Toxic Substances Litigation in the Fourth Circuit

Francis E. McGovern
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I. INTRODUCTION

Personal injuries caused by toxic substances¹ have generated problems of major concern to our social, political and legal systems. Reports in the news media concerning harm caused by toxic substances and expressions of public awareness of potential dangers associated with exposure to toxic substances are commonplace.² Legislatures,³ administrative agencies⁴ and courts⁵ at both

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1. Defining “toxic substances” is made difficult by the variety of materials which may be harmful to the health of humans. The Virginia General Assembly provided the following description: “any substance . . . that has the capacity, through its physical, chemical or biological properties, to pose a substantial risk of death or impairment either immediately or overtime, to the normal functions of humans.” VA. CODE ANN. § 32.1-239 (D) (Repl. Vol. 1979).


federal and state levels have begun to devote substantial energy to

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addressing issues raised by exposure to toxic substances. Scientific, industrial, financial, and legal communities are seeking to


Additionally, state agencies in the Fourth Circuit have issued regulations in an attempt to control toxic materials:

Maryland: Dept. of Health & Mental Hygiene, Air Pollution Quality, COMAR § 10.18.01 (1980); Dept. of Nat. Resources, Water Resources Adm., Receiving Water Quality Standards, COMAR § 08.05.04.02 (1980); Dept. of Nat. Resources, Water Resources Adm., Use of Toxic Materials for Aquatic Life Management, COMAR § 08.05.04.06 (1980); Dept. of Nat. Resources, Control of the Disposal of Designated Hazardous Substances, COMAR § 08.05.05 (1980).


South Carolina: Dept. of Health & Envt'l Control, Air Pollution Control Standards, Regulation 61-62.5 (1980); Pollution Control Authority, Regulation Requiring Minimum Standards for Industrial Solid Waste Disposal Sites and Facilities Regulation FC-SW-2 (1972).

Virginia: State Air Pollution Control Bd., Regulations for the Control and Abatement of Air Pollution, Parts I through VIII (1980); State Water Control Bd., Industrial Waste Survey, Regulation No. 7 (1976); Dept. of Health, Disposal of Solid Waste (1971).


6. In the field of epidemiology, for example, see A. Lilienfeld & D. Lilienfeld, Foundations of Epidemiology (1976).


deal with these problems from a number of different perspectives. Just as terms such as "Love Canal" and "asbestosis" have been added to the vocabulary of a generation of Americans, concepts such as "enterprise liability" and "collateral estoppel" are developing new meanings and roles in our legal system.

In many senses lawsuits brought for damages caused by toxic substances are not materially different from other types of product liability suits. Typically a business entity places a product into the stream of commerce that creates an unacceptable risk of harm and causes injury to a person. It can be argued that any differences that exist between toxic substances cases and product liability cases are merely differences of degree, not of kind. Toxic substances cases are further along the same continuum as product liability cases. For example, product liability cases have been distinguished by the mass produced nature of products and hence the large number of persons potentially affected by those products. Toxic substances potentially expose an even greater number of persons to harm. Product liability cases often involve a lag time of several years between the act of a manufacturer in producing a defective product and injury to a consumer. A twenty-year lag


11. Traditionally, collateral estoppel has been a device for assuring judicial economy but it now is being used as a means of lowering a plaintiff's cost of litigation and of forcing defendants to settle claims. See Weinberger, Collateral Estoppel and the Mass Produced Product: A Proposal, 15 NEW ENGLAND L. REV. 1 (1979).

12. Similar legal theories are used, including strict liability in tort, negligence, breach of warranties, and breach of duty to warn or instruct. A product as defined in the Model Uniform Product Liability Act § 120(C), 44 Fed. Reg. 62,714, 62,717 (1979), could also be a toxic substance within the definition in VA. CODE ANN. § 32.1-239 (E)(Repl. Vol. 1979).

13. As many as three million daughters of women who took the synthetic estrogen-type drug DES are at risk of developing cancerous and precancerous vaginal tract abnormalities. Note, Market Share Liability: An Answer to the DES Causation Problem, 94 HARV. L. REV. 668, 668-99 (1981).

14. As many as 2,522,000 workers are exposed annually to products containing asbestos. NATIONAL CANCER INST., ASBESTOS: AN INFORMATION RESOURCE (1978). This figure does not include consumers who come into contact with asbestos fibers.

time would not be unusual in toxic substances cases.\(^{16}\) Proof of a
defect in a product liability case may be difficult for a plaintiff be-
cause of a defendant manufacturer's possession of essential expertise and information.\(^{17}\) Proof of a defect in a toxic substances case
may be even more difficult because of a high degree of scientific uncertainty concerning the harm caused by a toxic substance.\(^{18}\)

On the other hand, it can be argued that there are fundamental
differences between product liability and toxic substances cases be-
cause of (1) the number of cases,\(^{19}\) (2) the complexity of those cases\(^{20}\) and (3) the unique characteristics of how those cases oc-
cur.\(^{21}\) These differences can be illustrated by a host of novel legal
issues that are now being considered by both federal and state
courts.

The exceptionally large number of plaintiffs and defendants in
toxic substances cases has caused mechanical problems of case
management and has involved substantial transaction costs.\(^{22}\) The
application of multi-district litigation,\(^{23}\) class actions\(^{24}\) and new

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\(^{16}\) Exposure to asbestos for as short as a month may result in disease twenty years later. Richmond, 13 CLINICAL TOXICOLOGY 641 (1978).

\(^{17}\) For this and other rationales behind the adoption of strict liability in tort, see Owen, Rethinking the Policies of Strict Products Liability, 33 VAND. L. REV. 681 (1980).

\(^{18}\) Scientific researchers may be unable to isolate the effects of a particular substance on humans given the multitude of materials to which people are exposed. Davis and Rall, Risk Assessment for Disease Prevention, in STRATEGIES FOR PUBLIC HEALTH 131 (Ng & Davis ed. 1981).


\(^{20}\) Beyond the normal problems of determining causation and damages, the Newport News asbestos cases have been complicated with conflicts over the interpretation of the Virginia statute of limitation, by attempts to evoke admiralty jurisdiction and by manufacturers seeking indemnification from the United States government. See White v. Johns-Manville Corp., 662 F.2d 234 (4th Cir. 1981); Oman v. Johns-Manville Corp., 482 F. Supp. 1060 (E.D. Va. 1980).

\(^{21}\) "Such claims are not only particularly easy to fabricate, but there is a great tendency in a sufferer to ascribe, without conscious dishonesty, his illness to some cause from which he may hope to obtain relief." Bohlen, A Problem in the Drafting of Workmen's Compensation Acts, 25 HARV. L. REV. 328, 344-45 (1911-1912).

\(^{22}\) See Granelli, supra note 5.


techniques of managing discovery\textsuperscript{25} and trials\textsuperscript{26} have been hotly debated issues. Collateral estoppel has been adopted in some courts and has resulted in the rapid movement of cases.\textsuperscript{27} New methods of organizing representation of clients\textsuperscript{28} and dealing with conflicts of interest\textsuperscript{29} among counsel have become commonplace.

Decision-making by courts and juries has become exceptionally difficult because of the complexity of factual and legal issues. There is currently a conflict among jurisdictions on the meaning of "occurrence" in insurance contracts.\textsuperscript{30} Judges are finding conflicts between values of fairness and utility in fashioning legal rules,\textsuperscript{31} and juries are being asked to resolve factual issues that are rife with uncertainty.\textsuperscript{32}

All these unique characteristics seem to stem from the nature of injuries caused by toxic substances. There are simply no historic legal theories or particularistic proof available for some types of injuries.\textsuperscript{33} Courts are being asked to develop new theories of liability,\textsuperscript{34} to relax standards of proof,\textsuperscript{35} to circumvent existing bars to

\textsuperscript{25} For example, joint action judicial team was formed in connection with the Newport News asbestos cases with judges from the federal district court and two state circuit courts.
\textsuperscript{27} By removing the plaintiff's burden of proving that asbestos products are unreasonably dangerous, trial time would be shorter since the issues were reduced to those centered solely on the individual plaintiff (the sufficiency of his exposure and the amount of his damages). Flatt v. Johns-Manville Sales Corp., 488 F. Supp. 836, 838-39 (E.D. Tex. 1980).
\textsuperscript{28} See Granelli, supra note 5.
\textsuperscript{29} For example, a law firm which was handling over 200 asbestos cases arising out of the Newport News shipyards has been disqualified because it hired a former Justice Department attorney, who had represented the government in the manufacturers' third-party action seeking indemnification. The disqualification came despite assurances that the attorney would not be involved in these cases and a waiver issued by the Justice Department. Brief for Appellant, Greitzer & Locke v. Johns-Manville, appeal docketed, No. 81-1379 (4th Cir. May 7, 1981).
\textsuperscript{31} In Ferrigno v. Eli Lilly & Co., 175 N.J. Super. 551, ———, 420 A.2d 1305, 1314 (1980), the Court noted a strong policy favoring recovery by innocently injured plaintiffs against culpable defendants regardless of inability to identify the exact source of the injuries.
\textsuperscript{32} See note 18 supra.
\textsuperscript{34} See text accompanying notes 225 & 226 infra.
recovery, and to allow for new indices of damages.

The development of statutes and common law to meet these new demands placed upon the legal system forms the background to this article. This article will also present an overview of the procedural and substantive issues raised by actions for personal injuries caused by toxic substances and focus on the treatment of those issues in state and federal courts in the United States Fourth Circuit. The final area of discussion in this article concerns insurance coverage for producers of toxic substances.

II. Statutes of Limitation and Statutes of Repose

There is a broad range of statutes of limitation and statutes of repose that may be applicable in a toxic substances case depending on the theory of liability, the damages sought, and the subject matter under dispute. Written contract and unwritten contract, Uniform Commercial Code sales, trespass, fraud, and various statutory causes of action have limitations periods that vary from 2 to 6 years. Statutes of limitation for damage to personal prop-

35. See text accompanying notes 315-21 infra.
36. See text accompanying notes 307-10 infra.
37. See text accompanying notes 328-35 infra.
roperty, personal injury and wrongful death also range from 2 to 6 years. Medical malpractice, architects' and contractors', product liability and general statutes of limitation and repose have time periods that vary from 3 to 12 years. In some situations laches may apply.

There has been and will continue to be substantial debate concerning the applicable statute in any given case. In the asbestosis cases involving ship workers, plaintiffs have attempted to apply admiralty law rather than state common law because of the outcome determinative effect of some state statutes of limitation and repose. In cases where the tort statute of limitations bars recovery, actions for damages to person or property have been filed under warranty or fraud.

The most frequently litigated issue in this area has involved the interpretation of the commencement time for tort statutes of limitations. Most tort statutes of limitation begin to run at the accrual of a cause of action. "Accrual" has been defined to mean: when a duty is breached; when a person is first injured; when a


52. Id.


person is last injured; when a person is, or should be, aware of an injury; when a person is, or should be, aware of the full extent of injury, when a person is aware of the cause of injury; when a person is aware of the defendant's conduct; when a person is aware of a causal connection between an injury and a defendant; when a person is aware of facts that give rise to a lawsuit; and when a person is aware that there is a lawsuit. Even when the accrual of a cause of action has been judicially or statutorily defined, there has been debate concerning the applicability of that accrual time to a specific theory of liability. Some plaintiffs have had success, for example, in circumventing statute of limitation bars by asserting "continuing" and "secondary exposure" theories such as continuing duty to warn, continuing exposure, continuing negligence, and imputation of a continuing relationship.

There has been some confusion concerning the respective definitions of statute of limitation and statute of repose. Although these


In North Carolina, accrual of a cause of action does not occur "until bodily harm to the claimant or physical damage to his property becomes apparent or ought reasonably to have become apparent to claimant." There is a 10-year repose limitation. N.C. GEN. STAT. § 1-52(16) (Cum. Supp. 1981). In South Carolina, actions for injury to the person or rights of another, not arising from contract must be "commenced within six years after the person knew or by the exercise of reasonable diligence should have known that he had a cause of action." S.C. CODE § 15-3-535 (Cum. Supp. 1981).


Relying on the rationale of earlier trespass cases involving subterranean coal mining, West Virginia adopted the discovery rule in situations where a foreign object was negligently left in a patient following surgery. See Morgan v. Grace Hospital, Inc., 149 W. Va. 783, 144 S.E.2d 156 (1965). The discovery rule exception is no longer limited to fraudulent concealment type situations. See Harrison v. Seltzer, 268 S.E.2d 312 (W. Va. 1980) (improper diagnosis).

56. See Virginia cases cited in note 55 supra.
terms have been used in a number of different ways, a statute of limitation refers to the time between the accrual of a cause of action and the last date available for filing a lawsuit. In states that allow a plaintiff to file suit at the discovery of an injury rather than when the injury occurs, suit can potentially be filed a substantial number of years after an injury actually happens. Some state legislatures have put an outer limit or cap on the time available for a plaintiff to discover an injury and file suit. This outer limit typically begins to run from the time of actual injury. In North Carolina, for example, an injured person must bring an action for personal injury against a physician within three years of the time of the injury unless the injured party has not had an opportunity to discover the injury. In no event, however, can the injured party bring suit more than ten years from the occurrence of actual injury. This limit of ten years is called a statute of repose.

More appropriately, however, a statute of repose refers to a time limit for bringing a lawsuit that begins to run, not from the accrual of a cause of action, but from some other event such as the manufacture of a product. In Virginia, for example, actions for personal injury against architects and contractors in connection with the design or construction of a building must be brought within five years after the performance or furnishing of such services and construction.

The differences between these two definitions of statute of repose can become crucial when issues of constitutionality and conflict of laws are raised. Statutes of repose have been attacked under federal and state constitutional provisions including equal protection, special legislation, privileges and immunities, uniformity, equality, due process, vagueness, open court, remedy, title and subject and impairment of contract. The outcome of these challenges typically varies in accordance with the type of definition a court gives the statute. State supreme courts have had a variety of

58. Id. at 583.
60. Id.
61. For example, in South Dakota, product liability actions must be brought within six years of delivery to first user. S.D. Comp. Laws Ann. § 15-2-12.1 (Supp. 1981).
63. McGovern, supra note 57, at 600.
results: South Carolina declared its architects’ and contractors’ statutes unconstitutional, whereas a similar Virginia statute appears to be constitutional. The definition of statute of repose may also affect interpretations of whether they are purely procedural or substantive in nature for purposes of selecting the appropriate law when there is a conflict between jurisdictions.

Probably the most fruitful areas of future litigation concerning statutes of limitation and statutes of repose will involve a host of ingenious attempts by plaintiffs’ attorneys to circumvent these statutory bars. Efforts will be made to find more favorable forums, either federal or state. More attention will be devoted to both statutory and common law provisions such as incapacity, fraudulent concealment or estoppel to toll these statutes. Plaintiffs will seek to narrow the applicability of statutory bars by urging definitions of terms that allow more flexibility. New defendants and new concepts of plaintiffs and damages will arise.

70. For example, plaintiffs could urge use of a more favorable “accrual” date or of one of the “discovery” exceptions, see note 55 supra, and when appropriate, challenge the retroactive application of a newly enacted statute. See Flippin v. Jarrell, 301 N.C. 108, 270 S.E.2d 482 (1980).
71. See text accompanying notes 116 & 120 infra.
72. A child may be injured by acts committed before conception, Renslow v. Mennonite Hospital, 67 Ill. 2d 348, 367 N.E.2d 1250 (1977)(blood transfusion given mother several
One major ramification of attempts to have the judiciary circumvent the rigid bars to recovery for plaintiffs established by the legislature will be a more overt conflict between courts and legislatures in determining liability for personal injuries.74 Heretofore, legislatures have given the judiciary wide discretion in establishing rules of liability at common law. More recently, there has been a trend on the part of legislatures to overrule common law rules, at least in the area of product liability.75 If courts continue to expand liability and circumvent legislative dictates, the potential for further legislative intervention is enhanced.76

III. COLLATERAL ESTOPPEL

Plaintiffs' attorneys have suggested that the offensive use of collateral estoppel77 is appropriate in toxic substances cases. Under this theory a defendant who loses one or more cases involving the issue of the defectiveness of a particular toxic substance would be precluded from denying the defectiveness of an identical product in subsequent litigation by different plaintiffs.78 Plaintiffs argue that offensive collateral estoppel would promote judicial economy79

74. See McGovern, supra note 57, at 595.
and uniform decisionmaking\textsuperscript{80} and would prevent defendants with unlimited assets from relitigating the same issues to the detriment of less solvent plaintiffs.\textsuperscript{81} Even when a manufacturer is estopped from relitigating certain issues, a plaintiff retains the burden of proof as to many key issues.\textsuperscript{82} While possibly simplifying the trial, victory is in no way assured.\textsuperscript{83} Also, the use of collateral estoppel could effect the manner or style in which a trial is conducted. The defense bar has countered that mutuality of the parties is a prerequisite to the use of offensive collateral estoppel, that the standards for the application of offensive collateral estoppel are not met in these specific fact situations, and that state rules on collateral estoppel should be used in federal diversity actions. Issue preclusion has also been justified on alternative grounds of \textit{stare decisis} and judicial notice.\textsuperscript{84} Defense lawyers contend that use of these concepts is questionable because the factual situations vary greatly from case to case.\textsuperscript{85}

Most states have traditionally required that identical plaintiffs and defendants must have litigated an issue before one of the same plaintiffs can prevent one of the same defendants from re-litigating the same issue.\textsuperscript{86} The United States Supreme Court,\textsuperscript{87} the Restate-
ment of Judgments, and a minority of state courts, however, have abandoned this requirement of mutuality in certain types of cases. Some courts have carried the demise of mutuality even further by allowing the offensive use of collateral estoppel against parties in privity with a party in a prior adjudication. Other courts have held that any party who sold an identical product previously determined to be defective would also be estopped from asserting that the product was not defective in subsequent litigation.

Defendant manufacturers have relied upon arguments of due process and right to trial by jury to retain the requirement of mutuality. Commentators have argued that the common law judicial system should promote individualized justice and should not interfere with an individual’s allocation of his resources. These critics of the elimination of the mutuality rule note that there is no evidence that preempting future litigation on specific issues cuts down on litigation time; in fact, more effort may be expended in trying otherwise trivial cases or in arguing the appropriateness of the application of collateral estoppel in a particular situation. More importantly they suggest that concepts of fairness embodied in due process guarantees and common sense dictate that one loss by a defendant in an overall litigation potentially involving hundreds of plaintiffs should not preclude additional trials on the mer-

90. Such cases include actions for patent infringements, recovery of unpaid income taxes, and disputes over the ownership of or the right to land or monies.
94. See Note, Invoking Collateral Estoppel Offensively: The Ends of Justice or the End of Justice, 4 Am. J. Trial Advocacy 75, 88 (1980).
95. “Likewise, the losing party who is estopped by the nonparty requires no protection because litigation would mean a benefit, not a burden. Despite additional expense, the losing party may prefer to reopen the litigation with the hope of receiving a different judgment.” Note, Nonmutuality: Taking the Fairness out of Collateral Estoppel, 13 Ind. L. Rev. 563, 571 (1980).
96. Id. at 572-75.
its. Most of the states in the Fourth Circuit have been persuaded by these counterarguments.

Even if a court decides to eliminate the requirement of mutuality, the appropriateness of the use of offensive collateral estoppel in any specific fact situation involves substantial additional analysis by both the parties and the court. There is a broad range of inquiries to insure that a defendant has had a "full" and "fair" opportunity to litigate an issue. Courts have examined in detail whether an issue was fully litigated, whether it was necessary and essential to a previous judgment, and whether it was identical to the pending issue. A court may also examine the entire legal climate to insure that there have been no changes in related substantive or procedural law. Other factors for consideration may relate to the case as a whole: the size of the claim, the forum of prior litigation, the incentive to litigate, the extent of the litigation, the competence and experience of counsel, the availability of new evidence, indications of a compromise verdict, the feasibility of future litigation and potentially inconsistent verdicts. The standard is one of fairness, to be determined on a case-by-case method. Once a court decides that there is appropriate identity of issues, it may shift the burden to the defendant to show that there was not a full and fair opportunity to litigate in the earlier trial or that issue preclusion would be unjust. Appellate courts will grant

97. Opponents of collateral estoppel point to Professor Currie’s example of a train wreck with fifty injured passengers. The defendant prevailed in the initial twenty-five trials before losing the twenty-sixth. Should the remaining passengers benefit from this single adverse verdict? Currie, Mutuality of Estoppel: Limits of the Bernhard Doctrine, 9 STAN. L. REV. 281 (1957).

98. See note 86 supra. Also, the requirement of mutuality has not been abandoned in South Carolina. Stewart, Res Judicata and Collateral Estoppel in South Carolina, 28 S.C. L. Rev. 451, 475-78 (1977).


102. These factors were set out in Schwartz v. Public Admin. of County of Bronx, 24 N.Y. 2d 65, 246 N.E.2d 725, 298 N.Y.S.2d 955 (1969).


104. See State Farm Fire & Cas. Co. v. Century Home Co., 275 Or. 97, ____, 550 P.2d ___.
trial courts broad discretion to determine the application of offensive collateral estoppel in any given case.\textsuperscript{105}

The final major issue in this area concerns the application of federal or state rules concerning the offensive use of collateral estoppel in federal diversity actions.\textsuperscript{106} If there is a favorable verdict plaintiffs' attorneys typically argue that collateral estoppel is procedural and thus, federal law should apply. Similarly, they argue that there are strong federal policies for maintaining the integrity of federal court judgments such as, encouraging judicial economy and eliminating multiplicitous litigation, at least as far as the applicability of offensive collateral estoppel to previous federal court decisions.\textsuperscript{107} Defendants argue that collateral estoppel involves substantive law and, even if it is not substantive, it is outcome-determinative and thus the appropriate state law of collateral estoppel should apply.\textsuperscript{108} They further suggest that the federal law of collateral estoppel should not apply when a previous federal decision is based upon diversity jurisdiction and not upon a federal question.\textsuperscript{109} Otherwise, plaintiffs might be inclined to forum shop with an inevitable inequity in the administration of laws.\textsuperscript{110} Most

\textsuperscript{105} Parklane Hosiery Co. v. Shore, 439 U.S. at 331.

\textsuperscript{106} For a discussion of this issue, see the asbestos cases from the Federal District Court for the Eastern District of Texas cited in supra note 78. Texas state courts have consistently required mutuality. See also Hammonds v. Holmes, 559 S.W.2d 345 (Tex. 1977).


\textsuperscript{110} In Hardy v. Johns-Manville Sales Corp., one of the appellant manufacturers contended that:

The lower court's collateral estoppel ruling has also resulted in geographical forum shopping. An example of this is James S. Drake v. Johns-Manville Sales Corp., No. M-78-112-CA (E.D. Tex., Marshall Div.), in which there are thirty-two plaintiffs. All worked at the DuPont plant in Old Hickory, Tennessee. None of the plaintiffs ever lived in Texas or worked in Texas. When they decided to file an asbestos lawsuit, however they came to Marshall, Texas.

federal circuit and district courts apply state rules concerning the offensive use of collateral estoppel to diversity actions.\textsuperscript{111}

IV. IDENTIFICATION OF PARTIES

The scope of this article is restricted to physical harm to persons or property caused by toxic substances and thus the potential plaintiffs in these cases have suffered some type of physical harm.\textsuperscript{112} If an individual is barred from recovery for an injury because of a common law or statutory restriction, he may bring a derivative suit or may sue in a different capacity based upon his familial or other relationship to another injured person.\textsuperscript{113} A plaintiff's physical harm may be medically unascertainable and so suit may be brought for damages other than personal injury.\textsuperscript{114} Exposure to some toxic substances, for example, does not leave any immediate diagnosable harm but may generate substantial concern about the possibility of future untoward effects.\textsuperscript{115}

The range of defendants is enormous. Suits involving a definable product may include manufacturers, suppliers, wholesalers, com-


\textsuperscript{113} For example, in Spruill v. Boyle-Midway, Inc., 308 F.2d 79 (4th Cir. 1962), a mother, who may have been contributorily negligent in leaving a toxic furniture polish within reach of her infant, recovered in a wrongful death action against the manufacturer. Compare Phillips v. United States, 508 F. Supp. 537 (D.S.C. 1980)(rejection of child's action for damages on theory of wrongful life due to doctor's failure to give mother genetic counselling) with Phillips v. United States, 508 F. Supp. 544 (D.S.C. 1980) (parents' action for wrongful birth due to doctor's failure to give genetic counselling recognized as a valid cause of action).

\textsuperscript{114} See Marrapese v. Rhode Island, 500 F. Supp. 1207 (D.R.I. 1980) (suit brought under 42 U.S.C. § 1983 alleging violation of criminal suspects civil rights when a known carcinogen was applied to his hands as part of a chemical test for traces of blood). See also text accompanying notes 331 and 332 infra (actions for mental anguish) and text accompanying note 328 infra (allegations of putting persons "at risk").

mmercial carriers, packagers, advertisers, endorsers, franchisers and franchisees, fabricaters, storers, retailers and others.\textsuperscript{116} Exposure to industrial toxic substances may impose liability upon an entire industry, an area of industry, architects, contractors, maintainers, owners of land and an endless variety of providers of services.\textsuperscript{117} Employees exposed to toxic substances may bring suit against insurance, union, government and private inspectors, co-employees, product suppliers and manufacturers, contractors, architects, and employers.\textsuperscript{118} Health care providers such as doctors, hospitals, clinics, nurses and pharmacists are also potentially liable.\textsuperscript{119} Federal, state and local governments and government employees may not be immune from suit.\textsuperscript{120}

Once defendants are sued, they typically seek contribution or indemnity from an equally large variety of parties.\textsuperscript{121} Federal, state and local governments, entire industries, and other producers of an allegedly defective product may be joined.\textsuperscript{122} For example, manufacturers and sellers of asbestos who have been sued by individual plaintiffs for causing asbestosis have filed third party actions against both the United States Government and the entire tobacco industry.\textsuperscript{123}


\textsuperscript{120} See Burchfield v. Regents of Univ. of Colorado, 516 F. Supp. 1301 (D. Colo. 1981) (doctors and druggist held not liable).

\textsuperscript{121} See Eaton Corp. v. Wright, 281 Md. 80, 375 A.2d 1122 (1977).


One of the most interesting legal issues in connection with identifying the potential parties to a toxic substances case occurs when a plaintiff is aware of the particular agent that caused harm, but cannot establish a causal connection between that agent and a specific defendant. In Ryan v. Eli Lilly & Co., the plaintiff alleged that she suffered a pre-cancerous condition caused by prenatal exposure to diethyestilbestrol taken by her mother during pregnancy. She could not, however, identify the specific drug company that manufactured and sold the drug ingested by her mother. She sought to maintain suit against various manufacturers of DES under theories of alternative liability, concert of action, civil conspiracy, enterprise liability and market share liability. Although the court granted the defendants' motion for summary judgment based upon her failure to identify the manufacturer of the drug taken by her mother, each of these theories may have potential application in other toxic substances cases where a defendant has similar problems in identifying a defendant.

There are any number of techniques for establishing joint torts and several liability including: vicarious liability; common duty; concurrent causation of a single, indivisible result which neither cause would have accomplished alone; concurrent causation of a single, indivisible result which either would have caused alone; damage of the same kind which is difficult to apportion; and acts innocent in themselves that together cause damage. Alternative liability is a common approach. The typical application of this theory occurs in the context of two or more tortfeasors who combine to bring about harm to a plaintiff such as two hunters who fire rifles at the same time, one of whom shoots a plaintiff. The alternative liability doctrine allows the plaintiff to shift the burden of proof to the defendants to establish which one caused the al-

124. 514 F. Supp. 1004 (D.S.C. 1981). In a subsequent DES case, the trial judge refused to utilize market share liability, which was otherwise dictated by California law which controlled the substantive issues, because to do so would conflict with the public policy articulated in Ryan. See Mizell v. Eli Lilly & Co., 526 F. Supp. 589 (D.S.C. 1981) (plaintiff was born in and cancer was diagnosed in California).


leged harm. If the burden is not met both defendants will be jointly liable. The application of this theory to DES cases has generally been limited because of the following arguments: there are a large number of potential defendants and not all of them are brought into the lawsuit; the defendants do not have any greater access to information concerning who sold the drug and are dealing with the same level of uncertainty as the plaintiff; there is no specific information that any one of the named defendants sold the drug that allegedly caused the harm; and the activities of the defendants are different in time and place.  

Concert of action is another theory that may be used to solve a plaintiff's identification problem. Under this approach a group of defendants may be liable if they act in concert pursuant to a common design, knowingly give substantial assistance to others engaged in breaching a duty or give substantial assistance while breaching a separate duty to a plaintiff. The typically cited example of concert of action involves a suit brought by an innocent person who is injured as a result of a drag race. The specific facts connected with defendants' actions are usually controlling and courts have been inconsistent in applying this theory in DES cases. Reasons cited for not applying this theory have included lack of evidence of anti-social behavior, passage of time between conduct complained of and subsequent activities, lack of a tacit understanding or a common plan, joinder of fewer than all potential defendants, large numbers of defendants and evidence only of mere manufacturing activities with similar economic results. On the other hand, one jury has found that there was sufficient evidence of concerted action to hold the defendant manufacturers liable for failing to make sufficient tests and for marketing DES without adequate warnings.

Closely related to concert of action is a theory of civil conspiracy also considered in Ryan v. Eli Lilly & Co. Plaintiffs alleged that the named manufacturers of DES conspired to fraudulently misrepresent the benefits of DES or acquiesced in such misrepresenta-

129. See Sindell v. Abbott Labs., 26 Cal. 3d at 603-04, 607 P.2d at 931, 163 Cal. Rptr. at 139.
130. See generally RESTATEMENT (SECOND) OF TORTS § 876 (1966).
132. Sindell v. Abbott Labs., 26 Cal. 3d at 608, 607 P.2d 932-33, 163 Cal. Rptr. at 141.
On motion for summary judgment the court found that there was no evidence of an agreement by the named defendants to commit a criminal act or intentional tort pursuant to a common scheme.\textsuperscript{135}

Other plaintiffs have suggested that there is a concept of "enterprise liability" that should be appropriate for assisting plaintiffs to identify defendants in these kinds of cases.\textsuperscript{136} This type of enterprise liability should be distinguished from the larger social theory that enterprises should bear the risk of loss for all harm caused by that enterprise.\textsuperscript{137} Instead, enterprise liability in this latter context refers to the legal theory proposed in \textit{Hall v. Du Pont}.\textsuperscript{138} This theory proposes that various overwhelming social policies would be better served by shifting the risk of loss to an offending industry as a whole rather than maintaining the risk of loss on injured consumers.\textsuperscript{139} In the DES cases there has been no support for this approach for a number of reasons including the large number of defendants, the presence of pervasive governmental regulation, and a dearth of legal precedent.\textsuperscript{140}

The most recent suggestion by plaintiffs to surmount the difficulties of identifying defendants has been for "market share liability."\textsuperscript{141} According to this theory, if a plaintiff suffered harm caused by a toxic substance but cannot identify the manufacturer of that substance, then the plaintiff may sue a substantial portion of the entire industry producing the substance and recover damages to be paid by each manufacturer in proportion to respective shares of the market for that substance. This doctrine is based upon the express social policies of providing the most appropriate incentives for product safety and of placing liability on the parties most capable of bearing compensation costs. Objections to this theory have included the lack of precedent, unfairness to some defendants and plaintiffs, and that it is counter to such social policies as

\textsuperscript{135} Id. at 1007.
\textsuperscript{136} 26 Cal. 3d at 608, 607 P.2d at 933-34, 163 Cal. Rptr. at 141-42.
\textsuperscript{138} 345 F. Supp. 353 (E.D.N.Y. 1972) (actions against explosives manufacturers for injuries to children from blasting caps).
\textsuperscript{139} See Note supra note 10, at 1000.
\textsuperscript{141} Sindell v. Abbott Labs., 26 Cal. 3d at 611-14, 607 P.2d at 936-38, 163 Cal. Rptr. at 144-46.
the encouragement of medical research.\textsuperscript{142}

V. COMMON LAW THEORIES OF RECOVERY

The potentially available theories of liability\textsuperscript{143} are limited only by the fertility of the imagination of counsel for a plaintiff. This section will refer to over twenty separate approaches for there is no single theory that suits all toxic substances cases. The argument has been made that none of the existing causes of action adequately meet the needs of a plaintiff injured by a toxic substance and that there should be a new theory developed to accommodate the unique characteristics of these cases.\textsuperscript{144} There is little debate that each of the existing theories of liability has relative strengths and weaknesses. In selecting a particular theory for any case, counsel normally finds crucial distinctions from theory to theory based upon the applicable statute of limitations, the subject matter covered by each theory, the requisite relationship among the parties, the difficulty of proof of the elements of a cause of action, available defenses and potential damages. No plaintiff has convinced a court that the collective weaknesses of the existing theories of recovery mandate the creation of a new cause of action.

Probably the most popular single cause of action asserted in personal injury cases involving toxic substances is strict liability in tort.\textsuperscript{145} Cases involving lung disorders,\textsuperscript{146} exposure to pesticides,\textsuperscript{147}

\textsuperscript{142} See note 139 supra.


\textsuperscript{145} A reading of the Last Report Letter Section of [1974] 2 PROD. LIABILITY REP. (CCH) will demonstrate the number and variety of such strict liability actions.


\textsuperscript{147} See In re "Agent Orange" Prod. Liability Litig., 506 F. Supp. 762 (E.D.N.Y.), rev'd, 635
ingestion of drugs\textsuperscript{148} and incidence of cancer\textsuperscript{149} have relied heavily upon strict liability in tort. These cases typically have involved allegations that corporations or governments have put defective products into the stream of commerce that caused harm to persons or property thereby subjecting them to strict liability.\textsuperscript{150} Allegations of defect have been based upon the way a product was manufactured,\textsuperscript{151} the way it was designed,\textsuperscript{152} the fact that it was sold,\textsuperscript{153} the instructions\textsuperscript{154} and warnings\textsuperscript{155} either accompanying or not accompanying a product, and the overall promotion for sale of a product.\textsuperscript{156}

Strict liability in tort has been a popular theory because a plaintiff is not required to prove that a defendant knew or should have known of the defective nature of the product.\textsuperscript{157} Defendants also are stripped of some of the typical defenses available under other negligence based causes of action.\textsuperscript{158} Aside from the fact that several states have not adopted strict liability in tort or have limited its applicability,\textsuperscript{159} there are a number of weaknesses common to it and to tort actions in general. A plaintiff must prove that an iden-
tifiable product was sold or put into the stream of commerce by an identifiable defendant in the business of selling that product, and in some jurisdictions, the plaintiff must be either a user or consumer of that product. A plaintiff must usually prove that the specific defendant's product was the proximate cause of the physical harm to person or property. In some jurisdictions economic loss is not recoverable in the absence of physical harm. It can also be argued that there is little difference between proving a design or marketing defect and proving negligence. Some courts have made the element of scienter a prerequisite to recovery under the theory of strict liability in tort for both design and marketing defects.

The variety of fact situations that are amenable to the application of negligence is astonishing. Aside from the previously enumerated approaches of alleging manufacturing, design and marketing defects, negligence can be used as a basis of recovery because of problems in the operation of machinery or the manufacturing process as a whole. Failure to inspect the product, plant or environment; failure to test, maintain or repair a product or process; or simply a failure to act reasonably have been used as

160. Restatement (Second) of Torts § 402A, Comments e & f (1965).
161. See Armstrong Rubber Co. v. Urquidez, 570 S.W.2d 374 (Tex. 1978) (test driver was not a consumer).
165. See American Cyanamid Co. v. Fields, 204 F.2d 151 (4th Cir. 1953).
the basis of negligence claims by plaintiffs.\textsuperscript{171} Aside from cases against manufacturers or distributors of products, negligence theory has been used most commonly in the context of professional malpractice and premises liability.\textsuperscript{172} In circumstances where a plaintiff is unable to recover against parties involved in putting a product into the stream of commerce, there are a number of alternative defendants who are potentially subject to liability under a negligence theory. Individuals associated with medical care,\textsuperscript{173} safety inspections,\textsuperscript{174} premises design\textsuperscript{175} and related activities\textsuperscript{176} have been included as defendants for malpractice or negligence.

As is indicated by the range of potential fact situations, the greatest asset of a negligence action is the breadth of its applicability to circumstances involving personal injuries caused by toxic substances. In some instances the doctrine of \textit{res ipsa loquitur} has been particularly helpful in assisting a plaintiff to establish a negligence cause of action.\textsuperscript{177} Its use is restricted, however, by relatively short statutes of limitation and statutes of repose,\textsuperscript{178} rigorous standards of proof,\textsuperscript{179} and substantial defenses.\textsuperscript{180}

Related to negligent failure to warn and instruct is a range of representational theories that have received little attention in toxic substances cases, particularly in the context of fraudulent conceal-

\textsuperscript{210} S.E.2d 289 (1974).

171. For example, liability has been based upon not foreseeing that someone might ingest an otherwise safe product. See Barnes v. Litton Indus. Prods., Inc., 555 F.2d 1184 (4th Cir. 1977); Spruill v. Boyle-Midway, Inc., 308 F.2d 79 (4th Cir. 1962).


176. See McDougle v. Woodward & Lothrop, Inc., 312 F.2d 21 (4th Cir. 1963) (beauty salon which administered permanent wave).

177. \textit{Id}.


Plaintiffs may have grounds for alleging innocent misrepresentation, negligent misrepresentation, fraud or express warranty to establish a cause of action. The elements of most of these theories are relatively inexpensive to prove and are within the normal range of experience of a jury. A plaintiff must typically have, however, some type of personal relationship with a defendant in order to avail himself of one of these theories. At the same time a plaintiff may have substantial difficulty in meeting requirements of specificity and reliance mandated by these causes of action.

If a plaintiff can find some basis for establishing negligence per se, a number of the difficulties present under negligence and representational theories could be surmounted. Virtually every aspect of the business of placing products into the stream of commerce has some form of federal, state or local regulation. If a plaintiff can locate a violation of one of these regulations by a defendant, the substantial problems for a plaintiff in proving negligence or a defect can be eliminated. In one case, for example, a manufacturer was potentially liable for damages sustained by placing toxic materials into a city sewage system in violation of a municipal ordinance setting toxicity levels for waste.

Another theory of recovery that does not present the problem of proving culpability is strict liability for abnormally dangerous or ultra-hazardous activity. The distinguishing characteristics be-

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182. See generally Restatement (Second) of Torts § 402B (1965).


190. See generally Rylands v. Fletcher, L.R. 3 H.L. 330 (1868) (unnatural use); Restatement of Torts §§ 519 & 520 (1939) (ultrahazardous); Restatement (Second) of Torts §§
tween this theory and strict liability in tort are the nature of the activity covered and the lack of the need to prove a defect. Most courts have increased the number of potential plaintiffs and hazards by using a foreseeability standard. Some courts have relaxed the standard of proof for proximate cause and have eliminated contributory negligence as a defense. Other states have, however, limited this theory to unnatural activities involving physical invasion of property and have circumscribed the range of activities generally considered to be abnormally dangerous.

In the event a defendant is accused of particularly egregious conduct theories such as the tort of outrage, gross reckless conduct or intentional tort may be available. The tort of outrage may be particularly helpful in those instances where an individual does not suffer an immediately diagnosable personal injury but has an increased chance of contracting a physical problem at a future date. All of these theories, however, involve fact situations that are either relatively unusual or extremely difficult to prove.

Because of the relatively short statute of limitations for tort causes of action, some plaintiffs have attempted to use contract actions, such as breach of the implied warranty of merchantability and implied warranty of fitness for a particular pur-

519 & 520 (1977) (abnormally dangerous).
194. See generally Restatement (Second) of Torts § 46 (1965) (reckless conduct and its relation to the tort of emotional distress).
198. See Eaton Corp. v. Wright, 281 Md. 80, 375 A.2d 1122 (1977) (right to indemnification).
Although it may be easier to prove that a defendant has violated these contractual standards, these theories have limited applicability because of the requirement of some type of special relationship between plaintiff and defendant. In some jurisdictions, it may also be necessary to establish privity and notice, and there may be various disclaimers available to defendants to limit the measure of damages.

Some plaintiffs have sought to use land-based actions to avoid the problems inherent in the various strict liability, negligence, misrepresentation and contract theories. Trespass, public nuisance, private nuisance, and riparian ownership approaches have met with varying degrees of success. Under circumstances where there have been no overt personal injuries but some type of damage to property, plaintiffs have found these theories most appropriate. They are also potentially helpful when a plaintiff has suffered the potential for future personal injuries accompanied by an invasion of the use or enjoyment of land. Under these theories there is often a substantially easier standard of proof, a longer statute of limitations, and the defenses available are not as stringent as in tort and contract cases.

If a plaintiff can establish the applicability of one of these theories to the circumstances of a particular case, good faith and contributory negligence may not be available as potential defenses.


201. For example, in Bastiste v. American Home Prods. Corp., 32 N.C. App. 1, 231 S.E.2d 269 (1977), the plaintiff unsuccessfully argued that a doctor prescribing a drug was a "seller" under the UCC and that warranty provisions should apply.


206. See generally RESTATEMENT (SECOND) OF TORTS §§ 841-64 (1979) (riparian ownership). See also Davis, Theories of Water Pollution Litigation, 1971 Wis. L. REV. 738.


208. See generally RESTATEMENT (SECOND) OF TORTS § 840B (1979) (contributory negli-
Under a trespass theory, the applicable statute of limitations is typically longer than the tort statute.\textsuperscript{209} In a nuisance action a plaintiff may choose between proving either intentional\textsuperscript{210} or negligent interference\textsuperscript{211} and may show an indirect invasion to land.\textsuperscript{212} On the other hand, the trespass requirements of intentional invasion of property and possessory interest in land have precluded a large number of plaintiffs from suit.\textsuperscript{213} At the same time, individual plaintiffs have had substantial difficulty meeting the requirements of standing under public nuisance\textsuperscript{214} and have also been unable to meet the balancing test inherent in the nuisance standard.\textsuperscript{215} Actions for private nuisance have been more successful even though some plaintiffs have been unable to recover damages because of the necessity of proving some type of interest in land and substantial and unreasonable harm.\textsuperscript{216}

\textsuperscript{209} See notes 39-50 supra.


In riparian actions, the “comparative convenience” doctrine is sometimes used to weigh the interests of the parties. See Livezey v. Town of Bel Air, 174 Md. 566, 199 A. 338 (1938) (accepted); Williams v. Haile Gold Mining Co., 85 S.C. 1, 66 S.E. 117 (1909) (rejected); Arminius Chem. Co. v. Landrum, 113 Va. 7, 73 S.E. 459 (1912) (rejected); Day v. Louisville Coal & Coke Co., 60 W. Va. 27, 53 S.E. 776 (1906) (rejected).

Statute of limitations problems and restrictive views by some courts have led plaintiffs to seek more novel theories of liability under admiralty\textsuperscript{217} and federal common law,\textsuperscript{218} the public trust doctrine\textsuperscript{219} and a new tort for personal injuries caused by toxic substances.\textsuperscript{220} The asbestos cases have generated a substantial number of appellate opinions concerning the applicability of admiralty law to personal injuries suffered by ship workers.\textsuperscript{221} In the Agent Orange cases and in numerous nuisance suits, plaintiffs have attempted to develop a federal common law cause of action that would not suffer from the same perceived problems as the law of the various states.\textsuperscript{222} One of the most innovative approaches has been to develop a cause of action based upon the theory that the government has an affirmative duty to preserve the public's resources.\textsuperscript{223} Under this approach, each corporate member of society would also have a duty to insure that their activities did not harm public resources including the health and welfare of individuals.\textsuperscript{224}

The most overt approach to recovery has been the suggestion of a new theory of liability which would have universal applicability to causes of action arising from personal injuries caused by toxic substances.\textsuperscript{225} Under this theory a plaintiff would recover for damages if he could prove that he had contracted a disease, that the


\textsuperscript{218} Although there is a general federal common law, Miree v. DeKalb County, 433 U.S. 25 (1977), the federal common law of nuisance does not permit private suits. Committee for Consideration of Jones Falls Sewage Sys. v. Train, 375 F. Supp. 1148 (D. Md. 1974), aff'd, 539 F.2d 1006 (4th Cir. 1976).


\textsuperscript{220} See Rheingold & Jacobson, supra note 144.

\textsuperscript{221} See White v. Johns-Manville Corp., 662 F.2d 234 (4th Cir. 1981) (reversing trial court's ruling that installing insulation on ships is not a traditional maritime activity).


\textsuperscript{224} See Yannaconne, Cohen & Davison, supra note 219.

\textsuperscript{225} Rheingold & Jacobson, supra note 144.
disease had some causal relationship to a toxic substance, and that the toxic substance was a substantial factor in contributing to the disease. The burden of proof would then shift to the defendants who produced the toxic substance to prove that it was not unsafe or, if unavoidably unsafe, that there had been adequate testing and warnings. If there were multiple defendants involved in the placing of the toxic substance into the environment, the burden of proof would shift to those defendants to show that they did not contribute to cause plaintiff's injury. Actions for contribution or indemnity appear in virtually every toxic substances case involving multiple defendants. In most states there are common law or statutory provisions that allow joint tortfeasors or otherwise liable parties to seek reimbursement for part or all of a judgment against third parties who have a certain level of liability. Many defendants have also sought contribution or indemnity from governments. Under the Federal Tort Claims Act the United States waived its immunity for certain third party actions. But, there is a debate concerning governmental immunity for suits against the United States for injuries to federal employees covered by the Federal Employees Compensation Act (FECA). Suits based upon an independent relationship between the United States and a tortfeasor may be allowed notwithstanding the exclusive remedy provision of FECA and thus, recovery under alternative theories such as implied warranty may be available in third party actions.

VI. STATUTORY AND CONSTITUTIONAL CAUSES OF ACTION

A much larger number of persons who are injured by exposure to

226. Id.
toxic substances receive compensation from statutory systems of recovery rather than from common law suits.\textsuperscript{232} State workers' compensation laws,\textsuperscript{233} the Longshoremen's and Harbor Workers' Compensation Act,\textsuperscript{234} the Social Security Act,\textsuperscript{236} the Federal Tort Claims Act,\textsuperscript{238} the Black Lung Benefits Act,\textsuperscript{237} "Superfund,"\textsuperscript{238} the Price Anderson Act,\textsuperscript{239} the Federal Employers' Liability Act,\textsuperscript{240} the Federal Employees Compensation Act, various welfare legislation\textsuperscript{242} and many other state and federal statutes\textsuperscript{234} provide the basis for this recovery. There have been suggestions that federal legislation, similar to the compensation system for coal miner's pneumoconiosis, should be enacted to provide compensation for injuries caused by exposure to specific types of toxic substances.\textsuperscript{244} The "Superfund" legislation, for example, is designed to meet the specific problems caused by toxic substances disposal.\textsuperscript{246} There have also been suggestions that a national workers' compensation act or a national enterprise liability system should be initiated in order to insure recovery for persons injured under any and all cir-

\textsuperscript{232} P. BARTH, WORKERS' COMPENSATION & WORK-RELATED ILLNESSES AND DISEASES 26-44 (1976).
\textsuperscript{243} See, e.g., 38 U.S.C. § 301 (1976) (disability benefits from the Veterans' Administration).
cumstances. Although there has been little support for a comprehensive compensation scheme, there appears to be a trend toward expanding the coverage of state workers' compensation laws and perhaps toward the passage of national compensation systems to accommodate specific injuries caused by toxic substances. \(^{247}\)

The primary advantages of seeking recovery for toxic substances injuries under state and federal workers' compensation statutes include the speed and efficiency of receiving compensation, the absence of defenses and of the need to prove fault, the availability of a solvent compensator, and the reserved potential for further recovery against third parties. \(^{248}\) The disadvantages include a narrow scope of recovery, restrictive statutes of limitations and exclusive remedy provisions against the employer. \(^{249}\)

Initially, workers' compensation was limited to accidental or unforeseen occurrences. \(^{250}\) A wool sorter who came in contact with bacillus would be compensated because he could pinpoint a specific event which caused his injury, \(^{251}\) but there would be no compensation for lead poisoning since there was no identifiable event associated with an injury. \(^{252}\) Excluding occupational diseases from these statutes was justified because a large number of cases could bankrupt a compensation fund; recovery for occupational disease was a stranger to common law; workers' compensation was not designed to be a general health insurance law; and there was a lack of defined diagnostic tools to identify specific diseases. \(^{253}\)

The solution to these problems in most states has been to enact a variety of defined schedules of occupational diseases that are covered under a compensation system. \(^{254}\) As a general rule, the oc-


\(^{248}\) See generally Walton, Workmen's Compensation and the Theory of Professional Risk, 11 Colum. L. Rev. 36 (1911).


\(^{250}\) See Workmen's Compensation Act, 1897, 61 Vict., c. 37 (the British statute served as a model for early American statutes).


occupational disease must arise out of and in the course of employment and not be an ordinary disease of life, and there must be a direct causal connection between the disease and the type and amount of workplace exposure.\textsuperscript{255}

State workers' compensation laws for occupational disease may also require that timely notice of injury be given to an employer, that claims for compensation be filed within a specified period and that there be a specific period of exposure to a toxic substance.\textsuperscript{256} Since there may be no specific "event" or "occurrence" associated with the occupational disease, jurisdictional limitation periods commence with some event usually unrelated to the contraction of the disease itself such as hazardous or injurious exposure, manifestation of a disease, awareness of a causal connection, or disable-


For the applicable requirements concerning periods of exposure, see N.C. Gen. Stat. § 97-53(c) (Repl. Vol. 1979) (for lead poisoning, there must be exposure for at least 30 days in the preceding 12 months); S.C. Code & 42-11-60 (Cum. Supp. 1980) (for byssinosis claims, there must be at least seven years of exposure) Va. Code Ann. § 65.1-52 (Repl. Vol. 1980) ("Exposure to the causative hazard of pneumoconiosis for ninety work shifts shall be conclusively presumed to constitute injurious exposure"); W. Va. Code § 23-4-1 (Repl. Vol. 1981) (for occupational pneumoconiosis, there must be exposure for at least two continuous years during the 10 years immediately preceding last exposure, or for any five years of the last 15 years preceding last exposure).
Along with these limitations, some state laws specify that claims must be filed within certain periods of time regardless of whether or not the disease manifests itself or there is a disability.\footnote{\textsuperscript{258}}

The most prominent objections raised by employees to recovery under workers' compensation systems relate to the limitation of damages and the exclusivity provisions. Most statutory benefits are substantially below the recovery received in common law personal injury actions, and culpable employers are often able to minimize their potential financial exposure.\footnote{\textsuperscript{259}} Attorneys for injured workers have therefore sought to find and use a variety of statutory and common law stratagems for circumventing the workers' compensation restrictions and for obtaining additional recovery against third parties. Some state statutes provide that an employee can maintain a common law action against an employer for an intentional injury, for various non-physical injuries such as fraud and misrepresentation and for the violation of statutory or administrative standards.\footnote{\textsuperscript{260}} Other courts, having found that employers can function in a dual capacity, have allowed suits against such employers based on their non-employer role.\footnote{\textsuperscript{261}}


\footnote{\textsuperscript{261}} In Kohr v. Raybestos-Manhattan, Inc., 505 F. Supp. 159, 161 (E.D. Pa. 1981), a product liability action against employer as asbestos manufacturer, it was held that "Workmen's Compensation statutes derogate from the employee's common law rights, and as such, should not be construed to eliminate rights beyond which the \textit{quid pro quo} anticipated." \textit{See also} Petruska v. Johns-Manville, 83 F.R.D. 39, 40 (E.D. Pa. 1979), where the deceased worker's wife sued on basis of husband's exposure to asbestos as a result of living near and
In *Burdette v. Burlington Industries, Inc.*, former textile workers brought suit outside of workers' compensation alleging that their employer fraudulently concealed adverse health conditions during their employment and denied them the possibility of entitlement to workers' compensation benefits. These plaintiffs also sued various individual doctors employed by their employer and the workers' compensation carrier for the employer as third parties, alleging malpractice and negligence. In ruling on a motion to dismiss, based upon exclusivity provisions, the court allowed the case to continue under a tort of allegedly depriving the plaintiff of the benefits provided by the statute. This cause of action was distinct from the personal injuries suffered during the course of employment.

Virtually every serious injury sustained by an injured employee has the potential for lawsuits against a third party. As has been suggested above, manufacturers, suppliers, health care delivery personnel, co-employees, inspectors and many others are amenable to suit. These third parties in turn may seek contribution or indemnity from employers. Asbestos manufacturers, for example, have unsuccessfully sued the United States Navy as employer of shipyard personnel for failure to enforce safety regulations.

Aside from state and federal workers' compensation acts and the Federal Tort Claims Act, the Federal Employees Liability Act (FELA) may provide a statutory basis for recovery for injuries caused by toxic substances. Suits against the United States working at plant, and it was held that Workmen's Compensation Act was exclusive remedy, absent showing of "deliberate intention [to cause injury] rather than gross negligence." But see Mott v. Mitsubishi Int'l Corp., 638 F.2d 1073 (5th Cir. 1981) (dual capacity doctrine rejected in Texas). See generally, Note, Dual Capacity Doctrine: Third-party Liability of Employer-Manufacturer in Products Liability Litigation, 12 Ind. L. Rev. 553 (1979); Comment, Manufacturer's Liability as a Dual Capacity of an Employer, 12 Akron L. Rev. 747 (1979).

263. Id.
based upon state common law may be available against federal employees for their negligent acts not made within their discretionary functions or duties.\(^\text{269}\) Moreover, some states have passed statutes granting a limited waiver of their eleventh amendment immunity for the negligent acts of state employees.\(^\text{270}\) Railroad employees and persons covered by the Jones Act\(^\text{271}\) have a special compensation system under FELA\(^\text{272}\) that also provides for a common law remedy. The standards of proof and defenses are generally more favorable for the plaintiff than at common law in most states.\(^\text{273}\)

Various other federal statutes may also provide a basis for plaintiffs to establish either standing or new causes of action. Although these statutes have given governments authority and power to bring suits in toxic substances cases when construed broadly, private plaintiffs have not had substantial success under these statutes in the absence of specific statutory provisions authorizing such suits.\(^\text{274}\) In *Yates v. Island Creek Coal Co.*,\(^\text{275}\) for example, plaintiffs unsuccessfully sought a private cause of action under the Rivers and Harbors Appropriation Act and the Surface Mining Control and Reclamation Act. And, in *Langdon and Alpha Business Services, Inc. v. Hunt*,\(^\text{276}\) suit was brought by private parties under a host of theories including the citizens' suit provisions of various federal acts and North Carolina statutes in an attempt to recover monetary damages and to force federal and state governments to clean toxic waste from roadsides. Plaintiffs have also sought recovery against governments and government employees under the Civil Rights Acts.\(^\text{277}\)

Plaintiffs have used state and federal constitutional provisions to buttress their lawsuits. Although a few states have specific constitutional provisions that require a commitment to the maintenance of public resources, the federal constitution and most state consti-

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tutions do not. Attempts to develop either standing or private causes of actions with the fifth, ninth and fourteenth amendments have not met with great success. The theory of inverse condemnation, based upon an unconstitutional taking of property, has been the most useful constitutional theory.

The bulk of personal injury cases, however, do not usually lend themselves to this approach because of a lack of accompanying damage to property.

VII. DEFENSES

The range of legal defenses is as broad as the underlying theories of recovery and the practical defenses are even broader. During the trial of a case defendants may argue that the plaintiff is not injured; that the plaintiff is responsible for his own damages; that the plaintiff has not proved all the elements of his case; that a third party is responsible for causing the plaintiff's injuries; that a third party could have avoided plaintiff's injuries; and that the defendant's conduct and products were reasonable. These objectives translate into a variety of defensive strategies including factual, technical, legal, obfuscation and "eyes of the manufacturer" defenses.

In tort actions defendants have relied upon the affirmative defenses of contributory and comparative negligence, assumption of the risk and statute of limitations. Legislation in a number of

278. See, e.g., VA. CONST. art. XI, §§ 1-3.
283. Id. at 459-71.
states provides for additional defenses in product liability cases, such as alteration, modification and misuse; state of the art; compliance with government standards; and statutes of repose.\textsuperscript{285} Other defensive measures have included allergic or abreactions, intervening warnings or other intervening conduct, unintended use and substantial change.\textsuperscript{286}

In contract actions defendants often have defenses of privity, notice, disclaimers and occasionally assumption of the risk, contributory negligence and misuse.\textsuperscript{287} For land based actions there may be defenses involving prescriptive rights, assumption of the risk, compliance with governmental standards, unusual sensitivity, various forms of estoppel, and contractual or governmental authorization.\textsuperscript{288}

There are additional potential defenses when a governmental entity is a defendant. The Federal Tort Claims Act does not allow recovery when there is either due care or discretionary function exercised by a federal employee.\textsuperscript{289} In addition, a plaintiff must often meet the procedural requirements of exhaustion of administrative processes\textsuperscript{290} and overcome all the state common law defenses otherwise available. If the Federal Employees Compensation Act is applicable, then the exclusive remedy provisions also

\begin{itemize}
\item \textsuperscript{285} See, e.g., N.C. GEN. STAT. §§ 99B-1 to 99B-4 (Repl. Vol. 1979), See also notes 296-307 infra and accompanying text.
\item \textsuperscript{287} See notes 201-02 supra. See also Herman v. Smith, Kline & French Labs., 286 F. Supp. 694 (E.D. Wisc. 1968) (notice); Bennett v. Richardson-Merrell, Inc., 231 F. Supp. 150 (E.D. Ill. 1964) (privity and notice).
\item \textsuperscript{288} See Moy v. Bell, 46 Md. App. 364, 416 A.2d 289 (1980) (need to timely commence proceedings against a private nuisance); Liller v. State Highway Administration, 25 Md. App. 276, 333 A.2d 644 (1975) (laches is not a defense to the enjoining of a public nuisance); Hooks v. International Speedways, Inc., 263 N.C. 686, 140 S.E.2d 387 (1965) (inconvenience to ordinary, normal and reasonable persons); Blue Ridge Poultry & Egg Co. v. Clark, 211 Va. 139, 176 S.E.2d 323 (1970) (estoppel due to acquiescence to defendant's conduct). The defense most frequently raised is that the economic interests of the defendant, and of the general public, outweigh the harm inflicted upon the plaintiff. See cases cited in note 215 supra.
\item \textsuperscript{289} 28 U.S.C. § 2680(a) (1965).
\item \textsuperscript{290} See Deering & Milliken, Inc. v. Johnston, 295 F.2d 856 (4th Cir. 1961). But see Porter County Chapter of Izaak Walton League of Am. v. Costle, 571 F.2d 359 (7th Cir.), cert. denied, 439 U.S. 834 (1978) (administrative remedy does not have to be exhausted if to exercise it would be futile).
\end{itemize}
apply.291

The following four general defensive areas can be used to combat a number of theories of recovery by rebutting an element of a plaintiff’s case or establishing an affirmative defense. The first area involves a “government contractor’s” defense. If a defendant is operating under contract to the federal government and damages incurred by a plaintiff are sustained in connection with that operation, a defendant may have a government contractor’s defense recognized in some courts. Under this defense a defendant may take advantage of the government’s sovereign immunity and exclusive remedy protection from suits stemming from a third party’s damages.292 A defendant must show, however, that its activities were controlled and dictated by the United States government. Presumably for this reason, the court in the Agent Orange litigation suggested that there should be a trial on the government contractor’s defense issue before adjudication of the liability and damage issues.293

The “state of the art” defense is one of the most misunderstood defensive concepts in product liability cases.294 This misunderstanding has been created by both its definition and its role in lawsuits. Plaintiffs tend to view the most recent theoretical technical advances as part of the state of the art, whereas, defendants typically refer to proven technology in actual commercial use as such.295 This difference of perspective creates confusion, as might be anticipated. In the absence of legislation, there is no specific affirmative defense of state of the art or compliance with either governmental or industry standards.296 State of the art issues are

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generally raised when there are toxic substance effects which a defendant has not anticipated. Evidence of the unknown characteristics of a product can be used to establish that there was no negligence, that the product was not defective or that the product was unavoidably unsafe. 297

One potentially fruitful defensive measure may arise if there are changes that occur to a substance after it enters the stream of commerce but before it causes any harmful effects. 298 Although most product liability actions do not involve fact patterns in which there is a substantial change in a product between the time of manufacture and the time it reaches the hands of the consumer, toxic substances may undergo chemical or physical alteration that will enable a defendant to negate an element of the plaintiff's case. Alteration, modification and misuse of a substance after it enters the stream of commerce may also give defendants an opportunity to avoid liability. 299

One of the most popular defensive postures is to emphasize the role of other parties in causing an alleged harm. If it can be established that another entity is responsible for an intervening and superseding cause, the defendant can avoid liability. 300 Many defendants attempt to shift liability to employers who are in a superior position to eliminate a potential harm, to health care providers who could warn or otherwise reduce the chances of harm and to sophisticated plaintiffs who should have been able to cope with the dangers inherent in a potentially dangerous substance. 301

VIII. CAUSATION

Toxic substances cases raise fundamental questions concerning the adaptability of our common law to all types of evolving fact

300. For example, a distributor who is aware of a manufacturer's warning would be in a better position to advise users as to dangers of using a product in specific conditions than the manufacturer. See Wilson v. E-Z Flo Chem. Co., 281 N.C. 506, 189 S.E. 2d 221 (1972).
situations.\textsuperscript{302} Nowhere is this more evident than with the issue of causation. Although there is a rich legal literature concerning causation,\textsuperscript{303} there is much confusion concerning the theoretical and philosophical underpinnings and assumptions of its various concepts.\textsuperscript{304} This confusion, which is not unique to the legal profession, becomes apparent when comparing interdisciplinary concepts of causation. Some scientists and medical doctors, for example, seem to have a different understanding of the word “cause”. While an epidemiologist may identify a causal relationship between two factors if there is a mere “association”,\textsuperscript{305} a physician on the other hand may not testify concerning “probable” cause unless there is virtual certainty.\textsuperscript{306}

These philosophical differences compound the practical problems inherent in handling causation problems in toxic substances cases. A plaintiff may be faced with a situation involving joint, \textit{seriatim} or concurrent causation.\textsuperscript{307} There may be difficulties in proving a causal relationship between a particular defendant and a particular product,\textsuperscript{308} or the causal relationship between a defendant’s product and an injury suffered may be confused by the fact that a number of other products combined to cause a plaintiff’s particular harm.\textsuperscript{309} Moreover, a specific defendant’s product may cause only a percentage of or may merely aggravate a plaintiff’s harm.\textsuperscript{310}


\textsuperscript{305} See generally, Levine, \textit{Legal Questions Regarding the Causation of Occupational Disease, 26 Lab. L.J. 88, 89-90} (1975).


\textsuperscript{309} For example, is a textile worker’s breathing difficulties the result of heavy cigarette smoking or of exposure to cotton dust?

One of the threshold issues concerning causation is the distinction between cause-in-fact (actual cause) and proximate cause (legal cause).\textsuperscript{311} In general terms, the crucial distinction is that proximate cause involves a policy decision and thus includes an element of foreseeability.\textsuperscript{312} This presents a problem in strict liability in tort cases because most strict liability theories suggest that \textit{scienter}, and hence foreseeability, is banished from the cause of action.\textsuperscript{313} However, if causation is an element of the plaintiff's case, there remains the necessity of proving foreseeability. Some courts have recognized this problem and have reacted by requiring the plaintiff to prove only actual cause or by admitting that strict liability in tort is not completely strict.\textsuperscript{314}

One of the most difficult problems associated with causation involves the quantum of proof necessary to raise a fact issue for a plaintiff.\textsuperscript{315} Must the plaintiff prove probable cause or possible cause? Can the evidence be probabilistic, or must it be particularistic in nature? Although some plaintiffs' attorneys have suggested the contrary, most states require some specific words concerning causation to raise a fact issue — probable cause, reasonable medical certainty, substantial factor or the equivalent.\textsuperscript{316} Whether the sufficiency of evidence must be based upon direct evidence of the plaintiff's specific case is the subject of substantial debate.\textsuperscript{317}


\textsuperscript{312} Given the defendant's culpability, the issue becomes whether or not to assess liability. Seidelson, \textit{supra} note 312, at 3. "Proximate cause analysis, which involves policy considerations of remoteness and limitation of liability, need only be considered after cause-in-fact has been established." Harrison v. Flota Mercante Grancolombiana, S.A., 577 F.2d 968, 983 (5th Cir. 1978). As to the issue of foreseeability in cases not dealing with toxic substances, see Goode v. Harrison, 45 N.C. App. 547, 263 S.E.2d 33 (1980).

\textsuperscript{313} \textit{Restatement (Second) of Torts} § 402A (1965).

\textsuperscript{314} C.A. Hoover & Son v. O.M. Franklin Serum Co., 444 S.W.2d 596 (Tex. 1969).

\textsuperscript{315} "Proximate cause in the law is not necessarily the proximate cause of the logician, but is determined upon mixed considerations of logic, common sense and experience, policy and precedent." Gonzalez v. Virginia-Carolina Chem. Co., 239 F. Supp. 567, 573 (E.D.S.C. 1965).

\textsuperscript{316} See United States v. Standard Oil Co., 495 F.2d 911, 916 (9th Cir. 1974). "When direct proof of causation is lacking, the causal connection can be shown by facts and circumstances which, in the light of ordinary experience, reasonably suggests that the defendant's negligence in the manner charged operated proximately to produce the injury." Id. at 916 (quoting Johnson v. Griffiths S.S. Co., 150 F.2d 224, 226 (9th Cir. 1945)). See also \textit{In re Swine Flu Immunization Prods. Liab. Litig.}, 495 F. Supp. 1188, 1206 (D. Colo. 1990).

\textsuperscript{317} See Melville v. American Home Assur. Co., 443 F. Supp. 1064 (D. Pa.), rev'd, 584 F.2d 1306 (3d Cir. 1977). "It is also important to note that a longitudinal study yields infor-
fendants argue that negligence cannot be presumed from the mere happening of an accident, that they have due process rights and that they should be protected against fraudulent claims. From the defendant's point of view a plaintiff's expert may testify that there is a fifty-one percent chance that someone who is exposed to a certain toxic substance will contract a particular disease. If plaintiffs are allowed to recover without having to present direct evidence, all a plaintiff needs to do is prove that he has the disease and was exposed to the substance in a sufficient quantity to cause the disease. Although there is no direct evidence whatsoever that the specific toxic substance caused the injury and that in forty-nine percent of the cases his actions were not the cause of any injury, the defendant will have to pay damages. On the other hand, the problem of medical uncertainty often makes it impossible for the plaintiff to prove a causal relationship between the injury and the toxic substance in any manner other than by the use of this type of circumstantial evidence.

Defendants often seek to avoid liability by asserting that some third party's action constituted an intervening or superseding cause thereby breaking the causative link. Courts have taken different approaches to handling these close questions of concurrent and intervening cause. Some courts can resolve the issue as a matter of law, but, typically a jury is asked to make a decision based upon extremely complex legal and factual information.

IX. DAMAGES

Plaintiffs who seek redress for harm caused by toxic substances may obtain monetary or non-monetary relief, or a combination of

mation concerning probabilities of causal connection in a population, but the legal problem always is to determine whether a causal relationship is provable in each individual case." Levine, supra note 305, at 90 (emphasis in original).


320. For a discussion of this problem in the context of leukemia and radiation exposure, see Estep, supra note 310, at 268-98.


both, from courts or administrative agencies. Monetary relief is awarded for various kinds of injuries including: actual past or future damages to property; interference with the use or enjoyment of property; discomfort, annoyance or inconvenience; past or future medical expenses; past or future pain and suffering; past or future lost wages; past or future personal expenses; past or future business expenses; past or future lost profits; other past or future economic loss; mental anguish; loss of consortium; prejudgment interest; and attorney's fees. Depending on the legal theory pleaded, a plaintiff may be entitled to nominal damages when the actual loss cannot be substantiated.

Because monetary damages are not always possible, abatement, temporary or permanent injunctive relief, and mandamus might be sought. These remedies may be especially useful in preventing an anticipated harm. Because they are equitable in nature, a court will weigh the comparative interests of the parties, as well as the interests of the public. In order to obtain an injunction, it may be necessary in some circumstances for a party to agree to indemnification for damages if the subsequent judgment is in favor of the defendant.

The awarding and prescribing of the amount of monetary damages recoverable typically remain within the province of the finder.
of fact except awards given under some statutory systems or a court's remittitur power. Though the injured party bears the burden of proving his damages, absolute certainty is not required. The jury's determination, however, should not be based on mere speculation. A major potential difficulty in these types of cases is that a large number of people who may be exposed to various toxic substances could be aware of their exposure and the potential for future personal injury or disease, but may have no immediately diagnosable physical harm. These individuals have been termed "at risk" or "pre-cancerous." In states with a statute of limitation that commences at the time of exposure or a statute of repose that limits the time for bringing actions, these persons must file suit immediately or, in effect, waive their right to recover. The traditional basis for such a statute has been that the calculation of damages for being "at risk" is purely speculative and thus not recoverable. Recent diagnostic techniques, like those for ascertaining chromosomal damage, could create a factual basis for supporting immediate suits. Otherwise, if there is no immediately ascertainable damage, a plaintiff must seek to recover on some alternative basis. There may be recovery for mental anguish, if the defendant's conduct has been intentional or outrageous, but, generally, such recovery is only available if the mental anguish accompanies actual injury or at least the immediate potential for some actual injury.


331. "[A]ny future complications from a malady which are not probable become a risk which the injured person must bear because the law cannot achieve justice if speculation is to be used as the basis for determining damages." Davidson v. Miller, 276 Md. 54, 344 A.2d 422, 427 (1975). Courts may adhere to the notion "[t]hat there can be no recovery . . . before [the damages] occur." Midgett v. North Carolina Hwy. Comm'n, 265 N.C. 373, 144 S.E.2d 121, 124 (1965).


As with the "at risk" plaintiffs, parents may find that their children or grandchildren may suffer injury caused by their exposure to a toxic substance. Because of such mutagenic effects, there have been suits filed for preconception and prenatal injuries. Aside from the problem of measuring the dollar amount of damages, identifying defendants and establishing causation can present substantial difficulties for a plaintiff seeking to recover under these circumstances. There may also be toxic substances suits brought because of the birth of an unwanted child, the so-called "wrongful birth" or "wrongful life" actions, that raise a number of similar issues.

In other situations where there is no personal injury or property damage or where suit is brought under a theory of strict liability in tort, plaintiffs may have difficulty in recovering economic losses. Although, in appropriate circumstances, economic losses are potentially recoverable as special or compensatory damages, most states do not allow recovery for economic loss in the absence of some other type of damage. Under a theory of strict liability in tort, a plaintiff may recover for all losses incurred for physical harm to person or property. If, however, a defective product does not function properly because of mere deterioration, loss of economic opportunities resulting from the defect may not be compensable.

Statutory provisions may aid in obtaining compensation for harm caused by pollution because, in addition to creating standards of care, they may provide for damage awards. For example, North Carolina's Sedimentation Pollution Control Act of 1973 provides for double damages in civil actions where the actual loss is less than $500.00 as well as for the assessment of attorney's fees.

336. See notes 307-11 supra and accompanying text.


and investigating costs against a losing defendant.

Most plaintiffs seek to add a claim for exemplary or punitive damages whenever possible.\textsuperscript{341} The standards of proof required to support punitive damages vary from state to state, but, generally, the defendant's conduct must be either grossly negligent, willful, wanton, or intentional.\textsuperscript{342} Exemplary damages may not be available in actions based solely upon breach of contract or strict liability in tort.\textsuperscript{343} As a rule, there must be at least nominal compensatory damages before any punitive damages can be awarded.\textsuperscript{344} While there is no set rule concerning the relationship between the amount of compensatory and punitive damages, some positive correlation should exist, and courts have not been reluctant to grant remittitur where punitive damages were deemed excessive.\textsuperscript{345} One of the major difficulties for courts in awarding punitive damages is in reconciling the limited resources of most defendants with the potentially unlimited number of plaintiffs who may deserve recovery.\textsuperscript{346} Suggestions have been made that a trust fund or other type of collective system be developed to accommodate this situation.\textsuperscript{347}

\textsuperscript{341} "Ordinarily punitive damages are not recoverable . . . . In the proper case, however, punitive damages are permitted on public policy grounds." Terry v. Terry, ___ N.C. ___, ___, 273 S.E.2d 674, 680 (1981). Punitive damages may be a good deterrent because a person might reconsider his actions if he could be liable for more than just actual losses. See Wedeman v. City Chevrolet Co., 278 Md. 594, ___, 366 A.2d 7, 12 (1976) (fraud action). See also Cheek v. J.B.G. Properties, Inc., 28 Md. App. 29, 344 A.2d 180 (1975); F.B.C. Stores, Inc. v. Duncan, 214 Va. 246, 198 S.E.2d 595 (1973).


\textsuperscript{347} See Owen, supra note 323, at 1322-25. One criticism of using a tort-based system of compensation is that the plaintiff's recovery is delayed while issues of causation and fault are decided. Note, \textit{The End of A Faulted System: New Zealand Adopts a No-Fault Ap-
X. Evidentiary Issues

One of the least examined, yet most important, areas of legal issues in toxic substances litigation involves a myriad of evidentiary problems including the following: government generated information; activities or events subsequent to the entry of a toxic substance into the stream of commerce; evidence relating to elements of theories of recovery or defenses; documents, articles and tests; and expert witnesses. The complexity of these issues is compounded by the temporal relationship between the evidence and the various elements of a plaintiff's theory of recovery. Design changes, for example, may or may not be admissible depending upon when they occurred and what theory of liability is being asserted.

Government generated information may take the form of statutes, regulations, rulings, guidelines, investigations, hearings, memoranda, reports, tests and many other documents. Some of this information is available through the Freedom of Information Act. Attorneys have also attempted to use a federal agency's subpoena power to gather information helpful to their clients. Guidelines for the availability and use of this potential evidence vary from


agency to agency and state to state. Investigators of the National Transportation Safety Board and the Federal Aviation Administration are amenable to being deposed concerning their investigations of accidents but cannot be required to draw conclusions from the facts they may find.  

There are any number of events that may occur subsequent to the design, manufacture or sale of a product or injury to a plaintiff, but prior to trial or appeal, which the defendant may wish to introduce at trial. Such events include product recall, design change, repairs, production change, warning change, instructions change, industry custom change, scientific change, technological change, industry standards change, complaints or accidents, tests and experiments, and statutory or regulatory change. At the same time the plaintiff may seek to introduce the absence of any of these events. The use of strict liability in tort, with its unique elements and more liberalized rules of procedure, has led to a considerable increase in the admissibility of this type of evidence.  

As the difference among the elements of theories of recovery and defenses change and multiply, the evidence that may be potentially admissible increases proportionately. Evidence of due care and state of the art is crucial to a negligence action, but it has been argued that neither would be admissible under a strict liability in tort theory. Evidence of the efficacy or lack of efficacy of a drug may or may not be admissible depending upon the allegations of defect.  

Experiments, studies, articles, documents and expert witnesses

355. "Emphasizing the trend away from negligence-based liability toward strict liability in products cases, a growing number of judges and scholars have concluded that courts should consider time-of-trial knowledge of product-related hazards, at least, in determining the reasonableness of a manufacturer's earlier design and marketing decisions." Henderson, supra note 349, at 919.
have created substantial difficulties for the trial judge.\textsuperscript{369} Animal experiments concerning carcinogens have generally not been admitted into evidence to prove that a particular substance caused cancer to a particular person.\textsuperscript{360} Although some attorneys have been successful in introducing epidemiological and other statistical studies into evidence,\textsuperscript{361} they must, however, overcome arguments suggesting that these studies are unreliable, irrelevant, unnecessary, hearsay and not subject to cross-examination. Articles written concerning single cases of the potential effects of a toxic substance have run into the same objections.\textsuperscript{362} If this literature is not admissible, plaintiffs face extremely difficult problems establishing a prima facie case unless they can depose the authors of the articles or have them testify personally. This has led to the use of national and multi-state depositions and other attempts to use the same testimony in a large number of cases.\textsuperscript{363} In many instances the documents sought to be used are extremely old and cannot be authenticated by normal means, thus raising objections of remoteness, hearsay, relevancy, and unfair prejudice.\textsuperscript{364}

There is a trend for some attorneys to use expert witnesses who have never seen the plaintiff, such as biostatisticians, epidemiologists, or physicians, to prove a causal relationship between a toxic substance and the plaintiff's injuries.\textsuperscript{365} Their argument is that an expert can testify concerning facts or data of a type reasonably relied upon by experts in a particular field in forming opinions or inferences and can thus meet the quantum of proof for establishing causation.\textsuperscript{366} Defendants have argued that this type of testimony is inherently prejudicial because the defense cannot cross-examine the witness upon the controls, assumptions, soft variables, validity


\textsuperscript{362} Id.


and other factors inherent in the studies that form the basis of the expert opinion. If the nonexamining expert is allowed to testify, defendants argue that their testimony should be limited to only the conclusions drawn in those studies. However, such an expert witness should not be allowed to draw conclusions about the particular plaintiff because the witness had neither the ability nor the opportunity to give the plaintiff a medical examination to establish specific causation.367

XI. INSURANCE

There may be several primary and excess insurance policies that cover damages awarded against manufacturers in toxic injury cases—general comprehensive liability policies, product liability policies and various special policies. Litigation is not uncommon in interpreting both the language concerning coverage368 and specific exclusions such as pollution and war risk.369 There are also cases concerning mandatory deductibles, rights to settle, failure to settle, policy limits, stacking, punitive damages, injunctive relief, and successor corporations.370

One of the most novel and important issues raised in the context of toxic substances cases involves the allocation of responsibility for insurance coverage among the various insurance companies who may have issued many different policies over a number of years to a chemical manufacturer whose products cause progressive or cumulative injuries to claimants over a long period of time. In cases

367. Id. See also Nolan v. Dillon, 261 Md. 516, 276 A.2d 36 (1971).
368. Most general comprehensive liability policies contain a definition of “occurrence” such as “an accident, including continuous or repeated exposure to conditions, which results in bodily injury or property damage neither expected nor intended from the standpoint of the insured.” See Transamerica Ins. Co. v. Bellefonte Ins. Co., 490 F. Supp. 935, 936 (E.D. Pa. 1980). Insurance carriers for chemical companies that dump toxic waste may contend that there is no insurance coverage because the property damage caused by the toxic waste was both expected and intended.
like Borel v. Fibreboard Paper Products Corp.,\textsuperscript{371} the producers of asbestos were held jointly and severally liable for injuries sustained by a plaintiff because of prolonged exposure to the defendants' asbestos. The Fifth Circuit noted in Borel that the damage to the plaintiff was cumulative and indivisible, that the plaintiff was exposed to asbestos produced by all the defendants, and that each defendant was the cause in fact of some damage to the plaintiff.\textsuperscript{372} Because the injury was not susceptible of being divided to allocate responsibility to each defendant, the defendants were jointly and severally liable and the burden of apportionment of damages was shifted to the defendants.\textsuperscript{373}

Superimposed on this underlying liability are multiple insurance policies issued by a variety of insurance companies over a number of years. The specific language in these policies contains little guidance to solve the problem of which policy or policies provide coverage for an asbestos producer for the indivisible damages awarded injured plaintiffs. Typically the coverage terms are not materially different in the policies and the legal debate concerns when "bodily injury" was caused by an "occurrence" so as to trigger coverage.\textsuperscript{374} As may be anticipated, there has been a split in the insurance industry concerning the meaning of this language.\textsuperscript{375} Companies with coverage when a plaintiff was initially in contact with asbestos argue that the policy is triggered when asbestosis "manifests" itself.\textsuperscript{376} Companies with coverage when a plaintiff's

\textsuperscript{371} 493 F.2d 1076 (5th Cir. 1973), cert. denied, 419 U.S. 869 (1974).
\textsuperscript{372} Id. at 1094.
\textsuperscript{373} Id.

[The Insurer] will pay on behalf of the insured all sums which the insured shall be legally obligated to pay as damages because of . . . bodily injury or . . . property damage to which this policy applies caused by an occurrence. 'Bodily injury' means bodily injury, sickness or disease sustained by any person which occurs during the policy period, including death at any time resulting therefrom. 'Occurrence' means an accident, including injurious exposure to conditions which results, during the policy period in bodily injury . . . .

633 F.2d at 1216 (footnotes omitted). The court held that "bodily injury" includes tissue damage taking place upon inhalation of asbestos. 633 F.2d at 1223.

\textsuperscript{375} In Eagle-Picher Indus., Inc. v. Liberty Mut. Ins. Co., 523 F. Supp. 110, 113 (D. Mass. 1981) the court noted: "All parties to this dispute agree that the relevant policy language is clear and unambiguous. They disagree as to the meaning of the unambiguous language. . . ."

asbestosis is diagnosed argue that coverage is triggered when there was "exposure" to asbestos.\textsuperscript{377} Courts have generally agreed that these coverage problems were not contemplated by the parties and that any potential solution has flaws and anomalies.\textsuperscript{378}

There is currently a variety of solutions to these issues that vary from circuit to circuit.\textsuperscript{379} The United States Supreme Court, however, has not granted certiorari in any of these cases.\textsuperscript{380}

The Sixth Circuit has held that an insurance policy is triggered upon a plaintiff's exposure to asbestos and that, if there are multiple policies in force during the exposure period, then each policy is responsible for a pro rata share of indemnification of damages awarded in accordance with the ratio of the years of coverage during total proven exposure of the plaintiff to asbestos with the total number of years of total proven exposure of the plaintiff to asbestosis.\textsuperscript{381} This ratio can be reduced proportionately if the insurance company can satisfy the burden of proof that the plaintiff suffered no exposure to asbestos during the time its policies were in effect.\textsuperscript{382} No insurer would be liable "for more than the highest single yearly limit in a policy that existed during the period of the claimant's exposure for which judgment was obtained,"\textsuperscript{383} and a self-insured manufacturer would be responsible for a pro rata share of coverage just like the insurance carriers.\textsuperscript{384} Defense costs would be handled in the same manner.\textsuperscript{385} The dissent in the \textit{Forty-Eight Insulations} decision suggested that coverage should be triggered not by exposure, but by "discoverability" of asbestosis, that could be arbitrarily determined at ten years after initial

\begin{itemize}
\item 1230, 1238 (E.D. Mich. 1978), aff'd, 633 F.2d 1212 (6th Cir. 1980).
\item 377. \textit{Id.}
\item 378. 633 F.2d at 1226.
\item 379. The issues discussed have included the following: justiciability, conflict of laws, insurance coverage and apportionment for damages, manufacturer liability and apportionment for damages, insurance coverage and apportionment for defense, manufacturer liability and apportionment for defense, policy deductibles, policy limits, stacking, bad faith claims, and conflicts of interest.
\item 381. 633 F.2d at 1226.
\item 382. \textit{Id.} at 1225.
\item 383. \textit{Id.} at 1226.
\item 384. \textit{Id.} at 1224.
\item 385. \textit{Id.}
\end{itemize}
exposure. 386

At the opposite extreme, one federal district court has held that policy coverage is triggered at manifestation of asbestosis— "the day of actual diagnosis of the asbestos-related disease or, with respect to those in which no diagnosis was made prior to death, the date of death. 387 This interpretation of these general comprehensive insurance policies does not necessitate pro rata allocation of indemnification and defense costs.

Yet another suggested reading has been made by the United States Court of Appeals for the District of Columbia, holding that "bodily injury" means "any part of the single injurious process that asbestos-related diseases entail"; that is, exposure, damage while asbestos is in the lungs, and manifestation. 388 Defense costs would be born by the insurance carriers and allocation among insurance carriers would be determined by the "other insurance" provisions of each policy. 389 A self-insured manufacturer would not be liable for a pro rata share but would be able to collect under only one of the potentially applicable policies and only one policy's limits would apply for each injury. 390

Courts that have considered these cases have used a variety of methods of finding authority for their decisions: medical evidence, insurance policy language, insurance principles and law, analogous cases, and public policy and practical ramifications. Medical testimony has been interpreted to support the observation that each time an asbestos fiber is inhaled, there is a discreet insult or injury to the lungs. 391 Other medical evidence suggests that there is no immediate damage, but there is a time when exposure to asbestos results in a discoverable harm or a medically certain diagnosis of asbestosis. 392 Finally, there has been a suggestion that our knowl-

386. Id. at 1230-31 (Merritt, J., dissenting).
389. Id. at 1050.
390. Id. at 1050.
391. See Insurance Co. of North America v. Forty-Eight Insulations, Inc., 451 F. Supp. 1230, 1238 (E.D. Mich. 1978). Contrary arguments suggest that tissue damage takes time to occur, that only some people exposed to asbestos inhale particles into their lungs, that there may be no tissue damage in some instances, and that there may be no functional impairment of the lungs.
392. Id. Counter arguments suggest that individual determinations may be grossly expensive and that any arbitrary time frame of discoverability is unfair.
edge and lack of knowledge about the etiology and progress of asbestosis comports with a "process" view of the disease. 393

Aside from the contention that any interpretation of the disputed language must be consistent with the wording and related provisions of these policies,394 there is little guidance available in the policies themselves for a court to use. The appellants in the Forty-Eight Insulations case suggested that a literal interpretation,395 a plain meaning view,396 and the analysis actually used by insurance companies397 be used as rules of construction. The lack of specific language to support one analysis or another was also mentioned by the Sixth Circuit as an interpretive aid.398 Decisions concerning statutes of limitations,399 workers' compensation,400 health and hospital insurance,401 property insurance,402 ordinary accident cases,403 and the underlying theory of liability404 were also cited by the appellants.

Probably the most influential reference has been to the general insurance principle that any ambiguity in an insurance policy should be interpreted to favor the insured to promote indemnity and coverage.405 At the same time, there is a principle that the realistic expectations of the parties should be given great weight.406

393. See Keene Corp. v. Insurance Co. of North America, 667 F.2d 1034, 1057 (D.C. Cir. 1981) (Wald, J., concurring). Judge Wald also suggests that the "process-oriented definition not only provides a flexible formula for adjudicating the legal issues associated with asbestos-related diseases, but also sets a useful precedent for other product-exposure injuries, as of yet unknown in origin." Id. at 1058.

394. There should be no conflict with other provisions of the policy such as deductibles or limits. 633 F.2d at 1218.

395. See id. at 1223.


398. See 633 F.2d at 1222. The policies could have contained, for example, "claims made" or "discoverability" provisions.

399. Id. at 1220 n.13.

400. Id. at 1221 n.15.

401. Id. 1221 n.17.

402. Id. at 1222 n.18.

403. Id. at 1218.

404. Id. at 1219. Judge Bazelon suggested in one context that "the terms of the policies incorporate evolving tort doctrines." Keene Corp. v. Insurance Co. of North America, 667 F.2d 1034, 1044 n.20 (D.C. Cir. 1981).


406. See Keene Corp. v. Insurance Co. of North America, 667 F.2d 1034, 1041 (D.C. Cir.
Interestingly these two principles of insurance policy interpretation may favor opposite conclusions concerning identical policy language depending upon the underlying coverage situation.\textsuperscript{407}

As is the case in most of the difficult decisions concerning toxic substances, public policy issues and practical ramifications play a crucial role. High value has been placed upon fairness,\textsuperscript{408} administrative feasibility,\textsuperscript{409} certainty,\textsuperscript{410} availability of future insurance coverage,\textsuperscript{411} and the potential complexity and amount of future litigation.\textsuperscript{412} The evolving nature of the law in this area, and in toxic substances cases in general, has not been conducive, however, to promoting the public policy of certainty.

\section*{XII. Conclusion}

Whether toxic substances cases are viewed as either a subspecies of products liability or as a separate category of litigation, there is little doubt that these cases are straining the existing fabric of the common law. They raise conflicts among such fundamental values in our society that the debate over the social policies underlying these cases will reach new levels of intensity. How the common law will accommodate the issues raised by toxic substances cases will be one of the major legal developments over the next decade. In particular, there will be healthy debate concerning interpretations of standards of proof, burdens of proof, presumptions and other decision-making tools of the common law system and various methods of assimilating and digesting scientific and technological information and style. As plaintiffs find that the level of uncertainty in resolving issues which are necessary for the establishment of their case precludes recovery, they will attempt to shift burdens and presumptions to defendants. Courts, often uncomfortable with the dilemma of resolving uncertainty by all or nothing solutions,

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\textsuperscript{407} In \textit{Eagle-Picher Indus., Inc. v. Liberty Mut. Ins. Co.}, 523 F. Supp. 110 (D. Mass. 1981), the principles favored a manifestation interpretation because the manufacturer had no early insurance coverage, while in \textit{Insurance Co. of North America v. Forty-Eight Insulations, Inc.}, 633 F.2d 1212 (6th Cir. 1980), the principles supported an exposure interpretation because the manufacturer had no current insurance policies.

\textsuperscript{408} \textit{See Keene Corp. v. Insurance Co. of North America}, 667 F.2d 1034, 1058 (D.C. Cir. 1981) (Wald, J., concurring).

\textsuperscript{409} \textit{See} 633 F.2d at 1218.

\textsuperscript{410} \textit{See Keene Corp. v. Insurance Co. of North America}, 667 F.2d 1034, 1041 (D.C. Cir. 1981).

\textsuperscript{411} \textit{Id.}

\textsuperscript{412} \textit{See} 633 F.2d at 1226.
\end{flushright}
will seek alternative methodologies for handling cases.\footnote{A discussion of alternative methodologies is forthcoming from this author.}

Probably the most significant and major problems associated with toxic substances cases are institutional in nature. Is the jury capable of resolving complex scientific disputes? Is the common law system, itself, capable of resolving those disputes? Should some type of general statutory compensation system be enacted?

If common law courts fail to adapt the law and legal procedures to the recent developments illustrated by toxic substances cases, legislators may decide to provide more equitable systems of compensation for injured persons. If common law decisions carry social policies of compensating injured persons to their logical conclusions and resolve outstanding legal issues by making recovery of damages by plaintiffs a foregone conclusion, then it should not be unanticipated that legislatures will enact compensation schemes that will accomplish the same results more efficiently. If common law courts are vastly inconsistent in resolving the same issues, businesses associated with mass produced products will demand a national standard for what they perceive to be a national problem.\footnote{For a consideration of these issues in the context of product liability statutes of repose, see McGovern, \textit{supra} note 57 at 595.} The manner of resolution of these and related issues may well constitute an entire chapter in the history of political and social developments in this country.