harper, a Bristol Channel pilot, and was assisted through the narrows by the steam tug "Eagle," which cast off at the outer Roath buoy.

According to the pilot, while passing through Cardiff Roads, the engineer reported to the master that something (the pilot did not know what) had gone wrong with the engines, but the vessel was able to proceed to Barry Roads, where she anchored. The pilot noticed steam coming up from the engine-room skylight, but heard no noise, and there was no suggestion of putting back.

In cross-examination, the pilot said that he gathered that those responsible knew what was the matter before the ship left the docks, but had left it to be put right after they got outside.

However, the following telegram from the master to the owners, handed in at Cardiff Docks at 11.53 a.m., serves to explain what was really the matter:—"Autumn. Leaving this tide, cargo 8,122 tons, bunkers 1,475, anchoring roads, fix up h.p. cover, will be about one hour.—Arth."

Evidently the joint of the high-pressure cylinder cover had been imperfectly made and was blowing, a defect that could be rectified in a short time.

About 3 p.m., the work having been completed, the ship proceeded to get under weigh, but while doing so the windlass became disabled; it being put right by the engineers in about three-quarters of an hour.

The anchor was then hove up and the vessel again started on her voyage, the engines working properly.

When near Nash Point, a little before 4.30 p.m., something occurred in connection with the hydraulic steering gear, which the engineer said he could fix up in an hour, and the hand gear was brought into use.

Mr. William H. Smart, the superintending engineer, stated that nothing had been done to the hydraulic steering at Cardiff. There had been some complaints about the valves leaking upon previous voyages, but that defect was easily put right. There was a pressure of 1,000 lbs. at the rams and the gear required careful attention, but if looked after properly it worked well. He considered that the vessel and her machinery were in good condition.

The pilot left the ship off Nash Point about 4.30 p.m., and he stated that notwithstanding the little accidents recorded, the ship was in splendid condition for going to sea; that the hatches were on and battened down, with the exception of one hatch on the after part of each hatchway, which hatches were left off for the purpose of ventilation.

He further added, that he could see the vessel for about half an hour after he left her, that she was steering a little wild with the hand gear, and that it was fine weather, with a light southerly wind and no sea.

From the time that the pilot left her, there has been no reliable news concerning the "Maroa."

It is true that the following deposition was made at Barry on the 16th of April, 1912:—

"I, George Ferguson, master of the steamship 'Wagner,' now lying at Barry, in the County of Glamorgan, make oath and say as follows:—

"1. I sailed from the port of Cardiff on board the said steamer on the 8th day of February, 1912, laden with a cargo of coal and coke and bound for Port Said.

"2. That we proceeded on our voyage and at noon on Friday, the 16th day of February, 1912 (astronomical time), our position was 36° 10' N., longitude 3° 49' W., our course being set S. 82° E., or true course N. 84° E., the weather being clear with a moderate east wind and smooth sea.

"3. At 3.50 a.m., Europa Point was abeam at a distance of four miles.

" 4. We overhauled and passed several cargo steamers during the day, and one which we assumed to be the steamer 'Maroa,' which was three to four miles distant to the south at about 5 p.m., Friday, 16th February, 1912 (astronomical time).

" 5. This boat was moored alongside of me at the Queen Alexandra Dock, Cardiff, previous to the 8th day of February, 1912, for a period of about a week, and I was well acquainted with her appearance. She had left Cardiff 28 hours previous to me, or thereabouts.

" Sworn at Barry, in the County of Glamorgan, this 16th day of April, 1912.

" (Signed) GEORGE FERGUSON,  
" Master,  
" Steamship 'Wagner'."

Mr. Ferguson subsequently made the following deposition at Kingston-upon-Hull, on the 1st of July, 1912:—

" I, George Ferguson, of Creebank, Monifieth, N.B., make oath and say as follows:—

" 1. I am master of steamship 'Wagner,' of Sunderland, Official Number 106429.

" 2. I left Cardiff on the 9th February, 1912, for Port Said. The steamship 'Maroa,' which was laid alongside of us at Cardiff, left about 28 hours previously.

" 3. On 15th February, 1912, we passed many vessels, and about 5 p.m. (civil time) passed, from four to five miles distant, going in the same direction, what was assumed to be the steamship 'Maroa.' She was observed to be a steamer with two masts and a funnel, but no further details could be noticed. She was on the starboard side, the southward of steamship 'Wagner,' which at that time was about 40 miles W.N.W. of Trafalgar.

" 4. The weather was fine with no sea.

" 5. The vessel which I took to be the 'Maroa' was going about seven knots, steering in usual St. Vincent-Spartel track, S.E. by E. (about).

" 6. There were many steamers in the vicinity, which I did not recognise.

" (Signed) GEO. FERGUSON."

It will be observed that in both the foregoing depositions Mr. Ferguson only "assumed" that the steamship he saw, 40 miles W.N.W. of Cape Trafalgar at 5 p.m. of the 15th of February, 1912, was the "Maroa," and offers no very convincing proof of his assumption, as steamers "with two masts and a funnel" are extremely common objects in that locality. Hence, I am of opinion, that he was mistaken in his surmise. If he were not mistaken, then the disappearance of the "Maroa" is inexplicable, occurring, as it must have done, in a great highway for shipping, and without leaving a sign behind.

According to her log book, the "Wagner" encountered a "fresh (E.S.E.) gale with choppy head sea" during the night of the 15th of February, but the word "gale" seems to have been a misnomer, as the vessel was able to steam against it at the rate of eight knots per hour. The weather was clear, and thenceforward the "Wagner" experienced nothing but moderate and light breezes, accompanied by clear weather, all the way to Port Said.

On the other hand, examining the "Wagner's" log book on dates prior to the assumed sighting of the "Maroa," I find the following entries:—"February 10th, position at noon 48° 13' N., 6° 51' W., wind E.S.E. 'Brisk gale; sea high and confused; steamer labouring and shipping heavy water.' Midnight, wind W.S.W. 'Strong gale with high confused sea; steamer labouring heavily and shipping water; decks flooded fore and aft.' February 11th, position at noon 46° 56' N., 8° 22' W. 1 a.m., 'slackened speed and hauled steamer head on to the sea.' 3 a.m., 'heavy S.W. gale and mountainous sea. Steamer labouring and shipping heavy water.' 5 a.m., 'cargo thrown over to starboard, giving steamer a heavy starboard list.' Midnight, 'strong gale and mountainous sea.' February 12th, position at noon 45° 39' N., 9° 3' W. 4 a.m., 'westerly gale

with mountainous sea. Steamer labouring and shipping heavy water fore and aft.' p.m., 'strong wind with heavy beam sea. Steamer labouring and shipping heavy water fore and aft.' February 13th, position at noon 42° 52' N., 9° 27' W. 4 p.m., 'strong westerly wind and sea. Steamer shipping heavy water at times fore and aft.' February 14th, position at noon, 39° 38' N., 9° 26' W. 4 a.m., 'strong breeze with rough sea. Shipping heavy water at times.'"

The foregoing extracts, showing the character of the weather experienced by the "Wagner," weather which the "Maroa" would also encounter, lead me to believe that the "Maroa" foundered in the gales recorded.

The vessel appears to have been in every way seaworthy as regards hull, machinery, and equipments; but even if the engines or the steering gear did break down, that would not necessarily mean the loss of the ship, unless falling into the trough of the sea her hatches were stove in, or her hatches were then blown off by an explosion of gas, or her cargo shifted.

The managing owner (Mr. C. A. Adams), who had himself commanded the "Maroa" for some years, stated that she was an excellent sea-boat, and that he was unable to account for her disappearance.

It now becomes necessary to take into consideration the amount of vacant space that remained in those compartments of the ship wherein the cargo of coal was placed.

The Admiralty scale for Welsh coal is 40 cubic feet per ton, but witnesses in this case gave 43 cubic feet as the proper measurement.

Taking 40 cubic feet per ton first, the vacant space in each hold (including between decks) devoted to cargo upon this occasion, allowing for the number of tons weight stated to have been in the different compartments, would be: No. 1 hold, 1,189 tons; No. 2 hold, 104 tons; No. 3 hold, 273 tons; and No. 4 hold, 368 tons; making a total of 2,434 tons.

Then allowing 43 cubic feet per ton, the same vacant spaces would work out: No. 1 hold, 985 tons; No. 2 hold, no vacant space, but an excess of 75 tons of cargo; No. 3 hold, 81 tons; and No. 4 hold, 707 tons; which, making allowance for the 75 tons that would not go into No. 2 hold, equals a total of 1,698 tons.

The fact that at least 75 tons of coal less than the amount said to have been stowed there, could not possibly have been put into No. 2 hold if the latter scale were correct, conclusively proves that 43 cubic feet per ton is an erroneous measurement.

With regard to the vessel's own coal, the reserve bunker, taking 40 cubic feet per ton, would have a vacant space of 102 tons. There was also a considerable amount of vacant space under the bridge deck, but the coal there would not have much drift for shifting.

All coal is liable to shift in heavy weather unless the compartment or place in which it is stowed is perfectly full, although some descriptions are more susceptible to this class of danger than others.

In my report upon the case of the missing steamship "Cayo Largo," I expressed the view that her cargo of small anthracite coal would shift somewhat after the manner of shingle, and while there is a considerable difference between that and the steam coal carried by the "Maroa," the latter would undoubtedly be liable to shift under certain conditions.

As regards the "Maroa," it was stated in evidence that her cargo was properly trimmed and levelled off, and that it was nicely sloped at the forward end of No. 1 hold and the after part of No. 4 hold, and that under such circumstances it could not shift. No doubt the same thing would have been said about the "Wagner's" cargo of coal, and yet on the 11th of February, in the words of her own log book, she had her "cargo thrown over to starboard, giving steamer a heavy starboard list."

It is not usual for coal-laden vessels to make use of shifting-boards, but I am firmly convinced that if strong and well-secured shifting-boards, erected the full length of the cargo spaces of the ship and carried right up to the deck, not omitting under the various hatchways, were used, this practice would lead to a sensible diminution of the loss of many valuable lives and of much property.

At the conclusion of the evidence, Mr. Thew, on behalf of the Board of Trade, submitted the following questions for my opinion:—

1. What was the cost of the vessel to her owners? What was her value when she last left the United Kingdom? What insurances were effected upon and in connection with her?
2. When the vessel left Cardiff on the 7th of February last—
  - (a) Was she in good and seaworthy condition as regards hull and equipments?
  - (b) Was her cargo properly stowed and secured from shifting, and were the weights so distributed as to make her easy in a seaway?
  - (c) Had she the required freeboard, and was she in good trim for a voyage to Port Said?
3. Was the vessel seen or spoken after she had left Cardiff? If so, when and where, and what was her general appearance and condition at that time?
4. What is the cause of the loss of the "Maroa"?

Mr. Magee then addressed me on behalf of his clients, Mr. Thew replied, and I now return the following answers to the questions of the Board of Trade:—

1. The cost of the vessel to her owners in November, 1904, was £32,500; in subsequent years to which a sum of £23,685 was spent in damage repairs, ordinary repairs, and passing special survey. The managing owner estimated that her value, owing to the appreciation of steamship property, was £40,000 at the time when she last left the United Kingdom.

She was insured for £35,000 against all risks, the owners covenanting to remain uninsured for three per cent. of the value in the event of particular average, but in the case of total loss, and/or constructive total loss, the underwriters were only liable in the sum of £30,000. The outward freight was insured for £1,600, and the homeward freight for £2,850. There were no insurances effected upon disbursements or insurance premiums.

2. When the vessel left Cardiff on the 7th of February last—

- (a) She was in good and seaworthy condition as regards hull and equipments.
- (b) Her cargo was stowed in the customary manner without shifting-boards being used; but inasmuch as there was a considerable amount of vacant space in the various holds and the precaution of erecting shifting-boards was not adopted, it is evident that the coal was not properly secured from shifting.

For the reasons set forth in the body of this report, I am strongly of opinion that stout and thoroughly well-secured shifting-boards should be employed for the securing of these coal cargoes, and I am firmly convinced that if such a procedure were generally adopted it would bring about a diminution of loss alike of life and property.

The weights were so distributed as to make the vessel easy in a seaway.

- (c) She had the required freeboard, and was in good trim for a voyage to Port Said.

3. The master of the steamship "Wagner," of Sunderland, reported that on the 15th of February, 1912, when about 40 miles W.N.W. of Cape Trafalgar, he saw a vessel which he assumed to be the steamship "Maroa," but I am of opinion that he was mistaken. There is no evidence as to any other vessel having sighted her after she left Cardiff.

4. There is no direct evidence as to the cause of the loss of the "Maroa," but I am of opinion that she probably foundered during the prevalence of the gales recorded by the "Wagner" on the 10th, 11th, and 12th of February, 1912—gales that the "Maroa" would also encounter in her track towards the Mediterranean.

Again, while there is no direct evidence to that effect, I am inclined to ascribe as the principal factor in her loss the shifting of her cargo of coal.

Annexed is a list of the persons alleged to have lost their lives in this disaster; with the relatives of whom I desire to express deep sympathy.

I have the honour to be, Sir,

Your obedient servant,

W. F. CABORNE,  
Commander, R.N.R.,  
Inspector.

14th September, 1912.  
The Assistant Secretary,  
Marine Department,  
Board of Trade,  
Whitehall Gardens,  
London, S.W.

List of those persons alleged to have lost their lives through the disappearance of the "Maroa":—

Name.	Age.	Rating.	Nationality.
G. A. Adams ...	48	Master ...	British.
G. E. Wakefield ...	26	1st Mate ...	Do.
Chas. Austen Scott ...	63	2nd Mate ...	Do.
R. G. King ...	24	3rd Mate ...	Do.
E. Jones ...	42	1st Engineer...	Do.
A. Gibson ...	38	2nd Engineer	Do.
T. W. Clarke ...	25	3rd Engineer	Do.
S. E. Harris ...	20	4th Engineer	Do.
Harry Carmoni ...	42	Quartermaster	Greek.
		and A.B.	
Nicholas Pitadaker ...	26	Do.	Do.
J. Pappas ...	53	Do.	Turkish-Greek.
Bales Pintelxle ...	28	Do.	Greek.
N. P. Stiffenden ...	66	Carpenter ...	Swedish.
F. A. Adams ...	36	Stewardess ...	American
			(U.S.A.)

The following are the names of the Lascar and Goanese members of the crew who were shipped at Calcutta in November, 1911, since when there is no record of any changes having taken place:—

Name.	Rating.	Name.	Rating.
Someer ...	Lascar	Abdool Azim ...	Fireman.
	Serang.	Allee Hossein ...	Coal
Cassim ...	1st Tindal.		Trimmer
Ahamode ...	2nd do.	Assanoolla ...	Do.
Ameer Allee ...	Cassub.	Neaz Ahamode...	Do.
Peeroo ...	Lascar.	Nusuph ...	Do.
Mobaruck ...	Do.	Kalley Khan ...	Do.
Abdool Rahoman ...	Do.	Kaleendur ...	Do.
Abdool Goffoor ...	Do.	Safforeoody ...	Do.
Motia Rohomon...	Do.	Toraboolla ...	Do.
Calla Meah ...	Do.	Abdool Barrick..	Do.
Belatallee ...	Do.	Mossador Allee...	Do.
Rosseerodin ...	Do.	Abdool Jahoor...	Do.
Omer Allee ...	Do.	Mahomed ...	Bhandary.
Meher Ali ...	Do.	Jaha Bux ...	Fireman
Dilbur ...	Do.		3rd Tindal.
Belat Hossein ...	Do.	Sookoor...	Fireman.
Panchoo Mea ...	Do.	Noyer ...	Donkey-
Mahomed Allee ...	Do.		man.
Abdool Hays ...	Do.	Ismail ...	Do.
Mazil Rohomon...	Do.	Abdool Lotiff ...	Coal
Sodon ...	Do.		Trimmer.
Nogore Allee ...	Do.	S. F. Rodrigues...	Butler.
Abdool Razuok ...	Bhandary.	T. I. Fernandes...	Ship's Cook
Mahomed Amroo	Fireman		and Baker.
	Serang.	Joseph Fernandes	2nd Cook.
Wazidoolla ...	1st Tindal.	L. D. Pinto ...	Saloon
Forkit Meah ...	2nd do.		Waiter.
Hassienoolla ...	Donkey-	T. F. Mascarin...	Pantry Boy.
	man.	R. F. De Costa...	Officers
Aftar Allee ...	Cassub.		Boy.
Rehanood ...	Fireman.	R. P. Fernandes	Mess Room
Mahomed Hossein	Do.		Boy.
Aujuballee ...	Do.	I. Rodrigues ...	Topass.
Azidoolla...	Do.		
Assodeoolla ...	Do.		
Eusuphoolla ...	Do.		
Abdool ...	Do.		
Murfuthoolla ...	Do.		
Mossone ..	Do.		
Hazur Mahd. ...	Do.	Sojabhlan ...	Fireman.
		Amir Gulam ...	Lascar.

The two following persons were shipped at Cardiff, additional:—