

THE "VARDULIA" LOSS

Board of Trade Inquiry
Opened

NO QUESTION OF BLAME ON
OWNERS

From Our Own Correspondent

SUNDERLAND, Tuesday.—An inquiry was opened at Sunderland to-day by Judge Richardson, sitting as a Wreck Commissioner, into the loss of the Glasgow steamer *Vardulia*, which foundered with all hands, numbering 37, during a North Atlantic gale on Oct. 19 last year. Dr. Robb, Captain Thompson and Captain Williams sat with Judge Richardson as Assessors.

Mr. Stephen Furness (instructed by Messrs. Middleton & Co.) appeared for the Navigators & General Insurance Company, Ltd., representing relatives of Mr. J. Mackay, late chief officer, and Mr. E. I. Burns, late second officer, and also for the National Union of Seamen, representing the seamen and crew; Mr. C. C. Rooke represented the widow of the late wireless operator, Mr. A. Lothian; Mr. Hugh B. Spens represented the owners, Donaldson, Bros., Ltd., of Glasgow; the London & North Eastern Railway Company, as Dock Authorities for the Port of West Hartlepool, were represented by Mr. E. P. Merritt.

Mr. O. L. Bateson, opening the case for the Board of Trade, said he would like to make it clear that there was no charge of any kind which could be levelled against the owners or managers of the ship, and that the chief points for the Court would be as regards the responsibility for trimming the coal cargo.

Counsel said that the *Vardulia* was an extremely well maintained ship, and care was taken by all concerned on the part of the owners and managers to see that she was properly found and equipped in every way to face the perils of the voyage. In this case, unlike some recent inquiries, there was no possible charge of any sort or kind which could be levelled against the owners or managers of the ship. The Board of Trade felt that it was a matter which should be made abundantly clear in view of other recent events.

Judge RICHARDSON: That is very satisfactory.

THE VESSEL'S POSITION

After the disaster every step was taken to locate the ship and rescue her crew, continued Mr. BATESON. The last known position of the *Vardulia* was 58 N., 18 30 W. That was the position which was given some 14 hours before she sent out the S O S message. The *Vardulia* was originally named *Verdun*. She was built in 1917 and was acquired by her late owners, the Donaldson Line, Ltd., in 1929, from the Cunard Steam Ship Company. She was registered at Glasgow and her gross tonnage was 5735 tons, while her net tonnage was 3602 tons. She was fitted with steam steering gear, with a steering engine situated aft in the poop and controlled from the bridge by telemotor gear. No question arose in the case regarding the steering gear of the ship. The ship had five holds and six watertight bulkheads. She carried four lifeboats, two on each side, with a seating capacity of 66 people. She was purchased for £46,311 4s. 4d. in 1929, and at the time of her loss was insured as to hull and machinery for £30,000, £2500 for freight and £550 in respect of premium, reduced from £835.

X 226 Tons

She was loaded with ~~22,622~~ tons of general cargo at Manchester, and 7494 tons 5 cwt. of coal, loaded at West Hartlepool. She was bound from Manchester and West Hartlepool to Newfoundland, where she was to load paper pulp to be brought back to this country. The coal cargo consisted of 1410 tons 14 cwt. of large steam coal, 1185 tons 16 cwt. of large house coal, and 4900 tons 15 cwt. of small steam coal, Horden dry cleaned 3 smalls. This small coal was stowed in No. 1 hold and in the 'tween decks in the deep tank immediately abaft the engine-rooms, and in Nos. 4 and 5 holds and 'tween decks.

The facts of the *Vardulia*'s last voyage, so far as they were known, were that she arrived from Newfoundland at Manchester on Sept. 24, and there discharged her inward cargo and began loading her outward cargo on the afternoon of Sept. 27. She left Manchester on Sept. 30 and arrived at West Hartlepool on Oct. 4, and sailed after loading coal on Oct. 12. She was next heard of by the *Sulairia*, with which she was in wireless communication on Oct. 15, 16 and 17. On Oct. 18 she sent out an urgent wireless message to all ships, giving her position as 58 N., 18 30 W., reporting a gale and asking ships in the vicinity to indicate their positions. She was answered by two or three ships.

At 6 55 a.m. on the next day, she sent out an S O S giving the same position, stating she was steering S. 22 E., and adding "Want immediate assistance have taken dangerous list." At 6 57 a.m. she sent out a message

stating that the crew were abandoning ship. From that moment nothing more was seen or heard either of the ship, the boats or the crew, added Mr. Bateson. Eleven ships, which were not in the immediate vicinity, but which were within 450 miles or less of her, spent two or three days searching the area for traces of the *Vardulia* and her crew, but without success.

Counsel read extracts from the log books of several other ships in the vicinity of the *Vardulia* on Oct. 18 and 19. All referred to a gale of hurricane force and mountainous seas, and one spoke of the gale as being probably one of the severest storms which ever swept the North Atlantic.

Mr. Bateson said there were two big questions which the Board of Trade asked the Court to consider. The first was: Why did the *Vardulia*, which was so well found in every respect, take a dangerous list, apparently very suddenly? Working upon the evidence that was available, the Board's technical advisers had come to the conclusion that there was a great deal more free space than the evidence of the people who actually loaded the cargo would suggest, and they inferred from that that the cargo was not trimmed as it should have been. The second question was: What were the provisions made for seeing that the coal was properly stowed and trimmed, and who was responsible for seeing that it was properly trimmed? The Board imputed no fault or blame to anybody in this respect, but they were anxious to make it clear that possibly mistakes had been made in the past in assuming that coal of that kind was safer than apparently it turned out to be.

The purpose of the inquiry, added Counsel, was very largely concerned with bringing to the attention of everybody concerned that coal of that kind was a dangerous cargo, in the sense that it might be liable in certain circumstances to shift. The Board of Trade was anxious that the Court should indicate where the responsibility did lie, and indicate to what extent responsibilities were upon the masters or chief officers of vessels, or upon the foremen trimmers. As Counsel had already said, no attack was made on anyone in the case. Far might it be from him to make any attack upon a man who was dead.

Mr. J. M. IBSTER, chief superintendent engineer for the Donaldson Line, giving evidence, said the *Vardulia* was at the time only running on two of her three boilers, to reduce coal consumption. He could not say whether the spare boiler was full or empty. In any case it could not materially affect the question of the ship's seaworthiness.

Evidence was given by Lloyd's Register surveyors of surveys in 1932 and 1934.

Mr. CHARLES A. MILLER, senior ship surveyor, Hartlepool, spoke to surveying the ship at Hartlepool on Oct. 10 last, in consequence of the ship having been in collision with the motorship *Silverpine*. The *Vardulia*'s bulwarks were dented and the bulwark strake was buckled. That damage would not in any way affect the vessel's seaworthiness.

Mr. FURNESS: Seeing that you were the last surveyor who examined the ship, it would only be proper, having regard to the men who lost their lives, to ask your opinion of her condition.

Mr. MILLER: I found her in quite good condition and perfectly seaworthy. The main structure was not affected in any way by the collision.

PATRICK LAFFEY, foreman stevedore at Manchester, giving evidence regarding the stowage of the general cargo in the *Vardulia* on Sept. 29 and 30, said the cargo made a very good stow. There was no danger of it shifting.

The inquiry was adjourned until to-morrow.

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THE "VARDULIA" LOSS

Coal Trimmers' Evidence
at B.O.T. Inquiry

SHIP'S LIST TO STARBOARD

From Our Own Correspondent

SUNDERLAND, Wednesday
When the inquiry into the loss of the Glasgow steamer *Vardulia* was resumed at Sunderland to-day several witnesses gave evidence concerning the trimming of coal cargo at West Hartlepool. The vessel foundered with all hands, numbering 37, during a North Atlantic gale on Oct. 19 last year. The inquiry is being held before Judge Richardson, sitting as a Wreck Commissioner, with Dr. Robb, Captain Thompson and Captain Williams as Assessors.

Mr. Stephen Furness (instructed by Messrs. Middleton & Co.) appeared for the Navigators & General Insurance Company, Ltd., representing relatives of Mr. J. Mackay, late chief officer, and Mr. E. I. Burns, late second officer, and also for the National Union of Seamen, representing the seamen and crew; Mr. C. C. Rooke represented the widow of the late wireless operator, Mr. A. Lothian; Mr. Hugh B. Spens represented the owners, Donaldson Bros., Ltd., of Glasgow, the London & North Eastern Railway Company, as Dock Authorities for the Port of West Hartlepool, were represented by Mr. E. P. Merritt.

"IN GOOD CONDITION"

THOMAS STODDART, foreman riveter of Wm. Gray & Co., Ltd., gave evidence of minor repair work carried out on the *Vardulia* at Hartlepool last October. A hatch beam was corroded and this was renewed. Answering Mr. Stephen Furness, representing the Seamen's Union, Stoddart said he saw damage done to the *Vardulia* by collision with the *Silverpine*. His firm quoted for the repairs but the ship was given a certificate and sailed without repairs being carried out. The damage was not serious, being only bulwarks, and the ship was in quite good condition.

EDMUND WEST, foreman trimmer at Hartlepool Harbour staiths, said he was in general charge of the trimming of the coal cargo. On the *Vardulia* and other ships the trimmers were contract men under the jurisdiction of the chief officer of the ship. Each gang of trimmers had its own foreman, and witness only visited them occasionally. He particularly watched the loading of No. 1 hold, with three quarter smalls, but did not see it when the men reported it was full. The main deck hatch was not closed, but the beams were put on. That was the usual practice at Hartlepool. He agreed that 'tween deck ships were more difficult to load than the ordinary collier. It was most important that the lower hold should be trimmed so that it was absolutely full, otherwise the coal might shift at sea.

Mr. FURNESS: If there was coal in the 'tween decks when it should have gone below does it not show that coal was not properly trimmed in the lower hold?—According to the quantities it could not have been.

ROBERT FOSTER, a foreman trimmer at Hartlepool, said that it was not strictly his duty to see that the work of trimming on any particular ship was properly done. The foreman trimmer was only called in if the charge hands on the ship were not giving satisfaction. He was in charge when No. 2 hold was completed. He did not agree that the coal put into No. 2 'tween decks should have gone below into the lower hold. "I am quite convinced that those coals would not go below. I am sure of it," he added.

Questioned by Judge Richardson, Foster said frequently a ship's officer said he wanted a certain quantity of coal in the hold, and it was found impossible. The trimmers did their best, but if the coal would not go in the hold, that was all there was to it. It might be due to a miscalculation of the capacity of the hold for coal cargo.

LLOYD'S LIST & SHIPPING GAZETTE.

THURSDAY, MARCH 26, 1936

THE HOLDS FILLED

JOHN MARTINDALE, ERNEST WM. HURST and HAROLD CHAPMAN, trimmers, gave evidence on the trimming of the coal in Nos. 1, 2 and 3 holds, which they stated were filled.

Captain HENRY R. HAY, assistant dock master at Hartlepool, said he saw Captain Patterson taking the draught of his ship *Vardulia*, and he pointed out to him the ship had a starboard list of about four degrees. He shouted to him to take the list out of his ship, and Captain Patterson waved his hand in acknowledgment that he would do so. When the *Vardulia* sailed witness said the ship still had this list, and he asked the master why he had not taken the list out of his vessel. Captain Patterson replied that he would correct it when he got outside. The ship had a draught of 25 ft. forward and 25 ft. aft. In witness's opinion the ship was well battened down and in good order.

Judge RICHARDSON: Do ships often sail with lists?—Frequently they do, sir. Witness added, in reply to Mr. Spens, that Captain Patterson did not seem worried about the list, which could be easily corrected by adjusting the ballast tanks and by working out the bunker coal from one side.

Captain JOHN BOGIE, pilot employed by the Hartlepool Pilotage Commission, said when he took the *Vardulia* out on Oct. 12 he noticed she had a "strongish list" of four or five degrees. He told the captain the ship had a nasty list, but the captain replied he would soon take the list out of her.

Mr. BATESON: Did you think it was a dangerous list?—Well, no, except on account of the weather. There were gales of wind from the west and it is

a bad wind to cross the Atlantic in if your ship has a list. The ship was still listing when he left her in the Bay.

Mr. FURNESS: You thought it unfortunate that she should be listing. Would you have taken your own ship out at that time with a list like that?

—I think I should have liked to take the list out of her before we left, either by trimming or working the starboard bunker out.

But it was too late to do any trimming when she was outside?—Yes.

Mr. SPENS: If the tank on the starboard side was full and that on the port side empty, the list could very easily have been corrected?—Oh, yes.

Mr. JOSEPH THOMAS JACKSON, manager of Feetham & Grieseson, of West Hartlepool, colliery agents for the coal cargo shipped in the *Vardulia*, said the total amount of coal loaded was 4900 tons 15 cwt. of three-quarter smalls and 2596 tons 10 cwt. of large coal, 7497 tons 5 cwt. in all. In No. 1 hold and 'tween decks were teamed 1605 tons 17 cwt.; in No. 2 hold and 'tween decks 1601 tons 2 cwt.; in No. 3 hold and 'tween decks 995 tons 8 cwt.; deep tank, 750 tons 15 cwt.; in No. 4 hold and 'tween decks 1363 tons 15 cwt.; and in No. 5 hold and 'tween decks 1180 tons 8 cwt. It was impossible for anyone to say how much coal was left in the 'tween decks. The shippers of cargo had informed him as to the capacity of the holds and had asked him to ship the large coal in Nos. 2 and 3 holds. Usually in a 'tween decks ship it was the chief officer who decided how much coal was to go into each hatch. From his experience he thought that three-quarter small coal occupied about 48 cubic feet to the ton in a ship's hold, while large coal occupied 50 or more cubic feet to the ton. He agreed that small coal was more liable to shift while part of a cargo than large coal.

Mr. BATESON said correspondence showed it was the master of the *Vardulia* who decided exactly how the cargo was to be stowed.

LOADING INSTRUCTIONS

Mr. WM. ARTHUR COOLEY, outdoor officer, Board of Trade, said before the *Vardulia* sailed he took measurements. From her rail to water down ship's side on the port side the distance was 19 ft. 3 in., and on the starboard side 15 ft. 9 in.

Mr. ALFRED C. PARKYN, Board of Trade Surveyor at West Hartlepool, said when the *Vardulia* was last in port Captain Patterson came to see him with regard to whether he should sail on the summer or winter marks. It was estimated that the *Vardulia* would enter the North Atlantic zone where winter loading would apply at about midnight, Oct. 15. It was calculated by that time the *Vardulia*'s draught would have been lightened by about two inches, having regard to the consumption of fuel and feed water. The difference between the summer and winter loading in draught was 5½ in., so if the *Vardulia* had sailed from Hartlepool on her summer marks she would have been 3½ in. deep when she entered the winter-loading zone. Consequently the master of the *Vardulia* was instructed to load his ship 3½ in. light of summer marks. He visited the ship on Oct. 12 to see these instructions were carried out. The angle of the *Vardulia*'s list was 3½ degs.

Answering Mr. Furness, Mr. Parkyn said he discussed the list with the master, who undertook to get rid of the list within two or three days, which was quite reasonable. He would do this by working out bunkers and feed water from the starboard side. "I was of opinion that the list would be eliminated before she entered the winter zone, which was the important thing." Answering Dr. Robb, Mr. Parkyn agreed he considered the list was due to unbalanced weight and not to instability.

Dr. ROBB commented that the list could be almost entirely accounted for by the fact that there were 60 tons of water in the starboard No. 3 tank, while port No. 3 tank was empty.

The inquiry was adjourned until to-morrow.

In yesterday's report the tonnage of the general cargo loaded at Manchester was inaccurately stated. This should have been given as 226.83 tons. The coal cargo loaded at West Hartlepool was 7497 tons 5 cwt.

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THE "VARDULIA" LOSS

B.O.T. Inquiry Concluded

ACCURACY OF N.E. COAST
STOWAGE RATES QUESTIONED

From Our Own Correspondent

SUNDERLAND, Thursday. The inquiry into the loss of the Glasgow steamer *Vardulia*, which foundered with all hands, numbering 37, during a North Atlantic gale on Oct. 19 last, was concluded at Sunderland to-day before Judge Richardson. It was announced that the findings of the Court would probably be delivered on Tuesday. Dr. Robb, Captain Thompson and Captain Williams sat with Judge Richardson as Assessors. At the concluding stages of the inquiry it was revealed that in the view of the technical advisers of the Board of Trade rates of stowage used on the North-East Coast were erroneous.

Mr. Stephen Furness (instructed by Messrs. Middleton & Co.) appeared for the Navigators & General Insurance Company, Ltd., representing relatives of Mr. J. Mackay, late chief officer, and Mr. E. I. Burns, late second officer, and also for the National Union of Seamen, representing the seamen and crew; Mr. C. C. Rooke represented the widow of the late wireless operator, Mr. A. Lothian; Mr. Hugh B. Spens represented the owners, Donaldson Bros., Ltd., of Glasgow; the London & North Eastern Railway Company, as Dock Authorities for the Port of West Hartlepool, were represented by Mr. E. P. Merritt.

RESPONSIBILITY FOR LOADING

Mr. WALTER BRUCE, assistant staiths superintendent at Hartlepool docks, said he knew each day how many truck loads of coal were teemed into each hatch of a vessel but he had to take the word of the foreman trimmer as to whether the holds were full. He remembered that at 7.30 a.m. on Oct. 12 the *Vardulia* had to be moved from the staiths because of her draught of water. She was then, he understood, 60 or 70 tons short of her full cargo. She was brought into the berth again at 10.30 a.m. to finish loading. On that morning, from 6 o'clock to the time when she finished loading shortly after noon, about 130 tons were loaded, all into No. 1 hatch. So far as he knew he did not think No. 2 hatch was opened again.

Mr. FURNESS: Can you help us on this point? So far as we can see no one seems to be in charge of the loading of any ship as a ship. There are gangers in charge of each section of a hold; there are foremen trimmers looking after the loading of a number of ships; there is yourself who has to allocate ships to their berths and say how many trimmers will be required; but there seems to be no one in charge of the loading of each ship.

WITNESS: The chief officer of each ship is in charge of the loading.

Mr. WILLIAM J. NUTTON, surveyor in the Mercantile Marine Department, Board of Trade, said he had calculated the deadweight capacity of the ship at 9116 tons, and the total weight of cargo, bunkers, stores, &c., at 8993 tons. Further calculations showed that when the *Vardulia* entered the North Atlantic winter zone her trim would have altered from three inches by the stern to six inches by the stern; that was on the assumption that bunkers were used from the fore part of the bridge space and feed water from the dry well. Mr. Nutton gave evidence on the calculations of stowage rates for the various classes of coal shipped in the *Vardulia*. The average stowage rate was 45.63 cubic feet per ton.

Mr. O. L. BATESON: On your calculated rates of stowage, all coal cargo put into No. 2 hatch should have gone into the lower hold?—Yes.

That is, so far as space is concerned?—Yes. There were 78,160 cubic feet in the hold, and on my stowage rates the coal put into No. 2 hatch would occupy 73,055 cubic feet.

There would be an empty space?—Yes, about 5105 cubic feet of empty space in No. 2 hold.

In your opinion, could the coal have been trimmed in to the lower hold?—Yes, there was room for all the coal to go in, if it had been trimmed. Mr. Nutton added that Nos. 4 and 5 holds would be well filled by the amounts of coal teemed, and a certain amount left in the 'tween decks. There would be an empty space in the deep tank.

Mr. BATESON: So far as we know, all the coal teemed was got into the deep tank?—Yes.

PROBABLE CAUSES OF LIST 8

Have you any doubt that the *Vardulia* was in a perfectly stable condition when she left West Hartlepool?

—Stable, yes. The ship had a very big margin of stability if the cargo was properly loaded. The list of the *Vardulia* was probably due to unsystematic loading of bunkers and feed water and not to instability.

Mr. BATESON: The SOS message mentions a dangerous list. What are the probable causes of a dangerous list?—Wind pressure, the incursion of water into the hull, or the transverse movement of internal weights.

To what extent could wind heel the *Vardulia*?—Wind of force 10 to 11 would heel the vessel only one to two

degrees, wind of force 12, that is a hurricane, could heel her only four degrees.

Then, so far as wind is concerned, it can be ruled out as a cause of the dangerous list?—With a ship of this stability, yes.

What about the incursion of water into the hull?—I was thinking of water getting in on one side of the ship and wetting the cargo of coal, thus increasing the weight on one side and affecting the trim of the vessel.

Mr. NUTTON said that if a hatchway was stove in sufficient water could get in to cause this. Asked with regard to the transverse movement of internal weights, he said: "I have made some very drastic assumptions to give the Court an idea of what may have happened. I assumed (a) that the coal had moved over and the whole of the empty space in the lower holds had moved to the high side, and (b) I have assumed that coal in the 'tween decks had moved over and the whole of the empty space was on the high side. On assumption (a) I have worked out that the ship might list to 42 degrees; on assumption (b) I make her list 31 degrees. Those are dangerous lists, that is as lists and not as rolling. In 'tween deck ships there is more danger attendant with empty spaces in the holds than in the 'tween decks." Mr. Nutton added that there were two things to consider with empty spaces in the hold: stability was not so good, while the deeper the compartment the more the centre of the weight could shift.

Mr. BATESON: Have you formed any opinion as to the cause of the dangerous listing of the *Vardulia*?—I am inclined to think it was the shifting of coal cargo, though No. 2 hatch might have been stove in and brought about a dangerous list.

Mr. FURNESS: Was the *Vardulia*'s list when she left Hartlepool, taken in conjunction with the presence of empty spaces in the hold, of a serious character?—I do not think a list of 31 degrees is a serious matter. Certainly a ship is better upright, but a ship with that list is all right, provided the cargo is properly stowed.

SHIFTING OF CARGO

Judge RICHARDSON: But supposing the cargo is not properly stowed, would the coal not start to run from the beginning?—It would remain at its normal slope till wind and weather had their effect. The run would be cumulative.

Mr. SPENS pointed out that only a few minutes elapsed between the sending out of the SOS and abandoning of ship, and asked if he would expect a shifting of the cargo to take effect so quickly.

Mr. NUTTON: I should think the ship first took a small list, and that it was gradually increasing. Then she probably tried to turn round and was struck by a sea.

Mr. SPENS: From your experience would it take effect so quickly?—Well, there was the case of the *Usworth*. She had only a slight list, but she met three very heavy seas. She rode over the first two, but the third got her on the starboard bow and knocked her over on her beam ends. The cargo shifted and she came back to a list of 27 degrees and stayed there. There was an increasing list after that, but there was a cargo shift in a few seconds.

Answering Dr. Robb, Mr. NUTTON said a violent rolling might cause coal to run and give the ship a list. There was nothing to suggest that the *Vardulia's* rolling would be violent.

Dr. ROBB: I am suggesting that the effect of rolling has been exaggerated. Do you know that there is a ship on service with the main engines not bolted down? She is a small ship, with twin electric generating engines, each engine weighing 39 tons. The engines were merely floating on springs. That ship has been in service for two years in all sorts of weather, and the engines have stayed where they are. It suggests to me that the effect of rolling motion is possibly exaggerated.

Dr. Robb pointed out that in every one of the 16 voyages which the *Vardulia* had undertaken previous to this with coal cargoes there had been material empty spaces in the holds. He agreed with Mr. Nutton that, apart from the last three of those voyages, No. 2 hatch had always previously been protected by the cattle deck.

Questions submitted by Mr. Bateson on behalf of the Board of Trade to the Commissioner and Assessors numbered 30. These included questions as to whether coal cargo of the *Vardulia* was stowed and trimmed properly, and what, if any, portion of cargo was liable to shift, and what was the cause of the loss of the ship?

Mr. FURNESS said the unions he represented had not instructed him to make any allegations of any kind against the owners. "Is it not possible that this ship was lost by her hatches on the foredeck being stove in? Trouble with hatches is, unfortunately, the reason for the majority of ships being lost at sea," said Mr. Furness. There was evidence that the ship had had previous trouble with her hatches and that she had had to run before a gale for 22 hours. One of the last messages from the *Vardulia*

showed her steering on a course with her stern to the prevailing wind. Did this not point to trouble on the foredeck? Mr. Furness further suggested that if the foredeck ventilators had been unshipped and plugged there might, with a cargo of small coal, be some accumulation of gas which might have led to hatches being dislodged.

As to the vacant space in the holds, Mr. Furness said: "Unless we are to presume that the coal trimming at Hartlepool has been badly done for a long time, we cannot very well assume that that was a very large amount of vacant space in these holds." It was somewhat unsatisfactory that there should be no one person in charge of trimming. He felt there should be rather more executive control over the work of trimmers. From certain evidence, it seemed that small coal of this sort was a somewhat dangerous cargo unless it was stowed very efficiently.

Mr. Spens expressed sympathy with the relatives of the lost crew and said they had done all they could to relieve their immediate suffering. The evidence, he submitted, showed that the owners had done everything possible in respect of maintenance and management of the *Vardulia*. He thought they could consider that the master sailed with his cargo properly stowed, and it was extremely difficult to arrive at any other conclusion than that the *Vardulia's* loss must remain a mystery of the sea.

N.E. COAST STOWAGE RATE

Mr. BATESON said the Board of Trade "have satisfied themselves that the loading of ships on the North East Coast is to some extent proceeding upon a misapprehension. That misapprehension is that those actively engaged in loading cargo have been working upon rates of stowage which, in the view of the technical advisers to the Board of Trade, are quite erroneous. That is the big point which the Board desire to have brought to the notice of the public and the people specially concerned: that stowage of this sort of cargo is not such a simple matter as may have been supposed."

Mr. Bateson suggested that the cause of the disaster might well have been that, after having been hove to, the master had decided to run before the gale. In getting his ship round she had somehow got broached to, was blown over and the cargo shifted to give her a dangerous list. Dealing with the question of trimming, he said officers of any ship must to a very great extent rely upon the trimmers. It appeared that there had been a very grave lack of real supervision.



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THE "VARDULIA" LOSS

Owners Exonerated from
Blame

"A MYSTERY OF THE SEA"

From Our Own Correspondent

SUNDERLAND, Tuesday

The findings in the *Vardulia* inquiry were given to-day by Judge Richardson, sitting as Wreck Commissioner, at Sunderland. He said no possible blame could be attributed to the owners, the Donaldson Line, Ltd., who had made every provision for the safety of the ship which experience could suggest and regulations require. The loss of the *Vardulia* must remain to a large extent a mystery of the sea. The Court made suggestions regarding the stowage and trimming of coal cargoes.

The Court found that the value of the *Vardulia* when she left Manchester was £25,000, and that she was insured for £30,000 on hull and machinery, £2500 on freight, and £550 premium reducing. The general cargo loaded at Manchester of 286 tons 8 cwt. was properly and securely stowed at Hartlepool. The plan of loading was decided by the master, Captain Patterson, and approved by the owners. The master had no specific orders with regard to trimming the cargo, but acted under the general instructions issued by the Donaldson Line. Each of the lower holds was loaded with coal trimmed and stowed in accordance with the usual practice of the port, and therefore there were no abnormal empty spaces.

"Although the Court is aware that one provision of the National Coal Trimming Tariff is that all trimming shall be done under the control and to the satisfaction of the officer in charge of the ship, it appears in this case that the foremen trimmers who should reasonably assist the officer were more concerned with allocating gangs of men to their work than with supervision of the trimming, and that these foremen become concerned with the trimming only on occasions of complaints made by officers. It appears, indeed, that the real supervision of the trimming was carried out only by the charge hands of the various gangs of trimmers. Each charge hand is responsible only for a limited region in the ship and for the period of his shift such supervision is not proper and sufficient and the Court is of the opinion that the foremen should towards the completion of the loading of each compartment be present to exercise responsibility under the officer in charge of the ship."

"A MATTER FOR CONJECTURE"

Answering the question: "What was the cause of the loss of the *Vardulia*?" Judge Richardson said: "The cause of the loss is necessarily a matter for conjecture, and an examination of possible causes is given in an annex to the report. In drawing deductions," he continued, in reading the annex, "it is important to bear in mind, firstly, the severe weather prevailing in that particular region of the North Atlantic at the time of the ship's loss; and, secondly, that the only direct evidence from the ship herself is contained in the last two tragic and somewhat meagre messages sent out in the morning of Oct. 19. It must remain largely a matter of conjecture as to what actually happened on that fatal morning. It must to a large extent necessarily remain a mystery of the sea. The *Vardulia* was a well-found ship, and no possible blame for the disaster can be attributed to the owners. Every provision for the well-being and safety of the ship had been taken that normal experience could suggest or regulations require. Nevertheless, we think that some useful lessons may be gleaned from this disaster."

Commenting on the absence of wireless signals from the *Vardulia* between 4 19 p.m. on Oct. 18 and 6 58 a.m. the next day when she sent out an S O S, the Judge suggested it might well have been that the ship's wireless aerial was brought down by the hurricane and could not be replaced until the morning of Oct. 19. The Danish ship *Oregon* lost her aerial the same night, and it was also noticed that only two vessels appeared to have answered the urgency message sent out by the *Vardulia* at 4 19 p.m. on Oct. 18.

Discussing the question of stowage rates, the Judge said the material consideration was that the figures given in the evidence were stowage rates in trucks at docks and it was to be expected that coal would stow more easily in trucks than in compartments in ships, while jolting would cause the coal to settle down in the trucks. According to the evidence of the trimmers No. 1 hold and 'tween decks, like all the others, were thoroughly trimmed. In fact, however, the coal was not so well stowed there as in the other compartments and the stowage rate of 50.23 cu. ft. per ton for small coal was sufficiently in excess of all the others for small coal to indicate incomplete trimming. "The suggestion of incomplete trimming," the Judge proceeded, "justified as it is by the known fact that loading into No. 1 hold was completed only a short time before the ship sailed on her fatal voyage leads to the inference that complete trimming from the point of view of the trimmer is possibly not perfect trimming from the point of view of those who have to sail with the cargo. The purpose of the evidence regarding stowage rates presented by Mr. Nutton (a Board of Trade expert) was to lead up to the



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conclusion that there were extensive empty spaces in the holds and 'tween decks.

"It is apparent that in ships of the type of the *Vardulia* there must be empty spaces within a coal cargo, since perfect trimming is impracticable. It is not, however, certain that the empty spaces within the hold were as extensive as were indicated by Mr. Nutton. The calculations are based on the assumption that the coals loaded into the *Vardulia* should have been stowed at low rates determined by the measurements of trucks. The objections to those low rates have already been indicated, and on the basis of these objections the Court has rejected the figures presented by Mr. Nutton indicating the extent of the empty spaces within the holds. While rejecting these figures, and stating that there were no abnormal empty spaces within the holds, the Court is, however, of the opinion that a space which under general prevailing conditions may not be abnormal may still be excessive.

SPACES IN THE 'TWEEN DECKS

"The Court has no doubt that there were extensive empty spaces in the 'tween decks. The figures given in the answer to question 10, apart from the figure for No. 1 'tween deck, are based on the harmony between the evidence of the trimmers as to the space occupied and the figures for the actual stowage rates presented by Mr. Nutton. In determining the figure for No. 1 'tween deck the Court has for the reason indicated above rejected the evidence of the trimmers as to the space being completely filled, and in place of that evidence has assumed that the stowage rate for small coal in No. 1 hold and the 'tween deck was nearly the same as for the small coal stowed in other compartments. It is clear that these empty spaces in the 'tween decks occurred in some instances at the ends of quantities of coal left to take up their natural angle of slope between the decks forming the upper and lower boundaries of the space occupied. There is also evidence for the belief that in some instances the empty spaces occurred around quantities of coal dumped approximately in shape of pyramids extending downwards and outwards from the upper deck hatches.

"The Court is of the opinion that such stowage is not satisfactory. It therefore recommends that in cases where compartments cannot be completely filled the top of the coal should be trimmed down approximately level to the exclusion of slopes to sides or ends. This recommendation is made without any implication that shifting of the coal cargo was the cause of the disaster. It is made on the ground that levelling of the top reduces the possibility of shifting and is, therefore, a proper thing to do. As to the provision of shifting boards in cases where there are large empty spaces above cargoes of small coal, such small coal being liable to shift, the Court is not certain that possibilities of shifting do demand this precaution in addition to levelling of the top. The Court does, however, recommend that consideration should be given to this matter by investigation of actual states of cargo on arrival after ocean voyages."

Discussing the possible explanations of the disaster, Judge Richardson referred to the theory developed by Mr. Nutton that the cause of the loss was a heavy list as a result of the shifting of the cargo. "The culmination of the theory," he said, "is that on certain drastic assumptions as to the shifting of cargo, the ship may have taken a list of from 31 to 42 degrees, these figures corresponding to two different assumptions as to distributions of empty spaces. In either case the list is dangerous. Before accepting the figures, it is necessary to note that the word 'drastic' used to describe the assumptions was employed by Mr. Nutton, who himself made the assumptions, and the assumptions as to shift certainly were drastic, too drastic for the basis of a theory as to possible occurrence. Incidentally, more justifiable assumptions as to shift of cargo would appreciably reduce the possible angle of list.

AN ALTERNATIVE THEORY

"It is necessary to consider an alternative theory, namely, that a dangerous list was caused by the influx of water entering an extensive, sparsely filled space in Nos. 2 and 3 'tween decks. A material consideration here is that 'slack water' is a potent factor in the reduction of stability. Mr. Nutton has agreed that a moderate quantity of water entering this large empty space would at once and seriously diminish the stability. Incidentally, an influx of water in that fashion would probably wash some loose coal towards the low side and so aggravate the direct effect of the water.

With this alternative possibility there is no need for drastic assumptions. In endeavouring to assess the probabilities, it is desirable to consider two pieces of evidence. The first of these is the record of the vessel's voyages, showing that between September, 1929, and the fatal voyage in October last the *Vardulia* had made 16 Atlantic crossings from east to west with coal or part coal cargoes and empty spaces in the holds or 'tween decks or both. There is no record of cargo shifting on any of these voyages. The other piece of evidence is that on 14 of these voyages the hatches in the forward well were protected by a cattle deck, the removal of which in May, 1935, was at once followed by uneasiness on the part of the master as to the security of Nos. 1 and 2 hatches. Two voyages made subsequent to the removal of the cattle deck and which gave rise to uneasiness were made during the summer months. The uneasiness of the master as to the security of these hatches

prompted a request for additional precautions, at once conceded and slightly extended by the owners.

ADEQUACY OF REGULATIONS

"Hence, whether the casualty was caused by the shifting of the cargo or by the influx of water through the failure of a hatch or by a combination of both circumstances there is evidence to justify a doubt as to whether the existing regulations are adequate as regards height of platform or more properly in this case the height of the most vulnerable region. In expressing this doubt, due regard has been paid to the fact that published statistics of losses have shown a decrease of danger, but regard has also been paid to the fact that several recent casualties can be ascribed largely to the failure of hatches. These failures have occurred in ships of the same general type as the *Vardulia*.

"In concluding these remarks on the adequacy of existing regulations, it seems desirable to call into question the propriety of the interdependence of freeboard and tonnage regulations to the effect that an extension of space exempted from tonnage should be accompanied by a reduction in the height of the most vulnerable region. In effect the reduction of tonnage in relation to deadweight carrying capacity is accompanied by a reduction in the margin of safety."



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