Cambridge Law Journal, **70(2)**, July 2011, pp. 451–468
doi:10.1017/S0008197311000572

MORE GRIEF ON UNCERTAIN CAUSATION IN TORT

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The Common law's tort of negligence, like its equivalents elsewhere, grew up with a basic rule of causation: in order to be liable, the defendant must be proved to have caused harm to the victim. In a series of cases, brought to a head in *Sienkiewicz* v. *Greif*,[1] the courts have developed an exception to this rule to be applied in cases of ambiguous causation, i.e. when it cannot be shown which one of a number of competing factors was the true cause of the victim's harm. This exceptional rule, now apparently with several sub-forms, has operated in particular where the victim has suffered mesothelioma as a result of exposure to asbestos, a situation in which it is scientifically impossible to identify which fibre or fibres brought about the illness, though it cannot be limited to such cases.

The facts of *Sienkiewicz* were relatively straightforward. Mrs. Enid Costello died of mesothelioma. She had been tortiously exposed to asbestos while working for the defendants; in addition there was a background exposure to asbestos in the atmosphere. The statistical evidence suggested that the background asbestos would lead to some 24 cases of mesothelioma per million persons, and that the exposure by the defendant had increased this by approximately 18%. In other words, accepting for the moment the statistical evidence, there was an 85% chance that Mrs Costello had died from a non-tortious cause. None the less, it was held that the consequence of the earlier line of cases was that her estate should recover in full from the defendants as if they were the sole cause. The result perhaps appears strange, but it is hard to see how the court could have reached a different decision on the state of the authorities; as Lady Hale suggests, it was a hard case rather than a difficult one.[2]

The purpose of the present article is to examine the state of the law after the decision in *Sienkiewicz*, to trace how it reached this state, and to assess how satisfactory it is both in theoretical terms and in terms of the results to which it leads.

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[1] [2011] UKSC 10.
[2] Para. [167].

https://doi.org/10.1017/S0008197311000572 Published online by Cambridge University Press

The Genesis of the Exceptional Rule of Causation

The normal rule of causation, which applies in almost all situations, has two aspects: the evidential and the conceptual. In order to establish liability, P has to show on balance of probabilities (evidential) that but for D's wrongful conduct the injury would not have occurred (conceptual)[3].

This rule comes under stress in situations of over-determination, where an injury is caused by two separate events either of which would have been sufficient in itself to bring it about. D1 and D2 simultaneously, though independently, shoot P through the head. It cannot be said that either shot was a but-for cause, since the other shot would in any event have killed the victim. But to avoid the absurdity of neither being liable, it is generally recognised that each should be treated as a complete cause so that each gunman is jointly and severally liable for the death.[4] In this situation it is the conceptual aspect of causation that is being massaged, but only a very slight alteration of the fact situation shifts the focus onto the evidential. Say D1 and D2 independently shoot P through the head, their shots being separated by one second. Clearly, the first shot caused the death and the second was causally irrelevant, and if it can be shown which shot hit first, then the person responsible for that shot will be liable and the other person not. But where it cannot be shown which shot brought about the death, legal systems have generally held that both D1 and D2 should be liable.[5]

One common feature of these situations is that the victim has been injured tortiously, but either there is more than one cause of the injury (the first case) or we cannot know which of several potentially wrongful acts was the true cause (the second case). A second feature is that the potentially causative events have occurred simultaneously (the first case) or very nearly so; a third is that the potential causes in each case are of the same kind. For many jurisdictions, the real question lying behind the exceptional rule of causation is how far these situations can be extended. However, this is not the way the issue was addressed in the line of cases culminating in *Sienkiewicz*. Instead, the courts built on a

[3] So far as the conceptual element goes, English law is here in accord with all other European legal systems: R. Zimmermann, "Conditio sine qua non: Comparative Report", in B.Winiger/B.A. Koch/H. Koziol/R. Zimmermann (eds.), *Digest of European Tort Law, vol.1: Essential Cases on Natural Causation* (Vienna 2007), § 1/29, no.1

[4] Different reasoning underlies this recognition, which is largely an academic consensus. One move is simply to have a special rule in such cases without conceptual elaboration: e.g. Art. 3:102, *Principles of European Tort Law*; Restatement Third (Torts), §27; another is to argue that but-for (a test of simple necessity) is not all there is to the concept of causation (which is a complex of necessity and sufficiency): e.g. R.W. Wright, "Causation in Tort Law" (1985) 73 California Law Review 1735.

[5] United States: *Summers* v. *Tice* 33 Cal. 2d 80; 199 P. 2d 1 (1948); see now Restatement Third (Torts), §28(b). Canada: *Cook* v. *Lewis* [1951] S.C.R. 830. French and German law also find liability in such cases, though by different routes: C. Van Dam, *European Tort Law* (Oxford 2006), pp. 286–288.

https://doi.org/10.1017/S0008197311000572 Published online by Cambridge University Press

different series of cases dealing with the situation in which injury had been caused by the cumulation of different acts, in which each act contributed in part to the result.

The genetic source of this appears to have lain in the nineteenth-century Scots law of nuisance. As occurred elsewhere in the context of large-scale industrial development, rivers and other waterways were an attractive route for factory owners to rid themselves of the by-products of their activities. Such pollution constituted in principle an actionable nuisance, but where there were a number of factory owners polluting the same river it was easy for any one of them to argue that his factory was not the cause of the degraded state of the water since others were polluting it too and he had merely added his bit to the channel of filth. In order to avoid this unattractive argument, and explicitly grounded in common sense, in *Duke of Buccleuch* v. *Cowan* the Court of Session held that it was sufficient that his factory had "materially contributed" to the polluted state of the river, and it did not matter whether his source of discharge would itself have constituted a nuisance in the absence of the other sources.[6] This language of "material contribution" was repeated in later Scots cases on the same topic;[7] and it was in this context that Hart and Honore used the terminology, citing American authority.[8]

This language was picked up and transplanted into a different context in another Scottish case, *Wardlaw* v. *Bonnington Castings*.[9] The pursuer, an industrial worker, contracted pneumoconiosis in the course of his work as a result of the inhalation of silica dust. This was the result in part of dust which was in the atmosphere of the plant as a result of breach of duty and in part of dust which was there without breach of duty on the defenders' part. In the Court of Session it was said that the defenders should be liable provided that the negligent dust had made a "material contribution" to the injury. Lords Carmont and Russell held that once it was accepted that there had been a breach of duty by the defenders the burden of proof was on them to show that this was not a cause of the disease, and on this basis liability was established. Lord President Clyde dissented, denying that the burden of proof was reversed and holding that on the facts it had not been proved

[6] (1866) 5 M. 214, 216 (Lord Justice-Clerk), 223–224, 227–229 (Lord Cowan), 232–233 (Lord Benholme), 234–237 (Lord Neave).

[7] *Countess Dowager of Seafield* v. *Kemp* (1899) 1 F. 402, 406 n.3; *Fleming* v. *Gemmill* 1908 S.C. 340, 347, 350; *Brownlie & Son* v. *Magistrates of Barrhead* 1923 S.C. 915, 927, 933, 935. The idea of contribution to an injury is commonly found in cases of contributory negligence, though these cases are different since but-for causation would not normally have applied to them: *Senior* v. *Ward* (1859) 1 El. & El. 385; *S.S. "Rowan"* v. *S.S. "West Carnak"* 1923 S.C. 316, 338. Note too the use of the idea by the Scottish Lord Watson in *Wakelin* v. *London & South Western Railway Co*. (1886) 12 App. Cas. 41, 47.

[8] H.L.A. Hart and A.M. Honore, *Causation in the Law* (Oxford 1959), p. 211.

[9] 1955 S.C. 320; [1956] A.C. 613.

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that the dust in the workshop in breach of duty had been shown to have made a material contribution. The decision was upheld in the House of Lords; although the approach of Lords Carmont and Russell that the burden of proof should be reversed was rejected, it was held that on the true reading of the evidence the pursuer had in fact shown that the negligent dust had made a material contribution, in the sense that it had contributed in a more than *de minimis* way to the pneumoconiosis. It is noteworthy that, while the reasoning of all their lordships was the same, the "material contribution" terminology is found only in the speeches of the two Scottish members of the Appellate Committee, Lord Reid and Lord Keith, reflecting its memetic function in the Scottish context.[10]

Although the nuisance cases were not cited, the situation in *Bonnington Castings* as analysed by the House of Lords[11] was structurally identical to them. The pursuer's illness was the result of the progressive build-up of silica dust in the lungs, so that all the dust – negligent and non-negligent – played its part in it, in exactly the same way as each bit of effluent in the rivers played its part in the totality of the pollution. The decision can be regarded as a common-sense application of the normal rules[12] – D's conduct has caused part of the injury, or has part-caused the injury, where the only outstanding question is the extent of the liability.[13] The situation was the same as if a 5-ton vehicle crossed a bridge with a maximum loading of 20 tons at the same time as a 20-ton lorry crossed it. Alternatively, and equally orthodoxly, it could be said that D's negligence was a but-for cause of the total injury happening when it did, the extent of liability depending on the point at which the injury would have happened anyway without the defendant's negligence.[14] On the other, the decision can be seen as a departure from orthodoxy in so far as it massages the conceptual component of causation. It may be that, just as in the case of the simultaneously striking bullets, the presence of the other non-tortious dust prevents us saying that the negligent production of dust was a but-for cause of any part of the disease; but we might not simply wish to say therefore that the negligence did not play any role in the production of

[10] Simon Deakin, "Evolution for Our Time: A Theory of Legal Memetics" [2002] Current Legal Problems 1.

[11] See in particular the summary of Lord Reid, [1956] A.C. 613, 621.

[12] So far as one can judge from case notes, contemporaries did not see it as marking any major breach with orthodoxy: (1956) 72 L.Q.R. 306; (1956) 19 M.L.R. 530 (C. Grunfeld); (1956) 1 Jurist (N.S.) 177 (DM Walker). *Cf. Duke of Buccleuch* v. *Cowan*, above.

[13] *Holtby* v. *Brigham & Cown (Hull) Ltd* [2000] 3 All E.R. 421 (according to the relative lengths of the exposure of each wrongdoer). *Cf.* M. Jones in M. Jones (ed.), *Clerk & Lindsell on Torts*, 20th edn. (London 2010), 2–29.

[14] For this interpretation, see: S.H. Bailey, "Causation in Negligence: What is a Material Contribution?" (2010) 30 Legal Studies 167. It should be noted that this is analytically different from saying that the defendant was liable because he made the extent of the disease worse, in the sense of making its physical effects worse than they would have been.

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the disease. Rather we can describe that role by saying that the defendant contributed to it, even if he did not cause it in a but-for sense.[15] If that is correct, then the causal issue has been settled and the question is again one of quantification of damage. On both accounts, causation, either in a but-for sense or in the sense of contribution, has been shown on the balance of probabilities. Hence we are not yet in the realm of true exceptions to the evidential component of the normal rule.

The next important case in the sequence, again a Scottish case, was *McGhee* v. *National Coal Board*.[16] The pursuer, a worker in the defenders' brick kiln, developed dermatitis. It was accepted that this was the result of his work in the kiln, but the only fault found on the part of the defenders was that they had failed to provide adequate washing facilities; if such facilities had been available the pursuer would not have had to cycle home in a sweat-ridden and grimy state. It could not be proved on balance of probability that the failure to provide showers would have prevented the dermatitis arising, the medical witnesses saying simply that it would have "materially reduced" the risk, but that the extent of that reduction could not be stated as a matter of percentages. Pursuer's counsel, faced with pleadings stating that the defenders' breaches of duty had caused the disease, argued that the material increase in the risk of contracting the disease which could be attributed to the absence of showers was the same as a material contribution to the disease itself – by now treated as the equivalent of causation in Scots law – but this was roundly, and rightly,[17] rejected by the Court of Session: "risk of dermatitis and causation of dermatits are two separate matters".[18] The pursuer appealed successfully to the House of Lords. There are differences of nuance in the reasoning of their Lordships, but common to all of them is a strand rejecting the reasoning of the Court of Session and linking a material increase of risk with material contribution to injury.

The circumstances of the appeal have been described by Lord Hope, who had been junior counsel for the respondents.[19] For present purposes there are two relevant features. First, as Lord Hope graphically describes it, "But it was obvious, almost from the moment that he [*i.e.* counsel for the appellant] got to his feet, that their Lordships were determined to find in McGhee's favour." Secondly, the easiest means to achieve this result were the grounds put forward in the appellant's

[15] For a model of this notion of contribution, see Jane Stapleton, "Choosing what we mean by 'Causation' in the Law" (2008) 73 Missouri Law Review 433.
[16] 1972 S.L.T. (Notes) 61; 1973 S.C. (H.L.) 37; [1973] 1 W.L.R. 1. Before this *Wardlaw* v. *Bonningtons Castings* had been followed in *Nicholson* v. *Atlas Steel Foundry and Engineering Co. Ltd.* [1957] 1 W.L.R. 613 (H.L.), another – Scottish – case of pneumoconiosis.
[17] Below, ***
[18] 1973 S.C. (H.L.) 37, 45, *per* Lord President Clyde.
[19] "James McGhee: A Second Mrs. Donoghue?" [2003] C.L.J. 587, 592–595, 599, 600–612.

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case, that a material increase in the risk of some injury was the equivalent of a material contribution to that injury. These features need a little unpicking. As for the first, it is easy to have some sympathy with the gut-feeling of sympathy for McGhee: given the medical impossibility of showing that the failure to provide showers had in fact caused the dermatitis, the House was faced with a choice between in effect holding on the one hand that the normal rules of causation applied and that the duty to provide adequate washing facilities could be ignored with impunity, or on the other that some adjustment to the normal rules of causation had to be made. They chose the latter. The conjunction of the conceptual and evidentiary rules, but-for causation and proof on balance of probabilities, generated what was seen as an obvious injustice, so a more flexible rule was required. It is the second feature that created the difficulty, the means whereby that flexibility was introduced. The omissive nature of the defendant's negligence, the failure to alleviate the danger of the non-tortious exposure in the kiln by the provision of showers,[20] put the case rather beyond the contribution framework of *Bonnington Castings*. Perhaps, on the other hand, it could have been thought arbitrary to distinguish *Bonnington* if but-for causation had not in fact been established. In any event, treating a material increase of risk as equivalent to a material contribution to injury created too broad a base for liability, since anything which had the potential to bring about a result could – obviously – be said to have increased the risk of that result occurring. With *McGhee*, English law first clearly departed from the normal evidential rule in proof of causation.

The authority of *McGhee* was substantially weakened in the quarter-century or so after the decision. That the defendant's act might have caused an injury but could not be proved to have done so on balance of probabilities was held insufficient in *Wilsher* v. *Essex Area Health Authority*,[21] and in *Hotson* v. *East Berkshire Area Health Authority* a failure by a doctor to diagnose an injury was held actionable only if it was proved on balance of probabilities that correct diagnosis would have led to the injury being effectively treated.[22] But the case was never overruled, retaining its potential to be used to justify any decision where it was thought that the orthodox rules of causation should be departed from.

This potential was realised in *Fairchild* v. *Glenhaven*.[23] Workers who had been negligently exposed to asbestos in several employments died of mesothelioma, presumptively the result of this exposure. Scientific

[20] So too *Gardiner* v. *Motherwell Machinery & Scrap Co Ltd* [1961] 1 W.L.R. 1424.
[21] [1987] Q.B. 730.
[22] [1987] A.C. 750.
[23] *Fairchild* v. *Glenhaven Funeral Services Ltd* [2003] 1 A.C. 32.

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uncertainty over the aetiology of mesothelioma – it was thought that the disease could be caused either by one single fibre or by multiple fibres in combination – made it impossible to prove which employer was the cause of the death. The estates therefore brought actions against all the employers, and succeeded. The result in *Fairchild* can seem intuitively just: once it is assumed[24] that the victims had died as a result of someone's tort, so that a right to damages was prima facie established[25], it looks strange to refuse the claim simply because it cannot be proved on balance of probabilities which of the wrongdoers was to blame, a burden of proof which it was impossible for a claimant ever to satisfy. The difficulty lies in the majority's justification of the decision on the basis of *Bonnington Castings* and *McGhee*, that the defendants were liable because of the material increase in risk which they had created.[26] These, and similar cases, were the authorities to which Lord Bingham, for example, turned after having dealt with the policy issues.[27] As was the case in *McGhee* itself, the structure of the reasoning simply reflects the way in which counsel framed their arguments. Some limitation had to be put on *McGhee* to prevent the annihilation of the evidential rule of but-for causation; this was found in the requirement that the competing causes should have been identical, a requirement which lacked any principled base though conveniently distinguished *Fairchild* from the decision in *Wilsher*. Thus was spawned the "*Fairchild* exception", slipping across from being a qualification of the evidentiary rule that causation had to be proved on the balance of probabilities to being a qualification of the conceptual rule that the defendant had to be the but-for cause of the injury.

Once this step had been taken, the decision in *Barker* v. *Corus*[28] that liability under the *Fairchild* exception was proportionate had *prima facie* doctrinal plausibility. Just as each party who had contributed to an injury should be liable for his or her share of the injury inflicted, so should each party who had contributed to the risk under *Fairchild*: contribution to risk and contribution to injury were on a par with each other. In effect, the wrong was conceptualised as the increasing of the risk[29] (though it was not actionable unless the injury actually occurred), and it was the extent of this increase that had to be quantified.

[24] Background exposure was (without warrant) ignored: see J. Stapleton,"Lords a'leaping evidentiary gaps" (2002) 10 Torts Law Journal 276, 281.

[25] It may be noted here that German law (even if it does not arguably cover the precise facts of *Fairchild* for other reasons) restricts its exception to proof of causation, § 830(2) BGB, to cases where there is a demonstrated right to damages (*festehende Ersatzberechtigung*): G. Wagner, in F.J. Säcker, R.Rixecker (eds.), *Münchener Kommentar zum BGB §§705-853*, 2282, §39.

[26] Paras. [65], [67] (Lord Bingham), [108] (Lord Hoffmann).

[27] The transition is explicit at [13]–[14].

[28] [2006] 2 A.C. 572.

[29] As Lord Clarke, at para. [55], and Smith L.J. at paras. [18] and [27] stated in the Court of Appeal in *Sienkiewicz* [2009] EWCA Civ 1159. Criticised by S. Steel, "Uncertainty over Causal Uncertainty: *Sienkiewicz v Greif*" (2010) 73 Modern Law Review 646, 652–653

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Parliament immediately reversed this result for cases of mesothelioma caused by asbestos: in these situations, assuming the conditions of *Fairchild* were satisfied, those who had tortiously increased the risk were made liable in full, jointly and severally, for the resulting injury.[30] This spawned an exception to an exception, the "mesothelioma exception". It was this "mesothelioma exception" which was picked up by the Supreme Court in *Sienkiewicz* v. *Greif*, though the reasoning of the court is applicable to all cases falling under the principle of *Fairchild*.[31]

The *Fairchild – Barker – Sienkiewicz* line of cases is not the only offspring of the decision in *Bonnington Castings*. In *Bailey* v. *Ministry of Defence*[32] the defendant's negligent medical care had contributed to severe muscular weakness on the part of the claimant who was already weakened by the effect of a non-tortious surgical operation. In her weakened state she was unable to cough, aspirated her own vomit and as a result suffered a heart attack and severe brain damage. The question was whether the defendant's contribution to that weakness made any difference to the claimant's aspirating her vomit which led to the heart attack/brain damage. Was it a but-for cause of her injury? It was impossible to say whether or not the injuries would have occurred on the balance of probabilities. In these circumstances Waller L.J. held that the case fell within *Bonnington Castings*:[33] The defendant's conduct had undoubtedly materially increased the risk of the injuries occurring, but it had also played some role, even if not as a necessary condition, in the cumulative mechanism by which the injury occurred. This is essentially the final interpretation of *Bonnington* to which we advert above:[34] a conceptual massaging of the normal rule. Admittedly, the boundary here between saying that there is some form of actual causation established and saying that the defendant has merely increased the risk of injury is elusive. Furthermore, even if we accept that the defendant has shown causation, if this rule allows for full damages to be awarded, as it apparently does,[35] where it is scientifically impossible to discern whether the whole injury would have occurred anyway, or if some part of it would have been avoided, how much, it is of huge advantage to claimants. It also looks somewhat odd that such a thin causal connection, as opposed to the mere increase in risk, should have

[30] Compensation Act 2006, s.3

[31] This follows from the fact that the Court accepted what was slightly blurred by Smith L.J. in the Court of Appeal that s.3 of the Compensation Act 2006 is entirely parasitic upon there being liability already established by common law (see *Sienkiewicz*, para. [70] *per* Lord Phillips; para. [131] *per* Lord Rodger; para. [223] *per* Lord Dyson) and the fact that the common law exception is not limited to mesothelioma cases (*McGhee* itself being the obvious non-mesothelioma case).

[32] [2008] EWCA Civ 883. Noted by M. Stauch [2009] C.L.J 27.

[33] *Ibid.*, para. [46].

[34] Above, ***.

[35] This interpretation finds its roots in Lord Rodger's speech in *Fairchild*, para. [129]. It was adopted by the Court of Appeal in *Ministry of Defence* v. *AB & Ors* [2010] EWCA Civ 1317 [134]. It also seems to be accepted by the judge *obiter* in *Ingram v Williams* [2010] EWHC 758 (QB), para. [83].

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such radical effect, leading to full damages, given the approach of apportionment in *Barker*.

The Scope of the Fairchild Exception: The Role of Material Increase in Risk

If the basis of the exceptional liability in *Fairchild*, as interpreted in *Barker*, is the wrongful creation of a *non de minimis* risk, it might seem readily to follow that the estate in *Sienkiewicz* had to succeed, if it could be shown on the balance of probabilities that the defendant had indeed wrongfully subjected Mrs. Costello to such a risk. Call this the "risk argument".

The argument is problematic. It is misleading to say that the "basis" of the liability in *Fairchild* is wrongful creation of a material increase in risk. To speak of the basis of liability suggests that, beyond demonstrating the breach of a duty of care, material increase in risk is a *sufficient* condition of liability. This, of course, is incorrect: for the rule to apply, proof of causation on the balance of probabilities must be "impossible";[36] the claimant must have actually have suffered the damage; and there must, in some sense, be a "single agent" at work. The root of the problem with the argument is simply that it does not come to terms with *Fairchild* as specifically a response to *evidential uncertainty* over causation.[37] *Fairchild* allows, for reasons of justice, the evidential requirements of causation to be satisfied by proof of a material increase in risk.

Analytically, it is important to be clear that this relaxation in the rules of evidence does not alter the nature of causation; nor does it eradicate the need for causation as a matter of substantive law. The former is true since conceptually it is impossible to equate a material increase in risk with actual causation. For x materially to increase the risk of y is not necessarily for x to cause y. Nor does *Fairchild* eradicate causation as a requirement of liability. If it did, then a court would have to hold a defendant liable where it was shown, on evidence accepted as probative, that the defendant did *not* cause the claimant's damage. In reality, then, *Fairchild* relaxed the evidential requirements of proof of causation in certain circumstances: where it applies, proof of a material increase in risk is enough.[38]

Barker seems to make this "evidential" analysis of *Fairchild* difficult. Lord Hoffmann says that "the damage which the defendant should be regarded as having caused is the creation of [such] a risk or

[36] *Fairchild*, para. [2] *per* Lord Bingham, paras. [47] and [61] *per* Lord Hoffmann; *Barker* para. [17] *per* Lord Hoffmann, para. [53] *per* Lord Scott, para. [109] *per* Lord Walker.

[37] For a similar observation, see R.W. Wright, "Liability for Possible Wrongs: Causation, Statistical Probability, and the Burden of Proof" (2009) 41 Loyola of Los Angeles Law Review 1295, 1296.

[38] Nor is this a fiction – or, at least, no more so than the balance of probabilities rule.

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chance".[39] This is a modification of the substantive damage for which the defendant is liable. On the other hand, earlier in his speech, Lord Hoffmann adverts to the "purpose" of the *Fairchild* exception being: "to provide a cause of action against a defendant who has materially increased the risk that the claimant will suffer damage and may have caused that damage, but cannot be proved to have done so because it is impossible to show, on a balance of probability, that some other exposure to the same risk may not have caused it instead"[40]. This locates *Fairchild* as a response to evidential uncertainty. As Baroness Hale recognised, it is unnecessary, in addressing the supposed unfairness created by the evidential deficit, to proceed by changing the substantive law's notion of damage, hence she emphasised that the "gist" of the tort remained the mesothelioma.[41] In other words, nothing explanatory is added to the proposition that the rules of proof of causation in *Barker* are being relaxed in the face of insuperable uncertainty, but that, as a trade-off to the defendant, the quantum of liability is discounted to reflect the uncertainty over an essential element of the cause of action, by treating the risk as itself constituting the damage.[42] To avoid confusion, it would be better to say that there is proportionate liability in respect of potential causation.[43]

The Scope of the Fairchild Exception: The Possibility of Proof

The claim in *Sienkiewicz*, then, was not destined to succeed solely by virtue of the risk argument. Rather, beyond a material increase in risk, the other preconditions of the *Fairchild* exception had to be shown; in particular, the impossibility of proof on the balance of probabilities. Did the statistical evidence, which purported to show that there was approximately an 85% chance[44] that environmental exposure caused the mesothelioma, preclude the exception applying, on the grounds that the defendant had successfully shown himself on the balance of probabilities not to be a cause?

[39] *Barker*, para. [35].
[40] Para. 17.
[41] Paras. [120]–[122].
[42] See also, D. Nolan, "Causation and the Goals of Tort Law", in A. Robertson and Tang Hang Wu (eds.) *The Goals of Private Law* (Oxford 2009), 165, 177–178.
[43] This is how such liability is characterised in Austrian law, building on the theory of F. Bydlinski, "Haftung bei alternativer Kausalität", [1959] Juristische Blätter 1. See K. Oliphant, "Alternative Causation: A Comparative Analysis of Austrian and English Law", in P. Apathy/R. Bellenberger/P. Bydlinski/G. Iro/ E. Karner/M. Karollus (eds.), *Festschrift für Helmut Koziol* (Vienna 2010), 795, 798.
[44] The probability of causation for the environment is given by 1 – ((28.39–24)/28.39). For a discussion of this calculation (normally known as the "attributable fraction") see, R. Scheines, "Causation, Truth and the Law" (2007–2008) 73 Brooklyn Law Review, 959, 969.

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All the Justices, except perhaps Lady Hale and Lord Brown,[45] considered this question to be crucial to the resolution of the case. Lord Dyson is particularly clear:

> It is implicit in *Fairchild* and *Barker* that, if it were possible for a victim of mesothelioma to establish causation on the balance of probability in the conventional way, then the rationale for the *Fairchild* exception would disappear.[46]

Similarly, the question of whether the statistical evidence takes one outside *Fairchild* is implicit in the "conundrum" which Lord Phillips posed. If it is possible, as the apportionment in *Barker* suggests, to determine the risk to which a claimant has been exposed by a particular defendant, and that risk is very small, why, he asked, may it not be said that the defendant has proven himself not to be a cause on the balance of probabilities?[47] That is to say, if the statistics really are probative, then proof on the balance of probabilities would not be impossible and *Fairchild* ought not to apply.[48]

Different approaches, however, were taken to resolving the conundrum. Lord Phillips held that the epidemiological evidence relied upon by the defendant was in the first instance vitiated primarily by its *inadequacy*[49] and, secondly, though less importantly, by its *unreliability*.[50] His Lordship illustrated the notion of inadequacy of statistical evidence as a basis upon which to make a finding of causation by reference to a famous hypothetical case. A person is knocked down by a taxi whose colour is not observed. The incident occurs in a town where there are only two taxi firms: one has three blue cabs, the other has one yellow cab. The example is supposed to show that it would be inappropriate to infer from those facts alone that it was more probable than not that the accident was caused by the negligence of the blue cab firm (though there is a 75% statistical probability of this):

> [I]t was not possible to postulate that the risk of being knocked down by a negligent driver of a taxi-cab was proportional to the number of taxi cabs in the town. Much more significant would have been the care taken by the rival taxi firms in employing

[45] Lady Hale thought that discussion of the validity of the statistical evidence presented was "*obiter*": para. [169]. On the other hand, she expresses agreement with Lord Rodger, whose approach does not make this issue *obiter*, that holding the defendant liable was a "logical consequence" of *Fairchild*: para. [167]. Lord Brown agreed that the state of the law is as described by Lords Rodger and Phillips (para. [174]) but his reasons seem to be closer to the risk argument described in the text: see para. [184].

[46] *Sienkiewicz*, para. [213].

[47] *Ibid.* paras. [45], [52].

[48] See also Lord Rodger para. [135].

[49] Paras. [96]–[97]; [101]–[102].

[50] Paras. [98]–[99].

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> competent drivers, and the past accident record of the firms in question.[51]

The location of the inadequacy of the evidence in the lack of a proportional relationship between the risk of being run over negligently and the number of cabs was central to the finding of inadequacy in the mesothelioma context. Due to the unresolved uncertainty over the aetiology of mesothelioma, Lord Phillips considered that it was not reasonable to infer that the increase in risk of contracting mesothelioma was proportional to the amount of exposure.[52] The mere fact that the defendant had exposed the claimant to less dust than the environment did not necessarily mean that the defendant had exposed the claimant to less risk. There may be a cumulative causal mechanism whereby early fibres contribute together with later fibres.[53] The uncertain aetiology of mesothelioma, then, renders the statistical evidence an inadequate basis to infer causation.

Importantly, however, Lord Phillips considered that, outside the mesothelioma context, where the particular problem of uncertain aetiology renders the epidemiological evidence inadequate, such evidence could, by itself, be enough to generate a finding of causation on the balance of probabilities. The normal proof rule – the balance of probabilities – could, then, be satisfied simply by epidemiological evidence showing that the defendant's breach of duty had more than doubled the risk due to some other source.[54] This comes with a two provisos. On the one hand, "the court must be astute to see that the epidemiological evidence provides a really sound basis for determining the statistical probability of the cause of the disease or causes of the disease."[55] Perhaps this relates to the criterion of *reliability*, which his Lordship discusses later: has, for example, the data been collated properly?; has the study been constructed appropriately? The second proviso is implicit. Lord Phillips' discussion of the acceptability of the "doubling of the risk" test is focused upon cases where the claimant has been exposed to agents which are known to be able to cause the disease in question. Thus, *Hotson* and *McGhee* are given as examples of where this approach might be appropriate. There is no mention in this section of the speech of cases where it is unclear whether x can cause y (where "general causation" is unclear) at all.

[51] Para. [96]; taken from Lord Mackay's speech in *Hotson*, and originally from *Herskovits* v. *Group Health Cooperative of Puget Sound* (1983) 664 P 2d 474 (Supreme Court of Washington), per Brachtenbach J. (in dissent). Similar examples have been endlessly discussed in the literature. For a useful (if partisan) introduction, see A. Stein, *Foundations of Evidence Law* (Oxford 2005), chapter 3, pp. 238–240.

[52] Para. [101].

[53] Para. [102]. J. Stapleton, "Factual Causation and Asbestos Cancers" (2010) 126 L.Q.R. 351, 354 supported this analysis.

[54] Paras. [91], [93].

[55] Para. [91].

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It is in this acceptance of the doubling of the risk approach as satisfying the balance of probabilities rule that Lord Phillips' approach differs from that of Lord Rodger. According to the latter, the normal balance of probability rule requires the fact-finder to be convinced on the balance of probability that there actually was causation, not merely that the chances are that there was causation. In short, there is a logical difference between being convinced on the balance of probabilities that *x* is true or that *x* occurred (a fact), and being convinced on the balance of probabilities that it is probable that *x* is true or that *x* occurred (a probability).[56] According to Lord Rodger, epidemiological evidence can in itself only ever ground propositions of the latter form. It can never, in itself, allow the fact-finder to be convinced on the balance of probabilities that the defendant's breach of duty caused this particular claimant's disease. This meant the defendant's argument had to fail, since the normal proof rule required conviction[57] of actual causation, not merely probable causation, on the balance of probabilities.

An example may illustrate his Lordship's point. Suppose in *McGhee* there had been statistical evidence to the effect that without provision of showers for persons working in brick kilns 60 workers in 100 suffer dermatitis. With showers, the number is 25. For Lord Phillips, all else being equal,[58] this will satisfy the normal balance of probabilities standard of proof: the defendant has doubled the risk due to the background, hence it is more likely that the defendant is the cause than the background risk. On Lord Rodger's analysis, the evidence only demonstrates, if it is reliable, that on the balance of probabilities, it is probable that the defendant's negligence caused the dermatitis. On his Lordship's interpretation of the balance of probabilities rule, that is insufficient.

Whose view is the law? Lords Kerr[59], Mance[60], Dyson[61], and Brown[62] agreed with *both* Lord Phillips and Lord Rodger. Lady Hale agreed with Lord Rodger that the claim must fail. But the agreement in both cases explicitly did not go to details of whose account of epidemiological evidence was correct nor, consequently, whether epidemiological evidence could suffice on its own to prove causation on the balance of probabilities. This selective agreement is slightly puzzling since, in Lord Rodger's case, it was a crucial element of his reasoning that *generally*,

[56] Beginning at para. [143]; see especially paras. [153] and [156].
[57] His Lordship acknowledged his debt to Steve Gold's article, "Causation in Toxic Torts: Burdens of Proof, Standards of Persuasion and Statistical Evidence" (1986–7) 96 Yale Law Journal 376, whose analysis distinguishes between fact and belief probability, at pp. 380–384.
[58] All else would not be equal, for example, if the particular person had been exposed to other risk sources for dermatitis.
[59] Para. [203].
[60] Para. [189].
[61] Para. [220].
[62] Para. [174].

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as a matter of logic, statistical evidence on its own does not prove the case on causation: *that* was why proof was impossible on the balance of probabilities, hence *Fairchild* applied and the claim had to succeed. Nonetheless, *obiter*, on the question of whether epidemiological evidence alone could prove causation, Lord Dyson was broadly supportive[63] of Lord Phillips, whilst all the other Justices sided more with Lord Rodger's position.[64]

Formally, then, it remains unresolved whether epidemiological evidence can, on its own, suffice to generate proof of causation on the balance of probabilities where a doubling of the background risk is shown. It must be thought, however, that the weight of the opinion expressed in Supreme Court is decidedly against this.[65]

The Normal Rule: An Assessment

It can plausibly be asserted, in the light of the general approval of Lord Rodger's reasoning in *Sienkiewicz*, that the balance of probability rule on causation requires that the fact-finder believe that the defendant's negligence actually caused the claimant's injury; not merely that it probably did. The balance of probabilities rule is still a probabilistic rule in so far as the fact-finder's belief does not have to be a certain one. The main point, however, is that the probabilistic aspect of the rule is a reflection of the fact-finder's degree of belief, not the content of that belief. This might be thought to be a purely philosophical point,[66] but its consequences are clear: if statistical evidence only generates belief in a *probability*, not a fact, it cannot on its own satisfy the balance of probabilities rule. And the reason statistical evidence only generates such a belief is that it does not speak to the specific case at hand. In the context of our dermatitis example given above, it only shows that

> *In most cases* the dermatitis *would have been related* to the lack of showers. … Whether, in any particular case, the claimant's dermatitis was actually caused by the lack of showers is a matter of fact – and one that remains unknown, if the only available evidence is statistical.[67]

In other words, the fact-finder does not have the right kind of belief for the balance of probability rule where he or she can only infer what

[63] Para. [222].
[64] Except Lord Brown who did not discuss the point at all.
[65] No one, however, doubted that epidemiological evidence could be put to valuable use alongside other "specific" evidence to show causation in appropriate cases E.g. [163] *per* Lord Rodger. That view clearly reflects earlier understandings: see *Gregg v Scott* [2005] 2 A.C. 176, [32] *per* Lord Nicholls.
[66] Though it is indeed a matter of some philosophical dispute: for an overview, see H.L. Ho, *A Philosophy of Evidence Law* (Oxford 2008), chapter 3, especially pp. 106 ff.
[67] *Sienkiewicz*, para. [156] *per* Lord Rodger.

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actually happened in a particular case from the inherently group-based nature of a statistic.

That the fact-finder must form a belief in the actuality or truth of the facts in the particular case at hand, for the purpose of the balance of probabilities standard, is probably representative of common law orthodoxy.[68] More disputed, and disputable, however, is the further premise that statistical evidence cannot function on its own to generate such a belief.[69] For example, some American states allow proof of individual causation on the basis of a doubling of the background risk due to the tortious exposure, where the claimant can show an adequate "fit" between their case and those underlying the epidemiological study relied upon.[70]

Prior to *Sienkiewicz*, there was also some support for a similar rule in English law. In the *Creutzfeldt-Jakob Disease Litigation, Group A and C Plaintiffs*,[71] the claimants had developed Creutzfeldt Jakob Syndrome (CJD) by receiving an injection of human growth hormone. Claimants had received some injections prior to 1 July 1977 (the "cut off date") which were non-tortiously administered by the defendant and some afterwards which were. It was accepted that CJD was caused by a single injection but that "there is no scientific method of establishing whether that dose was given before or after [1 July 1977]."[72] Morland J. held that if a claimant could show that he or she had more injections after the cut-off date, then he or she would succeed in showing that the CJD had been tortiously caused by the defendant. Thus, to put the point graphically, if C had had 49 injections prior to the cut-off date, and 51 after, then causation by a tortious injection would have been established.[73]

The *CJD* case illustrates potential difficulties in Lord Rodger's approach. According to his Lordship's view, it seems we must say that

[68] *Seltsam* v. *McGuinness* [2000] NSWCA 29, [136] *per* Spiegelman C.J., citing many authorities; *Sargent* v. *Massachusetts Accident Co*. (1940) 29 N.E. 2d 825 at 827, cited by R.W.Wright, "Proving Causation: Probability versus Belief", in R. Goldberg (ed.), *Perspectives on Causation* (forthcoming Oxford 2011), 13. For Canadian cases, see L. Khoury, *Uncertain Causation in Medical Liability* (Oxford 2006), 34–35.

[69] There had been some suggestion that this was the position in England pre-*Sienkiewicz*: see *Gregg*, paras. [28]–[29] *per* Lord Nicholls. Lord Mackay's speech in *Hotson* is equivocal; clearer is Croom-Johnson L.J. in the Court of Appeal, [1987] A.C. 750, 769. The Australian cases leave this issue open: *Seltsam*, at paras. [78]–[79], [89]; *Amaca Pty. Ltd* v. *Ellis* [2010] HCA 5, [62]; for some discussion, see D. Hamer, "Before the High Court: Mind the Evidential Gap: Causation and Proof in *Amaca Pty Ltd v Ellis*", (2009) 31 Sydney Law Review 465, 466.

[70] See S. Gold, "The More We Know, The Less Intelligent We Are? – How Genomic Information Should and Should Not, Change Toxic Tort Doctrine" (2010) 34 Harvard Environmental Law Review 369, 381. Of course, it could be disputed whether these courts are in fact applying a "special rule", without actually affirming that such evidence amounts to proof on the balance of probabilities as traditionally understood.

[71] (2000) 54 B.M.L.R. 100

[72] *Ibid.*, 101.

[73] Lord Phillips seems to have had situations like this in mind when he observed in *Sienkiewicz* that the balance of probability standard is "one that is inherently capable of producing capricious results" *Sienkiewicz*, [26]. Criticised by Wright, "Proving Causation", p. 44 n. 94.

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the fact that more injections occurred after the cut-off date than before is proof only of a probability of causation, not of the fact of causation. Perhaps, however, that should not be decisive. What if 95 injections had occurred after the cut-off date and only 5 before? It seems compelling here to say that it was more probable than not that the disease was caused by a tortious injection (*i.e.* that fact was more probable than not). In other words, sometimes probabilities ought to alter our degree of belief in a proposition about a fact; and some probabilities ought to alter that degree enough as to satisfy the balance of probability standard.[74]

A more flexible approach, which would allow the reasoning in *CJD* to stand, and which would avoid too much hinging upon the classification of "fact" or "probability", is still very much open to English law. One may emphasise that Lord Rodger's views in *Sienkiewicz* on the general force of statistical evidence are *obiter*, as those agreeing with him made clear. The *ratio* of *Sienkiewicz* could then be said to lie simply in unique uncertainty posed by diseases of highly uncertain aetiology, like mesothelioma; the case establishes that that peculiar uncertainty cannot be overcome by statistical evidence alone. On the other hand, one could, less attractively, accept the approach of Lord Rodger, but take a broad approach as to what will constitute "specific" evidence particular to the case at hand: with that in mind, one might observe that the facts generating the probability in *CJD* were specific to the claimant's case (the number of injections the claimant had).

The Exceptional Rules: An Assessment

Our analysis of the *Fairchild-Barker* exception has so far focused primarily on its appropriate doctrinal conceptualisation.[75] even if there has been a temptation to conceptualise *Fairchild-Barker* as giving rise to a new tort of wrongfully increasing the risk, this is unappealing, for the reasons we have given. But underlying these conceptual questions, and running alongside the development of the exceptional rule, are normative questions of fairness, justice and policy. Indeed, the recourse to these broad notions is a striking feature of the judgments in *Fairchild* and *Barker*.[76] Whereas in those cases judicial understanding of fairness moved the Court towards exceptional liability, that the result was "draconian"[77] did not alter the outcome in *Sienkiewicz*.

[74] *Contra* R.W. Wright, "Proving Causation". This is a very difficult question to which we have only been able to give cursory attention here.

[75] Above, p. 457.

[76] See e.g. *Fairchild*, para. [33] *per* Lord Bingham. It is no accident that Professor Dworkin uses cases of uncertain causation to illustrate his moral theory of law: see R. Dworkin, "Hart's Postscript and the Character of Political Philosophy" (2004) 24 Oxford Journal of Legal Studies 1.

[77] *Sienkiewicz*, para. [58] *per* Lord Phillips; Lord Mance agreed with this description at para. [184]. See also Lady Hale at para. [168].

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With the conclusion that proof on the balance of probabilities was impossible, this was the practically inevitable result of *McGhee – Fairchild – Barker*. The logical structure of *Sienkiewicz* was tortious exposure from one source coupled with non-tortious exposure from a different source. *McGhee* established that the existence of a non-tortious exposure from the same source as the tortious exposure was no bar to the application of the exception. *Fairchild* established that it would apply where there are two tortious exposures from different sources. And *Barker* found that it would apply where there was a non-tortious source (the claimant's own behaviour) different from the tortious source: logically on all fours with *Sienkiewicz*. The only realistic route, then, if the result in *Sienkiewicz* was to have been avoided, was to overrule authority.

Nonetheless, the law now seems fixed in an unprincipled position. The claimant who succumbs to a deadly cancer potentially due to a doctor's negligence receives nothing, whilst the victim of dermatitis potentially caused by his employer's[78] negligence has access to proportional liability. Yet there is no logical reason[79] why *Barker* should not apply to medical negligence cases where there is a sufficient degree of uncertainty over causation. It takes one little further to say that this would re-write the rules of evidence: that is simply to re-state the question of whether proportional liability should be applied.[80] To say the distinction is one of policy – perhaps protection of limited NHS funds – needs much greater scrutiny to go beyond conjecture.[81]

Whether the inconsistency should be resolved towards the expansion[82] of the exceptional rule or its contraction is a difficult question. The difficulty arises from a fundamental tension to which cases of causal uncertainty give rise. On the one hand, the traditional, individualist model of tort law dictates that a particular defendant must be shown to have caused harm to a particular claimant in order to come under a duty to compensate. Without the causation of harm, there is nothing to correct and hence no place for corrective justice (hence mere risk is not enough); and without showing that the particular defendant caused harm to the particular claimant, there is no reason to demand the defendant pay compensation to the claimant.[83] Thus, if individual

[78] Though there is no reason within the law as it stands to restrict *Barker* to employers.
[79] The single-agent limitation will not preclude its application in a case like *Hotson*.
[80] Cf. L. Khoury, "Causation and Risk in the Highest Courts of Canada, England and France" (2008) 124 L.Q.R. 103, 127. Furthermore, the traditional rules of evidence – all or nothing liability on the balance of probabilities – have already been re-written in the context of liability for the loss of an economic chance.
[81] See J. Morgan, 'Policy Reasoning in Tort Law: The Courts, the Law Commission and the Critics' (2009) 125 L.Q.R. 215.
[82] The Principles of European Tort Law opt for proportional liability in all cases. See Art. 3:101; Art. 3:106.
[83] See e.g. E. Weinrib, *The Idea of Private Law* (Cambridge, Mass. 1995), 153.

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causation is essential to ground the liability to compensate, and the claimant cannot show it, the claimant should lose.[84] On the other hand, beyond reasons of individual justice, there are also reasons of collective justice, based upon the fair distribution of burdens or losses across groups of individuals. In cases like *Fairchild*, it seems unjust that negligent defendants as a group are privileged over the class of mesothelioma sufferers. This unfair privileging arises from the fact that if the normal evidential rule of causation is applied, there will, in all probability, be far more denials of liability than there ought to be – claimants as a whole will lose more than they ought – though we cannot tell in an individual case whether there should be liability or not. This privileging seems almost unbearable when the defendant has actually been shown to have caused harm as in the American drug manufacturer cases, where each defendant has been shown to have caused much harm but the claimant cannot identify his injurer.[85] At what points the individualist principle ought to give way to the group principle is a major question, beyond the scope of the present article.

[84] See R. Stevens *Torts and Rights* (Oxford 2006) 150–151.
[85] As in *Sindell v Abbott Laboratories* 26 Cal. 3d. 588; 607 P. 2d. 924 (1980).

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