Amaca Pty Ltd v Booth - [2011] HCA 53

HIGH COURT OF AUSTRALIA

FRENCH CJ,
GUMMOW, HAYNE, HEYDON AND CRENNAN JJ

Matter No S219/2011

AMACA PTY LIMITED (UNDER NSW ADMINISTERED WINDING UP) APPELLANT

AND

JOHN WILLIAM BOOTH & ANOR RESPONDENTS

Matter No S220/2011

AMABA PTY LIMITED (UNDER NSW ADMINISTERED WINDING UP) APPELLANT

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Amaca Pty Limited (Under NSW Administered Winding Up) v Booth
Amaba Pty Limited (Under NSW Administered Winding Up) v Booth
[2011] HCA 53
14 December 2011
S219/2011 & S220/2011

ORDER

In each matter, appeal dismissed with costs.

On appeal from the Supreme Court of New South Wales

Representation

J T Gleeson SC and N J Owens for the appellant in S219/2011 (instructed by Holman Webb Lawyers)

G M Watson SC with J C Sheller for the appellant in S220/2011 (instructed by DLA Piper Australia)

D F Jackson QC with S Tzouganatos for the first respondent in both matters (instructed by Turner Freeman Lawyers)

Submitting appearance for the second respondent in both matters

CATCHWORDS

Amaca Pty Limited (Under NSW Administered Winding Up) v Booth
Amaba Pty Limited (Under NSW Administered Winding Up) v Booth

Evidence – Expert evidence – First respondent sued appellants in Dust Diseases Tribunal of New South Wales – First respondent claimed exposure to asbestos fibres in breach of each appellant's duty of care caused his mesothelioma – First respondent's expert evidence that cumulative exposure to asbestos contributed to mesothelioma accepted at trial – Appellants led epidemiological evidence disputing link between exposure to asbestos of members of first respondent's profession and risk of mesothelioma – Whether inference of fact concerning contraction of disease reasonably open on evidence.

Negligence – Causation – Whether more probable than not that appellants' negligence was a cause of first respondent's disease – Whether issues of causation lie within common knowledge and experience – Role of expert medical evidence.

Practice and procedure – Appeal – No evidence – Appeal from Dust Diseases Tribunal of New South Wales to Supreme Court of New South Wales – Section 32 of *Dust Diseases Tribunal Act* 1989 (NSW) confers a right of appeal to Supreme Court against decision of Tribunal "in point of law" – Whether Tribunal erred in point of law when deciding that appellants' negligence more probably than not a cause of first respondent's disease.

Words and phrases – "causation", "cause and consequence", "epidemiological evidence", "manifest error", "mesothelioma".

Dust Diseases Tribunal Act 1989 (NSW), s 32 .

FRENCH CJ.

Introduction

1. John Booth, a retired motor mechanic, suffers from malignant pleural mesothelioma. He had two brief exposures to asbestos as a child and youth in connection with home renovations and one brief exposure when loading a truck in 1959. He attributes his disease to his exposures to asbestos in brake linings on which he worked over 30 years between 1953 and 1983[1]. In July 2008, he commenced proceedings in the Dust Diseases Tribunal of New South Wales ("the Tribunal") against Amaca Pty Ltd ("Amaca") and Amaba Pty Ltd ("Amaba"), the two companies which manufactured most of the brake linings on which he worked.

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[1] Less a three year interregnum between 1969 and 1971.

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2. The primary judge found that an "overwhelming inference of causation" adverse to Amaca and Amaba could be drawn from the following facts [2] :

- Mr Booth's mesothelioma was caused by the inhalation of asbestos fibre;
- mesothelioma very rarely occurs in persons who have not been exposed to asbestos fibres beyond the background level that pervades urban environments;
- for a total of 27 years, week in and week out, Mr Booth was additionally exposed to asbestos fibres liberated from asbestos brake shoes by his own work and by the work of others in his vicinity;
- the previous exposure in the course of home renovations and truck loading was, in comparison, trivial.

His Honour held that proof of causation in the case did not "turn upon the epidemiological evidence, or upon questionable estimations of total fibre burden." [3]

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[2] [2010] NSWDDT 8 at [162] .

[3] [2010] NSWDDT 8 at [162] .

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3. His Honour also found that it was reasonably foreseeable by Amaca and Amaba at the relevant times that an automotive mechanic exposed to asbestos fibre released from brake linings over many years might contract an asbestos-related disease [4] . Each of Amaca and Amaba owed a duty to take reasonable precautions to prevent Mr Booth suffering harm in consequence of the use of their products [5] . Each had breached that duty by failing to provide adequate warnings to persons working on the brake lining products [6] . His Honour awarded judgment for Mr Booth against both Amaca and Amaba in the sum of $326,640 [7] . He also ordered that Amaca and Amaba pay Mr Booth's costs.

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[4] [2010] NSWDDT 8 at [186], [198] .

[5] [2010] NSWDDT 8 at [200] .

[6] [2010] NSWDDT 8 at [207]-[212], [219], [221] .

[7] [2010] NSWDDT 8 at [236] .

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4. Amaca and Amaba appealed to the Court of Appeal of the Supreme Court of New South Wales on questions of law pursuant to s 32 of the *Dust Diseases Tribunal Act* 1989 (NSW) ("t he Act"). They also filed summonses pursuant to s 69 of the *Supreme Court Act* 1970 (NSW) ("the Supreme Court Act ") seeking orders in the nature of certiorari to quash the Tribunal's decision for jurisdictional error. The argument before the Court of Appeal focussed on the appeals filed under s 32 . No separate argument was raised in support of the summonses under s 69 of the Supreme Court Act [8] . The Court of Appeal held that Amaca and Amaba had failed to show that the primary judge had erred in law. It dismissed their appeals and their summonses [9] .

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[8] *Amaba Pty Ltd (Under NSW Administered Winding Up) v Booth*; *Amaca Pty Ltd (Under NSW Administered Winding Up) v Booth* (2011) Aust Torts Reports ¶82079.

[9] (2011) Aust Torts Reports ¶82-079 at 64,603 [6] .

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5. On 10 June 2011, Gummow, Hayne and Heydon JJ made orders granting Amaca and Amaba special leave to appeal from the decision of the Court of Appeal limited to the following grounds:

> "The Court of Appeal erred in holding that any act or omission on the part of the Appellant caused the First Respondent's injury:

a) By declining to correct, or alternatively by approving, the primary Court's decision that causation could be established by reference to an increase in risk, even a small increase in risk;

b) By declining to correct, or alternatively by approving, the primary Court's reliance upon insufficient expert opinion evidence in respect of causation."

6. For the reasons that follow the evidence was sufficient to support the conclusion of the Tribunal that Amaca and Amaba's products caused Mr Booth's disease. The appeals should be dismissed with costs.

Factual background

7. The following factual background emerged from the findings of the primary judge and is not in issue in these appeals.

8. John Booth was born on 26 April 1937. He first experienced the symptoms of his disease, shortness of breath and chest pains, in February or March 2008. He was diagnosed with mesothelioma. There is no serious contest that his disease was caused by the inhalation of asbestos fibres.

9. Mr Booth was exposed to asbestos fibre of different kinds and at different times over many years since his childhood. There were three brief exposures between 1943 and 1959. As a child in 1943, he helped his father with the cutting of asbestos sheets for use in the renovation of their family home. He held the sheets in place. The cutting process took about half an hour. In 1953, he helped his father in the building of a fibro garage over a period of two days. He held asbestos sheets in place while his father cut and nailed them to a timber frame. In 1959, Mr Booth worked briefly as a truck driver. On one occasion during that period he spent about 20 minutes loading bags containing asbestos onto his truck.

10. The brief isolated exposures described in the preceding paragraph were dwarfed by Mr Booth's occupational exposure to asbestos in brake linings during his career as a motor mechanic. Mr Booth commenced his apprenticeship in February 1953 and completed it in April 1954. From 1954 until 1983 he worked as a motor mechanic, save for an interregnum between 1969 and 1971. His work, for a variety of employers, included the replacement of brake linings made from asbestos. The frequency of the replacement tasks varied from twice a month to three times a week depending upon the particular employment.

11. Mr Booth's work in replacing brake linings required him to hammer rivets through holes in the linings in order to fix the linings to metal shoes. He would drill holes in linings when the misalignment between the manufactured holes and corresponding holes in the metal shoe was too great to allow rivets to be forced through both. His work also involved grinding the leading edge of brake linings on a bench grinder. This grinding generated asbestos dust which collected on his clothes, on the workbench and on the floor of the workshop. It would be re-agitated into the atmosphere by brooms, passing feet and the use of compressed air to clean the workbench. It took Mr Booth about four hours to replace the linings on a passenger vehicle and up to three hours per wheel to replace the linings on commercial trucks.

12. Hardie-Bestos and Hardie-Ferodo brake linings were manufactured by Amaca between 1953 and 1962. From 1962 to 1983 they were manufactured by Amaba. Mr Booth worked with a number of different brands of brake linings during his career as a motor mechanic. The primary judge found that 70 per cent of the asbestos fibres to which he was exposed between 1953 and 1962 were released from brake linings manufactured by Amaca and 70 per cent of the fibres to which he was exposed from 1962 to 1969 and from 1971 to 1983 were from linings manufactured by Amaba [10] .

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[10] [2010] NSWDDT 8 at [164]-[165] .

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13. There are different kinds of asbestos fibre including amosite, chrysotile and crocidolite. Amphibole asbestos, which includes crocidolite or amosite, is a more powerful causal agent in relation to mesothelioma than chrysotile. The kind of asbestos fibre to which Mr Booth was exposed as a child and young man in assisting his father with home renovation work was not known. The asbestos fibre which he loaded on to the truck in 1959 was probably chrysotile. So too was the asbestos used in the Hardie-Bestos and Hardie-Ferodo brake linings on which he worked.

14. **Following paragraph cited by:**

Turner v Bayer Australia Ltd (10 December 2024) (Keogh J)

> 1464 A further relevant decision is *Amaca v Booth* [1516] (‘*Booth*’) which concerned a retired motor mechanic who suffered from mesothelioma caused by exposure to respirable asbestos. Booth claimed that exposure to asbestos in brake linings on which he worked for over 30 years was a cause of his disease. The following findings by the trial judge were either not in dispute, or were not able to be challenged on appeal:
>
> • Mr Booth’s mesothelioma was caused by the inhalation of asbestos fibre;
>
> • chrysotile asbestos has the capacity to cause mesothelioma;
>
> • the brake linings manufactured by Amaca and Amaba contained chrysotile asbestos; and
>
> • Mr Booth inhaled chrysotile asbestos fibre liberated from Amaca and Amaba products. [1517]
>
> The trial judge accepted expert evidence to the effect ‘that all asbestos exposure, both recalled and unrecalled, will contribute causally towards the ultimate development of a mesothelioma’. [1518] French CJ said, in relation to the defendant’s reliance on epidemiological evidence:

> Amaca and Amaba relied, in the Tribunal, upon nineteen epidemiological studies published in peer reviewed journals about the incidence of mesothelioma among automotive mechanics and three "meta-analyses" which had combined the results of several studies to produce what was said to be "a more precise estimate of the risk". Each of the meta-analyses concluded that the epidemiological data showed that automotive mechanics are not at a greater risk of developing mesothelioma. The primary judge observed that the studies relied upon by the meta-analyses covered "motor mechanics", "garage workers" and "vehicle mechanics". His Honour said that the average exposure of motor mechanics might have "little in common with the particular exposure of Mr Booth". [1519]

The trial judge's criticisms of the epidemiological evidence culminated in the following conclusion:

> I am not persuaded that the epidemiological evidence specific to automotive mechanics is adverse to the submission that causation has been proved in this particular case. [1520]

With respect to this conclusion, French CJ said:

> This may be taken as a finding that the epidemiological evidence did not displace the inference of factual causation which was open on the basis of Mr Booth's history and the medical evidence relating to the cumulative effects of exposure to asbestos. [1521]

via
[1521] Ibid .

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- Mr Booth's mesothelioma was caused by the inhalation of asbestos fibre;
- chrysotile asbestos has the capacity to cause mesothelioma;

• the brake linings manufactured by Amaca and Amaba contained chrysotile asbestos; and

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In addition to the preceding factual background, the following findings of the primary judge were either not in dispute or, given the limited grant of special leave, not able to be challenged on these appeals [11] :

- Mr Booth's mesothelioma was caused by the inhalation of asbestos fibre;
- chrysotile asbestos has the capacity to cause mesothelioma;
- the brake linings manufactured by Amaca and Amaba contained chrysotile asbestos; and
- Mr Booth inhaled chrysotile asbestos fibre liberated from Amaca and Amaba products.

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[11] [2010] NSWDDT 8 at [22] .

The primary judge's reasons on causation

15. The primary judge found that exposure to asbestos dust liberated from brake linings manufactured by Amaca and Amaba "materially contributed to Mr Booth's contraction of mesothelioma." [12] Amaca and Amaba contended that there was no basis in the evidence to support that conclusion. Central to their argument was the proposition that the primary judge drew an impermissible conclusion, from evidence of risk, that Mr Booth's exposure to their products had caused his mesothelioma.

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[12] [2010] NSWDDT 8 at [172] ; see also at [219].

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16. The primary judge had regard to Mr Booth's early exposure to asbestos, his work history as a motor mechanic, his exposure to asbestos in brake linings manufactured by Amaca and Amaba, and medical and epidemiological testimony. Based upon the medical evidence, he accepted that the effect of asbestos exposures on the development of mesothelioma was cumulative [13] . He applied estimates of Mr Booth's exposures to lifetime risk figures based upon epidemiological studies. He derived from that application an estimate of Mr Booth's lifetime risks attributable to the products manufactured by Amaca and Amaba [14] .

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[13] [2010] NSWDDT 8 at [47]-[62] .

[14] [2010] NSWDDT 8 at [67]-[138] .

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17. The expert medical witnesses at trial called by Mr Booth were Professor Douglas Henderson, a professor of pathology, Dr James Leigh, a consultant occupational physician, Dr Maurice Heiner, a consultant thoracic physician and Professor William Musk, a respiratory physician. Mr Booth also called Mr Gordon Stewart, an occupational hygienist. Amaca and Amaba did not call any medical witnesses. They relied upon the evidence of Professor Geoffrey Berry, a biostatistician and epidemiologist, and Messrs Geoffrey Pickford and Alan Rogers, who are both occupational hygienists.

18. Professor Henderson gave evidence concerning the mechanical and chemical steps by which, in his opinion, the accumulation of asbestos fibres in the lungs causes mesothelioma. In a report dated 2 March 2009 he set out a number of propositions, including the following [15] :

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[15] Reproduced in the judgment of the Court of Appeal: (2011) Aust Torts Reports ¶82-079 at 64,615-64,616 [87] .

"Asbestos fibres including chrysotile are known Class 1 human carcinogens.

The [World Health Organisation] has concluded that asbestos fibres including chrysotile have the capacity to induce both lung cancer and mesothelioma.

No safe threshold level of asbestos exposure has been delineated for the carcinogenic risks from asbestos fibre inhalation, including chrysotile fibre inhalation.

…

Given the no-threshold model for cancer induction by asbestos, including chrysotile, exposures above background will, following an appropriate latency interval, confer an increment in risk on top of any underlying pre-existing background risk.

…

Exposures to asbestos dust from grinding of new brake blocks/linings/pads are known to have yielded increased airborne concentrations of respirable asbestos fibres.

Such inhalation represents exposure in excess of any exposure derived from the general environment.

…

Although some epidemiological studies have failed to identify an increased risk of lung cancer among brake mechanics, some have …

Data in Australian Mesothelioma Register – which records all mesotheliomas in a nation of almost 20,000,000 people – constitute the strongest evidence for an

increased risk of mesothelioma among brake mechanics who ground and chamfered new brake pads/linings/blocks."

19. Professor Henderson said, in a passage quoted in the primary judge's reasons [16] :

> "When there are multiple episodes of asbestos exposures, and the individual concerned inhales increasing number of fibres on different occasions, that contributes to the total burden of asbestos fibres deposited in the lung, and translocated to the pleura and [it] is thought that mesothelioma develops because of an inter-action between the asbestos fibres and the mesothelial cells by way of secondary chemical [messengers].
>
> And to simplify the answer, the point is that the more fibres there are, the greater number of fibres there will be interacting with the mesothelial cells which themselves undergo proliferation. And so the progress goes on, with increasing numbers of mesothelial cells interacting with increasing number of fibres, so that the ultimate development of mesothelioma, and its probability of development, will be influenced by the number of fibres interacting with mesothelial cells over multiple periods of time and probably over multiple different generations of mesothelial cells.
>
> And I think this is a fairly well accepted model now and it flies in the face of what used to be called the one fibre hypothesis, that mesothelioma came about from a single fibre interacting with a single mesothelial cell which in biological terms is a ridiculous proposition."

Dr Heiner gave evidence to similar effect, which was accepted by his Honour [17] . Similarly, Dr Leigh, in a passage quoted by his Honour, said [18] :

> "the current consensus view is that asbestos is involved in both the initiation phase and the promotion/proliferation phase of mesothelioma tumour development".

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[16] [2010] NSWDDT 8 at [25] .

[17] [2010] NSWDDT 8 at [31]-[32] .

[18] [2010] NSWDDT 8 at [34] .

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20. His Honour quoted and clearly accepted Professor Henderson's important observation that it is "almost universally accepted that all asbestos exposure, both recalled and unrecalled, will contribute causally towards the ultimate development of a mesothelioma" [19] . Professor Musk had spoken of cumulative exposure increasing the risk of contracting mesothelioma. His Honour observed that in cross-examination he "did not … resile from his evidence", that where a mesothelioma had occurred all exposure had materially contributed to its development and that this was the case with Mr Booth [20] . His Honour referred to Dr Leigh's testimony that because of the capacity of asbestos fibres to be involved at several

stages of tumour development, all cumulative exposure to asbestos fibre must play some part in "causation" in an individual case [21] . His Honour noted, however, that Dr Leigh agreed that if there had been no other exposure, the childhood exposure or the exposure as a truck driver, either separately or in combination, would have been sufficient to cause Mr Booth's mesothelioma [22] .

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[19] [2010] NSWDDT 8 at [26] .

[20] [2010] NSWDDT 8 at [27] .

[21] [2010] NSWDDT 8 at [35] .

[22] [2010] NSWDDT 8 at [37] .

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21. The primary judge rejected, on the basis of the medical testimony, the theory that mesothelioma can be caused by a single fibre of asbestos [23] . He held that the mechanical theory of the aetiology of mesothelioma which was based on physical properties of asbestos, the chemical theory and the "complete carcinogen theory" were complementary [24] . His Honour said [25] :

> "At issue between the parties in this case is the proposition that all exposure to chrysotile asbestos, other than trivial or *de minimis* exposure, that occurred in a latency period of between 26 and 56 years, materially contributed to the cause of Mr Booth's mesothelioma. I resolve that issue in favour of the plaintiff."

Amaca and Amaba submitted that there was no basis in the evidence for that resolution of the issue.

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[23] [2010] NSWDDT 8 at [48]-[50] .

[24] [2010] NSWDDT 8 at [51] .

[25] [2010] NSWDDT 8 at [59] .

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22. Amaca and Amaba relied, in the Tribunal, upon 19 epidemiological studies published in peer reviewed journals about the incidence of mesothelioma among automotive mechanics and three "meta-analyses" which had combined the results of several studies to produce what was said to be "a more precise estimate of the risk." [26] Each of the meta-analyses concluded that the epidemiological data showed that automotive mechanics are not at a greater risk of developing mesothelioma. The primary judge observed that the studies relied upon by the meta-analyses covered "motor mechanics", "garage workers" and "vehicle mechanics". His Honour said that the average exposure of motor mechanics might have "little in common with the particular exposure of Mr Booth." [27]

[26] [2010] NSWDDT 8 at [70] . Meta-analysis has been described as a new sub-science involving "the analysis of epidemiological analysis to enable the results of epidemiological studies of different types and of different validity to be combined to produce overall conclusions": Freckelton, "Epilogue: Dilemmas in Proof of Causation", in Freckelton and Mendelson (eds), *Causation in Law and Medicine*, (2002) 429 at 444.

[27] [2010] NSWDDT 8 at [75] .

23. His Honour accepted Dr Leigh's criticisms of the epidemiological evidence to the effect that many of the studies on which the meta-analyses were based were themselves based on "weak case reference design, and low statistical power." [28] His Honour rejected, as not justified by the data, the unqualified statement, in the meta-analysis by Goodman et al, that the epidemiological data showed that "[e]mployment as a motor mechanic [did] not increase the risk of developing mesothelioma" [29] . Dr Leigh had argued that much of the data did support a strong correlation between exposure to asbestos as an auto mechanic and the contraction of mesothelioma [30] . His Honour concluded his consideration of the epidemiological evidence with a negative finding [31] :

> "I am not persuaded that the epidemiological evidence specific to automotive mechanics is adverse to the submission that causation has been proved in this particular case."

This may be taken as a finding that the epidemiological evidence did not displace the inference of factual causation which was open on the basis of Mr Booth's history and the medical evidence relating to the cumulative effects of exposure to asbestos.

[28] [2010] NSWDDT 8 at [76] .

[29] [2010] NSWDDT 8 at [80] .

[30] [2010] NSWDDT 8 at [81] .

[31] [2010] NSWDDT 8 at [82] .

24. The occupational hygienists called by Amaca and Amaba, Messrs Pickford and Rogers, sought to quantify Mr Booth's reported exposure to asbestos fibres from various sources. His Honour accepted Mr Pickford's expertise in that respect, but concluded that its application had been unfair [32] . Mr Pickford's initial estimates had made no allowance for exposure to background asbestos fibres in the workshop generated by the work of others and by cleaning. He had also been misinformed as to the duration of the work involved in loading

asbestos in 1959 [33] . His Honour did not accept Mr Rogers' evidence save for his estimate of the fibre concentration to which Mr Booth was exposed when loading bags of asbestos on to his truck [34] .

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[32] [2010] NSWDDT 8 at [97] .

[33] [2010] NSWDDT 8 at [98] .

[34] [2010] NSWDDT 8 at [153] .

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25. After an extended discussion of the hygienists' estimates, his Honour made adjustments to them. He recast a table of lifetime risks prepared by Professor Berry, on the basis of the hygienists' estimates. The recast table was as follows [35] :

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[35] [2010] NSWDDT 8 at [133] .

Lifetime Risks of Mesothelioma per Million

Brake Repairs	Home Renovations		Loading Trucks	
	50% amosite	15 x 4% = 0.6		
	50% crocidolite	93 x 4% = 4		
18 x 170% = 30.6			Chrysotile	29 x 0.5% = 0.15

His Honour found that the brake repair work undertaken by Mr Booth "increased the background causal component of 70 per million lifetime risks by a further 30.6 per million lifetime risks" and said that "[e]xpressed in terms of cause, the brake work increased by approximately 44 per cent that fibre burden which comprised the background risk." [36] His Honour regarded that contribution as "material." [37]

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[36] [2010] NSWDDT 8 at [137] .

[37] [2010] NSWDDT 8 at [138] .

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26. By way of a qualified conclusion from his quantitative findings, his Honour said [38] :

> "Although I do not think that the mathematics are necessarily compelling, if it were necessary to assign mathematical weight to the exercise, the products of Amaca were responsible for 70 per cent (the proportion of Amaca products) of 33 per cent (the proportion of the 27 years of brake work exposure) of 44 per cent (the excess accumulation of fibre burden beyond background exposure) which equals 10 per cent of the additional fibre burden beyond background which caused Mr Booth's mesothelioma.
>
> Upon the same basis, the products of Amaba were responsible for 70 per cent of 66 per cent of 44 per cent, which equals 20 per cent of the additional fibre burden."

In so saying his Honour accepted that the causal contribution of Amaba's products was probably somewhat less than indicated by the simple apportionment he had undertaken because of the greater potency of the earlier period of exposure to Amaca's products. He found, however, that the adjustment would be relatively minor [39] . His Honour concluded that [40] :

> "asbestos dust liberated from brake linings manufactured by each of the defendants Amaca and Amaba materially contributed to Mr Booth's contraction of mesothelioma."

As was to be pointed out later in the Court of Appeal, the qualified way in which the primary judge made his quantitative finding of fibre burden attributable to Amaca and Amaba, indicated that he did not rely upon the figures as part of his essential reasoning [41] .

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[38] [2010] NSWDDT 8 at [166]-[167] .

[39] [2010] NSWDDT 8 at [168] .

[40] [2010] NSWDDT 8 at [172] .

[41] (2011) Aust Torts Reports ¶82-079 at 64,623 [133] .

The Court of Appeal's reasons

27. The judgment of the Court of Appeal was given by Basten JA, with whom Beazley and Giles JJA agreed. It is necessary only to refer to that part of the reasoning of Basten JA which dealt with the question of causation.

28. Amaca and Amaba submitted in the Court of Appeal that the primary judge failed to apply the correct legal test to the question of causation. Basten JA characterised the correct test "at a high level of generality" as "no more than whether or not the respondent established on the balance of probabilities that, in respect of each appellant, exposure to inhalation of asbestos liberated from its products materially contributed to his injury." [42] Adversely to Amaca

and Amaba, his Honour found that the evidence called by Mr Booth at trial was capable of supporting a finding of causation by reference to a scientific theory tested and accepted according to scientific method and secondly, by reference to the epidemiological evidence.

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[42] (2011) Aust Torts Reports ¶82-079 at 64,615 [84] .

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29. His Honour held that findings as to the cumulative effect of exposure to asbestos were open. Mr Booth's medical witnesses had sought to reconcile that view with the epidemiological studies which suggested there was no increased risk in the case of brake mechanics. It was open to the primary judge to accept their evidence and he did. The proposition advanced by Amaca and Amaba that the epidemiology was conclusive against Mr Booth's contention, did not give rise to a question of law but to a question of fact, which the primary judge had resolved against them [43] . This was not a case in which the plaintiff had relied solely upon epidemiological evidence.

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[43] (2011) Aust Torts Reports ¶82-079 at 64,616 [90] .

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30. His Honour held:

- there was evidence from Professor Henderson, among others, which provided a more than adequate basis for a conclusion that all inhalation of asbestos contributed to Mr Booth's injury [44] ;
- the evidence which the primary judge had accepted distinguished between the risk and the event. The concept of risk looks prospectively. If risk materialises, a causal connection may be inferred [45] .

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[44] (2011) Aust Torts Reports ¶82-079 at 64,621 [118] .

[45] (2011) Aust Torts Reports ¶82-079 at 64,621 [119] .

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31. The primary judge did not rely upon fibre burden figures attributable to Amaca and Amaba (or thereby upon quantitative risk assessments) as part of his essential reasoning. Basten JA quoted the primary judge's key findings as to causation set out in the introduction to these reasons and said correctly [46] :

> "It was these findings which had to be shown, both to be erroneous and in respect of a point of law."

[46] (2011) Aust Torts Reports ¶82-079 at 64,623 [134].

The appellants' contentions

32. The appeals to the Court of Appeal pursuant to s 32 of the Act were limited to questions of law. The grants of special leave were limited, in effect, to the question of the sufficiency of the evidence, taken as a whole, to support the finding by the primary judge that Mr Booth's exposures to the chrysotile asbestos in the brake linings manufactured by Amaca and Amaba had been causes of his mesothelioma.

33. The grants of special leave did not authorise a review of the correctness of the primary judge's findings of fact. It was not open to Amaca, for example, to advance the argument which it put in its written submissions that "[t]he trial judge's findings in relation to the causative role of each exposure to asbestos are entirely at odds with the factual findings made in other jurisdictions on what is essentially the same body of international learning." In any event, the function of the primary judge was to decide the case on the evidence before him, not on some asserted global consensus. Nor was it open to Amaba to offer arguments about the weight to be attributed to evidence given by the medical experts, including what was, given the confined nature of these appeals, the gratuitous suggestion that Dr Leigh's testimony as to the cumulative effect theory was "partly driven by an interest to reform the law in this area." [47]

[47] A suggestion footnoted by reference to what was said to be Dr Leigh's disagreement with this Court's decision in *Amaca Pty Ltd v Ellis* (2010) 240 CLR 111; [2010] HCA 5.

34. Both Amaca and Amaba argued that the evidence of the medical witnesses was focussed on "risk" rather than "cause" and that there was a slippage between those two terms in their testimony. Professor Henderson, it was said, used the terminology of "cause" when in fact he was speaking of "risk" referable to a population of persons. Amaca offered a similar interpretation with respect to the evidence of Professor Musk. The nature of its interpretation was encapsulated in its submission that:

> "Professor Musk was making the point that the increase in risk of developing mesothelioma in a population exposed to asbestos allows the inference to be drawn that asbestos causes that disease viewing the population as a whole. But he was not saying that, in Mr Booth's case, each exposure was in fact causative."

Amaba characterised Professor Musk as rejecting the cumulative effect theory.

35. Dr Heiner was said by Amaca to have framed his evidence in terms of risk and likelihood rather than in terms of causation. He had made clear that medical science could only draw conclusions as to risk in populations as a whole. Amaca submitted that there was nothing in

his evidence to support the conclusion that every fibre to which a person, who has in fact developed mesothelioma, was exposed made a material contribution to the development of the disease. Amaba made a submission to like effect.

36. In a similar vein, Amaca argued that Dr Leigh's testimony did not amount to evidence that every fibre to which a person is exposed plays some role in the development of mesothelioma. Amaba said that Dr Leigh was the "strongest proponent of what might be called the 'cumulative effect' theory". It acknowledged his statement that:

> "In view of the capacity of asbestos fibres to be involved at several stages of tumour development, all cumulative exposure to asbestos in an individual case must be considered to play some part in causation."

Dr Leigh had referred to the "current consensus view" that asbestos is involved or can have effects at both the initiation and promotion phase and the proliferation phase of tumour development. Amaba submitted that his testimony was internally inconsistent and that his evidence supporting the cumulative effect theory fell short of offering any basis for it.

37. On its interpretations of the evidence of the medical witnesses, Amaca argued that there was no basis for the trial judge's conclusion that all exposure to chrysotile asbestos, other than trivial or *de minimis* exposure, that occurred in a latency period of between 26 and 56 years, materially contributed to the cause of Mr Booth's mesothelioma. The effect of the expert evidence was said to be that while various exposures to asbestos had been shown by reference to what occurs across populations to increase the cumulative risk of development of mesothelioma, it was not possible to say which exposures in fact made a material contribution to its development or when or why. Amaba submitted that "[p]roperly analysed" none of the medical witnesses supported the cumulative effect theory. Rather, they were suggesting that an increase in exposure to asbestos would increase the risk of mesothelioma.

38. **Following paragraph cited by:**

Amaca Pty Ltd v King (22 December 2011) (Nettle, Ashley and Redlich JJA)

> 114. Sixth, the submission that the opinion was outside the revealed expertise of the two witnesses because neither they – nor anyone else in the medical profession, it seems – can describe the exact process by which asbestos fibres interact with mesothelial cells to produce mesothelioma does not mean that, with their very great knowledge of the subject, they were disqualified from offering an opinion as to causation based upon their hypotheses as to the mechanism involved. Each of the witnesses, as well as Professor Douglas Henderson, gave opinion evidence as to causation in *Booth* .[48] It seems not to have been doubted that all of them were qualified to do so.

via

[48] Ibid [19]–[20] (French CJ) .

Mr Booth's submissions drew attention to aspects of the evidence of each of the medical witnesses which supported the primary judge's findings and were, for the most part, referred to in his Honour's reasons. The submissions also pointed to Professor Henderson's evidence on specific causation, in respect of which he said:

> "it also remains my cautious opinion 'on the balance of probabilities' that Mr Booth's total cumulative exposure to chrysotile-tremolite dust derived from brake linings made a significant causal contribution towards the development of his mesothelioma, by way of a significant proportional causal effect superimposed upon any antecedent exposure (such as any alleged childhood exposure) and also incremental upon any underlying 'background' risk of mesothelioma."

And further:

> "Given that [Mr Booth's] total cumulative brake-dust derived from chrysotile-tremolite exposure made a significant proportional causal contribution towards the development of his mesothelioma, it is also my opinion that the dust derived from the proportions set forth in paragraph 13 on page 14 (Amaca/Amaba brake materials) made a significant causal contribution towards the development of his mesothelioma, as a substantial fraction of his total brake dust-derived chrysotile-tremolite exposure."

Professor Henderson had also noted that his consultation and referral files included many cases of pleural malignant mesothelioma for which chrysotile-tremolite only exposure derived from new brake linings was the only identified pattern of exposure.

39. Both Amaca and Amaba criticised the primary judge's quantitative findings in relation to the percentage of additional fibres to which Mr Booth was exposed by reason of his work with their products. Amaba, which carried the principal burden of that argument, referred to the primary judge's findings that Amaca was responsible for 10 per cent of Mr Booth's additional fibre burden beyond background and that Amaba was responsible for 20 per cent of the additional burden, and that each had materially contributed to the injury. Apart from criticising the calculations carried out by the primary judge, Amaba argued that his Honour had found causation by reference to "a small increase in risk." Amaba invoked *Amaca Pty Ltd v Ellis* [48] to contend that the small increase in risk found by his Honour could not support a finding on the balance of probabilities that exposure to its products had been a cause of Mr Booth's mesothelioma.

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[48] (2010) 240 CLR 111.

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40. **Following paragraph cited by:**

Amaca Pty Ltd v King (22 December 2011) (Nettle, Ashley and Redlich JJA)

It should be said immediately that the present case is not of the kind considered in *Amaca Pty Ltd v Ellis* . In that case the evidence of a very limited exposure to asbestos coupled with epidemiological evidence simply did not support an inference that asbestos exposure was a factual cause of the deceased person's fatal lung cancer. In particular, and by way of contrast with the present case, it was not argued in *Amaca Pty Ltd v Ellis* that it could be concluded, independently of epidemiological analysis, that exposure to asbestos was a cause of the cancer [49] . It is necessary now to consider the relationship between risk and causation in the circumstances of this case.

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[49] (2010) 240 CLR 111 at 131 [47] .

Risk of harm and factual causation

41. **Following paragraph cited by:**

Saadat v Commonwealth (09 May 2025) (Stanley J)
Saadat v Commonwealth (09 May 2025) (Stanley J)
Horvath v Hunaca Nominees Pty Ltd (Civil Claims) (19 March 2024) (D. Kim, Member)

112. In *AMACA Pty Ltd v Booth* ,[11] French CJ made the following comments about the element of causation (with footnotes omitted):

> Causation in tort is not established merely because the allegedly tortious act or omission increased a risk of injury. The risk of an occurrence and the cause of the occurrence are quite different things. [12]
>
> …
>
> The existence of an association or a positive statistical correlation between the occurrence of one event and the subsequent occurrence of another may be expressed as a possibility, which may be no greater than a "real chance" that, if the first event occurs, the second event will also occur. The mere existence of such an association or correlation does not justify a statement, relevant to factual causation in law, that the first event "creates" or "gives rise to" or "increases" the probability that the second event will occur. Such a statement contains an assumption that if the second event occurs it will have some causal connection to the first. However, if the association between two events is shown to have a causal explanation, then the conclusion may be open, if the second event should occur, that the first event has been at least a contributing cause of that occurrence. An after-the-event inference of causal connection may be reached on the civil standard of proof, namely, balance of probabilities,

notwithstanding that the statistical correlation between the first event and the second event indicated, prospectively, no more than a "mere possibility" or "real chance" that the second event would occur given the first event. There may of course be cases in which the strength of the association, as measured by relative risk ratios, itself supports an inference of a causal connection. [13]

via

[12] Ibid [41] .

Horvath v Hunaca Nominees Pty Ltd (Civil Claims) (19 March 2024) (D. Kim, Member)
Sharma by her litigation representative Sister Marie Brigid Arthur v Minister for the Environment (27 May 2021) (Bromberg J)
Australian Competition and Consumer Commission v Kimberly-Clark Australia Pty Ltd (15 June 2020) (Perram, Murphy and Thawley JJ)
Australian Competition and Consumer Commission v Kimberly-Clark Australia Pty Ltd (28 June 2019) (Gleeson J)
Roo Roofing Pty Ltd v Commonwealth (31 May 2019) (John Dixon J)

1415. Later in his reasons, French CJ observed that:

> The distinction between a statistical correlation and factual causation precedes any consideration of the distinction between factual causation and legal causation which was discussed in *March v Stramare (E &MH) Pty Ltd*. Factual causation which can be established by the application of the 'but for' test is 'the threshold test for determining whether a particular act or omission qualifies as a cause of the damage sustained'. That threshold must also be surmounted in the case of concurrent or successive tortious acts…
>
> Factual causation does not require that the propounded cause be one link in a chain of causative factors or events. It may be, as some commentators have suggested, a 'necessary element of a sufficient set' of causes. [264]

via

[264] Ibid 56 [47]-[48] (citations omitted).

Roo Roofing Pty Ltd v Commonwealth (31 May 2019) (John Dixon J)
Carangelo v State of New South Wales (27 May 2016) (Macfarlan and Gleeson JJA, Emmett AJA)

2. As *Tabet v Gett* [2010] HCA 12; 240 CLR 537 demonstrates, in a tort action for damages arising out of personal injuries, proof that a defendant's negligent conduct has increased the prospect of the plaintiff suffering injury is not, without more, compensable (see also *Amaca Pty Ltd v Booth* [2011] HCA 53; 246 CLR 36 at [41] per French CJ). Rather, as I have indicated, what must be established is that the defendant's conduct was responsible for an adverse difference in the plaintiff's condition and its negligence was "a cause of that difference" (at [66] per Hayne and Bell

JJ). Section 5D(2) of the *Civil Liability Act 2002* (NSW) may give rise to exceptions to these propositions but, as Emmett AJA concludes, the subsection is inapplicable in the present case.

BHP Billiton Ltd v Hamilton (15 August 2013) (Kourakis CJ; Blue and Stanley JJ)
King v Western Sydney Local Health Network (14 June 2013) (Basten, Hoeben and Ward JJA)
BGC Residential Pty Ltd v Fairwater Pty Ltd (18 December 2012) (Pullin JA, Newnes JA, Murphy JA)
Fraser (nee Butcher) v Burswood Resort (Management) Ltd (18 December 2012) (Stevenson DCJ)
Allianz Australia Ltd v Sim (04 April 2012) (Allsop P, Basten and Meagher JJA)
Coote v Dr Kelly (14 March 2012) (Schmidt J)

Causation in tort is not established merely because the allegedly tortious act or omission increased a risk of injury [50] . The risk of an occurrence and the cause of the occurrence are quite different things[51]. That proposition is obvious enough and not determinative of these appeals.

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[50] *Roads and Traffic Authority v Royal* (2008) 82 ALJR 870 at 898 [144] per Kiefel J ; 245 ALR 653 at 689; [2008] HCA 19 .

[51] Rizzo, "Foreword: Fundamentals of Causation", (1987) 63 *Chicago-Kent Law Review* 397 at 403: "A rise in the probability (frequency) of an outcome may be *evidence* of causation. It is not the causal phenomenon itself" (emphasis in original); *Restatement Third, Torts: Liability for Physical and Emotional Harm* §28, Reporters' Note at 432-433. See generally Wright, "Proving Causation: Probability versus Belief", in Goldberg (ed), *Perspectives on Causation*, (2011) 195 at 207 ff.

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42. **Following paragraph cited by:**

Saadat v Commonwealth (09 May 2025) (Stanley J)

It is necessary, nevertheless, to reflect upon the relationship between risk and causation. In ordinary usage "risk" refers to a hazard or danger or the chance or hazard of loss[52]. Assessm ent of the risk of an occurrence is prospective in character. It can be expressed as an ex ante probability that the occurrence will occur. If quantifiable, that probability may be expressed numerically as a figure greater than "zero" up to "one" which denotes certainty. The range of probabilities may be traversed by terms such as "mere possibility", "real chance", "more likely than not", "highly likely" and, ultimately, "certainty".

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[52] *The Shorter Oxford English Dictionary*, 3rd ed (1973) at 1837.

43. **Following paragraph cited by:**

Rosanne Cleary as the Legal Personal Representative of the Estate of the late Fortunato (aka Frank) Gatt v Amaca Pty Ltd (06 September 2021) (Strathdee, J)
East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) (10 September 2020) (Quinlan CJ, Mitchell JA, Beech JA)
D'Souza v Barclays Building Services (WA) Pty Ltd (19 June 2020) (Gething DCJ)

> 504. Dr Ng places some weight on the fact that prior to 7 July 2015, the plaintiff was not experiencing the respiratory symptoms he experienced after that date. This is consistent with my finding of fact ([299]). However, mere proof of fault followed by injury does not show that the fault caused the injury. [531]
>
> *via*
> [531] ***St George Club Ltd v Hines*** (1961) 35 ALJR 106, 107 (Dixon CJ, Kitto, Taylor, Menzies, Windeyer JJ); ***Tubemakers of Australia Ltd v Fernandez*** (1976) 50 ALJR 720, 724 (Mason J, with whom Barwick CJ & Gibbs J agreed); ***Amaca Pty Ltd (under NSW administered winding up) v Booth; Amaba Pty Ltd (under NSW administered winding up) v Booth*** [43] (French CJ) .

Ellis (by his next friend Christopher Graham Ellis) v East Metropolitan Health Service (09 March 2018) (Gething DCJ)

> 812. Ninth, mere proof of fault followed by injury does not show that the fault caused the injury. [890]
>
> *via*
> [890] ***St George Club*** (107); ***Tubemakers*** (724); ***Amaca*** [43] (French CJ) .

Ellis (by his next friend Christopher Graham Ellis) v East Metropolitan Health Service (09 March 2018) (Gething DCJ)
Amaca Pty Ltd v Tullipan (15 August 2014) (Basten, Gleeson and Leeming JJA)

> 58. Sixthly, evidence as to the *relative* likelihood that a person who has been exposed to asbestos and who has pulmonary fibrosis diagnosed a decade ago is suffering from asbestosis as opposed to idiopathic pulmonary fibrosis was directly relevant to the question of discharging Mr Tullipan's burden of proof. If the relative risk is sufficiently high, that may of itself support an inference of causal connection: *Amaca Pty Ltd v Booth* [2011] HCA 53; 246 CLR 36 at [43] and [88] .

Leheste v The Minister for Health (20 June 2012) (Commissioner Gething)

The plaintiff also relied on the following passage from the decision of French CJ in ***Amaca Pty Ltd (under NSW administered winding up) v Booth; Amaba Pty Ltd (under NSW administered winding up) v Booth*** [2011] HCA 53 [43] :

Allianz Australia Ltd v Sim (04 April 2012) (Allsop P, Basten and Meagher JJA)

100. In *Amaca v Booth* , the question was whether Mr Booth had established that his malignant pleural mesothelioma was caused by his exposure to asbestos in working on brake linings over a period of 30 years, and involving two separate defendants. After noting the distinction between a predictive assessment of risk and a retrospective assessment of causation, French CJ stated at [43] :

> "The existence of an association or a positive statistical correlation between the occurrence of one event and the subsequent occurrence of another may be expressed as a possibility, which may be no greater than a 'real chance' that, if the first event occurs, the second event will also occur. The mere existence of such an association or correlation does not justify a statement, relevant to factual causation in law, that the first event 'creates' or 'gives rise to' or 'increases' the probability that the second event will occur. Such a statement contains an assumption that if the second event occurs it will have some causal connection to the first. However, if the association between two events is shown to have a causal explanation, then the conclusion may be open, if the second event should occur, that the first event has been at least a contributing cause of that occurrence."

The existence of an association or a positive statistical correlation between the occurrence of one event and the subsequent occurrence of another may be expressed as a possibility, which may be no greater than a "real chance" that, if the first event occurs, the second event will also occur. The mere existence of such an association or correlation does not justify a statement, relevant to factual causation in law, that the first event "creates" or "gives rise to" or "increases" the probability that the second event will occur. Such a statement contains an assumption that if the second event occurs it will have some causal connection to the first. However, if the association between two events is shown to have a causal explanation, then the conclusion may be open, if the second event should occur, that the first event has been at least a contributing cause of that occurrence. An after-the-event inference of causal connection may be reached on the civil standard of proof, namely, balance of probabilities, notwithstanding that the statistical correlation between the first event and the second event indicated, prospectively, no more than a "mere possibility" or "real chance" that the second event would occur given the first event. There may of course be cases in which the strength of the association, as measured by relative risk ratios, itself supports an inference of a causal connection [53] .

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[53] See, eg, *Seltsam Pty Ltd v McGuiness* (2000) 49 NSWLR 262 at 278-285 [102] -[137] per Spigelman CJ; Freckelton, "Epilogue: Dilemmas in Proof of Causation", in Freckelton and Mendelson (eds), *Causation in Law and Medicine*, (2002) 429 at 452-453.

44. In coming to his view, expressed in his report of March 2009, that epidemiological studies had demonstrated quite conclusively that chrysotile has the capacity to induce malignant mesothelioma, Professor Henderson applied the "Bradford Hill criteria". They were set out by Sir Austin Bradford Hill in an address in 1965, a copy of which was in evidence before the primary judge[54]. The criteria were expressed as the aspects of an association between two variables that should be considered before inferring that the most likely interpretation of the association is causation. In summary, they are:

[54] "The Environment and Disease: Association or Causation?", (1965) 58 *Proceedings of the Royal Society of Medicine* 295.

- strength of association – eg, reflected in the ratio of the death rates between groups exposed to a suspected agent and those not so exposed;
- consistency in the observed association – eg, has it been repeatedly observed by different persons in different places, circumstances and times;
- the specificity of the association – if the association is limited to specific workers and particular sites and types of disease and there is no association between the work and other modes of dying, that is a strong argument in favour of causation;
- temporality – the temporal relationship of the variables;
- biological gradient – whether the association reveals a biological gradient or dose-response curve;
- plausibility – whether the expected causation is biologically plausible – a consideration which depends upon the biological knowledge of the day;
- coherence – the cause and effect interpretation of the data should not seriously conflict with the generally known facts of the natural history and biology of the disease;
- experiment – whether experimental or semi-experimental evidence supports a causation hypothesis;
- analogy – eg, given the effects of thalidomide and rubella it is easier to accept slighter but similar evidence with another drug or another viral disease in pregnancy.

The nine factors referred to by Sir Austin Bradford Hill were not presented in his paper as necessary conditions of a cause and effect relationship. They have the character of circumstantial evidence of such a relationship[55].

[55] Freckelton notes that these criteria were proposed when epidemiology was "a very young science" and correctly observes that "they do not displace the need for rigorous, scientific scrutiny of the individual items of epidemiological evidence brought to court": Freckelton, "Epilogue: Dilemmas in Proof of Causation", in Freckelton and Mendelson (eds), *Causation in Law and Medicine*, (2002) 429 at 444.

45. In a discussion of the application of the Bradford Hill criteria in the *Restatement Third, Torts*, it was said[56]:

> "Whether an inference of causation based on an association is appropriate is a matter of informed judgment, not scientific methodology, as is a judgment whether a study that finds no association is exonerative or inconclusive. No algorithm exists for applying the Hill guidelines to determine whether an association truly reflects a causal relationship or is spurious. Because the inferential process involves assessing multiple unranked factors, some of which may be more or less appropriate with regard to a specific causal assessment, judgment is required."

[56] *Restatement Third, Torts: Liability for Physical and Emotional Harm* §28, Comment c(3) at 406-407.

46. Applying the Bradford Hill factors in his report of March 2009, Professor Henderson said that the epidemiological data were inconclusive for brake lining workers specifically, but had also shown quite conclusively that chrysotile has the capacity to induce pleural malignant mesothelioma. A dose-response relationship had been demonstrated for non-brake chrysotile exposures, although not for brake lining exposures. The causal relationship was supported by experimental studies and also from the perspective of biological plausibility. Temporality was fulfilled, as was reasoning by analogy. On that basis Professor Henderson said:

> "This being so, it is my conclusion from pathobiological principles that substantial or protracted chrysotile (chrysotile-tremolite) exposure to dust derived from new (non heat-altered) brake linings probably does have the capacity to induce mesothelioma in dedicated brake mechanics. One of the problems with epidemiological studies on this issue is that they do not clearly distinguish between dedicated brake mechanics versus general automotive mechanics or garage mechanics."

In answer to the question posed for his opinion – Does exposure to dust derived from brake linings that contain chrysotile asbestos have the capacity to induce mesothelioma? – he wrote:

"Accordingly, my response … is cautiously in the affirmative, 'on the balance of probabilities'. This opinion is not given at a high order of confidence because of the controversy over this issue in the scientific literature at present. However, from surveying all of the evidence (*not only* the epidemiological evidence) and from first principles and from what is known about other chrysotile-only exposures, a causal-contributory relationship follows." (emphasis in original)

47. **Following paragraph cited by:**

Horvath v Hunaca Nominees Pty Ltd (Civil Claims) (19 March 2024) (D. Kim, Member)
Allianz Australia Insurance Ltd v Pomfret (11 February 2015) (Beazley P, McColl, Basten, Macfarlan and Meagher JJA)
Shoalhaven City Council v Pender (10 July 2013) (McColl, Barrett and Ward JJA)

203. In *Garzo* , at [170] , Tobias AJA said:

> ... it was necessary to consider first, what the position would have been had the respondents not been negligent in the relevant respect and, secondly, whether in that event the slip would have been prevented or not occurred. That was the position under the common law: *Brady v Girvan Bros Pty Ltd* (1986) 7 NSWLR 241 at 248, 249, 256 ; *Marc h v Stramare* [1991] HCA 12; (1991) 171 CLR 506 at 514 ; *Amaca Pty Ltd v Booth* [2011] HCA 53; 86 ALJR 172 at [47] ; and remains the position under ss 5D and 5E of the CL Act: *Harris v Woolworths Ltd* [2010] NSWCA 312 at [34] .

Garzo v Liverpool/Campbelltown Christian School (25 May 2012) (Basten and Meagher JJA, Tobias AJA)

170. Section 5D(1)(a) required proof that "*but for*" the respondents' negligence the appellant would not have slipped and fallen suffering the injuries that she did: *Strong v Woolworths Ltd* [2012] HCA 5; 86 ALJR 267 at [18], [4 4] . In order to address that question it was necessary to consider first, what the position would have been had the respondents not been negligent in the relevant respect and, secondly, whether in that event the slip would have been prevented or not occurred. That was the position under the common law: *Brady v Girvan Bros Pty Ltd* (1986) 7 NSWLR 241 at 248, 249, 256 ; *March v Stramare* [1991] HCA 12; (1991) 171 CLR 506 at 514 ; *Amaca Pty Ltd v Booth* [2011] HCA 53; 86 ALJR 172 at [47] ; and remains the position under ss 5D and 5E of the *CL Act* ; *Harr is v Woolworths Ltd* [2010] NSWCA 312 at [34] .

The distinction between a statistical correlation and factual causation precedes any consideration of the distinction between factual causation and legal causation which was discussed in *March v E & M H Stramare Pty Ltd* [57] . Factual causation which can be established by the application of the "but for" test is "the threshold test for determining

whether a particular act or omission qualifies as a cause of the damage sustained." [58] That threshold must also be surmounted in the case of concurrent or successive tortious acts [59] :

> "it is for the plaintiff to establish that his or her injuries are 'caused or materially contributed to' by the defendant's wrongful conduct … Generally speaking, that causal connexion is established if it appears that the plaintiff would not have sustained his or her injuries had the defendant not been negligent".

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[57] (1991) 171 CLR 506; [1991] HCA 12 .

[58] (1991) 171 CLR 506 at 530 per McHugh J.

[59] (1991) 171 CLR 506 at 514 per Mason CJ, Toohey and Gaudron JJ agreeing at 524-525 .

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48. **Following paragraph cited by:**

Ellis (by his next friend Christopher Graham Ellis) v East Metropolitan Health Service (09 March 2018) (Gething DCJ)

The threshold requirement still holds good in Australia [60] . As appears from the 10th edition of *Fleming's The Law of Torts* [61]:

> "The first inquiry involves the factual question whether the relation between the defendant's breach of duty and the plaintiff's injury is one of cause and effect in accordance with objective notions of physical sequence. If such a causal relation does not exist, the plaintiff has no actionable claim in negligence. To impose liability for loss to which the defendant's conduct has not contributed is incompatible with the principle of individual responsibility upon which the law of torts is based." (footnotes omitted)

Factual causation does not require that the propounded cause be one link in a chain of causative factors or events. It may be, as some commentators have suggested, a "necessary element of a sufficient set" of causes[62].

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[60] *Tabet v Gett* (2010) 240 CLR 537 at 578 [112] per Kiefel J, Hayne and Bell JJ agreeing at 564 [65], Crennan J agreeing at 575 [100] ; [2010] HCA 12 ; *Chappel v Hart* (1998) 195 CLR 232 at 255 [62] per Gummow J, 281-282 [111] per Hayne J; [1998] HCA 55 ; *Bennett v Minister of Community Welfare* (1992) 176 CLR 408 at 412-413 per Mason CJ, Deane and Toohey JJ; [1992] HCA 27 .

[61] (2011) at 227 [9.20].

[62] Wright, "The NESS Account of Natural Causation: A Response to Criticisms", in Goldberg (ed), *Perspectives on Causation*, (2011) 285.

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49. **Following paragraph cited by:**

Amaca Pty Limited (Under NSW Administered Winding Up) v Roseanne Cleary as the Legal Personal Representative of the Estate of the Late Fortunato (aka Frank) Gatt (23 August 2022) (Brereton, Beech-Jones and Mitchelmore JJA)

> 78. Like the evidence in *Ellis* described above, the conclusions of Professor Moolgavkar and Associate Professor Mackenize about the balance of probabilities were simply based on a quantitative comparison of the probability that the lung cancer was caused by smoking compared to the probability that it was caused by exposure to asbestos. In *Booth* at [49] , French CJ observed that a "causal connection may be inferred by somebody expert in the relevant field considering the nature and incidents of the correlation" between the relevant disease and the relevant exposure. Both Professor Moolgavkar and Associate Professor MacKenzie's evidence was of that kind, although they expressed an opinion about the causal connection with smoking (and a negative opinion about a causal connection with asbestos).

Langmaid v Dobsons Vegetable Machinery Pty Ltd (04 July 2014) (Blow CJ, Porter and Pearce JJ)

In summary, a finding that a defendant's conduct has increased the risk of injury to the plaintiff must rest upon more than a mere statistical correlation between that kind of conduct and that kind of injury. It requires the existence of a causal connection between the conduct and the injury, albeit other causative factors may be in play. As demonstrated by medical evidence in this case and in particular by Professor Henderson's evidence, a causal connection may be inferred by somebody expert in the relevant field considering the nature and incidents of the correlation. The Bradford Hill criteria provide a guide to the kind of considerations that lead to an inference of causal connection. As noted above [63] , they may include reference to relative risk ratio as an indicator of the strength of the association. Where the existence of a causal connection is accepted it can support an inference, in the particular case, when injury has eventuated, that the defendant's conduct was a cause of the injury. Professor Henderson offered that inference of specific causation by reference to Mr Booth's exposure to the products of both Amaca and Amaba. Where such an inference is drawn, the probability that it is correct is not to be determined only by reference to epidemiologically based ex ante probabilities. In *Betts v Whittingslowe* [64] , Dixon J employed apposite logic when he said:

"the breach of duty coupled with an accident of the kind *that might thereby be caused* is enough to justify an inference, in the absence of any sufficient reason to the contrary, that in fact the accident did occur owing to the act or omission amounting to the breach of statutory duty." (emphasis added)

That logic encompasses the case of an ex ante probability, of accident given breach, supported by a causal explanation linking breach and accident. In this case an explanatory causal mechanism was proposed in the medical evidence.

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[63] At [43].

[64] (1945) 71 CLR 637 at 649; [1945] HCA 31 .

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50. Lord Reid applied similar logic in *Gardiner v Motherwell Machinery and Scrap Co Ltd* when he said [65] :

"when a man who has not previously suffered from a disease contracts that disease after being subjected to conditions likely to cause it, and when he shows that it starts in a way typical of disease caused by such conditions, he establishes a prima facie presumption that his disease was caused by those conditions."

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[65] [1961] 1 WLR 1424 at 1429; [1961] 3 All ER 831 at 832. See also [1961] 1 WLR 1424 at 1429 per Lord Cohen and 1430 per Lord Hodson agreeing with Lord Reid's reasons; [1961] 3 All ER 831 at 833.

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51. **Following paragraph cited by:**

Aiberti and Military Rehabilitation and Compensation Commission (Compensation) (14 October 2019) (Deputy Boyle P)

70. In relation to the issue of whether Mr Aiberti's RAN service contributed to his development of mesothelioma, to a significant degree for the purposes of s 5B of the DRC Act , the Applicants submit:[29]

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The purpose of amending the word "material" to "significant" in s 5B of the DRC Act , as explained in the Explanatory Memorandum of the

Safety, Rehabilitation and Compensation and Other Legislation Amendment Bill 2006, was to strengthen the connection necessary between the employment and the contraction

(or aggravation) of the disease, citing *Comcare v Power* (2015) 238 FCR 187; [2015] FCA 1502 (***Comcare v Power***) at [93] .

It is insufficient if the contribution of the employment is more than trivial

(being material), it must be substantially more than trivial to be significant, again citing *Comcare v Power* at [93] .

- The determination as to whether the necessary threshold has been established, is an evaluative exercise that includes consideration of a non-exhaustive list of factors, some of which are set out in s 5B(2) of the DRC Act citing *Comcare v Power* at [94] .

- It is beside the point that one factor contributes greater than another. Nor does it matter that factors outside the employment also contribute to a significant degree. The DRC Act does not require the employment to be the sole, proximate or dominant cause of the injury; rather, the Tribunal must be satisfied, on the balance of probabilities, that the contribution was a significant contributing factor, which is a question of fact to be determined by the Tribunal in each case, citing *C omcare v Power* at [94] .

- To rebut the presumption under s 7(1) of the DRC Act the Tribunal must be satisfied, on the balance of probabilities, that Mr Aiberti's exposure to asbestos in the RAN did not contribute, to a significant degree, to his mesothelioma citing *Freeman and Military Rehabilitation and Compensation Commission (Compensation)* [2016] AATA 741 (***Freeman and MRCC***) at [98] .

- To be satisfied on the balance of probabilities, the Tribunal is not required to be satisfied with certainty or precision (*Tabet v Gett* [2010] HCA 12 at [145] – [149] ; *White and Military Rehabilitation and Compensation Commission* [2017] AATA 1555 [80]). An assessment on the balance of probabilities is not a mathematical calculation but simply a matter of an assessment of what is human experience (*Sydney South West Area Health Service v Stamoulis* [2009] NSWCA 153 at [139] (***Stamoulis***); *Fazio v Fazio* [2012] WASCA 72 at [46]), and the question of what is probable is where the person judging the

probability of that thing has the appropriate degree of confidence in its existence or correctness based on or judged according to reason (*Stam oulis* at [140]-[141]).

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Epidemiological evidence may be utilised, particularly in cases like the present (*Seltsam Pty Ltd v McGuinness* (2000) 49 NSWLR 262; [2000] NSWCA at

[93]- [94]).

· Where an expert witness expresses an opinion on the ultimate issue in the case it is important that the decision-maker recognises that this has occurred and ensures that the expert, in reaching that opinion, has correctly applied the relevant legal test upon which the ultimate issue turns (*Wiegand v Comcare Australia* [2002] FCA 1464 (***Wiegand***) at [30] per von Doussa J).

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All asbestos exposure has a cumulative effect in causal contribution to the ultimate development of a mesothelioma, based upon the understanding of physiological mechanisms and not epidemiology (*Am aca Pty Ltd v Booth* [2011] HCA 53;

(2011) 246 CLR 36 (***Amaca v Booth***) at [51]).

· There are authoritative studies that put the position beyond any doubt that both workers in Wittenoom and RAN personnel are in a category of occupations that carry significant risks for developing mesothelioma due to occupational exposure to asbestos.

· Mr Aiberti's exposure to asbestos during his service in the RAN and how asbestos causes mesothelioma establishes that his service in the RAN was a significant contributing factor to the development of his peritoneal mesothelioma because:

o He was likely exposed to low to high quantities of crocidolite, amosite and chrysotile during his seven years in the RAN, which was significantly higher than background environmental exposure. Considering the duration of his service with the RAN and, the occasions his service would have resulted in him being exposed to asbestos (as is detailed in Mr Aiberti's statements and Mr Kottek's reports), his level of exposure to asbestos during his RAN service alone placed him at a significant risk of suffering mesothelioma given:

(i) there is no level of exposure to asbestos that does not result in an increased risk in developing mesothelioma;

(ii) RAN personnel in Australia, as in other international studies examining the incidence of mesothelioma in naval and merchant shipping occupations, are at a significantly increased risk of suffering mesothelioma even if the exposure was of a short duration; and

(iii) in the hypothetical situation that Mr Aiberti's only exposure to asbestos was during his service in the RAN, it was sufficient to have caused his peritoneal mesothelioma.

- The Respondent relies primarily on Professor Fox. The evidence of Mr Kottek, Professor Musk and Dr Leigh should be preferred over that of Professor Fox as they have greater expertise in epidemiology and biological research in asbestos related disease. Professor Fox has had no training in epidemiology, and has conducted no epidemiological or biological research into asbestos related diseases whereas:

  - Mr Kottek has postgraduate training in epidemiology at Monash University and expertise in epidemiology.

  - Professor Musk holds postgraduate qualifications in epidemiology from Harvard University and has authored or co-authored hundreds of research articles specifically related to asbestos related disease.

  - Dr Leigh was the head of the Epidemiology Unit at the National Occupational Health and Safety Commission for almost 10 years and has authored 141 peer reviewed research articles, of which half are specifically related to asbestos related lung disease, and which included research in lung pathology.

- The differences in expertise between Professor Fox and the other experts is stark and offers a starting point to explain their differences in opinion. In particular, epidemiology is concerned with an evaluation of risk to which an inference of causation may be drawn; it is not direct evidence of causation in an individual case. The limit to which epidemiology assists in determining causation in this case was demonstrated in the following evidence:

  - Mr Kottek explained that, in relative terms, Mr Aiberti's exposure in Wittenoom is more important as to risk; however, he could not express an opinion as to causation in an individual case. He otherwise expressed the opinion that the risk posed by the RAN exposure was, in and of itself, significant.

  - Professor Musk, in his evidence, demonstrated the difference between risk and causation. In his report dated 8 June 2016, he

explained that it is not possible to identify which specific asbestos exposures caused or materially contributed to any mesothelioma. He explained that whilst the Wittenoom exposure was more significant, based on statistical evidence, it does not "tell us what actually happened".

- Professor Musk explained that the RAN exposure on its own was significant in increasing Mr Aiberti's risk of suffering mesothelioma.

- Dr Leigh explained that risk is a different concept to causation in an individual case and is not the same as comparing occupational groups and measuring the risk of developing mesothelioma based on incidence rates, because in this case the probability of Mr Aiberti getting mesothelioma was now one. In other words, Mr Aiberti's risk of developing mesothelioma posed by the two occupations in which Mr Aiberti was exposed to asbestos, has come home.

- Dr Leigh and Professor Musk explained that it not a matter of competing risks when comparing the risk from each of the two exposures.

- Dr Leigh explained that the exposures are not divided; rather, they are cumulative and any exposure 10 years before the occurrence of the tumour is relevant.

- Professor Fox concluded, contrary to the other experts, that because the epidemiology evidence confirmed that Mr Aiberti's risk of developing mesothelioma was greater because of his exposure to asbestos at Wittenoom when compared to the RAN exposure, it meant that the RAN's contribution was *de minimis*.

· Both occupations significantly increased Mr Aiberti's risk of developing mesothelioma, with the Wittenoom exposure being greater than the RAN exposure. However, there is no evidence to say that means the RAN exposure was *de minimis*.

· Mr Aiberti's exposure to asbestos in Wittenoom and in the RAN cumulatively contributed to the risk of him developing mesothelioma. The RAN exposure to asbestos was, in and of itself a significant risk factor and there is no evidence the Wittenoom exposure diminished or lessened the contribution the RAN exposure made to Mr Aiberti's risk of developing mesothelioma. Professor Fox agreed the more fibres an individual is exposed to the greater the risk.

· Continued exposure to asbestos in the RAN, if it did not initiate, would have proliferated the genetic change that ultimately caused Mr Aiberti's mesothelioma (Dr Leigh).

BHP Billiton Ltd v Hamilton (15 August 2013) (Kourakis CJ; Blue and Stanley JJ)

92. French CJ said:

> It is enough for present purposes to say that an inference of factual causation, as against both Amaca and Amaba, was open on the evidence before the primary judge. The cumulative effect mechanism involving all asbestos exposure in causal contribution to the ultimate development of a mesothelioma had been propounded and was accepted by his Honour. It depended upon an understanding of physiological mechanisms. It did not depend upon the epidemiology. Whether or not medical science in the future vindicates or undermines that theory, is not to the point. That is not a question which can be agitated on these appeals. The cumulative effect mechanism, accepted by his Honour, implicated the products of both Amaca and Amaba in the development of Mr Booth's disease. The primary judge's interpretation of the expert evidence and his conclusions from it, were open as a matter of law. [51]

and Gummow, Hayne and Crennan JJ said:

> The "but for" criterion of causation proved to be troublesome in various situations in which multiple acts or events led to the plaintiff's injury, for example, where the development of a particular medical condition was the result of multiple conjunctive causal factors. In such cases what may be unclear is the extent to which one of these conjunctive causal factors contributed to that state of affairs. These situations have been addressed by the proposition stated by Lord Watson in *Wakelin v London & South Western Railway Co* that it is sufficient that the plaintiff prove that the negligence of the defendant "caused or materially contributed to the injury". In that regard, reference may be made to the well-known passage in the speech of Lord Reid in *Bonnington Castings Ltd v Wardlaw* . Of that case it was said in the joint reasons in *Amaca Pty Ltd v Ellis* :
>
> "The issue in *Bonnington Castings* was whether exposure to silica dust from poorly maintained equipment caused or contributed to the pursuer's pneumoconiosis, when other (and much larger) quantities of silica dust were produced by other activities at the pursuer's workplace. Those other activities were conducted without breach of duty. As Lord Reid rightly pointed out, the question in the case was not what was the most probable source of the pursuer's disease: dust from one source or the other. The question was whether dust from the poorly maintained equipment was *a* cause of his disease when the medical evidence was that pneumoconiosis is caused by a gradual accumulation of silica particles inhaled over a period of years."
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> …
>
> Mr Booth developed his case in the following steps: (1) he had contracted mesothelioma; (2) the only known cause of that disease is exposure to asbestos; (3) the expert evidence at trial, accepted by the primary judge, was that: (a) exposure to asbestos contributes to the disease; and (b) the prospective risk of contracting the disease increases with the period of significant exposure; (4) Mr Booth had two periods of significant exposure; (5) it is more probable than not that each period of

exposure made a material contribution to bodily processes which progressed to the development of the disease.

…

It was open to the primary judge to decide that he was "not persuaded that the epidemiological evidence specific to automotive mechanics is adverse to the submission that causation has been proved in this particular case".

The Court of Appeal, with respect, correctly concluded:

"Findings as to the cumulative effect of exposure to asbestos were undoubtedly open. [Mr Booth's] witnesses, including Professor Henderson and Dr Leigh, sought to reconcile that approach with the epidemiology which suggested there was no increased risk in the case of brake mechanics. It was open to his Honour to accept their evidence, as he did. The underlying proposition put forward by the appellants, that the epidemiology was conclusive, in accordance with the principles applicable to such evidence, did not give rise to a question of law, but to a question of fact, which his Honour resolved against the appellants." [52]

[citations omitted]

Other issues

via
[51] Ibid at [51] per CJ .

BHP Billiton Ltd v Hamilton (15 August 2013) (Kourakis CJ; Blue and Stanley JJ)

It is enough for present purposes to say that an inference of factual causation, as against both Amaca and Amaba, was open on the evidence before the primary judge. The cumulative effect mechanism involving all asbestos exposure in causal contribution to the ultimate development of a mesothelioma had been propounded and was accepted by his Honour. It depended upon an understanding of physiological mechanisms. It did not depend upon the epidemiology. Whether or not medical science in the future vindicates or undermines that theory, is not to the point. That is not a question which can be agitated on these appeals. The cumulative effect mechanism, accepted by his Honour, implicated the products of both Amaca and Amaba in the development of Mr Booth's disease. The primary judge's interpretation of the expert evidence and his conclusions from it, were open as a matter of law.

52. **Following paragraph cited by:**

Carangelo v State of New South Wales (29 May 2015) (Adamson J)

It is not necessary in this case to consider the application of any modified concept of causation of the kind developed in *Fairchild v Glenhaven Funeral Services Ltd* [66] . That concept was, as Lord Phillips of Worth Matravers PSC pointed out in *Sienkiewicz v Greif (UK) Ltd* [67] , a response to "ignorance about the biological cause of the disease" which rendered it "impossible for a claimant to prove causation according to the conventional 'but for' test", a result which would have caused injustice to claimants [68] . In those cases, legal causation was extended beyond the limits of factual causation. In the result, a new head of tortious liability appears to have been created. The understanding of the aetiology of mesothelioma in *Fairchild* did not encompass the cumulative effect mechanism accepted by the primary judge in this case. In *Sienkiewicz* , Lord Phillips observed that [69] :

> "The possibility that mesothelioma may be caused as the result of the cumulative effect of exposure to asbestos dust provides a justification, even if it was not the reason, for restricting the *Fairchild/Barker* rule to cases where the same agent, or an agent acting in the same causative way, has caused the disease, for this possibility will not exist in respect of rival causes that do not act in the same causative way."

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[66] [2003] 1 AC 32 .

[67] [2011] 2 WLR 523; [2011] 2 All ER 857.

[68] [2011] 2 WLR 523 at 531 [18]; [2011] 2 All ER 857 at 865.

[69] [2011] 2 WLR 523 at 556 [104]; [2011] 2 All ER 857 at 890.

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53. The present case proceeds upon the foundation of findings, based on evidence before the primary judge, that Mr Booth's exposure to the chrysotile asbestos in brake linings manufactured by Amaca and Amaba not only prospectively increased the risk of his contracting the disease but, in the event, causally contributed to its development and continuation.

Conclusion

54. For the preceding reasons the appeals must be dismissed with costs.

55. GUMMOW, HAYNE AND CRENNAN JJ. These appeals from the New South Wales Court of Appeal (Beazley, Giles and Basten JJA)[70] were heard together. The appellant in the first appeal ("Amaca") was formerly named James Hardie & Coy Pty Ltd. In 1962 it entered into a joint venture with a British company, Ferodo Ltd, and they became the shareholders in the appellant in the second appeal ("Amaba"), then named HardieFerodo Pty Ltd. However, no case has been presented to the effect that by reason of that relationship, Amaca is fixed with the tortious liabilities of Amaba.

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[70] *Amaba Pty Ltd (Under NSW Administered Winding Up) v Booth; Amaca Pty Ltd (Under NSW Administered Winding Up) v Booth* (2011) Aust Torts Reports ¶82079.

The course of the litigation

56. The first respondent, Mr Booth, was born in Sydney in 1937. Between 1953 and 1962, Mr Booth worked as a motor mechanic using brake linings which contained asbestos manufactured by Amaca. Between 1962 and 1983 (excluding the period from 1969 to mid1971 when he was doing other work), Mr Booth worked as a brake mechanic and was exposed to asbestos in Amaba products. He also worked with brake linings produced by other manufacturers but he estimated that about 70 per cent to 75 per cent of the brake linings with which he worked were the product of Amaca or Amaba.

57. Many years later, in 2008, Mr Booth was diagnosed with malignant pleural mesothelioma, and he instituted proceedings in negligence against Amaca and Amaba in the Dust Diseases Tribunal of New South Wales ("the Tribunal"). He alleged, inter alia, failure by Amaca and Amaba to warn in respect of the use of their brake linings. The Tribunal is established, as a court of record, by s 4 of the *Dust Diseases Tribunal Act* 1989 (NSW) ("the Act"). Any evidence that would be admissible in proceedings in the Supreme Court of New South Wales is admissible in Tribunal proceedings (s 25(1)).

58. **Following paragraph cited by:**

Azar v Kathirgamalingan (18 December 2012) (McColl, Basten and Campbell JJA)

> 127. The Appellant submits, in reliance upon ***Amaca Pty Ltd (Under NSW Administered Winding Up) v Booth*** [2011] HCA 53; (2011) 86 ALJR 172 that *"subject to section 5D of the* ***Civil Liability Act*** *the primary judge ought to have asked and answered the common law test of causation namely whether the defendant's negligence 'caused or materially contributed to the injury'."* I do not accept that submission. As Gummow, Hayne and Crennan JJ noted in ***Amaca v Booth*** at [58] , the provisions of ss 5D and 5E ***Civil Liability Act*** did not apply to the proceedings that they were considering.

The effect of s 3B(1)(b) of the *Civil Liability Act* 2002 (NSW) is that the provisions of Pt 1A, Div 3 thereof, headed "Causation" and comprising ss 5D and 5E, did not apply to the proceedings instituted by Mr Booth in the Tribunal. Accordingly, no reliance was placed by any party to this litigation upon that legislation.

59. On 10 May 2010, the Tribunal (Curtis DCJ) entered judgment against Amaca and Amaba in the sum of $326,640[71]. The Tribunal found that both companies had "failed to discharge their duty to warn Mr Booth of the dangers of asbestos, and that it is because of this failure that he has contracted mesothelioma". No issue arises on these appeals of any apportionment between Amaca and Amaba; Mr Booth recovered judgment for the full sum.

[71] *Booth v Amaca Pty Ltd and Amaba Pty Ltd* [2010] NSWDDT 8.

60. Section 32 of the Act confers a right of appeal to the Supreme Court from a decision of the Tribunal "in point of law" or "on a question as to the admission or rejection of evidence". Secti on 48(2)(f) of the *Supreme Court Act* 1970 (NSW) assigned the appeal to the Court of Appeal, the Tribunal being a "specified tribunal" as defined in s 48(1)(a).

61. Each of Amaca and Amaba appealed to the Court of Appeal. The appeals were heard together, and on 10 December 2010, they were dismissed. The grants of special leave by this Court were limited to alleged error by the Court of Appeal in holding that Mr Booth's condition was caused by an act or omission on the part of Amaca and Amaba.

62. Thus, as was the situation in the appeal to this Court in *Amaca Pty Ltd v Ellis* [72] , neither the existence of duty nor breach of duty is in issue in these appeals. The central question is whether the Court of Appeal was correct in concluding that the Tribunal had not erred "in point of law" when deciding that, in respect of each appellant, it is more probable than not that its negligence was a cause of the contraction, by Mr Booth, of his disease.

[72] (2010) 240 CLR 111 at 122 [10]; [2010] HCA 5 .

63. An inference of fact, concerning the contraction of disease by Mr Booth, which was reasonably open on the evidence, will not manifest error "in point of law" [73] . In any event, the Court of Appeal assumed in favour of Amaca and Amaba that they were entitled to an appeal by way of a rehearing, but nevertheless dismissed the appeals.

[73] *Australian Broadcasting Tribunal v Bond* (1990) 170 CLR 321 at 356, 365, 369; [1990] HCA 33.

Causation

64. **Following paragraph cited by:**

Langmaid v Dobsons Vegetable Machinery Pty Ltd (04 July 2014) (Blow CJ, Porter and Pearce JJ)

13. So far as the appellants' claims for damages for breach of statutory duty and negligence are concerned, the position is different. In my view there is nothing impermissible in a trial judge making findings of fact first, and considering the legal consequences of those findings, to the extent necessary, after those findings have been made. Thus, in *Amaca Pty Ltd v Booth* (2011) 246 CLR 36, a case about liability for damages for negligence, Gummow, Hayne and Crennan JJ said at [64] :

> "… as Windeyer J observed in *The National Insurance Co of New Zealand Ltd v Espagne* the notion of cause and consequence 'is a necessary element in law, especially in the law of crime and tort'. Two issues commonly arise: first, the identification of the cause or causes of a particular occurrence or state of affairs; and, secondly, whether a legal right or liability is engendered by any one or more of those outcomes." [Footnotes omitted.]

It first should be emphasised that, as Windeyer J observed in *The National Insurance Co of New Zealand Ltd v Espagne* [74] , the notion of cause and consequence "is a necessary element in law, especially in the law of crime and tort". Two issues commonly arise: first, the identification of the cause or causes of a particular occurrence or state of affairs; and, secondly, whether a legal right or liability is engendered by any one or more of those outcomes [75].

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[74] (1961) 105 CLR 569 at 593; [1961] HCA 15 .

[75] French, "Science and judicial proceedings: Seventysix years on", (2010) 84 *Austra lian Law Journal* 244 at 250.

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65. **Following paragraph cited by:**

Karpik v Carnival plc (The Ruby Princess) (29 July 2025) (Markovic, Sarah C Derrington and Jackson JJ)

122. In *Hunt & Hunt Lawyers v Mitchell Morgan Nominees Pty Ltd* [2013] HCA 10; 247 CLR 613 at [43] , French CJ, Hayne and Kiefel JJ said: “Causation is largely a question of fact, to be approached by applying common sense to the facts of the particular case”. This means that it is an evaluative question, to be assessed in a practical manner: see ***Fisher*** *v Nonconformist Pty Ltd* [2024] NSWCA 32; 114 NSWLR 1 at [107] (Kirk JA, Meagher JA and Simpson AJA agreeing). Just as the High Court has traditionally discouraged directions to juries on the point “containing theoretical analysis and exposition” (*Amaca Pty Ltd v Booth* [2011] HCA 53; 246 CLR 36 at [65] , quoted in *Fisher* at [107]), so too would it be

wrong to hem in the trial judge's fact finding function with prescriptive rules as to how the issue of causation is to be approached. It must also be recalled that in cases of statutory causation under the ACL and the TPA , "the relevant question is whether the contravention was *a* cause of (in the sense of materially contributed to) the loss": *I & L Securities Pty Limited v HTW Valuers (Brisbane) Pty Limited* [2002] HCA 41; 210 CLR 109 at [62] (McHugh J) (emphasis in original).

Fisher v Nonconformist Pty Ltd (20 February 2024) (Meagher and Kirk JJA, Simpson AJA)

107. The notion of common sense in legal causation has been employed to connote a number of ideas, including the following. First, it is used to indicate that it is an evaluative question of fact, to be assessed in a practical manner. That seems to be the sense it was used in *Hunt & Hunt* and other such judgments. Historically, this point was linked to the fact that questions of causation were often matters for a jury, and the High Court discouraged "judicial directions containing theoretical analysis and exposition": see *Booth* at [65] . As senior counsel for Ms Fisher himself put it, "at the end of the day, if it's meant to indicate that an evaluative process is informed by the sense of the person applying it, it's hardly remarkable". It was on that basis that senior counsel said that the appellants did not need to challenge the statement made in the joint judgment in *Badawi* that causation "is a fact-laden conclusion which the courts have been told must be based on common sense" (at [81] , citing *March v Stramare* and *Nunan*). Kirby P's statement in *Kooragang* that "[w]hat is required is a commonsense evaluation of the causal chain" is of a similar nature (at 463-464).

Amaca Pty Ltd v King (22 December 2011) (Nettle, Ashley and Redlich JJA)

85. In *Amaca Pty Limited (under NSW Administered Winding up) & anor v Booth* ,[35] Gummow, Hayne and Crennan JJ said that –

> For a long period, matters of cause and consequence were said to be questions of fact for decision by the jury…hence the attraction in saying that questions of cause and consequence are to be decided by the jury applying 'common sense' to the facts of each particular case. The invocation of the 'common sense' of the jury discredited judicial directions containing theoretical analysis and exposition. [36]
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> …
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> Further, the absolute defence of contributory negligence, as Mason CJ put it in *March v Stramare (E & M H) Pty Ltd*, provided a fertile source of confusion in the development of the common law. His Honour added:
>
> > "The existence of the defence, as well as the absence of any mechanism for apportionment of liability as between a plaintiff guilty of contributory negligence and a defendant and as between codefendants who were

> concurrent tortfeasors, was a potent factor in inducing courts to embrace a view of causation which assigned occurrences to a single cause. So long as contributory negligence remained a defence, the adoption of this approach was more likely to produce just results." [37]

and

…this reasoning has lost some of its force with the decline in many jurisdictions in the trial by jury of civil actions, and the removal of contributory negligence as an absolute defence. Further, many issues of causation, including those recently considered in *Lithgow City Council v Jackson* and those which arise on the present appeals, lie outside the realm of common knowledge and experience. They fall to be determined by reference to expert evidence, for example, medical evidence. [38]

and

Even if the issue is one to which other disciplines may not be able to give any conclusive answer, questions of causation, as a step in the ascertainment of rights and the attribution of liability in law, call for sufficient reduction to certainty to satisfy the relevant burden of proof for the attribution of liability. In *Tubemakers of Australia Ltd v Fernandez*, Mason J, with the concurrence of Barwick CJ and Gibbs J, referred to a statement by Dixon J as elaborating the general onus which lies upon the plaintiff where the issue of causation lies outside the realm of common knowledge and experience. In *Adel aide Stevedoring Co Ltd v Forst*, Dixon J said:

> "I think that upon a question of fact of a medical or scientific description a court can only say that the burden of proof has not been discharged where, upon the evidence, it appears that the *present state of knowledge* does not admit of an affirmative answer and that competent and trustworthy expert opinion regards an affirmative answer as lacking justification, *either as a probable inference or as an accepted hypothesis*." (emphasis added) [39]

The ‘but for’ criterion of causation proved to be troublesome in various situations in which multiple acts or events led to the plaintiff's injury, for example, where the development of a particular medical condition was the result of multiple conjunctive causal factors. *In such cases what may be unclear is the extent to which one of these conjunctive causal factors contributed to that state of affairs.* These situations have been addressed by the proposition stated by Lord Watson in *Wakelin v London and South Western Railway Co* that it is sufficient that the plaintiff prove that the negligence of the defendant ‘caused or materially contributed to the injury’. In that regard, reference may be made to the wellknown passage in the speech of Lord Reid in *Bonnington Castings Ltd v Wardlaw*. Of that case it was said in the joint reasons in *Amaca Pty Ltd v Ellis*:

> "The issue in *Bonnington Castings* was whether exposure to silica dust from poorly maintained equipment caused or contributed to the pursuer's

pneumoconiosis, when other (and much larger) quantities of silica dust were produced by other activities at the pursuer's workplace. Those other activities were conducted without breach of duty. As Lord Reid rightly pointed out, the question in the case was not what was the most probable source of the pursuer's disease: dust from one source or the other. The question was whether dust from the poorly maintained equipment was *a cause* of his disease when the medical evidence was that pneumoconiosis is caused by a gradual accumulation of silica particles inhaled over a period of years." (emphasis in original) [40]

via

[38] Ibid [67] (citations omitted).

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85. In *Amaca Pty Limited (under NSW Administered Winding up) & anor v Booth* ,[35] Gummow, Hayne and Crennan JJ said that –

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Further, the absolute defence of contributory negligence, as Mason CJ put it in *March v Stramare (E & M H) Pty Ltd*, provided a fertile source of confusion in the development of the common law. His Honour added:

"The existence of the defence, as well as the absence of any mechanism for apportionment of liability as between a plaintiff guilty of contributory negligence and a defendant and as between codefendants who were concurrent tortfeasors, was a potent factor in inducing courts to embrace a view of causation which assigned occurrences to a single cause. So long as contributory negligence remained a defence, the adoption of this approach was more likely to produce just results." [37]

and

…this reasoning has lost some of its force with the decline in many jurisdictions in the trial by jury of civil actions, and the removal of contributory negligence as an absolute defence. Further, many issues of causation, including those recently considered in *Lithgow City Council v Jackson* and those which arise on the present appeals, lie outside the realm of common knowledge and experience. They fall to be determined by reference to expert evidence, for example, medical evidence. [38]

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> "I think that upon a question of fact of a medical or scientific description a court can only say that the burden of proof has not been discharged where, upon the evidence, it appears that the *present state of knowledge* does not admit of an affirmative answer and that competent and trustworthy expert opinion regards an affirmative answer as lacking justification, *either as a probable inference or as an accepted hypothesis*." (emphasis added) [39]

The ‘but for’ criterion of causation proved to be troublesome in various situations in which multiple acts or events led to the plaintiff's injury, for example, where the development of a particular medical condition was the result of multiple conjunctive causal factors. *In such cases what may be unclear is the extent to which one of these conjunctive causal factors contributed to that state of affairs.* These situations have been addressed by the proposition stated by Lord Watson in *Wakelin v London and South Western Railway Co* that it is sufficient that the plaintiff prove that the negligence of the defendant ‘caused or materially contributed to the injury’. In that regard, reference may be made to the wellknown passage in the speech of Lord Reid in *Bonnington Castings Ltd v Wardlaw*. Of that case it was said in the joint reasons in *Amaca Pty Ltd v Ellis*:

> "The issue in *Bonnington Castings* was whether exposure to silica dust from poorly maintained equipment caused or contributed to the pursuer's pneumoconiosis, when other (and much larger) quantities of silica dust were produced by other activities at the pursuer's workplace. Those other activities were conducted without breach of duty. As Lord Reid rightly pointed out, the question in the case was not what was the most probable source of the pursuer's disease: dust from one source or the other. The question was whether dust from the poorly maintained equipment was *a cause* of his disease when the medical evidence was that pneumoconiosis is caused by a gradual accumulation of silica particles inhaled over a period of years." (emphasis in original) [40]

via

[37] Ibid [66] (citations omitted).

Amaca Pty Ltd v King (22 December 2011) (Nettle, Ashley and Redlich JJA)
Amaca Pty Ltd v King (22 December 2011) (Nettle, Ashley and Redlich JJA)
Amaca Pty Ltd v King (22 December 2011) (Nettle, Ashley and Redlich JJA)

For a long period, matters of cause and consequence were said to be questions of fact for decision by the jury. In civil actions, for example, questions of cause and consequence arose on the issue joined on the pleaded averment that commonly commenced with the word "whereby" [76] . Hence the attraction in saying that questions of cause and consequence are to be decided by the jury applying "common sense" to the facts of each particular case [77] . T he invocation of the "common sense" of the jury discredited judicial directions containing theoretical analysis and exposition [78] . So it was said in *Fitzgerald v Penn* [79] :

> "as soon as one attempts such analysis or exposition, one must enter on a field which is not really appropriate for exploration by a jury".

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[76] *The National Insurance Co of New Zealand Ltd v Espagne* (1961) 105 CLR 569 at 590.

[77] *Fitzgerald v Penn* (1954) 91 CLR 268 at 277278; [1954] HCA 74.

[78] cf *Adeels Palace Pty Ltd v Moubarak* (2009) 239 CLR 420 at 440 [43] ; [2009] HCA 48.

[79] (1954) 91 CLR 268 at 278.

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66. Further, the absolute defence of contributory negligence, as Mason CJ put it in *March v Stramare (E & M H) Pty Ltd* [80] , provided a fertile source of confusion in the development of the common law. His Honour added [81] :

> "The existence of the defence, as well as the absence of any mechanism for apportionment of liability as between a plaintiff guilty of contributory negligence and a defendant and as between codefendants who were concurrent tortfeasors, was a potent factor in inducing courts to embrace a view of causation which assigned occurrences to a single cause. So long as contributory negligence remained a defence, the adoption of this approach was more likely to produce just results."

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[80] (1991) 171 CLR 506 at 511; [1991] HCA 12 .

[81] (1991) 171 CLR 506 at 511.

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67. **Following paragraph cited by:**

Saadat v Commonwealth (09 May 2025) (Stanley J)
Fisher v Nonconformist Pty Ltd (20 February 2024) (Meagher and Kirk JJA, Simpson AJA)

> 108. Secondly, and overlapping with the first point, "common sense" carried with it the suggestion of drawing upon the life experience of the decision-maker in making the judgment required. That being said, it has come to be recognised that "many issues of causation … lie outside the realm of common knowledge and experience": *Booth* at [67] . The current matter is such a case, as the Member correctly recognised in declining the appellants' invitation that he "draw a lay inference" (MD [126]).

East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) (10 September 2020) (Quinlan CJ, Mitchell JA, Beech JA)
East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) (10 September 2020) (Quinlan CJ, Mitchell JA, Beech JA)
Ellis (by his next friend Christopher Graham Ellis) v East Metropolitan Health Service (09 March 2018) (Gething DCJ)
BGC Residential Pty Ltd v Fairwater Pty Ltd (18 December 2012) (Pullin JA, Newnes JA, Murphy JA)

> 51. The proper inference to be drawn on the balance of probabilities depends, as has been said above, upon a commonsense assessment of all relevant evidence, although the justification for that approach has lost some of its force for the reasons given by the plurality in ***Booth*** [67] . In many cases in place of the 'rough and ready answers of the practical man' an 'exact and reasoned solution' is now required. This is so in cases where the wealth of knowledge of science may provide such an exact and reasoned solution to a causation issue: ***Booth*** [68] . However, the plurality in ***Booth*** accepted [69] that there will still be cases (and this is one such case) where 'other disciplines' cannot give any conclusive answer, in which case a commonsense assessment of the evidence is the only method which can be used to reach a conclusion about whether a breach of contract has caused the claimed damage. The question to be asked is whether it is possible to infer, on the balance of probabilities and applying a commonsense approach, that but for the breach the damage would not have occurred.

However, this reasoning has lost some of its force with the decline in many jurisdictions in the trial by jury of civil actions, and the removal of contributory negligence as an absolute defence. Further, many issues of causation, including those recently considered in *Lithgow City Council v Jackson* [82] and those which arise on the present appeals, lie outside the realm of common knowledge and experience. They fall to be determined by reference to expert evidence, for example, medical evidence. In such cases, the investigation of difficult and

complicated facts cannot be separated from an appreciation of any special branch of knowledge which affects them.

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[82] (2011) 85 ALJR 1130 at 1146 [66], 1149 [81]; 281 ALR 223 at 243, 247; [2011] HCA 36 .

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68. **Following paragraph cited by:**

East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) (10 September 2020) (Quinlan CJ, Mitchell JA, Beech JA)

> The suggestion that ***Amaca v Booth*** represents a change in the law (i.e. '*now* mandated') is misplaced. The plurality's reference in ***Amaca v Booth*** to the need for 'an exact and reasoned solution' in cases of causation was taken directly from extra-curial remarks made by Sir Owen Dixon. [297] Sir Owen made those remarks in 1933, seven years before his Honour's judgment in ***Adelaide Stevedoring Co Ltd v Forst*** . We refer to what we have said in [267]-[271] above.
>
> *via*
> [297] ***Amaca v Booth*** [68] (Gummow, Hayne & Crennan JJ).

East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) (10 September 2020) (Quinlan CJ, Mitchell JA, Beech JA)

> (b) adopted statements by Sir Owen Dixon that the 'wealth of knowledge put by science at the disposal of the processes of the law meant that, in place of what in simpler times had been "the rough and ready answers of the practical man", an exact and reasoned solution was now required'. [247]
>
> *via*
> [247] ***Amaca v Booth*** [68] .

East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) (10 September 2020) (Quinlan CJ, Mitchell JA, Beech JA)
Ellis (by his next friend Christopher Graham Ellis) v East Metropolitan Health Service (09 March 2018) (Gething DCJ)
BGC Residential Pty Ltd v Fairwater Pty Ltd (18 December 2012) (Pullin JA, Newnes JA, Murphy JA)

Speaking in September 1933 to the MedicoLegal Society of Melbourne, a month after delivery of judgment by the High Court in *Australian Knitting Mills Ltd v Grant* [83] , Sir

Owen Dixon referred to the extensive category of legal liabilities in which causation forms a chief element; he added that the field covered by the general statement of the law of negligence is enormous and, further, that the wealth of knowledge put by science at the disposal of the processes of the law meant that, in place of what in simpler times had been "the rough and ready answers of the practical man", an exact and reasoned solution now was required[84].

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[83] (1933) 50 CLR 387; [1933] HCA 35 .

[84] "Science and Judicial Proceedings", in Woinarski (ed), *Jesting Pilate*, (1965) 11 at 14. See further, French, "Science and judicial proceedings: Seventysix years on", (2010) 84 *Australian Law Journal* 244 at 246247.

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69. **Following paragraph cited by:**

Fisher v Nonconformist Pty Ltd (20 February 2024) (Meagher and Kirk JJA, Simpson AJA)

94. As noted above, it has been accepted in this State at least since *Nunan* was decided in 1941 that the causal requirement in the notion of "arising out of employment" involves assessing whether the employment "caused, or to some material extent contributed to, the injury", being in substance the approach taken in tort. That the causal requirement is relevantly the same in that respect as in tort is illustrated by the fact that in *Booth* at [69] the High Court quoted part of Dixon J's dissent in ***Adelaide Stevedoring*** *Co Ltd v Forst* [1940] HCA 45; (1940) 64 CLR 538, a workers' compensation case, when discussing the nature of causation in tort. And there is reason to construe a causal requirement in statute consistently with the common law approach to causation in a closely related context "except in so far as that concept is modified or supplemented expressly or impliedly by the provisions of the Act": quotation from *Wardley Australia Ltd v Western Australia* [1992] HCA 55; (1992) 175 CLR 514 at 525. That is so even taking account of the fact that, as discussed further below, "it is doubtful whether there is any 'common sense' approach to causation which can provide a useful, still less universal, legal norm": *Co mcare v* ***Martin*** [2016] HCA 43; (2016) 258 CLR 467 at [42] .

Turner v Norwalk Precast Burial Systems Pty Ltd (Ruling) (18 October 2023) (Pillay J)
Sayed v Lee (19 August 2022) (Whitby DCJ)

48. As Dixon J said in ***Adelaide Stevedoring Co Ltd v Forst*** : [18]

> … upon question of fact of a medical or scientific description, a court can only say that the burden of proof has not been discharged where, upon the evidence, it appears that the present state of knowledge does not admit of an affirmative answer and that competent and trustworthy expert opinion regards an affirmative answer as lacking justification, either as a probable inference or as an accepted hypothesis.

via
[18] ***Adelaide Stevedoring Co Ltd v Forst*** (1940) 64 CLR 538 cited with approval in ***Amaca Pty Ltd v Booth*** [2011] HCA 53; (2011) 246 CLR 36 (***Amaca v Booth***) [69] ; and in ***EMHS v Ellis*** [267] .

East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) (10 September 2020) (Quinlan CJ, Mitchell JA, Beech JA)
East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) (10 September 2020) (Quinlan CJ, Mitchell JA, Beech JA)

Even if the issue is one to which other disciplines may not be able to give any conclusive answer, questions of causation, as a step in the ascertainment of rights and the attribution of liability in law, call for sufficient reduction to certainty to satisfy the relevant burden of proof for the attribution of liability [85] . In *Tubemakers of Australia Ltd v Fernandez* [86] , Mason J, with the concurrence of Barwick CJ and Gibbs J, referred to a statement by Dixon J as elaborating the general onus which lies upon the plaintiff where the issue of causation lies outside the realm of common knowledge and experience. In *Adelaide Stevedoring Co Ltd v Forst* [87] , Dixon J said:

> "I think that upon a question of fact of a medical or scientific description a court can only say that the burden of proof has not been discharged where, upon the evidence, it appears that the *present state of knowledge* does not admit of an affirmative answer and that competent and trustworthy expert opinion regards an affirmative answer as lacking justification, *either as a probable inference or as an accepted hypothesis*." (emphasis added)

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[85] *Amaca Pty Ltd v Ellis* (2010) 240 CLR 111 at 121122 [6] .

[86] (1976) 50 ALJR 720 at 724; 10 ALR 303 at 311.

[87] (1940) 64 CLR 538 at 569; [1940] HCA 45 . This statement may be compared with the passage in *Australian Knitting Mills Ltd v Grant* (1933) 50 CLR 387 at 426 in which Dixon J declined to act on the evidence of the chemist called by the plaintiff.

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70. **Following paragraph cited by:**

Saadat v Commonwealth (09 May 2025) (Stanley J)
Insurance Australia Ltd t/as NRMA Insurance v Kirkpinar (10 March 2025) (Mitchelmore J)
Zhao v Insurance Australia Limited t/as NRMA Insurance (07 November 2024)
Value Constructions Pty Ltd v Badra (31 July 2024) (Leeming and Kirk JJA, Griffiths AJA)
Kazzi v KR Properties Global Pty Ltd t/as AK Properties Group (07 June 2024) (Gleeson and Mitchelmore JJA, Basten AJA)

169. As to Mr Kazzi's third submission, that the contractual date for practical completion was not inherently relevant to Mr Kazzi's duty in tort, it is difficult to understand why that would be the case. As a matter of fact, the Owners paid interest on their loans beyond the date of practical completion, at least one cause of which was defective works as to which I have found that Mr Kazzi breached his statutory duty of care. Where an injury was the result of multiple conjunctive causal factors, it is sufficient for a plaintiff to prove that the negligence of the defendant "caused or materially contributed to the injury": *Amaca Pty Ltd v Booth* (2011) 246 CLR 36; [2011] HCA 53 at [70] (Gummow, Hayne and Crennan JJ) ; see also at [47] (French CJ). The relevant question is whether Mr Kazzi's breaches of duty were a material cause of the Owners having to make those payments.

Fisher v Nonconformist Pty Ltd (20 February 2024) (Meagher and Kirk JJA, Simpson AJA)

70. Although the joint judgment used the double negative, the point can be made positively: s 9A imposes a more stringent causal requirement than that involved in the causal requirement in the first limb of s 4(a) . That understanding is implicit in the joint judgment. It is consistent with the Attorney's reference to the "weaker test" in s 4 in his second reading speech. And it reflects a deeper point. The causal standard for the "arising out of employment" notion in workers compensation legislation has long been accepted to involve consideration of whether the employment "caused, or to some material extent contributed to, the injury": *Nunan* at 1 24. That is relevantly the same approach as taken at common law for tort: see eg ***March v** E & M H **Stramare** Pty Ltd* [1991] HCA 12; (1991) 171 CLR 506 at 514 per Mason CJ. There are various aspects to the notion of "material contribution": note *Strong v Woolworths Ltd* [2012] HCA 5; (2012) 246 CLR 182 at [21]-[25] . One role that it plays was explained in *Amaca Pty Ltd v **Booth*** [2011] HCA 53; (2011) 246 CLR 36 at [70] per Gummow, Hayne and Crennan JJ and in ***Hunt & Hunt** Lawyers v Mitchell Morgan Nominees Pty Ltd* [2013] HCA 10; (2013) 247 CLR 613 at [45] per French CJ, Hayne and Kiefel JJ. To quote the latter (citations omitted):

> The law's recognition that concurrent and successive tortious acts may each be a cause of a plaintiff's loss or damage is reflected in the proposition that a

plaintiff must establish that his or her loss or damage is "caused or materially contributed to" by a defendant's wrongful conduct. It is enough for liability that a wrongdoer's conduct be one cause. The relevant enquiry is whether the particular contravention was a cause, in the sense that it materially contributed to the loss. Material contribution has been said to require only that the act or omission of a wrongdoer play some part in contributing to the loss.

Amaca Pty Limited (Under NSW Administered Winding Up) v Roseanne Cleary as the Legal Personal Representative of the Estate of the Late Fortunato (aka Frank) Gatt (23 August 2022) (Brereton, Beech-Jones and Mitchelmore JJA)
Rosanne Cleary as the Legal Personal Representative of the Estate of the late Fortunato (aka Frank) Gatt v Amaca Pty Ltd (06 September 2021) (Strathdee, J)

The requirement for such counterfactual satisfaction of the but for test was one of the matters that Mason CJ rejected in *March v Stramare*, that Gummow J, Hayne J and Crennan J can be taken to have rejected in *Amaca v Booth* at [70] and that French CJ, Gummow J, Creenan J and Bell J rejected in *Strong v Woolworths* at [26]–[28].

Rosanne Cleary as the Legal Personal Representative of the Estate of the late Fortunato (aka Frank) Gatt v Amaca Pty Ltd (06 September 2021) (Strathdee, J)
Harvard Nominees Pty Ltd v Tiller (No 2) (11 May 2020) (Jackson J)
Berhane v Woolworths Ltd (08 August 2017) (Gotterson and Morrison JJA and Dalton J,)

72. However, senior counsel for Mr Berhane also put the case on causation on the basis of s 305D(2) of the *Workers Compensation and Rehabilitation Act* . For that purpose the “but for” test in s 305D(1) is inapplicable, and the test is whether the breach materially contributed to the injury. [64] At trial the case was conducted on the basis that the workplace activities [65] materially contributed to the acceleration of the pre-existing condition.[66] If those workplace activities were carried out as a result of Woolworths’ breach of duty, as they were, then the case as conducted would engage s 305D(2) . The conclusion reached in paragraph [50] above would also be sufficient to satisfy s 305D(2) .

via

[64] *Amaca Pty Ltd v Booth* (2011) 246 CLR 36, [2011] HCA 53, at [70] ; *Hunt & Hunt Lawyers v Mitchell Morgan Nominees Pty Ltd* (2013) 247 CLR 613, [2013] HCA 10 at [45] ; *Strong v Woolworths Ltd* (2012) 246 CLR 182, [2012] HCA 5, at [26] ; *Prasad v Ingham’s Enterprises Pty Ltd* [2016] QCA 147 at [90] .

Hayes v State of Queensland (29 July 2016) (Margaret McMurdo P and Mullins and Dalton JJ,)
Carangelo v State of New South Wales (27 May 2016) (Macfarlan and Gleeson JJA, Emmett AJA)

72. The “but for” criterion of causation can be troublesome in different situations in which multiple acts or events lead to injury of a plaintiff. In

such cases, what might be unclear is the extent to which one of those conjunctive causal factors contributes to that state of affairs. It is sufficient for the plaintiff to prove that the negligence of the defendant caused or materially contributed to the injury. For example, where a plaintiff is exposed to quantities of silicon dust produced by various activities, one of which is at the plaintiff's work place, and the other activities are conducted without any breach of duty, the question is not what the most probable source of the plaintiff's disease was. Rather, it is whether dust from the employer's negligent conduct was **a** cause of the disease, when the medical evidence was that disease can be caused by gradual accumulation of silica particles inhaled over a period of years (*Amaca v Booth* at [70]).

BHP Billiton Ltd v Hamilton (15 August 2013) (Kourakis CJ; Blue and Stanley JJ)
CSR Timber Products Pty Ltd v Weathertex Pty Ltd (11 March 2013) (Bathurst CJ, Meagher and Hoeben JJA)

28. I do not understand Weathertex to allege that it is entitled to a more limited indemnity under s 151Z(1)(d) on the basis that the worker was entitled independently of the Act to take proceedings against it and CSR to recover damages so that the provisions of s 151Z(2) might apply. Weathertex and CSR would each be liable to the worker if both negligently exposed him to conditions which materially contributed to the carcinoma. In those circumstances each would be liable for the worker's loss subject to the application to one or both of them of the modified damages regime in Division 3 in Part 5 of the 1987 Act: *Grant v Sun Shipping Co Ltd* [1948] AC 549 at 563 ; *Dingle v Associated Newspapers Ltd* [1961] 2 QB 162 at 188-189 ; *Thompson v Australian Capital Television Pty Ltd* [1996] HCA 38; 186 CLR 574 at 600 ; *Elayoubi bhnf Kolled v Zipser* [2008] NSWCA 335 at [57] ; *Gett v Tabet* [2009] NSWCA 76; 254 ALR 504 at [367] ; *Sienkiewicz v Greif (UK) Ltd* [2011] 2 WLR 523 at [90] ; *Amaca Pty Ltd v Booth* [2011] HCA 53; 86 ALJR 172 at [70] ; *Strong v Woolworths* [2012] HCA 5; 86 ALJR 267 at [26] ; *Allianz Australia Ltd v Sim* [2012] NSWCA 68 at [41]-[43], [49] . The carcinoma contracted by the worker is an "indivisible" disease as that expression is used in this context, because once contracted its severity is not affected by the quantity of wood dust that has been or continues to be inhaled or ingested.

Allianz Australia Ltd v Sim (04 April 2012) (Allsop P, Basten and Meagher JJA)
Allianz Australia Ltd v Sim (04 April 2012) (Allsop P, Basten and Meagher JJA)
Maxwell v GTI International Pty Ltd (22 December 2011) (Ashley, Mandie and Hansen JJA)

The "but for" criterion of causation proved to be troublesome in various situations in which multiple acts or events led to the plaintiff's injury [88] , for example, where the development of a particular medical condition was the result of multiple conjunctive causal factors. In such cases what may be unclear is the extent to which one of these conjunctive causal factors

contributed to that state of affairs. These situations have been addressed by the proposition stated by Lord Watson in *Wakelin v London and South Western Railway Co* [89] that it is sufficient that the plaintiff prove that the negligence of the defendant "caused or materially contributed to the injury" [90] . In that regard, reference may be made to the wellknown passage in the speech of Lord Reid in *Bonnington Castings Ltd v Wardlaw* [91] . Of that case it was said in the joint reasons in *Amaca Pty Ltd v Ellis* [92] :

> "The issue in *Bonnington Castings* was whether exposure to silica dust from poorly maintained equipment caused or contributed to the pursuer's pneumoconiosis, when other (and much larger) quantities of silica dust were produced by other activities at the pursuer's workplace. Those other activities were conducted without breach of duty. As Lord Reid rightly pointed out [93] , the question in the case was not what was the most probable source of the pursuer's disease: dust from one source or the other. The question was whether dust from the poorly maintained equipment was *a* cause of his disease when the medical evidence was that pneumoconiosis is caused by a gradual accumulation of silica particles inhaled over a period of years." (emphasis in original)

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[88] *March v Stramare (E & M H) Pty Ltd* (1991) 171 CLR 506 at 516517 .

[89] (1886) 12 App Cas 41 at 47.

[90] See *March v Stramare (E & M H) Pty Ltd* (1991) 171 CLR 506 at 514 per Mason CJ; *Athey v Leonati* [1996] 3 SCR 458 at 466468 per Major J; Tse, "Tests for factual causation: Unravelling the mystery of material contribution, contribution to risk, the robust and pragmatic approach and the inference of causation", (2008) 16 *Torts Law Journal* 249 at 252256.

[91] [1956] AC 613 at 621.

[92] (2010) 240 CLR 111 at 136 [67] .

[93] [1956] AC 613 at 621.

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71. **Following paragraph cited by:**

East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) (10 September 2020) (Quinlan CJ, Mitchell JA, Beech JA)
Riverman Orchards Pty Ltd v Hayden (28 June 2017) (John Dixon J)
Riverman Orchards Pty Ltd v Hayden (28 June 2017) (John Dixon J)
Allianz Australia Ltd v Sim (04 April 2012) (Allsop P, Basten and Meagher JJA)

It should be emphasised that the resolution of the issue before this Court in *Ellis* does not govern the issues in the present appeals. *Ellis* involved alternative causes of the plaintiff's lung cancer, asbestos inhalation and inhalation of tobacco smoke; the plaintiff had not shown that it was more probable than not that exposure to asbestos had made a material contribution to his cancer [94] ; but the evidence in the present case, to which further reference will be made, was that, unlike the situation regarding lung cancer, exposure to asbestos is effectively the only known cause of mesothelioma.

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[94] (2010) 240 CLR 111 at 135 [65] .

The evidence

72. **Following paragraph cited by:**

BHP Billiton Ltd v Hamilton (15 August 2013) (Kourakis CJ; Blue and Stanley JJ)

64. The effect of the statutory presumption is to translate a mere possibility (that the exposure might have caused or contributed to the plaintiff's dust disease) into an actuality or finding [34] (that the exposure did cause or contribute to the plaintiff's dust disease). The statutory presumption overcomes the type of problem faced by a plaintiff such as that faced in *Amaca Pty Ltd v Ellis* [35] in which the plaintiff can only prove the possibility, but not the probability, that the exposure resulting from the defendant's negligence caused or contributed to the plaintiff's dust disease. The reference to "the exposure" when used in the second pre-condition in paragraph (b) and the operational presumption in the body of the subsection is to whatever exposure is established as having possibly caused or contributed to the disease.

via

[34] Compare the analysis of legal certainty derived from an assessment of probabilities in *Bank of New South Wales v Commonwealth* (1948) 76 CLR 1 at 340 per Dixon J; *Amaca Pty Ltd v Ellis* (2010) 240 CLR 111 at [6] per French CJ, Gummow, Hayne, Heydon, Crennan, Kiefel and Bell JJ and *Amaca Pty Ltd v Booth* (2011) 246 CLR 36 at [72] per Gummow , Hayne and Crennan JJ.

The state of medical and scientific knowledge concerning what may be sufficient exposure to asbestos to engender mesothelioma may develop as further study is made. This advancing state of knowledge may be reflected in the evidence given from one case to the next. What is taken, in one case, to be a proposition of law derived from the attribution of legal liability, or its absence, may require consideration of the particular state of the evidence from which the court reduced a question of causation to the relevant standard of legal certainty.

73. In the present litigation the following matters were not in dispute: (1) Mr Booth's mesothelioma was caused by inhalation of asbestos fibre; (2) chrysotile asbestos has the capacity to cause mesothelioma; (3) the brake linings manufactured by the appellants contained chrysotile asbestos; and (4) Mr Booth inhaled chrysotile asbestos from the appellants' products.

74. Curtis DCJ found that 70 per cent of the asbestos fibres to which Mr Booth was exposed over the period between 1953 and 1962 were released from Amaca products and the same percentage of Amaba products represented exposure in the period between 1962 and 1983 (excluding the period he was doing other work). His Honour also found that his exposure from other activities, including home renovations when he was a child, were insignificant, trivial or *de minimis*.

75. Section 25B of the Act provides that, without leave of the Tribunal, "[i]ssues of a general nature" determined by the Tribunal may not be relitigated or reargued in other Tribunal proceedings, whether or not they are between the same parties; in deciding to grant leave, the Tribunal is to have regard to the availability of new evidence, whether or not previously available. The primary judge stated that, for the purposes of s 25B , he determined that "all exposures to chrysotile asbestos, other than trivial or *de minimis* exposure, occurring in a latency period of between 25 and 56 years, materially contributes to the cause of mesothelioma".

76. **Following paragraph cited by:**

Wheelahan v City of Casey (No 11) (13 December 2011) (Osborn J)

Mr Booth relied upon, and Curtis DCJ accepted, the expert evidence of Professor Douglas Henderson (Professor of Pathology at Flinders University), Dr James Leigh (a consultant occupational physician), Dr Maurice Heiner (a consultant thoracic physician) and Professor William Musk (Clinical Professor of Medicine at the University of Western Australia). Writing extrajudicially, Sir Owen Dixon described the three true functions of such witnesses as follows[95]:

> "First, to provide the court with the abstract knowledge which is requisite in order to understand and use the considerations which should determine its decision upon the scientific questions involved.
>
> Second, to collate and describe the facts, scientifically material, which the witness has obtained.
>
> Third, to state his own conclusions and opinions, and the grounds upon which he has formed them."

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[95] "The Law and the Scientific Expert", a paper delivered in 1934 and reprinted in Woinarski (ed), *Jesting Pilate*, (1965) 24 at 34.

77. Several points respecting this evidence should be noted. The first is that the appellants called no expert clinicians, rather relying upon crossexamination of the four experts called by Mr Booth and upon Professor Geoffrey Berry, a biostatistician and epidemiologist. The second is that Professor Henderson, Dr Heiner and Professor Musk had each encountered cases of mesothelioma where the only identified exposure to asbestos was from working with brake linings. Professor Musk said in evidence that he had "seen brake lining exposed mechanics with mesothelioma who [did not] appear to have had significant other exposure". Professor Henderson concluded his written report of 2 March 2009:

> "I would also emphasise that my consultation and referral files now include many cases of pleural malignant mesothelioma for whom chrysotiletremolite only exposure derived from new brake linings was the only identified pattern of exposure."

78. The third point concerns what, in *Fairchild v Glenhaven Funeral Services Ltd* [96] , Lord Bingham of Cornhill said was the state of medical knowledge in about 2000 respecting the cause of mesothelioma:

> "the condition may be caused by a single fibre, or a few fibres, or many fibres: medical opinion holds none of these possibilities to be more probable than any other, and the condition once caused is not aggravated by further exposure".

The reasons of the Court of Appeal in that litigation had included the passage [97] :

> "It was therefore common ground on these appeals that it could not be said whether a single fibre of asbestos was more or less likely to have caused the disease, alternatively whether more than one fibre was more or less likely to have caused the disease. In the latter event, it could not be shown that it was more likely than not that those fibres came from more than one source. In other words, none of these scenarios could be proved on the balance of probabilities. Similarly, it could not be proved on the balance of probabilities that any one man's mesothelioma was caused cumulatively by exposure to asbestos dust in more than one employment."

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[96] [2003] 1 AC 32 at 43.

[97] *Fairchild v Glenhaven Funeral Services Ltd* [2002] 1 WLR 1052 at 1064.

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79. The "single fibre" theory was not accepted in the evidence in the present case as representing current expert opinion. In the course of his crossexamination, Dr Leigh said of the proposition that mesothelioma could be generated from a single fibre that this was not physically possible. In his evidenceinchief Professor Henderson gave a long answer to a

question that he explain his statement that each of multiple asbestos exposures contributes to the causation of mesothelioma. His answer included the following:

> "[W]hen there are multiple episodes of asbestos exposures and the individual concerned inhales increasing numbers of fibres on different occasions, that contributes to the total burden of asbestos fibres deposited in the lung and translocated to the pleura and it is thought that mesothelioma develops because of an interaction between the asbestos fibres and the mesothelial cells by way of secondary chemical messengers[. A]nd to simplify the answer, the point is that the more fibres there are the greater number of fibres there will be interacting with mesothelial cells which themselves undergo proliferation and so the progress goes on with increasing numbers of mesothelial cells interacting with increasing numbers of fibres, so that the ultimate development of mesothelioma and its probability of development will be influenced by the numbers of fibres interacting with mesothelial cells over multiple periods of time and probably over multiple different generations of mesothelial cells[. A]nd I think this is a fairly well accepted model now and it flies in the face of what used to be called the one fibre hypothesis that mesothelioma came about from a single fibre interacting with a single mesothelial cell which in biological terms is a ridiculous proposition."

Finally, it should be noted that the witnesses were appreciative of the need to indicate the relative degrees of strength of the conclusions they reached. For example, Professor Henderson expressed "at a high order of confidence" his opinion that chrysotile has the capacity to cause malignant mesothelioma; and, "cautiously ... 'on the balance of probabilities'", his opinion that exposure to dust derived from brake linings which contain chrysotile asbestos has the capacity to cause mesothelioma.

The United Kingdom authorities

80. The expert evidence in the present case shows that the limits in medical knowledge disclosed by the (now discredited) "one fibre" theory accepted in the evidence in *Fairchild* have been removed by further advances in medical science. However, in the United Kingdom the decision in *Fairchild* has left in place a common law principle, now supplemented by a statutory regime[98], designed to bridge what Professor Jane Stapleton has called an "evidentiary gap"[99]. The problem of legal coherence which thus is presented was recognised in *Fairchild* by Lord Rodger of Earlsferry when he observed [100] :

> "In future more may be known. As Mr Stewart rightly observed, in the course of submissions that were both helpful and sensitive, this may change the way in which the law treats such cases. But the House must deal with these appeals on the basis of the evidence as to medical knowledge today and leave the problems of the future to be resolved in the future."

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[98] *Compensation Act* 2006 (UK).

[99] "Factual Causation and Asbestos Cancers", (2010) 126 *Law Quarterly Review* 351 at 356.

[100] [2003] 1 AC 32 at 97.

81. **Following paragraph cited by:**

Ellis (by his next friend Christopher Graham Ellis) v East Metropolitan Health Service (09 March 2018) (Gething DCJ)

In considering the recent decision of the United Kingdom Supreme Court in *Sienkiewicz v Greif (UK) Ltd* [101] it is important to appreciate the statement by Lord Phillips of Worth Matravers PSC [102] :

> "The special rule of causation applied to mesothelioma was devised because of ignorance about the biological cause of the disease. It was accepted in *Fairchild* and *Barker* [[103]] that this rendered it impossible for a claimant to prove causation according to the conventional 'but for' test and this caused injustice to claimants. It is not possible properly to consider the issues raised by this appeal without reference to what is known about mesothelioma. This has been summarised in many cases, and much of my own summary in *Bryce v Swan Hunter Group plc* [104] of what was known 25 years ago remains true today. *The cases under appeal did not involve the introduction of detailed evidence of what is known today about mesothelioma, proceeding on the basis that findings in previous cases could be taken as read.*" (emphasis added)

[101] [2011] 2 WLR 523; [2011] 2 All ER 857.

[102] [2011] 2 WLR 523 at 531; [2011] 2 All ER 857 at 865.

[103] *Barker v Corus UK Ltd* [2006] 2 AC 572.

[104] [1988] 1 All ER 659 .

82. The case which Amaca and Amaba were required to meet thus differed significantly in its evidentiary foundation from that in *Fairchild* and in *Sienkiewicz.*

Conclusions

83. **Following paragraph cited by:**

Fisher v Nonconformist Pty Ltd (20 February 2024) (Meagher and Kirk JJA, Simpson AJA)
Allianz Australia Ltd v Sim (04 April 2012) (Allsop P, Basten and Meagher JJA)

Mr Booth developed his case in the following steps: (1) he had contracted mesothelioma; (2) the only known cause of that disease is exposure to asbestos; (3) the expert evidence at trial, accepted by the primary judge, was that: (a) exposure to asbestos contributes to the disease; and (b) the prospective risk of contracting the disease increases with the period of significant exposure; (4) Mr Booth had two periods of significant exposure; (5) it is more probable than not that each period of exposure made a material contribution to bodily processes which progressed to the development of the disease.

84. The response of the appellants was to emphasise that step (3) did not make proper allowance for the epidemiological evidence which they had presented. The appellants relied upon 19 studies upon the incidence of mesothelioma in automotive mechanics. These had been published in peer reviewed literature. In particular, the appellants relied upon three analyses of the literature, by Wong, Goodman and others, and Laden and others.

85. **Following paragraph cited by:**

Amaca Pty Ltd v King (22 December 2011) (Nettle, Ashley and Redlich JJA)

For example, Wong concluded that "there is no evidence to support or even to suggest an association between an increased risk of mesothelioma and exposure to brake linings or clutch facings among garage mechanics". However, in the course of his crossexamination, Professor Berry said that although Wong had found "no significant evidence of effect", for himself he accepted that there might be some risk due to chrysotile exposure as a result of working with brakes, "for example drilling holes in them to make them fit the car".

86. **Following paragraph cited by:**

Nonconformist Pty Ltd v Fisher (19 August 2021) (Deputy President Elizabeth Wood)

181. The appellant is critical of the Arbitrator for taking into account Dr Helprin's medical speciality when Dr Herman was of the same expertise. I do not consider that the Arbitrator was referring to Dr Helprin's expertise as being a reason to prefer his opinion over that of Dr Herman. In *Amaca Pty Ltd v Booth* ,[71] Gummow, Hayne and Crennan JJ considered the status of scientific research as evidence in relation to the test of causation. Their Honours said (citation omitted):

> "The discipline of epidemiology, and its application in answering issues of causation in litigation, was described by Lord Phillips in *Sienk iewicz* as follows:
>
> 'Epidemiology is the study of the occurrence and distribution of events (such as disease) over human populations. It seeks to determine

> whether statistical associations between these events and supposed determinants can be demonstrated. Whether those associations if proved demonstrate an underlying biological causal relationship is a further and different question from the question of statistical association on which the epidemiology is initially engaged.'" [72]
>
> *via*
> [72] *Amaca* , [86] .

The discipline of epidemiology, and its application in answering issues of causation in litigation, was described by Lord Phillips in *Sienkiewicz* as follows [105] :

> "Epidemiology is the study of the occurrence and distribution of events (such as disease) over human populations. It seeks to determine whether statistical associations between these events and supposed determinants can be demonstrated. Whether those associations if proved demonstrate an underlying biological causal relationship is a further and different question from the question of statistical association on which the epidemiology is initially engaged.
>
> Epidemiology may be used in an attempt to establish different matters in relation to a disease. It may help to establish what agents are capable of causing a disease, for instance that both cigarette smoke and asbestos dust are capable of causing lung cancer, it may help to establish which agent, or which source of an agent, was the cause, or it may help to establish whether or not one agent combined with another in causing the disease."

Lord Mance JSC left for consideration on another occasion the question whether "epidemiological evidence can by itself prove a case" [106] , that is to say, a plaintiff's case. *Sienkiewicz* was decided on other grounds, namely, that as a matter of law *Fairchild* applied [107] .

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[105] [2011] 2 WLR 523 at 551; [2011] 2 All ER 857 at 885.

[106] [2011] 2 WLR 523 at 583; [2011] 2 All ER 857 at 916.

[107] Laleng, " *Sienkiewicz v Greif (UK) Ltd* and *Willmore v Knowsley Metropolitan Borough Council*: A Material Contribution to Uncertainty?", (2011) 74 *Modern Law Review* 777 at 788790.

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87. In the present case, the plaintiff, Mr Booth, did not challenge the reception of epidemiological evidence, represented principally by studies in published papers, which was tendered by the defendants. Rather, his attitude in this Court was close to that of Lord Mance in *Sienkiewicz* [108] , namely that such evidence can be admissible and relevant but its weight will depend upon the nature of the evidence and the particular factual issues before the court.

[108] [2011] 2 WLR 523 at 583; [2011] 2 All ER 857 at 916.

88. The epidemiological evidence, considered by itself, did leave open the inference that cumulative exposure to asbestos increased the risk of contracting mesothelioma by developing bodily processes to an irreversible point. Further, as Dr Leigh emphasised in his report, inability to demonstrate epidemiologically a statistically significant increase in risk in motor mechanics, relative to other occupational categories, does not, in any way, negate a causal inference in an individual case where, beyond the general background environment, the only asbestos exposure was incurred in that occupation.

89. Professor Henderson accepted that epidemiological data respecting work with brake linings was inconclusive. But he wrote in his report that "[o]ne of the problems with epidemiological studies on this issue is that they do not clearly distinguish between dedicated brake mechanics versus general automotive mechanics or garage mechanics". That report further stated that a dedicated brake mechanic includes one "who frequently machined/ground new and not heataltered brake linings". Mr Booth had done grinding work throughout the periods in question. Professor Henderson also discounted the epidemiological data for other deficiencies in the methodology employed. Dr Leigh, who is trained in epidemiology, gave what the primary judge described as cogent evidence, criticising the methodology and case design upon which many of the studies were based.

90. It was open to the primary judge to decide that he was "not persuaded that the epidemiological evidence specific to automotive mechanics is adverse to the submission that causation has been proved in this particular case".

91. The Court of Appeal, with respect, correctly concluded [109] :

> "Findings as to the cumulative effect of exposure to asbestos were undoubtedly open. [Mr Booth's] witnesses, including Professor Henderson and Dr Leigh, sought to reconcile that approach with the epidemiology which suggested there was no increased risk in the case of brake mechanics. It was open to his Honour to accept their evidence, as he did. The underlying proposition put forward by the appellants, that the epidemiology was conclusive, in accordance with the principles applicable to such evidence, did not give rise to a question of law, but to a question of fact, which his Honour resolved against the appellants."

[109] *Amaba Pty Ltd (Under NSW Administered Winding Up) v Booth; Amaca Pty Ltd (Under NSW Administered Winding Up) v Booth* (2011) Aust Torts Reports ¶82079 at 64,616.

Orders

92. Each appeal should be dismissed with costs.

93. HEYDON J. Mesothelioma is a painful illness leading to death. It is a cancer of the lining of the lung. It is very commonly caused by inhaling asbestos fibres, though perhaps not always. It can be caused by very brief intense exposures whether occupational, domestic or recreational, and by lower-level environmental exposures – sometimes after exposures which are very short – a day – or very slight. On the other hand, many people can have heavy and sustained exposures to even the most dangerous types of asbestos without suffering the disease. This phenomenon, like much else about the disease, is something which scientists have found difficult to explain. The disease has a latency period of at least 10 years, and sometimes much longer – as long as 75 years. The disease is often not diagnosed until many years after exposure to asbestos. It is therefore difficult for plaintiffs suffering from mesothelioma to establish the facts necessary for success in negligence actions. In particular it can be difficult for them to establish that the conduct of a given defendant caused the disease. A related difficulty for plaintiffs springs from the fact that the earlier the exposure the greater the chance that it could cause harm. Because of the valuable characteristics of asbestos, particularly its capacity to retard fires, it has been commonly used until quite recently. The extent of exposure to asbestos amongst those now living, the likely exposure amongst those yet to be born, and the likelihood of further injury taking place when asbestos is removed from the many places where it is now found, mean that problems of the kind thrown up in these appeals will remain for decades to come. Perhaps a social-medical problem of this size requires a legislative solution. In some places solutions have been sought in judicial or legislative changes to the law relating to causation. New South Wales is not one of those places. In New South Wales a special court called the Dust Diseases Tribunal has been established. It has attracted considerable admiration for the energy it throws into the urgent resolution of controversies involving dying plaintiffs. But it is bound by the general rules of causation in negligence. The question which these appeals raise is whether the Tribunal's causation findings in this case, and cases like it, are supported by any evidence.

The factual background

94. In 2008 John William Booth ("the plaintiff"), then aged 71, was diagnosed as having pleural mesothelioma. It was probably caused by inhaling asbestos fibres. The plaintiff probably inhaled asbestos fibres from four sources.

95. The first source comprised those asbestos fibres which exist as part of "the background … that pervades urban environments" [110] . This "background risk" or "background level" is the sum of all exposures to asbestos fibres which those suffering from mesothelioma cannot attribute a specific cause to, either because they did not identify the cause or because they could not remember having been exposed. The proportion of those suffering from mesothelioma who cannot identify any prior exposure to asbestos is 15%-30%. One estimate of the risk of an Australian contracting mesothelioma without any specific exposure to asbestos that can be recalled is 70-140 per million per lifetime of 70 years.

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[110] *Booth v Amaca Pty Ltd and Amaba Pty Ltd* [2010] NSWDDT 8 at [162] (2) per Judge Curtis.

96. The second source comprised asbestos fibres released into the atmosphere when the plaintiff, aged 8, was holding down asbestos sheeting which his father cut with fibro cutters in order to build a house, and those released when the plaintiff, aged 16, helped his father in cutting and handling asbestos cement sheets they were using to build a garage. There was evidence that once dust containing asbestos is introduced into domestic premises – for example, dust from renovation work – it can persist: it is difficult to remove the fibres even by vacuuming, and everyday activity can cause the fibres to be resuspended and to persist in the air for considerable periods.

97. The third source comprised asbestos fibres released into the atmosphere when the plaintiff had to load hessian bags of pure asbestos onto his truck on the Sydney wharves. This may have been amphibole asbestos including crocidolite – a much more dangerous form of asbestos than chrysotile.

98. The fourth source comprised those asbestos fibres to which the plaintiff was exposed while working on brakes during the 27 years he spent working as a motor mechanic. The fibres in this category came in part from brake parts manufactured by Amaca Pty Ltd ("Amaca"), in part from brake parts manufactured by Amaba Pty Ltd ("Amaba") and in part from brake parts manufactured by other manufacturers. The linings in brakes on which the plaintiff worked contained asbestos. The process of replacing brakes released asbestos into the atmosphere. The plaintiff worked on Amaca brake linings from 1953 to 1962. He worked on Amaba brake linings from 1962 to 1969 and from 1971 to 1983. Although some of those who have worked on brake linings have contracted mesothelioma, most have not. Over a 16 year period (1986-2001) 78 sufferers from mesothelioma had brake lining exposure (compared to 38 who lived in asbestos dwellings and 85 who built or renovated asbestos dwellings, and 5,546 notifications overall); in 1997 there were 83,000 vehicle mechanics, of whom many would have worked with brake linings.

99. All asbestos is dangerous. But the products manufactured by Amaca and Amaba contained the least dangerous type of asbestos, chrysotile. The trial judge found that the combined lifetime risk created by the home renovations, the loading of the truck with asbestos, and brake repair work was 31.4 per million (of which the brake exposure contributed 97%) if the asbestos used in home renovations was chrysotile and 35 per million (of which the brake exposure contributed 87%) if it was crocidolite.

100. The trial judge found that 30% of the fibres to which the plaintiff was exposed came from sources other than Amaca or Amaba over the periods in which he was a mechanic. The trial judge found that the brake repair work done by the plaintiff increased the background risk by 44%. As a result of calculations which Amaca and Amaba challenge[111], the trial judge found that the asbestos for which Amaca was responsible increased the background risk of mesothelioma by 10%, that the asbestos for which Amaba was responsible increased the background risk of mesothelioma by a little less than 20%, and that an increase in risk of these magnitudes "materially contributed" to the contracting of mesothelioma by the plaintiff. It follows that despite the dusty nature of the brake repair work on which the plaintiff laid stress, which the trial judge set out and which the trial judge no doubt took into account, the respective contributions of Amaca and Amaba were much less than the background risk.

[111] They said that the calculations purported to be based on Professor Berry's estimate that background exposure corresponded to a lifetime risk of 70 per million: in fact Professor Berry's figure was 70-140 per million. And they said that it was wrong to compare the contributions of Amaca and Amaba with background risk only, rather than with all other sources of risk.

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101. Further, if the respective contributions of Amaca and Amaba were compared with all other exposures (ie background, home renovations, truck loading, and those for which other brake manufacturers were responsible) those contributions would be even lower.

102. One causation difficulty created by these facts is that, leaving aside the exposures for which Amaca and Amaba were responsible, any of the groups of asbestos fibres to which the plaintiff was exposed either alone or in combination with others could have caused his disease. Another is that there was no evidence as to when the plaintiff contracted the disease – ie when the asbestos fibres injured him by causing changes in the lungs and pleura which were irreversible and led him later to display the symptoms of mesothelioma.

103. It follows that to prove causation against Amaca, for example, the plaintiff had to prove two things. First, that the exposures before he became a motor mechanic in 1953 had not caused the irreversible changes in his body which led him later to display the symptoms of mesothelioma. Secondly, that some of the fibres to which he was exposed as a brake repairer were Amaca fibres (as distinct from the fibres of other brake manufacturers), and that they caused those changes in his body. Alternatively, he had to prove that even if the Amaca fibres to which the plaintiff had been exposed did not cause those changes up to 1962, after 1962 there were exposures to fibres which, in combination with Amaca fibres, caused those changes.

The nature of the appeals

104. An appeal only lies to the Court of Appeal from a decision of the Dust Diseases Tribunal on a question of law. It is an error of law to make a material finding which is not supported by any evidence. However, an appeal on a "no evidence" point in this type of case is difficult to succeed in. It must necessarily be conducted in a much more restricted way than the trial which gave rise to the appeal. At the trial Amaca and Amaba relied positively on epidemiological evidence. But in these appeals positive reliance on their own evidence could bring them little aid: they had to concentrate on what they said were gaps in the plaintiff's evidence. The "no evidence" issue was a narrow one, from which the parties' submissions often strayed.

The primary argument of Amaca and Amaba

105. The key issue is not whether chrysotile *can* cause mesothelioma. Nor is it whether chrysotile dust from brake linings *can* cause it – a question to which Professor Henderson gave a "response … cautiously in the affirmative, 'on the balance of probabilities'." At least in this Court, Amaca and Amaba did not dispute the proposition that chrysotile *can* cause mesothelioma and that chrysotile dust from brake linings *can* do so. They did not dispute that partly because the evidence supported the proposition, and partly because it was in their

interests to rely on evidence that all forms of exposure to asbestos can cause mesothelioma. Nor did Amaca and Amaba dispute the proposition that particular instances encountered by some of the experts were instances of mesothelioma caused by exposure to brake linings. What Amaca and Amaba did dispute was the following finding of the trial judge: "all exposures to chrysotile asbestos, other than trivial or *de minimis* exposure, occurring in a latency period of between 25 and 56 years, materially contributes [sic] to the cause of mesothelioma." [112] In particular, they contended, as they had to, that there was no evidence to support that finding, which was an essential step to the trial judge's conclusion that the plaintiff's exposure to the asbestos in brake linings materially contributed to his mesothelioma. The significance of the finding goes well beyond this particular case. That is because the trial judge preceded that finding with the words: "I specifically determine for the purpose of s 25B that". Section 25B of the *Dust Diseases Tribunal Act* 1989 (NSW) prevents this issue from being re-litigated in other cases without leave. In short, however erroneous the trial judge's finding may be as a matter of fact, unless it can be demonstrated that there was no evidence to support it, later litigants will be bound by it without having been heard in relation to it. Amaca and Amaba also submitted that there was no evidence that the asbestos exposure for which they were responsible was a cause of the plaintiff's mesothelioma, as distinct from it being caused by other exposures.

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[112] *Booth v Amaca Pty Ltd and Amaba Pty Ltd* [2010] NSWDDT 8 at [62].

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106. Amaca and Amaba relied on evidence that no epidemiological study had ever shown that motor mechanics were at an increased risk of mesothelioma from brake work. One study supporting that view stated that "auto mechanics do not have an increased risk of malignant mesothelioma as a result of exposure to asbestos fibers from brake linings and clutch facings." The trial judge said that statements of that kind in the study were correct but misleading. He did not, however, give reasons for that view. The trial judge concluded by saying [113]:

> "I am not persuaded that the epidemiological evidence specific to automotive mechanics is adverse to the submission that causation has been proved in this particular case."

Apart from reversing the burden of proof, this passage did not say that there was epidemiological evidence favourable to causation.

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[113] *Booth v Amaca Pty Ltd and Amaba Pty Ltd* [2010] NSWDDT 8 at [82].

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107. The "no evidence" battle was largely fought on a different field. One step in the trial judge's reasoning was his conclusion that while inhalation of a single fibre of asbestos could not cause mesothelioma, the four experts called by the plaintiff "are each of the opinion that all asbestos fibres contribute to the development of a mesothelioma." [114] Amaca and Amaba submitted

that although fragments of the evidence of each expert considered in isolation might be thought to support the trial judge's finding – words like "cause" and "made a material contribution" appear – as a whole their evidence did not and the fragments were to be read down in that light. Amaca and Amaba therefore referred to the various parts of the evidence of each expert which qualified the evidence on which the trial judge seemed to have relied.

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[114] *Booth v Amaca Pty Ltd and Amaba Pty Ltd* [2010] NSWDDT 8 at [52] .

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108. The plaintiff attacked the submissions of Amaca and Amaba as depending on selective quotation from the experts' evidence. The plaintiff submitted that the evidence of each expert read more fully did support the trial judge's conclusion. The questions whether Amaca and Amaba are right that the pieces of evidence relied on by the trial judge read in context do not support him, or whether the plaintiff is right that on any view they do support him, are questions only to be answered by reading the evidence as a whole. In view of the conclusion reached by other members of the Court it would be unduly wasteful of space to analyse every piece of evidence to which the parties pointed. It is necessary to evaluate what the experts meant by the various verbal formulae they used. The plaintiff's citation of evidence was fuller than that of Amaca and Amaba, but the latter were not misleadingly selective. Further, to some extent the parties were not squarely at issue, for the plaintiff concentrated on whether asbestos can cause mesothelioma, while Amaca and Amaba concentrated on whether every exposure to asbestos (and in particular the plaintiff's exposure to asbestos from brake linings) contributed to mesothelioma. With that background, it is necessary to go to some of what the four experts said.

Professor Henderson's evidence

109. The trial judge quoted the following evidence of Professor Henderson: "It is, I think, almost universally accepted that all asbestos exposure, both recalled and unrecalled, will contribute causally towards the ultimate development of a mesothelioma"[115]. However, the next answer which Professor Henderson gave revealed that the "phenomenon that [he was] describing" was that as "cumulative exposure increases, so does the *risk* of mesothelioma" (emphasis added). Professor Henderson continued: "the *risk* is not a theoretical construct, but rather it is a rate of the number of cases of mesothelioma one will see in the exposed populations" (emphasis added). Amaca correctly submitted that by "risk" Professor Henderson meant consequences which might come home against a population of persons as a whole – not "cause" the particular plaintiff's mesothelioma. The Court of Appeal set out the answer quoted by the trial judge, and said it provided a basis for the conclusion that all exposures contributed to the mesothelioma suffered by the plaintiff. It did not refer to the subsequent evidence qualifying and explaining the answer[116].

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[115] The evidence was inadmissible: it was given in answer to a leading question in chief to which the cross-examiner objected.

[116] See below at [119]-[120].

110. The correctness of Amaca's submission is supported by the fact that the oral evidence was given in the context of page 15 of Professor Henderson's report of 2 March 2009. Professor Henderson there said:

> "*Appendix A* that forms an attachment to this report sets forth a generic discussion on the scientific basis for causation of pleural malignant mesothelioma by asbestos. In particular, I emphasise that the ***risks and causal contributions*** from asbestos exposure towards the development of malignant mesothelioma are dependent upon the following factors in particular:
>
> . the inhaled 'dose' of asbestos fibres, by way of a no-threshold dose-response relationship – so that as cumulative asbestos exposure increases so does the ***risk*** of mesothelioma as a consequence. It follows that each pattern/episode of asbestos exposure within an acceptable latency interval contributes ***causally*** towards the development of mesothelioma." (bold emphasis added)

Amaca submitted:

> "The words 'it follows' in the bullet point, by linking the second sentence with the first, emphasised that when Professor Henderson used the terminology of 'cause', he was speaking of 'risk' referrable to a population of persons. That is borne out by reference to Appendix A, which Professor Henderson said contained a more detailed treatment of the issues discussed in that passage."

The plaintiff criticised the submissions on the ground that the word "population" did not appear in the passage quoted from page 15 of Professor Henderson's report. But the word and the idea appeared in other passages [117] relevant to the line of thought being developed in that passage. Amaca then drew attention to the following passages from Appendix A (which dealt with "The Scientific/Medical Evidence for Causation of Malignant Mesothelioma by Asbestos"):

> "From the Peto model and its modifications, the *risk* of mesothelioma can be related to cumulative asbestos exposure …, so that other factors being equal, the time elapsed following commencement of exposure is a major determinant of *risk*: ie, early exposures are more significant for mesothelioma *risk* than later exposures, other factors remaining constant.
>
> …
>
> One factor that emerges from the Peto model and its modifications is that when there are multiple asbestos exposures, each *contributes* to cumulative exposure and hence to the *risk* and *causation* of mesothelioma, within an appropriate latency interval." (publication references omitted; emphasis added)

[117] Quoted below at [114].

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111. The Peto model gives the "relationship between asbestos exposure and the risk/incidence of mesothelioma". It reveals the number of cases of mesothelioma one would expect to see within a population of persons who bear the characteristics of exposure and latency reflected in the formula. For example, it might reveal that for persons suffering particular intensities of exposure over particular periods with particular latency, there will be 10 cases of mesothelioma per million persons per year. A little later Professor Henderson said:

> "*No minimum threshold dose of inhaled asbestos has been delineated below which there is no increase in the risk of mesothelioma*, as indicated by the following publications". (emphasis in original)

He then set out numerous publications reflecting the incidence of mesothelioma in a population of defined characteristics either absolutely or relatively to a controlled group of persons who face only background risk. One of these was a Swedish study revealing that some occupations, located entirely or primarily in the country, had a standardised incidence ratio of less than 0.5 – persons in farming, gardening, religious, forestry and food manufacturing occupations. Farmers had the lowest figure of 0.28. The study went on to compare the much higher standardised incidence ratio of city groups not exposed occupationally to asbestos. The studies go on to deal with concepts similar to standardised incidence ratio like "relative risks", "odds ratios" and "proportional mortality ratios". Professor Henderson said that these calculations "for cohort and casecontrol studies on mesothelioma represent cases *in excess* of any 'background' risk from 'background' exposures" (emphasis in original).

112. Professor Henderson summarised the discussion in Appendix A by saying:

> "In other words, causal attribution of mesothelioma to antecedent asbestos exposure(s) requires evidence that the exposure(s) constituted cumulative exposures in excess of so-called 'background' exposure sustained from the general environment".

That is, he described the risk analysis based on a comparison of particular populations with a control group as a process of "causal attribution". That may be an apt term in science. It may be a useful term in deciding what response there should be from government and employers to public health issues arising from dangers to particular groups of the public. But it is not a usage corresponding with the expression "causation" as used in relation to the legal rule that one particular sufferer from mesothelioma suing in negligence must prove that the disease was caused by an exposure.

113. That is further highlighted by an earlier part of Appendix A:

> "Mesothelioma occurs in only a minority of asbestos-exposed individuals, even in those exposed heavily to amphibole asbestos. This observation might be explicable by mesothelioma induction as a chance event: that is, mesothelioma is the outcome of a multistage process involving multiple mutational and epigenetic events, so that most of those exposed by asbestos simply do not strike the 'correct'

> combination of a complex set of events necessary for development of mesothelioma. Alternatively one of the mutations induced by asbestos may be lethal to the initiated cell, so that subsequent steps cannot occur. However, alternative explanations include: (i) modulation of the asbestos-imposed risk by genetic or acquired susceptibility/resistance factors; or (ii) a combination of randomness and predisposition." (publication references omitted)

Hence Professor Henderson was conscious that while risk analysis enables one to predict how many of a particular group or population will suffer mesothelioma it does not enable one to predict which ones will, or, once the disease is diagnosed, whether the disease in a particular sufferer is the result of a particular exposure or only a background exposure. Very many people who suffer the same exposure do not contract the disease; relatively few do. Professor Henderson is there revealing the incapacity of such analysis to say precisely why those who have contracted the disease have done so. He is revealing that to move from "risk" to "cause" is an impermissible attempt to leap a gap.

114. What Professor Henderson meant by "risk" is also seen in Appendix B to his report – which dealt with "Mesothelioma and Exposure to Asbestos Dust Derived from Brake Linings /Materials (Chrysotile-Only Exposure)". Early in Appendix B there is a section headed "Some Preliminary Remarks on Relative Risk (RR) *Versus* Individual Risk" (emphasis in original). That section amplifies the words quoted above [118] – "the risk is not a theoretical construct". In that section Professor Henderson said:

> "*Absolute* associative or causal effects involve assessment of the actual numbers of cases or incidences, whereas *relative* effects involve assessment of ratios: hence RR represents the ratio of the incidence for cases seen in the *exposed* group divided by the incidence for the same disease in the *controls* …
>
> It should also be emphasised that 'risk' in this context is no theoretical construct: instead, it represents the ratio of the incidence rates derived from the actual number of observed cases relative to the control/reference group. 'Rate ratio' would be preferable but 'relative risk' is well entrenched. Because RR is derived as an *average* across a population/group, it is unlikely to correspond to the *individual* risk for each and every individual who makes up the population under study, because individual risks will vary from one individual to another …
>
> In other words, an RR or odds ratio (OR) is essentially a net or average (mean) population-based assessment: although the mean RR/OR value is suitable for public health policy planning and for assessment of causal effects on a population-wide basis, it is quite inappropriate simply to extrapolate the mean RR/OR to each and every individual comprising the population – for the simple reason that biological systems such as human beings vary in multitudinous different ways." (footnote omitted; emphasis in original)

This passage is centred on the notion of a "population/group". In short, the "relative risk" or "rate ratio" describes the ratio of incidence rates derived from the actual number of observed cases in a population (for example, brake mechanics) compared to a central group (for example, persons with general background exposure to asbestos, but no other exposure). A rate ratio is an average across a group. It will not correspond with the risk to an individual

member of a group, which may vary from person to person. The assessment of the risk applying to a particular member of the population is another question; and an assessment of whether illness in a member of the population was caused by the condition giving rise to the risk is yet another question.

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[118] At [109].

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115. Professor Henderson said a little later:

> "If one approaches causation of mesothelioma relative to brake dust exposures using *The Bradford-Hill Criteria*, one can state that the epidemiological data are inconclusive for brake lining work specifically, but epidemiological studies have also demonstrated quite conclusively that chrysotile – whether contaminated with tremolite or not – does have the capacity to induce malignant mesothelioma (at least pleural malignant mesothelioma, leaving aside for the moment the issue of peritoneal mesothelioma). In terms of dose-response, epidemiological studies on non-brake chrysotile exposures have demonstrated a dose-response relationship, although this has not been demonstrated clearly for brake lining exposures. The relationship in causal terms is supported by experimental studies, and also from the perspective of biological plausibility. Of course, temporality in this case (and in others) is fulfilled, as is reasoning by analogy (perhaps the weakest of the criteria).
>
> This being so, it is my conclusion from pathobiological principles that substantial or protracted chrysotile (chrysotile-tremolite) exposure to dust derived from new (non heat-altered) brake linings probably does have the capacity to induce mesothelioma in dedicated brake mechanics." (publication reference omitted)

That is a cautious conclusion. But Professor Henderson deals only with capacity in general. He does not purport to say whether a particular brake mechanic's mesothelioma was caused by a particular exposure.

116. At the end of Appendix B he said:

> "[T]he grounds on which I would attribute a significant *causal* contribution to asbestos derived from chrysotile-containing brake linings/pads/blocks include the following". (emphasis added)

The last three grounds he referred to were:

> "Given the no-threshold model for lung cancer induction by asbestos, including chrysotile, exposures above background will, following an appropriate latency interval, confer an increment in *risk* on top of any underlying pre-existing background risk for mesothelioma.

> Although some epidemiological studies have failed to identify an increased *risk* of cancer among brake mechanics, some have …
>
> Data in Australian Mesothelioma Register – which records all mesotheliomas in a nation of almost 20,000,000 people – constitute the strongest evidence for an increased *risk* of mesothelioma among brake mechanics who ground and chamfered new brake pads/linings/blocks." (publication reference omitted; emphasis added)

By "causal" contribution, Professor Henderson was referring to increase in risk. And by "brake mechanics" he was referring to a particular population.

117. Professor Henderson also said at the end of Appendix B:

> "causation for any mesothelioma can be considered to represent the sum of the risks for the true spontaneous mesothelioma rate + mesotheliomas related to non-identifiable exposures from the general environment only (ie, 'known no exposure') + mesotheliomas for which there is exposure in excess of 'general environmental' exposure (ie, unrecognised above'general environmental' exposure + recognised above-'general environmental' exposure – whether occupational (direct/bystander) or nonoccupational). That is, the model is one of a cumulative exposurecausal effect model with no threshold, whereby each exposure adds to the risk of any exposures that have gone before and incremental upon any spontaneous ('known no exposure') risk."

That is, used in this way, "causation" refers to the sum of the risks which a person faces. The model does not establish which of the exposures brought about the disease from which a particular person suffers. Some of the risks relate to what disease has occurred across an entire population over a particular period. But the model does not reveal which particular exposure caused mesothelioma in a particular victim.

118. Professor Henderson was asked in chief what he meant by the following statement in Appendix A in his report, which was quoted above [119] :

> "One factor that emerges from the Peto model and its modifications is that when there are multiple asbestos exposures, each contributes to cumulative exposure and hence to the risk and causation of mesothelioma, within an appropriate latency interval."

Over objection, he answered:

> "Well it goes to the issue of the dose response model for mesothelioma induction by asbestos and that is that when there are multiple episodes of asbestos exposures and the individual concerned inhales increasing numbers of fibres on different occasions, that contributes to the total burden of asbestos fibres deposited in the lung and translocated to the pleura and it is thought that mesothelioma develops because of an interaction between the asbestos fibres and the mesothelial cells by way of secondary chemical messengers and to simplify the answer, the point is that the more fibres there are the greater number of fibres there will be interacting

with mesothelial cells which themselves undergo proliferation and so the progress goes on with increasing numbers of mesothelial cells interacting with increasing numbers of fibres, so that the ultimate development of mesothelioma and its *proba bility* of development will be influenced by the numbers of fibres interacting with mesothelial cells over multiple periods of time and probably over multiple different generations of mesothelial cells and I think this is a fairly well accepted model now". (emphasis added)

As it did of the first answer of Professor Henderson quoted above [120] , the Court of Appeal said of this evidence, which the trial judge quoted [121] , that it provided a basis for the conclusion that all exposure contributed to the mesothelioma suffered by the plaintiff. The reference to "probability", however, highlights the generality of the testimony: it was evidence of a biological process in relation to how mesothelioma probably develops, but it was not evidence about which exposures caused the plaintiff's mesothelioma, and in particular it was not evidence about whether the exposures for which Amaca and Amaba were responsible caused it.

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[119] At [110].

[120] At [109].

[121] *Booth v Amaca Pty Ltd and Amaba Pty Ltd* [2010] NSWDDT 8 at [25] .

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119. Professor Henderson said that if the plaintiff had had no exposure to asbestos beyond background exposure and the exposure which took place when he helped his father in building operations, those exposures would have "made a very small causal contribution", that is, a "small increase in risk." Professor Henderson gave the following evidence in answer to questions from the trial judge:

> "Q. … when you say it caused an increase in risk, that was an increase of risk at the time. A – No, an increase in risk subsequently, your Honour. There is no increase in risk at the time the fibre is inhaled but if the fibres are deposited in the lungs, reach the pleura, the risk such as it is, and again I think it's a very bad term, risk, because you can say, okay from this he is at risk but the risk is not – does not eventuate until the mesothelioma develops. And risk is always based on the numbers of cases in the exposed versus unexposed populations.
>
> Q. In the case of [the plaintiff], are you able to say whether or not that particular risk of that last exposure came home. A – No. I'd say particularly the risk from all of his exposures came home because the model which I adopt is that of a cumulative exposure dose response, so I think that all of the asbestos fibres that he's inhaled, or at least a proportion of them, will contribute to the risk and to the ultimate development of the mesothelioma."

The Court of Appeal quoted the last question and answer. That answer was explained in an answer given to the next question asked by counsel:

> "Q. But I think what you are also saying is this, that individually you cannot say whether any of these risks, whether as a child, whether as a boy, whether on the back of the truck, whether from the background or whether from [brake linings], you cannot say that any risk came home, you can only say it was an increment to the risk. A – That's right."

120. As Amaca and Amaba submitted, this reveals that by "cause" Professor Henderson meant nothing more than an identifiable part of the cumulative bundle of risks faced by a person. In saying that "at least a proportion of [the fibres inhaled] will contribute to the risk and to the ultimate development of the mesothelioma", he was not saying that every exposure caused mesothelioma. The plaintiff criticised the submission put by Amaca and Amaba, but did concede that the passage reveals that Professor Henderson was not prepared to say that the plaintiff's mesothelioma was caused by the risk of one particular exposure as opposed to another. That means that it was not evidence of causation.

121. The Court of Appeal then said of the answer it quoted [122] :

> "That evidence, which his Honour effectively accepted, distinguished between the risk and the event. Thus, a person who is in a room containing asbestos dust is at risk of inhaling asbestos fibres. If the risk materialises and the fibre is inhaled, he will be at risk of some fibres lodging in his lung. If that happens, there is a risk that some of those fibres will translocate to the pleura. If that happens, he is at risk of contracting mesothelioma. The concept of 'risk' looks at the matter prospectively; if the risk materialises, a causal connection may be inferred. Professor Henderson's evidence accepted the causal connection at each stage. It was open to his Honour to conclude that Professor Henderson, for example, did not use risk synonymously with cause and to conclude that Professor Henderson did not 'prefer' to describe the state of medical science in terms of risk; indeed, he described 'risk' as 'a very bad term'".

With respect, this analogy is overstretched. It is remote from the present case, for the analogy postulates only one source of risk and one possible cause, while in the present case there are several sources of risk and several possible causes. It was not open to the trial judge to reason as the Court of Appeal said he could because his reasoning rested on a misreading of the evidence.

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[122] *Amaba Pty Ltd (Under NSW Administered Winding Up) v Booth; Amaca Pty Ltd (Under NSW Administered Winding Up) v Booth* (2011) Aust Torts Reports ¶82079 at 64,621-64,622 [119] .

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122. A final piece of evidence from Professor Henderson was his answer in other proceedings to a question about what he meant by "causal contribution from the asbestos exposures in this case". He said:

> "I suppose what I was trying to say was that we know that there is a relationship, or a dose response relationship between asbestos exposure and the likelihood of the development of mesothelioma and that when there are multiple exposures each exposure is considered to add to the overall risk of the development of mesothelioma, so that each exposure will exert an incremental increase in risk on top of background and on top of exposures that have gone before. In terms of the causation, again it comes down to probabilities and I really couldn't do better than to quote from page 4 of Dr James Leigh's report where in dealing with the development of mesothelioma he comments, 'All of these processes at cellular level are [stochastic] in that the probabilities of fibre cell interaction depend on the number of fibres and the number of cells present at any point in time, hence simplistically the more fibres the more free radicals and the greater probability of initiated, promoted or proliferated cells at any given point, at any given time point.' So there is a theoretical basis to explain the increase in risk in terms of the numbers of fibres inhaled and the more fibres that you have the greater the probability that these fibres will interact with mesothelia cells and eventually [lead] by a multistage process to mesothelia."

That shows a sense in which a great increase in risk can lead to a conclusion that mesothelioma will follow. But the passage does not show that all exposures materially contribute to mesothelioma. It could not do so without accounting for the fact that most asbestos fibres which have been inhaled do no harm, even in people who contract mesothelioma.

123. Professor Henderson's evidence did not support the view that all exposures to chrysotile asbestos materially contribute to mesothelioma.

Professor Musk's evidence

124. The trial judge said [123] :

> "Although at times Professor Musk spoke in terms of cumulative exposure to asbestos increasing the *risk* of contracting mesothelioma, he did not in cross-examination resile from his evidence that, where a mesothelioma has occurred, all exposure has materially contributed to the development of that mesothelioma, and that this was so in the case of [the plaintiff]." (emphasis in original)

Professor Musk said in his report:

> "It is my opinion that [the plaintiff's] exposure to asbestos from brake linings manufactured and supplied by Amaca and Amaba … was sufficient to make a material contribution to the development of his mesothelioma because these were the main sources of the asbestos to which he was exposed and the period between exposure and the development of disease was consistent with the known increasing risk with increasing time since first exposure. His earlier exposures as a child would also have contributed to his risk of developing mesothelioma to a much smaller extent because the levels of exposure would have been much less even though the time since exposure was more."

[123] *Booth v Amaca Pty Ltd and Amaba Pty Ltd* [2010] NSWDDT 8 at [27] .

125. Professor Musk in his oral evidence in chief gave affirmative answers to a number of leading questions to which objection was taken. One was whether he agreed with Professor Henderson's "conclusions concerning causation in this case." Another was whether he considered "that all exposure to asbestos within an acceptable latency period materially contributes to the mesothelioma in a particular patient." A third was whether "all exposure to asbestos within an acceptable latency period materially contributes to the mesothelioma." All these leading questions were impermissible and should have been rejected. The answers were inadmissible.

126. Professor Musk also gave an affirmative answer to the question whether he agreed "with the reasoning that Professor Henderson uses to reach the conclusions that he reaches." It has been seen that Professor Henderson's reasoning is that all exposures to asbestos contribute to the risk that persons so exposed will suffer mesothelioma: it is not that all exposures to asbestos cause mesothelioma in a particular person so exposed. That circumstance suggests that Professor Musk's evidence does not support the trial judge's conclusion any more than Professor Henderson's does. He did, however, decline to concede in re-examination that his understanding of the biological processes leading to mesothelioma was inferior to those of Professor Henderson and Dr Leigh.

127. In cross-examination Professor Musk gave the following evidence:

> "Q. Professor, do you think this is a fair way to express it, that given the biological processes remain incompletely understood, what the medical science establishes is that inhaling asbestos increases the risk of contracting mesothelioma. A – Yeah, that's certainly true and the relationship between the inhalation of asbestos and the development of mesothelioma is so consistent that it's accepted as a causative relationship.
>
> Q. And in fact, we cannot say at a biological level how or why asbestos causes mesothelioma, we can only say that we know that inhaling asbestos is a proven risk for contracting mesothelioma. A – Yes, it's a proven risk and – and most people, as far as I know, are prepared to say that it's a causative association.
>
> Q. Well, that's right, because they infer that in cases [where] the evidence is there in respect of the risk. Is that so. A – Yes. We hardly ever see mesothelioma in the general population and we see it increasingly in people exposed to asbestos and the different varieties of asbestos have a different propensity to cause mesothelioma and the risk increases with time since first exposure after the first 10 to 15 years."

Professor Musk was not asserting that the asbestos exposures for which Amaca and Amaba were responsible caused the plaintiff's mesothelioma. Read as a whole, Professor Musk's

evidence is similar to that of Professor Henderson – experience across populations as a whole supports the conclusion that the greater the exposure to asbestos, the greater the risk of mesothelioma – but it does not permit the conclusion that all exposures experienced by any particular individuals in those populations caused mesothelioma in those individuals.

Dr Heiner's evidence

128. The trial judge said [124] :

> "Dr Heiner says that causation in cases of mesothelioma is best explained by total cumulative asbestos exposure because there is no threshold dose below which mesothelioma will not occur, and the incidence of mesothelioma increases with cumulative dose."

That summary was correct to the extent that it suggested that Dr Heiner's opinion was that the "incidence of mesothelioma" – that is, considered across a population – increases the greater the exposure of individuals within it. But it does not follow that he held the opinion that the mesothelioma suffered by a particular individual was caused by any particular exposure. Dr Heiner's actual evidence is consistent with those points.

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[124] *Booth v Amaca Pty Ltd and Amaba Pty Ltd* [2010] NSWDDT 8 at [31] .

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129. Thus in chief he gave the following evidence:

> "Q. Do you consider the causation is best explained by total cumulative exposure to asbestos. A – Well, the academic teaching, and I think the state of the academic debate at this time is (1) there is no threshold dose but (2) if one has ongoing exposure to asbestos, one then has a greater risk of developing mesothelioma. …
>
> Q. Yes, and in that sense do you consider that all asbestos exposure within an acceptable latency period contributes to the ultimate mesothelioma?
>
> …
>
> A – One may have a threshold exposure at age eight to asbestos and that may or may not result in a mesothelioma developing 20 or 30 years later and that depends on genetic factors, et cetera. But if that person at age eight, even if he had a very mild exposure and then through the rest of his life continually was exposed to asbestos fibres, the likelihood of him developing mesothelioma would increase and he would be more likely to develop a mesothelioma but alone that exposure at age eight may not result in a mesothelioma … occurring. That's how I understand it."

130. And in cross-examination he gave the following evidence:

"Q. Is this what you were saying, that what is known about it is that inhaling asbestos can, at least in some circumstances, increase the risk of contracting mesothelioma. A – Inhaling asbestos can – can certainly cause mesothelioma, yes.

Q. And inhaling asbestos increases the risk, depending upon dose, fibre type and latency periods. A – It does.

Q. And that's the best medical science can offer us in explanation at the moment is that depending upon dose, fibre type and latency periods, what is known that inhaling asbestos can increase the risk of contracting mesothelioma. A – Correct."

But Dr Heiner's evidence is not evidence that the conduct of Amaca and Amaba caused the plaintiff's mesothelioma in law. It is also notable that Dr Heiner denied the "cumulative effect" theory – the theory that all asbestos exposure materially contributes to the development of a particular person's mesothelioma – on which the plaintiff's primary case rested.

Dr Leigh's evidence

131. The trial judge quoted Dr Leigh as saying [125] :

"the current consensus view is that asbestos is involved in both the initiation phase and the promotion/proliferation phase of mesothelioma tumour development".

The trial judge then said [126] :

"It is because of this capacity of asbestos fibres to be involved at several stages of tumour development that Dr Leigh considers that, in an individual case, all cumulative exposure to asbestos fibre must play some part in causation.

Although Dr Leigh at times used the word '*risk*' interchangeably with '*cause*' in his evidence, he explained that once the disease had occurred, the accumulating risk had come home, and that it was the accumulation of fibres that caused the disease in the particular case." (emphasis in original)

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[125] *Booth v Amaca Pty Ltd and Amaba Pty Ltd* [2010] NSWDDT 8 at [34] .

[126] *Booth v Amaca Pty Ltd and Amaba Pty Ltd* [2010] NSWDDT 8 at [35]-[36] .

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132. Those remarks appear to be based on the following statement in Dr Leigh's report:

"In view of the capacity of asbestos fibres to be involved at several stages of tumour development, all cumulative exposure to asbestos in an individual case must be considered to play some part in causation."

A similar proposition appeared earlier:

> "[inability] to demonstrate epidemiologically a statistically significant increase in risk in an occupational category of work, relative to all other occupational categories does not negate in any way a causal inference in an individual case where the only asbestos exposure, above general background environment, was incurred in that occupation."

But what Dr Leigh meant by these two passages was explained immediately after the first of them as follows:

> "In an individual case current understanding suggests that cells are being initiated, initiated cells promoted and altered cells proliferating at different times. DNA repair processes are occurring, and oncogenes and suppressor genes being activated and inactivated. Altered cells are being removed by apoptosis, necrosis and immunological means. Fibres are being cleared at differing rates and, if exposure is continuing, being deposited in the lung. All these processes at cellular level are stochastic in that probabilities of fibre/cell interaction depend on the number of fibres and number of cells present at any point in time. Hence, simplistically, the more fibres, the more free radicals and greater probability of initiated, promoted or proliferated cells at any given time point."

133. Thus Dr Leigh was not saying that every exposure of a person suffering from mesothelioma to asbestos caused the mesothelioma. He was saying that the more fibres to which the person was exposed, the greater the chance that they would initiate the disease. He said in his report: "All exposure, recalled and unrecalled or unrecognized, would have contributed cumulatively to the risk of mesothelioma." However, it does not follow that all exposures caused the disease, or that any particular exposure did. The plaintiff submitted that passages in Dr Leigh's evidence similar to the one last quoted provided a "biological basis" for Dr Leigh's view that asbestos exposure cumulatively contributes to cause as well as risk. But those passages do not provide evidence for the view that every non-trivial exposure of a person to asbestos fibres is causative of mesothelioma. Further, there was expert evidence from Professor Henderson and Dr Leigh that the plaintiff's exposures to asbestos prior to the exposures he received from Amaca and later Amaba products were capable of causing mesothelioma on their own. And, as already noted, there was no expert evidence as to when the plaintiff developed mesothelioma.

134. Dr Leigh was asked the following question in chief:

> "Q. … do you consider that all the exposure contributes cumulatively to the cause of mesothelioma.
>
> …
>
> A – All exposure cumulatively contributes to cause as well as risk, as I think his Honour was alluding to. Once the disease has occurred the risk has come home or been expressed."

The question was leading, and it went well outside the witness's report: for those reasons the evidence was inadmissible. The answer, however, was explained in cross-examination. Dr

Leigh was asked: "Are you in a position to say that but for the exposure, say, on the wharfs, [the plaintiff] wouldn't have contracted mesothelioma[?]" This was a reference to the plaintiff's exposure to asbestos while loading hessian bags of asbestos onto his truck on the Sydney wharves. Dr Leigh answered: "No, I am not, I'm saying no to that." The evidence continued:

> "Q. Is what you're saying really in effect that the exposure on the wharfs can't be excluded. A – I'm saying that, yes. It can't be excluded as part of the overall causation.
>
> Q. That's because it added to the risk. A – Yes."

135. A little later Dr Leigh gave the following evidence:

> "Q. … Dr Leigh, you can't say that except for the brake work [the plaintiff] wouldn't have got his mesothelioma, can you. A – No, I can't say that.
>
> Q. What you're saying is you can't exclude the brake work. A – Yes."

Two points emerge. First, Dr Leigh often conflated "risk" and "cause". Secondly, the asbestos inhaled during the "brake work" did not satisfy the "but for" test for causation in Dr Leigh's eyes. It followed that the risk was not a cause in law.

136. Evidence of Dr Leigh in another case revealed that, while rejecting the theory that one single asbestos fibre could cause mesothelioma, he believed that the more fibres that were inhaled the greater the chance of the disease. That was because while some might initiate the disease others would promote it, by acting on a number of cells in a "probabilistic" way, thereby increasing the "overall risk". On being asked: "Again it's all a matter of risk and increase of risk?", he answered:

> "Well, it's a matter of the fact that he's got it and he had this exposure, so that you have to assume, you know, from the end point that all the exposure must have had something to do with it, whatever the risk-creating potential was. You have to assume that some of those fibres had something to do with it."

He accepted that there was still a question whether mesothelioma could occur spontaneously without any exposure to asbestos. But after referring to the Peto model, he was asked whether fibres inhaled 40 years ago are "causally much more potent than a similar number of fibres of similar type of asbestos inhaled only 10 years ago". He said: "Statistically, yes, statistically." He was then asked what it meant to say "causally more potent and statistically more potent", and answered:

> "It is statistically because you can't actually say, you know – there is no direct way of knowing which fibre did what to which cell at which time. That's what I mean by stochastic or statistical. So it's not really a question of cause or potency, it's just statistical. It is probability, I think, it's probability."

That is, there is no direct way of discovering what any fibre – from home improvement, or loading asbestos bags, or Amaca or Amaba products, or the general background – did to which cell at which time. Later he gave this evidence:

> "Why must [the handyman exposure] have had something to do with it? – Well, you can't say that it didn't because they were additional fibres. As I said, the whole process is probabilistic. There must have been some probability that those additional fibres had something to do with it. You can't exclude that possibility. You can't exclude that.
>
> If a single fibre may initiate the … cell change is it necessary that there be further fibres to promote the process? – That's a good question. I would say yes. Certainly there needs to be some more – some agents acting to further process. Whether they are further fibres or something else I don't know but I would say yes.
>
> And if one or more fibres have initiated the process commencing with the cell change will the inhalation of further fibres necessarily play some part in the promotion or further promotion of that process? – You can't exclude the possibility that they do. You can't exclude it."

This is evidence of risk and possibility, not of causation.

137. Both Dr Leigh and a work he relied on – Dodson and Hammar (eds): *Asbestos: Risk Assessment, Epidemiology, and Health Effects* – contend that it is possible that multiple asbestos fibres have roles to play in initiating and developing mesothelioma over a process which takes some time. But they do not amount to evidence that fibres from every exposure over the entire period of exposure more probably than not play a role in causing a particular person to contract mesothelioma.

138. It is necessary to return to what the trial judge said about Dr Leigh. The trial judge's movement from what he quoted from Dr Leigh's evidence to the next two paragraphs of the reasons for judgment [127] rested on invalid reasoning. It was a movement from a statement about risk which was then treated as a statement about cause and which led to a conclusion about cause that was not open. The trial judge said [128] :

> "In cross-examination Dr Leigh agreed that, *if* there had been no other exposure, the childhood exposure, or the exposure as a truck driver, either separately or in combination was sufficient to cause [the plaintiff's] mesothelioma. He further agreed that he could not say that, because of this earlier exposure, [the plaintiff] would not have contracted mesothelioma in the absence of the work on asbestos brake linings." (emphasis in original)

These concessions amount to a denial that causation of the plaintiff's mesothelioma by the exposures for which Amaca and Amaba were responsible has been, more probably than not, established.

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[127] See above at [131].

[128] *Booth v Amaca Pty Ltd and Amaba Pty Ltd* [2010] NSWDDT 8 at [37] .

Conclusion in relation to the plaintiff's four experts

139. Thus, while there was evidence that examining what happened across populations revealed that a succession of exposures to asbestos increased the cumulative risk of suffering mesothelioma both for the populations as a whole and for individuals within them, the evidence did not show that in the case of a particular individual like the plaintiff it could be said that all exposure to chrysotile asbestos materially contributed to his mesothelioma. Each exposure increased his risk of developing mesothelioma. It does not follow that each exposure caused the mesothelioma. With respect, the Court of Appeal misunderstood the expert evidence by accepting the snippets of it quoted by the trial judge as representative, and by accepting the trial judge's characterisation of it as correct.

Professor Berry's evidence

140. The plaintiff submitted that the contention of Amaca and Amaba that there was *no* evidence to support the trial judge's conclusion as to causation was capable of refutation in two ways: by examining the medical evidence alone, or by examining it in combination with other evidence. The first way rested on the proposition that the references by the medical experts to causation meant causation in law, not increased risk. That proposition has just been discussed. The second way contended that even if the medical experts spoke only of increased risk, the trial judge could infer causation from increased risk and other evidence.

141. The plaintiff submitted that there was expert evidence apart from the four experts discussed above supporting the theory that every exposure to asbestos materially contributes to mesothelioma. He said it was to be found in the evidence of Professor Berry, who was called by Amaca and Amaba. The plaintiff submitted: "Professor Berry agrees that it was '… the lifetime load of all asbestos exposure which *causes* the illness in the individual'" (emphasis added). In fact that was a quotation from a question asked by counsel for the plaintiff. Professor Berry did not agree with the suggestion. He answered thus: "it's the total lifetime exposure and the components that make up that total lifetime exposure that *increase the risk*" (emphasis added).

142. The plaintiff also submitted that Professor Berry "testified that [the plaintiff] was undoubtedly at increased risk of contracting mesothelioma from brake work." That is not so. What Professor Berry actually said was: "I certainly wouldn't wish to argue that brake workers were at … lower risk than the general population."

143. Professor Berry did not support the theory that every exposure to asbestos materially contributes to mesothelioma; indeed he thought that in assessing causation it was necessary to know "the relativities of background which is part of the lifetime load, plus the increment".

Causation inferred from risk

144. The plaintiff did submit that even if Professor Henderson's evidence did not support the view that every exposure to asbestos was causative of mesothelioma, but only added to the cumulative risk of mesothelioma, it was open to the trial judge to infer causation from the increased risk of injury. The submission cited authority which did not support it, for it held [129] that an increase in risk does not by itself support a conclusion of causation. Indeed, Amaba submitted, the trial judge's reasoning proceeded on the opposite view. A key element

of the trial judge's reasoning on causation, under the heading "Specifically", was that 70% of the asbestos fibres to which the plaintiff was exposed in 1953-1962 were from Amaca products, and 70% of the asbestos fibres to which the plaintiff was exposed in later years were from Amaba products. This amounted respectively to 10% and 20% of "the additional fibre burden beyond background which caused [the plaintiff's] mesothelioma." [130] The trial judge arrived at these figures thus [131] :

> "Professor Berry says that it may be appropriate to assume that the background exposure of [the plaintiff] to asbestos fibre as a consequence of general low-level concentrations of asbestos in urban air corresponds to a lifetime *risk* of 70 per million.
>
> The brake repair work increased the background *causal* component of 70 per million lifetime risks by a further 30.6 per million lifetime risks. Expressed in terms of *cause*, the brake work increased by approximately 44 per cent that fibre burden which comprised the background risk." (emphasis added)

The reasoning treats "risk" and "cause" as being identical. Amaba's submission is to be accepted.

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[129] *Roads and Traffic Authority v Royal* (2008) 82 ALJR 870 at 898 [144]; 245 ALR 653 at 689; [2008] HCA 19.

[130] *Booth v Amaca Pty Ltd and Amaba Pty Ltd* [2010] NSWDDT 8 at [166] .

[131] *Booth v Amaca Pty Ltd and Amaba Pty Ltd* [2010] NSWDDT 8 at [136]-[137] .

The trial judge's alternative route to causation

145. The trial judge considered that an [132] :

> "overwhelming inference of causation may be drawn from the following facts:
>
> (1) [The plaintiff's] mesothelioma was caused by the inhalation of asbestos fibre;
>
> (2) Mesothelioma very rarely occurs in persons who have not been exposed to asbestos fibres beyond the background level that pervades urban environments;
>
> (3) For a total of 27 years, week in and week out, [the plaintiff] was additionally exposed to asbestos fibres liberated from asbestos brake shoes by his own work, and by the work of others in his vicinity,
>
> (4) The previous exposure, in the course of home renovations and truck loading was, in comparison, trivial."

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[132] *Booth v Amaca Pty Ltd and Amaba Pty Ltd* [2010] NSWDDT 8 at [162].

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146. Amaca accepted propositions (1) and (2). Amaca attacked proposition (3) on three grounds. It did not discriminate between Amaca-Amaba brake exposure and other brake exposure. It insinuated that the additional exposure referred to was very substantial, when in fact it was only 10% for Amaca and 20% for Amaba, even on the trial judge's controversial calculations. Thirdly, the reasoning did not explain why it should be concluded, more probably than not, than between 1953 and 1962 changes occurred in the plaintiff's body leading to him later developing the symptoms of mesothelioma which were attributable to Amaca's fibres, or that between 1962 and 1969, and between 1971 and 1983, changes occurred in the plaintiff's body leading to him developing the symptoms of mesothelioma which were attributable to Amaca's fibres in combination with other fibres.

147. Amaca also attacked proposition (4). The home renovation could create an additional four cases per million per lifetime: that was not trivial relative to the additional seven cases per million per lifetime for Amaca.

148. Amaca was correct to submit that this alternative route to causation suggested by the trial judge was neither an "overwhelming inference" nor available at all.

The "but for" test

149. The trial judge did not inquire whether the plaintiff had established that but for the Amaca and Amaba exposures he would not have contracted mesothelioma. The "but for" test is a necessary but not sufficient test for causation [133]. There was specific evidence that it was not satisfied[134], and for the reasons given above, there was no evidence that it was satisfied.

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[133] *March v E & M H Stramare Pty Ltd* (1991) 171 CLR 506 at 515-516; [1991] HCA 12.

[134] See above at [134]-[135].

Orders

150. **Following paragraph cited by:**

Director of Public Prosecutions v Mathew Batich and County Court of Victoria and Second respondent (20 March 2013) (Warren CJ, Redlich and Whelan JJA)

60. As this court has observed in the past, [48] there are times where a respondent should not carry the burden where a State authority seeks to

clarify legislation. Given the way the application proceeded, we consider this to be one such case.

via

[48] See, eg, *Secretary to the Department of Justice v LMB; Secretary to the Department if Justice v PMY* [2012] VSCA 143 and *Secretary to the Department of Justice v XQH* [2012] VSCA 72 [14]-[15] citing examples from the High Court in *Maurice Blackburn Cashman v Brown* (2011) 242 CLR 647 [43]; *Amaca Pty Ltd v Booth* 283 ALR 461, [150] ; *Australian Crime Commission v Stoddart* [2011] HCA 47 [42] ; *Minister for Immigration and Citizenship v SZGUR* (2011) 241 CLR 594 [45].

Secretary, Department of Justice v LMB; Secretary, Department of Justice v PMY (29 June 2012) (Warren CJ, Osborn JA and Cavanough AJA)
Secretary to the Department of Justice v XQH (20 April 2012) (Warren CJ and Bongiorno JA)

Each appeal should be allowed. Order 1 of the Court of Appeal made on 10 December 2010 should be set aside, and, in lieu thereof, each appeal to that Court should be allowed. The order of the trial judge made on 10 May 2010 should be set aside, and, in lieu thereof, there should be verdict and judgment for the defendants. The appellants must pay the costs of the first respondent in the Court of Appeal and in this Court pursuant to a condition on the grants of special leave to appeal.

Cited by:

Karpik v Carnival plc (The Ruby Princess) [2025] FCAFC 96 (29 July 2025) (Markovic, Sarah C Derrington and Jackson JJ)

122. In *Hunt & Hunt Lawyers v Mitchell Morgan Nominees Pty Ltd* [2013] HCA 10; 247 CLR 613 at [43] , French CJ, Hayne and Kiefel JJ said: "Causation is largely a question of fact, to be approached by applying common sense to the facts of the particular case". This means that it is an evaluative question, to be assessed in a practical manner: see ***Fisher*** *v Nonconformist Pty Ltd* [2024] NSWCA 32; 114 NSWLR 1 at [107] (Kirk JA, Meagher JA and Simpson AJA agreeing). Just as the High Court has traditionally discouraged directions to juries on the point "containing theoretical analysis and exposition" (*Amaca Pty Ltd v Booth* [2011] HCA 53; 246 CLR 36 at [65] , quoted in *Fisher* at [107]), so too would it be wrong to hem in the trial judge's fact finding function with prescriptive rules as to how the issue of causation is to be approached. It must also be recalled that in cases of statutory causation under the ACL and the TPA , "the relevant question is whether the contravention was *a* cause of (in the sense of materially contributed to) the loss": *I & L Securities Pty Limited v HTW Valuers (Brisbane) Pty Limited* [2002] HCA 41; 210 CLR 109 at [62] (McHugh J) (emphasis in original).

Saadat v Commonwealth [2025] SASC 59 (09 May 2025) (Stanley J)

Amaca Pty Ltd v Booth; Amaba Pty Ltd v Booth (2011) 246 CLR 36 ; *Behrooz v Secretary, Department of Immigration and Multicultural and Indigenous Affairs* (2004) 219 CLR 486; *Burnie Port Authority v General Jones Pty Ltd* (1994) 179 CLR 520; *Chamou n v Minister for Immigration, Citizenship, Migrant Services and Multicultural Affairs (No. 2)* [2019] FCA 1520; *Chappel v Hart* (1998) 195 CLR 232; *Collings v Amaroo Pty Ltd & Worker's Compensation Board of Queensland* [1997] QCA 224; *Dasreef Pty Ltd v Hawchar* (2011) 243 CLR 588; *Graham v Minister for Immigration and Border Protection* (2018) 265 FCR 634; *Hegarty v Queensland Ambulance Service* [2007] QCA 366; *Makita (Australia) Pty Ltd v Sprowles* (2001) 52 NSWLR 705; *McDonald v South Australia; McDonald v Minister for Education and Child Development (No. 3)* [2016] SASC 79; *New South Wales v Lepore* (2003) 212 CLR 511; *P oniatowska v Channel Seven Sydney Pty Ltd (No. 2)* (2020) 136 SASR 455; *SBEG (No 2) v Commonwealth* (2012) 292 ALR 29 at 57-58 ; *SBEG v Commonwealth* (2012) 208 FCR 235; *Secretary, Department of Immigration and Multicultural and Indigenous Affairs v Mastipour* (2004) 259 FCR 576; *Tabet v Gett* (2010) 240 CLR 537, applied.

Saadat v Commonwealth [2025] SASC 59 (09 May 2025) (Stanley J)

2535. Causation is largely a question of fact to be approached by applying common sense to the facts of the particular case. Value judgments and policy have a part to play. [2218] The "but for" analysis is not a definitive or exclusive test of legal causation. [2219] However, as the High Court explained in the joint reasons of Gummow, Hayne and Crennan JJ in *Amaca Pty Ltd v Booth* (*Booth*), many issues of causation lie outside the realm of common knowledge and experience. They fall to be determined by reference to expert evidence, for example, medical evidence. In such cases, investigation of difficult and complicated facts cannot be separated from appreciation of any special branch of knowledge which affects them. [2220] At common law, establishing merely that it is possible that the defendant's conduct was a cause of or materially contributed to the disease or injury is insufficient. The High Court in *T abet v Gett* [2221] confirmed the need for a plaintiff to prove causation on the balance of probabilities. It must be proved on the balance of probabilities that the defendant's conduct was a cause of or materially contributed to the plaintiff's injury or illness. [2222] There is also a distinction between a mere prospective risk that the defendant's conduct might cause injury to the plaintiff and the possibility or probability that the defendant's conduct assessed in retrospect did in fact cause or materially contribute to the injury suffered by the plaintiff. [2223]

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via

[2222] *Amaca Pty Ltd v Ellis* [2010] HCA 5 at [51], (2010) 240 CLR 111 at 132-133 ; *Amaca Pty Ltd v Booth; Amaba Pty Ltd v Booth* [2011] HCA 53 at [69]-[71] , (2011) 246 CLR 36 at 61-63 .

1464 A further relevant decision is *Amaca v Booth* [1516] ('*Booth*') which concerned a retired motor mechanic who suffered from mesothelioma caused by exposure to respirable asbestos. Booth claimed that exposure to asbestos in brake linings on which he worked for over 30 years was a cause of his disease. The following findings by the trial judge were either not in dispute, or were not able to be challenged on appeal:

> • Mr Booth's mesothelioma was caused by the inhalation of asbestos fibre;
>
> • chrysotile asbestos has the capacity to cause mesothelioma;
>
> • the brake linings manufactured by Amaca and Amaba contained chrysotile asbestos; and
>
> • Mr Booth inhaled chrysotile asbestos fibre liberated from Amaca and Amaba products. [1517]

The trial judge accepted expert evidence to the effect 'that all asbestos exposure, both recalled and unrecalled, will contribute causally towards the ultimate development of a mesothelioma'. [1518] French CJ said, in relation to the defendant's reliance on epidemiological evidence:

> Amaca and Amaba relied, in the Tribunal, upon nineteen epidemiological studies published in peer reviewed journals about the incidence of mesothelioma among automotive mechanics and three "meta-analyses" which had combined the results of several studies to produce what was said to be "a more precise estimate of the risk". Each of the meta-analyses concluded that the epidemiological data showed that automotive mechanics are not at a greater risk of developing mesothelioma. The primary judge observed that the studies relied upon by the meta-analyses covered "motor mechanics", "garage workers" and "vehicle mechanics". His Honour said that the average exposure of motor mechanics might have "little in common with the particular exposure of Mr Booth". [1519]

The trial judge's criticisms of the epidemiological evidence culminated in the following conclusion:

> I am not persuaded that the epidemiological evidence specific to automotive mechanics is adverse to the submission that causation has been proved in this particular case. [1520]

With respect to this conclusion, French CJ said:

> This may be taken as a finding that the epidemiological evidence did not displace the inference of factual causation which was open on the basis of Mr Booth's history and the medical evidence relating to the cumulative effects of exposure to asbestos. [1521]

via

[1521] Ibid.

Turner v Bayer Australia Ltd [2024] VSC 760 (10 December 2024) (Keogh J)

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[1520] Ibid at [23].

Turner v Bayer Australia Ltd [2024] VSC 760 -
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Turner v Bayer Australia Ltd [2024] VSC 760 -
Zhao v Insurance Australia Limited t/as NRMA Insurance [2024] NSWPIC 624 -
Value Constructions Pty Ltd v Badra [2024] NSWCA 181 -
Value Constructions Pty Ltd v Badra [2024] NSWCA 181 -
McNickle v Huntsman Chemical Company Australia Pty Ltd (Initial Trial) [2024] FCA 807 -
McNickle v Huntsman Chemical Company Australia Pty Ltd (Initial Trial) [2024] FCA 807 -
Kazzi v KR Properties Global Pty Ltd t/as AK Properties Group [2024] NSWCA 143 (07 June 2024) (Gleeson and Mitchelmore JJA, Basten AJA)

169. As to Mr Kazzi's third submission, that the contractual date for practical completion was not inherently relevant to Mr Kazzi's duty in tort, it is difficult to understand why that would be the case. As a matter of fact, the Owners paid interest on their loans beyond the date of practical completion, at least one cause of which was defective works as to which I have found that Mr Kazzi breached his statutory duty of care. Where an injury was the result of multiple conjunctive causal factors, it is sufficient for a plaintiff to prove that the negligence of the defendant "caused or materially contributed to the injury": *Amaca Pty Ltd v Booth* (2011) 246 CLR 36; [2011] HCA 53 at [70] (Gummow, Hayne and Crennan JJ); see also at [47] (French CJ). The relevant question is whether Mr Kazzi's breaches of duty were a material cause of the Owners having to make those payments.

Kazzi v KR Properties Global Pty Ltd t/as AK Properties Group [2024] NSWCA 143 -
Horvath v Hunaca Nominees Pty Ltd (Civil Claims) [2024] VCAT 246 (19 March 2024) (D. Kim, Member)

112. In *AMACA Pty Ltd v Booth* ,[11] French CJ made the following comments about the element of causation (with footnotes omitted):

> Causation in tort is not established merely because the allegedly tortious act or omission increased a risk of injury. The risk of an occurrence and the cause of the occurrence are quite different things. [12]
>
> ...
>
> The existence of an association or a positive statistical correlation between the occurrence of one event and the subsequent occurrence of another may be expressed as a possibility, which may be no greater than a "real chance" that, if the first event occurs, the second event will also occur. The mere existence of such an association or correlation does not justify a statement, relevant to factual causation in law, that the first event "creates" or "gives rise to" or "increases" the probability that the second event will occur. Such a statement contains an assumption that if the second event occurs it will have some causal connection to the first. However, if the association between two events is shown to have a causal explanation, then the conclusion may be open, if the second event should occur, that the first event has been at least a contributing cause of that occurrence. An after-the-event inference of causal connection may be reached on the civil standard of proof, namely, balance of probabilities, notwithstanding that the statistical correlation between the first event and the second event indicated, prospectively, no more than a "mere possibility" or "real chance" that the second event would occur given the first event. There may of course be cases in which the strength of the association, as measured by relative risk ratios, itself supports an inference of a causal connection. [13]

via

[12] Ibid [41] .

Horvath v Hunaca Nominees Pty Ltd (Civil Claims) [2024] VCAT 246 -
Horvath v Hunaca Nominees Pty Ltd (Civil Claims) [2024] VCAT 246 -
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Horvath v Hunaca Nominees Pty Ltd (Civil Claims) [2024] VCAT 246 -
Fisher v Nonconformist Pty Ltd [2024] NSWCA 32 (20 February 2024) (Meagher and Kirk JJA, Simpson AJA)

108. Secondly, and overlapping with the first point, “common sense” carried with it the suggestion of drawing upon the life experience of the decision-maker in making the judgment required. That being said, it has come to be recognised that “many issues of causation ... lie outside the realm of common knowledge and experience”: *Booth* at [67] . The current matter is such a case, as the Member correctly recognised in declining the appellants’ invitation that he “draw a lay inference” (MD [126]).

Fisher v Nonconformist Pty Ltd [2024] NSWCA 32 (20 February 2024) (Meagher and Kirk JJA, Simpson AJA)

90. In *Booth* French CJ said (citations omitted):

> [41] Causation in tort is not established merely because the allegedly tortious act or omission increased a risk of injury [citing Kiefel J in *Royal* at [144]]. The risk of an occurrence and the cause of the occurrence are quite different things. That proposition is obvious enough ...

Fisher v Nonconformist Pty Ltd [2024] NSWCA 32 (20 February 2024) (Meagher and Kirk JJA, Simpson AJA)

107. The notion of common sense in legal causation has been employed to connote a number of ideas, including the following. First, it is used to indicate that it is an evaluative question of fact, to be assessed in a practical manner. That seems to be the sense it was used in *Hunt & Hunt* and other such judgments. Historically, this point was linked to the fact that questions of causation were often matters for a jury, and the High Court discouraged "judicial directions containing theoretical analysis and exposition": see *Booth* at [65] . As senior counsel for Ms Fisher himself put it, "at the end of the day, if it's meant to indicate that an evaluative process is informed by the sense of the person applying it, it's hardly remarkable". It was on that basis that senior counsel said that the appellants did not need to challenge the statement made in the joint judgment in *Badawi* that causation "is a fact-laden conclusion which the courts have been told must be based on common sense" (at [81] , citing *March v Stramare* and *Nunan*). Kirby P's statement in *Kooragang* that "[w]hat is required is a commonsense evaluation of the causal chain" is of a similar nature (at 463-464).

Fisher v Nonconformist Pty Ltd [2024] NSWCA 32 (20 February 2024) (Meagher and Kirk JJA, Simpson AJA)

Bendix Mintex Pty Limited v Barnes (1997) 42 NSWLR 307; *TC (by his tutor Sabatino) v New South Wales* [2001] NSWCA 380; *Gittani Stone Pty Limited v Pavkovic* [2007] NSWCA 355; *Amaca Pty Limited v Gatt* [2022] NSWCA 151; *Mt Pleasant Stud Farm Pty Ltd v McCormick* [2022] NSWCA 191; *Roads and Traffic Authority v Royal* [2008] HCA 19; (2008) 82 ALJR 870; *Amaca Pty Ltd v Ellis* [2010] HCA 5; (2010) 240 CLR 111; *Amaca Pty Ltd v Booth* [2011] HCA 53; (2011) 246 CLR 36 , referred to.

Fisher v Nonconformist Pty Ltd [2024] NSWCA 32 (20 February 2024) (Meagher and Kirk JJA, Simpson AJA)

70. Although the joint judgment used the double negative, the point can be made positively: s 9A imposes a more stringent causal requirement than that involved in the causal requirement in the first limb of s 4(a) . That understanding is implicit in the joint judgment. It is consistent with the Attorney's reference to the "weaker test" in s 4 in his second reading speech. And it reflects a deeper point. The causal standard for the "arising out of employment" notion in workers compensation legislation has long been accepted to involve consideration of whether the employment "caused, or to some material extent contributed to, the injury": *Nunan* at 124. That is relevantly the same approach as taken at common law for tort: see eg ***March v E & M H Stramare Pty Ltd*** [1991] HCA 12; (1991) 171 CLR 506 at 514 per Mason CJ. There are various aspects to the notion of "material contribution": note *Strong v Woolworths Ltd* [2012] HCA 5; (2012) 246 CLR 182 at [21]-[25] . One role that it plays was explained in *Amaca Pty Ltd v* ***Booth*** [2011] HCA 53; (2011) 246 CLR 36 at [70] per Gummow, Hayne and Crennan JJ and in ***Hunt & Hunt*** *Lawyers v Mitchell Morgan Nominees Pty Ltd* [2013] HCA 10; (2013) 247 CLR 613 at [45] per French CJ, Hayne and Kiefel JJ. To quote the latter (citations omitted):

> The law's recognition that concurrent and successive tortious acts may each be a cause of a plaintiff's loss or damage is reflected in the proposition that a plaintiff must establish that his or her loss or damage is "caused or materially contributed to" by a defendant's wrongful conduct. It is enough for liability that a wrongdoer's conduct be one cause. The relevant enquiry is whether the particular contravention was a cause, in the sense that it materially contributed to the loss. Material contribution has been said to require only that the act or omission of a wrongdoer play some part in contributing to the loss.

Fisher v Nonconformist Pty Ltd [2024] NSWCA 32 (20 February 2024) (Meagher and Kirk JJA, Simpson AJA)

94. As noted above, it has been accepted in this State at least since *Nunan* was decided in 1941 that the causal requirement in the notion of "arising out of employment" involves assessing whether the employment "caused, or to some material extent contributed to, the injury", being in substance the approach taken in tort. That the causal requirement is relevantly the same in that respect as in tort is illustrated by the fact that in *Booth* at [69] the High Court quoted part of Dixon J's dissent in ***Adelaide Stevedoring*** *Co Ltd v Forst* [1940] HCA 45; (1940) 64 CLR 538, a workers' compensation case, when discussing the nature of causation in tort. And there is reason to construe a causal requirement in statute consistently with the common law approach to causation in a closely related context "except in so far as that concept is modified or supplemented expressly or impliedly by the provisions of the Act": quotation from *Wardley Australia Ltd v Western Australia* [1992] HCA 55; (1992) 175 CLR 514 at 525. That is so even taking account of the fact that, as discussed further below, "it is doubtful whether there is any 'common sense' approach to causation which can provide a useful, still less universal, legal norm": *Comcare v* ***Martin*** [2016] HCA 43; (2016) 258 CLR 467 at [42] .

Fisher v Nonconformist Pty Ltd [2024] NSWCA 32 -
Turner v Norwalk Precast Burial Systems Pty Ltd (Ruling) [2023] VCC 1843 -
Turner v Norwalk Precast Burial Systems Pty Ltd (Ruling) [2023] VCC 1843 -
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Turner v Norwalk Precast Burial Systems Pty Ltd (Ruling) [2023] VCC 1843 -
Fabbri v Masters Home Improvement Australia Pty Ltd [2023] WADC 97 -
Fabbri v Masters Home Improvement Australia Pty Ltd [2023] WADC 97 -
Smith v Walker [2023] VSCA 61 (28 March 2023) (Beach and Kennedy JJA; J Forrest AJA)

96. As the High Court noted in *Amaca Pty Ltd (under NSW administered winding up) v Booth* [50] so me of the force of this statement of principle may have been lost with the decline in many jurisdictions of trial by jury in civil actions and the removal of contributory negligence as an absolute defence. It can also be readily accepted that there are cases where questions of causation lie outside the realm of common knowledge and experience, [51] however, in a road traffic case such as this, the determination of causation remains one which is well within the realm of common knowledge and experience. [52]

via

[50] *Amaca Pty Ltd (under NSW administered winding up) v Booth* (2011) 246 CLR 36; [2011] HCA 53 (' ***Booth*** ') [65]–[67] (Gummow, Hayne and Crennan JJ) .

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via

[52] *Booth* (2011) 246 CLR 36; [2011] HCA 53 .

Smith v Walker [2023] VSCA 61 -
Smith v Walker [2023] VSCA 61 -

455. I am not persuaded that Associate Professor Sykes' theory, that any reported clinical sign associated with Equivac HeV (other than those transient ones that I have found earlier in these reasons) is biologically plausibly a side effect of the vaccination, provides a basis to conclude that it is, in fact, a side effect: *Ethicon* 288 FCR at 529 [849], *Amaca* 246 CLR at 61-62 [69]-[70], *McLean* 41 NSWLR at 411 B-C, *Peterson* 196 FCR at 182 [143], *Forst* 64 CLR at 569, *Briginshaw* 60 CLR at 361-362 , *Murray* 33 ALJR at 524.

208. In *Amaca Pty Limited v Booth* (2011) 246 CLR 36 at 61-63 [69]-[70] , Gummow, Hayne and Crennan JJ said:

> Even if the issue is one to which other disciplines may not be able to give any conclusive answer, **questions of causation, as a step in the ascertainment of rights and the attribution of liability in law, call for sufficient reduction to certainty to satisfy the relevant burden of proof for the attribution of liability** (*Amaca Pty Ltd v Ellis* (2010) 240 CLR 111 at 121-122 [6]). In *Tubemakers of Australia Ltd v Fernandez* ((1976) 136 CLR 681 (note); 50 ALJR 720 at 724; 10 ALR 303 at 311), Mason J, with the concurrence of Barwick CJ and Gibbs J, referred to a statement by Dixon J as elaborating **the general onus which lies upon the plaintiff where the issue of causation lies outside the realm of common knowledge and experience**. In *Adelaide Stevedoring Co Ltd v Forst* ((1940) 64 CLR 538 at 569. This statement may be compared with the passage in *Australian Knitting Mills Ltd v Grant* (1933) 50 CLR 387 at 426 in which Dixon J declined to act on the evidence of the chemist called by the plaintiff), Dixon J said:
>
> > "I think that upon a question of fact of a medical or scientific description a court can only say that the burden of proof has not been discharged where, upon the evidence, it appears that the *present state of knowledge* do es not admit of an affirmative answer and that competent and trustworthy expert opinion regards an affirmative answer as lacking justification, *either as a probable inference or as an accepted hypothesis*."
> >
> > (Emphasis added.)
>
> The "but for" criterion of causation proved to be troublesome in various situations in which multiple acts or events led to the plaintiff's injury (*March v Stramare (E & MH) Pty Ltd* (1991) 171 CLR 506 at 516-517), for example, where the development of a particular medical condition was the result of multiple conjunctive causal factors. **In such cases what may be unclear is the extent to which one of these conjunctive causal factors contributed to that state of affairs.** These situations have been addressed by the proposition stated by Lord Watson in *Wakelin v London & South Western Railway Co* ((1886) 12 App Cas 41 at 47) that it is sufficient that the plaintiff prove that the negligence of the defendant "caused or materially contributed to the injury" (See *March v Stramare (E & MH) Pty Ltd* (1991) 171 CLR 506 at 514 per Mason CJ; *Athey v Leonati* [1996] 3 SCR 458 at 466-468 per Major J; Tse, "Tests for factual causation: Unravelling the mystery of material contribution, contribution to risk, the robust and pragmatic approach and the inference of causation", *Torts Law Journal*, vol 16 (2008) 249, at pp 252-256). In that regard, reference may be made to the well-known passage in the speech of Lord Reid in *Bonnington Castings Ltd v Wardlaw* ([1956] AC 613 at 621). Of that case it was said in the joint reasons in *Amaca Pty Ltd v Ellis* ((2010) 240 CLR 111 at 136 [67]):
>
> > "The issue in *Bonnington Castings* was whether exposure to silica dust from poorly maintained equipment caused or contributed to the pursuer's pneumoconiosis, when other (and much larger) quantities of

silica dust were produced by other activities at the pursuer's workplace. Those other activities were conducted without breach of duty. As Lord Reid rightly pointed out ([1956] AC 613 at 621), the question in the case was not what was the most probable source of the pursuer's disease: dust from one source or the other. **The question was whether dust from the poorly maintained equipment was *a* cause of his disease when the medical evidence was that pneumoconiosis is caused by a gradual accumulation of silica particles inhaled over a period of years.** "

(italic emphasis in original; bold emphasis added)

Abbott v Zoetis Australia Pty Ltd [2022] FCA 1390 -
5 Boroughs NY Pty Ltd v State of Victoria (No 2) [2022] VSC 494 -
Amaca Pty Limited (Under NSW Administered Winding Up) v Roseanne Cleary as the Legal Personal Representative of the Estate of the Late Fortunato (aka Frank) Gatt [2022] NSWCA 151 (23 August 2022) (Brereton, Beech-Jones and Mitchelmore JJA)

Amaca Pty Ltd v Ellis (2010) 240 CLR 111; [2010] HCA 5; *Amaca v Booth* (2011) 246 CLR 36; [2011] HCA 53 ; *Bonnington Castings Ltd v Wardlaw* [1956] AC 613 applied.

Amaca Pty Limited (Under NSW Administered Winding Up) v Roseanne Cleary as the Legal Personal Representative of the Estate of the Late Fortunato (aka Frank) Gatt [2022] NSWCA 151 (23 August 2022) (Brereton, Beech-Jones and Mitchelmore JJA)

78. Like the evidence in *Ellis* described above, the conclusions of Professor Moolgavkar and Associate Professor Mackenize about the balance of probabilities were simply based on a quantitative comparison of the probability that the lung cancer was caused by smoking compared to the probability that it was caused by exposure to asbestos. In *Booth* at [49] , French CJ observed that a "causal connection may be inferred by somebody expert in the relevant field considering the nature and incidents of the correlation" between the relevant disease and the relevant exposure. Both Professor Moolgavkar and Associate Professor MacKenzie's evidence was of that kind, although they expressed an opinion about the causal connection with smoking (and a negative opinion about a causal connection with asbestos).

Amaca Pty Limited (Under NSW Administered Winding Up) v Roseanne Cleary as the Legal Personal Representative of the Estate of the Late Fortunato (aka Frank) Gatt [2022] NSWCA 151 (23 August 2022) (Brereton, Beech-Jones and Mitchelmore JJA)

68. The primary judge's reasons in relation to this limb of Mr Gatt's causation case addressed in detail the evidence and submissions concerning the cumulative level of asbestos exposure. [27] Her Honour then addressed the authorities in relation to causation and the epidemiology of lung cancer, including *Ellis* and *Amaca v Booth* (2011) 246 CLR 36; [2011] HCA 53 ("Booth"). Her Honour placed particular emphasis on the proposition accepted in *Strong v Woolworths* (2012) 246 CLR 182; [2012] HCA 5 at [26] that "[n]egligent conduct that materially contributes to the plaintiff's harm but which cannot be shown to have been a necessary condition of its occurrence may, in accordance with established principles, be accepted as establishing factual causation". [28] Her Honour then described aspects of Dr Leigh's evidence and the debate about whether his reasoning on causation was precluded by *Ellis* . [29] Her Honour then summarised some aspects of the other experts' reports, including that of Professor Moolgavkar. Her Honour noted Professor Moolgavkar's conclusion that "asbestos exposure made no contribution to the development of Mr Gatt's lung cancer" and observed: [30]

> "The conclusion that the asbestos made no contribution to Mr Gatt's cancer is not explained to the extent that I would accept that proposition. The vast majority of the opinions expressed in the report relate to 'risk'. To then opine as to the 'cause' of the disease, is not explained and not consistent with the balance of the report. Prof Moolgavkar concedes that 96% of the cancer is attributable to cigarette smoking. *In my view, it is therefore reasonable to accept that the remaining 4% on Prof Moolgavkar's assessment, was caused by his asbestos exposure, given the defendant concedes that Mr Gatt was in fact exposed to asbestos dust and fibre at Camellia*." (emphasis added)

Amaca Pty Limited (Under NSW Administered Winding Up) v Roseanne Cleary as the Legal Personal Representative of the Estate of the Late Fortunato (aka Frank) Gatt [2022] NSWCA 151 -
Sayed v Lee [2022] WADC 76 (19 August 2022) (Whitby DCJ)

48. As Dixon J said in ***Adelaide Stevedoring Co Ltd v Forst*** : [18]

> ... upon question of fact of a medical or scientific description, a court can only say that the burden of proof has not been discharged where, upon the evidence, it appears that the present state of knowledge does not admit of an affirmative answer and that competent and trustworthy expert opinion regards an affirmative answer as lacking justification, either as a probable inference or as an accepted hypothesis.

via

[18] ***Adelaide Stevedoring Co Ltd v Forst*** (1940) 64 CLR 538 cited with approval in ***Amaca Pty Ltd v Booth*** [2011] HCA 53; (2011) 246 CLR 36 (***Amaca v Booth***) [69] ; and in *EMHS v Ellis* [267] .

Sayed v Lee [2022] WADC 76 -
Irlam v Byrnes [2022] NSWCA 81 -
Irlam v Byrnes [2022] NSWCA 81 -
Pietrobelli v Jewell Family Nominees Pty Ltd [2022] NSWSC 660 -
Minister for the Environment v Sharma [2022] FCAFC 35 (15 March 2022) (Allsop CJ; Beach and Wheelahan JJ)

875. The second scenario is where there are multiple events, each of which is demonstrated to create an increased risk of injury such that each might be a sufficient cause of injury, but the evidence does not permit a finding on the balance of probabilities as to which, if any, of the events was a cause of the injury, as with *Wintle v Conaust (Vic) Pty Ltd* [1989] VicRp 84; [1989] VR 951 , and *Amaca Pty Ltd v Ellis* [2010] HCA 5; 240 CLR 111. The last point about absence of proof is important, and distinguishes this second scenario from that considered in *Betts v Whittingslowe* where the fact that an event created an increased risk of injury in combination with other facts gave rise to an inference of causation on the balance of probabilities. This second scenario was the subject of the decision of the House of Lords in *Fairchild v Glenhaven Funeral Services Ltd* [2002] UKHL 22; [2003] 1 AC 32 (***Fairchild***), which concerned claims for damages by workers who contracted mesothelioma, the features of which Lord Bingham described in his speech at [7] , on the basis of the medical science evidence that was before the House at that time. The crucial feature was that there was no way of identifying on the balance of probabilities as between alleged tortfeasors the source of asbestos fibres that were the likely cause of the injury. The House of Lords effected a modification of orthodox causation principles by treating conduct that materially increased the risk of contracting mesothelioma as amounting to a material contribution to injury. In the subsequent case of *Barker v Corus UK Ltd* [2006] UKHL 20; 2 AC 572, Lord Hoffman at [1] described the principle in *Fairchild* as an exceptional test, and at [36] treated the increase in the material risk of injury as the damage. In *Sienkiewicz v Greif (UK) Ltd* [2011] UKSC 10; 2 AC 229, the Supreme Court extended the principle in *Fairchild* to circumstances where the claimant suffered from mesothelioma and where there was only one alleged tortfeasor who was alleged to have materially increased the risk of injury, but there was also a background risk of mesothelioma

arising from ordinary environmental exposure independent of the risk of exposure from the alleged tortfeasor. The common law principle identified in *Fairchild* has not been recognised by the High Court as part of the common law of Australia: *Amaca Pty Ltd v Booth* [2011] HCA 53; 246 CLR 36 at [52]–[53] (French CJ), [80][82] (Gummow, Hayne and Crennan JJ) ; *Alcan Gove Pty Ltd v Zabic* [2015] HCA 33; 257 CLR 1 at [15] (French CJ, Kiefel, Bell, Keane and Nettle JJ). Further, as developed in the United Kingdom, the *Fairchild* principle would likely be inconsistent with the rejection in *Tabet v Gett* [2010] HCA 12; 240 CLR 537 of a lost opportunity to avoid personal injury as constituting damage (see Kiefel J at [114], [141]-[142], Hayne and Bell JJ at [65], and Crennan J at [100] agreeing), noting that at [149] Kiefel J stated that it was unnecessary to consider *Fairchild* .

Ottrey v Bedggood's Transport Pty Ltd [2022] VSC 59 -
5 Boroughs NY Pty Ltd v State of Victoria [2021] VSC 785 (02 December 2021) (John Dixon J)

214. In *Amaca Pty Ltd v Booth* , French CJ said:

> The existence of an association or a positive statistical correlation between the occurrence of one event and the subsequent occurrence of another may be expressed as a possibility, which may be no greater than a 'real chance' that, if the first event occurs, the second event will also occur. The mere existence of such an association or correlation does not justify a statement, relevant to factual causation in law, that the first event 'creates' or 'gives rise to' or 'increases' the probability that the second event will occur. Such a statement contains an assumption that if the second event occurs it will have some causal connection to the first. However, if the association between two events is shown to have a causal explanation, then the conclusion may be open, if the second event should occur, that the first event has been at least a contributing cause of that occurrence. An after-the-event inference of causal connection may be reached on the civil standard of proof, namely, balance of probabilities, notwithstanding that the statistical correlation between the first event and the second event indicated, prospectively, no more than a 'mere possibility' or 'real chance' that the second event would occur given the first event. There may of course be cases in which the strength of the association, as measured by relative risk ratios, [220] itself supports an inference of a causal connection to the first. [221]

5 Boroughs NY Pty Ltd v State of Victoria [2021] VSC 785 -
5 Boroughs NY Pty Ltd v State of Victoria [2021] VSC 785 -
Montevento Holdings Pty Ltd v Central City Pty Ltd [2021] WASC 154 -
Pike v Coles Supermarkets Australia Pty Ltd; Pike v Solomon [2021] NSWSC 1492 -
Rosanne Cleary as the Legal Personal Representative of the Estate of the late Fortunato (aka Frank) Gatt v Amaca Pty Ltd [2021] NSWDDT 5 (06 September 2021) (Strathdee, J)

> The requirement for such counterfactual satisfaction of the but for test was one of the matters that Mason CJ rejected in *March v Stramare,* that Gummow J, Hayne J and Crennan J can be taken to have rejected in *Amaca v Booth* at [70] and that French CJ, Gummow J, Creenan J and Bell J rejected in *Strong v Woolworths* at [26]–[28].

Rosanne Cleary as the Legal Personal Representative of the Estate of the late Fortunato (aka Frank) Gatt v Amaca Pty Ltd [2021] NSWDDT 5 -
Rosanne Cleary as the Legal Personal Representative of the Estate of the late Fortunato (aka Frank) Gatt v Amaca Pty Ltd [2021] NSWDDT 5 -
Nonconformist Pty Ltd v Fisher [2021] NSWPICPD 26 (19 August 2021) (Deputy President Elizabeth Wood)

181. The appellant is critical of the Arbitrator for taking into account Dr Helprin's medical speciality when Dr Herman was of the same expertise. I do not consider that the Arbitrator

was referring to Dr Helprin's expertise as being a reason to prefer his opinion over that of Dr Herman. In *Amaca Pty Ltd v Booth* , [71] Gummow, Hayne and Crennan JJ considered the status of scientific research as evidence in relation to the test of causation. Their Honours said (citation omitted):

> "The discipline of epidemiology, and its application in answering issues of causation in litigation, was described by Lord Phillips in *Sienkiewicz* as follows:
>
> 'Epidemiology is the study of the occurrence and distribution of events (such as disease) over human populations. It seeks to determine whether statistical associations between these events and supposed determinants can be demonstrated. Whether those associations if proved demonstrate an underlying biological causal relationship is a further and different question from the question of statistical association on which the epidemiology is initially engaged.'" [72]

Nonconformist Pty Ltd v Fisher [2021] NSWPICPD 26 (19 August 2021) (Deputy President Elizabeth Wood)

WORKERS COMPENSATION – epidemiological evidence and the question of causation – *Amaca Pty Ltd v Booth* [2011] HCA 53 ; *Seltsam Pty Limited v McGuiness; James Hardie & Coy Pty Limited v McGuiness* [2000] NSWCA 29; 49 NSWLR 262; 19 NSWCCR 385 discussed and applied – principles applicable to establishing error in accordance with s 352(5) of the *Workplace Injury Management and Workers Compensation Act 1998* – *Raulston v Toll Pty Ltd* [2011] NSWWCCPD 25; *Henderson v Foxworth Investments Ltd* [2014] UKSC 41; SLT 775; 1 WLR 2600 applied

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via

[72] *Amaca* , [86] .

Nonconformist Pty Ltd v Fisher [2021] NSWPICPD 26 -
Nonconformist Pty Ltd v Fisher [2021] NSWPICPD 26 -
Sharma by her litigation representative Sister Marie Brigid Arthur v Minister for the Environment [2021] FCA 560 -
Montevento Holdings Pty Ltd v Central City Pty Ltd [2021] WASC 154 -
McNamara v The Queen [2021] SASCFC 2 (28 January 2021) (Nicholson, Livesey and Bleby) JJ)

79. The appellant commenced by invoking the High Court's statement in *Douglass v The Queen* , [56] approving of an observation by Doyle CJ of this Court in *R v Keyte* ,[57] that:

> in the absence of reasons, the appellate court is unable to determine whether the judge has correctly applied the relevant rules of law.

via

[56] (2012) 86 ALJR 186 ; [2012] HCA 34 at [14] (French CJ, Hayne, Crennan, Kiefel and Bell JJ) .

McNamara v The Queen [2021] SASCFC 2 -
Peniamina v The Queen [2020] HCA 47 -
Gladstone Ports Corporation Limited v Murphy Operator Pty Ltd [2020] QCA 250 -
East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) [2020] WASCA 147 (10 September 2020) (Quinlan CJ, Mitchell JA, Beech JA)

As French CJ explained in ***Amaca v Booth*** , [234] an aftertheevent inference of causal connection may be reached on the balance of probabilities notwithstanding that the statistical correlation between the first event and the second event indicated, prospectively, no more than a 'mere possibility' that the second event would occur given the first.

East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) [2020] WASCA 147 (10 September 2020) (Quinlan CJ, Mitchell JA, Beech JA)

In the earlier passages in ***Amaca v Booth*** upon which the appellant also relies, Gummow, Hayne and Crennan JJ:

East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) [2020] WASCA 147 (10 September 2020) (Quinlan CJ, Mitchell JA, Beech JA)

> As observed in *Amaca Pty Ltd v Booth* , even if scientific proof or disproof is not available, 'an exact and reasoned solution' is 'required'. A more exacting and principled approach than that in *EMI* is now mandated by *Amaca Pty Ltd v Booth* .

East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) [2020] WASCA 147 (10 September 2020) (Quinlan CJ, Mitchell JA, Beech JA)

The suggestion that ***Amaca v Booth*** represents a change in the law (i.e. '*now* mandated') is misplaced. The plurality's reference in ***Amaca v Booth*** to the need for 'an exact and reasoned solution' in cases of causation was taken directly from extra-curial remarks made by Sir Owen Dixon. [297] Sir Owen made those remarks in 1933, seven years before his Honour's judgment in ***Ad elaide Stevedoring Co Ltd v Forst*** . We refer to what we have said in [267]-[271] above.

East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) [2020] WASCA 147 (10 September 2020) (Quinlan CJ, Mitchell JA, Beech JA)

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via

[297] ***Amaca v Booth*** [68] (Gummow, Hayne & Crennan JJ).

East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) [2020] WASCA 147 (10 September 2020) (Quinlan CJ, Mitchell JA, Beech JA)

(b) adopted statements by Sir Owen Dixon that the 'wealth of knowledge put by science at the disposal of the processes of the law meant that, in place of what in simpler times had been "the rough and ready answers of the practical man", an exact and reasoned solution was now required'. [247]

via

[247] ***Amaca v Booth*** [68] .

East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) [2020] WASCA 147 -
East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) [2020] WASCA 147 -
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East Metropolitan Health Service v Ellis (by his next friend Christopher Graham Ellis) [2020] WASCA 147 -
Bowman v Nambucca Shire Council [2020] NSWSC 1121 -
Lewis v Australian Capital Territory [2020] HCA 26 -
Parliament Square Hobart Landowner Pty Ltd v Tonkin [2020] TASSC 30 -
D'Souza v Barclays Building Services (WA) Pty Ltd [2020] WADC 87 (19 June 2020) (Gething DCJ)
Amaca Pty Ltd (under NSW administered winding up) v Booth; Amaba Pty Ltd (under NSW administered winding up) v Booth [2011] HCA 53 ; (2011) 246 CLR 36
Astley v Austrust Ltd

D'Souza v Barclays Building Services (WA) Pty Ltd [2020] WADC 87 (19 June 2020) (Gething DCJ)

504. Dr Ng places some weight on the fact that prior to 7 July 2015, the plaintiff was not experiencing the respiratory symptoms he experienced after that date. This is consistent

with my finding of fact ([299]). However, mere proof of fault followed by injury does not show that the fault caused the injury. [531]

via

[531] ***St George Club Ltd v Hines*** (1961) 35 ALJR 106, 107 (Dixon CJ, Kitto, Taylor, Menzies, Windeyer JJ); ***Tubemakers of Australia Ltd v Fernandez*** (1976) 50 ALJR 720, 724 (Mason J, with whom Barwick CJ & Gibbs J agreed); ***Amaca Pty Ltd (under NSW administered winding up) v Booth; Amaba Pty Ltd (under NSW administered winding up) v Booth*** [43] (French CJ) .

D'Souza v Barclays Building Services (WA) Pty Ltd [2020] WADC 87 -
Brocklands Pty Ltd v Tasmanian Networks Pty Ltd [2020] TASFC 4 (15 June 2020) (Blow CJ, Estcourt and Pearce JJ)

182. Finally, as to the approach to the question of the legal consequences of any breach by the respondent of a duty of care owed to the appellant, it is useful to remember, as Porter J pointed out in *Langmaid* at [49] :

> "In terms of the general principle, I agree with Blow CJ that there is nothing impermissible in a trial judge first making findings of fact about whether there is a causal connection between conduct around which breaches of duty are alleged and damage, and going on to consider the legal consequences of those findings to the extent necessary: *Amaca Pty Ltd v Booth* (2011) 246 CLR 36 per Gummow, Hayne and Crennan JJ at 60 [64] . That is particularly so where there is no real argument about the existence of the pleaded duties and about breaches of those duties."

Australian Competition and Consumer Commission v Kimberly-Clark Australia Pty Ltd [2020] FCAFC 107 -
Brocklands Pty Ltd v Tasmanian Networks Pty Ltd [2020] TASFC 4 -
Peebles v WorkCover Queensland [2020] QSC 106 (27 May 2020) (Jackson J)

Amaca Pty Ltd v Booth (2011) 246 CLR 36 , cited

Peebles v WorkCover Queensland [2020] QSC 106 -
Harvard Nominees Pty Ltd v Tiller (No 2) [2020] FCA 604 -
Zugic v Vesuvius Australia Pty Ltd [2020] NSWSC 106 -
Aiberti and Military Rehabilitation and Compensation Commission (Compensation) [2019] AATA 4238 (14 October 2019) (Deputy Boyle P)

70. In relation to the issue of whether Mr Aiberti's RAN service contributed to his development of mesothelioma, to a significant degree for the purposes of s 5B of the DRC Act , the Applicants submit:[29]

> .
>
> The purpose of amending the word "material" to "significant" in s 5B of the DRC Act , as explained in the Explanatory Memorandum of the *Safety, Rehabilitation and Compensation and Other Legislation Amendment Bill 2006,* was to strengthen the connection necessary between the employment and the contraction
>
> (or aggravation) of the disease, citing *Comcare v Power* (2015) 238 FCR 187; [2015] FCA 1502 (***Comcare v Power***) at [93] .

.

It is insufficient if the contribution of the employment is more than trivial

(being material), it must be substantially more than trivial to be significant, again citing *Comcare v Power* at [93] .

· The determination as to whether the necessary threshold has been established, is an evaluative exercise that includes consideration of a non-exhaustive list of factors, some of which are set out in s 5B(2) of the DRC Act citin g *Comcare v Power* at [94] .

· It is beside the point that one factor contributes greater than another. Nor does it matter that factors outside the employment also contribute to a significant degree. The DRC Act does not require the employment to be the sole, proximate or dominant cause of the injury; rather, the Tribunal must be satisfied, on the balance of probabilities, that the contribution was a significant contributing factor, which is a question of fact to be determined by the Tribunal in each case, citing *Comcare v Power* at [94] .

· To rebut the presumption under s 7(1) of the DRC Act the Tribunal must be satisfied, on the balance of probabilities, that Mr Aiberti's exposure to asbestos in the RAN did not contribute, to a significant degree, to his mesothelioma citing *Freeman and Military Rehabilitation and Compensation Commission (Compensation)* [2016] AATA 741 (***Freeman and MRCC***) at [98] .

· To be satisfied on the balance of probabilities, the Tribunal is not required to be satisfied with certainty or precision (*Tabet v Gett* [2010] HCA 12 at [145] – [149] ; *White and Military Rehabilitation and Compensation Commission* [2017] AATA 1555 [80]). An assessment on the balance of probabilities is not a mathematical calculation but simply a matter of an assessment of what is human experience (*Sydney South West Area Health Service v Stamoulis* [2009] NSWCA 153 at [139] (***Stamoulis***); *Fazio v Fazio* [2012] WASCA 72 at [46]), and the question of what is probable is where the person judging the probability of that thing has the appropriate degree of confidence in its existence or correctness based on or judged according to reason (*Stamoulis* at [140]-[141]).

.

Epidemiological evidence may be utilised, particularly in cases like the present (*Seltsam Pty Ltd v McGuinness* (2000) 49 NSWLR 262; [2000] NSWCA at

[93]- [94]).

· Where an expert witness expresses an opinion on the ultimate issue in the case it is important that the decision-maker recognises that this has occurred and ensures that the expert, in reaching that opinion, has correctly applied the relevant legal test upon which the ultimate issue turns (*Wiegand v Comcare Australia* [2002] FCA 1464 (***Wiegand***) at [30] per von Doussa J).

.

All asbestos exposure has a cumulative effect in causal contribution to the ultimate development of a mesothelioma, based upon the understanding of physiological mechanisms and not epidemiology (*Amaca Pty Ltd v Booth* [2011] HCA 53;

(2011) 246 CLR 36 (***Amaca v Booth***) at [51]).

· There are authoritative studies that put the position beyond any doubt that both workers in Wittenoom and RAN personnel are in a category of occupations that carry significant risks for developing mesothelioma due to occupational exposure to asbestos.

· Mr Aiberti's exposure to asbestos during his service in the RAN and how asbestos causes mesothelioma establishes that his service in the RAN was a significant contributing factor to the development of his peritoneal mesothelioma because:

o He was likely exposed to low to high quantities of crocidolite, amosite and chrysotile during his seven years in the RAN, which was significantly higher than background environmental exposure. Considering the duration of his service with the RAN and, the occasions his service would have resulted in him being exposed to asbestos (as is detailed in Mr Aiberti's statements and Mr Kottek's reports), his level of exposure to asbestos during his RAN service alone placed him at a significant risk of suffering mesothelioma given:

(i) there is no level of exposure to asbestos that does not result in an increased risk in developing mesothelioma;

(ii) RAN personnel in Australia, as in other international studies examining the incidence of mesothelioma in naval and merchant shipping occupations, are at a significantly increased risk of suffering mesothelioma even if the exposure was of a short duration; and

(iii) in the hypothetical situation that Mr Aiberti's only exposure to asbestos was during his service in the RAN, it was sufficient to have caused his peritoneal mesothelioma.

· The Respondent relies primarily on Professor Fox. The evidence of Mr Kottek, Professor Musk and Dr Leigh should be preferred over that of Professor Fox as they have greater expertise in epidemiology and biological research in asbestos related disease. Professor Fox has had no training in epidemiology, and has conducted no epidemiological or biological research into asbestos related diseases whereas:

o Mr Kottek has postgraduate training in epidemiology at Monash University and expertise in epidemiology.

- Professor Musk holds postgraduate qualifications in epidemiology from Harvard University and has authored or co-authored hundreds of research articles specifically related to asbestos related disease.

- Dr Leigh was the head of the Epidemiology Unit at the National Occupational Health and Safety Commission for almost 10 years and has authored 141 peer reviewed research articles, of which half are specifically related to asbestos related lung disease, and which included research in lung pathology.

· The differences in expertise between Professor Fox and the other experts is stark and offers a starting point to explain their differences in opinion. In particular, epidemiology is concerned with an evaluation of risk to which an inference of causation may be drawn; it is not direct evidence of causation in an individual case. The limit to which epidemiology assists in determining causation in this case was demonstrated in the following evidence:

- Mr Kottek explained that, in relative terms, Mr Aiberti's exposure in Wittenoom is more important as to risk; however, he could not express an opinion as to causation in an individual case. He otherwise expressed the opinion that the risk posed by the RAN exposure was, in and of itself, significant.

- Professor Musk, in his evidence, demonstrated the difference between risk and causation. In his report dated 8 June 2016, he explained that it is not possible to identify which specific asbestos exposures caused or materially contributed to any mesothelioma. He explained that whilst the Wittenoom exposure was more significant, based on statistical evidence, it does not "tell us what actually happened".

- Professor Musk explained that the RAN exposure on its own was significant in increasing Mr Aiberti's risk of suffering mesothelioma.

- Dr Leigh explained that risk is a different concept to causation in an individual case and is not the same as comparing occupational groups and measuring the risk of developing mesothelioma based on incidence rates, because in this case the probability of Mr Aiberti getting mesothelioma was now one. In other words, Mr Aiberti's risk of developing mesothelioma posed by the two occupations in which Mr Aiberti was exposed to asbestos, has come home.

- Dr Leigh and Professor Musk explained that it not a matter of competing risks when comparing the risk from each of the two exposures.

- Dr Leigh explained that the exposures are not divided; rather, they are cumulative and any exposure 10 years before the occurrence of the tumour is relevant.

- Professor Fox concluded, contrary to the other experts, that because the epidemiology evidence confirmed that Mr Aiberti's risk of developing mesothelioma was greater because of his

exposure to asbestos at Wittenoom when compared to the RAN exposure, it meant that the RAN's contribution was *de minimis*.

· Both occupations significantly increased Mr Aiberti's risk of developing mesothelioma, with the Wittenoom exposure being greater than the RAN exposure. However, there is no evidence to say that means the RAN exposure was *de minimis*.

· Mr Aiberti's exposure to asbestos in Wittenoom and in the RAN cumulatively contributed to the risk of him developing mesothelioma. The RAN exposure to asbestos was, in and of itself a significant risk factor and there is no evidence the Wittenoom exposure diminished or lessened the contribution the RAN exposure made to Mr Aiberti's risk of developing mesothelioma. Professor Fox agreed the more fibres an individual is exposed to the greater the risk.

· Continued exposure to asbestos in the RAN, if it did not initiate, would have proliferated the genetic change that ultimately caused Mr Aiberti's mesothelioma (Dr Leigh).

Aiberti and Military Rehabilitation and Compensation Commission (Compensation) [2019] AATA 4238 -
Aiberti and Military Rehabilitation and Compensation Commission (Compensation) [2019] AATA 4238 -
Aiberti and Military Rehabilitation and Compensation Commission (Compensation) [2019] AATA 4238 -
Aiberti and Military Rehabilitation and Compensation Commission (Compensation) [2019] AATA 4238 -
Aiberti and Military Rehabilitation and Compensation Commission (Compensation) [2019] AATA 4238 -
Groote Eylandt Mining Company Pty Ltd v Secretary for Mineral Royalties (NT) [2019] NTSC 58 (25 July 2019) (Grant CJ)

14. Against that background, the issue for determination is whether the levy is properly characterised as an "operating cost" within the general definition in s 4B(1)(a) , or within the specific inclusions of fees and charges under s 4B(1)(k) and/or other matters necessary for the proper administration of the production unit under s 4B(1)(p) of the MRA . That draws attention in the first instance to the structure of the provision, which uses "means" with reference to a general definition, followed by "includes" and "but does not include" with reference respectively to a number of more specific descriptors. By that structure the legislature has signified that the term "operating costs" has the limited meaning set out in paragraph (a), but that in order to either extend or restrict the scope of the general definition, or to avoid doubt, certain specific items or categories of expenditure are to be taken to fall within or without the scope of the designated meaning. [13] Some of those specific inclusions are subject to express requirements of reasonableness in amount and direct relationship or attributability. No question of reasonableness in amount arises in this context for the obvious reason that the levy is fixed by legislation.

via

[13] *Zickar v MGH Plastic Industries Pty Ltd* (1996) 187 CLR 310 at 329-330 ; *BHP Billiton Ore Pty Ltd v National Competition Council* (2008) 236 CLR 145 at [32] ; *International Litigation Partners Pte Ltd v Chameleon Mining NL* (2012) 246 CLR 45 at [26] .

Groote Eylandt Mining Company Pty Ltd v Secretary for Mineral Royalties (NT) [2019] NTSC 58 -
Groote Eylandt Mining Company Pty Ltd v Secretary for Mineral Royalties (NT) [2019] NTSC 58 -
Groote Eylandt Mining Company Pty Ltd v Secretary for Mineral Royalties (NT) [2019] NTSC 58 -
Australian Competition and Consumer Commission v Kimberly-Clark Australia Pty Ltd [2019] FCA 992 -

Roo Roofing Pty Ltd v Commonwealth [2019] VSC 331 (31 May 2019) (John Dixon J)

1413. In *Amaca*,[261] a motor mechanic had been exposed to asbestos fibres contained in brake linings made by three manufacturers, giving rise at trial to complex causation issues. Relevant in the present context is French CJ's statement that causation is not established merely because the allegedly tortious conduct increased the risk of injury. [262] The risk of an occurrence and the cause of the occurrence are quite different things, which necessitates that a court reflect on the relationship between risk and causation. A finding that a defendant's conduct increased the risk of injury to the plaintiff must rest upon more than a mere statistical correlation between that kind of conduct and that kind of injury. It requires the existence of a causal connection between the conduct and the injury, albeit other causative factors may be in play.

via

[262] Ibid 53 [41] .

Roo Roofing Pty Ltd v Commonwealth [2019] VSC 331 (31 May 2019) (John Dixon J)

1415. Later in his reasons, French CJ observed that:

> The distinction between a statistical correlation and factual causation precedes any consideration of the distinction between factual causation and legal causation which was discussed in *March v Stramare (E &MH) Pty Ltd*. Factual causation which can be established by the application of the 'but for' test is 'the threshold test for determining whether a particular act or omission qualifies as a cause of the damage sustained'. That threshold must also be surmounted in the case of concurrent or successive tortious acts...
>
> Factual causation does not require that the propounded cause be one link in a chain of causative factors or events. It may be, as some commentators have suggested, a 'necessary element of a sufficient set' of causes. [264]

via

[264] Ibid 56 [47]-[48] (citations omitted).

Roo Roofing Pty Ltd v Commonwealth [2019] VSC 331 (31 May 2019) (John Dixon J)

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via

[261] (2011) 246 CLR 36 .

Roo Roofing Pty Ltd v Commonwealth [2019] VSC 331 -
Roo Roofing Pty Ltd v Commonwealth [2019] VSC 331 -
Amaca Pty Ltd v Latz [2018] HCA 22 (13 June 2018) (Kiefel CJ, Bell, Gageler, Keane, Nettle, Gordon and Edelman JJ)

107. Over the last 30 years, significant changes have directly impacted the process of assessment: namely, the significance of superannuation in the context of an ageing population [119] and, as these appeals demonstrate, the late onset of diseases like mesothelioma [120] .

via

[120] See, eg, *Amaca Pty Ltd v Booth* (2011) 246 CLR 36 at 69-70 [93] ; [2011] HCA 53 ; *Alcan Gove Pty Ltd v Zabic* (2015) 257 CLR 1 at 6 [5][6]; [2015] HCA 33.

Weber v Greater Hume Shire Council [2018] NSWSC 667 -
Asbestos Injuries Compensation Fund Limited as Trustee for the Asbestos Injuries Compensation Fund [2018] NSWSC 589 -
Ellis (by his next friend Christopher Graham Ellis) v East Metropolitan Health Service [2018] WADC 36 (09 March 2018) (Gething DCJ)

812. Ninth, mere proof of fault followed by injury does not show that the fault caused the injury. [890]

via

[890] ***St George Club*** (107); ***Tubemakers*** (724); ***Amaca*** [43] (French CJ) .

Ellis (by his next friend Christopher Graham Ellis) v East Metropolitan Health Service [2018] WADC 36 (09 March 2018) (Gething DCJ)

821. Counsel for the defendant placed weight on judicial observations to the effect that, where medical science is able to give clear and direct evidence as to causation or the unlikelihood of causation, significant weight should be given to it.[901] He placed particular emphasis on the observations of the plurality in ***Amaca Pty Ltd v Booth*** . [902] Those observations are conveniently summarised by Pullin JA in ***BGC Residential*** : [903]

> The proper inference to be drawn on the balance of probabilities depends ... upon a commonsense assessment of all relevant evidence, although the justification for that approach has lost some of its force for the reasons given by the plurality in ***Booth*** [67] . In many cases in place of the 'rough and ready answers of the practical man' an 'exact and reasoned solution' is now required. This is so in cases where the wealth of knowledge of science may provide such an exact and reasoned solution to a causation issue: ***Booth*** [68] . However, the plurality in ***Booth*** acce pted [69] that there will still be cases ... where 'other disciplines' cannot give any conclusive answer, in which case a commonsense assessment of the evidence is the only method which can be used to reach a conclusion about whether a breach of contract has caused the claimed damage. The question to be asked is whether it is possible to infer, on the balance of probabilities and applying a commonsense approach, that but for the breach the damage would not have occurred.

Ellis (by his next friend Christopher Graham Ellis) v East Metropolitan Health Service [2018] WADC 36 (09 March 2018) (Gething DCJ)

Amaca Pty Ltd (under NSW administered winding up) v Booth; Amaba Pty Ltd (under NSW administered winding up) v Booth [2011] HCA 53 ; 246 CLR 36

Ellis (by his next friend Christopher Graham Ellis) v East Metropolitan Health Service [2018] WADC 36 -
Ellis (by his next friend Christopher Graham Ellis) v East Metropolitan Health Service [2018] WADC 36 -
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Drew Cuthbertson v State of New South Wales; Daniel Fletcher v State of New South Wales [2017] NSWDC 367 -
Comcare v Chambers [2017] FCA 1014 -
Berhane v Woolworths Ltd [2017] QCA 166 (08 August 2017) (Gotterson and Morrison JJA and Dalton J,)

Ltd [2016] QDC 142 , related

Berhane v Woolworths Ltd [2017] QCA 166 (08 August 2017) (Gotterson and Morrison JJA and Dalton J,)

72. However, senior counsel for Mr Berhane also put the case on causation on the basis of s 305D(2) of the *Workers Compensation and Rehabilitation Act* . For that purpose the "but for" test in s 305D(1) is inapplicable, and the test is whether the breach materially contributed to the injury. [64] At trial the case was conducted on the basis that the workplace activities [65] materially contributed to the acceleration of the pre-existing condition.[66] If those workplace activities were carried out as a result of Woolworths' breach of duty, as they were, then the case as conducted would engage s 305D(2) . The conclusion reached in paragraph [50] above would also be sufficient to satisfy s 305D(2) .

via

[64] *Amaca Pty Ltd v Booth* (2011) 246 CLR 36, [2011] HCA 53, at [70] ; *Hunt & Hunt Lawyers v Mitchell Morgan Nominees Pty Ltd* (2013) 247 CLR 613, [2013] HCA 10 at [45] ; *Strong v Woolworths Ltd* (2012) 246 CLR 182, [2012] HCA 5, at [26] ; *Prasad v Ingham's Enterprises Pty Ltd* [2016] QCA 147 at [90] .

Berhane v Woolworths Ltd [2017] QCA 166 -
Berhane v Woolworths Ltd [2017] QCA 166 -
David Jones Ltd v BI (Contracting) P/L [2017] SADC 79 (28 July 2017) (Gilchrist J)

57. In *Amaca Pty Ltd v Booth* [11] Heydon J spoke of the evidentiary difficulties confronting a plaintiff in prosecuting a claim for damages in connection with mesothelioma. He made the point that because the disease is often not diagnosed until many years after exposure to asbestos, it can be difficult for a plaintiff to establish that the conduct of a given defendant caused the disease.

David Jones Ltd v BI (Contracting) P/L [2017] SADC 79 -
David Jones Ltd v BI (Contracting) P/L [2017] SADC 79 -
David Jones Ltd v BI (Contracting) P/L [2017] SADC 79 -
Beagle v Australian Capital Territory and Southern New South Wales Rugby Union Limited [2017] ACTCA 29 (21 July 2017) (Murrell CJ, Burns and Collier JJ)

110. In our view, these tests unnecessarily muddy the waters in relation to the issues the Court is required to consider in this matter. A requirement of "effective cause" is routinely implied into contracts appointing real estate agents, in circumstances where a particular outcome contemplated by the contract is achieved (for example, sale of a property) but there is a

dispute as to the causal connection between the outcome and the actions of the agent: see, for example, *LJ Hooker Ltd v WJ Adams Estates Pty Ltd* (1977) 138 CLR 52; *Moneywood Pty Ltd v Salamon Nominees Pty Ltd* [2001] HCA 2; 202 CLR 351; G E Dal Pont, *Law of Agency* (LexisNexis Butterworths, 3rd ed, 2014) [16.2]; Peter Watts, *Bowstead and Reynolds on Agency* (Sweet & Maxwell, 20th ed, 2014) article 57, 320. The authorities also support the implication of such a term into contracts governing other forms of commission agency, for example *White v Munro* [1876] 13 SLR 651 (ship broker); *David Leahy (Aust) Pty Ltd v Macpherson's Ltd* [1991] 2 VR 367 (business broker engaged to acquire companies or businesses); *Castlepines (IBM) Pty Ltd v Residential Housing Corporation Ltd* [2002] NSWSC 232 (agent appointed to market loans on behalf of a finance company) and *Williams v Nicoski* [2003] WASC 131 (cosmetic company consultant); cf *Challenger Group Holdings Ltd v Concept Equity Pty Ltd* [2008] NSWSC 801 (agent appointed to effect business introductions) and *Superyacht Technologies Pty Ltd v Mackeddie Marine Pty Ltd* [2012] QSC 401 (yacht broker). Similarly, the concept of "material contribution" is familiar to negligence claims: see, for example, *Amaca Pty Ltd v Booth* [2011] HCA 53; 246 CLR 36 ; *Chappel v Hart* [1998] HCA 55; 195 CLR 232. His Honour recognised the link in the application of the test to Mr Beagle's contribution to principles in tort: at [162] .

Riverman Orchards Pty Ltd v Hayden [2016] VSC 379 (28 June 2017) (John Dixon J)

224. The basis for the defendant's submission was that two or more possible causes were supported by the evidence and that the cause that he promoted placed fault at the plaintiff's door. I have rejected the defendant's contention that Riverman's management of the Mallee Block caused or exacerbated the damage to the vines. [53] The evidence identified only one possible cause. That one posited cause, the spray drift event, remains does not necessarily elevate it from a possible to a probable factual cause. In *Amaca Pty Ltd v Booth* , [54] the High Court distinguished the factual matrix of *Amaca v Ellis* . French CJ discussed this issue, stating: [55]

> Causation in tort is not established merely because the allegedly tortious act or omission increased a risk of injury. The risk of an occurrence and the cause of the occurrence are quite different things. That proposition is obvious enough and not determinative of these appeals. The existence of an association or a positive statistical correlation between the occurrence of one event and the subsequent occurrence of another may be expressed as a possibility, which may be no greater than a "real chance" that, if the first event occurs, the second event will also occur. The mere existence of such an association or correlation does not justify a statement, relevant to factual causation in law, that the first event "creates" or "gives rise to" or "increases" the probability that the second event will occur. Such a statement contains an assumption that if the second event occurs it will have some causal connection to the first. However, if the association between two events is shown to have a causal explanation, then the conclusion may be open, if the second event should occur, that the first event has been at least a contributing cause of that occurrence. An after-the-event inference of causal connection may be reached on the civil standard of proof, namely, balance of probabilities, notwithstanding that the statistical correlation between the first event and the second event indicated, prospectively, no more than a "mere possibility" or "real chance" that the second event would occur given the first event. There may of course be cases in which the strength of the association, as measured by relative risk ratios, itself supports an inference of a causal connection.
>
> ...
>
> In summary, a finding that a defendant's conduct has increased the risk of injury to the plaintiff must rest upon more than a mere statistical correlation between that kind of conduct and that kind of injury. It requires the existence of a causal connection between the conduct and the injury, albeit other causative factors may be in play... Where the existence of a causal connection is

accepted it can support an inference, in the particular case, when injury has eventuated, that the defendant's conduct was a cause of the injury…In *Betts v Whittingslowe*, Dixon J employed apposite logic when he said:

> "[T]he breach of duty coupled with an accident of the kind that might thereby be caused is enough to justify an inference, in the absence of any sufficient reason to the contrary, that in fact the accident did occur owing to the act or omission amounting to the breach of statutory duty."

That logic encompasses the case of an ex ante probability, of accident given breach, supported by a causal explanation linking breach and accident.

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That logic encompasses the case of an ex ante probability, of accident given breach, supported by a causal explanation linking breach and accident.

via

[54] (2011)246 CLR 36 , 63 [71] (Gummow, Hayne and Crennan JJ) .

Riverman Orchards Pty Ltd v Hayden [2016] VSC 379 -
Riverman Orchards Pty Ltd v Hayden [2017] VSC 379 -
Riverman Orchards Pty Ltd v Hayden [2016] VSC 379 -
Riverman Orchards Pty Ltd v Hayden [2017] VSC 379 -
VWA v O'Brien [2017] VSC 39 -
VWA v O'Brien [2017] VSC 39 -
VWA v O'Brien [2017] VSC 39 -
VWA v O'Brien [2017] VSC 39 -
Australian Securities and Investments Commission v Drake (No 2) [2016] FCA 1552 -
Australian Competition and Consumer Commission v Valve Corporation (No 7) [2016] FCA 1553 -
Victorian WorkCover Authority v C & a Battaglia & Sons Pty Ltd [2016] VCC 1866 (13 December 2016) (Her Honour Judge Morrish)

> Cases Cited: *Victorian WorkCover Authority v Carrier Air Conditioning Pty Ltd* [2006] VSCA 63; *Czatyrko v Edith Cowan University* (2005) 214 ALR 349; *Victorian WorkCover Authority v Stoddart (Vic) Pty Ltd* [2015] VSC 149; *Leighton Contractors Pty Ltd v Fox* (2009) 240 CLR 1; *Wallace v Kam* (2013) 250 CLR 375; *Powney v Kerang and District Health* (2014) 43 VR 506; *Amaca Pty Ltd v Booth* (2011) 246 CLR 36 ; *Stevens v Brodribb Sawmilling Co Pty Ltd* (1986) 160 CLR 16; *Victorian WorkCover Authority v Australian Steel Company (Operations)* Pty Ltd [2015] VSC 58 ; *Evans v R* (2007) 235 CLR 521; *R v Clark* (2001) 123 A Crim R 506; *Ordukaya v Hicks* [2000] NSWCA 180; *R v Lisoff* [1999] NSWCCA 364; *R v Shamouil* (2006) 66 NSWLR 228; *Godrd Elliott (A Firm) v Fritsch* [2012] VSC 87; *Roach & Ors v Page & Ors (No 11)* [2003] NSWSC 907; *TNT Australia Pty Ltd v Christie & Ors* (2003) 65 NSWLR 1

Victorian WorkCover Authority v C & a Battaglia & Sons Pty Ltd [2016] VCC 1866 (13 December 2016) (Her Honour Judge Morrish)

> 474 The parties referred to a number of authorities in support of their respective submissions, not all of which I shall repeat here. [452]

via

[452] *Victorian WorkCover Authority v Carrier Air Conditioning Pty Ltd* [2006] VSCA 63 at paragraph [6] ; *Czatyrko v Edith Cowan University* (2005) 214 ALR 349; *Victorian WorkCover Authority v Stoddart (Vic) Pty Ltd* [2015] VSC 149 at paragraph [98] including footnote 52; *Leighton Contractors Pty Ltd v Fox* (2009) 240 CLR 1 at paragraphs [20]-[21] ; *Wallace v Kam* (2013) 250 CLR 375 at paragraph [16] ; *Powney v Kerang and District Health* (2014) 43 VR 506 at paragraph [104] ; *Amaca Pty Ltd v Booth* (2011) 246 CLR 36 .

Commissioner of the Australian Federal Police v Courtenay Investments Ltd [2016] WASCA 194 -
Commissioner of the Australian Federal Police v Courtenay Investments Ltd [2016] WASCA 194 -
Beaven v Wagner Industrial Services Pty Ltd [2016] QDC 299 -

Hayes v State of Queensland [2016] QCA 191 -
Prasad v Ingham's Enterprises Pty Ltd [2016] QCA 147 (07 June 2016) (Fraser and Philip McMurdo JJA and Boddice J,)

90. To succeed, the appellant had to establish more than the mere existence of an association between the respondent's breach of duty and the occurrence of her condition. As French CJ observed, in *Amaca Pty Ltd v Booth* : [30]

> "The existence of an association or a positive statistical correlation between the occurrence of one event and the subsequent occurrence of another may be expressed as a possibility, which may be no greater than a 'real chance' that, if the first event occurs, the second event will also occur. The mere existence of such an association or correlation does not justify a statement, relevant to factual causation in law, that the first event 'creates' or 'gives rise to' or 'increases' the probability that the second event will occur. Such a statement contains an assumption that if the second event occurs it will have some causal connection to the first. However, if the association between two events is shown to have a causal explanation, then the conclusion may be open, if the second event should occur, that the first event has been at least a contributing cause of that occurrence. An after-the-event inference of causal connection may be reached on the civil standard of proof, namely, balance of probabilities, notwithstanding that the statistical correlation between the first event and the second event indicated, prospectively, no more than a 'mere possibility' or 'real chance' that the second event would occur given the first event."

What must be established is a causal connection between the conduct and the injury, even if it be that other causative factors may be in play. [31] In that event, the question is not what was the most probable cause but whether the respondent's negligence was a cause of the appellant's condition. [32]

via

[32] *Amaca Pty Ltd v Booth* (2011) 246 CLR 36 at 62 – 3 per Gummow, Hayne & Crennan JJ, citing with approval the joint reasons in *Amaca Pty Ltd v Ellis* (2010) 240 CLR 111 at 136 [67] .

Prasad v Ingham's Enterprises Pty Ltd [2016] QCA 147 -
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Prasad v Ingham's Enterprises Pty Ltd [2016] QCA 147 -
Carangelo v State of New South Wales [2016] NSWCA 126 (27 May 2016) (Macfarlan and Gleeson JJA, Emmett AJA)

2. As *Tabet v Gett* [2010] HCA 12; 240 CLR 537 demonstrates, in a tort action for damages arising out of personal injuries, proof that a defendant's negligent conduct has increased the prospect of the plaintiff suffering injury is not, without more, compensable (see also *Amaca Pty Ltd v Booth* [2011] HCA 53; 246 CLR 36 at [41] per French CJ). Rather, as I have indicated, what must be established is that the defendant's conduct was responsible for an adverse difference in the plaintiff's condition and its negligence was "a cause of that difference" (at [66] per Hayne and Bell JJ). Section 5D(2) of the *Civil Liability Act 2002* (NSW) may give rise to exceptions to these propositions but, as Emmett AJA concludes, the subsection is inapplicable in the present case.

Carangelo v State of New South Wales [2016] NSWCA 126 (27 May 2016) (Macfarlan and Gleeson JJA, Emmett AJA)

72. The “but for” criterion of causation can be troublesome in different situations in which multiple acts or events lead to injury of a plaintiff. In such cases, what might be unclear is the extent to which one of those conjunctive causal factors contributes to that state of affairs. It is sufficient for the plaintiff to prove that the negligence of the defendant caused or materially contributed to the injury. For example, where a plaintiff is exposed to quantities of silicon dust produced by various activities, one of which is at the plaintiff's work place, and the other activities are conducted without any breach of duty, the question is not what the most probable source of the plaintiff's disease was. Rather, it is whether dust from the employer's negligent conduct was a cause of the disease, when the medical evidence was that disease can be caused by gradual accumulation of silica particles inhaled over a period of years (*Amaca v Booth* at [70]).

Carangelo v State of New South Wales [2016] NSWCA 126 -
Brown v Hewson [2015] NSWCA 393 -
Alcan Gove Pty Ltd v Zabic [2015] HCA 33 (07 October 2015) (French CJ, Kiefel, Bell, Keane and Nettle JJ)

15. The position in the United Kingdom appears to be similar [20] . In *Barker v Corus UK Ltd* [21] , Lord Hoffmann proposed the view that, given the exception to the ordinary rules of causation in relation to cases of mesothelioma which was recognised in *Fairchild v Glenhaven Funeral Services Ltd* [22] , it would be appropriate henceforth to treat the risk of contracting mesothelioma as forming the gist of the action [23] . But his Lordship's view has since been repudiated by a majority of the Supreme Court of the United Kingdom in *Durham v BAI (Run off) Ltd* [24] . In this country, where the *Fairchild* exception has not to date been recognised [25] , there is still more reason to reject it.

via

[25] See *Amaca Pty Ltd v Booth* (2011) 246 CLR 36 at 58 [52]-[53] per French CJ, 66-67 [80]-[82] per Gummow, Hayne and Crennan JJ; [2011] HCA 53 .

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via

[25] See *Amaca Pty Ltd v Booth* (2011) 246 CLR 36 at 58 [52]-[53] per French CJ, 66-67 [80]-[82] per Gummow, Hayne and Crennan JJ ; [2011] HCA 53 .

Caason Investments Pty Ltd v Cao [2015] FCAFC 94 -
Calvert v Badenach [2015] TASFC 8 (24 July 2015) (Tennent, Porter and Estcourt JJ)

47. In *Langmaid v Dobsons Vegetable Machinery Pty Ltd* [2014] TASFC 6, the court held that the trial judge had not erred by resolving the case on the issue of causation, without making findings about duty and breach. Relying on statements made by Gummow, Hayne and Crennan JJ in *Amaca Pty Ltd v Booth* (2011) 246 CLR 36 at 60 [64] , the court's view was that

there was nothing impermissible in a trial judge making findings of fact first, and considering the legal consequences of those findings to the extent necessary, after those findings had been made; that is, in first making findings of fact about whether there is a causal connection between conduct around which breaches of duty are alleged, and damage, and then going on to consider the legal consequences of those findings to the extent necessary. See the judgment of Blow CJ at [13] and my judgment (with which Pearce J agreed) at [49]. In that paragraph, I went on to say that this would be particularly so where there is no real argument about the existence of the pleaded duties and about breaches of those duties.

May v Military Rehabilitation and Compensation Commission [2015] FCAFC 93 -
May v Military Rehabilitation and Compensation Commission [2015] FCAFC 93 -
Balassone v Victorian YMCA Community Programming Pty Ltd; Victorian WorkCover Authority v Nillumbik Shire Council [2015] VCC 766 (18 June 2015) (Her Honour Judge Morrish)

Cases Cited: *Balassone v Victorian YMCA Community Programming Pty Ltd and Anor and VWA v Nillumbik Shire Council and Anor* (Unreported, County Court of Victoria, Judge Murphy, 30 October 2013); *YMCA v Nillumbik* [2014] VSCA 197; *Podrebersek v Australian Iron & Steel Pty Ltd* (1985) 59 ALJR 492; *Papadopoulos v MC Labour Hire Services Pty Ltd & Anor (No 4)* [2009] VSC 193; *Bevillesta Pty Ltd v Liberty International Insurance Co* [2009] NSWCA 16; *Laresu Pty Ltd v Clark* [2010] NSWCA 180; *Powney v Kerang and District Health* [2014] VSCA 221; *Adeels Palace Pty Ltd v Moubarak* (2009) 239 CLR 420; *Strong v Woolworths Ltd t/a Big W* (2012) 246 CLR 182; *Wallace v Kam* (2013) 250 CLR 375; *Amaca Pty Ltd v Booth* (2011) 246 CLR 36 ; *Browne v Dunn* (1893) 6 R 67; *Chapman v Cole* (2006) 15 VR 150; *Chong & Neale v CC Containers Pty Ltd & Ors* [2015] VSCA 137.

Balassone v Victorian YMCA Community Programming Pty Ltd; Victorian WorkCover Authority v Nillumbik Shire Council [2015] VCC 766 -
Carangelo v State of New South Wales [2015] NSWSC 655 -
Commissioner of the Australian Federal Police v Courtenay Investments Ltd (No 4) [2015] WASC 101 (27 March 2015) (Edelman J)

421. **First**, and fundamentally, the Commissioner's submission fails on the issue of causation. Section 338 requires that the unlawful conduct *causes* or is intended to *cause* a benefit to the value of at least $10,000 for that person or another person. The word 'cause' is not defined. The language is important. Section 338 speaks of conduct that 'causes' or is 'intended to cause' the benefit. It does not speak of conduct that 'causes *or materially contributes*' [275] to the benefit. The language of 'cause' contrasts with the language, elsewhere in that section and in s 329(2) , of 'in connection with' (which language I discuss below).

via

[275] ***Amaca Pty Ltd v Booth*** [2011] HCA 53; (2011) 246 CLR 36, 62 [70] (Gummow, Hayne & Crennan JJ).

Commissioner of the Australian Federal Police v Courtenay Investments Ltd (No 4) [2015] WASC 101 -
BHP Billiton Ltd v Dunning [2015] NSWCA 55 -
Allianz Australia Insurance Ltd v Pomfret [2015] NSWCA 4 -
Allianz Australia Insurance Ltd v Pomfret [2015] NSWCA 4 -
State of Queensland v Munro [2014] QCA 231 -
State of Queensland v Munro [2014] QCA 231 -
Powney v Kerang and District Health [2014] VSCA 221 (11 September 2014) (Osborn and Beach JJA and Forrest AJA)

106. Accordingly, we think it equally as clear that an increase in the relevant risk of injury, particularly if significant, is a relevant consideration for a tribunal of fact as one of the matters to be taken into account in determining if factual causation is made out. In *Booth,* Gummow, Hayne and Crennan JJ said:

> The 'but for' criterion proved to be troublesome in various situations in which multiple acts or events led to the plaintiff's injury, for example where the development of a particular medical condition was a result of multiple conjunctive causal factors. In such cases what may be unclear is the extent to which one of these conjunctive causal factors contributed to that state of affairs. These situations have been addressed by the propositions stated by Lord Watson in *Wakelin v London and South Western Railway Co* that it is sufficient that the plaintiff prove that the negligence of the defendant 'caused or materially contributed to the injury'. [65]

via

[65] Ibid 62 [70] (citations omitted).

Powney v Kerang and District Health [2014] VSCA 221 (11 September 2014) (Osborn and Beach JJA and Forrest AJA)

59. *Bonnington Castings* has been accepted and applied in the United Kingdom and in Australia. [17]

via

[17] See, in Australia for example, *Hunt & Hunt Lawyers v Mitchell Morgan Nominees Pty Ltd* (2013) 247 CLR 613, 635 [45] ; *Amaca Pty Ltd v Booth* (2011) 246 CLR 36, 62 [70] ; *Henville v Walker* (2001) 206 CLR 459, 493 [106] ; *Chappel v Hart* (1998) 195 CLR 232, 244 [27] ; *Bennett v Minister of Community Welfare* (1992) 176 CLR 408, 428.

Powney v Kerang and District Health [2014] VSCA 221 (11 September 2014) (Osborn and Beach JJA and Forrest AJA)

75. We should also mention here that in *Strong* , the High Court considered the application of the factual causation test in circumstances where more than one set of conditions was necessary for the occurrence of the harm. The majority explained that:

> Under the statute, factual causation requires proof that the defendant's negligence was a necessary condition of the occurrence of the particular harm. A necessary condition is a condition that must be present for the occurrence of the harm. However, there may be more than one set of conditions necessary for the occurrence of particular harm and it follows that a defendant's negligent act or omission which is necessary to complete a set of conditions that are jointly sufficient to account for the occurrence of the harm will meet the test of factual causation within s 5D (1)(a) . In such a case, the defendant's conduct may be described as contributing to the occurrence of the harm. [37]

via

[37] (2012) 246 CLR 182, 191-192 [20] (citations omitted). See also *Amaca Pty Ltd v Booth* (2011) 246 CLR 36 .

Powney v Kerang and District Health [2014] VSCA 221 -
Powney v Kerang and District Health [2014] VSCA 221 -

Powney v Kerang and District Health [2014] VSCA 221 -
Powney v Kerang and District Health [2014] VSCA 221 -
Powney v Kerang and District Health [2014] VSCA 221 -
Allianz Australia Insurance Ltd v BlueScope Steel Ltd [2014] NSWCA 276 (21 August 2014) (Basten, Meagher and Ward JJA)

239. Allianz submits that his Honour's finding that Mr Jackson's claim was of no evidentiary value was made absent any foundational evidence; that his Honour mistakenly assumed that causation could only in law be demonstrated where the frequency and/or intensity of asbestos was "significant"; and that his Honour misunderstood the cumulative exposure theory of mesothelioma induction (referring to what was said in *Amaca Pty Ltd v Booth* [2011] HCA 53; (2011) 246 CLR 36 at [18] to [26] and [51] per French CJ).

Amaca Pty Ltd v Tullipan [2014] NSWCA 269 (15 August 2014) (Basten, Gleeson and Leeming JJA)

58. Sixthly, evidence as to the *relative* likelihood that a person who has been exposed to asbestos and who has pulmonary fibrosis diagnosed a decade ago is suffering from asbestosis as opposed to idiopathic pulmonary fibrosis was directly relevant to the question of discharging Mr Tullipan's burden of proof. If the relative risk is sufficiently high, that may of itself support an inference of causal connection: *Amaca Pty Ltd v Booth* [2011] HCA 53; 246 CLR 36 at [43] and [88] .

Langmaid v Dobsons Vegetable Machinery Pty Ltd [2014] TASFC 6 (04 July 2014) (Blow CJ, Porter and Pearce JJ)

49. In terms of the general principle, I agree with Blow CJ that there is nothing impermissible in a trial judge first making findings of fact about whether there is a causal connection between conduct around which breaches of duty are alleged and damage, and going on to consider the legal consequences of those findings to the extent necessary: *Amaca Pty Ltd v Booth* (2011) 246 CLR 36 per Gummow, Hayne and Crennan JJ at 60 [64] . That is particularly so where there is no real argument about the existence of the pleaded duties and about breaches of those duties.

Langmaid v Dobsons Vegetable Machinery Pty Ltd [2014] TASFC 6 (04 July 2014) (Blow CJ, Porter and Pearce JJ)

139. It might be thought that it is unlikely a fire would occur in the circumstances established in this case, but there is a clear distinction between the prospective assessment of a risk of something happening, and the retrospective exercise of making findings of fact about what has happened. In *Amaca Pty Ltd v Booth* (above) French CJ said (omitting references):

> "42 It is necessary, nevertheless, to reflect upon the relationship between risk and causation. In ordinary usage 'risk' refers to a hazard or danger or the chance or hazard of losshttp://www.westlaw.com.au/maf/wlau/app/document?snippets=true&ao=&src=docnav&docguid=Ia1cede2070a511e2a4418afa19371501&srguid=&startChunk=2&endChunk=2&nstid=std-anz-highlight&nsds=AUNZ_AU_COMMWLTHLR&isTocNav=true&tocDs=AUNZ_CASES_TOC&searchInDoc=&details=most&originates-from-link-before=false - FTN.11. Assessment of the risk of an occurrence is prospective in character. It can be expressed as an ex ante probability that the occurrence will occur. If quantifiable, that probability may be expressed numerically as a figure greater than 'zero' up to 'one' which denotes certainty. The range of probabilities may be traversed by terms such as 'mere possibility', 'real chance', 'more likely than not', 'highly likely' and, ultimately, 'certainty'.
>
> 43 The existence of an association or a positive statistical correlation between the occurrence of one event and the subsequent occurrence of another may be

> expressed as a possibility, which may be no greater than a 'real chance' that, if the first event occurs, the second event will also occur. The mere existence of such an association or correlation does not justify a statement, relevant to factual causation in law, that the first event 'creates' or 'gives rise to' or 'increases' the probability that the second event will occur. Such a statement contains an assumption that if the second event occurs it will have some causal connection to the first. However, if the association between two events is shown to have a causal explanation, then the conclusion may be open, if the second event should occur, that the first event has been at least a contributing cause of that occurrence. An after-the-event inference of causal connection may be reached on the civil standard of proof, namely, balance of probabilities, notwithstanding that the statistical correlation between the first event and the second event indicated, prospectively, no more than a 'mere possibility' or 'real chance' that the second event would occur given the first event. There may of course be cases in which the strength of the association, as measured by relative risk ratios, itself supports an inference of a causal connection."

Langmaid v Dobsons Vegetable Machinery Pty Ltd [2014] TASFC 6 (04 July 2014) (Blow CJ, Porter and Pearce JJ)

13. So far as the appellants' claims for damages for breach of statutory duty and negligence are concerned, the position is different. In my view there is nothing impermissible in a trial judge making findings of fact first, and considering the legal consequences of those findings, to the extent necessary, after those findings have been made. Thus, in *Amaca Pty Ltd v Booth* (2011) 246 CLR 36, a case about liability for damages for negligence, Gummow, Hayne and Crennan JJ said at [64] :

> "... as Windeyer J observed in *The National Insurance Co of New Zealand Ltd v Espagne* the notion of cause and consequence 'is a necessary element in law, especially in the law of crime and tort'. Two issues commonly arise: first, the identification of the cause or causes of a particular occurrence or state of affairs; and, secondly, whether a legal right or liability is engendered by any one or more of those outcomes." [Footnotes omitted.]

Langmaid v Dobsons Vegetable Machinery Pty Ltd [2014] TASFC 6 -
Langmaid v Dobsons Vegetable Machinery Pty Ltd [2014] TASFC 6 -
Langmaid v Dobsons Vegetable Machinery Pty Ltd [2014] TASFC 6 -
Agricultural Land Management Ltd v Jackson (No 2) [2014] WASC 102 -
Agricultural Land Management Ltd v Jackson (No 2) [2014] WASC 102 -
Transport Accident Commission v Florrimell [2013] VSCA 247 -
BHP Billiton Ltd v Hamilton [2013] SASCFC 75 (15 August 2013) (Kourakis CJ; Blue and Stanley JJ)

310. I do not accept that the evidence of Mr Rogers contradicts his opinion. In my view, it was beyond the expertise of Mr Rogers, as an occupational hygienist, to contradict Professor Henderson's evidence on this topic. Mr Rogers' evidence amounted to a retrospective estimate of the relative exposure of the deceased to asbestos fibres in the course of his work in Scotland and in Whyalla. The analysis involved various assumptions about exposure frequency and duration which rendered the evidence problematic. Like the judge, I harbour real reservations as to the confidence the finder of fact could have in relation to the accuracy of this analysis. In any event, I am not satisfied that it provides a basis upon which this Court should find that the judge was in error in failing to find that the extent of the Scottish exposure was so great that the Court should dismiss as insignificant the proposition that the negligent Whyalla exposure, could not have contributed to the development of the deceased' s mesothelioma. After all, as Heydon J observed in *Amaca Pty Ltd v Booth* [203] mesothelioma can be caused by very brief intense exposures. This observation is in accord with the evidence at trial of Professor Henderson. [204]

via

[203] (2011) 246 CLR 36 at 191.

BHP Billiton Ltd v Hamilton [2013] SASCFC 75 (15 August 2013) (Kourakis CJ; Blue and Stanley JJ)

194. The Act was enacted against a background where it was a matter of notoriety that plaintiffs who were the victims of asbestos related disease, with its long latency period, confronted significant forensic hurdles in proving a cause of action in negligence or breach of statutory duty in respect of events which mostly had occurred three or four decades earlier. The purpose of s 8 is to overcome some of those forensic hurdles. As Heydon J observed in *Amaca Pty Ltd v Booth:* [136]

> Mesothelioma is a painful illness leading to death. It is a cancer of the lining of the lung. It is very commonly caused by inhaling asbestos fibres, though perhaps not always. It can be caused by very brief intense exposures whether occupational, domestic or recreational, and by lower-level environmental exposures – sometimes after exposures which are very short – a day – or very slight. On the other hand, many people can have heavy and sustained exposures to even the most dangerous types of asbestos without suffering the disease. This phenomenon, like much else about the disease, is something which scientists have found difficult to explain. The disease has a latency period of at least 10 years, and sometimes much longer – as long as 75 years. The disease is often not diagnosed until many years after exposure to asbestos. It is therefore difficult for plaintiffs suffering from mesothelioma to establish the facts necessary for success in negligence actions. In particular it can be difficult for them to establish that the conduct of a given defendant caused the disease. A related difficulty for plaintiffs springs from the fact that the earlier the exposure the greater the chance that it could cause harm. Because of the valuable characteristics of asbestos, particularly its capacity to retard fires, it has been commonly used until quite recently. The extent of exposure to asbestos amongst those now living, the likely exposure amongst those yet to be born, and the likelihood of further injury taking place when asbestos is removed from the many places where it is now found, mean that problems of the kind thrown up in these appeals will remain for decades to come. Perhaps a social-medical problem of this size requires a legislative solution. In some places solutions have been sought in judicial or legislative changes to the law relating to causation.

via

[136] (2011) 246 CLR 36 at 191-192 .

BHP Billiton Ltd v Hamilton [2013] SASCFC 75 (15 August 2013) (Kourakis CJ; Blue and Stanley JJ)

61. At common law, establishing merely that it is *possible* that the defendant's conduct was a cause of (or materially contributed to) the disease or injury is insufficient: it must be proved in accordance with the civil onus that it is probable that the defendant's conduct was a cause of (or materially contributed to) the plaintiff's disease or illness. [31] There is also a distinction between a mere prospective risk that the defendant's conduct might cause injury to the plaintiff and the possibility or probability that the defendant's conduct assessed in retrospect did in fact cause the injury suffered by the plaintiff. [32] This is not to say that, as an evidentiary matter, proof of risk of injury coupled with other circumstances may not be sufficient to prove causation on the balance of probabilities. [33]

via

[33] *Betts v Whittingslowe* (1945) 71 CLR 637 at 649 per Dixon J; *Amaca Pty Ltd v Booth* (2011) 246 CLR 36 at [42]-[50] per French CJ .

BHP Billiton Ltd v Hamilton [2013] SASCFC 75 (15 August 2013) (Kourakis CJ; Blue and Stanley JJ)

64. The effect of the statutory presumption is to translate a mere possibility (that the exposure might have caused or contributed to the plaintiff's dust disease) into an actuality or finding [34] (that the exposure did cause or contribute to the plaintiff's dust disease). The statutory presumption overcomes the type of problem faced by a plaintiff such as that faced in *Amaca Pty Ltd v Ellis* [35] in which the plaintiff can only prove the possibility, but not the probability, that the exposure resulting from the defendant's negligence caused or contributed to the plaintiff's dust disease. The reference to "the exposure" when used in the second pre-condition in paragraph (b) and the operational presumption in the body of the subsection is to whatever exposure is established as having possibly caused or contributed to the disease.

via

[34] Compare the analysis of legal certainty derived from an assessment of probabilities in *Bank of New South Wales v Commonwealth* (1948) 76 CLR 1 at 340 per Dixon J; *Amaca Pty Ltd v Ellis* (2010) 240 CLR 111 at [6] per French CJ, Gummow, Hayne, Heydon, Crennan, Kiefel and Bell JJ and *Amaca Pty Ltd v Booth* (2011) 246 CLR 36 at [72] per Gummow , Hayne and Crennan JJ.

BHP Billiton Ltd v Hamilton [2013] SASCFC 75 (15 August 2013) (Kourakis CJ; Blue and Stanley JJ)

216. The first reference to "the exposure" is in s 8(1)(b) . That provision imposes the second of the two evidentiary conditions which must be established for the operation of the statutory presumption. "The exposure" referred to therein is the exposure to asbestos dust experienced by the injured person which might have caused or contributed to the dust disease from which the injured person suffers or suffered. The legislature, in imposing this test, plainly had in contemplation that not every exposure might cause or contribute to that dust disease. On the other hand, the terms of the provision in s 8(1) that predicate the operation of the statutory presumption on exposure that "might have caused or contributed to the disease" suggests that the evidentiary condition which the plaintiff in a dust diseases action must satisfy, is evidence that the relevant exposure created the possibility of the injured person contracting the dust disease from which he or she suffers or suffered. Proof that the exposure to asbestos dust created the possibility of suffering a dust disease, to my mind, means that the exposure "might have" caused or contributed to that disease. The concept of exposure that might have caused or contributed to the disease connotes something contingent or possible. If the exposure has created or given rise to a possibility of a person suffering a disease, the exposure might have caused or contributed to the disease, unless the exposure was so insignificant in a causative sense as to be disregarded on the *de mi nimus* principle. That is the meaning which I would attribute to the concept of exposure to asbestos dust which might have caused or contributed to the injured person's dust disease. The statutory presumption relieves the plaintiff from proving that the exposure actually caused or contributed to the injured person suffering asbestos disease. As French CJ observed in *Amaca Pty Ltd v Booth* [149] causation in tort is not established merely because the alleged tortious act or omission increased the risk of injury. The risk of an occurrence and the cause of the occurrence are quite different things. That proposition highlights the work that is performed by the specified condition which enlivens the presumption. It is sufficient for the presumption to operate for the plaintiff merely to prove that the exposure created or gave rise to a possibility of the injured person suffering dust disease rather than proof of actual causation. So much is obvious because if proof of actual causation was required it would negate the presumption of causation which is the purpose of s 8(1) .

via

[149] (2011) 246 CLR 36 at 182.

BHP Billiton Ltd v Hamilton [2013] SASCFC 75 (15 August 2013) (Kourakis CJ; Blue and Stanley JJ)

92. French CJ said:

> It is enough for present purposes to say that an inference of factual causation, as against both Amaca and Amaba, was open on the evidence before the primary judge. The cumulative effect mechanism involving all asbestos exposure in causal contribution to the ultimate development of a mesothelioma had been propounded and was accepted by his Honour. It depended upon an understanding of physiological mechanisms. It did not depend upon the epidemiology. Whether or not medical science in the future vindicates or undermines that theory, is not to the point. That is not a question which can be agitated on these appeals. The cumulative effect mechanism, accepted by his Honour, implicated the products of both Amaca and Amaba in the development of Mr Booth's disease. The primary judge's interpretation of the expert evidence and his conclusions from it, were open as a matter of law. [51]

and Gummow, Hayne and Crennan JJ said:

> The "but for" criterion of causation proved to be troublesome in various situations in which multiple acts or events led to the plaintiff's injury, for example, where the development of a particular medical condition was the result of multiple conjunctive causal factors. In such cases what may be unclear is the extent to which one of these conjunctive causal factors contributed to that state of affairs. These situations have been addressed by the proposition stated by Lord Watson in *Wakelin v London & South Western Railway Co* that it is sufficient that the plaintiff prove that the negligence of the defendant "caused or materially contributed to the injury". In that regard, reference may be made to the well-known passage in the speech of Lord Reid in *Bonn ington Castings Ltd v Wardlaw* . Of that case it was said in the joint reasons in *Amaca Pty Ltd v Ellis* :
>
> "The issue in *Bonnington Castings* was whether exposure to silica dust from poorly maintained equipment caused or contributed to the pursuer's pneumoconiosis, when other (and much larger) quantities of silica dust were produced by other activities at the pursuer's workplace. Those other activities were conducted without breach of duty. As Lord Reid rightly pointed out, the question in the case was not what was the most probable source of the pursuer's disease: dust from one source or the other. The question was whether dust from the poorly maintained equipment was *a* cause of his disease when the medical evidence was that pneumoconiosis is caused by a gradual accumulation of silica particles inhaled over a period of years."
>
> ...
>
> Mr Booth developed his case in the following steps: (1) he had contracted mesothelioma; (2) the only known cause of that disease is exposure to asbestos; (3) the expert evidence at trial, accepted by the primary judge, was that: (a) exposure to asbestos contributes to the disease; and (b) the prospective risk of contracting the disease increases with the period of significant exposure; (4) Mr Booth had two periods of significant exposure; (5) it is more probable than not that each period of exposure made a material contribution to bodily processes which progressed to the development of the disease.
>
> ...
>
> It was open to the primary judge to decide that he was "not persuaded that the epidemiological evidence specific to automotive mechanics is adverse to the submission that causation has been proved in this particular case".
>
> The Court of Appeal, with respect, correctly concluded:
>
> "Findings as to the cumulative effect of exposure to asbestos were undoubtedly open. [Mr Booth's] witnesses, including Professor Henderson and Dr Leigh, sought to reconcile that approach with the epidemiology which suggested there was no increased risk in the case of brake mechanics. It was open to his Honour to accept their evidence, as he did. The underlying proposition put forward by the appellants, that the epidemiology was

conclusive, in accordance with the principles applicable to such evidence, did not give rise to a question of law, but to a question of fact, which his Honour resolved against the appellants." [52]

[citations omitted]

Other issues

via

[51] Ibid at [51] per CJ .

BHP Billiton Ltd v Hamilton [2013] SASCFC 75 -
BHP Billiton Ltd v Hamilton [2013] SASCFC 75 -
BHP Billiton Ltd v Hamilton [2013] SASCFC 75 -
BHP Billiton Ltd v Hamilton [2013] SASCFC 75 -
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BHP Billiton Ltd v Hamilton [2013] SASCFC 75 -
BHP Billiton Ltd v Hamilton [2013] SASCFC 75 -
BHP Billiton Ltd v Hamilton [2013] SASCFC 75 -
Cross v Moreton Bay Regional Council [2013] QSC 215 (30 July 2013) (Jackson J)

121. *AMACA* dealt with the subject of causation of the disease of mesothelioma and was principally concerned with difficulties created by the limits of medical science, including the science of epidemiology, in that context. It does not detract from Kiefel J's reasoning set out above. More than that, the plurality reasons included:

> "In such cases what may be unclear is the extent to which one of these conjunctive causal factors contributed to that state of affairs. These situations have been addressed by the proposition... that it is sufficient that the plaintiff prove that the negligence of the defendant 'caused or materially contributed to the injury'." [46] (citations omitted)

Cross v Moreton Bay Regional Council [2013] QSC 215 -
Cross v Moreton Bay Regional Council [2013] QSC 215 -
Cross v Moreton Bay Regional Council [2013] QSC 215 -
Cross v Moreton Bay Regional Council [2013] QSC 215 -
Shoalhaven City Council v Pender [2013] NSWCA 210 (10 July 2013) (McColl, Barrett and Ward JJA)

203. In *Garzo* , at [170] , Tobias AJA said:

> ... it was necessary to consider first, what the position would have been had the respondents not been negligent in the relevant respect and, secondly, whether in that event the slip would have been prevented or not occurred. That was the position under the common law: *Brady v Girvan Bros Pty Ltd* (1986) 7 NSWLR 241 at 248, 249, 256 ; *March v Stramare* [1991] HCA 12; (1991) 171 CLR 506 at 514 ; *Amaca Pty Ltd v Booth* [2011] HCA 53; 86 ALJR 172 at [47] ; and remains the position under ss 5D and 5E of the CL Act: *Harris v Woolworths Ltd* [2010] NSWCA 312 at [34] .

Van Soest v BHP Billiton Limited [2013] SADC 81 (17 June 2013) (Parsons J)

686. As to whether the "but for" test is appropriate in this context the plaintiff relied on *AMACA Pty Limited (Under NSW Administered Winding Up) v Booth & Another and AMABA Pty Limited (Under NSW Administered Winding Up) v Booth & Another*: [473]

"The 'but for' criterion of causation proved to be troublesome in various situations in which multiple acts or events led to the plaintiff's injury, for example, where the development of a particular medical condition was the result of multiple conjunctive causal factors. In such cases what may be unclear is the extent to which one of these conjunctive causal factors contributed to that state of affairs. These situations have been addressed by the proposition stated by Lord Watson in *Wakelin v London & South Western Railway Co* that it is sufficient that the plaintiff prove that the negligence of the defendant 'caused or materially contributed to the injury'. In that regard, reference may be made to the well-known passage in the speech of Lord Reid in *Bonnington Castings Ltd v Wardlaw*. ..." (Citations omitted).

via

[473] [2011] 246 CLR 36 Gummow, Hayne and Crennan JJ at 62

Van Soest v BHP Billiton Limited [2013] SADC 81 -
Van Soest v BHP Billiton Limited [2013] SADC 81 -
Van Soest v BHP Billiton Limited [2013] SADC 81 -
King v Western Sydney Local Health Network [2013] NSWCA 162 -
Langmaid v Dobsons Vegetable Machinery Pty Ltd [2013] TASSC 23 -
Langmaid v Dobsons Vegetable Machinery Pty Ltd [2013] TASSC 23 -
Director of Public Prosecutions v Mathew Batich and County Court of Victoria and Second respondent [2013] VSCA 53 (20 March 2013) (Warren CJ, Redlich and Whelan JJA)

60. As this court has observed in the past, [48] there are times where a respondent should not carry the burden where a State authority seeks to clarify legislation. Given the way the application proceeded, we consider this to be one such case.

via

[48] See, eg, *Secretary to the Department of Justice v LMB; Secretary to the Department if Justice v PMY* [2012] VSCA 143 and *Secretary to the Department of Justice v XQH* [2012] VSCA 72 [14]-[15] citing examples from the High Court in *Maurice Blackburn Cashman v Brown* (2011) 242 CLR 647 [43]; *Amaca Pty Ltd v Booth* 283 ALR 461, [150] ; *Australian Crime Commission v Stoddart* [2011] HCA 47 [42] ; *Minister for Immigration and Citizenship v SZGUR* (2011) 241 CLR 594 [45].

CSR Timber Products Pty Ltd v Weathertex Pty Ltd [2013] NSWCA 49 (11 March 2013) (Bathurst CJ, Meagher and Hoeben JJA)

28. I do not understand Weathertex to allege that it is entitled to a more limited indemnity under s 151Z(1)(d) on the basis that the worker was entitled independently of the Act to take proceedings against it and CSR to recover damages so that the provisions of s 151Z(2) might apply. Weathertex and CSR would each be liable to the worker if both negligently exposed him to conditions which materially contributed to the carcinoma. In those circumstances each would be liable for the worker's loss subject to the application to one or both of them of the modified damages regime in Division 3 in Part 5 of the 1987 Act: *Grant v Sun Shipping Co Ltd* [1948] AC 549 at 563 ; *Dingle v Associated Newspapers Ltd* [1961] 2 QB 162 at 188-189 ; *Thompso n v Australian Capital Television Pty Ltd* [1996] HCA 38; 186 CLR 574 at 600 ; *Elayoubi bhnf Kolled v Zipser* [2008] NSWCA 335 at [57] ; *Gett v Tabet* [2009] NSWCA 76; 254 ALR 504 at [367] ; *Sienki ewicz v Greif (UK) Ltd* [2011] 2 WLR 523 at [90] ; *Amaca Pty Ltd v Booth* [2011] HCA 53; 86 ALJR 172 at [70] ; *Strong v Woolworths* [2012] HCA 5; 86 ALJR 267 at [26] ; *Allianz Australia Ltd v Sim* [2 012] NSWCA 68 at [41]-[43], [49] . The carcinoma contracted by the worker is an "indivisible" disease as that expression is used in this context, because once contracted its severity is not affected by the quantity of wood dust that has been or continues to be inhaled or ingested.

BGC Residential Pty Ltd v Fairwater Pty Ltd [2012] WASCA 268 (18 December 2012) (Pullin JA, Newnes JA, Murphy JA)

> 51. The proper inference to be drawn on the balance of probabilities depends, as has been said above, upon a commonsense assessment of all relevant evidence, although the justification for that approach has lost some of its force for the reasons given by the plurality in ***Booth*** [67] . In many cases in place of the 'rough and ready answers of the practical man' an 'exact and reasoned solution' is now required. This is so in cases where the wealth of knowledge of science may provide such an exact and reasoned solution to a causation issue: ***Booth*** [68] . However, the plurality in ***Booth*** accepted [69] that there will still be cases (and this is one such case) where 'other disciplines' cannot give any conclusive answer, in which case a commonsense assessment of the evidence is the only method which can be used to reach a conclusion about whether a breach of contract has caused the claimed damage. The question to be asked is whether it is possible to infer, on the balance of probabilities and applying a commonsense approach, that but for the breach the damage would not have occurred.

BGC Residential Pty Ltd v Fairwater Pty Ltd [2012] WASCA 268 (18 December 2012) (Pullin JA, Newnes JA, Murphy JA)

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> Amaca Pty Ltd v Booth [2011] HCA 53

Azar v Kathirgamalingan [2012] NSWCA 429 (18 December 2012) (McColl, Basten and Campbell JJA)

> 127. The Appellant submits, in reliance upon ***Amaca Pty Ltd (Under NSW Administered Winding Up) v Booth*** [2011] HCA 53; (2011) 86 ALJR 172 that *"subject to section 5D of the Civil Liability Act t he primary judge ought to have asked and answered the common law test of causation namely whether the defendant's negligence 'caused or materially contributed to the injury'."* I do not accept that submission. As Gummow, Hayne and Crennan JJ noted in ***Amaca v Booth*** at [58] , the provisions of ss 5D and 5E ***Civil Liability Act*** did not apply to the proceedings that they were considering.

BGC Residential Pty Ltd v Fairwater Pty Ltd [2012] WASCA 268 -
BGC Residential Pty Ltd v Fairwater Pty Ltd [2012] WASCA 268 -
Fraser (nee Butcher) v Burswood Resort (Management) Ltd [2012] WADC 175 -
Azar v Kathirgamalingan [2012] NSWCA 429 -
BGC Residential Pty Ltd v Fairwater Pty Ltd [2012] WASCA 268 -
BGC Residential Pty Ltd v Fairwater Pty Ltd [2012] WASCA 268 -
Secretary, Department of Justice v LMB; Secretary, Department of Justice v PMY [2012] VSCA 143 -

Leheste v The Minister for Health [2012] WADC 92 (20 June 2012) (Commissioner Gething)

> The plaintiff also relied on the following passage from the decision of French CJ in ***Amaca Pty Ltd (under NSW administered winding up) v Booth; Amaba Pty Ltd (under NSW administered winding up) v Booth*** [2011] HCA 53 [43] :

Leheste v The Minister for Health [2012] WADC 92 -
Garzo v Liverpool/Campbelltown Christian School [2012] NSWCA 151 (25 May 2012) (Basten and Meagher JJA, Tobias AJA)

> 170. Section 5D(1)(a) required proof that "*but for*" the respondents' negligence the appellant would not have slipped and fallen suffering the injuries that she did: *Strong v Woolworths Ltd* [2012] HCA 5; 86 ALJR 267 at [18], [44] . In order to address that question it was necessary to consider first, what the position would have been had the respondents not been negligent in the relevant respect and, secondly, whether in that event the slip would have been prevented or not occurred. That was the position under the common law: *Brady v Girvan Bros Pty Ltd* (19 86) 7 NSWLR 241 at 248, 249, 256 ; *March v Stramare* [1991] HCA 12; (1991) 171 CLR 506 at 514 ; *Am aca Pty Ltd v Booth* [2011] HCA 53; 86 ALJR 172 at [47] ; and remains the position under ss 5D and 5E of the *CL Act* : *Harris v Woolworths Ltd* [2010] NSWCA 312 at [34] .

Secretary to the Department of Justice v XQH [2012] VSCA 72 -
Allianz Australia Ltd v Sim [2012] NSWCA 68 (04 April 2012) (Allsop P, Basten and Meagher JJA)

> 42. Of course, Mason CJ recognised (at 514 [16]) the often important place of the but for test in causal analysis, but (at 514-515 [16]-[19]) his Honour also discussed its deficiencies in certain kinds of circumstances, in particular where there are conjunctive causal factors. This refusal to accept that proof that the damage would not have occurred but for the defendant's negligent act as always essential was recognised by Gummow J, Hayne J and Crennan J in *Am aca v Booth* at 480 [70] . See also *Amaca v King* at [123] .

Allianz Australia Ltd v Sim [2012] NSWCA 68 (04 April 2012) (Allsop P, Basten and Meagher JJA)

> 100. In *Amaca v Booth* , the question was whether Mr Booth had established that his malignant pleural mesothelioma was caused by his exposure to asbestos in working on brake linings over a period of 30 years, and involving two separate defendants. After noting the distinction between a predictive assessment of risk and a retrospective assessment of causation, French CJ stated at [43] :
>
> > "The existence of an association or a positive statistical correlation between the occurrence of one event and the subsequent occurrence of another may be expressed as a possibility, which may be no greater than a 'real chance' that, if the first event occurs, the second event will also occur. The mere existence of such an association or correlation does not justify a statement, relevant to factual causation in law, that the first event 'creates' or 'gives rise to' or 'increases' the probability that the second event will occur. Such a statement contains an assumption that if the second event occurs it will have some causal connection to the first. However, if the association between two events is shown to have a causal explanation, then the conclusion may be open, if the second event should occur, that the first event has been at least a contributing cause of that occurrence."

Allianz Australia Ltd v Sim [2012] NSWCA 68 -
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Allianz Australia Ltd v Sim [2012] NSWCA 68 -
Coote v Dr Kelly [2012] NSWSC 219 -
Strong v Woolworths Ltd [2012] HCA 5 -
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Hamilton v BHP Billiton Ltd [2012] SADC 25 (29 February 2012) (McCusker J)

345. If for any reason the presumption does not operate as I have indicated then the matter is one of causation in ordinary terms. The decision of *Amaca Pty Ltd v Booth* [865] is of guidance in the appropriate approach to be taken. The plaintiff's case in *Booth* relied on the evidence from Professor Henderson. His evidence there was in the same general terms the "cumulative effect" explanation of causation. That evidence was that the effect of all significant asbestos exposures were causative. [866] He gave evidence that the more fibres inhaled the greater number of fibres that would interact with the mesothelial cells which themselves underwent proliferation and so progressively, with increasing number of mesothelial cells interacting with increasing numbers of fibres, until the ultimate development of mesothelioma. This was the result of the number of fibres inter-reacting over multiple periods of time and probably over multiple different generations of mesothelial cells. It was this process that was causative and involved all accumulative exposure to asbestos fibres, other than trivial exposures, occurring in the requisite latency period contributing to the disease. [867]

via

[865] [2011] HCA 53

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Hamilton v BHP Billiton Ltd [2012] SADC 25 -
Amaca Pty Ltd v King [2011] VSCA 447 (22 December 2011) (Nettle, Ashley and Redlich JJA)

127. Nonetheless, it is a mistake to think that risk is irrelevant to proof of causation. Thus, French CJ said this in *Booth* :

> It is necessary, nevertheless, to reflect upon the relationship between risk and causation. In ordinary usage 'risk' refers to a hazard or danger or the chance or

> hazard of loss. Assessment of the risk of an occurrence is prospective in character. It can be expressed as an ex ante probability that the occurrence will occur. If quantifiable, that probability may be expressed numerically as a figure greater than 'zero' up to 'one' which denotes certainty. The range of probabilities may be traversed by terms such as 'mere possibility', 'real chance', 'more likely than not', 'highly likely' and, ultimately, 'certainty'.
>
> The existence of an association or a positive statistical correlation between the occurrence of one event and the subsequent occurrence of another may be expressed as a possibility, which may be no greater than a 'real chance' that, if the first event occurs, the second event will also occur. The mere existence of such an association or correlation does not justify a statement, relevant to factual causation in law, that the first event 'creates' or 'gives rise to' or 'increases' the probability that the second event will occur. Such a statement contains an assumption that if the second event occurs it will have some causal connection to the first. However, if the association between two events is shown to have a causal explanation, then the conclusion may be open, if the second event should occur, that the first event has been at least a contributing cause of that occurrence. An after-the-event inference of causal connection may be reached on the civil standard of proof, namely, balance of probabilities, notwithstanding that the statistical correlation between the first event and the second event indicated, prospectively, no more than a 'mere possibility' or 'real chance' that the second event would occur given the first event. There may of course be cases in which the strength of the association, as measured by relative risk ratios, itself supports an inference of a causal connection. [54]

and

> In summary, a finding that a defendant's conduct has increased the risk of injury to the plaintiff must rest upon more than a mere statistical correlation between that kind of conduct and that kind of injury. It requires the existence of a causal connection between the conduct and the injury, albeit other causative factors may be in play. As demonstrated by medical evidence in this case and in particular by Professor Henderson's evidence, a causal connection may be inferred by somebody expert in the relevant field considering the nature and incidents of the correlation. The Bradford Hill criteria provide a guide to the kind of considerations that lead to an inference of causal connection. As noted above, they may include reference to relative risk ratio as an indicator of the strength of the association. Where the existence of a causal connection is accepted it can support an inference, in the particular case, when injury has eventuated, that the defendant's conduct was a cause of the injury. Professor Henderson offered that inference of specific causation by reference to Mr Booth's exposure to the products of both Amaca and Amaba. Where such an inference is drawn, the probability that it is correct is not to be determined only by reference to epidemiologically based ex ante probabilities. In *Betts v Whittingslowe*, Dixon J employed apposite logic when he said:
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> > "the breach of duty coupled with an accident of the kind *that might thereby be caused* is enough to justify an inference, in the absence of any sufficient reason to the contrary, that in fact the accident did occur owing to the act or omission amounting to the breach of statutory duty." (emphasis added) [55]

via

[55] Ibid [49] (citations omitted).

85. In *Amaca Pty Limited (under NSW Administered Winding up) & anor v Booth* ,[35] Gummow, Hayne and Crennan JJ said that –

> For a long period, matters of cause and consequence were said to be questions of fact for decision by the jury...hence the attraction in saying that questions of cause and consequence are to be decided by the jury applying 'common sense' to the facts of each particular case. The invocation of the 'common sense' of the jury discredited judicial directions containing theoretical analysis and exposition. [36]
>
> ...
>
> Further, the absolute defence of contributory negligence, as Mason CJ put it in *March v Stramare (E & M H) Pty Ltd*, provided a fertile source of confusion in the development of the common law. His Honour added:
>
> > "The existence of the defence, as well as the absence of any mechanism for apportionment of liability as between a plaintiff guilty of contributory negligence and a defendant and as between codefendants who were concurrent tortfeasors, was a potent factor in inducing courts to embrace a view of causation which assigned occurrences to a single cause. So long as contributory negligence remained a defence, the adoption of this approach was more likely to produce just results." [37]
>
> and
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> ...this reasoning has lost some of its force with the decline in many jurisdictions in the trial by jury of civil actions, and the removal of contributory negligence as an absolute defence. Further, many issues of causation, including those recently considered in *Lithgow City Council v Jackson* and those which arise on the present appeals, lie outside the realm of common knowledge and experience. They fall to be determined by reference to expert evidence, for example, medical evidence. [38]
>
> and
>
> Even if the issue is one to which other disciplines may not be able to give any conclusive answer, questions of causation, as a step in the ascertainment of rights and the attribution of liability in law, call for sufficient reduction to certainty to satisfy the relevant burden of proof for the attribution of liability. In *Tubemakers of Australia Ltd v Fernandez*, Mason J, with the concurrence of Barwick CJ and Gibbs J, referred to a statement by Dixon J as elaborating the general onus which lies upon the plaintiff where the issue of causation lies outside the realm of common knowledge and experience. In *Adel aide Stevedoring Co Ltd v Forst*, Dixon J said:
>
> > "I think that upon a question of fact of a medical or scientific description a court can only say that the burden of proof has not been discharged where, upon the evidence, it appears that the *pres ent state of knowledge* does not admit of an affirmative answer and that competent and trustworthy expert opinion regards an affirmative answer as lacking justification, *either as a probable inference or as an accepted hypothesis*." (emphasis added) [39]
>
> The 'but for' criterion of causation proved to be troublesome in various situations in which multiple acts or events led to the plaintiff's injury, for example, where the development of a particular medical condition was the

result of multiple conjunctive causal factors. *In such cases what may be unclear is the extent to which one of these conjunctive causal factors contributed to that state of affairs.* These situations have been addressed by the proposition stated by Lord Watson in *Wakelin v London and South Western Railway Co* that it is sufficient that the plaintiff prove that the negligence of the defendant 'caused or materially contributed to the injury'. In that regard, reference may be made to the wellknown passage in the speech of Lord Reid in *Bonnington Castings Ltd v Wardlaw*. Of that case it was said in the joint reasons in *Amaca Pty Ltd v Ellis*:

> "The issue in *Bonnington Castings* was whether exposure to silica dust from poorly maintained equipment caused or contributed to the pursuer's pneumoconiosis, when other (and much larger) quantities of silica dust were produced by other activities at the pursuer's workplace. Those other activities were conducted without breach of duty. As Lord Reid rightly pointed out, the question in the case was not what was the most probable source of the pursuer's disease: dust from one source or the other. The question was whether dust from the poorly maintained equipment was *a cause* of his disease when the medical evidence was that pneumoconiosis is caused by a gradual accumulation of silica particles inhaled over a period of years." (emphasis in original) [40]

via

[38] Ibid [67] (citations omitted).

Amaca Pty Ltd v King [2011] VSCA 447 (22 December 2011) (Nettle, Ashley and Redlich JJA)

172. *Ellis* involved a claim for damages in respect of lung cancer. The plaintiff sought to implicate asbestos exposure as a cause of his disease. His claim failed in the High Court. In *Booth* , French CJ and the plurality explained why *Ellis* was not in point. [62] The same distinguishing circumstances are present in this case.

Amaca Pty Ltd v King [2011] VSCA 447 (22 December 2011) (Nettle, Ashley and Redlich JJA)

123. There are problems with the 'but for' test both as a test of inclusion and exclusion. The limitations of the test in cases of 'conjunctive causal factors' were described in *March v Stramare (E&MH) Pty Ltd*. [51] In *Booth* , it was said by the plurality, in the passage cited at [85] above, that those cases have been addressed by resort to the concept of material contribution. The judgment of French CJ [52] describes, consistently with the judgment of the plurality, the way in which the 'but for' test has a certain application in cases of concurrent or successive tortious acts.

via

[52] *Amaca & Anor v Booth & Anor* [2011] HCA 53, [47]–[48] .

Amaca Pty Ltd v King [2011] VSCA 447 (22 December 2011) (Nettle, Ashley and Redlich JJA)

114. Sixth, the submission that the opinion was outside the revealed expertise of the two witnesses because neither they – nor anyone else in the medical profession, it seems – can describe the exact process by which asbestos fibres interact with mesothelial cells to produce

mesothelioma does not mean that, with their very great knowledge of the subject, they were disqualified from offering an opinion as to causation based upon their hypotheses as to the mechanism involved. Each of the witnesses, as well as Professor Douglas Henderson, gave opinion evidence as to causation in *Booth* . [48] It seems not to have been doubted that all of them were qualified to do so.

via

[48] Ibid [19]–[20] (French CJ) .

Amaca Pty Ltd v King [2011] VSCA 447 (22 December 2011) (Nettle, Ashley and Redlich JJA)

113. Fifth, and compatibly with the position both at common law and by statute, it is the fact that medical specialists have on countless occasions, to our knowledge, expressed opinion as to the relationship between accident and injury. It has happened in asbestos exposure cases. Indeed, the judgments in *Booth* show that it happened there; [47] and it elicited no adverse comment from the judges in the majority in the High Court.

Amaca Pty Ltd v King [2011] VSCA 447 (22 December 2011) (Nettle, Ashley and Redlich JJA)

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Maxwell v GTI International Pty Ltd [2011] VSCA 448 -
Amaca Pty Ltd v King [2011] VSCA 447 -
Amaca Pty Ltd v King [2011] VSCA 447 -
Wheelahan v City of Casey (No 11) [2011] VSC 655 -