RETHINKING ENDS AND MEANS IN MASS TORT: PROBABILISTIC CAUSATION AND RISK-BASED MASS TORT CLAIMS AFTER *FAIRCHILD V. GLENHAVEN FUNERAL SERVICES*

Jamie Cassels[1] and Craig Jones[2]
Victoria

The authors review the obstacles facing plaintiffs involved in mass tort litigation. Their work reveals the evolutionary nature of tort law by which early defendant successes are later overcome by a shift in the law in the plaintiff's favour. One such 'plaintiff-friendly' decision, that of the House of Lords in Fairchild v. Glenhaven Funeral Services Ltd., is the focus of this inquiry. The authors speculate on the future of such risk-based analysis in furtherance of the policy objectives of efficiency, compensation, deterrence and morality.

Les auteurs passent en revue les obstacles auxquels sont confrontés les demandeurs impliqués dans des actions délictuelles collectives. Leur article révèle une évolution du droit de la responsabilité civile puisque, si au départ, on a pu constater plusieurs rejets de telles actions, plus récemment on remarque un changement de cap de la jurisprudence qui semble maintenant favoriser la partie demanderesse. Une de ces décisions favorables au demandeur, l'affaire Fairchild c. Glenhaven Funeral, de la Chambre des Lords, s'avère la pierre angulaire de leur analyse. Les auteurs réfléchissent quant à l'avenir d'une telle analyse centrée sur le risque et de son impact sur la finalité du droit de la responsabilité délictuelle que sont l'efficience, la compensation, la dissuasion et la morale.

[1] Jamie Cassels, of the Faculty of Law, University of Victoria, Victoria, British Columbia.

[2] Craig Jones, of the Faculty of Law, University of British Columbia, Vancouver, British Columbia. The authors are indebted to our colleagues who reviewed drafts of this article, and in particular Peter Burns, Q.C. and Vaughan Black. Earlier drafts also benefited from the editorial assistance and thoughful analysis of Michael Welters and Clint Megaffin.

I. *Introduction*

In mass tort cases, especially those involving large numbers of persons who have been exposed through negligence to toxic substances which cause adverse health effects through non-observable modes of causation (often called "toxic torts"), the traditional rules of law and procedure are both inefficient and unfair. Modes of procedure and evidence that require proof and assessment on a particularistic, individual-by-individual basis do not easily accommodate claims based on non-traumatic, gradual or cumulative harms.

Much has been written recently on the problem of causation, as the conceptual framework of nineteenth century tort law has had to evolve to meet claims for injury compensation for harms that are more widespread and causally complex. The variety of products, processes and activities that can cause injury have vastly expanded during that time. Modes of mass production and distribution ensure that the potential consequences of error are more widely felt and scientific understandings of causal relationships has vastly expanded (and complicated) our understanding of the links between products, activities and environments, and harms to human health.

Tort scholars and courts have debated doctrinal innovations such as onus- shifting and presumptions, and procedural innovations such as science panels[3] and the aggregation of claims through the aggressive use of class action suits.[4] Certainly these methods have potential to ease some

[3] T.A. Brennan, "Causal Chains and Statistical Links: The Role of Scientific Uncertainty in Hazardous-Substance Litigation" (1987-88) 73 Cornell L. Rev. 469 [*Brennan*].

[4] Harvard's David Rosenberg has been perhaps the most outspoken champion of the

of the problems of particularistic proof. But dealing with aggregate claims on a probabilistic basis may require more than procedural innovation and advanced methods of proof of causation. In fact, it may require that we re- examine the necessity of establishing precise causal connections between plaintiff and defendant *at all*.

Posner,[5] Calabresi[6] and others[7] had considered the question of causation in law in terms of economic efficiency, laying the groundwork for many of the 'instrumentalist', 'functionalist', or 'utilitarian' proposals that followed. The late 1980s led to further analyses by Fleming,[8] Moore,[9] Brennan,[10] Wright,[11] and Ginsberg & Weiss,[12] all of whom canvasses possible solutions to what Fleming called "the problem of the indeterminate defendant".[13] Proposals for reform which included the imposition of liability on the basis of risk – rather than harm - creation were greeted with deep suspicion by those who saw tort law not from a functional but from a "corrective justice" point of view, such as Epstein[14]

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latter approach, and we have discussed procedural options elsewhere: See D. Rosenberg "Class Actions for Mass Torts: Doing Individual Justice by Collective Means" (1987) 62 Ind. L.J. 561; D. Rosenberg, "Of End Games and Openings in Mass Tort Cases: Lessons from a Special Master" (1989) 69 B.U. L. Rev. 695; D. Rosenberg, "Individual Justice and Collectivizing Risk-Based Claims in Mass-Exposure Cases" (1996) 71 N.Y.U. L. Rev. 210; D. Rosenberg, "Mandatory-Litigation Class Action: The Only Option for Mass Tort Cases" (2001) 115 Harvard L. Rev. 831. See also C. Jones, *A Theory of the Class Action: Optimal Aggregation in Mass Tort Litigation* (Toronto: Irwin Law Book) [forthcoming in 2002]; [*Jones*] Cassels, *The Uncertain Promise of Law: Lessons from Bhopal* (Toronto: University of Toronto Press, 1993) at 75-95 [*Cassels*

[5] *R.A. Posner, "A Theory of Negligence" (1972) 1 J. Legal. Stud. 29 [Posner]*; R. A. Posner, "The Concept of Corrective Justice in Recent Theories of Tort Law" (1981) 10 J. Legal Stud. 187.

[6] G. Calabresi, "Concerning Cause and the Law of Torts" (1975-76) 43 U. Chi. L. Rev. 69.

[7] See the discussion of "actuarial causation" in J.D. Fraser & D.R. Horwarth, "More Concern for Cause" (1984) 4 Leg. St. 131. The initial role of the legal economists in the causation debate is well summarized in H.L.A. Hart & T. Honoré, *Causation in the Law,* 2nd ed. (London: Oxford, 1985) at 67-81.

[8] J.G. Fleming, "Probabilistic Causation in Tort Law" (1989) 68 Can. Bar. Rev. 661 [*Fleming*].

[9] M.S. Moore, "Thomson's Preliminaries About Causation and Rights" (1987) 63 Chi.- Kent L. Rev. 497.

[10] Brennan, *supra* note 3.

[11] R.M. Wright, "Causation in Tort Law" (1985) 73 Calif. L. Rev. 1735.

[12] Ginsberg & Weiss, "Common Law Liability for Toxic Torts: A Phantom Remedy" (1981) 9 Hofstra L. Rev. 859.

[13] Fleming, *supra* note 8; McLachlin, J., "Negligence Law - Proving the Connection" in Mullany & Linden, eds., *Torts Tomorrow, A Tribute to John Fleming,* (L.B.C Information Services, 1998) at 18 [*McLachlin, J.*].

[14] Epstein's views were set out in detail in R. Epstein, "A Theory of Strict Liability" (1973) 2 J. Legal. Stud. 151; R. Epstein, "Causation – In Context: an Afterword" (1987)

and Weinrib,[15] and the question became a significant focus of the debate between the economic analysts of law and those purporting an independent, normative or moral role for tort.[16] Despite the differences in approach, most who confronted the issue seemed to agree that causal uncertainty presents central questions for philosophers and lawyers alike.[17]

Now, proponents of assessing causation probabilistically and imposing liability on a 'creation of risk' basis have gained a somewhat surprising ally – a unanimous House of Lords in the decision of *Fairchild et al. v. Glenhaven Funeral Services Ltd. et. al.*[18] In *Fairchild*, the Lords decided that workers injured by exposure to asbestos dust could recover from the companies who negligently exposed them to the substance – and thus to the risk of disease – even though it could not be known *which* of the negligent defendants had caused the illness, and in fact recognizing that, in all likelihood, they were imposing liability on parties whose negligence did not in fact contribute to the injury. Significantly, in imposing liability, the majority of the Lords resisted the temptation to describe their action in the customary, if obfuscative, terms of 'reversal of onus' or the 'drawing of inferences', preferring to openly acknowledge that what they were in fact doing was rewriting the laws of liability and imposing it without any necessity that causation be shown, at least in a certain category of cases.[19]

Our main purpose here is to explore the application of this new liability – '*risk-based liability*' – to mass tort claims viewed in the aggregate. Even in individual litigation, we believe that *Fairchild* will be extended in the years to come in order to aid plaintiffs faced with causal uncertainty. But in mass tort litigation, where the claims of numerous plaintiffs and numerous defendants can be aggregated, *Fairchild* provides further impetus to the movement towards a fully probabilistic assessment of liability and damages, and the arguments against imposing risk-based liability are muted in the context of the class action lawsuit. A thoughtful application of the *Fairchild* principles to mass torts will permit a more

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63 Chi.-Kent L. Rev. 653.

[15] E.J. Weinrib, "Causation and Wrongdoing" (1987) 63 Chi.-Kent L. Rev. 407 [*Weinrib*].

[16] The original debate is captured in R. A. Posner, "Epstein's Tort Theory: A Critique" (1979) 8 J. Legal Stud. 457.

[17] M. Kelman, "The Necessary Myth of Objective Causation Judgments in Liberal Political Theory" (1987) U. Chi.-Kent L. Rev. 579 at 580 "[T]he two liberal theories of the state dominating mainstream legal thought, libertarianism and efficiency-orientation, both rely to an alarming extent on the false premise that causal uncertainty is a peripheral issue."

[18] *Fairchild et al. v. Glenhaven Funeral Services Ltd. et al.*, [2002] UKHL 22 [*Fairchild*].

[19] The Law Lords' speeches are discussed *infra* Part II.

efficient use of the justice system and better ensure that the true costs of harmful activities are internalized by the defendant (the economic justification of both negligence and strict liability rules). Most importantly, though, we argue that such an approach is, in the unique context of the mass tort, completely congruous with moralist, as well as economic, analyses of the purposes of tort law.

II. *The Fairchild Decision*

A. *Is Proof of Causation Really Necessary?*

It is commonly accepted that even a single inhaled asbestos fibre can lead to mesothelioma, a fatal type of cancer that may take decades to proceed to a stage where it can be diagnosed, let alone treated. *Fairchild* involved workers, each of whom had contracted mesothelioma through the negligence of one of the several employers who had wrongfully exposed them to asbestos over the course of their respective employment histories. Because mesothelioma is almost always caused by asbestos exposure, it was accepted that the victim must have contracted it through his work.[20] Upon reaching a unanimous decision that the victim's employers would be held jointly and severally liable to compensate the victim, the House of Lords took the opportunity to review rules of causation from Ancient Rome to modern European countries. In his extensive speech on the question, the senior Law Lord, Bingham of Cornhill, said in the lead judgment:

> The problem of attributing legal responsibility where a victim has suffered a legal wrong but cannot show which of several possible candidates (all in breach of duty) is the culprit who has caused him harm is one that has vexed jurists in many parts of the world for many years... It is indeed a universal problem calling for some consideration by the House, however superficially, of the response to it in other jurisdictions.[21]

His Lordship then reviewed the literature from authorities on European law, and from jurisdictions in which liability had been imposed on a market- share basis,[22] and concluded:

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[20] Even such assumptions, however, reveal the inherent difficulty in knowing anything on more than a probabilistic basis. The recent death of noted author Stephen Jay Gould, for instance, is attributed to mesothelioma even though he had no known contact with asbestos in any workplace. If Gould *had* worked in a shipyard (where many of the asbestos cases originated) at any point in his life, the House of Lords would apparently say, without any hesitation, not that his disease was *probably* caused by that exposure, but rather that it *certainly* was, even though it was not. This paradox results from the refusal by the Lords, like other courts, to recognize the extent to which all evidence of causation is probabilistic, a topic to which we will return later in this article.

[21] *Fairchild, supra* note 18 at para. 23.

[22] *Ibid.* at para. 29, citing *Sindell v. Abbott Laboratories,* 26 Cal. 3d 588 (Sup. Ct.

> Whether by treating an increase in risk as equivalent to a material contribution, or by putting a burden on the defendant, or by enlarging the ordinary approach to acting in concert, or on more general grounds influenced by policy considerations, most jurisdictions would, it seems, afford a remedy to the plaintiff.[23]

B. *Inferences of Law and Fact vs. Risk-Based Liability*

The leading case prior to *Fairchild* had been *McGhee v National Coal Board.*[24] *McGhee* involved an employee who developed dermatitis from coal dust at work but could not establish that the provision of washing facilities (the negligence found) would have prevented his dermatitis. The House of Lords held that he had shown that the failure had *materially increased the risk* of injury and that this was sufficient to shift the burden of proof to the defendant. Lord Wilberforce stated:

> [I]t is a sound principle that where a person has, by breach of a duty of care, created a risk, and injury occurs within the area of that risk, the loss should be borne by him unless he shows that it had some other cause.[25]

The Lords appeared to retreat from their position in *McGhee* in *Wilsher v. Essex Area Health Authority,*[26] holding that the onus of proof may not be reversed, at least in cases where the cause of the harm was not, with certainty, attributable to the defendant. In *Wilsher*, a premature baby had received negligent medical treatment after birth; the child developed an eye condition that could have been caused by negligent treatment (exposure to too much oxygen) or one of a number of other, non-tortious, factors. The claim against the Health Authority had succeeded in the Court of Appeal, which extended the *McGhee* principles. However, Sir Nicholas Browne-Wilkinson dissented and distinguished *Wilsher* from *McGhee* as in *McGhee*, there was only one possible cause of the plaintiff's dermatitis (albeit not necessarily tortious). The Law Lords sided with Sir Nicholas, and refused to impose liability upon the Health Authority, which had no control over the other potential causes of the ailment.

It would be tempting to see Fairchild as nothing more than a cautious return to – and extension of – the ratio of *McGhee*. Although in *Fairchild*, as in *Wilsher*, there may have been other factors responsible for the

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Cal. 1980) [*Sindell*] and *B. v. Bayer Nederland B.V.* (Hoge Raad, 9 October 1992, NJ 1994, 535).

[23] *Fairchild, ibid.* at para. 32. See also *Fairchild, ibid.* at para. 168 "[I]t is not necessarily the hallmark of a civilised and sophisticated legal system that it treats cases where strict proof of causation is impossible in exactly the same way as cases where such proof is possible," per Rodger L.J.

[24] *McGhee v. National Coal Board,* [1973] 1 W.L.R. 1 (H.L.), [1972] 3 All E. R. 1008 [*McGhee* cited to W.L.R.].

[25] *Ibid.* at 6.

[26] *Wilsher v. Essex Area Health Authority,* [1988] 2 W.L.R. 557 [*Wilsher*].

disease apart from a *particular* defendant's negligence, the case was more like McGhee to the extent that the Lords found no possible non- tortious cause of the injury.

But to focus on this aspect of the decision is to lose sight of *Fairchild*'s principle innovation. In *Fairchild*, the Lords chose to embrace *McGhee*'s outcome-oriented approach but abandoned the dishonest device of inferred causation in fact.[27] As Lord Nicholls of Birkenhead suggested:

> In an area of the law already afflicted with linguistic ambiguity I myself would not describe this process of legal reasoning as a 'legal inference' or an 'inference of causation'. This phraseology tends to obscure the fact that when applying the principle described above the court is not, by a process of inference, concluding that the ordinary '*but* for' standard of causation is satisfied. Instead, the court is applying a different and less stringent test. It were best if this were recognised openly.[28]

While from an analytical point of view it may not matter; as Lord Bingham observed, "whether, in certain limited and specific circumstances, a legal inference is drawn or a new legal approach is taken to proof of causation may not make much practical difference," a trend towards clarity and transparency in judicial decision making is welcome:

> ...Lord Wilberforce, in one of the passages of his opinion in McGhee quoted in paragraph 20 above, wisely deprecated resort to fictions and it seems to me preferable, in the interests of transparency, that the courts' response to the special problem presented by cases such as these should be stated explicitly. I prefer to recognise that the ordinary approach to proof of causation is varied than to resort to the drawing of legal inferences inconsistent with the proven facts.[29]

So the decision in *Fairchild* must be seen as more than the simple preference of the earlier decision of *McGhee* over the later, more restrictive view of *Wilsher*. Each of these cases attempted to introduce

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[27] Four of five Lords rejected the use of a factual inference and three rejected the substitution of a legal inference. Lord Hutton was the dissenting voice in favour of clinging to the "factual inference" analysis, and based his speech on his reading of *McGhee*, holding that that case involved an inference of fact. Lord Bingham rejected resort to a factual or legal inference, although he seemed to have acknowledged that in *McGhee* a legal inference was used (*Fairchild, supra* note 16 at paras. 21,34 Bingham L.J.). In Lord Nicholls' view, the Lords were applying a less stringent test rather than a factual or legal inference (*ibid.* at para. 45, Nicholls L.J.). Lord Hoffman acknowledged that the house in *McGhee* made a legal inference, but preferred not to resort to the same legal fiction (*ibid.* at para. 65, Hoffman L.J.). Lord Rodgers disagreed, holding that the increase in risk was sufficient to prove a material contribution and thus appears to have used a legal inference, as the other three Lords agreed was done in *McGhee* (*ibid.* at para. 168, Rodgers L.J.).

[28] *Ibid.* at para. 45 [emphasis added].

[29] *Ibid.* at para. 35 Bingham L.J.

elements of probabilistic causation (i.e. exposure to risk) into the traditional "but for" test of causation-in-fact. In *Fairchild*, the majority of the Lords consciously departed from the "but for" requirement altogether.

C. *Where Does Risk-Based Liability Apply?*

While two of the Lords were content to decide when to apply the new rule on a case by case basis,[30] the three others set out the circumstances required before the rule may be applied.[31] We can reduce the requirements for the imposition of liability in *Fairchild* into four general requirements: (1) that the defendant committed a breach of a duty to the plaintiff, leading to the exposure of the plaintiff to an injurious substance; (2) the plaintiff has been injured; (3) it must be impossible to determine the exact cause of the injury; (4) the wrongdoing was capable of causing the injury that in fact occurred, and there must be an increase in the risk of that injury. If these conditions are found, the causation requirement will be satisfied.[32]

Significantly, all of the Law Lords found that liability arises as a result of *risk contribution*.[33] While such a finding is not groundbreaking in cases of *cumulative* causation (i.e. where each defendant contributed, not just a risk, but an actual causal agent into the chain), it is certainly important when *alternative* independent causes are proposed, as in *Fairchild*.

Fairchild does not offer explicit guidance for a far more common situation: where there are other, possible alternative risk factors that have nothing to do with either the defendant's activities, or other defendants' tortious activities;[34] in other words, where there is simply a "background risk" of the type of harm suffered. The majority of the Lords explicitly avoided deciding this point.[35] Although, in their heavy reliance on the California decision of *Rutherford v. Owens-Illinois*

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[30] *Ibid.* at para. 118 Hutton L.J. See also *ibid.* para. 43 Nicholls L.J.

[31] *Ibid.* at para. 2 Bingham L.J.; *ibid.* at para. 61 Hoffman L.J.; *ibid.* at para. 170 Rodgers L.J. Note that Lord Rodgers considered the conditions listed to be necessary but not always sufficient.

[32] Lord Bingham also set out the additional condition that the employment be at different times and for different periods, as was the case in *Fairchild*, *supra* note 16 at paras. 2,34 Bingham L.J. but it is not clear why the principle should be applied differently when an employee works for two negligent employers at the same time.

[33] See *ibid.* at para. 34 Bingham L.J.; *ibid.* at para. 42 Nicholls L.J.; *ibid.* at paras. 73-74 Hoffman L.J.; *ibid.* at para. 108 Hutton L.J.; *ibid* at para. 168 Rodgers L.J.

[34] Interestingly, Lord Rodgers in *Fairchild* left this door open, but no other Lord explicitly mentioned these possibilities and indeed Lord Bingham's speech appeared to require that the plaintiff should rule out non-tortious causes. See *ibid.* at para. 170 Rodgers L.J.; *ibid* at para. 2 Bingham L.J.

[35] *Ibid.* at paras. 2,34 Bingham L.J.; *ibid.* at para. 118 Hutton L.J.; *ibid.* at para. 170 Rodgers L.J. Lord Nicholls did not mention the question.

Inc.,[36] they suggest a willingness to embrace liability even in such cases.[37]

Another unresolved question following *Fairchild* is whether there remains any distinction between diseases that seem to develop from cumulative exposure to a substance (such as asbestosis) and those that can be caused by a single exposure from alternative possible sources (such as mesothelioma). In the former case, it is easier to consider the exposure a substantial contributing cause of the harm, as opposed to simply creating a risk. Lord Bingham recognized, again relying on *Rutherford*, the distinction is difficult:

> Were the law otherwise, an employer exposing his employee to asbestos dust could obtain complete immunity against mesothelioma (but not asbestosis) claims by employing only those who had previously been exposed to excessive quantities of asbestos dust. Such a result would reflect no credit on the law.[38]

The rules regarding causation in individual cases of gradual exposure of toxic substances can therefore be summarized as follows:

> First, Fairchild confirms the holding in McGhee that, where the defendant breached a duty to the plaintiff, the breach materially contributed to the risk of the type of harm suffered, and the only other possible cause of the harm was that defendant's own (albeit non tortious) activity, that defendant will be liable on a 'semi-strict liability' basis.

Second, a defendant will be jointly and severally liable where it breached a duty to the plaintiff, the breach materially contributed to the risk of the type of harm suffered, and the only other possible cause of the harm was other defendants' parallel breaches of duty to that same plaintiff.

Third, although the point is not at issue in Fairchild, it appears that

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[36] *Rutherford v. Owens-Illinois Inc.*, 67 Cal. Rptr. 2d 16 (Sup. Ct. Cal. 1997) [*Rutherford*].

[37] In *Rutherford*, a judgment with which the Chief Justice and all save one member of the Supreme Court of California concurred, Baxter J. observed (at para. 19):

> Proof of causation in such cases will always present inherent practical difficulties, given the long latency period of asbestos-related disease, and the occupational settings that commonly exposed the worker to multiple forms and brands of asbestos products with varying degrees of toxicity. In general, however, no insuperable barriers prevent an asbestos-related cancer plaintiff from demonstrating that exposure to the defendant's asbestos products was, in reasonable medical probability, a substantial factor in causing or contributing to his risk of developing cancer. We conclude that plaintiffs are required to prove no more than this. In particular, they need *not* prove with medical exactitude that fibers from a particular defendant's asbestos-containing products were those, or among those, that actually began the cellular process of

[38] *Fairchild, supra* note 18 at para. 33.

the Law Lords agree with the Supreme Court of Canada that, in cases of cumulative disease causation, a defendant who contributes an agent into the chain of causation that materially increases the risk of developing a disease that is dependent on the *cumulative* exposure to such agents is liable.[39]

We consider, later in this paper, whether the distinction between 'contributing cause of harm' and 'cause of risk of harm' have any meaning when claims are viewed in the aggregate. But we also focus on this distinction to examine the extent to which it is intertwined with the Lords' choice to consider liability on a joint-and-several, rather than proportional basis. In fact, we will argue that the "no non-tortious cause" requirement, if it is a requirement, need only apply in individual cases where such liability is considered. When liability can be assessed on the basis of risk contribution, and in particular in aggregate claims, the distinction is unnecessary and arbitrary.

III. *The Problem of Indeterminate Causation*

A. *The Inadequacy of the 'But For' Test*

There are both factual and legal elements to the traditional analysis of causation in tort and in negligence in particular. Generally, one must demonstrate causation in fact according to the "but for" test, or "whether the plaintiff would have escaped loss but for the defendant's conduct". Then, if one is applying a negligence, as opposed to strict liability, standard, the question of "proximate cause" arises – "whether the link in question is close enough to merit the imposition of legal responsibility".[40] This might be characterized as a scientific question, followed by a question that is heavily infused with notions about rights and responsibilities, and is viewed as a question of policy. Both aspects of this process have been highly individualistic. The model of responsibility for harm upon which the law of tort has been built focuses on the identification of a single wrongdoer who, through observable chains of either mechanical or organic causation can be said to be uniquely responsible for the injury caused. This model has, of course, been substantially embellished to deal with multiple defendant and multiple

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[39] See the discussion of *Athey, infra* at notes 117 and 118 and accompanying text.

[40] *Ibid.* The question of "remoteness" and the related idea of "foreseeably" is most famously discussed in the case of *Palsgraf v. Long Island Railroad Company*, 248 N.Y. 339, 162 N.E. 99 (N.Y. Ct. App. 1928), rearg. den. 249 N.Y. 511, 164 N.E. 564 [*Palsgraf*], where an extraordinary unlikely igniting of fireworks at a train station led to a bystander's injury from falling scales. The *Palsgraf* rules were modified in *Derdiarian v. Felix Contracting Corp.*, 51 N.Y.2d 308 at 315 (N.Y. Ct. App. 1980) to break the "causal nexus" where "the intervening act is extraordinary under the circumstances, not foreseeable in the normal course of events, or independent of or far removed from the defendant's conduct".

plaintiffs, and has also developed a "robust" approach to the inference of causation in certain cases, yet at bottom it is still built on the individualistic premises of nineteenth century tort law.

There is a maturing awareness in various common law communities of the limitations of the traditional tort law approach to causation, particularly in the case of delayed onset diseases. In 1998, Madame Justice McLachlin (as she then was), writing extra-judicially, put it this way:

> Why are courts now asking questions that for decades, indeed centuries, did not pose themselves, or if they did, were of no great urgency? I would suggest that it is because too often the traditional 'but-for', all-or-nothing, test denies recovery where our instinctive sense of justice - of what is the right result for the situation - tells us the victim should obtain some compensation.[41]

Fleming, in his influential article on probabilistic causation, had suggested that tort law's inability to cope with the inadequacy of the 'but for' test was in part a result of the different problems arising within the field as a consequence of modern civilization:

> Courts have now been confronted repeatedly with tort plaintiffs whose fate depends on acceptance of probabilistic evidence based on epidemiological or other statistical evidence. Modern technology has contributed to this situation in two ways, by both creating the agents of pollution and by increasing scientific knowledge enabling more confident assessments of causation and attribution of responsibility. A principal question is whether legal routines can adapt themselves to changing scientific epistemology based on probabilistic evidence.[42]

In our view, McLachlin J. and Fleming are, taken together, correct. It is the evolving scientific (and, correspondingly, public) understanding of the uncertainty of proof identified by Fleming that gives rise to the injustice perceived by McLachlin.

The way the law thinks about the causal sequence of events has tended to mirror the way that science understands them, and indeed, the way in which ordinary people view the world. That is to say, scholars promoting a view of corrective justice rooted in Aristotelian thought stress the necessity of connection between wrongdoing and injury,[43] in the same way that the ancient Greeks understood the moral role of fate and the determinism of circumstances. Similarly, modern tort law developed in an era where the accepted scientific view was essentially Newtonian, dominated by ideas of cause and effect. Likewise, the problems that the law could deal with involved observable forms of

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[41] McLachlin J., *supra* note 13 at 16.

[42] Fleming, *supra* note 8 at 681.

[43] The Aristotelian view of "corrective justice" as it is applied by modern tort scholars is explained in *Weinrib*, *supra* note 15 at 449-50.

injury (usually traumatic), caused by easily identified agents (usually acting by commission rather than omission, since the latter raises speculative causal issues).

Over the last 100 years science has come to understand that causation exists on a continuum of probabilities, and while scientists most often continue to use the shorthand of Newtonian certainty, they are really expressing ideas with varying levels of confidence.[44] As a result, legal and scientific thought on questions of cause and effect have diverged.[45]

The modern understanding of disease, injury and illness is no longer confined to the mechanical and particularistic model. As our understanding of disease patterns progresses, science and medicine are increasingly able to attribute the source of illness in a population with a high degree of confidence. However, disease often, if not usually, have numerous potential causes (and indeed may occur naturally), it is often difficult or impossible for a plaintiff to prove, on the balance of probabilities, that his injury resulted from the defendants' negligence, or to put it another way, that his injury would *not* have arisen "but for" the negligence of the defendant.

The resulting irony is that we may know with certainty (or at least as much certainty as scientific inference can provide) that in 100 cases of a particular injury, at least 40 of those injuries were caused by exposure to a toxic substance. Yet in any individual case, because there is only a 40% chance that the injury was caused by the exposure, the defendant cannot be said legally to have caused the individual harm complained of. The divergence of legal and scientific conclusions in this fashion seriously undermines the law's deterrence and compensation functions, and it is our aim in this paper to show how the divergence can be significantly reduced or eliminated.

Causation of harm *in the aggregate* becomes clearer, even as the individual identity of the victims, and their individual connection with each wrongdoer, is lost. "Likelihood" in an individual sense is based on the predicted causation in the aggregate population. Each concept, in

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[44] Brennan, *supra* note 3 at 483 "[s]cientists recognize that the causal concepts they use often express probabilistic reasoning as deductive reasoning".

[45] It remains a common tool of legal argumentation to suggest that one's interlocutor is 'confusing correlation with causation', yet to a scientist, there is only theoretical difference between the two: science expresses confidence about the causation of events largely based on correlation; causal hypotheses based on observed phenomena may be formed and tested through predicted "outcomes" and confounding factors reduced in experimental conditions, but in the end such experiments still produce only more correlations, though after a sufficient consistency the two events can be said with *increasing confidence – but never absolute certainty* – to be causally connected. Causality, in other words, is innately hypothetical; the purpose of much of science is to test and probe the causal hypothesis.

other words, is conceptually reliant on the other. But is there a ground for preferring one view? In our view, viewing inherently probabilistic causation in the aggregate – as a definite harm in a percentage of the population rather than a probabilistic harm in an individual – provides several advantages in the resolution of mass tort claims.

This problem of "specific causation" or "individual injury attribution" is compounded when we are faced with multiple defendants. We may know that the plaintiff's injury is clearly attributable to exposure to a particular substance, but there are many potential defendants whose wrongdoing *might* have exposed the plaintiff to that substance and therefore it is similarly impossible to determine who is to blame (what Fleming famously called the problem of the "indeterminate defendant"[46]). Again, traditional tort law, which relies not just on blameworthiness but on causation in fact, is of little assistance.

In a system, such as ours, that relies in part upon tort victims and their lawyers to regulate the behaviour of wrongdoers, if the victims cannot recover then those whose negligence causes such widespread insidious harm might escape having to pay for, or internalize, the cost of the harm. The result – in either a negligence or strict liability regime[47] – is systemic undercompensation of victims, and underdeterrence of wrongdoing, two profound problems for the law of torts from a functionalist perspective. Even if first-party insurance covers the costs to the victims, underdeterrence means the overall costs of accidents is not reduced. Moreover, the business activities of the wrongdoers in such a paradigm are being externalized – heavily subsidised by either the victims (who bear their own harm or, in the case of contractual consumers, pay a 'tort insurance premium' to the defendants), the public at large (in the case of social insurance) or other particular classes (through private insurance policies).[48]

Because most disease processes, particularly latent diseases, have

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[46] Fleming, *supra* note 8.

[47] Although law and economics scholars disagree over the best rule to apply in particular circumstances, optimal deterrence in either analysis depends on the full internalization of at least that harm which is foreseeable. See S. Shavell, *Economic Analysis of Accident Law* (Cambridge: Harvard University Press, 1987).

[48] The analysis here is based on basic economic principles of accident law as developed by scholars of the previous three decades. See G. Calabresi, "Some Thoughts on Risk Distribution and the Law of Torts" (1961) 70 Yale L.J. 499; G. Calabresi, *The Costs of Accidents: A Legal and Economic Analysis* (New Haven: Yale University Press, 1970); A. M. Polinsky, *An Introduction to Law and Economics*, 2nd ed., (Boston: Little Brown, 1989); R.A. Posner, *Economic Analysis of Law*, 5th ed., (New York: Asper Law & Business, 1998); Shavell, *supra* note 45; S. Shavell, "The Level of Litigation: Private Versus Social Optimality of Suit and of Settlement" (1999) 19 Int'l Rev. L. & Econ. 99; Kaplow & Shavell, "Fairness vs. Welfare" (2001) 114 Harv. L. Rev. 961 [*Kaplow & Shavell*

many correlatives that might be said to increase risk, it is often very difficult to ascertain who in the population of sufferers actually got their disease from exposure to any single substance, let alone whether it was the defendant before the court who made it. Mesothelioma is in comparison a straightforward issue – it is, for practical purposes, always caused by inhalation of asbestos fibres, exposure to which might always result from negligence. Other diseases, including most other cancers, have numerous factors associated with their occurrence; the most that can be said in most cases is that exposure to particular substances increased the risk of disease; tortious causation – even by the relaxed standard of 'substantial i.e. non-*de minimus* contribution' – can in most cases never be directly proven. Parallelling the problem of the indeterminate defendant, then, is what Fleming called that of the indeterminate *plaintiff*.[49]

Yet the problems of the indeterminate plaintiff and defendant, while they may be procedurally distinct, are analytically the same: the problem is the ambiguity of the causal nexus between an injured person and a person who has negligently exposed that person to risk of the sort of injury that the person has.

Dealing with the problem of probabilistic or indeterminate causation challenges lawyers to think in ways that are not necessarily familiar; in particular, it forces us to confront the idea of liability based upon *risk contribution*, rather than in the more traditional modes of causation that are vestiges of intentional torts such as trespass.[50] Yet this approach may be necessary. Decisions made by defendants regarding the level of precaution that they will take are made, where not dictated by formal regulation, on a probabilistic basis; investments in precautions will be made up to the point of diminishing returns, based on the companies' own assessment of the aggregate of its expected liability. In other words, the behaviour of potential wrongdoers (which tort law seeks to modify and regulate) is governed by the wrongdoers' own assessment of the risk of harm that it will eventually be forced to internalize if precautions are not taken, weighed against the savings that will likely accrue if they are. If we are to assign liability on a fault-based system, then, it is not unjust – indeed it seems perfectly just – to assign it on the basis of increased risk, at least from a deterrence point of view.

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[49] *Fleming, supra* note 6 at 679ff.

[50] For a history of probabilistic analysis, see P. L. Bernstein, *Against the Gods: The Remarkable Story of Risk* (New York: Wiley, 1996). Bernstein traces the theory of probability, the root of all the modern principles of insurance, investment and risk tolerance (and by implication substantive notions of objective reasonableness) to no earlier than 1654, a remarkably short time ago. That our legal system has yet to fully accept it is perhaps some testament to the extent to which probabilistic thinking runs against the natural grain of human thought.

B. *Some Approaches to Indeterminate Causation*

(1) *Statutory Reform of Causation Rules*

Perhaps not surprisingly, some of the earliest innovations to relieve the burden of proving causation in mass exposure situations were the result of political, rather than judicial, initiatives. In early workers' compensation laws, for instance, employees of particular businesses with which certain diseases were associated could recover without proof of causation if they developed the disease.[51] That these schemes were necessitated by systemic inability to prove scientific causation in the case of prolonged exposure diseases is made clear by McElveen & Postol:

> When states first began to compensate workers for occupational diseases, they grafted coverage for such diseases onto existing accident compensation systems. Thus, a disease or illness was considered to be "occupational" if ... it arose out of or in the course of employment. Yet establishing the causation of a disease is often complicated: a disease's etiology may be unknown and undeterminable. Moreover, diseases tend to develop over a period of years rather than at a single moment in time. States therefore developed various methods to determine whether a disease arose out of or in the course of employment.
>
> The first solution to [this problem] was the development of schedules, which listed diseases that medical science had demonstrated to be employment related. Listed diseases were presumed compensable and, under some statutory schemes, the listing was conclusive....[52]

Statutory reversal of onuses in indeterminate causation cases, or even conclusively-deemed causation, are common devices, enacted to deal with problems as diverse as railway-related injuries in B.C.,[53] Black Lung Disease in the U.S.,[54] tobacco-related harm in British

[51] The *Workmen's Compensation Act*, (U.K.) 1906, 6 Edw. VII, c. 58 established a cause of action for employees against their employer regardless of fault. There were provisions for 'deemed liability', and statutory apportionment among multiple employers for the compensation. Under the Schedules to the Act, certain diseases were deemed to have been caused by exposure in particular industries. For instance, if a miner contracted Anklyostomiasis (*ibid.* at Sch. III), he was deemed to have contracted the disease from his work at the mine, "unless the employer proves to the contrary" *ibid.* at s.8(2).

[52] McElveen & Postol, "Compensating Occupational Disease Victims Under the Longshoremen's and Harbour Workers' Compensation Act" (1983) 32 Am. U.L. Rev. 717 at 720.

[53] British Columbia's *Employers' Liability Act of 1891*, S.B.C. 1891, c. 10 provided that injuries suffered in certain circumstances by rail-workers are "deemed and taken to have been caused by reason of [an actionable] defect".

[54] In *Usery v. Turner Elkhorn Mining Co.*, 428 U.S. 1 (1975), the Supreme Court

Columbia[55] and Newfoundland.[56] and even damage resulting from Canadian nuclear accidents.[57]

Even in cases where the statute does not explicitly alter causation rules, some courts have proven themselves willing to relax the rules of causation when the breach is of a legislative duty. In the earlier case of *Nicholson v .Atlas Steel Foundry and Engineering Co Ltd.*, Vol. 1, [1957] 1 WLR 613 the victim had worked in the defenders' steel foundry, had inhaled dust containing siliceous particles, and died of pneumoconiosis. It was alleged that the defendant had failed to provide adequate ventilation to extract the dust. The House of Lords considered the statutory duty to provide proper ventilation imposed by section 4(1) of the *Factories Act 1937*, and Viscount Simonds said (at p 618):

> . . . . if the Statute prescribes a proper system of ventilation by the circulation of fresh air so as to render harmless, so far as practicable, all fumes, dust and other impurities that may be injurious to health, generated in the course of work carried on in the factory, and if it is proved that there is no system or only an inadequate system of ventilation, it requires little further to establish a causal link between that default and the illness, due to noxious dust, of a person employed in the shop. Something is required as was held in Wardlaw's case. I was a party to that decision and would not in any way resile from it. But it must not be pressed too far. In the present case there was, in my opinion, ample evidence to support the appellants' case.

In other words, if the defendant's breach of its statutory duty increases exposure to a material that can cause the disease eventually contracted by the victim, the traditional rules of causation will be relaxed markedly in the circumstances. But should it make any difference whether the duty was imposed by statute or at common law?

(2) *Probabilistic Discounting*

Courts have always accepted that where the *future* manifestation of wrong-caused injury is uncertain, the award should be discounted on a

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of the United States upheld the constitutionality of the U.S. Federal *Coal Mine Health and Safety Act of 1969*, 83 Stat. 792 as amended by the *Black Lung Benefits Act of 1972*, 86 Stat. 150, 30 U.S.C. 901 et seq. (1970 ed. and Supp. IV), which applied to a particular industry, namely coal mining, and enacted a series of presumptions relating to the cause of respiratory disease in miners.

[55] *Tobacco Damages and Health Care Costs Recovery Act*, S.B.C. 2000, c. 30.

[56] *Tobacco Health Care Costs Recovery Act*, S. N. 2001, c. T-4.2.

[57] The *Nuclear Liability Act*, R.S.C. 1985, c. N-28 at s. 4 provides, that an operator of a nuclear installation is, "without proof of fault or negligence, absolutely liable for a breach of duty imposed on him...". If more than one operator is at fault and it is not possible to separate the damages caused by each, they are, by virtue of s.5, jointly and severally liable. Certain consequential damages may be also according to s. 6, be "deemed... to be attributable to that breach of duty".

probabilistic basis.[58] Where the negligence of the defendant causes some present injury, the future extent of that injury, the possibility that the plaintiff might develop a related injury or disease, the chances of aggravation or improvement, and all the associated costs, are all measured probabilistically. Thus, where there is a chance that the plaintiff's injury will diminish, damages can be discounted for that probability. Where the chances are that things will get worse, damages are increased.[59]

Courts treat past incidents, whether knowable or not, as somehow distinctly different from future eventualities, which are inherently probabilistic. It is said that probabilistic reasoning can be used to measure the extent of loss or injury in the future (because the future is inherently probabilistic), but not to determine whether a current injury was in fact caused by the defendant (because the present and past are susceptible of exact proof). But there is no principled reason for doing this. If one accepts that the causal connection between an incident of negligence and an individual's disease is unknown, and quite possibly unknowable, then the court dealing with causation-in-fact is engaged in a probabilistic assessment exactly paralleling the one involved in the calculation of future damages, it just refuses to admit it.

A natural objection to the discounting of *most* awards probabilistically is, of course, that to do so will not provide *restitutio ad integrum*; such an award cannot "make the victim whole."[60] Setting the obviously questionable underlying assumption that the award of pecuniary damages does indeed make an injured person "whole", we must remember that we are, at least notionally, concerned with all outcomes in the tort system, not only the outcomes in those few cases where both factual and legal causation cross the 50% threshold of likelihood.[61] Against this, it could be argued that in "under 50%" cases it is better to receive something than nothing at all, and in "over 50%" cases it might be more just to the defendant to avoid charging the whole of the costs. While compensation may, in individual cases be less satisfying, deterrence will be more accurate as overall defendants will internalize the cost of harm. Optimal deterrence would in turn reduce the number of

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[58] S.M. Waddams, "The Valuation of Chances" (1998) 30 Can. Bus. L.J. 86 at 87 [*Waddams*].

[59] Cassels, *supra* note 4 at 120-21.

[60] Fleming, *supra* note 8 at 680.

[61] Indeed we use the 50% figure only for convenience assuming, of course, that courts do require a 50%-plus probability. There is some evidence to suggest that in fact both judges and juries view the probabilistic threshold for civil liability at around 75%, closer to the 'proof beyond a reasonable doubt' standard of criminal law: R.J. Simon & L. Mahan, "Quantifying Burdens of Proof" (1970-71) 5 Law & Soc. Rev. 319. For simplicity's sake, though, we here refer to the 51% threshold when dealing with proof on a balance of probabilities.

future victims.[62]

Nevertheless, the incorporation of probabilistic discounting into questions of the causation of *past* harm has found application in Canadian jurisprudence only when it can be characterized as a "loss of chance", and only for a brief time at that, as we shall discuss later in this Part.

(3) *Alternate Liability*

The theory of alternate liability applies where two or more defendants are guilty of negligent conduct in circumstances where the conduct of just one of them must have injured the innocent plaintiff. By this theory, each of the defendants in such a case would be considered to be the cause of the plaintiff's loss unless they can exculpate themselves individually. Defendants unable to meet the burden of proof are held jointly and severally liable.

The famous case of *Cook v. Lewis*,[63] is one contribution of the Supreme Court of Canada to the problem of the indeterminate defendant. Two hunting companions both negligently fired at a third, who was struck by one bullet. The Supreme Court of Canada held that where both defendants are negligent and had rendered it impossible for the plaintiff to prove which one had caused the injury, both would be equally liable if they could not prove their causal innocence.

In reaching this decision, the Supreme Court relied upon the similar American case of *Summers v. Tice*. In that case, the California Supreme Court had stated:

> [The defendants] are both wrongdoers - both negligent toward the plaintiff. They brought about a situation where the negligence of one of them injured the plaintiff, hence, it should rest with them each to absolve himself if he can. The injured party has been placed by defendants in the unfair position of pointing to which defendant caused the harm. If one can escape the other may also and the plaintiff is remediless. Ordinarily defendants are in a far better position to offer evidence to determine which one caused the injury.[64]

While the outcome of *Cook* and *Summers* may seem intuitively satisfying, the reasoning employed in the above passage seems somewhat

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[62] It is difficult to determine just how much support the current regime derives from its self-delusion that the compensation it provides is adequate. While this may be so in individual cases, these must be weighed against the many more cases in which compensation is denied, or not even pursued. Moreover, in choosing compensation *over* deterrence, courts are simply expressing an irrational (though understandable) preference to ameliorate the suffering of the party it actually sees, rather than the victims who escape its attention.

[63] *Cook v. Lewis*, [1951] S.C.R. 830 [*Cook*].

[64] *Summers v. Tice*, 199 P. 2d 1 (Sup. Ct. Cal. 1948) [*Summers*].

strained. The defendants did not "[bring] about a situation where the negligence of one of them injured the plaintiff"; at least, one of them did not. How, then, is it possible to justify the imposition of liability on the "innocent" defendant?[65] One rationale offered by the Courts is that the negligence of the "innocent" hunter covered up the liability of the "guilty" one. That is to say, had the "innocent" gunman not negligently fired, the plaintiff would not have been deprived of the opportunity to prove causation. But this explanation is difficult to fit within traditional conceptions of negligence, because it would, in theory, require that the "innocent" gunman could foresee that a second, "guilty" gunman would fire in the same direction at the same time, and thus a duty was owed by the "innocent" gunman to the victim not to shield the "guilty" gunman from liability. If such an analysis is to be inferred (for it is nowhere explicit), then it would require that we acknowledge, at the very least, a striking relaxation of the doctrine of remoteness.

But an alternative, and perhaps more straightforward rationale is to once again take refuge in a distributive decision – to say that, as between the reckless hunters and the innocent victim, it is better that the harm is borne by the wrongdoers, causation aside.[66] Here, a semblance of corrective justice is maintained by requiring at least that both defendants have acted carelessly towards the plaintiff and there has been, therefore, some moral wrongdoing by each 'directed at' the eventual victim.

But *Cook* and *Tice*, by ostensibly relying on an onus shift when it was clear the reversed burden could not possibly be met (and indeed the rule seems to apply principally in cases – conspiracies of silence aside[67] – where the onus *cannot* be met), managed to do away with causation while retaining the pretense that they were doing nothing of the sort. They are therefore unsettling decisions for those wed to the corrective justice model, while managing to be hardly satisfying for functionalists, either.

Although the theory of alternate liability has been tailored in the

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[65] Here of course, an "innocent" and "guilty" defendant exist only in the way it can be said that Schrodinger's famous cat is neither alive nor dead – they must be conceived as entirely probabilistic assignments to the extent that the true state of affairs cannot be known. We might as well describe each defendant as, causally speaking, "innocent/guilty".

[66] Certainly this is the traditional justification for *Summers*. See Malone, "Ruminations on Cause-In-Fact" (1956) 9 Stan. L. Rev. 60 at 66-68. Yet Rosenberg points out, that reliance on the distributive rationale "surely represents a radical departure from traditional notions of culpability": D. Rosenberg, "The Causal Connection in Mass Exposure Cases: A 'Public Law' Vision of the Tort System" (1984) 97 Harv. L. Rev. [*Rosenburg*] at 882.

[67] See *Ybarra v. Spangard*, 25 Cal. 2d 486, 154 P. 2d 687 (Sup. Ct. Cal. 1944). In that case a surgical team bore burden of explaining how anaesthetized victim was injured in the shoulder during an appendectomy. None could explain and all were held liable.

United States to have application in some products liability cases,[68] the justifications offered for the *Cook v. Lewis* rule do not find ready application in mass tort situations, for a variety of reasons. Consider, for instance, that the *Cook* rule appears only to apply when the conduct of the *defendant* destroys the plaintiff's power of proof. What if it is the plaintiff who does so, through her own lifestyle choices, selection of products, and so on? What if *no one* is responsible for the absence of information on causation, but rather it results from the limits of scientific knowledge? This last case, moreover, counters a main justification for the rule in *Cook v. Lewis* – the idea that the defendants are in a better position to say which of them caused the plaintiffs injury. While this may hold true in a small minority of products liability or toxic tort cases, the fact remains that scientific understanding of causation of disease processes is still primitive,[69] and cases of genuinely indeterminate causation will always remain. If we hold one of several manufacturers jointly liable for an exposure-related harm, it cannot be because we believe that that defendant possesses information about the actual liability of another that could be prised out through the lawsuit; some other justification must be found.

(4) *Liability Based on Concert in Action, Enterprise Theory, or Market Participation*

Before continuing to discuss the breadth of the extension of burden-shifting causation rules and their interaction with other emerging tort doctrines such as "loss of chance", we should describe some other ways in which legal findings of joint liability can serve to relieve the plaintiff of the burden of demonstrating exactly which defendant caused the harm complained of.

It has long been recognized that a person may be liable for harm caused by the act of another if acts in concert toward the commission of a tort.[70] Yet, while a tort of "concerted action" might ease the burden on

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[68] See *Abel v. Eli Lilly & Co.*, 343 N. W. 2d 164 (Mich. 1984); *Ferrigno v. Eli Lilly & Co.*, 420 A. 2d 1305 (N.J. 1980); and *Minnich v. Ashland Oil Co., Inc.* 473 N.E.2d 1199 (Ohio 1984).

[69] And we here mean that the particularistic understanding of many disease processes, be they chemical, biological, mechanical, is primitive, not that (as we emphasize here throughout), causal attribution cannot be known in an aggregate sense with some precision.

[70] This is so if he: (a) does a tortious act in concert with another or pursuant to a common design with the other, or (b) knows that another's conduct constitutes a breach of duty and gives substantial assistance or encouragement, or (c) gives substantial assistant to the other in accomplishing a tortious result and that person's own conduct, separately considered, constitutes a breach of duty to the third person: American Law Institute, *Restatement (2d) of Torts* (1979), § 876. endorsed in *Granewich v. Harding*, 985 P.2d 788 (Sup. Ct. Or. 1999).

plaintiffs of proving causation, it does not represent a disconnection of the causal nexus. Rather, it widens the old notions of duty and foreseeability to capture behaviour that might before have appeared too remote to attract liability.[71]

Related to "concerted action" is the concept of "enterprise liability"[72] first adopted in *Hall v. E.I. duPont De Nemours & Co.*[73] In *Hall*, the plaintiffs were children who had been injured by blasting caps. As they could not identify the particular explosives manufacturers of the caps that had injured them, the plaintiffs sought damages from six manufacturers and their trade association. The Court held that each member of the blasting cap industry could be found liable on the theory that each contributed to the failure of the trade association to set adequate industry-wide safeguards and warnings:

> [W]here...individual defendant-manufacturers cannot be identified, the existence of industry-wide standards or practices could support a finding of joint control of risk and a shift of the burden of proving causation to the defendants.[74]

So while, following *Hall*, a plaintiff need not identify the specific defendant that manufactured the product that caused her particular injury, she must still demonstrate that the defendants were aware of the risks of their product and possessed a joint capacity to significantly reduce or totally eliminate those risks[75] in order for the burden shift to operate.[76] Again, this is not a disconnection of the causal nexus, but a broadening of the traditional requirement to connect through foreseeability the behaviour (the "controlled" risk) with the harm (to customers of the industry as a whole). Such "enterprise liability", like concerted action and the *Cook* and *Tice* cases, still relies on the idea that the defendant has, in fact, *caused* the plaintiff's harm through act or omission. The risk-based liability of *Hall* still requires that the defendant increased the risk *to the plaintiff*.

A more flexible, but arguably far slipperier means of approaching indeterminate causation is to impose liability on the basis of *global* risk-creation as was accomplished through the "market share liability"

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[71] See *Hymowitz v. Eli Lilly and Co.*, 539 N.E.2d 1069 (N.Y. 1988), cert. denied, 493 U.S. 944 (1989). In that case the court held that a parallel activity, without more, was not sufficient to establish a concert action claim.

[72] Enterprise liability is a term used in a broad array of contexts. Here it is used to describe the imposition of liability on the basis of participation in a particularly cohesive industry.

[73] *Hall v. E.I. duPont De Nemours & Co., Inc.*, 345 F. Supp 353 (E.D.N.Y. 1972) [*Hall*].

[74] *Ibid.* at 374 [emphasis added].

[75] *Ibid.* at 378.

[76] *Ibid.* at 379-80.

designed in the 'DES cases' in the United States, and in particular *Sindell v .Abbott Laboratories*.[77] Under these approaches, where an individual or group is injured by a product or process, but it is unclear which of a number of defendants involved in the activity is specifically responsible, all wrongdoers are assessed damages according to their contribution to the overall risk to the exposed population (assessed by their market share or other factors).[78]

Market share liability bridges the conceptual gap between these types of case on the one hand, and true probabilistic causation on the other. While it is in its strictest form simply a form of apportioning damages, in practice it might also be said to establish liability on a probabilistic basis – because under market share theory, a defendant can be found liable for negligence "in the air"; that is to say, a liable defendant need not, as in *Cook* and *Hall*, have breached its duty to the particular plaintiff before the Court.

While there is still a vestige of the idea in *Sindell* that liability is being imposed through a rebuttable presumption of causation, it is difficult to entirely confine the Court's reasoning in this way.[79] The breakthrough in *Sindell* is the explicit recognition that liability is almost certainly being imposed upon defendants who, while they must be shown to have breached a duty 'at large', cannot be shown to have owed any duty to the particular plaintiff. The causal nexus is therefore not simply enlarged, but ignored. Such a bold move, generally lauded by functionalists,[80] was of course not without its

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[77] *Sindell, supra* note 21. From 1947 to the 1971, DES had been prescribed to women as a means of preventing miscarriages. Tragically, the drug caused cancer in young women whose mothers had used the drug while pregnant. After the Food and Drug Administration banned DES, a number of lawsuits were filed against its manufacturers by daughters of women who took the drug during their pregnancy. Prior to *Sindell*, many of these lawsuits were dismissed because of an inability of the plaintiffs to identify the manufacturer of the DES taken by their mother; DES had been produced in a generic form by over 300 drug companies.

[78] Richard Delgado, "Beyond Sindell: Relaxation of Cause-in-Fact Rules for Indeterminate Plaintiffs" (1982) 70 Cal. L. Rev. 881; Glen O. Robinson, "Multiple Causation in Tort Law: Reflections on the DES Cases" (1982) 68 VA. L. Rev. 713; Glen O. Robinson, "Probabilistic Causation and Compensation for Tortious Risk" (1985) 14 J. Legal Stud. 779.

[79] *Sindell, supra* note 22 at 936.

[80] See Kaplow & Shavell, *supra* note 48 at 1207 noting that deterrence and compensation are both optimized in a market-share regime. Indeed, Kaplow & Shavell persuasively argue that, when all members of an industry are negligent in a way that results in widespread harm, any resources spent on determining who is to blame detract from the amounts that can be dedicated to compensation, without providing any more exact deterrence, because *expected* liability is the same throughout the industry no matter how blame is eventually apportioned.

moralist critics.[81] Even Fleming argued that courts should avoid such radical departure, which is "not corrective, but distributive justice":

> Such a break from the whole tradition of our cultures should be at best a program for legislation, not judicial reform.[82]

Indeed, since Fleming wrote, market share liability has been enacted in several jurisdictions with respect to generalized harm of a causally-indeterminate nature. For instance, in many US states, "Drug Dealers' Liability Acts" [83] provide for market-share liability of drug dealers for harm caused within their "markets" as the term is statutorily defined. Similarly, tobacco costs recovery legislation in British Columbia,[84] Newfoundland[85] and Florida[86] have contained market-share liability-apportionment schemes. There is even some suggestion that market-share theory might, at common law, support a cause of action in Canada.[87]

(5) *Liability for Medical Monitoring*

Another interesting way in which risk-based liability is being introduced into judgments is through claims for medical monitoring. That is, plaintiffs argue that the defendant's negligence has exposed them to greater risk of harm, and that although the harm has not yet manifest (and indeed will not manifest in many of the plaintiffs), the risk itself has

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[81] See D.A. Fischer, "Products Liability – An Analysis of Market Share Liability" (1981) 34 Vand. L. Rev. 1623 at 1623, 1629-30, 1638-39.

[82] Fleming, *supra* note 8 at 668.

[83] See e.g. Arkansas: *Drug Dealer Liability Act*, 1995 Ark. Acts No. 896 (codified at Ark. Code Ann. '' 16-124-101 to -112 (Mich. Supp. 1997)); California: *Drug Dealer Liability Act*, 1996 Cal. Legis. Serv. 3792 (West) (codified at Cal. Health & Safety Code '' 11700 to 11717 (West Supp. 1998)); Illinois: *Drug Dealer Liability Act*, 1995 Ill. Leg. Serv. 89-293 (West) (codified at 740 ILL. COMP. STAT. ANN. 57/1-25 (West Supp. 1997)); Michigan: *Drug Dealer Liability Act*, 1994 Mich. Legis. Serv. 27 (West) (codified at Mich. Comp. Laws Ann. '' 691.1601-.1619 (West Supp. 1998)).

[84] *Tobacco Damages and Health Care Costs Recovery Act*, S.B.C. 2000, c. 30.

[85] *Tobacco Health Care Costs Recovery Act*, S. N. 2001 c. T-4.2.

[86] *Medicare Third Party Liability Act* 409.910(9)(b), Fla. Stat. (1995), considered in *Agency for Health Care Administration et al. v. Associated Industries of Florida Inc.*, 678 So.2d 1239 (Fla. 1996).

[87] In *Gariepy v. Shell Oil Co.* (2000), 51 O.R. (3d) 181 the Court declined to dismiss a claim against a defendant served *ex juris*, in part on the ground that the plaintiffs' claim for market share liability made the extension of jurisdiction to the defendants appropriate even absent any other act by the defendants establishing the requisite "real and substantial connection" with Ontario. Cumming J. said at para. 11: As well, where the specific manufacturer of a defective product used by a particular class member is unknown but the product by different manufacturers is the same, then liability may be able to be determined on a market share theory: *Hall v. Du Pont de Nemours & Co.*, 345 F.Supp. 353 (E.D.N.Y. 1972) at pp. 370, 371; *Sindell v. Abbott Laboratories*, 26 Cal.3d 588, 607 P.2d 924 (1980) at para. 59.

caused loss in the form of the costs associated with medical tests and procedures necessary to either prevent or detect onset.

In a sense, a medical monitoring award can be seen as probabilistic because it is unrelated to the actual causation of injury (as that term is traditionally understood) and might represent a "discounted" assessment of damages, though this latter point is more difficult. The claim is perhaps most closely analogous to the economic loss asserted in *Rivtow Marine Ltd. v. Washington Iron Works*,[88] where the Court allowed compensation for 'down time' incurred when (probabilistically) dangerous cranes were taken out of commission when one of them had failed due to cracks.

A medical monitoring claim has been advanced in the Phen-Fen diet pill litigation, where provincial health plans are claiming as subrogees for the cost of monitoring. The hearing judge refused to dismiss the claim, and on appeal it was noted that medical monitoring claims have been advanced previously in Canada,[89] and that the "issue is arguable and should not be excluded at this stage of the proceeding."[90] Medical monitoring pleadings had been allowed to proceed in at least two other cases,[91] neither of which offered a final resolution of the legal question.

(6) *From Burden-Shifting and "Loss of Chance" to Probabilistic Causation*

The principles that we have described so far elucidate the move from the joint liability of traditionally-defined wrongdoers (i.e. those who have owed, and breached, a duty to the particular plaintiff, and that breach has demonstrably caused the harm) towards a more results-focused liability based on distributive principles. In the latter theory, it is not necessary to demonstrate that causal relationship between wrongdoer and wronged – the necessity of causation-in-fact has been relieved to serve the ends of deterrence and compensation. Concert-in-action, enterprise liability, and more starkly market-share liability represent a trend toward a functionalist approach to mass exposure torts, and away from the moralistic viewpoint.

As we noted earlier, the leading English cases considering probabilistic causation prior to *Fairchild* had been *McGhee*,[92] in which an employee who developed dermatitis - certainly through his employment

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[88] *Rivtow Marine Ltd. v. Washington Iron Works,* [1974] S.C.R. 1189.

[89] *Wilson v. Servier Canada Inc.* (2000), 52 O.R. (3d) 20 (Sup. Ct.).

[90] *Ibid.* at para. 12.

[91] *Nantais v. Telectronics Proprietary (Canada) Ltd.* (1995), 127 D.L.R. (4th) 552 (Ont. S.C.), leave to appeal refused (1995), 129 D.L.R. (4th) 110 (Gen. Div.), leave to appeal denied (1996), 28 O.R. (3d) 523n (C.A.); and *Anderson v. Wilson* (1999), 44 O.R. (3d) 673 at 675-76 (C.A.).

[92] *McGhee* cited to W.L.R., supra note 24

but not necessarily negligently – was compensated, and *Wilsher*,[93] which held that the onus of proof may not be reversed, at least in cases where the cause of the harm was not, with certainty, known.

We have described the difficulty of ascertaining the relevance of the plaintiff's needing to 'cover off' all possible non-tortious causes before any liability could be imposed or any remedy afforded. Assuming a 20% likelihood that the dermatitis in *McGhee* could have been avoided had the employer provided showers, and a 20% likelihood that the harm to the *Wilsher* baby could have been avoided had the Health Authority not been negligent, of what possible relevance is it, analytically, whether the other 80% probability results from the (non-negligent) activities of the defendant, or some other cause? To draw such a distinction is to impose a form of strict liability upon defendants for harm that arises in the course of their negligent activities, based on the fortuitous occurrence of a certain type of harm. If such a thing is being done, it should be done explicitly, at the very least.

It is also difficult to see how the distinction between *McGhee* and *Wilsher* could be maintained within the negligence paradigm, because it treats the main question of negligence – liability based on the probabilistic *ex ante* foreseeability of harm and the failure to take precautions – as contingent, not only on the fortuitous *ex post* manifestation of harm (as in any negligence case), but also on whether other potential causes of that harm can be related to the innocent activities of the defendant. This may be a valid distinction from a policy point of view (representing, as we assert, a limited form of strict liability), but it cannot retain the pretence of basing its liability on the *wrongdoing* of the defendant.

In *Snell v Farrell*,[94] the Supreme Court of Canada reacted to the uncertainty of the House of Lords with ambivalence of its own. In *Snell*, Sopinka J. seemed to reject the *McGhee* approach, though on the assumption that it was unnecessary to resolve the problems of causation He stated:

> I have examined the alternatives arising out of the McGhee case. They were that the plaintiff simply prove that the defendant created a risk that the injury which occurred would occur. Or, what amounts to the same thing, that the defendant has the burden of disproving causation. If I were convinced that defendants who have a substantial connection to the injury were escaping liability because plaintiffs cannot prove causation under currently applied principles, I would not hesitate to adopt one of these alternatives. In my opinion, however, properly applied, the principles relating to causation are adequate to the task.[95]

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[93] *Wilsher*, *supra* note 26.

[94] *Snell v. Farrell*, [1990] 2 S.C.R. 311, (1990), 72 D.L.R. (4th) 289 [*Snell* cited to D.L.R.].

[95] *Ibid.* at 299 [emphasis added].

In the end, the *Snell* court found that the defendant's negligence was a significant contributing factor to the plaintiff's injuries, and thus liability could follow. In this sense, *Snell* went no further than earlier cases considering cumulative, rather than alternative, causation.

Invoking Lord Bridge in *Wilsher*, who had described a "robust approach to the facts", Sopinka J. said:

> The legal or ultimate burden remains with the plaintiff, but... an inference of causation may be drawn, although positive or scientific proof of causation has not been adduced.[96]

Snell was applauded by Linden as a "significant breakthrough, rejecting the rigidity of the past", describing its doctrine as the "twin sister" of *res ipsa loquitor* in that it allowed inferences to be drawn based on "common sense".[97] However, *Snell* cannot escape the criticism that it clarifies little of real consequence. What, for instance, does "substantial connection to the injury" in the above passage *mean*, divorced of evidence of causation?

The Court may be saying that inferences may be drawn when the evidence raises a likely case of causation. However, this would add nothing to the law and would still leave the plaintiff with the burden of proof on the balance of probabilities. But if a "robust" approach is meant to permit inferences to be drawn in the *absence* of such evidence, while providing no guiding principles, then this simply alters the law in the guise of finding facts.[98] Such an approach seems necessary only to avoid 'opening the floodgates' to probabilistic-based litigation;[99] a worthy goal, perhaps, but not one conducive to principled analyses along the lines proposed.

The idea that a plaintiff may recover for "lost opportunity", even if the chance of that opportunity materializing into gain was less than 50%,

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[96] *Ibid.* at 300.

[97] A.M. Linden, *Canadian Tort Law*, 6th ed. (Toronto: Butterworths, 1997) at 106-107.

[98] A similar approach has been adopted where intervening events are at issue. In *Hollis v. Dow Corning Corp.*, [1995] 4 S.C.R. 634, (1995) 129 D.L.R. (4th) 609 [*Hollis*] the defendant manufacturer of breast implants argued that, even if it had issued an appropriate warning, there was no evidence that the plaintiff's physician would have passed it along to her. Following *Cook*, the majority held that this burden need not be discharged by the plaintiff, as the defendant had "creat[ed] the set of causal conditions leading to her injury", and thus could not rely on the uncertainty of the physician's actions to save it. But the central difficulty of *Cook* remains: if indeed the doctor had not passed on the warning, then the defendant had not "created" the conditions leading to her injury, except when viewed on a *probabilistic* basis, an analysis that, once again, the Court was at pains to avoid.

[99] *Ibid.* at 299.

was first set out in *Chaplin v. Hicks*.[100] There, the defendant advertised a contest inviting applications from young women. According to the terms of the contest, twelve winners would be awarded contracts providing a weekly wage for three years. The plaintiff was selected as one of 50 finalists for one of the twelve prizes, but the defendant failed properly to notify her; she missed her interview and lost her chance (one might calculate it at 12/50ths, or 24%) at a prize. It was held that the defendant had breached his contract by failing to use reasonable efforts to notify the plaintiff and the jury awarded damages of £100.

It was argued that the plaintiff should receive only nominal damages since the harm suffered was too remote and speculative; that it was subject to so many contingencies that it could not be assessed. The Court of Appeal, however, upheld the jury verdict. The judges held that the mere fact that the prize was contingent did not mean that the chance of winning had no value, or that its value could not be assessed. They all referred to the fact that the plaintiff's chance of winning was about one in four, and that the jury could take this into account in determining the value of the chance.[101]

Chaplin, therefore, clearly established the principle that at least in some cases, damages *could* be awarded for lost chances even when the chance was well under the traditional but-for threshold of 50%. Thus, if a lawyer negligently permits a limitation period to expire, the award to the plaintiff might be discounted by the chance that he would have succeeded at trial.[102] Similarly where a defendant neglected to take steps that could have realized for the plaintiff a profitable rezoning of property, calculations can be made of the profit to be realized, discounted by the probability of the success of the rezoning effort.[103]

Some have suggested that that the chance itself should be regarded as a thing of value, and thus the expected loss "real" in its entirety.[104] But of course, there is no "market" for most types of chance. While a lottery ticket might be resold, most opportunities that might be measured probabilistically – the chance of recovery, job prospects, and so on – are so individualistic as to make any requirement of alienability a virtual bar to recovery.

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[100] *Chaplin v. Hicks*, [1911] 2 K.B. 786 (C.A.) [*Chaplin*].

[101] Note that the amount awarded was still less than the 'probabilistic value' of the prizes, which had an average value of around £600 (24% of £600 = £144).

[102] *Kitchen v. Royal Air Force Association*, [1958] 1 W.L.R. 563 (C.A.); *Prior et al. v. McNab* (1976), 78 D.L.R. (3d) 319 (Ont. H.C.).

[103] *Multi-Malls Inc. v. Tex-Mall Properties Ltd.* (1980), 28 O.R. (2d) 6, aff'd (1981), 37 O.R. (2d) 133 (C.A.).

[104] For an overview of loss of chance doctrine and the various philosophical positions advanced in its favour, see generally D. A. Fischer, "Tort Recovery for Loss of a Chance" (2001) 36 Wake Forest L. Rev. 605.

Theoretically, the concept probabilistic valuation of chances could be used to resolve problems of causal indeterminacy. Of course, when the plaintiff is able to prove on the balance of probabilities that the defendant caused his injury, courts will value the future extent and consequences of that injury on a probabilistic basis. Similarly, when it can only be established that there is a "substantial chance" that negligence caused a particular injury, liability and damages might be based on this chance. Thus if the likelihood is 25% that the wrong caused the damages, then a quarter of the damages should be paid. Conversely (though this has not come up in the cases), it might be open to a defendant to argue that, notwithstanding that causation has been made out on a balance of probabilities, there is still only a, say, 75% likelihood that the wrong caused the damages, and thus the amount of liability should be *reduced* by 25%.

The advantage to this approach, of course, is that it does not depend on whether all possible causes of the injury have been identified, let alone whether they were necessarily tortious and the defendants known. However, despite some early judicial willingness to explore this avenue, it has been – at least temporarily – foreclosed.

One example is *Seyfert v. Burnaby Hospital Society*,[105] where the plaintiff, who was being treated for a fall, was misdiagnosed and developed complications. It was unclear, however, that the medical negligence caused the complications because they may have developed in any event. Relying on *McGhee*, McEachern C.J. held that the negligence had materially contributed to the risk of complications and awarded 25% of the damages representing the lost chance of avoiding the complications and the longer period of convalescence.

McEachern C.J.'s approach to alleviating the burden of proof of causation was explicitly rejected in England,[106] and similar efforts have received a mixed and inconsistent reception in the United States.[107] The retreat from the possibilities suggested by *Seyfert* began in *Hotson v. East Berkshire Area Health Authority*. In this case a child had fallen from a tree and received negligent treatment from the defendant doctor. The trial judge had found that there was a 75% chance that the child's eventual losses would have occurred even with appropriate care, and awarded 25% on that basis. The House of Lords, however, analysed the trial judge's

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[105] *Seyfert v. Burnaby Hospital Society* (1986), 36 C.C.L.T. 224 (B.C. S.C.) [*Seyfert*].

[106] In England, see *Hotson v .East Berkshire Area Health Authority*, [1987] 2 All E.R. 909 (H.L.).

[107] See the discussion in C. P. Reuscher, "*McMullen v. Ohio State University Hospitals*: This Isn't Vegas, But Don't Tell the Courts - Playing with Percentages and the Loss-of- chance Doctrine" (2001) 34 Akron L. Rev. 767; D.R. Carney, "Smith v. State of Louisiana, Department of Health and Hospitals: Loss of Chance of Survival: The Valuation Debate" (1997) 58 La. L. Rev. 339.

findings as indicia that the plaintiff had failed to prove "but for" causation on a balance of probabilities, and denied the award.

In *Laferriere v. Lawson*[108] the Supreme Court of Canada also overruled an award for loss of a chance. Here, the defendant doctor failed, following a biopsy in 1971, to inform the plaintiff that she had cancer. In 1978 the plaintiff died of generalized cancer. There was no doubt that the defendant was negligent, but substantial doubt that any additional treatment would have increased the plaintiff's chance of survival. Notwithstanding this doubt, the Quebec Court of Appeal awarded the plaintiff substantial damages based on the theory that she had been deprived of the opportunity or chance to seek additional treatment and improve her health. The Supreme Court of Canada reversed this element of the decision. The Court reaffirmed the traditional principles of causation whereby the plaintiff must establish causation on the balance of probabilities, at least within the four corners of the *Code Civile*.[109] Gonthier J concluded "I do not feel it is appropriate to focus on the degree of probability of success and to compensate accordingly..."[110] He explained:

> [I]t is only in exceptional loss of chance cases that a judge is presented with a situation where the damage can only be understood in probabilistic or statistical terms, and where it is impossible to evaluate sensibly whether or how the chance would have been realised in that particular case. The purest example of such a lost chance is that of the lottery ticket which is not placed in the draw due to the negligence of the seller of the ticket. The judge has no factual context in which to evaluate the likely result other than the realm of pure statistical chance. Effectively, the pool of factual evidence regarding the various eventualities in the particular case is dry in such cases, and the plaintiff has nothing other than statistics to elaborate the claim in damages... I am not prepared to conclude that particular medical conditions should be treated for purposes of causation as the equivalent of diffuse elements of pure chance, analogous to the non-specific factors of fate or fortune which influence the outcome of a lottery.[111]

The different results in *Chaplin* on the one hand, and *Hotson* and *Laferriere* on the other, reinforces the idea that courts are engaged in a results-based linguistic game when choosing between analyses based on "loss of chance" (where claims are in theory compensable), and "probabilistic causation" (where they are in theory not). In *Hotson*, for instance, was it that there was a one-in-four chance that inappropriate treatment caused the injury? Or rather was it that the negligence had taken away a 25% chance of recovery?[112] Is there any principled basis for

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[108] *Laferriere v. Lawson* (1991), 78 D.L.R. (4th) 609 (S.C.C.) [*Laferriere*]

[109] McLachlin J. has written extra-judicially that *Laferriere* sets out no rules for common law courts: McLachlin, J. *supra* note 13 at 27-28.

[110] *Laferriere*, *supra* note 108 at 659.

[111] *Ibid.* at 654-56.

[112] Fleming puts it this way *supra* note 8 at 674-75: In sum, all that *Hotson*

deeming one compensable and the other not? Waddams, for one, suggested that *Hotson* and *Laferriere* were arguably "loss of chance" cases and both ought be compensable.[113] It is sometimes suggested that the difference lies in the form of the action – that in contract cases (*Chaplin*), proof of damage is not and element of the cause of action and therefore probabilistic reasoning is acceptable solely as an instrument of measuring the loss, whereas in negligence cases, proof of damage is an essential element of the claim and probabilistic reasoning cannot be used to establish liability.[114] This distinction achieves doctrinal reconciliation at the expense of substantial coherence (and suggests a resurrection of old and interesting debates about concurrent liability in contract and tort), was implicitly rejected by Waddams[115] and explicitly disparaged by Black. "However," noted Black, "abandoning it does raise the question of what distinction we should adopt in its stead."[116]

The most recent authoritative discussion of the issue (before *Fairchild*) is in *Athey v Leonati*[117] where the Supreme Court of Canada joined the skeptics in rejecting a purely probabilistic approach to damages assessment - whether cloaked as "loss of chance" or otherwise. The issue in *Athey* was whether an automobile accident caused the plaintiff's back injury; the trial judge held that the accident was a minor contributing factor and awarded 25% damages. The Supreme Court of Canada disapproved of this method, stating:

> [The trial judge] awarded only 25 per cent of the global damages because she held that the accidents were a "causation factor" of 25 per cent. Taken out of context, this could be read as meaning that there was a 25 per cent chance that the injury was caused by the accidents, and a 75 per cent chance that it was caused by the pre- existing condition. In that case, causation would simply not be proven.[118]

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interdicted was the attempt, in a case where the cause of action depended on physical injury, to circumvent proof of such an injury by proof of a lost chance to avoid it. The distinction may not appeal to everybody.

[113] Waddams, *supra* note 58 at 90 (discussing *Hotson*) and 95 (discussing *Laferriere*).

[114] In *de la Giroday v. Brough* the B.C. Court of Appeal clung to the artificial and ancient distinction of actions 'in trespass' and those 'on the case', holding that, where damages were a necessary part of the action (as in negligence), causation that did not rise to the level of probability (at least with respect to *some* damages) could not, as a matter of law, trigger any liability because no cause of action was made out. See *de la Giroday v. Brough* (1997), 33 B.C.L.R. (3d) 171 (C.A.), leave to appeal ref'd November 6, 1977 (S.C.C.).

[115] Waddams, *supra* note 58.

[116] Vaughan Black, "Not a Chance: Comments on Waddams, The Valuation of Chances" (1998) 30 Can. Bus. L.J. 96 *at 98.*

[117] *Athey v. Leonati,* [1996] 3 S.C.R. 458 [*Athey*].

[118] *Ibid.* at para. 42.

The better approach, according to the Supreme Court, was to consider the facts as indicating that the accidents were a 25% cause of the harm – i.e. a material cause that rose above *de minimus*. The analysis, however, only assists in cases where the harm might be seen – however strainedly – as cumulative, rather than alternative.[119] It offers little help in mass exposure cases, for instance, because exact disease processes are frequently unknown, and the extent to which a disease should be seen as alternatively caused (as is perhaps arguable with mesothelioma) or cumulatively caused (the dominant view of smoking-related lung cancer) will often be impossible to assess. This is especially true with diseases in which causes may be synergistic, i.e. where multiple factors compound, rather than just increase, the risk of disease.

It is difficult to state precisely where the line is presently drawn on the use of probabilistic damages in individual tort cases. They are clearly available when the causal uncertainty is in relation to the extent of the plaintiff's future injuries (for example, the chance of improvement or deterioration).[120] They are also available in respect of opportunities of which the plaintiff has been deprived and which remain hypothetical (as in *Chaplin v. Hicks* or the personal injury victim who lost the opportunity to pursue a particular career). In these cases the defendant's wrongful conduct has clearly caused the plaintiff a loss, but there is doubt about the extent or value of the loss. On the other hand, when the question is whether an injury or illness, which has in fact occurred, was caused by the defendant's wrong, the plaintiff must establish causation on the traditional balance of probabilities. The principle is usually explained in the following fashion: courts adopt a different approach depending upon whether they are assessing hypothetical events that might have occurred but for the accident, or that might yet occur in the future, and events that have in fact occurred. In the latter type of case, causation must be established on traditional grounds. As Lord Diplock stated in *Mallett* v. *McMonagle*:[121]

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[119] As in the English case of *Lambton v. Mellish*, [1894] 3 Ch. 163, where two merry-go- round operators were found liable in nuisance for the cacophony produced when their organs operated simultaneously, though neither would have been individually liable but for the activity of the other. See also *Corey v. Havener* (1920), 182 Mass. 250, involving two motorists passing a horse and wagon at high speed on either side, frightening the horse and injuring the plaintiff. More particularly, see *Bonnington Castings v. Wardlaw*, [1956] A.C. 613 (H.L.), where the plaintiff contracted pneumoconiosis from silica dust that could have originated from either or both of two machines, one of which was operated negligently and the other not. In such circumstances, the employer was held liable as the negligence had "materially contributed" to the risk. The decision, though, depended on the premise that pneumoconiosis resulted from cumulative, rather than alternative, exposure to the silica.

[120] *Lewis v. Todd and McClure*, [1980] 2 S.C.R. 694.

[121] *Mallett v. McMonagle*, [1970] A.C. 166 (H.L.).

> The role of the court in making an assessment of damages which depends on its view as to what will be and what would have been is to be contrasted with its ordinary function in civil actions of determining what was. In determining what did happen in the past a court decides on the balance of probabilities. Anything more probable than not it treats as certain. But in assessing damages which depends on its view as to what will happen in the future or would have happened in the future if something had not happened in the past, the court must make an estimate as to what are the chances that a particular thing will or would have happened and reflect those chances, whether they are more or less than even, in the amount of damages which it awards.[122]

We have tried to make the point in this section that these distinctions are not entirely satisfactory, either in terms of logic or justice. We agree with Professor Black's assertion that "redescription" should not be determinative of the claims of injured persons, or the liability of defendants. Ironically, the adoption of probabilistic reasoning and measurement in these cases, as *Athey* shows, is potentially fairer not only to plaintiffs (who would otherwise have difficulty establishing their case) but also to defendants (who, while being found liable would have damages discounted). While it may be hoped that the Supreme Court will revisit, in a more principled way, the questions of loss of chance and probabilistic causation generally, we move in Part IV to a discussion of the application of such principles in the context of mass torts, where we argue that paradoxically the issues can actually be considerably simplified.

IV. *Proposed Application in Mass Tort Cases*

A. *The Moralist Objection to Risk-based liability*

No matter what the distributive justice arguments, there are those who will argue that any imposition of liability without causation-in-fact violates, not just legal norms, but moral ones. Though the arguments in support of this proposition are sometimes perplexing, they emanate from respected academic quarters and are worthy of review and consideration.

As we noted in our Introduction, recent tort scholarship on the topic of causation-in-fact has focused on the debate between legal economists, who propose that tort rules must be explained or justified on the basis of utility,[123] and tort moralists, who suggest that there are irreducible interests of justice that must be catered to, presumably even at the expense of utility. The latter group has centred its attention in the causation debate on Aristotle's idea of "corrective justice"; that is, justice "which plays a rectifying part in transactions between man and man."[124]

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[122] *Ibid.* at 176 [emphasis added].

[123] Whether measured in terms of wealth maximization or the promotion of 'welfare' more generally. See Kaplow & Shavell, *supra* note 48.

[124] Aristotle, *Nicomachean Ethics*, Bk. V para. 2.

Corrective justice, which in its most straightforward formulation "requires A to compensate B for loss caused by A's conduct (in fault-based theory, by A's *faulty* conduct)"[125] does not permit the abandonment of the causal nexus. Inevitably the causation requirement is expressed in moral, rather than utilitarian or functionalist terms; the law's authority is contingent on its ability to mirror reality.[126] That authority, then, is presumably diminished to the extent that the reality cannot, with certainty, be comprehended.

Weinrib appears to be persuaded by "the conceptual irreducibility of the two-party [i.e. injurer and injured] relationship,"[127] although he is not certain that it would lead to the strict liability regime that Epstein proposed. Weinrib argues that tort law cannot serve instrumentalist ends, because it has no end beyond itself. The reasoning at times appears difficult:

> Causation construed as the particularization of the sufferer in relation to the actor has a further implication. Neither causation so conceived nor the tort law whose bilateral structure embodies this conception can be understood in terms of an instrumental functioning. If tort law were a means to an independently specifiable end, that end would be directed to the defendant along, because no such purpose could be consistent with the restriction of liability to actual injury caused. This, as we have seen, is why tort liability is not in Thomson's hypothetical coextensive with the defendant's moral culpability. Nor can tort law have a purpose, such as compensation, directed to the plaintiff's injury, since tort law includes reference to the defendant's role in causing the injury. Nor can an instrumental purpose seize on the relationships as a whole, since the relationship's defining characteristic is the fortuitous linking of doer and sufferer, no independent goal could be congruent with it. Causation is thus not intelligible in terms of any functioning beyond itself.[128]

To paraphrase Weinrib's central point, traditional tort law cannot be understood outside the moral framework of causation-in-fact. Shifting the moral emphasis to focus on the breach of duty, rather than the causation, makes liability something other than tort law. But is it any more just to assign liability on the basis of "fortuitous linking" through causation-in-fact, irrespective of the degree of wrongdoing? The ancient Greeks might have thought that the fortuitousness holds within it some innate moral element, the voice of the Fates; yet this seems scarcely sufficient as a

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[125] S.R. Perry, "Tort Law" in D. Patterson, ed., *A Companion to Philosophy of Law and Legal Theory* (Oxford: Blackwell, 1996) at 74.

[126] J.L. Coleman, "The Practice of Corrective Justice" (1995) 37 Ariz. L. Rev. 15 at 30: "legal theorists who invoke the concept of corrective justice mean to treat it as a substantive moral ideal."

[127] Weinrib, *supra* note 15 at 421.

[128] We are not here exaggerating: Weinrib has argued that "goals have nothing to do with tort law" which, "just like love" "has no ulterior end": E. Weinrib, "Understanding Tort Law" (1989) 23 Val. L.J. 485 at 526.

basis for a modern system designed – at least notionally – around ideas of compensation and deterrence.

One of the difficulties of Weinrib's approach is that it is hard to determine which of his analysis is descriptive and which prescriptive. In other words, he appears to justify rules on the sole basis that they exist. This confusion is not atypical of tort moralists,[129] whose arguments tend to depend on the innate correctness of existing liability paradigms, without providing any external justification for them,[130] except the occasional invocation of religious authority or libertarian philosophy.[131] Forrest Gump might say, 'tort law is as tort law does.'

But tort law is hardly a static science; the arguments once championed by legal formalists that the common law was a scientific undertaking and rules were developed without reference to social necessity have been quite thoroughly debunked for a hundred years.

And even if one were to focus on the descriptive, rather than prescriptive, elements of Weinrib's arguments, we may be similarly unsatisfied. Tort law traditionally does not "restrict liability to actual injury caused". The burden of proof in civil cases requires instead that liability be restricted 'to actual injury *probably* caused', or even 'to *probable* injury *probably* caused',[132] though we may quibble over how certain we need to be, no one would say that we have to be absolutely certain of the causal chain, or even that we could be. Causation is, and indeed has always been, a probabilistic exercise. In the aggregate, we accept that sometimes, if not often, the 'balance of probabilities' rule will result in erroneous findings in cases where causation is at issue. This seems far short of the certainty that would be required if we were truly convinced of the necessity for a moral connection of wrongdoer with victim in the sense apparently contemplated by Weinrib.

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[129] Kaplow & Shavell, *supra* note 48 at 1044-46 (discussing the prevalence of description in the literature of advocates of "corrective justice").

[130] It has been pointed out that even Aristotle, upon whom many moralists rely as authority, is mainly found describing his idea of "corrective justice", rather than attempting to justify it normatively: *Ibid.* at 1047 n.163.

[131] Epstein, for instance, describes the "usual common law account" of rights – as deriving from personal autonomy, property, and freedom of contract – as "both naive and correct." His argument as to the fundamental moral difference between deprivation on the basis of force or fraud on the one hand and free bargaining and competition on the other is persuasive, but in our view hardly self-evidently correct. See R. Epstein, "Causation – In Context: an Afterword" (1987) 63 Chi.-Kent L. Rev. 653.

[132] This analysis adds an interesting dimension: because courts may consider that, once a, say, 60% probability is made out on the existence of the injury, it is "weighted" as having been found to have occurred. The court then moves to causation, and perhaps finds again that it is 60% likely that the injury was caused by the defendant's wrongdoing. In an individual action, this may lead a court to erroneously conclude that the harm was "probably" caused by the defendant.

Nevertheless, we can assign some weight to the moralists' concern that liability should not be imposed upon persons who have not caused harm. Or at least (considering the impossibility of knowing causation with certainty), that our tort system should prefer to avoid such an outcome where possible. We stress that our purpose here is not to show what we see as central flaws in the moralist argument. Rather, it is our intention to show that, whatever validity the moralist position may have in the context of traditional, individualistic claims, it seems to have far less bite when applied when mass tort claims are viewed – or adjudicated – in the aggregate.

B. *The Functionalist Criticism of Risk-based liability*

The courts' uncertainty regarding loss of chance and probabilistic liability stresses the difficulty in applying rules developed for single-incident torts – where it might, under moral principles if not functionalist ones, make sense to permit a tortfeasor to escape such risk-based liability – and mass torts, where the systemic exposure to relatively low-scale risk should not go unaddressed.

We have seen how, by imposing notions of certainty upon inherently probabilistic judgments in individual cases of uncertain causation, plaintiffs who cannot meet the 50% threshold of likely causation will receive nothing for their injury. In the mass tort setting, a defendant who has caused an incremental increase of disease in the population will escape liability entirely providing that the precise attribution of a particular victim's disease is impossible. On the other hand, as Rosenberg points out, in cases where 51% of a given disease in the population can be attributed to the defendant (or where a lesser risk might otherwise, using the 'material increase of risk' rules in individualistic tort cases, trigger liability), it could be unfair to impose the "crushing liability" of 100% attribution.[133]

We have also suggested that the barrier to the imposition of probabilistic liability in individual cases is the lingering moralist objection that causation-in-fact is a required element to avoid the assignment of liability upon persons who have caused no harm, and

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Conversely, a truly probabilistic analysis would find only a 36% chance that there was injury caused by the wrongdoing (60% x 60%).

The haphazard application of either analysis, in a collection of individual cases, would lead to opposite conclusions regarding liability which bear no resemblance to the true aggregate liability of the defendant. In the aggregate setting, of course, it would lead to liability for 36% of the harm alleged, a far more accurate estimate than the haphazard accumulation of individual judges' analyses.

[133] Rosenberg, *supra* note 66 at 859, citing S. Shavell, "An Analysis of Causation and the Scope of Liability in the Law of Torts" (1981) 9 J. Legal Stud. 463 at 465. Rosenberg advocates full aggregation of all mass torts into mandatory class actions.

(relatedly) the flow of compensation to persons whom the defendant did not injure. This is, we might add, related to the more pragmatic concern that litigation floodgates will open as proof of causation is relaxed. Yet few courts have yet recognized the fundamental, principled distinction between mass torts and individual torts where probabilistic causation is concerned. As a result, they remain stubbornly inconsistent regarding the cases in which they will accept probabilistic analyses, and those where they will not.

Much of the wind is taken from the moralist sails when mass tort claims are viewed in the aggregate, rather than individualistically. While an Aristotelian connection between individual wrongdoer and wronged is still arguably absent, when a class action is resolved on a probabilistic basis, we can be fairly assured of two things: that the *actual* victims of any given defendant are among those compensated; and that that defendant indeed is not "innocent" of causation in fact, at least with respect to that portion of the population. In this sense, it is possible to argue that the use of probabilistic proof in mass tort claims comes much closer to the moralist ideal of individual justice than does the traditional system of individualistic litigation that, as we have shown, employs probabilistic reasoning in the least efficient way – deciding whether something 'probably' did or did not happen. Viewed in the aggregate, one can argue whether the causation of disease in a particular population is 12% or 25%, but one will rarely be forced into the "all or nothing" propositions imposed by traditional tort rules. Fleming appears to agree that "class actions provide a procedural framework particularly suitable for implementing the [probabilistic discounting] formula."[134]

If there is anything left of the moral necessity of actually identifying which defendant harmed which plaintiff, it appears to be substantially outweighed by the advantages of mass resolution of claims. Indeed the only reason to identify *actual* victims, individually, in such a claim would be to calculate their separate entitlement to compensation. However, at this stage there is no necessity to distribute the award on the basis of the degree of the defendant's fault; systems of need-based compensation, calculated on an insurance basis and possibly co-ordinated with existing social insurance plans, could provide systems for distribution (in other words, probabilistic damages work particularly well in subrogated or direct claims by insurers or governments in respect of mass torts for which health benefits or income replacement has already been provided to a group of victims).

Moreover, the question of undercompensation of particular victims, or the overcompensation of others, may be reduced in the mass tort/class action setting (at least with respect to future costs) by the pooling of damages and payment to class members either in the form of formal

[134] Fleming, *supra* note 8 at 680.

health insurance policies or distribution on a 'need as arises' basis. The distribution problem might also be alleviated by a mass tort "superfund", possibly with the probabilistic assessment of injuries assessed by a "science panel" rather than by judges, as Brennan proposes.[135]

Fairchild's "no non-tortious cause" requirement, even in an individual case, could find some support among economic analysts, but only if joint and several liability is the only option. Suppose, for instance, that two tortfeasors expose a person to risk of disease that manifests and could have no other cause. One tortfeasor exposed the victim for 1 year, and the second for 9. Under *Fairchild,* the 10% contributor is jointly and severally liable for the entire amount of damages. This makes sense if, overall, the risk contribution among the contributors is continually varied. If in one case it is 90-10, and in the next 10-90, then the aggregate of liability of the two should roughly balance out, providing of course that the judgments are equally collectible (and roughly equally corrected) from each defendant.

If, on the other hand, the nine years' exposure was non-tortious, then does not seem helpful to hold the 10% contributor liable for the 100% of the harm. This is because, viewed in the aggregate (assuming a 10%- 90% probability in each case), such a wrongdoer would have an overall exposure to liability ten times that which it should have.[136] This is why market share liability (or some other method based on *risk* apportionment) will provide roughly appropriate deterrence as well as compensation when claims are viewed in the aggregate.[137]

Practically speaking, though, such an argument loses much of its authority. In the real world, recovery for such torts will depend as much on the solvency of the defendants and their insurance choices; under such circumstances, joint and several liability will provide disincentives to adequately insure, and will encourage asset-hiding and judgment proofing of companies involved in potentially dangerous activities.

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[135] Brennan, *supra* note 3 at 532-33.

[136] Another example should make this point clearer. Consider three *Fairchild* defendants, A, B, and C, who employed workers in the same industry and negligently exposed all of them to asbestos dust. Let us say that 100 workers who had worked for all three employers developed mesothelioma. Employer B should have foreseen that a certain percentage of its own workers (perhaps 33) would have become sick due to its negligence, although it also could have expected that they wouldn't be able to prove causation. While it might be optimal to upset A's 'reasonable expectations' to the extent of making A liable for the harm it caused, it is far less advantageous to impose liability for the harm caused to all 100. Probabilistically, employer A is entirely innocent-in-fact of harming the 67 'extra' workers for whose illnesses it now must pay if *Fairchild* is applied in all 100 individual cases.

[137] Kaplow & Shavell, *supra* note 48 (noting that investment in determining cause in such cases makes both plaintiffs and defendants worse off).

The joint and several liability of *Fairchild*, then, is a poor fit with that case's assertion of probabilistic risk-based liability. It may be that the Lords were too concerned with ensuring complete recovery by the plaintiffs in that case to weigh the full ramifications of such liability when all potential claims against such defendants are considered. Nevertheless, it appears that application of joint and several liability is unnecessary and indeed counterproductive in the context of aggregate claims.

C. *Mass Tort as Systemic Harm from Business Enterprises*

In the case of 'ordinary' accidents, what Oliver Wendell Holmes Jr. famously called "ungeneralized wrongs",[138] the Aristotelian idea of corrective justice may be, if not economically optimal, at least socially appropriate. If a driver becomes distracted and momentarily drifts to the edge of an empty highway without any effect, no one would have the right to sue in tort, even if the driver had exposed someone, perhaps a nearby pedestrian, to an increased risk of harm. If on the other hand, the pedestrian is struck, a suit will be launched and compensation paid. Punishment for the negligence "in the air", the simple creation of risk without a causal link to harm, has been left to the criminal law where available.

But in such a case, the driver is not deliberately seeing how close to the pedestrian he can go, he derives no personal advantage in recklessness: there is ordinarily no incentive for a driver to play such a dangerous and bizarre game; indeed quite the opposite, *inter alia* because the driver himself may well be injured in an accident.[139] In the contemporary industrial marketplace, however, incentives to risk do exist on systemic levels. The profit motive and competitive pressures suggest that firms will tend to invest in precautions against harming their customers or strangers only if they are either required to do so by a vigorously enforced regulatory sanctions or by being forced to internalize the full costs of the harm they cause. This latter effect can be theoretically achieved through tort liability. The lesson here is that optimal tort deterrence, the holy grail of the economic analysts of tort law, is more fully realizable when probabilistic assessments of causation are applied to

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[138] Holmes J., in perhaps the first articulation of the economic analysis of accident law, said:

> Our law of torts comes from the old days of isolated, ungeneralized wrongs, assaults, slanders, and the like, where the damages might be taken to lie where they fell by legal judgment. But the torts with which our courts are kept busy to-day are mainly the incidents of certain well known businesses. They are injuries to person or property by railroads, factories, and the like. The liability for them is estimated, and sooner or later goes into the price paid by the public.

O. W. Holmes, "The Path of the Law" (1897) 10 Harv. L. Rev. 457 at 467.

[139] See F.A. Sloan, B. A. Reilly & C. M. Schenzler, "Tort Liability Versus Other Approaches for Deterring Careless Driving" (1994) 14 Int'l Rev. L. & Econ. 53.

the systemic decisions of businesses regarding investment in precautions than the haphazard occurrences of common one-on-one accidents.

Causation in law, of course, is impossible to disentangle from notions of legal rights. Every accident has numerous causes; if a negligent driver crosses the centerline and strikes another head-on, it can be said that the accident would not have occurred "but for" the presence of the innocent driver; the distinction between relevant causation and irrelevant causation can be defined only by the legal "rights" of the parties: one may legitimately be at the location of the accident, the other not. Causation in fact can only demonstrate a confidence that the defendant's actions contributed to the accident. Causation in law is concerned between the connection between "rightless" – or wrongful – activity and the harm.

It seems correct to say that in cases of mass exposure torts, where we can be scientifically certain that the defendant's wrongdoing has hurt members of the population, but due to individual attribution problems it is not possible to determine who, that liability can attach to the wrongdoing. Rosenberg put it this way in 1984:

> The preponderance rule may be adequate for the set of sporadic accident cases in which causal indeterminacy arises randomly and always signifies a substantial chance that the defendant in fact harmed no one. But the rule is neither rational nor a just means of resolving the systematic causal indeterminacy presented by mass exposure cases involving defendants whose tortious conduct has caused or will cause a statistically ascertainable increase in the incidence of a particular disease.[140]

Fairchild moves us part of the way down the road to fully probabilistic assessment of damages, but not all the way. Lord Hoffman had distinguished *Sindell,* where probabilistic causation was used, on the basis that the presence of additional manufacturers did not increase the risk (of exposure). In *Fairchild,* each of the defendants had exposed to risk the individual plaintiff before the Court, and broken an independent duty to him. In other words, Weinrib's "irreducible" two party relationship is preserved in the form of a duty, even if it is abandoned from the point of view of cause-in-fact.

In a mass tort claim with multiple defendants, it might be argued that it is impossible to link the creation of risk by each defendant to each exposed plaintiff. In such cases, the question that arises is whether the increase in aggregate risk is sufficient, so that all wrongdoers who have exposed members of the plaintiff population to the risk of injury can be held liable, without the necessity of proving the 'nexus' between a particular plaintiff and a particular defendant. No doubt, in such circumstances, the courts will adopt a minimum threshold of risk, over and above background levels (somewhat analogous to the 'more than de

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[140] Rosenberg, *supra* note 66 at 858.

minimus' test of *Athey v. Leonati*), to trigger liability in a defendant.

The main significance of *Fairchild* for such cases lies in its forthright disconnection of wrongdoer and harm. If one can accept that the interests of justice require risk-based liability for the defendants in *Fairchild*, it is difficult to imagine that they do not similarly favour such liability in aggregated mass tort claims.[141] Indeed, as we have pointed out here, the risk of 'moral unfairness' to defendants is *reduced* in the aggregate, because unlike the defendants in *Fairchild*, each of whom has not been found to have caused harm to *anyone*, in an aggregate claim one can be satisfied with statistical and epidemiological evidence that each defendant is, aside from simply being a wrongdoer, also a cause of actual harm in the population.[142]

Much will no doubt be made of the requirement in *Fairchild* that the only possible cause of the harm – mesothelioma in the victim – was the negligence of one of the defendants. But while individual cases might fail because of the possibility of alternative, non tortious possible causes, this too need not be a barrier in mass tort claims, for all of the reasons articulated here. If there had been a significant "background risk" of mesothelioma in *Fairchild*, it would have been possible, even likely, that the defendant was causally 'innocent'. In the aggregate setting, evidence can show that he is not. However, in the aggregate setting, the global damage can be discounted to that amount done by each defendant; in the individual setting (at least with joint and several liability) it cannot.

At this stage, then, difficulties of apportionment of liability remain. In such circumstances, and assuming that the risk contribution of the defendants cannot be otherwise calculated, the *Sindell* solution of market share apportionment seems perfectly appropriate. Indeed this door was left explicitly open by Lord Hoffman, who described the "imaginative rule" created by the California Supreme Court in *Sindell*.[143] Similarly, more creative distribution paradigms will have to evolve as well.[144]

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[141] In fact, the consequences for mass tort actions from the elimination of causation requirements was described several years ago in M. A. Berger, "Eliminating General Causation: Notes Toward a New Theory of Justice and Toxic Torts" (1997) 97 Colum. L. Rev. 2117.

[142] Thus "notions of moral responsibility underlying tort law" are preserved: *ibid.* at 2117.

[143] *Sindell, supra* note 21 at 74 Hoffman L.J.

[144] "Accurate" distribution of awards may in fact be impossible, because in a case with substantial background risk, the amount of the defendant's liability will compensate only that portion of the population whom it has actually harmed. The problem is, one will not know which of the victims the defendant should pay. However, given the widespread availability of first-person health insurance (indeed, in Canada, the universal availability), it seems less unjust to distribute the award on the basis of

D. *Methods of Proof: Statistical Evidence in Mass Tort*

Legally and morally, we suggest that there is a strong case for the use of probabilistic analysis in mass tort claims. Legally, because statistics can indicate that the defendant's activity was a significant contributing factor (i.e. beyond *de minimus*) to the harm in the aggregate population, even if not in any individual case. Morally, because indications of causation within a population, even without proof of cause in any case, removes the possibility that a truly 'innocent' defendant is being held responsible despite having caused no harm at all.

Yet there is a very real concern, captured by Brennan, that courts may be unable to wholly divorce themselves from particularistic (Brennan calls it corpuscularian) thought, particularly in individual cases:

> [I]t is not enough simply to say that courts should adopt probabilistic reasoning. They must be instructed. But given the importance of the moral concept of individual responsibility in tort law, we can expect courts to accommodate only so much probabilistic reasoning.[145]

Inescapably, probabilistic proof in mass tort claims means the admission of and reliance upon statistical evidence at every step of the legal analysis, from causation to damages.[146] Various judicial justifications for this approach have been made,[147] though the most frequently-stated case seems simply to be based on efficiency: justice is a scarce resource, and economic rules favour the speedy and effective adjudication of as many simultaneous claims as our other priorities (chiefly concerns over individual victim compensation and litigative autonomy[148]) will permit.

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probabilistic discounting. That is, if 20,000 of the 100,000 class members, each victims of disease X became ill due to the defendant, each of the 100,000 might receive 20% of full compensation to supplement the health coverage subsidized by their fellow citizens. Other options that have been explored elsewhere are mass tort 'superfunds' that work alone or in conjunction with other government or private insurance. See Brennan, *supra* note 1; J. B. Weinstein, *Individual Justice in Mass Tort Litigation: The Effect of Class Actions, Consolidations, and other Multiparty Devices* (Evanston, Illinois: Northwestern University Press, 1995), ch. 2.

[145] Brennan, *ibid.* at 491.

[146] See generally L. Walker & J. Monahan, "Sampling Damages" (1998) 83 Iowa L. Rev. 545 at 546: "A complete solution of the number problem in mass torts can only be achieved by... randomly sampling damages without apology."

[147] It has been held, for instance that statistical proof of damages is particularly "where the conduct of wrongdoers has rendered it difficult to ascertain the damages suffered with the precision otherwise possible.": *Blue Cross and Blue Shield of New Jersey, Inc. et al v. Phillip Morris, Inc. et al.*, 133 F. Supp. 2d 162 (E.D.N.Y. 2001) at 169 [*Blue Cross*], citing *New York Pattern Jury Instructions* 2:277 Damages: General – Commentary 3rd. ed. (2000).

[148] Though there is reason to believe that the individual interest may actually be enhanced in aggregate claims; see for instance D. Hensler, "Resolving Mass Toxic

There is also a strong argument that statistical evidence of almost every factor in a single, aggregate trial will be more accurate 'proof' than any number of individual claims, pursued on a balance of probabilities,[149] and in fact the awards even in individual trials could similarly benefit.[150] Indeed this seems self evident on every issue with the exception of the eventual distribution of the award, which is of necessity an individualistic exercise.[151]

In Canadian discrimination law, as in the US,[152] statistical evidence is increasingly employed both with respect to probabilistic characteristics of employees for the purposes of designing reasonable standards,[153] and also to determine the characteristics of the available workforce to show disparity in hiring or promotion.[154] To make an analogy from discrimination law to tort, statistics are used to establish elements of causation, not simply of damages.

Recent cases, moreover, have suggested ways in which statistical methods can be used directly to prove causation in an aggregate population. In 1986, a proceeding was commenced against Ferdinand E. Marcos on behalf of a Class of 9,539 Philippine citizens (or their heirs) who had been tortured, summarily executed or disappeared during

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Torts: Myths and Realities (1989) U. Ill. L. Rev. 89 at 104: "The use of formal aggregative procedures may provide more litigant control over the litigation process, more opportunity for litigant participation in the process, and a better match between victims' losses and compensation for those losses."; to similar effect see Kaplow & Shavell, *supra* note 46 at 1207.

[149] See generally Rosenberg, *supra* note 66.

[150] See for instance J. Koeler & D. Shaviro, "Veridical Verdicts: Increasing Verdict Accuracy Through the Use of Overtly Probabilistic Evidence and Methods" (1990) 75 Cornell L. Rev. 247.

[151] See the discussion below at notes 166 through 171 and accompanying text.

[152] See *International Brotherhood of Teamsters v. United States et al.*, 431 U.S. 324 (1977) at 329: "[O]ur cases make it unmistakably clear that 'statistical analyses have served and will continue to serve an important role' in cases in which the existence of discrimination is a disputed issue."

[153] *Ontario Human Rights Commission v. Etobicoke*, [1982] 1 S.C.R. 202 at 212-13: "It seems to me, however, that in cases such as this, statistical and medical evidence based upon observation and research on the question of aging, if not in all cases absolutely necessary, will certainly be more persuasive than the testimony of persons, albeit with great experience in fire-fighting, to the effect that fire-fighting is 'a young man's game'."

[154] *Blake v. Minister of Correctional Services* (1984), 5 C.H.R.R. D/2417 (Ont. Brd. of Inquiry) (statistics showed a *prima facie* case of discrimination but defendant satisfied burden of demonstrating that particular complainant was not discriminated against); *CHRC v. Canada* (1998), 38 C.C.E.L. (2d) 121 (F.C.T.D.); aff'd (1999), 41 C.C.E.L. (2d) 3 (F.C.A.) (statistics could provide evidence of systemic discrimination, or, in individual cases, circumstantial evidence of individual discrimination). See generally Vizkelety, *Proving Discrimination in Canada* (Toronto: Carswell, 1987) at 187.

the Marcos rule between September 1972 and February 1986. Marcos's Estate was substituted as defendant upon his death in 1989. The Court entered Final Judgment on February 3, 1995 in favor of the Class in the amount of US$1,964,000,000. In *Hilao v. Estate of Ferdinand Marcos*, 103 F.3d 767 (9th Circ., 1996), the Master had used a representative sample to determine what percentage of the total claims were invalid. The majority of the Federal Court of Appeal upheld the method:

> While the district court's methodology in determining valid claims is unorthodox, it can be justified by the extraordinarily unusual nature of this case ... Hilao's interest in the use of the statistical method, on the other hand, is enormous, since adversarial resolution of each class member's claim would pose insurmountable practical hurdles. The "ancillary" interest of the judiciary in the procedure is obviously also substantial, since 9,541 individual adversarial determinations of claim validity would clog the docket of the district court for years. Under the balancing test set forth in Mathews and Doehr, the procedure used by the district court did not violate due process.

The most active American judicial advocate of probabilistic proof in mass tort claims is Senior Judge Jack Weinstein of the Federal Court, Eastern District of New York, who in a series of cases[155] and voluminous extra-judicial writings[156] has championed their use in aggregate actions. The use of statistics nevertheless remains controversial in the United States courts, where litigative autonomy of individuals is frequently described as a near- fundamental human right, and courts have difficulty accepting that some issues, like causation-reliance, can be proven statistically.[157] Nevertheless, statistical evidence has been introduced on virtually every element of mass tort claims in the United States[158] and is potentially far

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[155] In *re DES Cases*, 789 F. Supp. 548 (E.D.N.Y. 1992); In *re Joint Eastern and Southern District Asbestos Litig.*, 726 F. Supp. 426 (E. & S.D.N.Y. 1989); In *re: "Agent Orange" Product Liability Litig.*, 689 F. Supp. 1250 (E.D.N.Y. 1988); *Blue Cross*, *supra* note 147.

[156] Most notably *Individual Justice in Mass Tort Litigation: The Effect of Class Actions, Consolidations, and other Multiparty Devices*, *supra* note 144.

[157] *In Small v. Lorillard Tobacco Co.*, 252 A.D. 2d 1 (N.Y.App. Div. 1998), the First Department of New York's Appeals Division refused to certify a class action of over a million smokers because proof of reliance upon the misleading statements would need to be shown individually. However, the *Small* Court did not consider whether reliance could accurately or fairly be shown statistically, and Weinstein J. (in a 'derivative' action by health insurers) subsequently opined that it could be: *Blue Cross*, *supra* note 147 at 173-74. However, in the *Blue Cross* case, there was no distribution problem, as the statistical proof need only show how many of the insurer's customers were harmed; see also *Group Health Plan, Inc. v. Philip Morris Inc.*, 621 N.W. 2d 2 (Minn. 2001).

[158] *Joint Eastern & Southern District Asbestos Litigation v. United States Mineral Products Company*, 52 F.3d 1124 (2d Cir. 1995); In re *estate of Ferdinand Marcos Human Rights Litigation*, 910 F. Supp. 1460 (D. Haw. 1995), aff'd sub nom *Hilao v. Estate of Marcos*, 103 F.3d 767 (9th Cir. 1996); *Stewart v. General Motors* Corp., 542

more helpful on very difficult questions, such as causation-reliance, than individual plaintiff evidence would be.[159] In the Blue Cross case, Judge Weinstein noted at 172-73 that:

> A distinction must be drawn between substantive elements of a claim and procedural methods of proof... In an extreme case, for example, imagine that statistics demonstrate 99 out of 100 cases of specific causation in a particular group. In addition, imagine statistics also demonstrate 99 out of 100 cases of reliance in the same groups. Even if these sets do not include the exact same 99 people, there is no reason one cannot accept as more likely than not reliance and causation in approximately 98 percent of the population (99% x 99% [approximately equal to] 98%). A fortiori, the case which depends on total damages to a plaintiff through aggregation of client-by-client claims – that is to say damages to a proportion of an entire subscriber population – can safely support the proposition that 98 persons were caused to be injured by, and relied upon, a fraud; it is this situation [plaintiff] brings to the court. Obviously, plaintiff's models are in the less than 98% category, but the problems posed are ones of degree and burdens of proof. They do not alter the substantive elements of New York State law or the procedural elements of federal law.

Whatever turns out to be the reception afforded Judge Weinstein's views among members of the judiciary, increased reliance on statistical evidence in mass tort claims is gaining significant, and perhaps now overwhelming, support among American academics.[160]

There is some indication that the judiciary understands the inherently

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F.2d 445 (7th Cir. 1976), cert. denied, 433 U.S. 919 (1977); *Zippo Manufacturing Co. v. Rogers Imports*, 216 F. Supp. 670 (S.D.N.Y. 1963); see also decisions cited at footnote 155.

[159] It would be a foolish (or at least a rarely honest) plaintiff who admitted on the stand that he did not rely on the defendant's deceit or misrepresentation. Similarly, other types of causation are typically skewed by human witnesses: imagine a plaintiff testifying about whether she would have heeded her physician's warning regarding the danger of breast implants. It is difficult to imagine individual testimony being accurate on this point (after all, how does even the victim know for sure what she would have done?), as indeed the Supreme Court of Canada acknowledged in the case of *Hollis*, *supra* note 96. On the other hand, statistical and survey evidence might offer fairly precise estimates of how many plaintiffs' class members actually relied, or would have been dissuaded by accurate warnings. While of little use in an individual case, again such information is crucial to the accurate resolution of mass claims of deception or failure to warn, where aggregate assessment of both liability and warnings could be made.

[160] See for instance Kaplow & Shavell, *supra* note 48 at 1203 n. 580; M.J. Saks & P.D. Blank, "Justice Improved: The Unrecognized Benefits of Sampling and Aggregation in the Trial of Mass Torts" (1992) 44 Stan. L. Rev. 815; R. G. Bone, "Statistical Adjudication: Rights, Justice and Utility in a World of Process Scarcity" (1993) 46 Vand. L. Rev. 561; S. Gold, "Causation in Toxic Torts: Burdens of Proof, Standards of Persuasion, and Statistical Evidence" (1986) 96 Yale L. J. 376; Rosenberg, *supra* note 66.

probabilistic nature of cause-in-fact analyses. In *Snell* v. *Farrell*,[161] the Supreme Court of Canada distinguished between scientific proof and proof on the balance of probabilities, noting that expert witnesses need not be satisfied of causation *scientifically*, but only "more probably," "i.e. 51%".[162]

This point, though, needs to be made about *all* evidence. As Saks and Kidd put it:

> Much of the testimony that is commonly thought of as particularistic only seems so. It is far more probabilistic than we normally allow jurors (or judges) to realize.[163]

Rosenberg would go further, arguing that there is no proof *except* probabilistic proof:

> The concept of 'particularistic' evidence suggests that there exists a form of proof that can provide direct and actual knowledge of [the underlying facts]. 'Particularistic' evidence, however, is no less probabilistic than is the statistical evidence that courts purport to shun.[164]

The use of statistical sampling to prove all elements of causation in the Canadian mass tort context has not been explored. Yet there is reason to believe that Canadian courts will be receptive to the idea generally,[165] and the Canadian class proceedings legislation, which permit findings of aggregate liability without individual proof, seem tailor-made for such an approach.

Indeed, the provision within Canadian class action legislation for the aggregate assessment of damages deserves some further mention. The Acts provide that, once liability has been established, the amount of an aggregate award may be calculated on the basis of statistical evidence[166]

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[161] *Snell* cited to D.L.R., *supra* note 94.

[162] *Ibid* at para. 34, adopting Louisell, *Medical Malpractice* vol. 3 at 25-57.

[163] M.J. Saks & R. F. Kidd, "Human Information Processing and Adjudication: Trial by Heuristics" (1980-1981)15 Law & Soc'y Rev. 123 at 151.

[164] Rosenberg, *supra* note 160 at 870.

[165] Recently, in the trade-mark case of *London Life Insurance Co. v. Manufacturers Life Insurance Co.* (1999), 87 C.P.R. (3d) 229 (F.C.T.D.), the plaintiff insurance company argued that a competitor's trade-mark ("New Freedom to Plan") was not registerable because it would be confused with London's own trade-mark, "Freedom 55". To help prove this proposition, London Life commissioned a telephone survey of approximately 300 people to demonstrate that there was more widespread belief that the two slogans originated at the same company (29%) than when a 'placebo' slogan was used that did not contain the word 'freedom' (19%). The Court admitted the evidence, yet London Life was ultimately unsuccessful, in part because the Court was not convinced that the methodology employed by London Life's survey accurately represented the level of confusion in the marketplace caused by the competing slogans.

[166] *Class Proceedings Act*, R.S.B.C. 1996, c. 50 s. 30; *Class Proceedings Act 1992*, S.O. 1992, c. 6 s. 24.

if, *inter alia*, "the aggregate or a part of the defendant's liability to some or all class members can reasonably be determined without proof by individual class members."[167] In fact, the Ontario Law Reform Commission report in 1982 had quite sensibly recommended that aggregate assessment should be the rule, rather than the exception:

> [i]Individual proceedings relating to the assessment of monetary relief should be required only where an aggregate assessment is not feasible or where the amount of monetary relief to which class members are entitled cannot be established by consumer evidence.[168]

This willingness to aggregate claims from liability through damages seems to run counter to the jurisprudence in the United States, where efforts by U.S. courts to perform assessments of damages on an aggregate basis[169] have been seen as violation of defendants' rights under the Fifth and Seventh Amendments of the U.S. Constitution.[170] However, these provisions have no equivalent in Canadian law, where property and civil due process have no such explicit protection.[171]

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[167] *Class Proceedings Act*, R.S.B.C. 1996, c. 50 s. 29(1)(c). See also *Class Proceedings Act 1992*, S.O. 1992, c. 6 s. 24(1)(c).

[168] The Ontario Law Reform Commission, *Report on Class Actions, 3 vols.* (Toronto: Ministry of the Attorney General, 1982) at 597. A contemporary commentator noted that this represented a "mirror image of the United States Model": B. S. Duvall, Jr., "The Importance of Substance to the Study of Class Actions: A Review Essay on the Ontario Law Reform Commission Report on Class Actions" 3 Windsor Yearbook of Access to Justice 411 (Windsor, Ont: University of Windsor, 1983).

[169] In *Cimino v. Raymark Industries Inc.*, 751 F. Supp. 649 (E. D. Tex. 1990) the trial judge had designed a system whereby the tort victims were divided into groups by disease, and the claimant pool was 'sampled' with the damages from these hearings extrapolated across the disease group as a whole.

[170] *Cimino v. Raymark Industries Inc.*, 151 F.3d 297 (5th Cir. 1998). Amendment VII to the U.S. Constitution guarantees a trial by jury in federal civil court. The appeals court found that it guaranteed the defendants "to have a jury determine, the distinct and separable issues of the actual damages of each of the extrapolation plaintiffs": *Cimino v. Raymark* 151 F.3d 297 (5th Cir. 1998) at 320-21. The Court also suggested (at 311) that the procedure employed by the court denied the defendants their Fifth Amendment rights to "due process". Neither a jury trial nor any due process rights are guaranteed in the Canadian constitution (at least with respect to civil trials), so it appears that objections similar to those made in *Cimino* could not succeed against the aggregate damages provisions of the Canadian legislation.

[171] This analysis is supported by the Ontario Law Reform Commission's report *supra* note 168 at 536, which explicitly considered the constitutionality question:

> Most of the American commentary relating to aggregate assessment is of limited usefulness for our purposes, since it has centred on... whether this procedure violates the constitutional rights to trial by jury and due process [and] whether aggregate assessment constitutes a change in the substantive law of the United States and is therefore not permitted by the Rules Enabling Act.

V. *Conclusion*

It is possible that, in adopting a view of causation that is rooted in distributive justice and functionalist analysis, that the case can be made, at least in the case of mass torts, that the rules must be applied so as to best perform the dominant utilitarian functions of the negligence system – optimal compensation and deterrence.[172]

Should this position be accepted, then it is logically possible – indeed possibly even necessary to apply the reasoning in *Fairchild* beyond the narrow circumstances of its facts – i.e. cases in which the injury could only have resulted from the wrongdoing of known persons – and to impose probabilistic liability in cases where the risk was elevated over background levels by an identifiable wrongdoer. If such an extension of *Fairchild* is made, some form of discounted or probabilistic assessment of damages must also occur, and if more than one wrongdoer is found, probabilistic apportionment will be required to avoid overdeterrence.

The most significant aspect of the *Fairchild* decision is the disconnection, indeed the abandonment, of a probable showing of damages caused by the act or omission of the defendant in a negligence case. It is possible that the case marks the end of analysing whether actions are 'actionable per se' or whether the cause is one 'on the case' requiring causally connected damages as a prerequisite for the liability. In analytically disconnecting the negligence from the harm, the Lords seem to be acknowledging that proof of the causal nexus is not required to show negligence as such, though of course it will still be necessary to show causation (by whatever standards) in order to gain compensation.

In her essay on causation in 1998, Justice McLachlin (as she then was) wrote:

> We can reasonably predict that the rules that govern proof of causation in tort will change. What we cannot predict is the pace of the change. Will the common law process of change by small incremental steps suffice? Or will advancing public views about responsibility push the courts and/or the legislatures toward a more rapid and fundamental reappraisal?[173]

Even advocates of judicial restraint regarding causation admit that while "the vast majority of causal problems in tort law can be resolved [through the application of] a small number of rudimentary principles", cases

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Fortunately, there is no need for the Commission to become enmeshed in the more technical aspects of this debate, as the Rules Enabling Act is obviously inapplicable and there are no similar constitutional rights to trial by jury or due process in civil cases in Ontario.

[172] See R. Posner, *supra* note 5 at 33.

[173] McLachlin J., *supra* note 13 at 35.

considering "multiple sufficient causes" (i.e. *Fairchild* and most toxic torts) are "noticeably more complex", and "the 'but for' test often fails to provide a satisfactory answer."[174]

While problems of application remain to be fully resolved,[175] judicious resort to the *Fairchild* risk-based analysis holds great promise for such complex actions, in a way that might serve the functional requirements for improved efficiency of action and fuller compensation and deterrence, while satisfying the moralist demands that tort law not punish those wrongdoers who are 'innocent' in fact of causing harm.

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[174] M. McInnes, "Causation in Tort Law: Back to Basics in the Supreme Court of Canada" (1997) 35 Alta. L. Rev. 1013 at 1021. Nevertheless, McInnes, without reference to any mass tort decisions (which will of course amplify any errors inherent in the 'all or nothing' 'but for' approach, concludes that in such cases "courts (generally) arrive at appropriate conclusions". How McInnes is capable of making this determination without an omniscient understanding of causation-in-fact in the particular cases, though, is not made clear. The standard for judging "appropriateness" is never defined by McInnes, and certainly does not seem to be measured by the yardstick of "appropriate" deterrence or "appropriate" compensation. Indeed, the rules that McInnes argues can be employed to dispose of many indeterminate-causation cases, such as the "thin skull" and "crumbling skull" rules, and the "take your victim as you find him" principle, are simply put forward as self-justifying.

[175] One difficult remaining question of justice and fairness arises due to the retroactive nature of common law liability. While it is not central to our thesis, the fear that a broad category of liability might be imposed on defendants for conduct that was not *at the time actionable* is a real one, and so we deal briefly with it here.

In *Fairchild,* the employers' negligence had been committed since at least the 1960s; the exposure to the fatal fibers in one case might have occurred as early as 1953 or as late as the 1970s. At the time of the negligent exposure, the law of England did not provide for recovery absent a showing of "but for" causation. The House of Lords was therefore reaching back and imposing liability, not only upon a defendant who may have had nothing to do with the injuries suffered, but who at the time of their breach of duty would have had no idea that they could be liable for compensation on such a basis.

However, this problem can be eased if we accept that the focus is shifting from causation, but remaining fixed on wrongdoing and, in the aggregate sense, real injury. The employers in *Fairchild* breached their duty to their employees, and can be taken to have known at the time that they were doing on it; *they just thought they were getting away with it.* In the case of a mass tort, the causation excuse rings hollow: they might not have foreseen harm to the eventual victims, but in the aggregate the harm was perfectly foreseeable. In such circumstances, it seems that there cannot be a strong objection based on moral grounds to the imposition of a new liability for an old wrong, provided the wrong was recognized (or ought to have been recognized) as such at the time. In other words, in situations where the liability may be novel, but the wrong is not.