

# LEGAL ISSUES IN POLLUTION- ENGENDERED TORTS

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## I. Introduction

The end of World War II marked the birth of the modern chemical industry. From that time synthetic rubbers, fibers, and complex organohalogens have been produced in large commercial quantities, such that each member of modern society is exposed to chemicals of exotic physiochemical activity. For years, direct exposure to high concentrations of such compounds has resulted in tort claims.

There is now growing concern that chronic, low-level exposure to these compounds is causing, at an increasing rate, harmful physiological responses. However, the causal link between these agents and their alleged harms is often uncertain. For example, some have argued that there is a growing epidemic of cancer,<sup>1</sup> while a recent study indicates that the incidence of cancer has decreased, if lung cancer, attributable to cigarette smoking, is not counted.<sup>2</sup>

This uncertainty has led to the loss of the "stable state."<sup>3</sup> That is, traditional conflict-resolving institutions are being strained by claims based on new abilities of the scientific communities to identify and predict that products and tools of modern life may harm the environment and ourselves. This article examines the ap-

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<sup>1</sup>Samuel S. Epstein, M.D., *The Politics of Cancer* (San Francisco: Sierra Club Books, 1978), p. 17.

<sup>2</sup>*Chemical and Engineering News* 17 August 1981, p. 32.

<sup>3</sup>Donald A. Schon, *Beyond the Stable State* (New York: Norton and Co., 1971), pp. 9-10.

propriate limits of liability for harm and potential harm under the tort system of private rights resolution for harm arising from exposure to pollutants.<sup>4</sup>

Section II describes the social context and historical development of tort law. Section III outlines key features of four traditional theories of tort recovery to point out the doctrines affecting limitations on tort recoveries that are of particular importance to pollution tort litigation. Section IV addresses the stress on the tort system from the confusion of legal, medical, and scientific causation. Section V discusses the inflexibility of the tort system brought about by concepts of causation, burden of proof, and identification of the defendant in pollution tort cases. Finally, Section VI suggests a broad concept to introduce greater flexibility into the tort system in order to lessen the pressure for even greater government involvement in the regulation of pollution, and in the compensation for pollution injuries.

## II. Social Context of Tort Law

*"The life of the law has not been logic: it has been experience."*

Oliver Wendell Holmes, Jr., 1881

"Conformance to reasonable expectations" is the key to the law's effectiveness because it is only in that way that litigants will accept legal remedies in lieu of private vengeance.<sup>5</sup> Such conformance is possible only when the law reflects "the felt necessities of the time, the pervading moral and political theories and even the prejudices which the judges share with their fellow citizens."<sup>6</sup> Two points are crucial here. First, expectations are mutable, especially in a free society. Second, "prejudice" has a negative connotation, especially in connection with the judicial process, because it signifies a deviation from the goal of "objective truth." But this "truth" is not objective in the sense of moral certainty; rather it is more akin to the vagaries of contemporary standards. Thus, Justice Benjamin N. Cardozo believed that "[m]y duty as judge may be to objectify the law, not my own aspirations and convictions and philosophies, but the aspirations and convictions and philosophies of the men and

<sup>4</sup>Here, "pollutant" refers to any substance, material, or energy form not normally present in the environment or not normally present in the concentration in question.

<sup>5</sup>William L. Prosser, *Law of Torts*, 4th ed. (St. Paul, Minn.: West Publishing Co., 1971), p. 492.

<sup>6</sup>O. Holmes, *The Common Law* (Cambridge: Harvard University Press, 1963), p. 5.

women of my time."<sup>7</sup>

The law has responded to social change in three ways. First, it uses traditional legal doctrine and procedure to reach and justify particular results. Second, the legal system allocates official resources to determine what ought to be done and how. Third, the courts strive, as described above, to relate the perception of reality to contemporary standards, to identify some notion of cause and effect, and to achieve economy in realizing those values.<sup>8</sup> These responses are taken in balance with the desire for continuity of results. Thus, legal policy not only protects vested interests but promotes perceived social virtues, most notably the certainty of relationships.

Balancing these forces is intended to achieve decisions that are not only responsive to the needs of the litigants but also to those of society. However, such equilibrium is difficult when the popular perspective is ill-defined. Under such circumstances, the system appears to be unresponsive to the popular demand for redress of injury. This problem arises in the adjudication of factual disputes found in many pollution-based claims of injury because of the difficulty of establishing causation between the pollutant and the alleged injury, and the relatively new etiology and symptomatology of the harms of which plaintiff complains.

This uneasy relationship between science, technology, and the law is not new. It has been manifest in the historical development of tort principles. In fact, the impetus of tort law was the industrial revolution and its machines, and most notably the railroads, which substantially increased damage to property and persons.<sup>9</sup> The law shifted the cost of many of these injuries from the enterprises to the workers and the public. This was done by the development of legal doctrines, which altered the concepts of causation and procedure.

Proximate cause is a useful device in this regard because it enables the courts to limit liability where cause-in-fact is apparent. For example, in *Ryan v. New York Central Railroad Co.*<sup>10</sup> defendant railroad company negligently set a house on fire. Sparks emitted caused plaintiff's house to burn. The court, using proximate cause, found for the defendant, reasoning that "in a commercial

<sup>7</sup> Benjamin N. Cordozo, *The Nature of the Judicial Process* (New Haven: Yale University Press, 1955), p. 173.

<sup>8</sup> James W. Hurst, *Law and Social Process in United States History* (New York: DeCapo Publishing Co., 1972), pp. 20-21.

<sup>9</sup> B. Schwartz, *The Law of America* (New York: American Heritage Publishing Co., 1974), pp. 241-42.

<sup>10</sup> 35 N.Y. 210 (1866), 13 N.Y. Supp. 869.

country, each man, to some extent, runs the hazard of his neighbors' conduct, and each, by insurance against such hazards, is enabled to obtain a reasonable security against loss."<sup>11</sup> In effect, the court refused to find the railroad liable because it was capable of causing too much damage.

Legal procedure can also limit liability. The statute of limitations, the period of time in which the cause of action must be brought, and the rules regarding the running and tolling of that period directly affect the viability of personal injury suits. Also, the court's determination of which party has the burden of proving the particular facts at issue and the standard of proof to be met are important devices for effectuating social policy.

These 19th-century concepts gradually gave way to more liberal rules of compensation. This liberalization began as the industries became more successful and as the number of uncompensated injured persons, widows, and orphans increased. Strict liability of *Rylands v. Fletcher*<sup>12</sup> began to be applied to a growing number of factual settings, most notably common carriers. The 19th-century "moral" aspect of fault analysis gave way to the more objective standard of reasonable behavior. Finally, courts became more aware of the growing popular resentment against limited liability. Jury verdicts reflected the popular view that people, not industry, ought to be protected financially against industrial hazards.

In order to understand the likely response of the judicial system to personal injuries arising from new technology, including the production of exotic new chemicals, we must distinguish contemporary technology from that of the 19th century. For our purposes, a primary means of distinguishing these technologies is by focusing on the kind of injuries each produced.

Injuries caused by 18th and 19th-century industrial tools usually involved immediate trauma to gross anatomical structure, e.g., crushed or severed limbs. The cause-in-fact link between the defendant's action and the plaintiff's harm was rarely at issue. Also, most jurors and judges were aware of the consequences of the harm sustained. There was communal empathy for the suffering of tort victims.

However, modern chemicals are suspected of causing physical injuries, such as cancer, and certain emotional dysfunctions having etiologies that are little understood by science or medicine. One of the most significant characteristics of the development of these

<sup>11</sup> *Ibid.* at 217, 13 N.Y. Supp. at 873.

<sup>12</sup> L.R. 3 H.L. 330 (1868).

types of diseases is their latency, the time between exposure and expression of the disease. For example, a few types of cancer have a latency period of 20 to 30 years while some mutagenic diseases may take a generation or more to become evident. Moreover, chemicals suspected of causing such diseases often function at low concentrations, e.g., parts per billion, or perhaps a single molecule. In addition, pollution injuries, unlike common traumatic injuries, may be inflicted on many persons located far from the pollution source.

Particularly baffling is their unpredictability. If a heavy beam falls upon a worker, the injury will be much the same regardless of who is struck. Exposure to identical concentrations of a given pollutant, however, may produce reactions varying from no observable ailment to a life-threatening emergency.

These characteristics create unprecedented uncertainty, thereby challenging the ability of the judicial system to perform its traditional role of balancing the availability of compensation for individual injury against the social benefits of the injury-causing agent.

Particularly ponderable is whether the tort concepts of causation, both actual (scientific) and proximate (legal), can function effectively to achieve just results both for individuals injured and for society, where the identification and measurement of both the injury and the benefits are often illusive and imperfect.

This paper focuses on these questions.

### III. Traditional Causes of Action

#### *Nuisance*

Nuisance actions are based upon the ancient maxim, *sic utere tuo ut alienum non laedas* — use your own property in such a manner as not to injure that of another.<sup>13</sup> Although many consider this to be "utterly useless as a legal maxim,"<sup>14</sup> it does reveal the amorphous character of the cause of action. It is just this ill-defined nature which has led to the popularity of nuisance in private litigation to obtain injunctive relief for the control of pollution. However, the potential for using nuisance to recover damages for exposure to pollutants is limited.

Nuisance refers to the interests invaded, not the damage or harm

<sup>13</sup> *Black's Law Dictionary*, 4th ed. rev. (St. Paul, Minn.: West Publishing Co., 1968), p. 1551.

<sup>14</sup> *Ibid.*

inflicted.<sup>15</sup> A nuisance action exists where the plaintiff shows a "substantial" interference with his or her property interest by means of the defendant's "unreasonable" conduct.<sup>16</sup> An interference, physical or otherwise, is substantial if the defendant's action, taken in light of community standards, adversely affects the property interest or reasonable sensibilities of the plaintiff.

Community standards may make an activity a nuisance, although there is no foundation in scientific fact to support the fears and prejudices of that community. In the case of *Everett v. Paschall*,<sup>17</sup> a private nuisance action was brought in which plaintiff alleged that defendants' sanitarium, for use by persons having pulmonary tuberculosis, decreased the value of plaintiff's property. Defendants argued that as a scientific fact, the sanitarium presented no danger of infection and that this enterprise represented a great benefit to the community. The trial court found these allegations to be true and refused to grant an injunction against the sanitarium. The appellate court agreed with the factual findings of the lower court, but reversed, stating:

[W]e question our right to say that a fear is unfounded or unreasonable, when it is shared by the whole public to such an extent that property values are diminished. The question is, not whether the fear is founded in science, but whether it exists; not whether it is imaginary, but whether it is real; in that it affects the movements and conduct of men. Such fears are actual, and must be recognized by the courts as other emotions of the human mind.<sup>18</sup>

The appeals court stated further that "the theories and dogmas of scientific men, though provable by scientific reference, cannot be held to be controlling unless shared by the people generally."<sup>19</sup>

Thus, a nuisance action may be well founded even though it is based on mental attitudes or popular reactions that have no basis in scientific fact.<sup>20</sup>

<sup>15</sup>See Prosser, p. 577.

<sup>16</sup>The law of nuisance is divided into two parts, public and private. A public nuisance is an act or omission interfering with an interest common to the general public rather than peculiar to the individual. One has a cause of action here only if he or she has suffered damage peculiar in kind, not just degree, to himself or herself. A private nuisance requires interference with plaintiff's use and enjoyment of his or her land. If a private nuisance is found, consequential damages to the possessor's person or property may be awarded.

<sup>17</sup>61 Wash. 47, 111 P. 879 (1910).

<sup>18</sup>Ibid.

Courts universally require that interference with the particular protected interest be not only substantial, but also unreasonable. However, courts are divided as to the tests for "unreasonableness." The majority of the courts follow a balancing approach in which "the law must make the best arrangement it can between the contending parties, with a view of preserving to each one the largest measure of liberty possible. . . ." <sup>21</sup> The balance focuses mainly on the parties before the court. Thus, an individual plaintiff seeking recovery for injury resulting from large-scale pollution faces a difficult barrier in attempting to sway the balance to his behalf.

The minority position rejects the balancing doctrine and argues that "every substantial, material right of person or property is entitled to protection against all the world . . . [i]f the smaller interests must yield to the larger, all small property rights, . . . would sooner or later be absorbed by the large, more powerful few." <sup>22</sup>

Under this rationale, the defendant's activity is balanced against the normative principle of the sanctity of personal and private rights. However, courts have also indicated that in striking the balance between the competing property interests, the relative importance assigned property rights may vary from generation to generation. <sup>23</sup>

The use of a nuisance cause of action to recover damages for a pollution injury reduces the emphasis on causation. The focus of this tort is not on the culpability of defendant, but the occurrence of pollution. The question of whether the nuisance once proven caused an alleged personal injury still exists, but it is a matter of secondary focus — a question of "consequential" damages. However, the viability of a nuisance suit for the recovery of personal injury damages in pollution cases is limited by at least four considerations.

<sup>19</sup>Ibid. at 49; 111 P. at 881.

<sup>20</sup>This willingness to restrict activity without a scientific showing of danger also occurs in coercive government regulation. For example, when the California Assembly Health Committee (Chairman Art Torres) recently considered whether the state should regulate DNA recombinant research, Assemblyman Herschel Rosenthal stated, "We have a responsibility to allay people's fears, which the scientific community has done very little to allay. [New state] guidelines may not be necessary in terms of what you [science and industry] are doing but [may be required] in terms of people's perceptions . . . ." *Sacramento Bee*, 12 December 1981, p. E1.

<sup>21</sup>*Madison v. Duck Town Sulphur, Copper and Iron Company*, 113 Tenn 331, 366, 83 S.W. 658, 666 (1904).

<sup>22</sup>*Hulbert v. California Portland Cement Company*, 161 Cal. 239, 251, 118 P. 928, 933 (1911).

<sup>23</sup>*Antonik v. Chamberlain*, 81 Ohio App. 465, 475-76, 78 N.E.2d 752, 759 (1948).

First, there is no concept of a private nuisance to the person as an individual separate from the ownership or occupancy of land.<sup>24</sup> The need to establish a property right in the polluted area can be a significant barrier.

Second, pollution cases are likely to be classified as public nuisances rather than private nuisances because of the usually wide distribution of the pollutants. If it is considered to be public rather than private, the plaintiff must demonstrate that he or she has or will suffer some special injury not shared with the general public. As long as the courts require the special injury to be different in the kind of injury, not just in the degree of injury, the widespread health effects of most pollution make the nuisance action less viable.

Third, plaintiff may have to overcome the problem of showing that the polluter has not, through the passage of time, obtained prescriptive rights with respect to the polluting activity. For example, in *Hulbert* the court found that the statute of limitations had run and thereby "the defendant had acquired a prescriptive right to manufacture the maximum quantity of cement produced annually by that factory."<sup>25</sup>

Fourth, in light of the rapidly expanding urban population, plaintiff's nuisance suit may be inhibited by the doctrine referred to as "coming to the nuisance." Some courts use this doctrine to block recovery by plaintiffs who voluntarily place themselves in contact with the pollution.<sup>26</sup> However, "[t]he prevailing rule is that in the absence of a prescriptive right the defendant cannot condemn the surrounding premises to endure the nuisance, and that the purchaser is entitled to the reasonable use and enjoyment of his land to the same extent as any other owner."<sup>27</sup> However, priority of occupation may influence the "unreasonableness" of the defendant's activity.

### *Trespass*

Trespass, like nuisance, has had limited success in pollution cases even though it has certain procedural advantages. Depending upon whether or not the jurisdiction in question maintains a distinction between trespass and trespass on a case, the burden and necessity of proving damages may be lessened. Trespass actions also benefit

<sup>24</sup> See Footnote 16.

<sup>25</sup> *Hulbert*, 161 Cal. at 244, 118 P. at 930.

<sup>26</sup> 379 Pa. 441, 109 A.2d 310 (1954).

<sup>27</sup> See Prosser, p. 611.



from having a longer period for statute of limitations. Furthermore, the attendant difficulties of balancing the equities and the questions of the defense of coming to the nuisance are avoided.

Trespass is "any intrusion which invades the possessor's protected interest in exclusive possession."<sup>28</sup> At early common law one could be held strictly liable for any invasion of such an interest. However, the existing rule, as embodied in the *Restatement (Second) of Torts*, provides that liability in trespass exists only when defendant invades plaintiff's exclusive right of possession by engaging in an abnormally dangerous activity or intentionally or negligently entering the land of another.<sup>29</sup> However, where the invasion is intentional the trespasser will be held liable whether or not he or she caused harm.<sup>30</sup> New York alone appears to embrace strict liability in trespass where defendant intended to do the act done, but not necessarily the consequences.<sup>31</sup> However, where defendant is a polluter, this lack of strict liability may not hinder the viability of a trespass action. An intentional act on the part of defendant could be asserted in that the release of a pollutant should be known to defendant. Thus, the deposition upon the land or person of another would be substantially likely. If defendant did not know of the release, plaintiff could argue that defendant was negligent in not knowing.<sup>32</sup> The injured party could also assert that defendant had engaged in an ultra-hazardous activity.<sup>33</sup>

Pollution cases often present facts that blur the distinction between trespass and nuisance. Generally, trespass is considered to be an invasion of plaintiff's interests in the exclusive possession of his land, whereas nuisance is an interference with plaintiff's use and enjoyment of his possessory interest.<sup>34</sup> In part, this distinction

<sup>28</sup> *Martin v. Reynolds Metals Company*, 221 Or. 86, 94, 342 P.2d 790, 794 (1959), cert. denied, 362 U.S. 918 (1960).

<sup>29</sup> *Restatement (Second) of Torts* §166 (1965).

<sup>30</sup> *Ibid.* at §166. "Intent" denotes that the actor desires to cause the consequences of his act as opposed to intending the act done. However, where the actor knows that the consequences are certain, or substantially certain, one is treated as if he or she, in fact, desired the results. If the consequences are less than substantially certain, the acts are termed reckless, and where they create a mere risk that the results will follow, the defendant's acts are characterized as ordinary negligence. *Restatement (Second) of Torts* §8A, comments (a) and (b).

<sup>31</sup> *Phillips v. Sun Oil Co.*, 307 N.Y. 328, 331, 121 N.E.2d 249, 250-51 (1954); see also *Wood v. United Airlines*, 32 Misc. 2d 955, 223 N.Y.S.2d 692 (1962).

<sup>32</sup> See this article, Section III, p. 111.

<sup>33</sup> See this article, Section III, p. 113.

<sup>34</sup> For a different conceptualization, see M. Rothbard, "Law, Property Rights, and Air Pollution" in *Cato Journal* 2 (Spring 1982), pp. 81-82.

arose from the court's attempt to determine whether some direct physical invasion of a plaintiff's property had occurred. Here, the impact of science upon law is clear. Through the development of modern scientific detecting methods, the courts are now able to detect the physical invasion of microscopic particles. Thus, trespass may be found "whether that intrusion is by visible or invisible pieces of matter or by energy which can be measured only by the mathematical language of the physicist."<sup>35</sup> Through the application of this rationale, the use of trespass may increase.

Confusion between these two forms of action exists also because, contrary to popular belief, balancing of interests occurs in trespass as in nuisance. When a continuing trespass is at issue, for example, where defendant mistakenly builds a structure upon plaintiff's land, the court will decide whether it is better to have the structure removed by defendant or to force plaintiff to sell that portion of the property upon which the structure is located. Second, the prohibition against balancing of interests "does not mean that a weighing process does not take place when a court decides whether a particular kind of intrusion is of such a nature that it should be classified as a trespass."<sup>36</sup> That is, "the tort of trespass is composed of components which include the character of the defendant's conduct in causing an intrusion and the character of the harm visited upon the plaintiff in interfering with his interest in the exclusive possession of the premises."<sup>37</sup> Thus, the court could find by examining defendant's conduct in light of plaintiff's interest that the possessory interest invaded is *de minimis*.

Throughout the evolution of the law, changing social mores and perspectives have altered the identity of those interests that the legal system finds of such significance that strict rules of liability are developed to protect them. From early common law, the rules of trespass were intended to prevent bloodshed and community disintegration. Infringement upon land of another was just such a disruptive character because of the emotional turmoil it would cause. This basis of trespass law was expressly recognized in the *Martin* case where Justice O'Connell stated, "[p]robably the most important factor which describes the nature of the interest protected under the law of trespass is nothing more than a feeling which a possessor has with respect to the land which he holds."<sup>38</sup>

<sup>35</sup> *Martin*, 221 Or. at 94, 342 P.2d at 794.

<sup>36</sup> *Ibid.* at 98, 342 P.2d at 796.

<sup>37</sup> *Ibid.* at 98, 342 P.2d at 795.

<sup>38</sup> *Ibid.* at 100, 342 P.2d at 796.

As the legal system faces a changing social climate brought about in part by the introduction of exotic chemicals, the question arises whether there may be such emotionally-charged personal interests or rights, separate from property, that the traditional strict rules of trespass should be applied to protect them.

### *Negligence*

Negligence is a third major legal theory for the recovery of personal injury damages from pollution cases<sup>39</sup> and the theory most commonly employed.<sup>40</sup>

There are two major advantages of a negligence action. The first is the greater likelihood of obtaining punitive damages.<sup>41</sup> Second, generally in a negligence action the statute of limitations is tolled until plaintiff has discovered, or should have discovered, his or her injury. For example, in *Ruth v. Dight*<sup>42</sup> the court held the statute of limitations was tolled for 23 years, where defendant doctor had caused a sponge to be left in plaintiff's body for that period of time. A New York court decision recently followed a contrary rule in *Steinhordt v. Johns Manville Corporation*, 78 A.D. 2d 557 (1980); upheld in 50 L.W. 2280 (October 1981). There, plaintiff claimed that the deceased had died as a result of his exposure to asbestos during his 26 years at work. The court held that claims based on breach of warranty, negligence, and products liability were barred by the statute of limitations. The court ruled that the statutory period of limitation begins to run from the time when liability for wrong has arisen even though the injured party may be ignorant of the existence of the wrong or injury.<sup>43</sup>

There are four basic elements of any negligence action: A duty or obligation recognized by law requiring conformance to a particular standard of behavior, a breach of that standard, a causal connection between defendant's action or omission and plaintiff's injury, and actual loss or damage to a legally protectable interest.<sup>44</sup> This section briefly describes the impact of the elements of duty and standard of

<sup>39</sup> For a condemnation of negligence as a form of action, see Richard A. Epstein, *A Theory of Strict Liability: Toward a Reformulation of Tort Law* (Washington, D.C.: Cato Institute, 1980). See also, idem, "The Principles of Environmental Protection: The Case of Superfund" in *CATO Journal* 2 (Spring 1982), pp. 9-38.

<sup>40</sup> See Rothbard, pp. 81-82.

<sup>41</sup> See Prosser, pp. 9-10.

<sup>42</sup> 75 Wash. 2d 660, 453 P.2d 631 (1969).

<sup>43</sup> See *Schmidt v. Merchants Desp. Transp. Co.*, 270 N.Y. 287, 300 (1936); see also *Schwartz v. Heyden Newport Chemical Corp.*, 12 N.Y. 2d 212 (1963).

<sup>44</sup> See Prosser, p. 143.

care. Causation and harm are discussed in Section IV.

The existence of both duty and the requisite standard of care depend upon the risk of injury which the particular activity in question involves. A risk is either reasonable (not actionable) or unreasonable (actionable). Generally, courts determine reasonableness of defendant's conduct by examining the possibility and gravity of the harm involved discounted by the utility of defendant's activity in light of possible alternatives which defendant faced.<sup>45</sup> This balancing of interests can have a significant impact on pollution torts. For example, in situations involving chemicals of unknown physiological activity, i.e., having only a speculative risk of harm and of unique economic importance, the courts will have difficulties finding a violation of an appropriate standard of care. "In determining the duty of care the law imposed upon the defendant, it is to be borne in mind that the ordinary care which the law requires of such a defendant is measured in part by the defendant's knowledge of potential dangers."<sup>46</sup>

Thus, in determining the standard of conduct to which defendant must conform, the court, as in nuisance cases, must balance the social utility of defendant's activity with the risk of harm presented.<sup>47</sup>

However, an element of a fixed standard of care runs through this balancing. "[W]hat ought to be done is fixed by a standard of reasonable prudence, whether it usually is complied with or not."<sup>48</sup> In pollution-engendered negligence actions defendants can be expected to make a major issue of the standard of care unless a clear mistake has been made. For example, persons claiming injury from acidic fumes emitted from a plant during normal operations on a normal day would face a severe standard of care issue. On the other hand, a plaintiff allegedly injured from improper operation of the plant under exceptional weather conditions may find no issue at all.<sup>49</sup>

### *Strict Liability*

The notoriety of the last few years given to concepts of strict liability through "product liability" court decisions has raised the question of whether plaintiffs asserting a pollution-based tort claim

<sup>45</sup> See Prosser, pp. 145-46.

<sup>46</sup> *Reynolds Metals v. Yturbide Company*, 258 F.2d 321, 327 (9th Cir. 1958).

<sup>47</sup> See Prosser, p. 149.

<sup>48</sup> *Texas & Pacific Railway Company v. Behymer*, 189 U.S. 468 (1902), per Holmes, J.

<sup>49</sup> *Hagy v. Allied Chemical Co.*, 122 Cal. App. 2d 361, 265 P.2d 86 (1954).

might find the same advantage in a strict liability theory as have plaintiffs in consumer tort actions. It appears unlikely that this will occur.<sup>50</sup> Strict liability in tort is based upon the theory that one who realizes profit from the hazards of his or her activity assumes the attending risk and may be held liable for any invasion of the person or property of another, notwithstanding that he or she may be free from all negligence or wrongdoing.<sup>51</sup> The social argument supporting this theory is that where defendant is acting for his own purposes and such activity involves inevitable loss to innocent victims, defendant is in the better position to administer the unusual risk of loss by passing it on to the public as a cost of producing the product or service in question.

The applicability of strict liability to cases follows two lines. One line involves products and is set forth in *Restatement (Second) of Torts*. There, a businessperson who sells a defective product, which is thereby unreasonably dangerous to the consumer or his property, is subject to liability for physical harm caused by the product if that product reaches the consumer without substantial alteration.<sup>52</sup> In California, the product need not be "unreasonably dangerous."<sup>53</sup> This line of cases is the "product liability" line, which has so greatly expanded in recent years.

The second line of strict liability cases applies to abnormally dangerous activities based on the case of *Rylands v. Fletcher*.<sup>54</sup> This line of cases has the most potential for application to pollution-based torts. It is also described by *Restatement (Second) of Torts*, which provides that:

- (1) One who carries on an abnormally dangerous activity is subject to liability for harm to the person, land or chattels of another resulting from the activity, although he has exercised the utmost care to prevent the harm.<sup>55</sup>

The following factors are provided by *Restatement* in determining whether an activity is abnormally dangerous: The probability and degree of risk, uncommon nature of risk, ability to eliminate the

<sup>50</sup>See Epstein, *Theory of Strict Liability*, for arguments favoring the replacement of negligence with strict liability.

<sup>51</sup>See Prosser, p. 495.

<sup>52</sup>*Restatement (Second) of Torts* §402(A).

<sup>53</sup>*Cronin v. J.B.E. Olson Corp.*, 8 Cal. 3d 121, 104 Cal. Rptr. 433 (1972); *Beech Aircraft Corp. v. Superior Court of Los Angeles County*, 61 Cal. App. 3d 501, 132 Cal. Rptr. 541 (1976).

<sup>54</sup>See Footnote 12.

<sup>55</sup>*Restatement (Second) of Torts* §519.

<sup>56</sup>*Ibid.* §520.

risk, appropriateness of activity in the locale, and the activity's benefit to the community.<sup>56</sup>

This branch of the strict liability doctrine is limited, as under a negligence approach, by the requirement of a balance between risk of harm and social utility of the activity. "Even though the activity involves a serious risk of harm that cannot be eliminated with reasonable care . . . its value to the community may be such that the danger will not be regarded as an abnormal one."<sup>57</sup>

Thus, the use of strict liability in pollution torts will turn not only on the nature of the substance involved, but also on the circumstances of the alleged injury as well as the manner in which the competing interests are balanced by the forum in which the case is brought.

#### IV. Causation and Harm

"Fairness" requires that in order to hold defendant liable, a causal connection between defendant's allegedly tortious conduct and the harm of which plaintiff complains must be established. The sanguinity of this self-evident rule belies the philosophical and legal tumult generated when applying the concepts of causation and harm to pollution cases involving personal injuries.

##### *Causation*

##### *1. Reasons for Causal Disharmony*

The agitation over causation stems from three basic sources: First, the conceptual and language differences among the three disciplines that are usually involved in litigating a pollution tort case — science, medicine, and law; second, the courts' disfavor of statistical evidence; and third, the unknown etiology of many diseases pollution is suspected of causing.

Science functions "to establish general laws covering the behavior of empirical events or objects . . . and thereby to enable us to connect together our knowledge of the separately known events, and to make reliable predictions of events as yet unknown."<sup>58</sup> It does this by challenging mental constructs, called hypotheses, with experiments and then measuring the response of the particular parameter being investigated. The goal is "to discover what distin-

<sup>57</sup>Ibid. §520, comment (k).

<sup>58</sup>Richard R. Braithwaite, *Scientific Explanation* (Cambridge, Eng.: Cambridge University Press, 1955), p. 1.

guishes a causal antecedent from a merely temporal antecedent"<sup>59</sup> so that one can assess the probability that the presence of "X" results or causes the presence of "Y." Thus, science is concerned with the logical problems of defining the conditions under which it is valid to infer the existence of "unobserved matters of fact on the basis of evidence concerning observed matters of fact."<sup>60</sup>

The validity of scientific conclusions rests on the fundamental assumption "that the scientist can identify all dependent and independent variables and hold constant all, or at least most, of the significant, independent variables."<sup>61</sup> Moreover, the utility of a hypothesis (such as DDT thins the eggshells of California condors)<sup>62</sup> depends on how closely the experimental parameters relate to the physical system in question. For issues involving the environmental impact of pollutants, it is often impossible, on moral grounds as well as scientific grounds, to design a completely reliable experimental model. This provides the lawyer with fertile ground for aggressive cross-examination of expert witnesses.

Medicine, like science, attempts to identify the single event that gives rise to a particular disease. One of the most challenging areas of modern medicine is determining the etiology of neoplastic diseases and other idiopathic diseases,<sup>63</sup> especially those that may be caused by environmental factors. There are two fundamental problems in this regard: The lack of physiological knowledge about these types of diseases and the growing belief that a complex interaction of multiple factors may be required to induce the observed pathological disorders. For these reasons, it will be difficult if not impossible for the lawyer to provide convincing and irrefutable medical evidence of causation where the personal injury is of this type.

Another problem exists for the lawyer when he or she deals with a physician as a source of expert information. The lawyer must be

<sup>59</sup> A. Pap, *Introduction to the Philosophy of Sciences* (New York: Free Press of Glencoe, 1962), p. 252.

<sup>60</sup> W. Salmon, *The Foundations of Scientific Inference* (Pittsburgh: University of Pittsburgh Press, 1966), p. 76.

<sup>61</sup> D.W. Large and P. Michie, "Proving that Strength of the British Navy Depends on the Number of Old Maids in England: A Comparison of Scientific Proof and Legal Proof," 11 *Environmental Law* (1981): 537, 565.

<sup>62</sup> F.E. Guthrie and J.J. Perry, *Introduction to Environmental Toxicology* (New York: Elsevica North Holland Ltd., 1980), p. 110.

<sup>63</sup> Idiopathic denotes a disease of unknown cause. *Stedman's Medical Dictionary*, 23d ed. (Baltimore, Md.: Williams and Wilkins Co., 1976), p. 689.

aware that a doctor employs "habits of thought,"<sup>64</sup> which differ from those the attorney uses; this could cause difficulty in communication. Thus, in examining medical evidence, the lawyer must understand that the physician's training bends his thinking in a particular direction, distinct from the attorney's mind set.<sup>65</sup>

Contrary to both science and medicine, the legal system bifurcates causation into cause-in-fact and proximate or legal cause. Although commentators<sup>66</sup> have pointed out the difficulty in distinguishing these concepts as they are utilized by the courts, the consensus is that cause-in-fact is a phenomenon of the physical universe, i.e., akin to scientific cause, while proximate or legal cause is a question of social value.<sup>67</sup> Because the concept of causation in law is designed to aid the finder of fact in resolving conflict, the law must try to reflect the perception of people by safeguarding their reasonable expectations; a common-sense notion of causation must underlie legal analysis.<sup>68</sup> Thus, when the reasonable expectations of the populace are contrary to the notions of scientific or medical causation, a conflict arises between proof of legal causation and proof of causation acceptable for science and medicine.

## 2. *Use of Scientific Causation in the Law*

Traditionally, the difference between scientific cause and legal cause has been viewed as a product of proximate cause since there is no analogous concept in science or medicine.<sup>69</sup> Proximate or legal cause is defined as "[t]hat which, in a natural and continuous sequence, unbroken by any efficient intervening cause, produces the injury, and without which the result would not have occurred."<sup>70</sup> Justice Andrews accurately described the function of the concept when he stated, "What we do mean by the word 'proximate' is that because of convenience, of public policy, of a rough sense of justice, the law arbitrarily declines to trace a series of events beyond a cer-

<sup>64</sup> B.F. Small, "Gaffing at a Thing Called Cause," 31 *Texas Law Review* (1953): 630, 649.

<sup>65</sup> *Ibid.*

<sup>66</sup> See, e.g., W.S. Malone, "Ruminations in Cause-In-Fact," 9 *Standard Law Journal* (1957): 60.

<sup>67</sup> See, e.g., A.C. Becht and F.W. Miller, *The Test of Factual Causation in Negligence and Strict Liability* (St. Louis, Mo.: Washington University Studies, 1961).

<sup>68</sup> See generally H.L.A. Hart and A.W. Munroe, *Causation in Law* (Oxford: Clarendon Press, 1961), pp. 24-57.

<sup>69</sup> The term "proximate cause" as used by the medical profession means "that which immediately precedes and produces an effect." *Dorland's Illustrated Medical Dictionary*, 25th ed. (1975), p. 275.

<sup>70</sup> See *Black's Law Dictionary*, p. 1391.



tain point. This is not logic, this is practical politics."<sup>71</sup> Proximate cause, then, represents a device by which the law cuts off defendant's liability.

It would seem logical, from this description of proximate cause, that defendant's liability could exist only to the extent of cause-in-fact. This, however, is not always the case, especially when the cause-in-fact issue is difficult to resolve.

Causation in typical personal injury cases rarely involves questions about the harmful agent's capacity to inflict the harm of which plaintiff complains. Similarly, for an acute, discrete exposure to pollutants, such problems of proof may not be involved.<sup>72</sup> However, where exposure is protracted and involves small amounts of a substance or an agent having low or questionable physiological activity, cause-in-fact becomes a major issue.

Even though legal cause-in-fact is frequently associated with the scientific conceptualization of causation, this comparison begins to unravel where the pollution tort involves chronic and continuous exposure. Just as with Heisenberg's world of electron distribution, the more closely and nicely legal causation is examined, the more uncertainty is revealed.<sup>73</sup>

Scientific cause is typically an analog concept.<sup>74</sup> For example, a scientist tends to describe a substance's mutagenic capacity in terms relative to some known standard. When asked, "Did this substance cause this mutation?" a scientist tends to respond with a statement couched in statistical terms. In a trial, it is the function of the finder of fact to convert this analog signal, i.e., the scientist's answer, into a digital concept of cause-in-fact sought by the court. The court seeks a yes or no answer to the question of cause-in-fact because, in most instances, it must either find for plaintiff or defendant. It is ironic that the very scientific method that provides the scientist with his expert status inhibits his ability as a witness to re-

<sup>71</sup> *Palsgraf v. Long Island Railroad Co.*, 248 N.Y. 339, 352, 162 N.E. 99, 103 (1928).

<sup>72</sup> See, e.g., *Filisko v. Bridgeport Hydraulic Company*, 176 Conn. 33, 404 A.2d 889 (1978), where the court ruled "scientific proof" was not required in a pollution tort when causation was patently obvious.

<sup>73</sup> W. Heisenberg, "Illustrations of the Uncertainty Relations" in *The World of Laws and The World of Chance* (New York: Simon and Schuster, 1956), pp. 1051-52. The Heisenberg Uncertainty Principle refers to the inability to accurately describe simultaneous values of various quantities with which quantum theory deals. Thus, it is impossible to simultaneously define the position and velocity of an electron.

<sup>74</sup> "Analog," as used here, refers to information or data derived from measuring physical properties capable of having values along a continuum, e.g., length, mass, and temperature. Edgar B. Wilson, *An Introduction to Scientific Research* (New York: McGraw-Hill Publishing Co., 1952), pp. 344-45.

spond with the desired yes or no answers to the crucial questions of the lawyers.<sup>75</sup>

Confronted with this dilemma, some commentators<sup>76</sup> have argued that the traditional legal concept of cause-in-fact places unreasonable constraints on the ability of the legal system to adequately respond to the need to minimize the risks of future injury, such as those that may be caused by certain pollutants. Others have gone further and argued that both the concept of fault and cause-in-fact are inappropriate in this factual setting. They assert that liability should be found whenever it would be consistent with the efficient allocation of resources.<sup>77</sup>

These inherent problems of "A to D conversion"<sup>78</sup> are accentuated by the different social roles that science, medicine, and law play. Science is used to understand physical reality. Its continued objectivity as it searches for universal principles is to society's advantage. On the other hand:

[l]aw is a concept . . . representing a system of adjustment toward social harmony and accomplishment in an ordered direction. The system is an evolving one, reflecting the totality of Man's experience of all ages and of all times. It embraces primitive savagery with cultural enlightenment, lustful intemperance with moral awakening, fear with understanding, ignorance with learning.<sup>79</sup>

The "results" science pursues exist independent of their quest, being descriptive of reality. However, in law, the results exist only in the context of that search, borne from the desire for certainty in a world of evanescent, human perception.

### 3. Use of Statistical Evidence

The parties also face difficulty in utilizing scientific data in the courtroom. Courts tend to be suspect of statistical evidence, upon

<sup>75</sup> See Large and Michie, p. 595.

<sup>76</sup> See, e.g., Gelpe and A. Tanlock, "Environmental Decision Making," *So. California Law Review* 48 (1971): 371.

<sup>77</sup> See, e.g., G. Calabresi, *The Costs of Accidents* (New Haven: Yale University Press, 1970); R. Coase, "The Problem of Social Cost," *Journal of Law and Economics* 3 (1960): 1; R. Epstein, "A Theory of Strict Liability," *Legal Studies* 2 (1973): 151.

<sup>78</sup> There is an analogous problem in science where "analog" data is being analyzed in a digital manner. For example, the converting of a change in resistance, which can assume a continuum of values, to a digital representation. See Christie G. Enke, "Data Domains — An Analysis of Digital and Analog Instrumentation Systems and Computers," in *Instrumentation in Analytical Chemistry* (Washington, D.C.: American Chemical Society, 1973), p. 345.

<sup>79</sup> See Small, p. 652.

which science relies, for four reasons: The extrapolation problem, the "particularity" problem, variations in statistical methodology, and the "negative" bias.

Three extrapolations are usually required in the use of toxicological evidence.<sup>80</sup> First, toxicological findings are usually a product of experiments in which all variables, except one, e.g., the presence or absence of the studied compound, remain constant. From this controlled factual setting, the court is asked to apply the scientific results to the heterogeneous event experienced by plaintiff, i.e., an environment-to-environment extrapolation. Second, the results upon which the court is to rely are often derived from animal studies. Thus, the court is required to assume that the results obtained from studying experimental animals are applicable to man, i.e., a rat-to-man extrapolation.<sup>81</sup> This may present a problem because the incidences of certain diseases, such as cancer, are known to vary with respect to the species of animals used in the experiments, and even between sexes and strains of the same animal.

Third, the dose to which plaintiff is exposed is usually much less than that by which the test organism is challenged. The court is then required to extrapolate the test findings to the significantly different conditions to which the plaintiff was exposed, i.e., an extrapolation to zero. The problem is exemplified by the difficulty in estimating cancer rates from low doses of ionizing radiation. Even though there is a vast experimental literature on the health effects of radiation, a reasonable understanding of the mechanisms of physical damage of the cell which result in cancer, and wide agreement concerning the mathematical relationship between dose and cancer rates, "reasonable men have disagreed by as much as factor of 100 or more in the assessment of the risks from exposures to a single ray of sparsely ionizing radiation, like X-ray or gamma ray."<sup>82</sup> Even when the moving party uses human epidemiological data, the courts may find it unconvincing. Judges recognize that although such studies reveal information on probabilities of causal connection in a population, they are still faced with the legal problem of determining whether a causal relationship exists in the instant case.

Some of these problems with scientific testing techniques and statistical approaches have begun to be resolved by the publication of the Organization for Economic Cooperation and Development

<sup>80</sup>See Large and Michie, p. 561.

<sup>81</sup>Ibid.

<sup>82</sup>C. Land, "Estimating Risks from Low Doses of Ionizing Radiation," 209 *Science* (1980): 1197.

Guidelines for Testing of Chemicals.<sup>83</sup> That work describes various testing procedures and statistical methods that an international panel of experts consider to be good scientific practice.

There is also the possibility of conflicting results from statistical data due to the particular mode of data reduction employed. This is exemplified in the disagreement between Seskin and Lave's air pollution study and that conducted by Gibbons and McDonald for the General Motors Research Laboratories.<sup>84</sup> In their study, Seskin and Lave concluded that a 50 percent reduction of air pollution would lead to a 4.7 percent reduction in mortality nationally. However, Gibbons and McDonald, using essentially the same data, concluded that such a reduction of pollution would result only in a 0.43 percent reduction in mortality.

Scientific proof may also be subjected to the criticism that it is biased against negative results. For example, if the hypothesis is that compound "X" causes tumors, the positive finding is favored over the negative finding. This bias arises from the operation of the scientific method as well as from practical considerations. The scientific method provides that the failure of the experimental results to conform to the hypothesis does not necessitate the conclusion that the hypothesis is false.<sup>85</sup> Such a conclusion should be made only when the experimenter "in light of the hypothesis, its parameters, the experimental technique, and the treatment of the resulting data . . . [finds] that the experiment would have detected a positive result if the agent being investigated was truly harmful."<sup>86</sup> Furthermore, "[t]here appears to be an urge to generate and publish positive results regardless of how they are obtained."<sup>87</sup> Science, like legal practice, is a business and subject to influences other than the pure purpose of the discipline.

#### 4. Example of Causal Disharmony

These distinctions have led to arguably inconsistent factual findings. A clear example of such confusion is in comparing legal determinations of trauma and radioactive contamination as causes of cancer. An examination of the literature reveals that "[m]ost medical authorities . . . strongly believe that trauma, as a single fac-

<sup>83</sup> See Organization for Economic Cooperation and Development, *Guidelines for Testing Chemicals* (Washington, D.C.: OECD, 1981).

<sup>84</sup> Reported in 119 *Science News* (1981): 152.

<sup>85</sup> See Large and Michie, p. 567.

<sup>86</sup> *Ibid.*

<sup>87</sup> M. Green, "Scientific McCarthyism," *Chemtech*. 11 (1981): 402, 404.

tor, is not a causative agent of cancer."<sup>88</sup> Thus, awarding compensation solely on the basis of the appearance of a tumor after a single trauma would appear to be unjustifiable. It must be surprising to the medical profession that awards have been granted by juries finding that such a trauma can cause cancer.

In the case of *Traveler's Insurance Company v. Rowand*<sup>89</sup> (a Texas case), Mr. Rowand had suffered a single, severe trauma to his right testicle. Later, Mr. Rowand developed two small malignant tumors on that testicle, which later metastasized.<sup>90</sup> The jury found for plaintiff, even in light of expert testimony detailing the lack of a relationship between trauma and cancer. The court held, in upholding the award, that "it was within the province of the jury upon fair consideration, to believe or disbelieve all or any part of the evidence of this or any other witness where there was a conflict in the evidence or, even if there was no conflict, where the conflicting reasonable inferences might fairly be drawn from the undisputed facts."<sup>91</sup> Thus, the jury is free to disregard all scientific evidence on causation, even if there is no conflicting evidence, if the jury finds the evidence conflicts with inferences as to causation that the jury itself draws directly from the facts of the case.

Contrast this result to the determination of another court in the same state. In *A. Parker v. Employers Mutual Liability Insurance Company of Wisconsin*,<sup>92</sup> it was established that Mr. Parker, who worked for nearly five years as a handler of radioactive material (a powerful carcinogen), developed cancer in his groin. The trial court, on these facts, found for Parker; however, the Supreme Court of Texas ruled that, although the doctors testified "that the cancer 'could have' been caused by radiation, a sufficient causal link had not been established."<sup>93</sup> The Texas Supreme Court so found even though there was competent expert testimony as to the carcinogenic nature of radiation as well as facts indicating that Mr. Parker's employer knowingly allowed him to work for a great length of time around radioactive material without bodily protection of any kind.<sup>94</sup> The court distinguished this case from those involving traumatic cancer, stating "trauma has been seen to be so

<sup>88</sup>G. Monkman, G. Orwoll, and J. Ivans, "Trauma and Oncogenesis," *Mayo Clinic Proceedings* 49 (1974): 157.

<sup>89</sup>197 F.2d 283 (5th Cir. 1952).

<sup>90</sup>*Ibid.* at 284.

<sup>91</sup>*Ibid.* at 285.

<sup>92</sup>440 S.W.2d 43 (1969).

<sup>93</sup>*Ibid.* at 47.

<sup>94</sup>*Ibid.* at 50.

related to the onset of cancer to allow a jury decision whether it was in fact the cause . . . [however in this case] [t]here is no testimony or evidence other than coincidence supporting a reasoned relationship between the radiation and cancer in this case."<sup>95</sup> In the state of Texas, then, the widow and orphan of the late Mr. Parker would have been less destitute had Mr. Parker been hit in the testicles with a canister containing the radioactive material rather than simply having been irradiated by this known carcinogen.

### *Harm*

The extent of liability in tort depends upon the showing that plaintiff suffered an "injury" as a consequence of defendant's action. An injury is "any wrong or damage done to another, either to his person, rights, reputation or property."<sup>96</sup> Where plaintiff, in a pollution tort case, suffers a present observable injury, there is little distinction between this and the more typical tort case. However, where plaintiff has been merely exposed to a potentially harmful pollutant, he or she faces a difficult legal problem to prove that the damages are certain and not speculative. Future damages are awarded only with respect to the prospective costs of present injuries.

Although "[u]ncertainty as to the fact of damages, that is, as to the nature, existence, or cause of the damage, is fatal<sup>97</sup> to plaintiff's recovery, future damages may be awarded *but only* when prospective costs are shown to be reasonably likely to emanate from *present* injuries. Thus, a person who is simply exposed to a harmful pollutant, having a long latency period, would generally not be entitled to recovery. If plaintiff decides to wait to bring suit until the symptoms of the feared disease are manifested, the procedural difficulties of the statute of limitations must be overcome.<sup>98</sup> Other practical evidentiary problems arise, for as time passes, the chances of evidence being lost, and of the defendant becoming insolvent, increase. Even if the court accepted an argument that plaintiff was presently suffering a psychological injury, he or she could recover only those future damages resulting from the present psychological trauma, and not

<sup>95</sup>Ibid. at 48.

<sup>96</sup>See *Black's Law Dictionary*, p. 924.

<sup>97</sup>*Griffith Co. v. San Diego College for Women*, 45 Cal. 2d 501, 516, 289 P.2d 476, 484 (1955).

<sup>98</sup>*McKee v. Johns-Manville Corp.*, on appeal from 94 Misc. 2d 327, reported in *Environmental Reporter* 12 (1981): 529; see also Footnote 42, *infra*, and accompanying text.

for those physical injuries that the harmful agent later causes.<sup>99</sup>

A possible movement in this regard is hinted at by the idea that the shortening of one's life through injury is, in itself, a compensable loss. Although the law in the United States is contrary, the rule in Canada and England and that which has been expressed by several dissenting opinions, for example, the *Downie* case,<sup>100</sup> provides that the shortening of life through injury involves an amputation of life's substance and an absolute and irremediable loss and should, therefore, be compensable in and of itself.<sup>101</sup> Thus, where exposure to a pollutant increases the likelihood of plaintiff being inflicted with a disease, such as cancer, one could calculate the effect of that likelihood on the lifespan of plaintiff.

## V. Shifting the Burdens of Proof

### *Burden of Proof*

The burdens of proof involve "the obligation of a party to demonstrate the existence of facts that have a desired legal consequence."<sup>102</sup> This consists of two tasks. The first is the burden of producing evidence of sufficient force as to satisfy the judge so that the burdened party will avoid an adverse ruling, e.g., a directed verdict. This burden shifts to the opposing party when the other has discharged his or her initial duty. The second burden is that of persuasion. This refers to the obligation of a particular party to convince the trier of fact to the requisite degree of certainty. Historically, this burden has been stated never to shift since it is not allocated until all of the evidence has been presented.<sup>103</sup>

Generally, the burdens of proof are allocated such that the party having the burden of pleading a fact will also have the burden of producing evidence and persuading the trier of fact concerning the issue pleaded. This task usually falls to the party wishing to disrupt the status quo, i.e., plaintiff. However, this is not always the case. Professor McCormick has stated that "there is no key principle governing the apportionment of the burdens of proof. Their allocation, either initially or ultimately, will depend upon" common

<sup>99</sup> *Noble v. Tweedy*, 90 Cal. App. 2d 738, 746; 203 P.2d 778, 782 (1949).

<sup>100</sup> *Downie v. United States Lines Co.*, 359 F.2d 344 (3rd Cir. 1966).

<sup>101</sup> *Ibid.* at 348.

<sup>102</sup> Dworkin, "Easy Cases, Bad Law, and Burdens of Proof," *Vanderbilt Law Review* 25 (1972): 1151, 1153.

<sup>103</sup> McCormick, *Evidence*, 4th ed. (St. Paul, Minn.: West Publishing Co., 1972), pp. 483-84.

sense and social policy.<sup>104</sup>

The following three subsections show how the burden of producing evidence and the burden of persuasion are shifted in pollution tort cases, with special emphasis on the function of *res ipsa loquitur* in that process.

*Burden of Producing Evidence*

In a negligence action, plaintiff initially must produce evidence of defendant's negligence. When he or she has introduced evidence having sufficient persuasive force, defendant is required to offer refuting evidence or lose on the negligence issue. This process can be viewed from two perspectives. In the context of legal theory, once plaintiff has introduced such evidence that a reasonable person would be *required* by law to find defendant negligent, defendant must introduce evidence to show that he or she was not. However, in a practical context, once a reasonable person *may* feel defendant to be negligent, defendant should introduce evidence to show that he or she was not negligent.<sup>105</sup>

For example, in *Hagy v. Allied Chemical and Dye Corp.*,<sup>106</sup> Mrs. Hagy sued Allied for the negligent operation of its sulfuric acid plant, alleging that through this negligence she was exposed to a cloud of sulfurous fumes that caused her pre-existing cancer to be "lighted up," which in turn necessitated the removal of her larynx. Defendant contended that there was no causal connection between the smog and Mrs. Hagy's cancer. The court recognized that Mrs. Hagy had the burden of producing evidence to show that sulfurous fumes had the ability to "lighten up" a pre-existing, dormant cancer and that sulfurous fumes generated at the defendant's plant aggravated Mrs. Hagy's pre-existing cancer. However, the court was careful to delineate the scope of that burden by holding that plaintiff need not show that the removal of her larynx would not have been necessary *but for* her exposure to the acidic fog. Rather, the burden fell upon the defendant to show that the larynx would have been removed even though Mrs. Hagy had not been traumatized by the fog.<sup>107</sup>

This shifting of the burden from Mrs. Hagy to the plant operator was particularly important because the case involved difficult causation questions, including allegations of intervening events in

<sup>104</sup> *Ibid.*

<sup>105</sup> See Dworkin, p. 1159.

<sup>106</sup> 122 Cal. App. 2d 361, 265 P.2d 86 (1953).

<sup>107</sup> *Ibid.* at 370, 265 P.2d at 92.



the form of failure of doctors to properly diagnose and treat Mrs. Hagy's afflictions.

The shifting of the burden to produce evidence in a nuisance case was exemplified in *Renken v. Harvey Aluminum Company*.<sup>108</sup> There, a group of landowners sought an injunction to restrict the operation of defendant's plant so that excessive amounts of fluorine would not be released. The court found that plaintiffs had discharged their burden by producing evidence showing that fluorides were deposited upon their land. Then, "the burden of going forward with the evidence was on the defendant to show that the use of its property, which caused the injury, was unavoidable or that it could not be prevented except by the expenditure of such vast sums of money as would substantially deprive it of the use of its property."<sup>109</sup>

Potential defendants in pollution tort cases are beginning to recognize that as a practical matter the burden is likely to fall to them to prove their innocence. The importance to such defendants of being fully prepared to prove innocence was emphasized in a series of articles by Raymond M. Momboisse in the April and May issues of the magazine, *World of Agricultural Aviation*.

#### *Burden of Persuasion*

The burden of persuasion "represents an attempt to instruct the fact finder concerning the degree of confidence our society thinks he should have in the correctness of factual conclusions for a particular type of adjudication."<sup>110</sup> There are generally two "degrees of confidence" that the burdened party in a civil case may be required to meet.

The most common standard is the "preponderance of the evidence," which requires that after weighing the entirety of the evidence upon a particular point, the trier of fact is to find for the party whose evidence is the more convincing.<sup>111</sup> The second standard, "clear and convincing," requires some quantum of higher certainty on the part of the fact finder. It is used in civil cases involving special types of allegations, usually where defendant is accused of committing a quasi-criminal activity such as fraud.<sup>112</sup> In determining the degree of confidence, the rationale is that where one of the two parties has an interest of "transcending value [the]

<sup>108</sup> 226 F. Supp. 169 (D. Or. 1963).

<sup>109</sup> *Ibid.* at 174.

<sup>110</sup> *In Re Winship*, 397 U.S. 358, 370, 25 L. Ed. 368, 379, 90 S. Ct. 1068, 1076 (1970).

<sup>111</sup> See McCormick, pp. 794-95.

<sup>112</sup> *Ibid.*

. . . margin of error is reduced as to him by the process of placing on the other party the burden of producing a sufficiency of proof."<sup>113</sup>

Similarly, in determining the degree of certainty to which the burdened party must move the trier of fact in pollution tort cases, the law should look to the relative importance of the interests at stake. In doing so, attention is given not only to the particular interests of the parties before the court, but also to those "transcending values" society seeks to advance.<sup>114</sup>

An essential aspect of this process involves focusing upon the types of errors possible and examining the relative impact upon society's interests if an error is committed in the decision-making process. There are two such types of errors: Type I — finding "A" to exist, when "A" in fact does not exist; Type II — not finding "A" when "A" in fact does exist. The degree of confidence required must take into account the nature and consequence of the risk of error in finding or not finding a fact to exist. Where the facts themselves appear to be unsettled, as may occur in a pollution tort, the fact finder is faced with the problem of choosing between two alternatives, both of which have an uncertain probability. It has been stated that where an agency's regulation turns on "choices of policy, or on assessment of risks, or on predictions dealing with matters upon the frontiers of scientific knowledge, we will demand adequate reason and explanation, but not 'findings' of the sort familiar from the world of adjudication."<sup>115</sup> In effect, then, the court is going to be satisfied with less certainty when the basic factual elements are in doubt, i.e., the frontiers of science.

The decision to accept Type I or Type II errors should be made by carefully addressing the respective interests represented by each party in the courtroom. In a pollution tort case, there are usually two essential interests before the court: Economics and health. These interests are not mutually exclusive; the loss of one may also result in the loss of the other. The issue is not economics versus health, but how much certainty of each society is willing to abandon. This analysis requires a clear understanding of the true extent and nature of the health hazards that pollutants may cause. This is

<sup>113</sup>*Speiser v. Randall*, 357 U.S. 513, 525-26, 2 L. Ed. 2d 1460, 1472, 78 S. Ct. 1322, 1342 (1958).

<sup>114</sup>See Rothbard, p. 70. Rothbard advocates the "beyond a reasonable doubt" standard for both civil and criminal cases. He believes that it is axiomatic to libertarian philosophy that "when we don't really know . . . the only procedure consonant with libertarian principle is to do nothing."

<sup>115</sup>*Amoco Oil Co. v. Environmental Protection Agency*, 501 F.2d 722, 740-41 (D.C. Cir. 1974).

especially important where the pollutant is suspected of interfering with the genetic material or the gene plasma pool and where the effects of that interference cannot be discovered for several years or perhaps until future generations. On the other hand, knowledge of the economic consequences of choosing a particular course of action must also be fully assessed.

The decision to opt for a Type I or Type II error, like cost-benefit analysis, is fraught with methodological difficulties and possible misuse. The chief problems are that environmental and economic interests are not capable of a one-to-one pairing; although easier to express than benefits, costs may be no more certain or reliable; and the methods of deciding between the two appear neutral, but actually consist of value-laden assumptions.<sup>116</sup>

So when courts deal with pollutants they should recognize the potential for an asymmetrical distribution of the effects of error. For example, if plaintiff suffers from a mutation and can show that he or she was exposed to compound "X," then the question society must face is whether it is more in the public interest to risk erroneously finding "X" to be mutagenic and thereby give plaintiff a windfall and create an undue burden upon the producer of "X," which amounts to a misallocation of resources (and may deprive society of the value of "X"), or to risk erroneously finding "X" to be nonmutagenic and thereby cause plaintiff and others who may be in a like position to go uncompensated while providing the producers a windfall, which again would be a misallocation of resources.<sup>117</sup>

### *Res Ipsa Loquitur*

*Res ipsa loquitur*, "the thing speaks for itself," is a legal presumption of special importance for pollution torts.<sup>118</sup> The proper application of this doctrine often permits the double inference that the injury was caused in a particular manner, and that defendant's conduct with reference to that cause was negligent; i.e., the doctrine supplies a crucial missing fact or facts.<sup>119</sup> The classic statement of the rule is:

<sup>116</sup>See N. Ashford, "The Limits of Cost-Benefit Analysis in Regulatory Decisions," *Technology Review* 70 (May 1980).

<sup>117</sup>For an extensive discussion of this topic, see T. Page, "A Generic View of Toxic Chemicals and Similar Risks," *Ecology Law Quarterly* 7 (1978): 207; see also Gelpe and Tarlock, "The Uses of Scientific Information in Environmental Decisionmaking," *So. California Law Review* 48 (1974): 371.

<sup>118</sup>See *Black's Law Dictionary* p. 1067.

<sup>119</sup>See Prosser, p. 217.

There must be reasonable evidence of negligence; but where the thing is shown to be under the management of the defendant or his servants, and the accident is such as in the ordinary course of things does not happen if those who have the management use proper care, it affords reasonable evidence in the absence of explanation by the defendants, that the accident arose from want of care.<sup>120</sup>

A particularly important requirement is that *res ipsa loquitur* applies only where, in light of past experience, the injury or accident was probably the result of someone's negligence. One could argue, in an area of new technology, where knowledge and experience of its hazards are limited, that the doctrine would not be applicable.<sup>121</sup>

The certainty with which the inference of negligence must be established for the application of the doctrine to be proper is viewed in two ways. One view is that the inference must be of such compelling force that no other acceptable cause for the accident could be reasonably advanced. The opposing view is that the court only must find that reasonable men could make the connection between the circumstances of the accident and defendant's negligence.<sup>122</sup> This latter requirement appears to be so minimal, in a practical sense, as to be meaningless once plaintiff has survived a motion for a demurrer or nonsuit.

Another aspect of this doctrine, which may effect the viability of a pollution tort action, is its applicability to multiple defendants. Although joint control does not prevent the application of *res ipsa loquitur*, it is inappropriate if there is uncertainty as to which of two or more defendants had control of the instrumentality causing the injury.<sup>123</sup> However, *res ipsa loquitur* may be used against multiple defendants where the circumstances indicate the probability that all defendants were negligent.<sup>124</sup> These considerations may be of extreme importance in a *Sindell* setting.<sup>125</sup> Even where the doctrine is applicable against only one of several defendants, those other defendants may suffer from a shifting of the burden, for, as a practical matter, the jury may have difficulty limiting the presumption

<sup>120</sup>*Scott v. London & St. Katherine Docks Co.*, 3 H & C 596, 601, 159 Eng. Rep. 665, 667 (1865).

<sup>121</sup>See Prosser, p. 216. See also, J. Bodie, "The Irradiated Plaintiff: Tort Recovery Outside Price-Anderson," *Environmental Law* 6 (1976): 859, 879.

<sup>122</sup>*Bauer v. Otis*, 133 Cal. App. 2d 439, 443, 284 P.2d 133, 136 (1955).

<sup>123</sup>See this article, p. 130.

<sup>124</sup>*Pruett v. Burr*, 118 Cal. App. 2d 188, 194 257 P.2d 690, 694 (1953).

<sup>125</sup>See this article, p. 130.

just to the proper defendant.

In a pollution setting involving a new product or activity, this rule may be applied harshly against the alleged polluter. For example, in the *Yturbide* case, the Martin family sued for personal injuries allegedly received from fluoride compounds released from defendant's aluminum plant.<sup>126</sup> Since the instrumentality was under the exclusive control of defendant, the court held that the doctrine of *res ipsa loquitur* was applicable. However, the court recognized the dilemma that the operation of this rule placed on defendant:

the less effective his precautions to prevent the occurrence the more apt they are to appear negligent; the more effective the precautions testified to, the less likely they are to have [been] taken in this case since the accident *did happen*.<sup>127</sup>

The key attribute of *res ipsa loquitur* is its availability as an alternative theory in pollution tort cases where the primary theory may be difficult to establish. An example is *Suko v. Northwestern Ice Company*,<sup>128</sup> where plaintiff was injured when the tank located on defendant's building burst, sending water down upon plaintiff's house, causing extensive property and personal injury damage. The court, although noting the similarity of facts between this case and *Rylands v. Fletcher*,<sup>129</sup> failed to apply the doctrine of strict liability. Rather, the court held that "when the plaintiff proved the collapse of the tank and the injuries suffered by him as a result thereof, he made out a prima facie case of negligence [with the aid of the doctrine of *res ipsa loquitur*] on the part of the defendant."<sup>130</sup>

In essence, *res ipsa loquitur* may operate as an alternative route from the facts to a finding of liability, and it is one in which the causation hurdles have been lowered.<sup>131</sup> Instead of focusing on the actions of defendant to ask whether they were negligent and caused injury, the jury focuses on the nature of the incident to determine whether it ordinarily would have occurred in the absence of

<sup>126</sup> See *Reynolds Metals Co. v. Yturbide*.

<sup>127</sup> *Ibid.* at 332 (emphasis in original).

<sup>128</sup> 166 Or. 557, 113 P.2d 209 (1941).

<sup>129</sup> See Footnote 12.

<sup>130</sup> *Suko*, 166 Or. at 567-69, 113 P.2d at 214.

<sup>131</sup> *Jiminez v. Sears Roebuck and Company*, 4 Cal. 3d 379 (1979). In this case, the California Supreme Court found that even where plaintiff attempts to demonstrate negligence on the facts, he or she is also entitled to a *res ipsa loquitur* instruction. This case also depicts the possibility of applying *res ipsa loquitur* to strict liability. Where the plaintiff asserts two legal theories for liability, e.g., negligence and strict liability, the use of the *res ipsa loquitur* presumption by the jury may not be limited simply to negligence, but they may incorrectly apply it to the strict liability theory.

negligence. Therefore, in a difficult pollution tort case, *res ipsa loquitur* focuses the jury on the strength of plaintiff's case — the injury — and away from the probable weakness — the causal connection to defendant's actions.

#### *Identification of Defendant*

Identification of defendant is a problem common to pollution tort cases since the origin of the pollutant is often unknown. The courts have devised several concepts to relieve plaintiff of this difficulty by shifting the burden to defendant to show that he or she is not a proper defendant. In the recent California decision of *Sindell v. Abbott Laboratories*,<sup>132</sup> the Supreme Court discussed these techniques and established a new method to achieve this result.

Judith Sindell, plaintiff, developed a malignant bladder tumor, which was removed by surgery. She also suffers from adenosis and must be constantly monitored by biopsy and colposcopy. These conditions were allegedly caused by her mother's ingestion of diethylstilbestrol (DES), as prescribed by a physician. In her suit, plaintiff joined only a small percentage of the 200 companies that produced DES during the time in question; however, the joined defendants represented approximately 90 percent of the DES marketed. Although plaintiff admitted that she was unable to identify the particular manufacturer of the drug her mother had ingested, it was argued that defendant could be held liable under one or all of three theories; the theory promulgated under *Summers v. Tice*,<sup>133</sup> the *Restatement* doctrine of concert of action, and the theory of enterprise liability.

In *Summers*, plaintiff was injured when two hunters simultaneously and negligently shot in his direction. It could not be determined which of the two had fired the shot that injured plaintiff's eye; however, both defendants were held jointly and severally liable for all damages. The court reasoned that, as between two negligent and joint tortfeasors and the innocent plaintiff, it would be unfair to require plaintiff to isolate and identify defendant responsible. The California Supreme Court held the *Summers* rule inapplicable in *Sindell* because there was a chance that the actual tortfeasor was not among the few companies before it.

In the alternative, plaintiff argued that the *Restatement (Second) of Torts* doctrine of concert of action applied.<sup>134</sup> Here, plaintiff brought

<sup>132</sup> 26 Cal. 3d 588, 163 Cal. Rptr. 132, 607 P.2d 924 (1980).

<sup>133</sup> 33 Cal. 2d 80, 199 P.2d 1, 5 A.L.R.2d 91 (1948).

<sup>134</sup> *Restatement (Second) of Torts* §876.

evidence showing that all manufacturers of DES followed a common and mutually agreed upon formula, so as to allow the drug to be treated as a "fungible commodity." However, the court pointed out that the formula for DES was based upon a scientific constant as set forth in the United States Pharmacopoeia. Plaintiff also argued that defendants shared testing data and marketing methods. The court rejected an inference of concert of action by stating, "such conduct describes a common practice in industry; a producer avails himself of the experience and methods of others making the same or similar products. Application of the concept of concert of action to this situation would expand the doctrine *far beyond its intended scope.*"<sup>135</sup> Thus, the court held that there was no concert of action among defendants within the meaning of the *Restatement* doctrine.

Third, the theory of enterprise liability has been suggested in the case of *Hall v. E.I. DuPont de Nemours*.<sup>136</sup> This theory of liability provides that when the manufacturers of a product, in effect, delegate safety and design features to a trade association and where there is industry-wide cooperation in the manufacturing of the product in question, that the members of that industry could be held jointly liable in accordance with their proportionate share of the product's market. The California Supreme Court refused to apply this doctrine in the *Sindell* case. First, the court respected the caution of the *Hall* court's decision that the doctrine should not be applied where there are a large number of producers. Second, because so much of the manufacturers' conduct was required by federal regulation, the court could not find the sort of delegation of responsibility required by the enterprise doctrine.

Although the California Supreme Court rejected each of these established theories, it nonetheless granted recovery. In justifying the extension of liability, the court stated:

The response of the courts can be either to adhere rigidly to prior doctrine, denying recovery to those injured by such products, or to fashion remedies to meet these changing needs. . . . From a broader policy standpoint, defendants are better able to bear the cost of injury resulting from the manufacture of a defective product.<sup>137</sup>

The court determined that if plaintiff was able to join a "substantial share"<sup>138</sup> of the producers of the product causing the injury, then

<sup>135</sup> *Sindell*, 26 Cal. 3d at 605, 163 Cal. Rptr. at 141, 607 P.2d at 933.

<sup>136</sup> 345 F. Supp. 353 (E.D.N.Y. 1972).

<sup>137</sup> *Sindell*, 26 Cal. 3d at 610-11, 163 Cal. Rptr. at 144; 607 P.2d at 936.

<sup>138</sup> *Ibid.* at 612, 163 Cal. Rptr. at 145, 607 P.2d at 937.

"the injustice of shifting the burden of proof to the defendants to demonstrate they could not have made the substance which injured the plaintiff is significantly diminished."<sup>139</sup> The court held that liability would exist to the extent of defendant's market share.

All of these theories, particularly the *Sindell* extension, suggest potential for pollution tort cases. Combining the use of *res ipsa loquitur* to reduce the burden of proof related to causation with the *Sindell* approach to relieving plaintiff of responsibility to identify defendant opens the door to the opportunity to "get to the jury" with a case of possible injury from pollution of uncertain origin.

#### *Problems of Shifting the Burden of Proof*

The courts should be cautious when altering the traditional burdens of proof, especially in pollution tort cases. Where there is a high degree of scientific uncertainty about the inferences to be drawn from scientific evidence, the party assigned the burden may be unable to marshal evidence of sufficient force and clarity to meet the required standard of proof. Therefore, shifting of the burden of proof may be tantamount to the enactment of a general principle of resource distribution.

The courts and legislatures must also be sensitive to the practical aspects of the jury decision-making process. In cases involving highly emotional, complicated, and unsettled concerns, such as pollution tort cases, the "rules" of litigation often play a more limited role than the lawyers and judges would desire. As Justice Jackson stated, "Juries are not bound by what seems inescapable logic to judges."<sup>140</sup> In the uncertainty of pollution tort cases, the jurors may take a more visceral approach to the determination of rights and liabilities. As Finley Peter Dunne said:

Whin th' case is all over, the jury'll pitch th' tistimony out iv the window, an' consider three questions: 'Did Lootgert look as though he'd kill his wife? Did his wife look as though she ought to be kilt? Isn't it time we wint to supper?'<sup>141</sup>

## VI. Alternative Approaches to Adjudication

The present legal institution appears likely to suffer significant stress if required to administer a large-scale pollution tort compen-

<sup>139</sup>Ibid. at 613, 163 Cal. Rptr. at 145, 607 P.2d at 937.

<sup>140</sup>*Morrisette v. United States of America*, 342 U.S. 246, 276 (1951).

<sup>141</sup>Finley Peter Dunne, *Mr. Dooley in Peace and in War* (Boston: Small, Maynard & Co., 1898), p. 145.



sation program. The structure of that system does not adequately match the conceptual and practical demands placed upon it by pollution torts. Congress has recently recognized this problem in Section 301(e) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980.<sup>142</sup> This law establishes a study group "[i]n order to determine the adequacy of existing common law and statutory remedies in providing legal redress for harm to man and the environment caused by the release of hazardous substances into the environment."<sup>143</sup> This statute directs that the study group evaluate many of the problem areas discussed in this paper, including problems of causation and proof. A report to Congress is required, which must address "the need for revisions in existing statutory or common law."<sup>144</sup> The tenor of the statute implies that the "need" that is to be addressed is the need to insure the availability of adequate recovery mechanisms. The statute does, however, recognize that the expanded liability that may result can have significant adverse economic effects.<sup>145</sup> Congress recognized this potential by requiring the study group to address "the consequences, particularly with respect to obtaining insurance, of any change in [the scope of liability under existing law]."<sup>146</sup>

The problem presented here was exemplified in the *Hagy* case. There, compensation was possible for Mrs. Hagy when her pre-existing cancerous condition of the larynx was arguably aggravated when she was exposed to an unusual concentration of toxic fumes emitted from the plant of a large corporation.<sup>147</sup> However, the railroad yard workers located nearby who were chronically exposed to the substantially lower, "normal" levels of the same fumes receive no compensation and neither do the residents of the neighborhood over which the fumes regularly waft. Yet these persons may be able to show a cumulative exposure far in excess of Mrs. Hagy's discrete event. They are, however, hard pressed to

<sup>142</sup> P.L. 96-510, 94 Stat. 2767, 42 U.S.C. §§9601, et seq.

<sup>143</sup> 42 U.S.C. §9651(e)(1).

<sup>144</sup> 42 U.S.C. §9651(e)(4)(A); the study was due in December 1981.

<sup>145</sup> This concern for a balance of tort recovery and economic consequence, in part, has grown out of experience with product liability law. That development demonstrates the institutional confusion which occurs when the court system wavers in confusion on whether to administer the tort system for its "classic" purpose of apportioning liability based on fault or for its "modern" purpose of providing a compensation system for injured persons. See, e.g., *Hearings Before the Select Committee on Small Business, United States Senate, on Products Liability Problems Affecting Small Businesses* (Washington, D.C.: U.S. Government Printing Office, 1977).

<sup>146</sup> 42 U.S.C. §9651(e)(3)(E).

<sup>147</sup> See *Hagy v. Allied Chemical Co.* at 60.

show "fault" in the "normal" levels of emissions, and they encounter serious "proof" problems in trying to link any minor, present debilitations directly to the low-dosage exposure to the fumes. In addition, their most serious difficulty with obtaining an award may be the lack of sympathetic commiseration by the court and the jury in the absence of any severe physical disability. Therefore, the individuals who probably receive the greatest injury from the pollution go uncompensated while a person to whom the fumes may in fact have made no difference at all receives a substantial award.

As technology plays a greater role in human experience, the pressure grows for compensation for injuries resulting from that technology. This reality is the basis of various workers' compensation programs and special compensation programs such as the Black Lung Benefit Act.<sup>148</sup> New Zealand has already gone beyond these concepts by establishing a general compensation system.<sup>149</sup>

The essential shortcoming of the legal system in this context is that it inadequately manages new information and demands; it is not, fundamentally, a "learning" system. This is the case for four reasons: (1) like all other institutions, it perceives new demands as a challenge to its authority; (2) the law applies a retrospective analytical scheme; (3) it has the ability to resolve an individual dispute while ignoring the impact of that decision upon the more general problem; and (4) it responds in a digital fashion even when utilizing analog information. Such a system is likely to suffer significant stress and produce unpredictable results if pressured to adjudicate rights in the midst of the rapidly changing attitudes and scientific understanding relating to pollution-caused injuries.

The ideal modern institution for conflict resolution should have the capacity to "learn."<sup>150</sup> Learning, in this context, refers to the ability of an institution to change, to accept and utilize new information, to abandon past conclusions, and to recognize its function as part of a network of conflict resolution devices. The need for learning systems is even more pronounced in areas of rapid change.

A learning system tends to be self-limiting in size and scope. Institutions, because they operate through human beings, generally have a desire to expand their control in order to insure their security. The inevitable bureaucratic demands for power and security create permanence and high growth rates. A learning system avoids

<sup>148</sup> 33 U.S.C. §§901, et seq.

<sup>149</sup> New Zealand Public Act No. 36, Accident Compensation Amendment, Vol. 1 (1978), p. 296.

<sup>150</sup> See Schon, pp. 181-200.

these undesirable attributes by continually evolving as part of a network of conflict-resolving devices rather than functioning as a fixed, centrally oriented organization.<sup>151</sup>

The concept described here requires an extra decision step, which will enhance the judicial system's ability to learn. A requirement is imposed for the courts to address, in a law and motion context, an initial question of justiciability. At a preliminary stage the parties will set forth the nature of both the pollutant and the injury involved and will argue to the court whether the alleged causal connection is capable of proof in the judicial setting. In making this determination, the court can focus on the Type I — Type II error problem — that is, whether in balancing the interests of claimants and society, it is better, given the state of scientific knowledge, to find a causal connection when it does not exist or not to find a causal connection that does exist.

First, the court decides whether plaintiff has stated a justiciable harm. Second, it must determine the reliability and certainty of the causation evidence. This finding includes the determination of two subissues: (1) is defendant the (a) source of the pollutant; and (2) was the injurious act a high-dose, discrete event or a low-dose, chronic event? Most cases presented presumably would involve an exposure event and dosage level well within the bounds of cases previously litigated in the judicial system. Attention would focus on the relatively few cases in which the nature of the event and the dosage level present the close questions of proof.

This decisional paradigm requires that the court examine the context of the case. It does this in two ways. First, it examines the extra-party effect of the remedies sought by determining the potential number of plaintiffs and the economic consequence of the possible judgments. Second, the court determines the symmetry of consequences involving Type I and Type II errors.

This approach to pollution torts has three long-range advantages. By focusing squarely upon the issues of harm and causation in a nonjury setting, the court will organize the scientific knowledge in question and subject it to an adversarial peer review. Also, by handling new information in this way the court would act as an educational device by clarifying areas of scientific uncertainty and demarking the parameters of legitimate danger. And third, the system is self-limiting with respect to the growth of coercive government action through an administrative process. As scientists

<sup>151</sup> See Schon, pp. 190-197.

and doctors learn more about a certain pollutant and can acknowledge, with an acceptable degree of certainty, causal relationships between the pollutant and observed or likely injuries, the scope of justiciable claims under the tort system can expand. The screening of pollution tort cases for justiciability will remove the pressure on the legal system expressed in the *Sindell* case to distort established theories, rules, and procedures in order to grant compensation to needy plaintiffs who appear cloaked in sympathy but bearing no truly justiciable claim.

This decision process suggests a possible alternative for a concept such as a "scientific court."<sup>152</sup> Here, it would operate as a special court of appeal with limited jurisdiction to resolve only questions of justiciability of the tort claim based on pollution-engendered injuries.

## VII. Conclusion

Issues of causation, harm, and standards of proof in pollution-engendered tort actions vary with the nature of the pollutant, the nature of the event giving rise to the plaintiff's exposure, the tort theory asserted, and the forum in which the case is litigated. Established tort theories and judicial doctrines have been used for many years with varying results to obtain recovery for obvious physical injuries related primarily to discrete events of pollution. Attempting to force-fit this judicial mold to new, exotic pollutants and related low-dosage events promises to distort the established theories and exacerbate the problems of uncertainty of recovery and unpredictability of liability that have been growing in recent years. The court is required to force a yes or a no answer to questions for which the only candid answer is maybe. As seen in *Sindell*, this circumstance creates pressure on the judicial system to develop and to utilize flexible judicial theories to achieve results considered to be consistent with broad social concepts of fairness and justice. As each court system's perception of these concepts varies, so vary the results.

It is but a modest proposal to suggest that the courts should adjudicate only justiciable claims and that the perception of justiciability should be reasonably uniform throughout the jurisdiction.

<sup>152</sup>J. Martin, "Procedures for Decisionmaking Under Conditions of Scientific Uncertainty: The Science Court Proposal," *Harvard Journal on Legislation* 16 (1979): 443; H. Markey, "A Forum for Technocracy," *Judicature* 60 (1977): 365; L. Kantrowitz, "The Science Court Experiment: Criticisms and Responses," *Bulletin of Atomic Scientists*, April 1977; R. Tolbatt, *Environmental Law* 8 (1978): 827.