

SAINT LUCIA

IN THE COURT OF APPEAL

CIVIL APPEAL NO. 4 OF 1998

BETWEEN:

[1] JOHN GODDARD
[2] THERESA GODDARD

Appellants

and

C.O WILLIAMS CONSTRUCTION
[ST. LUCIA] LIMITED

Respondent

Before:

The Hon. Mr. Dennis Byron
The Hon. Mr. Satrohan Singh
The Hon. Mr. Albert Redhead

Chief Justice [Ag.]
Justice of Appeal
Justice of Appeal

Appearances:

Mr. Kenneth Monplaisir, Q.C. , Mr. Mark Maragh
with him for the Appellant
Mr. Michael Gordon for the Respondent

1998: October 28, 29
November 23.

JUDGMENT

REDHEAD J.A.

Appellants are husband and wife. They have their home at Vigie, St. Lucia, in which they reside with their family. In close proximity to their home, the Appellants own three other buildings namely, [1] the married women quarters or barracks - building A – [2] the kitchen block - building B and [3] the toilet block - building C . The appellants' residence is about 3 to 4 feet at its closest point from building A –the barracks.

The respondent who is a Construction Company carried on blasting operations at a quarry at Vigie. The evidence at the trial established that the respondent's quarry is located on the southern side of Vigie Airport runway and the appellants' property, including buildings A, B and C and their residence, is located obliquely to the North of the runway, about 25 feet above the runway and about 1,600 feet from the centre of the quarry. The respondent began blasting operations at their quarry from about 17th May, 1990. The appellants allege that as a result of these blasting operations by the respondent that their buildings at Vigie were severely damaged. As a result on 31st July, 1992 they took out a writ of summons alleging that as a result of the blasting operations carried on by the respondent at its quarry, the respondent wrongfully and negligently caused vibrations to come into the appellants' buildings. As a result the buildings have been damaged by the development of numerous cracks throughout. The appellants by their writ claimed damages for loss and an injunction against the defendant. The appellants in their writ relied on the maxim *res ipsa loquitur*.

The respondent in its defence which was merely of a technical and scientific nature allege that during the blasting operations the defendant used the "scale-distance" formula namely, $V = H D/W - B$ of less than 2 inches .

Where V = particle velocity, inches per second

D = distance to exposure, feet

W = maximum pounds per delay

B = constant

H = constant

Thus achieving a particle velocity of less than 2 inches per second and that such particle velocity is incapable of causing the damage alleged in the Statement of Claim.

The defendant denied that any buildings were damaged by its blasting operations. The matter came before Farara J who in dismissing

the appellant claim, held that the respondent had rebutted the presumption of negligence resulting from the application of the maxim *res ipsa loquitur* and that the appellants had failed to establish that the respondent, in executing the detonations breached its duty of care to the appellants as owners whose property are sufficiently proximate geographically to the quarry or that the respondent was negligent in carrying out the detonations. The learned trial judge also found that the respondent took reasonable care or precautions to avoid causing damage to the appellants' properties.

The appellants have appealed to this court. Five grounds of appeal were filed on behalf of the appellants.

[1] The judgment is unreasonable and cannot be supported having regard to the evidence

[2] The judge erred:-

- (a) In holding that he preferred the evidence of the expert witness, Mr. Taylor on whether blasting could have caused the cracks at the Appellants' buildings A, B and C;
- (b) In deciding that the appellants failed to discharge the burden of proof regarding causation;
- (c) In holding that the appellants failed to prove on a balance of probabilities or by reasonable inference that the respondent's blasting with resulting seismic type forces caused or substantially contributed to the severe cracking at their buildings A, B and C.

[3] The learned judge erred in law and in fact that the appellants failed to establish that the respondent, in executing the detonations, breached its duty of care to the appellants, or that the respondent was negligent in carrying out the said detonations.

- [4] The learned judge erred in law and in fact by failing to consider or adequately consider the following to conclude that the Respondent was negligent in its detonations causing damage to the appellants' property viz:
- (a) The discrepancy in blasting operations
 - (b) That the blasts were diverted towards the runway which is generally in the direction of the appellants' properties
 - (c) Written complaints by the appellants without response from the respondent
 - (d) Evidence by Mr. Goddard of the physical result of the blasting
 - (e) The payment of the appellants by insurers setting a claim for damage to their residence from the respondents blasting operations in 1991
- [5] The learned trial judge erred in law and in fact in failing to take into account or adequately take into account the minor cracks in the building become structural cracks, for months after examination to impute negligence on the part of the respondent for its blasting operations.

The first-named appellant produced in evidence a record of the dates and times of the blasting operations carried out by the respondent. The respondent also produced blasting logs at the trial. The learned judge found that the respondent's blasting logs coincided with all dates given by the first-named appellant for blasting in 1992 except that the respondent had a record of two occurrences on 4th June whereas, the first-named appellant noted 6th June instead.

The record of blasting operations produced by the first-named appellant shows that a total number of 33 blasting operations were carried out from 17th of May 1990 to 28th July, 1992. His record reveals that from 21st May 1991 to 2nd July, 1991 there were five heavy blasting operations and on 9th July, there were two extremely heavy blasting operations and

from 10th July to 28th July he recorded three extremely heavy blasting operations.

The second-named appellant in her testimony before the learned trial judge gave evidence as to the physical manifestations and effects on their property of the vibratory forces created by the blasting at the respondent's quarry and in particular, the blasting operations in 1992.

She supports the first-named appellant in observing cracks at their residence after the blasting commencing in 1990. She stated that when the detonations occurred "we could not keep anything on the shelves, everything would rattle and I could feel the vibrations. The vibrations got worse in 1992".

The learned trial judge in his judgment said that Mrs. Goddard graphically related an incident, which occurred on a particular day in June or July 1992; when she said:

"The entire top of the cliff close to the end where I was mowing caved in leaving me with the lawn mower hanging and I fell back. The lawn mower was over the cliff dangling where it fell out. The section of the cliff that gave away was 8 feet wide by 10 feet deep. About 10 feet from the top to bottom. I don't really know. My son came running and helped me up and took the lawn mower from me. The people across the airport from the hanger came running out of the hanger".

The learned trial judge said of the second named appellant's testimony:

"I have no hesitation in accepting as truthful the second plaintiff's account of this incident, including the uncontradicted fact that the collapse of a section of the cliff occurred immediately upon a blast emanated from the respondent's quarry".

The trial judge also said:-

"In my considered judgment the evidence of the said plaintiff regarding this occurrence is both graphic and illustrative of the effects felt or experienced by the plaintiffs at their residence from detonations at and vibratory forces emanating from the defendant's quarry at Vigie some 1,600 feet away whereby those vibratory forces which are seismic in nature and type, travel like a wave through the runway fill towards or

in the direction of the plaintiffs' properties at Vigie, with a resulting particle velocity at their property which is not negligible or inconsequential"

Three experts, Mr. Gregory George, Mr. Thomas Walcott and Mr. Leon Gordon gave evidence in this matter. The former two on behalf of the appellants and the latter on behalf of the respondent.

Mr. Thomas Walcott a Civil Engineer of 33 years standing was familiar with the appellants' properties at Vigie having visited them in a professional capacity on several occasions prior to 1991.

In 1990 he was requested and carried out a survey of the appellants' residence at Vigie. He testified that the cracks which he saw then were not there prior to 1991.

Mr. Walcott attributed the cracks to seismic impulses caused by blasting operations from the respondent's quarry. In his 1993 report he attributed the severe cracking to building A, B and C to seismic impulse caused by blasting operations at the respondent's quarry. Mr. Walcott gave the number of cracks to Block A as 182 [including 20 cracks at the south elevation of the basement section some as wide as ½ inch] Block B 80 cracks and Block C 28 cracks – a total of 290 cracks. He said that these cracks could only have resulted from shock and vibratory forces. They would be caused by forces similar to earthquake forces measuring about 4 on the Richter scale and would have caused the damage to the appellants' buildings.

The learned trial judge said:

"For my part I do not accept Mr. Walcott's estimation or opinion of the size of force of the blasting at the defendant's quarry necessary to cause the kind of severe cracking and damage at the plaintiff's buildings, even if only 4 on the Richter scale. I regard his opinion on this aspect as unreliable".

Presumably, the learned trial judge found Mr. Wacott's opinion unreliable because the respondent's expert, Mr. Taylor in his report had criticised Mr. Walcott's opinion, on the ground that an earthquake of the

magnitude of 6 on the Richter scale would create energy and ground vibrations substantially more than that associated with the respondent's blasting and would be felt within a radius of 168 miles of its epicentre and would cause building damage encountered at Goddard buildings if they were 33 miles away.

Mr. Walcott in his report as to the cause or source of the damages at buildings A, B and C said as follows:

"Because of the proximity of the quarry area, the only cause for the distress in Blocks A, B and C would be from blasting operations which have taken place".

Mr. Walcott also testified that about the same time he inspected the appellants' buildings A, B and C. He also inspected the Lang [French Embassy] building 750 ft. from the quarry because of complaints of cracks. There he observed extensive and recent cracks similar to the cracks at the appellants' buildings A, B and C, and which he attributed to seismic type impulses, that is blasting operations from the respondent's quarry.

The Windjammer buildings are significantly closer to the respondent's quarry than the appellants' buildings. These buildings were not damaged. Mr. Walcott explained that they were not damaged by the vibratory forces from the detonations at the quarry because of the type of construction. The Windjammer buildings are built of external load bearing walls and reinforced concrete sheer walls with timber floors which he contended is more resistant to horizontal seismic forces of the type which affected buildings A, B and C. In addition he emphasized that the Windjammer buildings sit on an extension of rock out crop at Vigie quarry which provides greater resistance to the vibratory forces than would be provided by the soil strata at the appellants' buildings. This witness also testified that a reinforced concrete building is definitely more resistant to these types of force. The appellants' buildings A, B and C are not reinforced concrete buildings. They are of masonry bricks held together by white lime and mortar.

The learned judge said:

“While I accept that there is a fill between the quarry and the plaintiffs’ buildings which provides less, perhaps significantly less, resistance to the vibratory force emanating from the defendant’s quarry than solid rock substance, I do not on the evidence before me accept that the plaintiffs’ buildings sit on a strata of different type from that of the quarry, or the Windjammer buildings. The preponderance of the expert evidence before me is that they both sit on a solid rock sub strata and I so accept. I also accept that the soil between the quarry and the Windjammer buildings is the same or much the same type as the quarry some 250 feet away, that is solid rock which would provide greater resistance to the vibratory forces caused by detonations at the quarry”.

Yet the learned trial judge seemed “puzzled”, having regard to the evidence that the Windjammer buildings were unaffected by the blasting at Vigie quarry which is about 100 yards away; accepting, as the learned judge did, that the Windjammer buildings are of the type of construction is more resistant to horizontal seismic type forces and they sit on the same solid rock out crop as the quarry; the learned judge found that to be one of the dilemmas in this case.

I make the observation that the learned trial judge said that there was a preponderance of expert evidence before him that both the appellants’ buildings and the Windjammer buildings sit on the [same] solid rock sub-strata and he accepted that. In my view the record does not reveal a preponderance of expert evidence to that effect.

Mr. Walcott in his testimony before the judge said:

“The Windjammer building is sitting on the extension of the quarry which means that the seismic type impulses would get more resistance from the strata on which the Windjammer is sitting than those the plaintiffs’ buildings are and the other buildings so affected”.

Mr. George, the appellants other expert did not deal with this aspect of the matter. In fact he did not make any reference to the windjammer buildings in his testimony.

Mr. Taylor in his evidence said:

"The soil conditions at the Married Women Quarters, the quarry and Windjammer is bed rock. They are all on bed rock".

It is my view, therefore, that Mr. Taylor's testimony is the only evidence which lends support to what the learned judge said:

"The preponderance of the expert evidence before me is that they both sit on a solid rock substrata and I so accept".

Mr. Gregory George the appellants' other expert witness, is a Civil Engineer for over 30 years with a masters degree in Structural Engineering. His bachelors degree included a study of soils and their response to seismological vibrations.

Mr. George inspected the appellants' buildings on numerous occasions from about 1978. He inspected the buildings again in 1990 or 1991. He prepared a report.

He testified that before 1990 the cracking which he referred to in his report was not evident. The cracks which had appeared in 1990 or 1991 in buildings A, B and C when he inspected were not evident when he inspected the buildings previously. He concluded that the cause of the cracking was due to blasting.

Mr. George inspected Mrs. Bailey's building at Vigie about 2 months after he inspected buildings A, B and C. He puts both properties about 1,200 feet from the quarry. He observed cracks at Bailey's and he concluded that the cracks at Bailey's building were due to blasting. He gave as his opinion that "the nature and pattern of the cracks are consistent with vibrations causing stress reversals".

The respondent's expert witness, Mr. Leon Taylor, is a Civil Engineer of some 38 years experience. He holds a masters of Engineering degree in soil mechanics and geotechnics. Over the years he developed "special expertise in seismic response of soils and seismic risk analysis" and has written some 22 papers on the subject.

He examined the appellants' buildings A, B and C some 2 ½ years after the respondent had ceased the blasting operations at its quarry. His testimony in relation to building A was as follows:

"I did not find the same sort of cracking in the basement. The basement was of a somewhat of more substantial construction but there were no cracks of any significance in the basement of building A.

In my opinion if the cracking was due to seismic forces I would expect more significant cracking in the basement but that is a qualified yes.

The cracks I saw in the three buildings were not typical of blasting cracks".

I do not know what Mr. Taylor meant, neither did he explain what he meant by "significant cracking" but Mr. Walcott the appellants' expert said in his uncontroverted evidence in relation to Block A that he found 182 cracks including 20 cracks at the south elevation of the basement section, some as wide as ½ inch.

The evidence reveals that block or building consists of a basement , ground and first floor. It is 224 feet long and 38 feet wide.

Surely 20 cracks in a 224 long building, some half inch wide, must, in my opinion, be considered as significant.

The learned trial judge said in his judgment p.135.

"It is clear to me that Mr. Taylor is uncertain as to the cause or causes of cracking at building A, although he is certain it could not be due to vibrations from blasting at the Vigie quarry".

I find this difficult to comprehend because if he is uncertain as to the cause or causes of the cracks how could he be dogmatic as to what did not cause it. In my view the answer to the problem lies in the opinion which Mr. Taylor gave i.e:-

"In my opinion if the cracking was due to seismic forces I would expect more significant cracking in the basement".

Of which, in my view, there was.

Mr. Taylor gave the reasons for the cracks which he saw in the buildings as oxidation and thermal expansion, both causes disputed by the appellants' experts.

The learned judge in his judgment said:

"He [Taylor] attributes the cause of cracking in building B to oxidation of the imbedded metal hinges for the original doors and windows. In support of this conclusion he offers photos 5,6,7,8 and 9. These show horizontal cracks in the area of the window and door openings where there are metal inserts and two instances where bricks at a door opening were crushed or broken."

This witness went on to explain that there is both upward and downward force being exerted as a result of the oxidation of the metal which will manifest itself at the weakest point in the structure. An opening like an arch window or door provides a point of least resistance where cracking is likely to occur.

The learned judge accepted this evidence as accurate. He said:

"I accept as accurate and representative of metal inserts at the openings of the kitchen building as observed by Mr. Taylor in January, 1995. The metal inserts in the brick at the points where cracking has occurred in building B is clearly visible in those photographs. It cannot be sheer coincidence that cracking has occurred in the building predominantly, if not only, where those inserts are or were in the brick work."

Mr. Walcott, the appellants' expert said in evidence:

"There was steel in the vicinity of the cracks in the kitchen building. Those cracks were not caused by oxidation of that steel. The steel is not reinforced steel. It is a steel to hold hinges. They were about ½ inch thick by two inches by five inches long. They are flat iron". I have recently examined those steel about a week ago. When I saw them a week ago they were not in the same condition as when I inspected them in 1993 for the giving of my report. They had deteriorated because of the weather. They deteriorated because there were cracks which allowed the weather to attack the steel causing scale to build upon them.

When the steel is attacked by the weather it gets rust and the scale grows on it and in tends to expand. **This was as a result of the cracking exposing the steel**". [my emphasis].

Mr. George, the appellants' expert witness said:

"The steel was not reinforcing steel. It was holding the frame into the windows.

A metal exposed to the atmosphere would oxidize and expand. Given the way the steel plates were imbedded in the block work, it is not possible for them to have expanded and cause the kind of damage which I observed.

At the time of inspection in 1992 I did observe the steel plates. I looked at them closely. I last looked at those steel plates last Friday, 5th December, 1997. They were not in the same condition as in 1992 when I did my examination. They were oxidized and some of them were almost 1 inch thick from the thickness of 3/16. The vertical cracks opened up in the plane of those anchors and exposed them to weather conditions for rusting and oxidation.

One of the reasons I believe for the cracking in that plate is that the horizontal cross section is nearest at the point where the anchors were imbedded".

This testimony is in my view to the same effect as that of the other expert, Walcott. As I understand the testimony of both experts there were cracks, as a result of those cracks the steel was exposed, water got to the exposed steel and as a result there was oxidation. So which came first, the cracks or the oxidation? In my view the cracks come first, having regard to the State of the evidence and also to the judges finding when he said:

"I therefore accept as a fact that the plaintiffs' residence did develop cracks in 1991 and new cracks in 1992".

And later he said:

"As regards the evidence of Ms.Lettie Frank shown in photo 20 taken in 1995, I accept the evidence of the first plaintiff and find as a fact that some cracks did appear in that building after 10th April, 1992".

This building is immediately across the road from the Appellants' residence and approximately 1,600 feet from the quarry.

Finally, on this aspect of the matter the learned trial judge said:

"Further, from the evidence of the first plaintiff it appears that it is only after the heavy blasting in 1992 that he noticed severe cracks in buildings A, B and C. This is supported by the testimony of

Lyndell Gordon who, up to inspection of 3rd April, 1992 did not notice severe cracking and sheering at the Married Women Quarters, although he did notice some cracking due to oxidation of the metal inserts”.

It must be borne in mind that Mr. George, the appellants’ expert said in his testimony:-

“Before I inspected the buildings in 1992 I had been up to that site on numerous occasions over a long time say from about 1978. On these occasions I had a look at these buildings. Before 1990 the cracking I observed in my report was not evident to me. The cracks are very very bad. The buildings are all cracked up”.

Mr. Walcott said:

“I visited the plaintiffs’ property at Vigie on several occasions prior to 1991. On these occasions I had cause to look at the buildings. The cracks which are the subject matter of my report were not there prior to 1991”.....

When I inspected the residence, the cracks to buildings A, B and C in my report were not obvious to me at that time”.

It must also be borne in mind that Mr. Taylor examined the buildings as late as 1995.

I shall return to this issue later in the judgment.

Mr. Taylor gives another cause for the cracking internal expansion, In his evidence he said:-

“.....the floor of the veranda is exposed to direct sunlight and temperatures of up to 100 F in the day and a little below 70°F at nights – a temperature fluctuation of 30° to 40° F with the metal beams of a significantly higher co-efficient of thermal expansion than the masonry bricks, they would create forces on the masonry, walls and produced cracking”.

The learned trial judge observed that:-

“These are the same cracks said by Mr. Taylor to be due to oxidation of the steel “I” beams. As I understand it Mr. Taylor is saying that all four [4] causes have been affecting building A but to different degrees”.

Both of the appellants' experts have dismissed Mr. Taylor's theory that thermal expansion could have been the cause of the cracking.

Mr. Walcott said:

"I do not believe that it is correct to say that the cracking was caused by "thermal expansion and contraction along the east/west axis from the central stair well".

I say this because those buildings by their very nature are very cool buildings so the tendency for thermal expansion suggests that heat would be affecting them. This is not so. The type of brick structure is low conductivity so heat would not be a problem at all.

Generally speaking, in St. Lucia thermal expansion in building is not a major consideration. Even [with] variation in temperatures in the tropics, you do not design for thermal expansion"

Mr. George in his evidence said:

"I don't agree it [cracking] was caused by thermal expansion and contraction because we do not have the temperature difference and the material in the building is brick".

The record reveals that by 1995 the buildings had been in existence for some 93 years. It is accepted that up to 1990 prior to the respondent commencing its blasting operations at the quarry that there were no cracks, thermal expansion could not have caused any cracks. It could then be safely assumed, there was no thermal expansion up to that time. Why then suddenly after 1990 there is thermal expansion?

The evidence reveals that the buildings as the learned trial judge puts it, were in a state of neglect or derelict condition with no roofs internal floors or windows and unoccupied.

Mr. Taylor of course ascribed the cracking to aging lack of maintenance and weathering. He testified that the cracks he saw on the appellants' buildings were not typical of blasting cracks but were of weathering. He produced in evidence a publication, **Blasting, Damage AND Other Structural Cracking** to support his contention. On page 63 of that publication which he referred to, there is a sketch. That sketch was meant to show the typical cracks in weathering condition. However, in

cross-examination Mr. Taylor admitted that the sketch shows cracks to plaster and were not structural.

Finally as the learned trial judge said there has been, amongst the expert testimony in this case, much discussion about the scale distance formula relied on by the respondent in its pleaded defence. The reliability of that format today, it having been revised around 1974, its effectiveness in predicting with some degree of certainty the particle velocity at a particular point away from the detonation, its reliability in producing a particle velocity of 2 inch per second or less as a criteria for ensuring no damage to residential buildings, and in particular, its application to buildings of the type of the constructions as the appellants buildings A, B and C.

Both of the appellants' experts say that the scale distance formula and particle velocity of 2 inches per second is unreliable and it is based upon certain assumptions and should not be used alone.

Mr. George in his testimony said that the figure of 2 inches per second come from the U.S Bureau of mines studies. The U.S Bureau of mines studies does not adhere to that figure of 2 inches per second from about 1974. The literature shows that these figures do not cover bricks or high rise buildings. He said in his opinion it is not safe to rely on the figure of 2 inches per second when blasting in relatively close proximity to buildings constructed of brick. The only thing that is recommended to accurately judge the effect of a blast on a building is to measure at the site of the blast using instruments.

Mr. Walcott testified that he has studied theories on blasting vibrations and he is familiar with the "scale distance" formula.

He said:

"That figure of 2 inches per second is not accepted today. That figure came from some source in the U.S.A pre 1974. It was a study carried out in one of the states. I have it here! It came from the Bureau of mines. The figure of 2 inches per second came from that report. The tests done to arrive at that figure of 2 inches per second were carried out on bungalow and 2 storey wooden frame

buildings. The other countries of the world do not accept 2 inches per second as their standard. It is a much lower figure. This document shows that other countries use a much lower figure. Australia for example use three different standards depending upon the type of soil. In 1974 the figure of 2 inches per second was under scrutiny. From my research that figure was questioned because from my actual blasting experience it was found that the figure was not reliable and that a lower figure was more realistic. When I say unreliable there were certain perimeters which were not established by instrumentation which were used in the formula under consideration. The figure of 2 inches per second was still resulting in damages to buildings.....

The figure of 2 inches per second is based upon assumption. That is the reason for its unreliability."

It is my view that Mr. Taylor did not deal in his evidence in Chief with the aspect of a particle velocity of 2 inches per second which is estimated by using the scale distance formula.

He said in cross-examination:-

" The formula $[d/w]^{1/2}$ is used to determine the scale distance that it is safe to blast. Nobody uses the formula to calculate. The formula allows you to estimate the safe distance from a particular building **where the probability of achieving a particle velocity of 2 inches per second is very, very small.** Nobody uses the formula looking for K and M for the reason stated at page 334 of the article on "Explosive and Rock Blasting". [my emphasis].

This evidence in my view can hardly be regarded as challenging or contradicting the clear and unambiguous testimony and opinion given by Mr. George that it is not safe to rely on the figure of 2 inches per second when blasting in relatively close proximity to buildings constructed of bricks. And that the research on which that figure is based does not apply to that type of buildings as the appellants

Also the testimony of Mr. Walcott who said that the figure of 2 inches per second is not accepted today. And that the test done to arrive at 2 inches per second were carried out on bungalow and 2 storey wooden frame buildings.

Having perused the record very closely, I am of the view that the appellants' experts evidence to the effect that it is not safe to rely on a

figure of 2 inches per second when blasting in relative close proximity to buildings constructed of brick remains uncontraverted .

The learned trial judge after "agonising" at length over the issue in this case concluded that:-

"On the one hand there is severe structural damage to the plaintiffs' buildings A, B and C and acceptable evidence of the actual effects felt by the plaintiffs at their house when blasting have occurred as well as some evidence of the cracks at the buildings at Vigie either closer to or about the same distance as the plaintiffs' buildings away from the quarry. On the other hand the defendant's blasting logs show "conservatives" blasting during the period under review well below the recommended weight of charge using the scale distance formula [even with the 1974 re-examination of that formula and any charges to the recommended safe level for blasting in or close to residential area], with the use of the sequence timer machine so as to eliminate or reduce the likelihood of reinforcement of vibrations coupled with the absence of any damage due to vibrations, at the Windjammer buildings 100 feet away from the blasts and no evidence of any adverse effects at the boatyard less than 200 feet away".

Mr. Monplaisir, learned Senior Counsel, for the appellants argued that the learned trial judge in arriving at his conclusion failed to balance Mr. Taylor's evidence with the preponderance of evidence in favour of the appellants. In my view not only did he fail to balance Mr. Taylor's evidence against the preponderance of evidence in favour of the appellants but also he failed to give consideration to the uncontroverted evidence given on behalf of the appellants by their experts that it is not safe to conduct blasting relatively close to buildings constructed of brick using the 2 inches per second formula.

The evidence reveals that blasting logs were missing for 1991 and 1992 and of those that were produced some did not show the maximum weight of charge used per delay interval.

The learned trial judge said:

"I have no reason to doubt the accuracy of the dates and times noted by the first plaintiff..... of the dates given by the first plaintiff, the defendant has produced no blasting logs for two of those occurrences on 7th February, or occurrences on 12th February, of

the one occurrence on 22nd March on the two occurrences on 21st May or the one occurrence on 2nd July 1991”

The first-named appellant in his record noted that on 21st May and 2nd July, 1992 there were heavy blasts.

Continuing the learned judge said:-

“The defendant blasting logs coincide with all dates given by the first plaintiff for blasting in 1992 of the blasting logs produced by the defendant two [9th and 10th July bear no record of the maximum size of the charge used per delay interval or the total size of the charge allowable per delay period and no log for 14th July the maximum size of charge used per delay period is written in pencil as 20lbs, while the rest of the document was completed in red ink”.

The first-named appellant has noted that on 10th July extremely heavy blasting [missing log] and on 14th July extremely heavy blasting [written in pencil]. Having regard to the State of the respondent's, logs, I have great doubt that the learned trial judge took into consideration the missing logs and the failure to note the size of the maximum charge on 9th and 10th July, 1992. If he did I am doubtful that he could have found that the defendants blasting logs show “conservative” blasting during the period under review well below the recommended weight.

Mr. Monplaisir, Queen's Counsel, argued that the absence of the logs and the failure to note the maximum charge used is significant. I agree that it is significant when viewed against the background of the first-named appellant's record which the judge found to be accurate.

I make the observation that the learned trial judge was also influenced in his conclusion that there was no evidence of any adverse effects at the boatyard less than 200 feet away.

The learned trial judge seems to have used the lack of that evidence to weigh in the balance in favour of the respondent. This in my view he is not allowed to do because there is no evidence one way or the other. In other words there may have been an adverse effect or there may not have been, simply there is no evidence.

The learned trial judge having accepted that some vibratory forces from blasting at the Vigie quarry during the relevant period did result in some particle velocity at the appellants' buildings A, B and C however, he did not on the state of the evidence find that the appellants had proved on a balance of probabilities or by reasonable inference that the respondent's blasting with resulting seismic type forces caused or substantially contributed to the severe cracking at the buildings A, B and C.

In **Northrock Ltd v Jardine** 1992 44 W.I.R. 160 at page 168

"Floissac C.J. said:

"With regard to proof of causation, it is well established that damage suffered by the plaintiff will be held to have been caused by the defendant's negligence if the plaintiff proves on a balance of probabilities or by reasonable inference that the negligence substantially contributed to the damages or the risk or danger thereof. Such negligence may either operate alone or concurrently or successively with other factors and in such a manner to form a component of one compound or cumulative causes....."

The evidence adduced by the appellants is that prior to 1990 their buildings A, B and C, notwithstanding their state of disrepair, were free from cracks. The respondent commenced its blasting operations in or about 17th May, 1990. Thereafter cracks began to appear in their buildings and the other neighbouring buildings, the long building, the Lettie Frank resident which were all free from cracks prior to the date of the commencement of the blasting operations. In addition the appellants gave testimony of the physical effects, the vibrations of the buildings when the blasting took place, the experience of the second-named appellant when she was mowing her lawn all of which were accepted by the learned trial judge as factually correct.

In my judgment there is sufficient factual basis from which it could and should be reasonably inferred that these cracks occurred as a result of the respondent blasting operations, or that the appellants have

established on a balance of probabilities by the evidence that the cracks were as a result of the respondent blasting operations.

In my view the fact that the Windjammer buildings were not damaged does not in any way deprive the appellants of that proof or result in the inference not being drawn that the blasting operations caused the cracks in the appellants buildings. The appellants' buildings are of a different structure to that of Windjammer buildings and from the evidence it is established that the Windjammer buildings are less likely to suffer the kind of damage the other buildings suffered.

The appellants in their pleadings rely on the maxim *res ipsa loquitur*. Mr. Gordon learned Counsel for the respondent argued that *res ipsa loquitur* is not applicable in this case as the appellants in their statement of claim pleaded that as a result of blasting operations carried on by the respondent the respondent wrongfully and negligently caused vibrations to come into the appellants' buildings.

He referred to Charlesworth and Percy on negligence at 5-102 the learned authors wrote:-

"The maxim is not a rule of law; it merely describes a state of evidence from which it was proper to draw an inference of negligence. It is "no more than a rule of evidence affecting onus. It is based on common-sense, and its purpose is to enable justice to be done when the facts bearing on causation and on the care exercised by the defendant are at the outset unknown to the plaintiff and ought to be with the knowledge of the defendant".

In Halsbury Laws of England [Fourth Edition] Vol. 34 paragraph 57 reads as follows:

"Under the doctrine *res ipsa loquitur* a plaintiff establishes a *prima facie* case of negligence where [1] it is not possible for him to prove precisely what was the relevant act or omission which set in train events leading to the incident, and [2] on the evidence as it stands at the relevant time it is more likely than not that the effective cause of the accident was some act or omission of the defendant or of someone for whom the defendant is responsible, which act or omission constitutes a failure to take proper care for the plaintiff's safety. There must be reasonable evidence of negligence. However, where the thing which causes the accident is shown to be

under the management of the defendant or his employees, and the accident is such as in the ordinary course of things does not happen if those who have the management use proper care, it affords reasonable evidence in the absence of explanation, by the defendant, that the accident arose from want of care”.

The fact that the appellants allege in their pleadings that the respondent carried on blasting operations and wrongfully caused vibrations to come into their buildings does not mean that these facts are bearing on causation and the care exercised by the respondent was at the outset unknown to the appellants and ought to be within the knowledge of the respondent.

I do hold therefore that plea *res ipsa loquitur* is applicable in this case. Has the respondent rebutted the presumption allegation of negligence? The learned trial judge in dealing with the issue of negligence said that the respondent produced cogent evidence in the expert witness of Taylor as to the cause of the cracking at the appellants buildings other than vibratory forces caused by detonations at the Vigie quarry. The judge also found that there was uncontroverted evidence of the method or technique employed in executing the detonations and the respondent following the guidelines and standard in the industry were strong evidence in favour of the respondent not being negligent in executing the detonations.

I have dealt with these issues, however, I shall reiterate that there is uncontroverted evidence that a particle velocity of 2 inches per second as a standard for ensuring safe blasting does not apply to brick buildings and that the figure is not now adhered to in the industry. This would therefore not be an acceptable guideline and standard in the industry. There would be no strong evidence in favour of the respondent not being negligent. The respondent has failed to rebut the presumption of negligence.

The first-named appellant wrote on more than one occasion, to the respondent complaining that blasting operations were posing a danger to life limbs and continuing the damages to his property. One such letter

was written on 21st July, 1992 with no response from the respondent. Although as Mr. Monplaisir put it, it is not absolutely correct to say there was no response because there was "response" with a bigger blast. Indeed the first-named appellant's record for 28th July, 1992, 7 days after the letter was written, noted heavy blasting.

In my view the respondent having being put on notice failed to visit and inspect the appellants' buildings to ensure that his operations were not causing damage to the appellants' buildings. Even if up to that point the respondent thought it was using a safe system, having regard to the close proximity of the appellants' buildings to its operations and having regard to the complaints that were made to it, a failure to inspect the appellants' buildings and to ensure that its operations were not damaging the appellants' buildings were tantamount to a failure to take reasonable care that its operations were not injuring the appellants, in that regard the respondent was negligent.

Having regard to the foregoing I would set aside the judgment of the learned trial judge and enter judgment for the appellants in the sum of **\$880,000.00** which was assessed by the learned trial judge and from which there is no challenge.

Costs to the appellants to be taxed if not agreed in this court and the court below.

ALBERT J REDHEAD
Justice of Appeal

DENNIS BYRON
Chief Justice [Ag.]

SATROHAN SINGH
Justice of Appeal