Michaelmas Term
[2017] UKPC 30
Privy Council Appeal No 0080 of 2015

JUDGMENT

Petroleum Company of Trinidad and Tobago Limited (Appellant) *v* Ryan and another (Respondents) (Trinidad and Tobago)

From the Court of Appeal of Trinidad and Tobago

before

Lady Hale
Lord Kerr
Lord Wilson
Lord Carnwath
Lord Hughes

JUDGMENT GIVEN ON

19 October 2017

Heard on 17 July 2017

Appellant	*Respondents*
Romie Tager QC Jonathan Crystal Charlotte Proudman (Instructed by Norton Rose Fulbright LLP)	Ian L Benjamin (Instructed by Simons Muirhead & Burton LLP)

LORD CARNWATH:

1. The claimants (respondents to this appeal), Stanley Ryan and, his daughter, Athena, have since 1994 lived at 13 Hickling Village, Fyzabad, some 45 feet to the south-east of a disused oil well FZ94, owned and formerly operated by the appellants ("the company"). In 2006 they were diagnosed with, respectively, pulmonary fibrosis and reactive airways disease. They attributed their conditions to emissions of hydrocarbon gases from the well and adjoining land under the company's control, and sought damages from the company, in negligence or nuisance. The claims were dismissed by the High Court (Rajkumar J), but allowed by the Court of Appeal (G Smith and P Moosai JJA, A Mendonca JA dissenting). The company appeals to the Privy Council. The appeal raises issues as to the appropriate test of causation in such cases, whether the Court of Appeal were entitled to reverse findings of fact made by the trial judge, and whether there was sufficient evidence to support their conclusions.

Background history

2. The well was installed in the 1920s and operated until 1943, when it was abandoned and plugged. Smith JA (para 8) provided a useful description of the "dynamics" of the well and of the abandonment process in 1943 (drawn from the company's evidence):

> "This oil well consisted inter alia of a metal casing (a shaft) drilled into the ground to a depth of about twelve hundred feet. The rocks in the area were porous and contained deposits of hydrocarbons (oil and gases) in them. When the shaft was drilled into an area that contained a substantial deposit of hydrocarbons (a reservoir) the release of the pressure in the rocks caused the hydrocarbons to flow up the shaft to the surface. From there they were carried to a refinery. The apparatus at the surface and the shaft created the communication with the underground reservoir. FZ94 had been a good producing well but was abandoned in 1943 when the output from the reservoir declined. The shaft was then 'plugged' with cement at three levels. These plugs were made out of cement and varied in length between twenty-four to one hundred and fifty feet. The lowest plug was at about nine hundred feet below ground. The highest one was located at about one foot from the surface."

There is mention in the papers (p 33) of a surface cement plug being inserted as part of a "final abandonment procedure" in May 1964, but nothing appears to turn on this.

3. In 1999, following a report from a company employee living in the village of a "slight odour of oil in the air", inspection by the company revealed an oil stain some 12 feet in diameter close to the well casing to the west. Although this was not clearly attributed to oil emanating from the well itself, the company took steps to deal with it by digging a small pit with a connecting drain, and instructing contractors to visit every two weeks or so to remove any oil traces. Although the judge accepted that the seepage was "small", he regarded this evidence as showing that the area of seepage was under the company's control and responsibility. The amount so extracted was not quantified and the collections ceased in August 2005 (Judgment paras 115-125).

4. Mr Ryan's evidence was that he had experienced oil smells since 1965, and had problems of coughing since the 1970s. He had in the past worked for 15 years for the company in an area called the tank farm. Although he spoke of oral complaints to the company in 2003 (Judgment para 53), his first written complaint was dated 9 February 2006, alleging that the well had been "leaking oil and emanating hydrocarbons for several years" and that this had had "a tremendous negative impact on my health" (para 48).

5. In January 2006 there was a visit by two company "safety specialists", Mr Julien and Mr Cadogan. Their inspection disclosed some oil seepage in the vicinity of the site. Although they regarded the oil seepage and any possible vapours as "of a minimal nature" (Judgment para 128), these were taken sufficiently seriously by the company to undertake a substantial project for the "re-abandonment" of the well.

6. The proposed work was described in an application made on 2 March 2006 to the Environmental Management Authority ("EMA") for a Certificate of Environmental Clearance. The purpose was said to be "to complete site decommissioning (of the well) to prevent further leaks in an effort to protect human health and environment". The estimated cost was given as T$200,000. Appended to this application was a "well abandonment programme". This was on a Ministry of Energy form, their approval also being required for the project. On a page headed "Well workover programme", the following appeared:

> "WELL HISTORY AND REASON FOR PROGRAMME
>
> …
>
> The well is bubbling around the casing - about 3' away and contaminates an area about 6' around the casing. Oil flows to a man made pit about 13' away from where it is supposedly recovered by tanker. The pollution problem seems to be in existence for several years. The NWD has already initiated construction of a

> containment tank to be installed around the casing which should serve as a temporary solution to the problem. A more permanent solution would be to drill out the present cement plugs, squeeze cement the perforated intervals, spot new cement plugs and officially abandon the well.
>
> PRESENT STATUS
>
> Abandoned - Leaking around wellhead.
>
> SUMMARY OF PROPOSAL
>
> To drill out cement plugs and abandon well according to API standards."

There followed a proposed programme of work.

7. The work was carried out between February and April 2006. It is described in the evidence of the company's witnesses, principally Mr Cadogan, Mr Jurawan and Mr Archie (Judgment paras 130-162). In short it involved replacement of existing plugs, pumping in substantial quantities of cement, sealing the well with a steel plate, and remediation work in the surrounding area (extending to some 550 m2 - S/F para 3). "Bubble tests" were carried out during the course of the work to check the extent of seepage and the effectiveness of the cement plugs. In April, following the work, environmental surveys were carried out by independent consultants (Kaizen Environmental Services (Trinidad) Ltd and ROSE Environmental Ltd) in the soil and the air, to determine the extent of volatile oil compounds (VOCs) in the vicinity of the well (Judgment paras 158-167). A gas monitoring survey by ROSE found that "the environment around the Well site is virtually free of Volatile Organic Compounds, Hydrogen Sulphide and Sulphur dioxide" (MS344).

8. On the basis of this and the other evidence, including his own site view during the course of the trial (para 168-172), the judge found that after the 2006 re-abandonment exercise "there were no hydrocarbon emanations from the well FZ94 or from the area surrounding it …" (para 173). As Smith JA observed (para 10), this finding was not contested in the Court of Appeal. It is common ground in this court.

9. The present proceedings were begun in July 2006. The judge heard evidence between December 2009 and March 2010. On 8 December 2010 he gave judgment dismissing the claims.

The judgments below

The trial judge

10. With respect to Rajkumar J (as Smith JA observed - para 21), analysis of his judgment is not made easier by the dispersion of findings of fact throughout the judgment (not always in consistent terms), and their intermingling with long extracts from the evidence, written and oral. On the other hand, the record of the evidence, including his own questions to the witnesses, indicate careful attention to the critical issues. His discussion of the law of negligence ends with a section headed "Findings and Application of Law" (paras 210-212), which provides a useful summary of his conclusions on the principal issues of law and fact arising under that head.

11. In summary, he accepted that the company had a duty to ensure that oil or other substances on land for which it was responsible did not emit gaseous emanations to such an extent as to pose a source of injury to adjoining landowners (para 188), and that it was sufficient for the claimants to show that those emissions made a material contribution to their complaints (para 190). He accepted that there was some seepage of hydrocarbons from the area around the well before 2006. But he concluded, in short, that the amount was minimal and effectively monitored by the company, that the extent of any gaseous emissions was unquantified, and that in any event the medical evidence did not establish a link with the claimants' ill health (para 210(b)-(f)).

The Court of Appeal

12. In the Court of Appeal, Mendonca JA held that it had been open to the judge to conclude as he had done. He summarised the effect of the judge's findings, with which he agreed:

> "The evidence in this case does not establish the cause of the [claimants'] diseases. It therefore does not establish that they were caused by the emissions of hydrocarbons from the [company's] well and surrounding lands or that they were caused by other emissions that could be found in a crude oil environment. The evidence also does not establish that there were in fact any such emissions in the vicinity of the [claimants'] home at all or in sufficient concentrations to be hazardous to their health." (para 31)

13. Smith JA (supported by Moosai JA) disagreed, holding that the judge's conclusions were affected by material errors and not supported by the evidence. For this purpose he conducted a detailed examination of the judgment and the evidence, written

and oral, to which it will be necessary to return below. He held that the claimants had proved on the balance of probabilities the medical basis of their complaints, and the causative link with hydrocarbon emissions for which the company was responsible. He also criticised the judge for placing too stringent a burden on the claimants, in circumstances where the evidence relating to the well and its environs lay within the control of the company, and accordingly they required "little affirmative evidence to establish a prima facie case of negligence which the [company] then had to rebut" (paras 23-24).

14. In a concluding section (para 58ff), Smith JA discussed a possible alternative approach to the issue of causation in negligence, designed as he put it to "bridg[e] any alleged evidential gaps …" Since this did not form part of his decision on the appeal, it will be convenient to address it so far as necessary at the end of this judgment (paras 47-49 below).

Issues in the appeal

15. Before the Board, while Mr Benjamin supported Smith JA's alternative approach, the dispute turned largely on his treatment of two issues of fact: (i) the nature and extent of hydrocarbon emissions from the company's land ("the emissions issue"), (ii) the medical link (if any) between such emissions and the claimants' respective conditions ("the medical evidence"). Both sides recognised the familiar limitations of the scope for an appellate court to interfere with findings of fact by the trial judge. It is sufficient to refer to Lord Reed's summary in *Henderson v Foxworth Investments Ltd* [2014] 1 WLR 2600, para 67:

> "67. It follows that, in the absence of some other identifiable error, such as (without attempting an exhaustive account) a material error of law, or the making of a critical finding of fact which has no basis in the evidence, or a demonstrable misunderstanding of relevant evidence, or a demonstrable failure to consider relevant evidence, an appellate court will interfere with the findings of fact made by a trial judge only if it is satisfied that his decision cannot reasonably be explained or justified."

The emissions issue

The trial judge

16. On this aspect the judge attached little weight to the evidence of the claimants themselves. This reflected his finding (now undisputed) that the 2006 remediation work

was successful, which was in direct conflict with their evidence that the emissions were continuing up to the time of the trial. Thus the judge recorded Mr Ryan's evidence in cross-examination that:

> "(f)rom 1965 to the present time I get the scent of crude oil every day - well emits gases and I smell it"

and that it was continuing "even as we speak" (Judgment paras 53-58). Athena's evidence was to similar effect. The only other local resident to give evidence, Mr Sorzano, said that the strong smell of oil "has always been present in the area and has also infiltrated our house" (Judgment paras 102-112), although he accepted in cross-examination that it was "a lot less" than before (MS1094).

17. The judge found Mr Ryan and Mr Sorzano "prone to exaggeration" (paras 58, 112), and that their reliability as to the pre-2006 emissions was thrown into doubt by the unreliability of their evidence regarding the later position (para 210(c)). There was no other supporting evidence on the emissions issue from local residents, even from other members of the Ryan family who were living in the same house (including his wife, the co-owner). Accordingly, he relied largely on what could be inferred from the company's evidence, arising from its inspections between 1999 and 2006.

18. Relevant "findings of fact" on this issue appear at various places in the judgment. The fullest statement is at para 13, where, having found that there was seepage of hydrocarbons before the 2006 re-abandonment, he said:

> "The quantity of that seepage was not the subject of quantitative measurement. Whether it comprised crude oil, methane, ethane, or other gaseous hydrocarbons, Hydrogen sulphide, or sulphur dioxide, aromatic hydrocarbons or some or none of these remains unknown The evidence at highest establishes that the fluid portion of that seepage was, on a balance of probabilities minimal, such that it could be collected in a pit three or four feet deep together with any water that carried it into the pit. It cannot be ruled out that such hydrocarbons as collected in that pit, and which remained there until collected at intervals of a few weeks, would have emitted an odour, and may have even been the source of volatile organic compounds as the lighter components evaporated. But the effect of wind dispersion is unknown as absolutely no evidence was produced of any testing of gaseous concentrations allegedly arising from that pit." (para 13)

19. Later, after reviewing all the evidence, he set out relevant findings of fact (paras 173-184). In relation to the period before the 2006 works, he found that "there was oil in the vicinity of (the well) for the removal of which the (company) was responsible"; that "it (did) not matter whether or not the oil came from within the well"; and that it was "within its power and ability to remove it, which it did by trucks, and to put a stop to it, which it also did in 2006" (para 177).

20. Under the heading "the level of hydrocarbons", he observed that Mr Ryan's evidence was "curiously silent" on this aspect. Although he claimed to have spent some $44,000 on works to alleviate the impact of gaseous emissions, he had failed himself to produce any analysis of samples of soil or air (para 178). The judge turned to the "essential constituents" to prove a causal link between "elements/substances in the air" emanating from the area under the company's control and the claimants' medical condition (para 178). He continued:

> "180. At highest the court was left to infer that the presence of a hydrocarbon emanation, most likely an emanation of crude oil from the area around well FZ94 was also associated with an emission of gaseous hydrocarbons from evaporation of its lighter elements in sufficient concentration as to be detectable at the claimants' premises and causative of injurious medical conditions.
>
> 181. I am prepared to infer on the evidence that the hydrocarbon emanation manifested as a blackened stained area of soil was of crude oil and/or hydrocarbon in nature.
>
> 182. I am also prepared to infer that on a balance of probabilities there could be evaporation of the lighter constituents of that substance into the atmosphere.
>
> 183. The evidence does not permit the third necessary inference ie that such evaporation produced a concentration of gaseous hydrocarbons in an amount sufficient to be detectable and to cause injury to either claimant …"

21. The same points were repeated in slightly different terms in his concluding "findings and application of the law" (paras 210-212). In particular, he accepted the company's evidence that -

> "the amount of that oil was minimal, that it was removed at intervals which prevented its accumulation to excessive levels and

> that the situation was monitored by its servants and agents." (para 210(b))

and further that there was "no objective or quantitative evidence of the level of gaseous emissions, if any, that evaporated from that oil" (para 210(b)(c)).

The Court of Appeal

22. For the majority, Smith JA concluded that the claimants had made out their case that the company "was responsible for emanations of hydrocarbon gases from FZ94 and its environs before the 2006 remediation exercise". He gave three reasons in summary for reversing the judge's conclusion on this issue:

> "The trial judge's findings to the contrary cannot be supported because of the material inconsistencies in his findings, the material error about air testing before the 2006 remediation exercise and his failure to appreciate the proper weight to be given to the affirmative evidence which was led." (para 39)

The three points there identified had been discussed in detail in the preceding paragraphs, with footnote references to the judgment below. They can be considered in turn.

23. *Material inconsistencies* The alleged inconsistencies related to the judge's findings as to the existence or otherwise of "hydrocarbon emanations" or "natural seepage" for which the company was responsible (para 35). Smith JA preferred the findings which, as he understood them, supported the conclusion that the company was responsible for emanations of "hydrocarbon gases", which he thought "well supported by the evidence". In particular, he criticised the judge for failing to mention or take note of certain oral evidence of Mr Jurawan, which in his view supported the contention that the seepage was "created or facilitated" by the well (para 36).

24. While there are some inconsistencies of language in the judgment, the Board is not persuaded that overall these criticisms are justified. In particular, they fail to take adequate account of the distinction drawn by the judge between liquid emanations into the soil and gaseous emanations into the air. Thus, for example, in footnote 26, Smith JA cites para 7(ii)(c) of the judgment as indicating a finding by the judge that "the appellants failed to prove that there were hydrocarbon emanations from FZ94" (para 35(i)). This is said to be inconsistent with later findings (eg para 10) that there were such emanations. Reference to para 7(ii)(c) does not support the criticism. It refers, not simply to hydrocarbon emanations, but specifically to emanations of "hydrocarbon

fumes" and "gaseous components". So read it is not inconsistent with para 10 (referring to hydrocarbons "seeping from the area around the well"); nor with the judge's later summary at paras 181-183 (quoted at para 21 above), where he was willing to infer the existence of emanations "of crude oil and/or hydrocarbons in nature", but not such as to result in "a concentration of gaseous hydrocarbons" in an amount sufficient to be detectable or harmful.

25. It is also difficult to understand the weight attached by Smith JA to the evidence of Mr Jurawan about the source of seepage as between the well and the surrounding area. The notes of evidence to which he referred (pp 143-144) show that this evidence emerged in the course of questions by the court itself. So it would be surprising if the judge failed to take account of it. However, he was not bound to refer to it unless he thought it of significance to his conclusion. Since he had held that the company was responsible for seepage from both the well and the surrounding area, and that the distinction was immaterial (see para 19 above), it is understandable that he did not.

26. *Material error about air-testing* The second material error identified by Smith JA (para 37) was the judge's supposed misunderstanding of evidence of Mr Cadogan about air tests carried out by him before the remediation project. According to Smith JA, the judge had wrongly interpreted these as showing that there were no Volatile Organic Compounds (VOCs) in the vicinity of the well; whereas on his own reading of the relevant evidence Mr Cadogan had been testing only for methane, and not for other significant VOCs, like hydrogen sulphide and sulphur dioxide. Mendonca JA (para 28), by contrast, thought the purport of the evidence clearly related to all types of VOCs.

27. The Board was taken to the relevant exchanges in the judge's notes of evidence (MS 1157-8). As Mr Tager QC pointed out, they included an answer to a question by the judge himself, which suggested that testing for VOCs other than methane had not been done by Mr Cadogan personally but by others in the team. Whether or not this is the correct interpretation of the evidence, the Board agrees with Mendonca JA that it is immaterial to the judge's conclusions more generally. As he said, on no view could Mr Cadogan's evidence be read as providing any support for a positive inference that hydrogen sulphide and sulphur dioxide were present, and if so in sufficient concentrations to affect health.

28. *Burden of proof* Finally Smith JA criticised the judge's failure to "appreciate the proper burden of proof in the circumstances of this case" (para 38). In his view, given the company's admitted responsibility for the maintenance of the well and its environs, the claimants had provided sufficient affirmative evidence (including their own evidence of "oil stains and noxious odours") to establish a prima facie case of the company's failure to prevent seepage of oil and fumes before the 2006 remediation exercise, and so shift the burden to the company to rebut negligence. This it had failed

to do, having led no evidence of the non-existence of VOCs pre-2006, nor carried out any tests to establish their non-existence.

29. In his oral submissions to the Board, Mr Benjamin relied particularly on the company's own assessment of the problem in March 2006, as recorded in its application to the Environmental Management Authority, and the accompanying application to the Ministry of Energy. That indicates that it was seen as a "pollution problem" which had been in existence for some years, that it was seen as sufficiently serious to require immediate remedial action (at an estimated cost of T$200,000), and that the purpose was "to protect human health and environment". Mr Benjamin pointed to the surprising absence from the company's evidence of any information about the surveys and internal reports, which must presumably have preceded such applications.

30. The Board observes that although this application was relied on in the Amended Statement of Claim, it seems to have played a very limited part in the hearing. None of the company witnesses professed any direct involvement in its production. Mr Archie had not advised on its production: MS1128. Mr Julien was not asked about it in terms; but, while he had spoken to Mr Ryan and another resident about their complaints, he said that no tests were carried out at their houses, and he was not aware of any medical reports, which were being dealt with by "another team": MS1146-7. Mr Cadogan was asked about the application to the EMA, but said that his department had not been involved: MS 1152. Mr Jurawan commented on aspects of the work programme, but, as an employee of the project contractors, he did not profess any direct knowledge of the company's thinking: MS1161. On the other hand there seems no reason to doubt that these documents accurately reflected the company's perception of the problem at the time.

31. Neither document was mentioned by the judge or by the Court of Appeal. They might have been seen as lending some force to Smith JA's concern that the judge's approach to the burden of proof was unduly generous to the company. The passages noted above (paras 18-21) show the emphasis he placed on the failure of the claimants to discharge the burden of providing specific evidence of the nature and extent of any gaseous emanations prior to the works in 2006. By contrast, it could be said, he made little of the failure of the company to explain its own actions or inactions in the seven-year period between the first detection of the problem in 1999 and the re-abandonment exercise in 2006, including the policy thinking behind the remediation project. Since it was the smell of oil, detected by a company employee, that first alerted the company to a potential problem, one might have expected some evidence of specific tests carried out by the company over the ensuing seven years, and in any event in January 2006 in response to Mr Ryan's complaints.

32. At this stage, however, it is difficult to draw any adverse inferences from this apparent gap in the company's evidence. The time to have explored it would have been

at the trial, when the company would have been able to respond. For example, the company's Chief Medical Officer, Dr Coombs, could have been asked to explain the medical concerns referred to in the application, and perhaps to produce any relevant internal reports. In the Board's view, the mere absence of such evidence cannot be relied on as in itself providing any affirmative support for the claimants' case, or as shifting the burden of proof to the company.

33. Accordingly, the Board respectfully agrees with Mendonca JA's conclusion that there was no proper basis for the Court of Appeal to reverse the judge's conclusions on this aspect of the case.

Medical evidence

34. The medical evidence was given, for the claimants, by Dr Michelle Trotman and Dr Carol Bhagan-Khan; and, for the company, by Dr Coombs and Dr Seemungal. Dr Trotman was the specialist with direct responsibility for the care of both claimants since March 2006. Dr Bhagan-Khan was an Occupational Health Physician who had prepared a report on Mr Ryan's condition in March 2007. Dr Coombs was the company's Chief Medical Officer, having held that position for 27 years. Dr Seemungal was an independent consultant physician, specialising in the field of chest and internal medicine, and a senior lecturer at the University of the West Indies. He was asked by Dr Coombs in August 2007 to advise on the possible causes of Mr Ryan's condition.

35. There was no disagreement with Dr Trotman's diagnosis: pulmonary fibrosis (Mr Ryan) and reactive airways disease (Athena). The issue was whether either condition could be attributed to hydrocarbon emissions from an oil well - either at all, or of the type and in the quantities shown to have come from land within the company's control.

36. In a section headed "Analysis of Medical Evidence" the judge first summarised the effect of Dr Trotman's cross-examination (Judgment paras 61-65): in summary that there were many possible causes of both conditions and that the link with hydrocarbon emissions was not established. She had no direct knowledge of any source or concentration of hydrocarbons and her focus on hydrocarbons as a cause was based on the information given to her by the claimants about their environment. Similarly, Dr Bhagan-Khan (Judgment paras 77-85) had had no personal knowledge of the claimants' environment, and the studies referred to by her did not establish a causal relationship between exposure to fumes from crude oil and any specific respiratory disease.

37. The judge made no direct reference to Dr Coombs' own evidence, based on his own experience of the oil industry and his exchanges with Dr Trotman in 2006. However, he summarised Dr Seemungal's response to Dr Coombs (Judgment paras 86-

93), which concluded "based on a review of the medical reports and published studies that no causative factor had been established". In a section headed "Can exposure to hydrocarbons cause pulmonary fibrosis?" (paras 94-101), the judge stated his own conclusions, in a passage in which the following were stated in bold type:

> "97. I find that no cause has been established for the medical condition of each claimant.
>
> 98. Further the state of the scientific studies in articles produced and the testimony to this court do not lead to the conclusion, and it is unable to conclude on a balance of probabilities, that hydrocarbon exposure can cause pulmonary fibrosis or interstitial lung disease or the condition of the claimant Stanley Ryan …
>
> 99. In the case of Athena it is clear that her condition can be caused by such a wide variety of agents that to assert that it is caused, on a balance of probabilities, by hydrocarbon exposure rather than any of the myriad other possible causes, for example, dust or agricultural chemicals or sugar cane fumes - (burnt?) is not possible on the evidence.
>
> 100. Further, the medical conditions of each claimant can have several possible causes, unrelated to hydrocarbon exposure …"

38. In the Court of Appeal, after a detailed review of the medical evidence, Mendonca JA held that these conclusions were reasonably open to the judge on the evidence, and there was no basis for an appellate court to intervene. Smith JA disagreed. In his view the claimants' medical evidence had been sufficient to establish "a strong prima facie case of the causes of their medical conditions" (para 28). He referred in particular to Dr Bhagan-Khan's reference to "literature which indicated the existence of lung changes due to hydrocarbon exposure, specifically so, to a condition known as hydrocarbon pneumonitis", which could lead to fibrosis, consistent with Mr Ryan's condition (para 27).

39. By contrast Smith JA found the company's attempted rebuttal "unimpressive". Dr Seemungal had not examined either of the claimants, and his opinions on "the causative role of hydrocarbon gases in human lung pneumonitis" had been "seriously discredited by cross-examination"; in particular:

> "He revealed that while he had previously stated that he did not find any literature linking lung disease like pneumonitis and

> fibrosis to hydrocarbon fumes, a recent internet search revealed such a link …" (para 30)

Dr Coombs' evidence was open to question because it was based on his researches of the literature "which must have been deficient in the light of the admissions of Dr Seemungal whose researches eventually found links between hydrocarbon exposure and lung disease …" He referred again to Dr Bhagan-Khan's production of "a medical text … confirming a link between hydrocarbon exposure and lung diseases like pneumonitis and fibrosis" (para 31).

40. In Mr Tager's submission, the judge's view that Dr Seemungal's evidence had been "seriously discredited" was without foundation. Since he had accepted Dr Trotman's diagnosis, there was no reason for him to have examined the patient himself. As appeared from a review of the judge's notes, the problem for all the medical experts was, not the diagnosis, but the lack of any evidence, in their combined experience or in the literature, of a causative link between hydrocarbon emissions associated with an oil well and the claimants' respective conditions. Dr Trotman had been aware of no studies showing such a link (MS1069).

41. The "literature" referred to by Dr Bhagan-Khan was very limited. In cross-examination she had said she could provide "texts" to "illustrate the changes in lungs due to hydrocarbon exposure" (MS1049). However, in re-examination (MS1055) she identified only a single reference in an American textbook (which had been on the reading list of a course attended by her: *Clinical Environmental Health and Toxic Exposures*. The court was given no information as to the standing of the book or of its authors. The reference came in a table (16-3) of "Common radiographic findings in occupational and environmental lung disease". This set out a series of radiographic findings with, in each case, a list of associated "diseases". Next to the finding "diffuse infiltrates acinar alveolar pattern (including pulmonary oedema)" was a list of some 30 items (in alphabetic order), one of which was "hydrocarbon pneumonitis". The reference was not supported by any explanation in the text, nor reference to medical studies or other sources. The three immediately preceding items in the list ("chlorine, cobalt, fire smoke") were no more informative. Other than the word "hydrocarbon", there seems to have been nothing to link this item to the present situation. The judge took note of the reference and asked Dr Bhagan-Khan some questions about her understanding of the term "hydrocarbon" in that context (MS1058), but he does not appear to have regarded it as important to the issues before him. The Board sees no reason to disagree with that assessment. As Mr Tager submits, it is difficult to see anything in the document itself or in the witness's answers to suggest that it had the significance now attributed to it by Smith JA.

42. As to the suggestion that Dr Seemungal's evidence had been "seriously discredited" in cross-examination, this needs to be looked at in the context of his

evidence as a whole. In his witness statement he said that his search of the literature had disclosed 230 papers on the effects of hydrocarbons. The judge accurately summarised this evidence:

> "Dr Seemungal conducted an extensive literature search but concluded that there is no evidence of volatile organic compounds of lung disease. A New Zealand study published 1994 on rabbits suggested a possible link between exposure to N-Hexane, (exposure of 3,000 parts per million) and pulmonary fibrosis but this was not borne out by further research, and in particular there were no other publications showing a relation between pneumonitis and volatile organic compounds in humans." (para 89)

43. It is true that the judge made no reference to his cross-examination by Mr Benjamin for the claimants. But it does not appear to have had the dramatic effect claimed by Smith JA. The passages cited by him related, first, to Dr Seemungal's recent internet search, and secondly to his acceptance in cross-examination that pulmonary fibrosis or pneumonitis could be clinically diagnosed, and his statement that he had "no quarrel" with the findings in the claimants' medical reports. The latter adds nothing, since it was in a context dealing simply with the agreed diagnosis, rather than the causes which were clearly in dispute. So far as concerns the internet search, Smith JA helpfully listed the references in the judge's notes to the answers on which he relied: pp 161, 167 and 168 (MS1187, 1193-4). In the Board's view, they do not support his criticisms of the judge's approach.

44. The first reference was to a passage dealing with the witness's lack of previous familiarity with the expression "hydrocarbon pneumonitis". He said that he had conducted an internet search over the weekend, commenting:

> "A: Yes I did over the weekend. I was not surprised by response. I got responses. That was first time I saw term having got responses over weekend. I did not print out any of the search results."

As far as appears from the judge's notes, the point was not pursued further by Mr Benjamin. The witness was not asked to repeat the exercise or to print out the results. Nor is there any indication that they were regarded as significant by the claimants' medical witnesses. The other reference is to an article in the Journal of Occupational Health, relating to the results of a Korean study, which Dr Seemungal had not previously seen: *Factors Related to the Prevalence of Respiratory Symptoms in Workers in a Petrochemical Complex*. This is clearly a serious academic treatment of the issue described in the title, but again there appears to have been no indication, by

the witness or Mr Benjamin, that his failure to notice it before was a serious omission, nor that it was regarded by the claimants' witnesses as significant in resolving the present problem. In questions by the judge, the witness confirmed again that the only study revealed by his own researches was the New Zealand study.

45. In the light of this review, the Board can find no support for Smith JA's statement that Dr Seemungal's evidence had been materially discredited in cross-examination. In the Board's view he was also wrong to discount Dr Coombs' evidence as based simply on the literature. His witness statement indicated that it was based on 27 years' experience as a medical officer in the oil and gas industry in Trinidad and Tobago, during which time he had not found a link between hydrocarbon emissions and pulmonary fibrosis. As Mendonca JA pointed out (para 27), Dr Coombs' evidence also highlighted the importance of looking beyond general terms such as hydrocarbons, and identifying the particular type of emissions which might be found in a crude oil environment, as opposed for example to a refinery complex. This was a point also touched on by the judge (see para 18 above).

46. In summary, the Board is unable to accept that the judge's findings on the medical evidence were undermined by his failure to take account of material parts of the evidence, or were otherwise open to challenge.

The alternative approach

47. As noted above, Smith JA discussed the possibility of a more flexible approach to the issue of causation on policy grounds, taking account of greater public awareness of environmental issues and the responsibilities of polluters. He reviewed the familiar line of House of Lords authorities on proof of causation in cases of competing causes for industrial diseases: *Bonnington Castings Ltd v Wardlaw* [1956] AC 613; *McGhee v National Coal Board* [1973] 1 WLR 1; *Wilsher v Essex Area Health Authority* [1988] 1 AC l 1074; *Fairchild v Glenhaven Funeral Services Ltd* [2002] UKHL 22; [2003] 1 AC 32. Adapting the approach of these authorities, he thought that, even if the claimants' evidence did not strictly satisfy the "but for" test of causation, there was a "sufficient substratum of evidence upon which a court could and should for policy reasons, draw inferences to bridge any such evidential gaps" (para 69).

48. More specifically, he saw the case as analogous to *Bonnington*, where the employer was held responsible for disease of an employee caused by inhaling silica dust, only some of which was "guilty dust" in the sense that it resulted from the employer's failure to maintain dust-extraction equipment. In the present case, as Smith JA put it (para 65):

> "(a) There was exposure to natural oil and gas seepage for which the respondent may not have been responsible (innocent gas) or for which the respondent may have been responsible by the fact of FZ94 causing or aggravating the seepage (guilty gas). Further, there was also seepage of gas fumes from FZ94 and its environs before the 2006 remediation exercise which provoked the appellants' medical conditions (guilty gas) and in the case of Mr Ryan, exposure at the tank farm many years earlier.
>
> (b) There was no evidence of the proportion of guilty to innocent gas. Assuming that the evidence led did not satisfy the 'but for' test of causation, this is a case where one can and should draw the inference that the guilty gas was a contributory cause and like in *Bonnington's* case, the respondent would be liable for the full extent to the loss."

49. Mr Tager does not question the application of the *Bonnington* line of authorities in this jurisdiction. However, as he submits, it has no possible application in the present case where no causative link between the claimants' condition and gaseous emissions - guilty or innocent - had been established. Smith JA's discussion proceeds on the erroneous premise that (in his words) the claimants "have proved that the gaseous emanations from FZ94 and its environs (were) at least a contributing cause of their injury" (para 63). For the reasons already discussed, the Board agrees that this premise is not supported by the evidence. In these circumstances, it agrees with Mendonca JA (para 44) that this line of authorities provides no assistance to the claimants, and no basis for adjusting the ordinary approach to causation in the present case.

Conclusion

50. For these reasons, the Board concludes that the company's appeal must be allowed, and that the order of the judge dismissing both claims be restored. Subject to any submissions received within three weeks of this judgment, the claimants will pay the company's costs before the Board and below.