JAMAICA

IN THE COURT OF APPEAL

SUPREME COURT CIVIL APPEAL NO: 15/95

BEFORE: THE HON MR JUSTICE CAREY, J A
THE HON MR JUSTICE DOWNER, J A
THE HON MR JUSTICE PATTERSON, J A

BETWEEN	ALCOA MINERALS OF JAMAICA INCORPORATED	APPELLANT
AND	HERBERT BRODERICK	RESPONDENT

22th, 23rd, 24th, 25th January
18th, 19th, 20th, 21st, March
& 11th November, 1996

Emil George, Q.C., John Vassell & Lance Cowan for Appellant

Mrs. Margaret Forte, Q.C., Maurice Frankson & Miss Alayne Frankson for Respondent

CAREY, J A

Mr. Broderick who is a carpenter, mason and Pastor of his Church, lives in Hayes, Clarendon, within a 11/2 mile radius of the appellant's Alumina plant. Since 1975 he has been living at that site, where, in 1973, he built a home, the roof of which was constructed of galvanized zinc sheets. Shortly before this, in 1972, the plant had gone into operation and Mr. Broderick worked there until 1982. In that same year he had to effect repairs to the entire roof and ceiling

because the zinc sheets developed rust holes, through which the rain descended onto the plyboard ceiling and the lathes to which the ceiling was attached. He was also forced to repair the walls to hide discolouration caused by the action of rainwater. He attributed this damage to his home to emissions from the plant's smoke stacks. His health and comfort, he claimed, were affected by a malodorous stench from the appellant's mudlakes but he did not suggest in what respect he suffered in health. He brought an action against the appellant claiming damages for nuisance and sought a mandatory injunction restraining the appellant from maintaining the nuisance.

The appellant at trial, put the plaintiff to proof and called a sole witness, Dr. Carlton Davis chairman of the Board of Clarendon Alumina Partners and chairman of the Jamaica Bauxite Institute. He spoke to the efforts of the appellant to reduce pollution whether by dust, noise or odours and its concern for the environment, manifested by the vast sums of money expended to improve it.

Theobalds J entered judgment in favour of Mr. Broderick in the sum of $938,400 with costs and granted a mandatory injunction allowing the appellant six months in which "to complete the necessary structural adjustments in order to eliminate the nuisance."

Before us, as indeed before the trial judge, the appellant argued that there was no causal connection between the damage the respondent claimed he had suffered and the appellant's operations at its alumina plant. He put his

argument in this way - the respondent could have no ground for complaint of premature corrosion of his zinc roofing when that roofing lasted between 7 - 9 years. The evidence of the life span of 0.7 Galvan zinc is approximately 7 years. Among the substances found on the roof were sulphate deposits which it was shown, was the result of the burning of bunker C oil which was used by the appellant but was also used by other factories in the area and by diesel vehicles operating on the roads around. The sulphate deposits also could be caused by the burning of cane during the reaping process. If it was being suggested that the sulphates emanated from a number of sources, then all the damage caused to the respondent could not be placed at the door of the appellant: each party would be responsible for his own damage. On this point reliance was placed on the views of the learned editors of **Clerk & Lindsell on Torts** (16th edition) at p. 179 paragraph 2-53 and on **Bank View Mill v. Nelson Corp** [1942] 2 All E.R. 477.

On the issue of liability, Mrs. Forte, Q.C., on behalf of the respondent submitted that the respondent had discharged the onus of proving that the appellant's emissions caused or materially contributed to the damage to the respondent's roof. She found support in **Bonnington Castings Ltd v. Wardlaw** [1956] A.C. 613 and **McGhee v. National Coal Board** [1972] 3 All E.R. 1008. She pointed to the evidence of Mr. Tewari, a retired Chief Plant Quarantine Inspector in the Ministry of Agriculture who owns premises in proximity to the appellant's plant. He said that the premises were there from 1941 when zinc

roofing was in place. In 1971 he extended the premises by some 1200 square feet. Ten years later, he made further additions. At that time, in raising the height of the roof, he removed zinc sheets but saw no defects with regard to the zinc save for nail holes in them. That evidence would tend to show that the other elements suggested as other sources of pollutants were having no effect on roofs in the area of the plant. After 1988, Mr. Tewari said, he experienced leaks which were never a problem prior to that time. Learned Queen's Counsel further pointed to the evidence of the whereabouts of other factories in the area There was the Jamaica Public Service Plant at Old Harbour some 13 miles from Hayes, the Monymusk Sugar Factory some 5 miles away, the New Yarmouth Sugar Factory, about 3-4 miles away. The sugar factories had been in existence since 1948 for the latter, while the former started up in 1950. Another factory included, was the West Indies Pulp and Paper Factory which was situated a distance of between 10 to 11 miles from Hayes.

In effect, learned Queen's Counsel for the respondent contended that the occupants of houses who lived in close proximity and gave evidence on his behalf, all testified to the same effect. The point of their evidence was that the damage to their roofs occurred subsequent to the commencement of operations by the appellant's plant in 1975. It was plain that the learned judge accepted these persons as witnesses of truth. It was also clear that the appellant's counsel did not challenge in his arguments the veracity or credit of these witnesses but argued that the evidence adduced on behalf of the respondent did

not establish a causal connection between emissions from the appellant's factory and the damage suffered by the respondent. That presents a point of law, not a question of fact for decision. In other words the question for this court is whether the plaintiff proved actionable nuisance.

The respondent, it was agreed on all sides, had the burden of showing that the appellant so operated its alumina plant, that it caused damage to the respondent's roof. The essence of nuisance is an activity which unduly interferes with the use or enjoyment of land and it is no answer for the appellant to say that he conducted his operations using the most modern methods available and could do no more. As **Bone v Seale** [1975] 1 All E R 787 illustrates, that riposte is not enough to acquit the appellant of liability where he has created and continued the nuisance. In the instant case, the main thrust of the appellant's submission was that liability depended on the efficacy of the expert evidence seeing that this was a scientific case and the commonsense test of causation adumbrated by Lord Salmon in **Alphacell Ltd v Woodward** [1972] 2 All E.R. 475 at 498, 490 was not applicable to a case of this nature. The learned Law Lord put it this way:

> "The nature of causation has been discussed by many eminent philosophers and also by a number of learned judges in the past. I consider, however, that what or who has caused a certain event to occur is essentially a practical question of fact which can best be answered by ordinary common sense rather than abstract metaphysical theory."

With all respect to the submissions forcefully made both by Mr. George, Q. C. and Mr. Vassell on behalf of the appellant, and bearing in mind the above dictum the test of causation remains the same whatever the nature of the claim. The dictum is both good sense and good law. The factors causing damage do not call for theoretical analysis but for the application of commonsense informed by accurate information. The tribunal of fact which is obliged to make the decision is hardly ever an expert in the particular field. At one time, it was a jury which decided the matter, a jury of lay persons, not experts. So long as the tribunal understands and can appreciate the evidence of the several experts, it then becomes a question of the application of commonsense by the tribunal to the facts provided to it.

I have previously ventured what I understood was the effect of the evidence of the witnesses for the respondent, I turn then to examine the expert evidence adduced in support of the respondent's case. Noel Gaunlett, a civil engineer who was called, did provide some evidence which perhaps could assist in demonstrating any causal link between the damage and the operations of the appellant's plant. He said he visited the respondent's home in 1989 and observed that the roof was extensively corroded. Four years later when he paid another visit he was alarmed by the deterioration in the condition of the zinc sheets which previously had been in good condition. Mr. Gauntlett never himself carried out any tests nor did he identify the white residue florescence he observed on the zinc sheets. Lena Whyte, a metallurgist at the Bureau of

Standards also visited the respondent's house where she examined the roof and took samples of a sheet of zinc. She also saw white rust on the zinc sheets. That material was doubtless what Mr. Gauntlett also noticed on the zinc sheets. The samples of zinc which were of the respondent's roof, were corroded. Bunker C oil which is burnt in the appellant's plant is also used by Jamaica Public Service Company in generating electricity. This oil contains sulphur which is transformed into sulphur dioxide and sulphur trioxide and these react to form sulphuric acid, a highly corrosive agent especially in liquid form. She expressed the view that the environment in which the respondent's house was situated, was an industrial environment giving off chemical fumes. She said this, which is, I think, most relevant:

> "If Broderick had to change his zinc so frequently it implies some compound or elements in the surrounding atmosphere causing the zinc to deteriorate. Given the environment that is proximity of plant and mudlakes it is likely that there would be an appreciable concentration of sulphate ions chloride ions and a caustic environment that would be able to react corrosively with the zinc in solution. These ions would react on the galvanize coating on steel sheet better known as zinc."

It would be remiss if I did not remark on the fact that she also said that she did not discover metallurgical factors in the exhibits which could identify the corrosive agents. Another metallurgist Mr. Dorr Campbell found that the sample of zinc taken from the respondent's roof showed areas where the zinc coating

had been depleted and the exposed steel had started to rust. He theorized that assuming bunker C oil was used and gases emitted into the atmosphere and condensed, the resulting rain with its acid content would fall on roofs and accelerate the degradation of the zinc. Other significant evidence from this expert was that the zinc sheets of the respondent showed they had been used in an aggressive environment, i.e. an industrial or marine environment and he would not expect leaking in 7 years under normal non-aggressive conditions. A Senior Standards Scientific Officer at the Jamaica Bureau Miss Arnella McFarlane tested for sulphate. She found sulphate on the respondent's zinc sample.

The sum of all that evidence suggests to me that the burden on the respondent to prove the causal connection between the damage to his house and the emission from the appellant's plant, has been discharged. The nearest plant to the respondent's home was the appellant's. Prior to the arrival of the appellant's plant, no evidence was had to show that there was any cause for complaint by adjoining land owners. It is not without significance that the other plants which the evidence shows use bunker C oil, are some distance away from Hayes. It would seem to me that the evidence was overwhelming that the appellant's plant is responsible for the damage to the respondent's roof. It was argued by the appellant that this was not a "commonsense case" but a "technological case." Pollution does involve technological or some scientific knowledge but the level of that knowledge I am inclined to think is not beyond

the ken of the ordinary reasonable person who can then apply the knowledge with commonsense.

The matter can be looked at in this way. The appellant's plant generates pollutants via its smoke stacks. These pollutants fall on the roofs of houses in the vicinity and cause corrosion. So much for scientific knowledge. I was not impressed by that submission. I do not for a moment suggest that the case is as simplistic as this but it illustrates the point I wish to make that really there is nothing so scientific about the case that it requires only a scientist to understand and to decide it. Nothing could be further from the reality of it all.

Because there was evidence that other plants, albeit further distant from the respondent's house also emitted sulphates, it was said that the respondent had to show what damage was caused by each of those sources of pollution. Since it was not scientifically possible to prove this, therefore the respondent had failed to prove his case which, accordingly, should be dismissed.

There really was no evidence before the court that sulphates from other sources than the appellant's caused the damage to the respondent's roof. What the evidence showed was that sulphates were found on the roof. Sulphates are derived from factories or plants using bunker C oil. Plants, other than the appellant's, use bunker C oil. Ergo, these other sources caused damage as, did the appellant's. In reality, the evidence only showed that other plants <u>could have</u> contributed not <u>must have</u> contributed. The onus on the respondent was to show that on a balance of probabilities, the appellant's plant caused or

contributed to the damage to the roof. From the fact of the distance of the other plants and from the fact that complaints began to be voiced after the coming into operation of the appellant's plant, I am satisfied that the burden on the respondent was discharged.

The evidence as I see it, does not show separate tortfeasors producing different damage or for that matter the same damage. Nor is there any evidence that the harm was caused by the independent acts of several plants. The law seems to be that the court will attempt to ascertain the respective contributions to the harm made by each, and failing that, the court would apportion the loss equally between them. **Bank View Mills Ltd v Nelson Corporation** [1942] 2 All E R 477. For the reasons earlier adumbrated the evidence showed a causal connection between the appellant's plant and the damage to the respondent's roof. It is not therefore necessary to examine these considerations further in order to make a determination as to liability in the instant appeal.

The appellant also challenged the judge's assessment of damages in the following ground of appeal.

> "4. That the learned trial judge failed to apply proper principles or to have regard to all the evidence and came to an erroneous assessment of the Plaintiff's loss in the sum of $938,400.00."

A curious argument was advanced by Mr. George, Q.C. in this ground. He said that since there was evidence that the sulphate deposits which was the cause of the damage could have emanated from a number of sources, it was wrong to

put all the damage on the appellant. There was nothing to prevent the appellant if he thought that other parties had contributed to the respondent's loss to apply to join such parties and claim contribution from them. The only party before the court was the appellant. It is its liability in respect of which an adjudication was required. Apportionment of blame could not possibly be considered in the absence of parties and evidence in that regard. I do not think I need say further with regard to that plea ad misericordiam.

I can therefore turn to consider the submissions of substance advanced on this ground of appeal. Learned Queen's Counsel referred us to the evidence of Mr. Arnold Whyte, a building surveyor employed to the KSAC. He had some 37 years of experience in the building industry. He inspected the respondent's premises in 1989 which he found had a floor area of 1564 square feet. With respect to the roofing his examination revealed:

> "... all zinc rusty holes and white spots from the ridge of the roof to the end of the sheets at the eve sheets rusty and disintegrated. Rusty holes on outside of sheets. The top half of outside walls had a light rust colour in portions caused from storm water."

Mr. George Q.C., was very critical of Mr. Whyte. He pointed out that the witness measured the floor area, he did not count the number of sheets of zinc which would be required to effect the repairs. The costing he arrived at, covered repairs to the entire house. He complained that the surveyor had not taken account of damage caused by storm water from hurricane Gilbert's passage

which had ravaged the island the year before his visit, and further he had taken into account factors other than corrosion in his estimate of cost. The learned judge, he said, had assessed damages on the basis of prices prevailing at the trial rather than at the time the loss occurred. The reason for the delay in repairing the damage given by the respondent was impecuniosity. Pinning his flag to the mast of **Liesbosch, Dredger (Owners) v. Owners of Steamship Edison** [1933] A.C. 449 Queen's Counsel reminded us that impecuniosity was a misfortune not a privilege and the appellant should not be asked to pay higher damages for his misfortune.

I think this argument about impecuniosity is founded upon a misconception of what **Liesbosch** decided. In that case, what the owners were seeking to recover was the added cost of hiring another dredger after much delay because of their straitened circumstances. But for their financial embarrassment, they could have replaced the **Liesbosch** at a moderate price and within a comparatively short time. Lord Wright in whose opinion all the other Law Lords concurred, pointed out at page 460 that :

> "... the appellants' actual loss in so far as it was due to their impecuniosity arose from that impecuniosity as a separate and concurrent cause, extraneous to and distinct in character from the tort; the impecuniosity was not traceable to the respondent's act, and in my opinion was outside the legal purview of the consequences of these acts."

The learned Law Lord also made it clear that there was a decided difference between remoteness of damage which was the principle at issue in the case and the duty on a plaintiff to mitigate his loss. Mr. George Q.C. was not by any manner or means suggesting that the claim for replacing the roof or other damage caused to his house was too remote. In my opinion, the time at which damages are to be assessed is not at all concerned with the victim's ability to minimize loss. The plaintiff is entitled to have his house restored to the condition it was, prior to the damage. The date at which such assessment is to take place will depend on all the circumstances but against a compensatory grund norm.

In this regard **Dodd Properties (Kent) Ltd v. Canterbury City Council** [1980] 1 All E.R. 928 is helpful. Megaw L J observed at page 935:

> "The general principle, referred to in many authorities, has recently been recognized by Lord Wilberforce in **Miliangos v George Frank (Textiles) Ltd** [1975] 3 All ER 801-813 [1976] AC at 468, namely that 'as a general rule in English law damages for tort or for breach of contract are assessed as at the date of the breach'. But in the very passage in which this 'general rule' is there stated, it is stressed that it is not a universal rule. That it Is subject to many exceptions and qualifications is clear. Cantley J in the present case rightly recognized that that was so, in the passage from his judgment which I have recently read.
>
> Indeed, where as in the present case, there is serious structural damage to a building, it would be patently absurd, and contrary to the general principle on which damages fall to be assessed, that

> a plaintiff, in a time of rising prices, should be limited to recovery on the basis of the prices of repair at the time of the wrongdoing, on the facts here, being two years, at least, before the time when, acting with all reasonable speed, he could first have been able to put the repairs in hand. Once that is accepted, as it must be, little of practical reality remains in postulating that, in a tort such as this, the 'general rule' is applicable. The damages are not required by English law to be assessed as at the date of breach.
>
> The true rule is that, where there is a material difference between the cost of repair at the date of the wrongful act and the cost of repair when the repairs can, having regard to all the relevant circumstances, first reasonably be undertaken, it is the latter time by reference to which the cost of repairs is to be taken in assessing the damages."

The law then is that in the present state of our economic malaise, the time at which the cost of repairs is to be assessed is when the repairs can reasonably be undertaken having regard to all the facts of the case which might well include financial embarrassment.

In my view, it is this approach which in all fairness should be adopted. In this case, impecuniosity was not the only reason for the delay in carrying out the repairs. There was nothing imprudent in delaying effecting repairs. The appellant was offering to repair roofs within a 21/2 mile radius of its operations and the respondent was within that range. The respondent was not to know that the appellant would ultimately deny liability.

The learned judge in the present case assessed damages based on prices prevailing at trial. The argument by the appellant in the court below was confined to a criticism of Mr. Whyte's evidence and a claim that the cost should be assessed on the figures originally pleaded and not on late amendments granted. No argument seemed to be addressed to the judge that assessment should be made at the date of the loss. Indeed, it appears that the time at which the cost was fixed was at the time the witness gave evidence. On the evidence before the judge, that date was the only relevant point In time for it would have been quite unfair to take the time when the damage was effected, that rule no longer being applied as a universal rule of general and inflexible application. The date of action was in all the circumstances, the only other date which fell to be considered as applicable. In that respect, I do not think the judge can be faulted, nor should he be, with respect to the figures given by Mr. Whyte which he used to arrive at the total cost. For my part, I can see nothing unreasonable about an expert in the building industry using the square footage of the area to be covered to determine the cost of roofing it. The appellant called no expert of his own to demonstrate that the costing of Mr. Whyte was skewed.

The final assault on the judgment, sought to impugn the order for mandatory injunction which the judge granted. The ground of appeal filed and argued was expressed in these terms:

> "2. The order for injunction was manifestly inappropriate and unnecessary in the circumstances of this case and in granting it the learned trial Judge erred in law and/or

> misdirected himself. Further, the order is too vague to be capable of compliance and the six month period is arbitrary and unreasonable."

It is convenient to begin this part of the judgment by reciting the order granted:

> "2. The Defendant is restrained by itself, its servants or agents, or otherwise from maintaining nuisance. The Defendant allowed until 30th June, 1995, to complete the necessary structural adjustments in order to eliminate the nuisance to the Plaintiff."

Mr. Frankson who responded to this ground, did not attempt to support the learned judge's order and requested that this court vary his order.

With respect to a mandatory injunction, it has long been said that "except in very exceptional circumstances, it ought to be granted in such terms that the person against whom it is granted ought to know exactly what he has to do." per Maugham, LJ in **Fishenden v Higgs and Hill, Ltd** [1935] All E R Rep 435 at p. 450. The same requirement was emphasized by Lord Upjohn in **Morris v. Redland Bricks Ltd** [1970] A. C. 652 at page 666:

> "4. If in the exercise of its discretion the court decides that it is a proper case to grant a mandatory injunction, then the court must be careful to see that the defendant knows exactly in fact what he has to do and this means not as a matter of law but as a matter of fact, so that in carrying out an order he can give his contractors the proper instructions."

In making the mandatory order, it is plain that the trial judge was wholly unmindful of this necessity. The order as worded to use the words of Lord

Upjohn - "imposed on the appellant an absolutely unqualified obligation upon them" to complete necessary structural adjustments in order to eliminate the nuisance "without giving them any indication of what was to be done." No evidence was led as to the necessary structural adjustments that would be required to eliminate the nuisance nor at what cost. It is enough to say that that order cannot stand nor can it be varied as requested for the reason that no evidence was led in this regard. I would therefore set aside that part of the judgment.

In the result, I would dismiss the appeal in part confirming the order entering judgment for the plaintiff in $968,000, but as already stated, I would set aside the order for mandatory injunction. The appellant has succeeded in relation to one of three issues raised on the appeal, and I would order it to pay two thirds of the costs of appeal of the respondent to be taxed if not agreed.

DOWNER J A

The respondent in this appeal Herbert Broderick instituted proceedings against the appellant Alcoa Minerals of Jamaica Incorporated and Clarendon Alumina Production Limited. The writ of summons was dated 9th April 1990. It was endorsed as follows:

> "The Plaintiff's claim is against the Defendants to recover damages for nuisance caused and maintained by the Defendants as a result of their processing bauxite ore in their plant at Halse Hall in the Parish of Clarendon.
>
> The Plaintiff also claims an Injunction to restrain the Defendants from maintaining the said nuisance."

Be it noted that the second defendant below, Clarendon Alumina Production Ltd., did not take part in this appeal. There was an amended statement of claim dated 26th July 1993 while August 4 1993, was the date of the amended defence. As for the Order under appeal, it disclosed that the action was heard over seventeen days commencing on 7th October 1991 while the final hearing was 30th September, 1994. The reserved judgment of Theobalds J was delivered orally on 19th December 1994.

The text was less than one half pages and the gist of the judgment was as follows:

> "There is evidence of persons who resided in the area for many years and who testified as to area in which they existed. There is a mass of expert evidence - scientific evidence by which sodium and its by-products could ...
>
> It is my view that on an overwhelming preponderance of evidence, the Plaintiff has discharged the burden of proof.
>
> I will not embark on an analysis of evidence of witnesses. In both categories case has been proved as to existence of the nuisance and the source of the nuisance being Defendant's plant and mud lake."

These features have been rehearsed to indicate the difficulties which arise when an attempt is made to determine the outcome of the appeal.

Our legal system requires judges of the Supreme Court in adjudicating in all cases and even more so in complex ones to evaluate the evidence as regards credibility and reliability and apply the relevant law before coming to a decision. This is demonstrated in the reasons for their decisions. These reasons are essential to the parties as well as for this court, if there is a further appeal. The judge's reasons are also required for Their Lordships' Board. It ought not to be the function of appellate courts to carry out an assessment of evidence and interpret the law for the first time. The failure to perform this fundamental judicial task puts an extra burden on appellate courts. We rehear cases on the record and the learned judge's reasons are essential if this court is to discharge

its duties effectively. Moreover, right reasoning is the basis for the growth of the common law. In stating the obvious, I am mindful of the heavy case load of Supreme Court judges, but the purpose of reserving decisions is to produce a considered judgment. This passage is not meant to be a stricture, but a guideline to judges of first instance for the future.

That the proceedings appeared somewhat haphazard is surprising, as the subject matter was of general public importance and both the hearing below and on appeal was keenly contested.

The pleading point

The ground of appeal relating to pleadings is important. It reads as follows:

> "3. That the learned trial Judge wrongfully exercised his discretion in granting the Respondent's application for amendment to the Statement of Claim made on the 21st June, 1993, in terms of the amendments shown at paragraphs 9 to 13, inclusive, of the Statement of Claim."

Having regard to this ground it is necessary to examine the amendments to determine whether they could qualify as proper averments and if so, what purpose they could serve.

Paragraph 9 of the statement of claim reads:

> "9. In about January, 1981 Mr. Rowe Hill, Managing Director of Defendants' plant at Hayes in the parish of Clarendon admitted that it is a fact that (SO2) was emitted from Defendants' plant at Hayes."

Even if there were a proper plea, the date January 1981 was outside the limitation period for contract or tort so to that extent paragraph 9 ought not to have been suggested or allowed. Then followed paragraphs 10, 11, 12, 13. Paragraphs 10 and 11 read:

> "10. On or about the 25th day of February, 1987, Dr. Carlton Davis, servant or agent of Defendants including Mr. Gerry Dudley and Mr. Robert Stevens and others at a meeting called by Defendants with the citizens of Hayes and other surrounding districts admitted that Defendants' were responsible for the damage caused to the galvanized zinc roofs of the houses of the said citizens and that Defendants had agreed to repair the said houses at the expense of the Defendants and replace their roofs with aluminum sheeting as a consequence of which the Defendants would cause personnel from National Housing Trust to measure the said damage and prepare estimates of same.
>
> 11. As a further consequence, complaint forms were issued by Defendants to the said citizens including Plaintiff."

These summaries of alleged evidence are of no value or averments in tort. They ought not have been proposed, let alone accepted. They also fall outside the limitation period. However, it ought to be noted that Dr. Davis gave evidence for the defendants in the court below. Paragraphs 12 and 13 are of a similar pattern. They read:

> "12. On a later date in 1987, Mr. Robert Stevens, servant or agent of Defendants admitted that Defendants had set aside a large sum of money to repair the said

> damaged roofs including that of the Plaintiff.
>
> 13. On or about the 2nd day of May, 1988 Mr. Gerry Dudley, servant or agent of Defendants admitted at a meeting called by Defendants that Defendants would repair all the damaged houses with galvanized zinc roofs of citizens in Hayes and other surrounding districts and that re-roofing of the damaged houses would commence in about six (6) weeks time."

Be it noted Gerry Dudley was ill and so could not give evidence for the defendants. These averments also were inappropriate for an action in tort. They cannot qualify as pleas. Again it should be noted that Mr. Robert Stevens gave evidence for the defendants in the court below. It could be that paragraph 13 could have been the basis of the plea of equitable estoppel as it was within the limitation period but the case was not conducted on that basis.

In spite of the nature of these "pleadings", the learned judge ruled:

> "... Leave granted to amend Statement of Claim as prayed."

These allegations might have established a case in contract if they were within the limitation period. There was a hint of this when the application was made to amend when Mrs. Forte was recorded as saying this:

> "Mrs. Forte - when I open case complaints and promises made to others. Deals with real controversy between the parties."

But neither Mrs. Forte nor Theobalds J were thinking that way. Here is how Mrs. Forte was recorded on the issue in her closing address:

> " On admissions - Refers to opening in which I referred to admissions and Court ruled they had to be pleaded. Statement of Claim supported by Dr. Davis."

Understandably, there is no mention of contract in the reasoning of the learned judge. Also there was a suggestion of admission, but admissions would have to arise on the appellants' pleadings and there was none.

Furthermore, the judge failed to detect the error of his ruling although the objection below was properly taken. In his reasons he said:

> "After trial had proceeded for some days substantial amendments were made to Statement of Claim and as a result to Defence."

This confirms that he had intimated and granted the amendments as admissions. Ground 3 of the notice of appeal outlined above therefore was successful.

Did the respondent Broderick prove nuisance against the appellant Alcoa Minerals?

(1) <u>The pleadings</u>

The gist of the respondent's Broderick claim is outlined in paragraphs 5 to 7 of the amended statement of claim. There is a notable absence of dates in these averments so the evidence had to be closely examined to see where it was relevant. These paragraphs read:

> "5. The Defendants have introduced and employ the Bayer Process in its

> operations which involves inter alia, grinding the dry ore, mixing the same with limestone, dissolving the alumina in a solution of caustic soda adding flocculants treating the resultant liquor with sodium sulphate, heat, pressure and the release of gases, impurities and chemical by-products into the atmosphere.
>
> 6. The said process generates pollutants, noxious gases, caustic aerosols and other corrosive dusts and acids for free and uncontrolled dispersion into the atmosphere.
>
> 7. By reason of the activities of the Defendants as aforesaid the atmosphere is polluted, the buildings and appliances of the residents including the Plaintiff's are severely eroded and the health comfort and the property of the said residents including the Plaintiff are severely affected as a consequence whereof the Plaintiff's dwelling house was destroyed and the Plaintiff has suffered injury to his health and property and has sustained damages."

Additionally, the respondent pleaded public nuisance thus:

> "8. Further or in the alternative the Defendants failed so to construct its plant and mud lakes and/or to apply some other process to win alumina from its mining operations as to cause dangerous noxious gases pollutants acids corrosive dusts caustic aerosols to escape into the atmosphere and thereby maintain a public nuisance as a consequence whereof the Plaintiff has suffered loss and damages."

That the appellant recognised the importance of dates was evidenced from paragraph 8 of their amended defence which states:

> "8. The Defendants further say that if, which is denied, their operations caused the alleged or any damage to the Plaintiff's property, the said damage would have occurred prior to or during the year 1982 and the Plaintiff's action in respect thereof is now statute barred."

Then the merits of the respondent's case was traversed thus:

> "6. The Defendants say that if, which is not admitted, sulphur dioxide falls in the region of the Plaintiff's property, such sulphur dioxide would be mere traces which would be unharmful to persons or buildings and the emissions are reasonable in the circumstances and not excessive."

There were particulars and as they are of importance; they must be quoted. They read:

> " PARTICULARS
>
> (i) Sulphur dioxide is a by product of all plants and engines that use fuel oil encompassing most plants and numerous makes of motor vehicles and is a feature of industries worldwide;
>
> (ii) In the control of pollution, there exists a maximum standard for emission of concentration into the atmosphere which has worldwide acceptance and the Defendants have always fallen well within the maximum standard at the said plant;
>
> (iii) The most modern and efficient control equipment are in use.
>
> (iv) Powerhouse stacks are 250 feet high and were designed for the control of pollution and emissions of sulphur dioxide

> are at a level into the atmosphere higher than in any existing plant in Jamaica;
>
> (v) The production of alumina is amongst the most vital requirements for the economic survival of Jamaica and is and has been actively encouraged by successive governments for over thirty (30) years; and
>
> (vi) The Bayer Process is one of the well accepted processes for the production of alumina worldwide."

The appellant further averred that their operations were authorised by the Mining Act. That traverse states:

> "10. Further or in the alternative, the matters complained of are natural and/or normal result of the Defendants' operations which are authorised under the provisions of the Mining Act and the special mining lease granted thereunder."

The purpose of this averment is not clear. There are special statutory provisions for compensation pursuant to section 12 of the Mining Act. It was not however contended that these provisions deprived the respondent from seeking redress in the Supreme Court. As for paragraph 8 of the statement of claim, the plea of public nuisance, here is the defence:

> "9. As to paragraph 8 of the Statement of Claim the Defendants deny that they maintain a nuisance and repeat paragraphs 6 and 7 above and further say:-
>
> (a) that efficiency for the control of pollution compares with the

highest level of efficiency at any plant; and

(b) that they recently designed and constructed new mud lakes with the latest and best technology available."

(11A) What did the scientific evidence of the appellant establish?

It is pertinent to commence with the analysis of the expert evidence. That for the appellant was given by Dr. Carlton Davis. In indicating his academic discipline, he said:

> "... I am a Doctor of Philosophy in soil chemistry and clay mineralogy. I take interest in dusting, ground and surface water pollutions, noise. I examine reports carefully either myself or some officer and one would be alerted to any emergency situation. There are standards to indicate problems."

As for his relevant experience, he states it thus:

> "Chairman of Jamaica Bauxite Institute since April '89 and 1976 to '89. I was the Executive Director. Jamaica Bauxite Institute tries to play a constructive role as an honest broker between the plants as there are important activities for the economy but have impacts on environment. Have received reports from Alcoa on sulphur emissions. I have copies of these reports - one such is here, sent to me by defendant (hearsay and self serving).
>
> These records are sent as a matter of course, I was then at Jamaica Bauxite Institute who monitors the economics, technical aspects (of) (sic) Jamaica

> Bauxite Institute acts as a matter of public responsibility."

The learned judge treated the opinion Dr. Davis gave of the reports as (hearsay and self serving). That seems to have been incorrect. As an expert, he was entitled to give an opinion on the reports. Further, his evidence suggests that the Jamaica Bauxite Institute is a public body which monitors the bauxite industry on behalf of the government. His evidence was continued thus:

> "... Between 1979 and '94 I am familiar with defendant plant. I have never had reason to be worried about sulphur dioxide in atmosphere based on the standard .024 on the basis of the Data and on the basis of the standard .02 parts per million, the data over the years have been at or under that standard. As Chairman of Clarendon Alumina Partners I am satisfied that no problem exists - Measuring those values against the standard."

Despite the standard, he admitted there is a problem thus:

> "Jamaica Bauxite Institute for last fifteen years have been trying to come to terms with the many complaints from communities, dust, odours and corrosion of galvanized roof and agricultural community - accelerated since 1987. We have not been able to establish link although severe corrosion has been seen by me. Isolating variables such as gauge, marine environment, other factories - Jamaica Public Service Company, Sugar factories, West Indies Pulp and Paper. I have been perturbed by these corrosions and the specific cause thereof."

Dr. Davis outlined the response to the problem thus:

> " Several efforts by Alcoa (1) try to consume as little oil as possible as the more oil used the more sulphur. This plant is the most efficient user of fuel oil. This has a positive environmental effect and costs less. Some Ten Million US dollars have been spent to improve environment. New precipitate which reduces dust and lift height of 275 feet. Plant has tried to improve engineering practices - dust, pollutants and disposal of mud - Twenty five million US dollars for a lake and to relocate two hundred families."

That the government was involved emerged thus:

> "... Government of Jamaica is fifty percent owners so we try to encourage the best practices in our environment. We are in business together for taxes levies etc. No interest in any issue."

The final paragraph of his evidence in chief reads:

> "... We had already determined that it is not possible to make causal link so what do you do? We adopt techniques or using aluminum linked with iron or copper so as to determine causes and arrive at a perimeter for which you take responsibility. I would be less than honest to say so but this has been a basis which you must have a basis. I do not know that this basis is perfect. w.5 miles was set as a basis from the clyber tests in area. 1.5 miles was area chosen for a powerful cause of corrosion."

Despite Dr. Davis' disclaimer of a causal link between the appellant's plant and the corrosion of the respondent's house, it was for the court

below and this court on appeal to determine the issue of causation on the basis of a balance of probabilities.

Dr. Davis was tested and under cross-examination, the following was revealed:

> " I familiar with Clyber Test and with paper by Vivian Blake at Bauxite Symposium in 1986. Proximity to Bayer Alumina Plant - this test uses data to define geographical limits around the plant. There is a mandate requiring compensation for demonstrable damage caused by the plant. I agree with statement that our Alumina plants generate substance that are potentially corrosive. I agree that potentially corrosive emissions come from plant at Hayes - sulphur dioxide."

The reference to mandate requiring compensation is a reference to the Mining Act mentioned previously. Further he said:

> "Also soot from the boiler stacks if on the surface of the roof. Also dust from alumina if it absorbs corrosive compounds it could have corrosive effects. Also fugitive alumina dust blown by the wind. In the Bayer process when bunker C oil is burst entire corrosive substance is expelled through the stacks - would be over 90% water saturated air and droplets of liquid from liquid cooling stacks. Caustic soda is corrosive for most metals. Chemical reactions are speeded up by heat.
>
> 1.5 M. is a convenient cut off point. I agree there is need to extend the conduct of climate testing. Man made and naturally occurring pollutants. always a slight trace of sulphur in air for example

> from rotting eggs. I agree pullutants in atmosphere depend on height of stacks as well as rate of which pollutants are produced also on topography of area."

Then under re-examination, Dr. Davis said:

> " The Clyber test does not tell source only probable cause of corrosion."

The significance of this evidence is the admission that Alcoa's plant produces sulphur dioxide. It also supports the respondent's statement of claim especially paragraphs 5 and 6 which speaks of the release of gases, impurities and chemical by-product into the atmosphere.

The other witness for the appellant was Robert Stephens who was the general manager of Alumina Production Limited during the relevant period. The pertinent part of his evidence was as follows:

> " In July '87 I address Citizens Association at Hayes. Alcoa had decided that roofs within a radius of 1.5 mile from Plant would be repaired based on results of survey by National Housing Trust (incomplete) that was there the concentration of damage was seen. The estimate was 2.4 million dollars which had been allocated for repairs to roofs. All the results of the tests undertaken by Alcoa and by Jamaica Bauxite Institute had been inconclusive separate and independent tests."

This was a significant admission. The admission relates to the inconclusive nature of the tests done by National Housing Trust, Alcoa and Jamaica Bauxite Institute. Then as to the general evidence of

corrosion, after a meeting on 25th February 1989 he made an inspection and reported thus:

> "... I went and looked at 3 houses in area. Members of Press were there. I saw corroded roofs - don't know if normal or abnormal. all 3 were corroded in a similar fashion. shown document -"

The witness visited three houses and there was a dispute on this issue as well as others as to whether similar fact evidence was relevant and admissible in civil proceedings. Mrs. Forte helpfully cited a relevant authority to show that it was. See **Mood Music Publishing Co. Ltd. v. De Wolfe Ltd.** [1976] 1 All ER 763. Lord Denning said at p. 766:

> " The admissibility of evidence as to similar facts has been much considered in the criminal law. Some of them have reached the highest tribunal, the latest of them being **Boardman v Director of Public Prosecutions** (1974] 3 All ER 887, [1975] AC 421. The criminal courts have been very careful not to admit such evidence unless its probative value is so strong that it should be received in the interests of justice: and its admission will not operate unfairly to the accused. In civil cases the courts have followed a similar line but have not been so chary of admitting it. In civil cases the courts will admit evidence of similar facts if it is logically probative that is if it is logically relevant in determining the matter which is in issue: provided that it is not oppressive or unfair to the other side; and also that the other side has fair notice of it and is able to deal with it. Instances are: **Brown v Eastern Midlands Railway Co.** [1889] 22 QBD 391, **Moore v Ransome's dock**

Committee [1898] 14 TLR 539, **Hayles v Kerr** [1908] 2 KB 601."

(11B) What did the scientific evidence of the respondent prove

Lena Whyte, a Metallurgist of the Bureau of Standards since 1978 stated her qualifications and experience thus:

> "M.S.C. in Metallurgic Engineering from Cranfield in U.K. B.Sc in Natural Science with Materials Options from U.W.I. - Mona. I work on metals in general - steel, copper I draft Jamaican standards for metallurgical process and practices. I offer technical assistance in area of metallurgy as well as administrative tasks. I have worked on zinc coated steel sheets for G.I. Industries Quality dealers Limited - Pre-specification work in drafting a Jamaican Standard - for zinc coated for Insurance purposes."

Then she recounted her involvement with the respondent's case thus:

> "I received request, went to Hayes in Clarendon on 29.9.91 with Mr. Rajah Tewari and to Broderick's house and deRois' residence. At Broderick's house I examined the zinc roof and sampled a sheet of zinc with the help of a young man. I select sheet and young man raise it from roof in my presence and cut in 3 pieces and labelled and put in trunk of Tewari's car and we drove to deRois residence and sampled another sheet. I examined roof from below and point at a sheet to be taken. It was cut in 3, tagged and labelled in my presence and put in trunk. Mr. Tewari and I drove to Bureau of Standard (sic) office where I hand samples (both sheets) to Annella McFarlane from Chemistry Department."

Her findings were reported thus:

> " Sheets from Broderick's house were corroded in some areas and had a white deposit on the surface. The corrosion was reddish in colour which is Indicative of removal of zinc coating to expose the sheet base. The white deposit is also a corrosion product referred to as white rust. When I said it was corroded it could have been to the extent that there were holes in it - if completely corroded material will be removed or it will change its physical appearance. It is in a similar condition now to what it was when taken from Broderick's premises."

She continued thus:

> "Without any hostile environment its life expectancy is about 20 years. I saw Alcoa Plant in area. This was an industrial environment giving off chemical fumes. If Broderick had to change his zinc so frequently it implies some compound or elements in the surrounding atmosphere causing the zinc to deteriorate. Given the environment that is proximity of plant and mud lakes it is likely that there would be an appreciable concentration of sulphate irons chloride ions and a caustic environment that would be able to react corrosively with the zinc in solution. These ions would react on the galvanize coating on steel sheet better known as zinc."

In explaining the cause of corrosion, she said:

> " I have had experience with Bunker C-Oil. I have done failure analyses for JPS Company and in order to generate electricity JPS Company is a user of Bunker C-Oil. (sic) Bunker C-Oil (sic) contains some amount of sulphur. The major contributor where you have

> environment embrittlement in boiler or super heater tubes. I cannot say amount of sulphur Bunker C Oil contains. On burning this oil sulphur is transformed into sulphur dioxide and sulphur trioxide - gases which react to form sulphuric and sulphurous acid. Hydrogen ions in water or liquid environment. It is the sulphur in the Bunker C Oil which forms the gases and in solution becomes sulphuric and sulphorous acid. sulphuric acid is highly corrosive especially in liquid form. Sulphuric acid would react with zinc and with most metals. It would break down zinc and decrease its protective action on the steel base and also it would react with the steel once the steel is exposed. It would reduce the iron to its oxide-ferrie and ferrous oxide (a mixture) equal rust. Depending on degree and rate of corrosion it would lead to fall out or holes in zinc sheets."

When she was tested under cross-examination her response was:

> " I would not say scientist more precise than metallurgist. I trying to indicate elements that contribute to corrosion - most important one is sulphurate ion. If you measure it you can a certain (sic) of sulphur chloride ions in the atmosphere. I never measure it at Hayes. All these have reactions on zinc. You don't have to carry out test. Zinc is zinc (metal). Areas of corrosion affected by wind and height of stack from which they come. My studies did not infer that one way or the other. sulphuric (acid) rain can have degrees of acidity. Normal rain does have acid not from clouds but from atmosphere."

The corrosion was evident to the layman. Here is how she put it:

> "A visual inspection could only give you an idea. Anyone could see the corrosion

> but not necessarily infer loss of zinc coating. Zinc coating not in its original state. Not so main purpose of taking weight was to determine loss in its original state. There are standards which tell you which part to cut off, how far from edge and what dimensions."

Another metallurgist who gave evidence was Dorr Campbell. He stated his qualification and experience thus:

> "Bureau of Standards - 6 Winchester Road, Kingston 10 - Head of Metallurgy Department since August '87 - '88 and in Metallurgy Department since August '81. B.Sc. Natural Science from University of the West Indies and M.Sc. in Mettallurgy Manufacturing Process and Management Burmingham University - United Kingdom. For B.Sc. I specialize in Chemistry and applied Physics (Material Science) option at Bureau. I involved in testing Metallic materials and products in all forms, shapes and times. Also consultant to local industrial sectors in metallurgy and quality assurance. From time to time I visit sites to collect samples for testing, to inspect areas of metallurgical failures and in work related to monitoring of products under Jamaican standard e.g. B.R.C. Jamaica Limited, Caribbean Steel Company."

He tested galvanized sheets taken from the respondent's roof in 1993. Although there was objection to the admissibility of this evidence, the objection was rightly overruled by the learned judge. This nuisance is a continuing tort and that is why the respondent sought an injunction.

The witness then indicated the method of testing thus:

> " I saw samples which Dixon tested. Before he tested I indicated to him the test method to be used - American Standard ASTM A90 which covers the deterioration of zinc coating weight on galvanized steel articles. I am myself familiar with the procedure. ASTM A90 is used in USA and I believe Canada and we used it for the development of our own Jamaican standards."

As to specifics, he said:

> "... The metal sheet coating - steel corrodes relatively rapidly so it is necessary to coat steel articles with a protective coating. Zinc is one such coating. It shields the steel base from exposure to atmosphere which may cause rusting or corrosion. Rust also has an aesthetically unattractive colour."

Here is how he explains the corrosion:

> "... I know bunker C oil is used a lot in Jamaica for energy for power plants. I am not familiar with its components. Sulphuric acid would dissolve zinc coating and rate of dissolution would depend on the strength of the acid. In its most diluted state sulphuric acid would have above affect on buildings close to Alcoa Plant at Hayes. Assuming bunker C oil used and gases emitted into atmosphere and condense and fall on roof as rain (with acid content) it would accelerate the degradation of the zinc. Significance of the gauge is to impart mechanical strength - a thicker gauge would be stronger than a thinner gauge. Life span starts at point of installation and ends - different criteria - for some on first rusting and for sometime when perforation and leakage commences. The sample(s) I saw had a significant areas where the zinc

> coating had been depleted and the exposed steel had started to rust. Generally the surface was tarnished not with bright lustre of new sheets."

Then he concluded his evidence in chief thus:

> "... I would not expect leaking in 7 years under normal non-aggressive conditions."

A significant part of the cross-examination was directed to the existence of the Jamaica Public Service plant in Old Harbour. And that in Hayes there are sugar estates - Monymusk and New Yarmouth which also use bunker C-oil. This requires a legal answer pertaining to joint or concurrent torts. This is important as it was admitted that Hayes area is an aggressive environment. Furthermore, Dorr Campbell stated:

> "I agree if emissions from Alcoa influence area it would be by way of mixing with other influences in area. I have done no tests to indicate the degree of any influence from Alcoa. I have seen Alcoa stacks - very high travel Jamaica extensively. The highest stacks I have seen are at Frome. Can't say if Alcoa stacks are higher - 250 feet stack is a high stack. The high stacks are used to minimize the amount that falls back. When breeze catch it goes far away. Don't know if Pittsburgh emissions go far afield life expectancy 18 years for 8 coating. I got this from tables based on tests. One table is based on weight loss per annum for highly industrialized environment .405 per square foot per annum. On that weight loss life expectancy would be two years (in Sheffield England). I agree I can't slot Hayes in any of these categories. Hayes is a rural area with heavy industries."

Annella McFarlane was another expert witness. She gave her training and experience thus:

> " Senior Standards Scientific Officer - Jamaica Bureau of Standards - Winchester Road. Specialize in chemistry at U.W.I - 1st Degree in Pure and Applied Chemistry. also Diploma in Education and Post Graduate training and several training programmes including plastics instrumentation and analysis of a number of materisos aloys, brass, aluminum, gold, silver, cement, limestone paper, cloth, water analysis and fuel and diesel oil, bunker C oil. Alloys equal any mixture of metals including galvanized zinc. Know head of Industrial section. I do some of the testing and standard writing. I am technical secretary soaps, detergents and cleaning agents mainly."

As for the relevant evidence she said:

> " I test sulphates go outside Bureau. Bunker C oil I personally test it - it is a crude oil. We distill it and the lighter portions which evaporate faster. Kerosene, gasoline and diesel, tar and crude oil (bunker C) Burning of bunker C oil gives off heat, water, soot, carbon dioxide, carbon monoxide sulphur dioxide and sulphur trioxide. These last two are gases basically colourless. Sharp pungent odour given off. Sulphur dioxide plus trioxide if dissolved in water would give an acid - sulphurous acid and sulphuric acid".

Then she continued:

> " Bunker C oil has 2.4 - 3.1% sulphur and diesel oil. .4 - .5% sulphur and in gasoline a maximum of .2%. I familiar

with bauxite industry and bayer process some long years ago. Bunker C oil is used. I have done samples of galvanized sheeting. I made note (refreshes memory) 25.9.91 submitted 3 zinc sheets - submitted from James Kerr (lab head). I tested them after examine label and code them -

1 tagged control from Farewell Avenue

1 tagged DuRoi (Clarendon)

1 tagged Broderick (Clarendon)

Two sheets had holes in addition to nail holes - DuRoi and Broderick also red rust areas."

Then the following significant results were obtained:

"Those from DuRoi and Broderick badly corroded. Sulphur dioxide equal SO2 S1 - Sulphur trioxide equal SO3 S1. I cut sheets in 3 portions scrape with metal brush and spatula top and bottom of all 3 pieces for Broderick, DuRoi and control. Collect scrapings and test for sulphate, chloride, aluminum and sodium. Six (6) weightings made of samples for each one two sets of tests done - put in glass beakers with strong nitrate acid dissolved and filtered sulphate (made notes) refresh memory - Broderick test -

3.65% sulphate on 1st determinati
3.60% sulphate on 2nd determination DuRoi's sample - 3.93% sulphate on 1st determination3.37% sulphate on 2nd determination

On control none on 1st test

011% in 2nd determination

> Normally on 2 or 3 determinations we average the results. Sulphate is SO4 with 2 minus charges - SO4 with 2 minus charges 1 sulphur and 4 atoms. The tests confirm that Broderick material badly corroded other on control was not."

The following significant extract gives a convincing explanation of the process of corrosion on the respondent's zinc roofing:

> " On samples red rust on both surfaces - white rust on both surfaces but none on underside. This white rust indicated to me that what was on top could have been washed off or through the nail holes or more corrosive material could have entered through the nail holes. Sulphate on B's sample indicated to me presence of sulphuric acid and that zinc was corroded by sulphuric acid. The reading on Broderick's sample as opposed to control - this is an enormous amount of sulphate if calculated as acid it would be a bigger figure. Sulphate (as sulphuric acid) would have an acidic reaction on zinc - it produces a salt (zinc sulphate which is white) and hydrogen gas. The zinc would be replaced by white powdery substance (zinc sulphate). The other products (hydrogen) would be released into the atmosphere. You would not see the reaction but you would see the result (white powder on the zinc and after a while you would have no zinc for the reaction to continue when the zinc is finished there would be just the steel exposed and for iron to rust you need oxygen and moisture."

Continuing the narrative an explanation was given as to how rust was formed and the consequences which probably occurred:

> "When iron rust you get iron oxide - when no more iron it breaks into holes. From my knowledge the bauxite industry uses high stacks for the removal of gases from the burning of crude oil. The gas coming off from the stacks soot, carbon dioxide and non-oxide sulphus dioxide matured are either wet or dry. If dry it would fall on plants in small specks or dry ash. If lot of moisture in the air then you would get some amount of acid - sulphurous or sulphuric mainly. If it rains some can be washed away or seep thru holes and mixed with the dry ash. The conversion to sulphuric acid takes place in the atmosphere and comes down as acid are both corrosive sulphuric more so can burn hole in skin - on paper would end up as carbon that's how corrosive it can be. Broderick is very near to the factory and it is possible that some deposits are reaching his house - the results from testing of zinc sheets show pressure of sulphuric acid so some sulphuric acid or some sulphur dioxide must have reached to the roof."

Then to the court the following answer was given:

> "My opinion was that zinc sheets were being damaged by Company in area - by the nearest Plant.

Although Theobalds J declined to analyse the evidence or even rehearse it he did find:

> "It is my view that on an overwhelming preponderance of evidence, the Plaintiff has discharged the burden of proof."

An aspect of the evidence he must have considered was that of Wilmot Wallen Bryan of the Jamaica Bauxite Institute. He was employed there as Chemist since 1976. Here is how he states his relevance to this case:

> "I have had to visit Alcoa Plant in Hayes usually in connection with analysis of bauxite. Also to examine roof and tests samples of the corroded roofs and photographs of them. I examined roofs about 3 years ago - 2 to 3. I took scrapings from the surfaces to see if I could determine the products of corrosion to see if could be attributed to common plant environs."

Of specific interest was his knowledge of the clyber test. He said:

> "I am familiar with clyber test. It is used in Alcan system to ascertain the radius of influence for corrosion activity. It can also adapted for marine corrosivity tests. I familiar with the results of clyber tests conducted by Alcan. I attempted once to apply it - about the time now - say before I went to get the scrappings (sic) - somewhere within the past four years - about the time when this litigation started. I came to no conclusion - it made me question the climate test as some amount of subjectivity was required in making these measurements."

Then he continued:

> "... My observation was that rate of corrosion did not bear any relationship to the distance from the Plants. My results did not coincide with Alcoa's. What I observed was that in fact the greatest rate of corrosive activity was furthest from plant. My furthest probe was 5 miles from the Plant (South of the Plant). I had probes all the way from edge of Plant

> back. All the probes had corrosion (but for the climate test to indicate) a trend of systematic reduction as you went further from the Plant did not emerge. One could not say that a specific plant effect was observed but it did indicate in vicinity of trees, trees and vegetation does contribute to the extent of corrosion. Joint corrosion but the source thereof still arises. The source does not act alone - trees can assist my test. Test compounds the effect - climate test was to determine factory effect. Other effects were to be eliminated - such as from trees if possible. Burning of bunker C oil throws sulphur dioxide and nitrogen gases into the air trees and so forth. (plant life) would not emit same quality of ..."

The learned judge must have accepted this evidence in the light of his findings. In concluding his examination in chief, he said:

> " Sulphur dioxide is an acidic substance. Assisted by moisture it forms sulphurous acid and can be oxidized to sulphuric acid which is stronger. Rain or anything which enhances the moisture levels will lead to formation of acid, contact between these acids and roofing material is by rain-fall and morning dew. Corrosion can be varied - contact with acid of metal will lead to dissolving of zinc coating. Electrolytic effect - two different metals - if they become covered with water with acid in it - this electrolyte conducts electricity easily. The origin of the electrical current is the The zinc could dissolve and cause zinc to be pitted. Carbonic acid is insignificant relative to sulphuric acid - carbonic acid has very little effect. I would expect on zinc contributes very little to destruction of zinc."

The evidence adduced by the respondent included the input of a civil engineer, Noel Gauntlett. He had considerable experience in his profession, being employed as a senior engineer, Public Works Department, Ministry of Local Government and the Water Commission. He reinspected the respondent's roof and others in 1989. The roofs were corroded in an unusual manner.

There was also evidence from a meteorologist, Roy Forrester. He holds a B.Sc. degree and had been in practice since 1958. He has worked in Jamaica, U.S.A., France and Turkey, Greenland and Spain. He is now Resident Meteorologist at Jamaica Broadcasting Corporation. With reference to Hayes he said:

> " In vicinity of Hayes winds can be strong, subsidence is also created. High pressure system keeps down air. Particles in air would be trapped at lower levels. For most part rain would not follow, but sometimes you could get precipitation. In absence of any synoptic scale winds (winds that are due to large scale weather features) - we have local winds which are the land and sea breezes. During day when land is heated the air is forced to rise and because the atmosphere is always trying to maintain a state of equilibrium air moves from the sea to replace the air that has moved aloft - called breeze."

Then he continued:

> "At night land cools more rapidly than sea and hence the cold air moving from the land to the sea - called land-breeze. Sea

> and land breeze do not move at same speed. Land breeze is slower."

There was yet another important expert witness, Worrell Lyew Young. As for his qualifications and experience he stated them thus:

> "Director of Jamaica Bauxite Institute. Pilot Aluminum Plant since 1989 - '90 Corn Piece Hayes Clarendon. Twelve years at Jamaica Bauxite Institute. Chemical Engineer of St. Augustine U.W.I. A BSc in Engineering. I had assignment with Alcoa Plant at Hayes. I do work for Clarendon Alumina which is one of the partners in a joint venture between Jamaica Government and Alcoa. My work takes me to the Alcoa Plant (Hayes) most Thursday (every week). They use the Bayer process."

After explaining how bauxite is recovered and transported to Rocky Point he gave this account of how pollution occurs:

> "Bunker C Oil is used. Sulphur content of bunker C oil is 2.5% (about). About 1.2 million barrels of bunker C oil is used per annum. Forty-two gallons are in a barrel. 48 units at the plant use bunker at the plant use bunker C oil. 3 boilers, 3 aluminium calcerners. 1 package boiler and the lime kiln. There are four stacks presently at the plant since last year and before there were six, two with boilers are 250 feet high."

Then he continued thus:

> "Three with calcerners are about 130 feet high. Other three less than 130 feet high. The three calcerners stacks were replaced by a single stack 275 feet high. This decision was taken to replace them along with the electro

> static precipitators to improve the emissions of alumina dust and products from the combustion of the oil - sulphur dioxide, carbon dioxide, water oxide of nitrogen and others. When bunker C oil is used (burnt) the hot gases come out via the route provided, the ducts for hot gases to get to the stack into the atmosphere. These hot gases would contain the above substance."

That standards vary, and that he was unsure of Alcoa's standards in Jamaica could be elicited from the following account:

> "There are standards for emissions set by different countries and companies. I am not sure if there are universal standards. They are National Reservation Conservation Agency are working in Jamaica to put standards in place. There are standards in the U.S.A. and Alcoa has standards before the stacks were changed from 3 to 1. It would be hard to say if Alcoa was meeting its standards. Don't know if met U.S.A. standards. The electro static precipations would collect more of the alumina dust so less of it - the dust and gases would get to the atmosphere. The gases would be disbursed over a wider area. At 130 feet stacks residents complained."

In explaining an aspect as to how pollution occurs he said:

> "All the sulphur in Bunker oil would be burnt but not all would go thru the stack. I cannot say what percent but most of it would go to the stacks. The bauxite is mined in the Mocho area. There are three mudlakes in area of plant to the West side and across the main road from May Pen to Lionel Town.

> One about 100 acres. Next about 250 acres and number 3 about 110 acres. These lakes store mud from the process and acts as a stage for recovery of caustic. About 70,000 tons of limestone is burnt per year at the plant and about 1.8 million tons of bauxite is consumed annually at the plant."

An important aspect of his evidence emerged from cross-examination. His opinion was that more could be done to reduce emission. Here is the evidence:

> "At Alcoa the lime kiln has a sunblew to take away dust. I don't agree Alcoa has done everything possible scientifically to reduce emissions. They could reduce sulphur dioxide emissions. I have not so advised because they are taking steps to do all that is possible. I believe as knowledge progresses they employ that knowledge to do better. The small package boiler was recently added. In the 1980s it was not there. I agree that by using oil with a 2.5% is more costly than 5% content. I sit on the Council. Company does show concern for the amount of sulphur going thru its stacks. I agree ambient concentration is the important thing not the height of the stack."

He also said:

> "... I could see stacks of Alcoa from plaintiff's home. Home is in opposite direction - this was In the day. A sea breeze was blowing then from sea to land - South to North. At night from land to sea - south breeze would dilute and disperse particles dependent on wind speed. If

slow - less dilution. Smoke would blow towards plaintiff's house."

(111) The effect of the scientific evidence:

Although there were other industrial plants in the vicinity of Hayes which use Bunker C oil, the evidence of the experts, including that of Clinton Davis, for the appellant was so compelling that the finding of the learned judge that there was a causal connection between the emission from Alcoa's plant and the damage to the roof of the respondent's house was proved. There was also the evidence of the respondent and his neighbours which must be adverted to.

(1V) The evidence of the respondent Broderick and others

Herbert Broderick, the respondent told the court he lived 10,720 feet from the Alcoa plant and the distance as the crow flies is about quarter mile. He built his house in the early seventies and occupied it in 1975. He noticed white spots on the zinc in 1980 and holes appeared and there was leaking. Significantly he changed his roof in 1982 and six weeks prior to the hearing on 7th October, he had to change fifteen sheets of zinc and he noticed spots again and leaking. The fifteen sheets covered a few bedrooms and the rest of the house was at the time of hearing, still leaking. It was a four bedroom house. He had to paint out the water marks and repair the ceiling. He described the leaking water as being of brownish colour which left a light blue stain on the blue walls.

He told the court he could see the plant from his house and that he could see the steam from the power house. It was thick and black in colour and when the wind blew southwards, the smoke came to his house. There was also unpleasant smell from the mud lake and his eyes and nostrils burnt as a result of the fumes from the lake.

Rajah Tewari owns property in Hayes and he has complained about damages similar to that of the respondent.

Witney Francis lives within a mile from the Alcoa plant. He is seven chains from the mud lake. He is an accountant and a Justice of the Peace. He discovered white spots on his roof in 1992 and thereafter rust appeared and leaks. He made complaints similar to that of the respondent but in more colourful language. Dalson DaSilva also gave evidence similar to the previous witnesses. He gave in greater detail his recollection of what was promised by Alcoa officers at various meetings.

(V) Was the appellant Alcoa liable for nuisance on the basis of the foregoing evidence?

It is now necessary to examine the relevant authorities to determine if, on the issue of liability, the learned judge below was correct. In **Halsey v Esso Petroleum Co. Ltd.** [1961] 2 All ER 145 at p. 150 Veale J cited the following passage:

> "... As long ago as 1865, in *St. Helen's Smelting Co. v. Tipping* Lord Westbury, L.C., said - (1865) 11 H.L. Cas at p. 650:
>
> '...in matters of this description it appears to me that it is a very desirable

> thing to mark the difference between an action brought for a nuisance upon the ground that the alleged nuisance produces material injury to the property, and an action brought for a nuisance on the ground that the thing alleged to be a nuisance is productive of sensible personal discomfort.'..."

In dealing with the specifics as regard injury to property the citation continues:

> "... But when an occupation is carried on by one person in the neighbourhood of another, and the result of that trade, or occupation, or business is a material injury to property, then there unquestionably arises a very different consideration. I think, my Lords, that in a case of that description, the submission which is required from persons living in society to that amount of discomfort which may be necessary for the legitimate and free exercise of the trade of their neighbours, would not apply to circumstances the immediate result of which is sensible injury to the value of the property."

Then he further stated:

> "... I bear in mind the observations of Lord Loreburn, L.C., in *Polsue & Alfieri, Ltd. v. Rushmer* (1907) A.C. at p. 123 Lord Loreburn, L.C., said:
>
> > 'The law of nuisance undoubtedly is elastic, as was stated by Lord Halsbury in the case of *Colls v. Home & Colonial Stores, Ltd.* (1904) A.C. at p. 185. He said: 'What may be called the uncertainty of the test may also be described as its elasticity. A dweller in towns cannot expect to have as pure

> air, as free from smoke, smell, and noise as if he lived in the country, and distant from other dwellings, and yet an excess of smoke, smell, and noise may give a cause of action, but in each of such cases it becomes a question of degree, and the question is in each case whether it amounts to a nuisance which will give a right of action.' This is a question of fact.' "

Since the complaint in this case concerns both injury to property and personal discomfort, it is appropriate to cite the relevant passage from Lord Westbury's speech in the **St Helen's** case cited by Veale J at 150 on the issue. It reads thus:

> "... With regard to the latter, namely, the personal inconvenience and interference with one's enjoyment, one's quiet, one's personal freedom, anything that discomposes or injuriously affects the senses of the nerves, whether that may or may not be denominated a nuisance, must undoubtedly depend greatly on the circumstances of the place where the thing complained of actually occurs. If a man lives in a town, it is necessary that he should subject himself to the consequences of those operations of trade which may be carried on in his immediate locality, which are actually necessary for trade and commerce, and also for the enjoyment of property, and for the benefit of the inhabitants of the town and of the public at large. If a man lives in a street where there are numerous shops, and a shop is opened next door to him, which is carried on in a fair and reasonable way, he has no ground for complaint, because to himself individually there may arise much discomfort from the trade carried on in that shop.' "

Useful passages are also to be found in **Crump v. Lambert** L.R. Vol. (III) Equity Cases 409 where Lord Romilly, M.R. said at p. 412:

> " With respect to the question of law, I consider it to be established by numerous decisions that smoke, unaccompanied with noise or noxious vapour, that noise alone, that offensive vapours alone, although not injurious to health, may severally constitute a nuisance to the owner of adjoining or neighbouring property; that if they do so, substantial damages may be recovered at law, and that this Court, if applied to, will restrain the continuance of the nuisance by injunction in all cases where substantial damages could be recovered at law. *Elliotson v. Feetham* 2 Bing. N.C. 134, and *Soltau v. de Held* 2 Sim. (N.S.) 133, are instances relating to noise alone. In the former, damages were recovered in an action at law; and in the second, an injunction was granted on account of sound alone."

Then on page 413 he said:

> "... in other words, whether he comes to the nuisance or the nuisance comes to him, - retains his right to have the air that passes over his land pure and unpolluted, and the soil and produce of it uninjured by the passage of gases, by the deposit of deleterious substances, or by the flow of water. and the doctrine suggested in *Hole v. Barlow,* that the spot from whence the nuisance proceeded was a fit, proper, and convenient spot for carrying on the business which produced the nuisance, is no excuse for the act, and cannot be made available as a defence either at law or in equity."

To my mind, the abundant scientific evidence and the evidence from the respondent and neighbours make it convincing that Alcoa was liable in nuisance because of the emission from their plant and mud lake. There was an argument that there were other plants in the area and that they also could have contributed to the nuisance. The authorities suggest that even if that were so, Alcoa would not be exonerated.

The general principle is set out with clarity by Devlin J in **Dingle v Associated Newspapers Ltd. And others** [1961] 1 All ER 897 at 916 thus:

> " This conclusion appears to me to be in accordance with and indeed to exemplify, a fundamental principle in the law of damage.(sic) Where injury has been done to the plaintiff and the injury is indivisible, any tortfeasor whose act has been a proximate cause of the injury must compensate for the whole of it. As between the plaintiff and the defendant it is immaterial that there are others whose acts also have been a cause of the injury and it does not matter whether those others have or have not a good defence. These factors would be relevant in a claim between tortfeasor for contribution but the plaintiff is not concerned with that: he can obtain judgment for total compensation from anyone whose act has been a cause of his injury. ..."

It is sufficient to cite two authorities from the House of Lords which affirm this principle. In **Bonnington Castings Ltd. v. Wardlaw** [1956] AC 613 at 626, Lord Keith said:

> "... The pursuer has, however, in my opinion, proved enough to support the inference that the fault of the defenders has materially contributed to his illness. During the whole period of his employment he has been exposed to a polluted atmosphere for which the defenders are in part to blame. The disease is a disease of gradual incidence. Small though the contribution of pollution may be for which the defenders are to blame, it was continuous over a long period. In cumulo it must have been substantial, though it might remain small in proportion. It was the atmosphere inhaled by the pursuer that caused his illness and it is impossible, in my opinion, to resolve the components of that atmosphere into particles caused by the fault of the defenders and particles not caused by the fault of the defenders."

There was a similar statement by Lord Reid at p. 621. In **McGhee v National Coal Board** [1972] 3 All ER 1008 at p. 1012 Lord Wilberforce expressed the principle thus:

> "... Secondly, from the evidential point of view, one may ask, why should a man who is able to show that his employer should have taken certain precautions, because without them there is a risk, or an added risk, of injury or disease, and who in fact sustains exactly that injury or disease, have to assume the burden of proving more: namely, that it was the addition to the risk, caused by the breach of duty, which caused or materially contributed to the injury? In many cases of which the present is typical, this is impossible to prove, just because honest medical opinion cannot segregate the causes of an illness between compound causes. And if one asks which of the

> parties, the workman or the employers should suffer from this inherent evidential difficulty, the answer as a matter in policy or justice should be that it is the creator of the risk who, ex hypothesi, must be taken to have foreseen the possibility of damage, who should bear its consequences."

So the authorities support the submissions of Mrs. Forte on behalf of the respondent. Accordingly the ground of appeal which reads:

> "1. The learned trial Judge erred in determining that on the evidence before him the Plaintiff had discharged the onus of showing that the Defendant's operation caused the damage to his roof or caused him any loss or damage at all."

has not been successful..

Were the special damages awarded appropriate?

Ground 4 in the Notice of Appeal reads:

> "4. That the learned trial judge failed to apply proper principles or to have regard to all the evidence and came to an erroneous assessment of the Plaintiff's loss in the sum of $938,400."

The learned judge gave no reason for his award of general damages or special damages. His award was as follows:

(1)	Special	$938,400
	General	$ 30,000

There was no express appeal against general damages but since damages is the gist of a claim in nuisance and there was an appeal

against a finding of nuisance, there was an implicit appeal against general damages. The claim for general damages was stated thus:

> "7. By reason of the activities of the Defendants as aforesaid the atmosphere is polluted, the buildings and appliances of the residents including the Plaintiff's are severely eroded and the health, comfort and the property of the said residents including the Plaintiff are severely (sic) affected as a consequence whereof the Plaintiff's dwelling house was destroyed and the Plaintiff has suffered injury to his health and property and has sustained damages."

The respondent certainly proved that his comfort was disturbed by pungent smells and fumes. His health was affected in that he caught colds frequently and the odour burnt his eyes and nostrils. He had to shift his furniture because of leaks. He had to dust his furniture frequently.

I consider the award for general damages appropriate and would not disturb it. Special damage calls for more detailed examination. The respondent did not repair the damages. His home was of four bedrooms and it seems he re-roofed two. There seems to have been provisions made by Alcoa to repair but this was not pleaded and conducted on the basis of a contract or equitable estoppel. So the issue was, would there be a basis in fact and law to delay repairs so as to get the replacement costs? It is well known that because of the dramatic fall in value of the Jamaican dollar building prices and labour costs have soared.

The acceptable basis is to found in **Dodd Properties (Kent) Ltd. & another. v. Canterbury City Council and others.** [1980] 1 All ER 928. (This case was considered in **Headley & Jacqueline Brown v Linval Tyrece** SCCA 52/90 delivered December 18 1990.) Donaldson LJ stated the principle applicable thus at p 941:

> " The position of the plaintiffs in the present case seems to me to be quite different. They were not impecunious in the *Liesbosch* [1933] AC 449, [1993] All ER Rep. 144 sense of one who could not go out into the market. On the contrary, they were financially able to carry out the work of reinstatement in 1970. However, on the judge's findings, they were commercially prudent in not incurring the cash flow deficiency which would have resulted from their undertaking the work in the autumn of 1970 and waiting for reimbursement until after the hearing, particularly when the defendants were denying liability and there was a dispute as to what works could and should be done by way of reinstatement. In my judgment, the decision in the *Liesbosch* case has no application to such a situation, which is distinguishable."

Then the learned judge continued thus:

> " If the decision whether to adopt 1970 costs turns on whether, bearing in mind the likelihood that prices would rise, the plaintiffs should have undertaken the work in 1970 in pursuance of their duty to mitigate their damage, there is another ground for distinguishing the *Liesbosch* case and for taking full account of the plaintiffs' financial position. This is that Lord Wright's explanation of the decision in *Clippens Oil Co Ltd v Edinburgh and*

> *District Water Trustees* [1907] AC 291 at 303, where Lord Collins said that the tortfeasor must take his victim as he found him, including any lack of means, was that that decision represented the rule in relation to the duty to minimise damage."

Certainly it was prudent for the respondent to await the promises of Alcoa to repair. It turned out that they did not. So they must pay the special damages if it has been properly proven. As for evidence of the promises, it is appropriate to refer to the evidence of the respondent and Dabson DaSilva. The respondent said :

> "DaSilva and Tewari have visited my house on more than one occasions. From 1987 I discussed my problems with DaSilva. I received a form from Alcan for me to fill out. I fill it out and returned it. People from Housing Trust came to my house and measure it up. This was at the request of the Citizens Association. I have heard nothing more since then."

Here is the telling evidence of DaSilva:

> At the 25.2.87 meeting, Dr. Davis, Dudley, Robert Stephens Financial Manager of Clarendon Alumina Partners and Wallen Bryan of Jamaica Bauxite Institute Lascelles Miller secretary of Clarendon Alumina Partners, Marcia Forbes of Community Relations, Officers of Alcoa. Dr. Davis said 'I must admit the citizens have a genuine case and Alcoa has decided to reroof the houses damaged by emissions from the Housing Trust to prepare the estimates. All costs will be borne by Alcoa Mining Company'. In July 1987 Mr. Logan came to my house

> and measure up the house. Some claim forms were sent out to different locations - Jamaica Bauxite (Mrs. Potopsingh) gate, Vere Technical High School. I believe I could recall such a form now. This is such a form - tendered as exhibit 5."

He continued thus:

> "Hundreds of such forms. I gave them to citizens in area to fill out and send to Alcoa and I receive back some which I sent to Jamaica Bauxite Institute. I gave Broderick a form which he completed and return to me and I sent it to Jamaica Bauxite Institute."

Then in conclusion, he said:

> "Even up to 1988 program never did start."

Arnold Whyte studied electrical engineering and building construction at Kingston Technical School and he has upgraded his skills by taking several courses. He is the building surveyor and chief planning officer at K.S.A.C. . He was therefore an expert witness by virtue of his studies and experience and was qualified to give an estimate of the costs of repairs at the time he gave evidence. In addition to the damage to the roof there were water marks on the walls. These, in his opinion, were caused by a leaking roof which discoloured the tiles. Further the ceiling had to be replaced.

The original claim for special damages was:

"PARTICULARS OF SPECIAL DAMAGES

Damages to 1564.0 square feet of building @ $135.00 per square feet	$211,140.00
The amendment reads:	$938,400"

There was no successful challenge to witness' analysis of the damage or the final computation as averred by counsel. So I am not prepared to interfere with the special damages either. The ground of appeal which reads:

> "4. That the learned trial judge failed to apply proper principles or to have regard to all the evidence and came to an erroneous assessment of the Plaintiff's loss in the sum of $938,400.00."

therefore fails.

Was it a correct exercise of discretion to grant an injunction?

The respondent's claim for a permanent injunction reads thus:

> "WHEREOF THE PLAINTIFF CLAIMS:-
>
> (a) Damages for nuisance
>
> (b) An order restraining the Defendants by themselves their servants and agents or otherwise from maintaining the aforesaid nuisance."

The order of the court below on this aspect reads:

> "(3) An Injunction is hereby granted restraining the Defendants by themselves their servants and/or agents from maintaining the nuisance. The Defendants are allowed until 30th June, 1995 to complete the necessary structural

> adjustments in order to eliminate the nuisance to the Plaintiff."

Be it noted that although the injunction is prohibitory in form, it was in substance, mandatory. How could the necessary structural adjustments take place without action on the part of the appellant? Where are the precise directions concerning the structural adjustments which were ordered?

The principles expressed in **Redland Bricks Ltd. v. Morris & Anor.** [1970] A.C. 652 are applicable to this case. Lord Upjohn said at p. 665:

> "A mandatory injunction can only be granted where the plaintiff shows a very strong probability upon the facts that grave damage will accrue to him in the future. As Lord Dunedin said in 1919 it is not sufficient to say 'timeo.' [*Attorney-General for the Dominion of Canada v. Ritchie Contracting and Supply Co. [1919] A.C. 999, 1005, P.C.]* It is a jurisdiction to be exercised sparingly and with caution but in the proper case unhesitatingly."

Then after stating the general principle that an injunction will only be granted if damages would not be adequate, Lord Upjohn said:

> 3. Unlike the case where a negative injunction is granted to prevent the continuance or recurrence of a wrongful act the question of the cost to the defendant to do works to prevent or lessen the likelihood of a future apprehended wrong must be an element to be taken into account:
>
> (a) where the defendant has acted

> without regard to his neighbour's rights, or has tried to steal a march on him or has tried to evade the jurisdiction of the court or, to sum it up, has acted wantonly and quite unreasonably in relation to his neighbour he may be ordered to repair his wanton and unreasonable acts by doing positive work to restore the status quo even if the expense to him is out of all proportion to the advantage thereby accruing to the plaintiff. As illustrative of this see *Woodhouse v. Newry Navigation Co.* [1898] IR 161;"

There was no evidence that Alcoa acted without regard to Broderick's rights or that they were unreasonable neighbours. There was some evidence to suggest they were conscious of obligations to their neighbours. One instance was their contribution to schools. Lord Upjohn continued:

> " (b) but where the defendant has acted reasonably, though in the event wrongly, the cost of remedying by positive action his earlier activities is most important for two reasons. First, because no legal wrong has occurred (for which he has not been recompensed at law and in equity) and in spite of gloomy expert opinion, may never occur or possibly only upon a much smaller scale than anticipated. Secondly, because if ultimately heavy damage does occur the

> plaintiff is in no way prejudiced for he has his action at law and all his consequential remedies in equity."

Then continuing to set the necessary guidelines, Lord Upjohn warned that:

> "4. If in the exercise of its discretion the court decides that it is a proper case to grant a mandatory injunction, then the court must be careful to see that the defendant knows exactly in fact what he has to do and this means not as a matter of law but as a matter of fact, so that in carrying out an order he can give his contractors the proper instructions.

This is particularly relevant in the instant case where there was no expert evidence as to what Alcoa must do to abate the nuisance in the future. On the other hand, there was some evidence that there has been a reduction in the emission of the fumes and contested evidence that the most modern method has been put in place by Alcoa:

The ground of appeal which reads:

> "2. The order for injunction was manifestly inappropriate and unnecessary in the circumstances of this case and in granting it the learned trial Judge erred in law and/or misdirected himself. Further, the order is too vague to be capable of compliance and the six month period is arbitrary and unreasonable."

has been successful and the order for an injunction must be set aside.

Conclusion

So the appeal has been allowed in part. The appropriate order in the circumstances of this case ought to be that the award of damages is affirmed but that the order for injunctive relief is set aside. The respondent Broderick must have two-thirds of the agreed or taxed cost of the appeal.

However, it emerged from the record that this was in the nature of a test case as there are several others pending in the Supreme Court. There is no doubt about the importance of a cost effective Bauxite industry to the economy of Jamaica. On the other hand, the law of nuisance gives the owner of land a protection which enables him to enjoy the comfort of his home. So a balance is to be struck between the economic benefits derived from bauxite mining and the environmental damage which is attendant on the extraction of bauxite.

The wider economic issues particularly for export earnings are therefore of public importance. Perhaps the satisfactory resolution of this thorny issue can best be considered and resolved by holding an enquiry under the Commissions of Equiry Act after the pending cases in the Supreme Court have been litigated or settled.

PATTERSON, J.A.:

This is an appeal by Alcoa Minerals of Jamaica, Inc., ("the appellants") against the judgment of Theobalds, J., delivered on 19th December, 1994. By that judgment, he awarded Herbert Broderick ("the respondent") the sum of $968,400 damages and granted an injunction restraining the appellants "by themselves their servants and/or agents from maintaining the nuisance". He allowed the appellants time "until 30th June, 1995 to complete the necessary structural adjustments in order to eliminate the nuisance to the plaintiff".

The appellants hold a mining lease granted under the provisions of The Mining Act which permits them to mine and win alumina from bauxite-rich lands. They have carried on operations in the parish of Clarendon and its environs since about 1972, with a smelting plant at Hayes and a mud lake not far off. Two turbine engines, fuelled by bunker "C" oil, generate electric power to the plant. The appellants employ the Bayer Process in the production of alumina, and they admit that as a result of their operations, there are "emissions of traces of sulphur dioxide and sometimes minute quantities of alumina dust" into the atmosphere.

The respondent, a carpenter and mason, and pastor, built a house between 1973 and 1975 on his land at Top Hill, about 1 1/2 miles "as the crow flies" from the appellants' plant at Hayes, and has occupied it since 1975. The

house was built of concrete blocks and steel, lumber, with ply-board and "cellutex" hardboard ceilings in two rooms, and a roof of "Australian 28 gauge zinc" sheets over wooden lathes. The respondent contended that the process employed by the appellants in the production of alumina generated pollutants, noxious gases, caustic aerosols and corrosive dusts and acids for free and uncontrolled dispersion into the atmosphere, resulting in severe erosion to buildings and appliances of residents in the area, including his own. In particular, the respondent contended that his dwelling house was destroyed and that he suffered injury to his health and property and has claimed damages. Further, or in the alternative, the respondent contended that the appellants maintained a public nuisance as a result of their mining operations, and as a consequence he suffered loss and damages.

The action gave rise to issues of fact and law which the learned judge resolved in favour of the respondent. The primary issue of fact was whether the operations of the appellants caused the damage to the respondent's roof or caused him any loss or damage at all, and it was a question of law whether the evidence adduced by the respondent was sufficient to discharge the onus of proving the causal link between the damage to the respondent's roof and the emissions from the appellants' operations. There is no doubt that by 1980, not more than seven years after the house was built, the galvanized roof was badly corroded and had fallen into holes. The respondent said he noticed at first that white spots appeared on the galvanized sheets and after that they commenced to

rust and fall into holes. The wooden lathes began to rot, no doubt because they were soaked by water coming through the rust holes in the galvanized roof. So bad was it, that by 1982, the respondent had to replace all the galvanized sheets and wooden lathes. By 1991, a similar situation developed but the respondent could not afford to replace more than 15 sheets of the galvanized roof then, although the other sheets had also corroded and needed to be replaced.

What then was the cause of the rapid deterioration of the galvanized sheets? The evidence of Dorr Campbell, a highly qualified metallurgist, is helpful and quite revealing. He carried out tests on a sheet of the roofing material taken from the respondent's home in November, 1993. The roofing material was a steel sheet coated with zinc to protect it from corroding. The life expectancy of such sheets (hereafter referred to as "zinc sheets"), would depend on the environment in which they were used, and the weight of the zinc coating applied to the steel sheets. In a non-industrial environment, which is considered non-aggressive, zinc sheets with zinc coating of 0.70 ounce per square foot over relatively thin steel sheets would have a life expectancy of about 14 years, whereas in an industrial environment, considered to be aggressive, the life span would be much less. When the protective zinc coating is removed, the steel base corrodes rapidly. Sulphuric acid dissolves the zinc coating and the rate of dissolution depends on the strength of the acid. The witness was posed the following question:

> "Q. Assuming that there are buildings situated near to the ALCOA plant, and assuming the

> "buildings have galvanized iron sheets on the roofs, and assuming in its operations ALCOA burns Bunker C oil, and in the process of burning Bunker C oil various gases are emitted to the atmosphere, and assuming that these gases coalesce with atmosphere and fall on the roofs, what would you expect to happen?"

The answer was quite simple:

> "I would expect degradation of the zinc coated roofs."

The zinc sheet taken from the respondent's home had significant areas where the zinc coating had been completely depleted and the exposed steel sheet had started to rust in those areas, suggesting that it was probably used in an aggressive environment. The average zinc coating weight on the remaining areas was found to be 0.81 ounce per square foot, but that suggested that the zinc coating had been of a greater weight when it was first installed. The minimum zinc coating weight recommended in Jamaica is 0.70 ounce per square foot, "but a better coating weight would be 0.90 ounce per square foot for longer life", and 1.20 ounce for highly industrialised areas. The respondent's home was in rural Jamaica "close to one heavy industrial plant".

But that was not all the scientific evidence tendered by the respondent. Another highly qualified metallurgist, Lena Whyte, had visited the respondent's house on the 29th September, 1991, and after examining the roof, took as sample one zinc sheet. She noticed that the zinc sheets on the roof were corroded in some areas and had a white corrosion deposit, referred to as white dust, on the surface. The colour of the corrosion suggested that the zinc coating had been

removed in those areas to expose the steel sheet base. The expected life span of zinc sheets was said to be 20 years, but that depended on the gauge of the steel base, the thickness of the zinc coating and the environmental conditions to which they were exposed. An extremely material portion of her evidence was noted by the learned judge in this fashion:

> "I saw Alcoa plant in area. This was an industrial environment giving off chemical fumes. If Broderick had to change his zinc so frequently it implies some compound or elements in the surrounding atmosphere causing the zinc to deteriorate. Given the environment, that is proximity of plant and mud lakes, it is likely that there would be an appreciable concentration of sulphate ions, chloride ions and a caustic environment that would be able to react corrosively with the zinc in solution. These ions would react on the galvanize coating on steel better known as zinc ... Bunker C oil contains some amount of sulphur. ... On burning this oil sulphur is transformed into sulphur dioxide and sulphur trioxide - gases which react to form sulphuric and sulphurous acid. ... Sulphuric acid is highly corrosive especially in liquid form. Sulphuric acid would react with zinc and with most metals. It would break down zinc and decrease its protective action on the steel base and also it would react with the steel base once the steel is exposed. It would reduce the iron to its oxide-ferrir and ferrous oxide (a mixture) equal rust. Depending on degree and rate of corrosion it would lead to fall out or holes in zinc sheets."

In my view, this bit of evidence, if accepted, was capable of explaining with great clarity what may have been the reason for the deterioration of the zinc sheets on the respondent's roof. But this witness said that she did not discover metallurgical features in the sample she had taken which could identify the corrosive agents. However, it was another witness, Anella McFarlane, a senior

standards scientific officer in the Jamaica Bureau of Standards, specializing in chemistry, who carried out tests on the sample. Her tests revealed the presence of sulphate on the sample zinc sheet, and that the zinc coating was corroded by sulphuric acid. She concluded that there was "an enormous amount of sulphate" on the sample from the respondent's house, and "If calculated as acid, it would be a bigger figure". She said further that the respondent's home is very near to the appellants' plant and it is possible that some deposits from it are reaching his house. The result from her testing of the zinc sheet shows the presence of sulphuric acid, and so some sulphur dioxide and/or trioxide must have reached to the roof. She did not think that chlorides caused the corrosion, and the test disclosed only a negligible quantity of alumina.

The question then surely must be, did the sulphates which undoubtedly caused the rapid deterioration of the respondent's roof, emanate from the appellants' operations? Mr. George, Q.C. submitted that the plaintiff had failed to prove that it did. He based his arguments on the fact that there are a number of factories and plants in quite close proximity to the respondent's house which use bunker "C" oil as a fuel, as well as many other vehicles which pass regularly on nearby roads. There is the Moneymusk Sugar Factory, about three miles to the west, the Jamaica Public Service plant in Old Harbour, about thirteen miles away, and West Indies Pulp and Paper Factory, about ten miles away. Then there is burning of cane in the cane belt which also releases sulphates in the atmosphere. He argued that the emissions from those sources created an

aggressive environment in the area of the respondent's house, and therefore the sulphate found on the respondent's roof could have come from any one or more of those sources. To support his argument, he referred to the evidence of Miss Anella McFarlane where she admitted that the sulphates found on the roof could have come from anywhere. In the circumstances, he contended that the respondent failed to establish a causal link between the alleged damage to his roof and the emissions from the appellants' plant. He said the question of joint tortfeasors did not arise in this case. There may be a coincidence of damage, but not by joint tortfeasors. I think the point that Mr. George was emphasizing is this: where several tortfeasors cause different damage, each is liable only for the part of the damage which he has caused. It follows, therefore, that if a plaintiff fails to prove the exact damage which the defendant caused, his action would fail. But the respondent did not base his case on the principle of joint or several tortfeasors causing the damage to his roof. The respondent adduced evidence which clearly established that after 1972 other roofs in close proximity to his home suffered damage similar to his. Dobson DaSilva, aged 62 years, testified that he owned a home at Hayes, 1 1/2 miles from the appellants' plant, which he built in 1971. Before that he "grew up" in his mother's home at Hayes, Corn Piece, which is less than one mile from the appellants' plant. His mother's house had a "galvanized zinc roof", and up to 1959 when he left home nothing was wrong with that roof. That house was destroyed by 1972. However, in 1978, he saw white spots on his roof for the first time. Rajah Tewari said he was born at

Hayes in 1928 and he owns premises about 1.6 miles from the appellants' plant. The 28 gauge zinc roof on one of his buildings dated back to 1941 and there are other buildings with zinc roofs put on in 1971. When he removed some sheets in 1981 to make additions, he saw nothing wrong with those sheets. However, by 1988, all the zinc sheets had been affected. He said they were "very rusty, corroded and with multiple holes." There were white spots on the underside of the zinc sheets which would rust and fall into holes. Wilney Francis who owns houses within a mile of the appellants' plant, suffered similar damage to his galvanized roof. One of two houses on his premises was built before 1940, the other in 1971 and both have galvanized roofs. In 1978 he discovered "white blotches" on the zinc sheets and soon after they too fell into holes.

It seems quite clear that there was sufficient evidence adduced by the respondent for the learned judge to have found that on a balance of probabilities, the environment in the Hayes area was not an aggressive one before 1972, and that by 1978 conditions had changed and the environment had become very aggressive. The reason for the drastic environmental change can only be attributed to the operations of the appellants' plant since 1972. The inescapable inference must be that the emissions from the appellants' plant caused the damage to the respondent's roof, or that it materially contributed thereto. The learned judge expressed the view that "on an overwhelming preponderance of evidence, the plaintiff had discharged the burden of proof", and I do not disagree entirely. It was said that on the evidence other sources could have

contributed to the damage, but, in my view, that is not enough to absolve the appellants from liability. It is plain that even if that was the case, the appellants' contribution would far outweigh each of the other tortfeasors. The appellants use a vast quantity of bunker "C" oil each year - about 1.2 million barrels at 42 gallons per barrel - in eight units. The amount of sulphur dioxide emitted must be great indeed. The appellants' plant was not only much closer to the respondent's house, but it operated throughout the entire year. The other sources that could have contributed to the damage were the sugar estates which were not far off, but they operated for only a part of the year, and the Jamaica Public Service Company and the West Indies Pulp and Paper factories which were far away. It is settled law that where it is shown that several tortfeasors cause the same damage, but only one has been sued, that one is nevertheless liable for the whole damage, even though his involvement may have been quite small.

Mrs. Forte submitted that the respondent was not required in law to prove to scientific precision to what degree the emission from the appellants' plant contributed to the damage as a whole, and she urged us to take a commonsense approach to the issue of causation. In ***McGhee v. National Coal Board*** [1972] 3 All E.R. 1008, the commonsense approach in cases such as this was adopted by the Board. This is what Lord Reid said (at p. 1011):

> "But it has often been said that the legal concept of causation is not based on logic or philosophy. It is based on the practical way in which the ordinary man's mind works in the everyday affairs of life.

> "From a broad and practical viewpoint I can see no substantial difference between saying that what the respondents did materially increased the risk of injury to the appellant and saying that what the respondents did make a material contribution to his injury."

In my judgment, the respondent adduced sufficient evidence to establish the causal link between the emissions from the appellants' operations and the damage to his home. The contention of the appellants is without merit.

It was contended that "the learned trial judge failed to apply proper principles or to have regard to all the evidence and came to an erroneous assessment of the plaintiff's loss in the sum of $938,400." Arnold Whyte, a building surveyor of Kingston and St. Andrew Corporation, with thirty-seven years experience in building, testified as to the damage he noticed at the respondent's home when he visited there on the 18th November, 1989. There was damage to the ceiling, rafters, lathes, zinc sheet roofing, walls, and the cement tile floors. He measured the floor area and found it to be 1564 square feet, and he estimated the cost of repairs, based on the floor area, to be $135 per square foot, a total of $211,140 at the time of his inspection. However, on the application of the respondent, the quantum of damages was amended to reflect the cost of repairs at $600 per square foot, a total of $938,400 on the 25th March, 1994, the date of the hearing. Included in the $600 per square foot for the repairs would be the cleaning and painting of the walls, the cutting and polishing of the tiles, replacement of ceiling, repairs to the roof, necessary building materials,

and labour. He estimated the cost of constructing a building, similar to the respondent's, would be $1,200 per square foot, at the date of hearing.

Mr. George, Q.C. submitted that the witness took into account "the cost of repairing the entire house", in the estimate of repairs, thus including damage which was caused by factors other than the damaged roof. He said the witness should have set out in detail all that was required to be done, instead of stating the cost per square foot of the repairs. It seems to me that the witness attributed all the damage he saw to the leaking roof, and I do not consider that to be unreasonable.

The method of assessment was not seriously challenged in the court below or before us. What has been challenged before us is the time at which the cost of repairs was assessed. The learned judge assessed the damages based on the cost of repairs at the date of the trial. The respondent testified that although the damage had been done in 1989, when Whyte inspected the building he was not able to replace more than fifteen zinc sheets due to his impecuniosity, and no further repairs had been done up to the date of trial. Mr. George, Q.C. contended that the learned judge should not have departed from the general rule that damages are to be assessed at the date of the breach and submitted that the respondent's impecuniosity was a case subject to the rule in ***Liesbosch, Dredger (Owners) v. Owners of Steamship Edison*** [1933] All E.R. Rep. 144. The decision in the ***Liesbosch*** has not gone without criticism, and Mrs. Forte, Q.C. submitted that the case which is apposite is ***Dodd Properties (Kent) Ltd. and another v.***

Canterbury City Council and others [1980] 1 All E.R. 928. In that case, the question arose as to which of two dates was relevant for the purpose of assessing the cost of repairs to a building, the date physically reasonable to commence the repairs or the date of the hearing. Megaw, L.J. in his judgment, (at page 933), said this:

> "The true rule is that, where there is a material difference between the cost of repair at the date of the wrongful act and the cost of repair when the repairs can, having regard to all the relevant circumstances, first reasonably be undertaken, it is the latter time by reference to which the cost of repairs is to be taken in assessing the damages."

On the question of impecuniosity, it is relevant to return to the words of Megaw, L.J. (at page 935):

> "A plaintiff who is under a duty to mitigate is not obliged, in order to reduce the damages, to do that which he cannot afford to do, particularly where, as here, the plaintiff's 'financial stringency', so far as it was relevant at all, arose, as a matter of common sense, if not as a matter of law, solely as a consequence of the defendant's wrongdoing."

In the instant case, the damage to the respondent's building was not done by a single stroke, it was done by an ongoing process. The appellants were deluged with complaints of the environmental hazards suffered by the community in close proximity to their plant. Dr. Carlton Davis, the Chairman of the Board of Clarendon Alumina Partners and also Chairman of Jamaica Bauxite Institute, testified on behalf of the appellants. He said (in examination in chief) that:

> "Jamaica Bauxite Institute for last fifteen years have been trying to come to terms with the many complaints from communities, dust, odours and corrosion of galvanized roof and agricultural community - accelerated since 1987. We have not been able to establish link although severe corrosion has been seen by me."

But when cross examined he agreed:

> "..that potentially corrosive emissions come from plant at Hayes - sulphur dioxide; also soot from the boiler stacks if on the surface of the soot - also dust from alumina, if it absorbs corrosive compounds it will have corrosive effects."

This evidence made it plain that the appellants were quite aware of the environmental hazards created by the operation of their plant, and of its continuing nature. In the present case, it is plain that the general rule that damages are to be assessed at the date of the breach, is inapplicable as it would create undue hardship to the respondent. The learned judge was quite aware of this, and when he assessed the damages by reference to the cost of repairs as at the date of hearing, he acted correctly in my view. The fact that the calculations for the repairs were based on the costs per square foot did not create an unfair result - this method is not unknown to the construction industry. In my judgment, the assessment of the special damages in the sum of $938,400 accords with the evidence which the learned judge accepted, and accordingly this ground of appeal also fails.

There remains the question of the order for injunction. The learned judge's order is in nature a mandatory injunction restraining the appellants "by

itself, its servants or agents, or otherwise from maintaining nuisance", which is in terms what the respondent prayed for. He, however, added that the appellants "are allowed approximately six months, that is, to the 30th June, 1995, in which to complete the necessary structural adjustments in order to eliminate the nuisance to the plaintiff." It is this order that the appellants contended "was manifestly inappropriate and unnecessary in the circumstances of this case and in granting it the learned trial judge erred in law and/or misdirected himself. Further, the order is too vague to be capable of compliance and the six month period is arbitrary and unreasonable."

Mr. Vassell relied primarily on the principles enunciated by Lord Upjohn in the case of ***Redland Bricks Ltd. v. Morris & anor.*** [1970] A.C. 652 to support the appellants' contention, but I do not think that all those principles can be applied in the instant case. In that case, the "interesting and important questions" raised were "the principles upon which the court will grant quia timet injunctions, particularly when mandatory." The instant case is somewhat different since the allegation is not of a threatened wrong, but of a continuing nuisance, and the injunction sought is to prevent the continuance of such nuisance. I am of the view that the "good working rule" enunciated by Lord Justice A. L. Smith in ***Shelfer v. City of London Electric Lighting Company*** [1895] 1 Ch. 287 is apposite. This is what he said:

> "So again, whether the case be for a mandatory injunction or to restrain a continuing nuisance, the appropriate remedy may be damages in lieu of an

"injunction, assuming a case for an injunction to be made out.

In my opinion, it may be stated as a good working rule that -

(1) If the injury to the plaintiff's legal rights is small,

(2) And is one which is capable of being estimated in money,

(3) And is one which can be adequately compensated by a small money payment,

(4) And the case is one in which it would be oppressive to the defendant to grant an injunction:

then damages in substitution for an injunction may be given."

The appellants in the instant case operate under statutory authority, but that does not empower them to inconsiderately create a nuisance, nor having created it, are they "entitled to ask the court to sanction [their] doing so by purchasing [their] neighbour's rights, by assessing damages in that behalf, leaving [their] neighbour with the nuisance..." (per A. L. Smith in the ***Shelfer*** case [supra]). On the other hand, neighbours must be accommodating to each other. There must be a certain amount of give and take to foster the relationship of good neighbours. If I create a nuisance which causes physical damage to my neighbour's property or severely affects his comfort or enjoyment, then prima facie, the court will give him protection by the granting of an injunction, even

though the nuisance arose from the lawful and reasonable use of my land. But if by grant of damages in lieu of the injunction, the damage to my neighbour can be eliminated or lessened to tolerable measures, an injunction would not be appropriate.

In the instant case, undoubtedly the appellants are aware of the nuisance that their operations create. They said they took steps to minimise its effect on the community. These included consuming as little oil as possible, which had a positive environmental effect. They have spent some ten million U.S. dollars to improve the environment. They have put in new precipitate tanks which reduce dust. They have lifted the height of the stacks. They have "tried to improve engineering practices - dust, pollutants and disposal of mud." They have spent twenty-five million U.S. dollars for a lake and to relocate two hundred families and over one million U.S. dollars in replacing roofs. Commendable though those steps may be, they cannot absolve the appellants of their liability in nuisance to the respondent. But the respondent is under a duty to take reasonable steps to mitigate the damage. It is plain from the evidence that the damage to the respondent's house all flowed directly from the corroded roof. Similar fact evidence was admitted, and it showed that all the roofs in the neighbourhood which suffered damage from corrosion were made of zinc sheets. The protective zinc coating over the steel sheets had washed off, thus causing the steel sheets to corrode and fall in holes. It seems to me that if zinc sheets are continually used for the roofs, from time to time they will always

corrode and fall in holes. However, there are many other kinds of roofing material that will survive the onslaught of the aggressive environmental conditions in the area, and the respondent and others likewise could mitigate by replacing their roof with such non-corrosive material. As Erle, C.J. said in ***Cavey v. Ledbitter*** (1863) 13, C.B.N.S. 470 at 476:

> "...the law must regard the principle of mutual adjustment."

In my opinion, those are relevant considerations that the learned judge should have taken into account before exercising his discretion to grant a mandatory injunction in this case. An award of damages, sufficient to replace the roof with a highly corrosive resistant material, such as clay tiles, or wooden shingles, would be sufficient in the circumstances of this case to stem the ravages of the nuisance. The personal discomfort suffered from the smell and odours coming from the mud lake were not enough to endanger life or interfere with the health of the respondent, although injury to health need not be proved. In any event, there was evidence that the offending mud lake had been removed and the interference from it had been substantially lessened, another factor which should have been taken into account in deciding on the grant of an injunction. It does not appear that the learned judge gave due consideration to the comparative convenience and inconvenience to the parties that would result from the grant of the mandatory injunction.

I come now to the terms of the order. It is a settled principle that the court exercises great caution when considering the grant of a mandatory injunction, and will award damages rather than grant a mandatory injunction unless damages cannot afford a sufficient or adequate remedy. But if such an injunction is granted, then its terms should be precise. Lord Justice Maugham puts it this way in ***Fishenden v. Higgs and Hill Ltd.*** [1935] 153 L.T. 128 at 142:

> "...a mandatory injunction, except in very exceptional circumstances, ought to be granted in such terms that the person against whom it is granted ought to know exactly what he has to do."

Lord Upjohn in ***Redland Bricks*** (supra) expressed a similar view in laying down general principles governing the grant of a mandatory injunction. The fourth principle reads (page 666):

> "4. If in the exercise of its discretion the court decides that it is a proper case to grant a mandatory injunction, then the court must be careful to see that the defendant knows exactly in fact what he has to do and this means not as a matter of law but as a matter of fact, so that in carrying out an order he can give his contractors the proper instructions."

The terms of the order suggest quite clearly that these principles were not applied to the instant case. The appellants are not told what are the "necessary structural adjustments" that they are ordered to "complete", in order to "eliminate the nuisance." On the facts, the appellants have set out what has been done, but there is nothing to say what else they are required to do. The order in its present terms cannot be complied with.

In my judgment, the learned judge fell in error in granting a mandatory injunction in the circumstances of this case, and the order cannot stand. This ground of appeal succeeds.

I would, therefore, allow the appeal in part by setting aside the order for the mandatory injunction, but dismiss the appeal in all other respects. The respondent is entitled to two-thirds costs of this appeal.

CAREY, J.A.:

This then is the order of the court. Appeal allowed in part. Order for mandatory injunction set aside. Judgment of the court below affirmed in all other respects.

The respondent is entitled to two thirds of the costs of appeal, to be paid by the appellant, such costs to be taxed if not agreed.