

STATE OF THE ART EVIDENCE: FROM LOGICAL CONSTRUCT TO JUDICIAL RETRENCHMENT*

By NICOLAS P. TERRY**

I. Introduction

“State of the art” has become a touchstone for manufacturer resistance to strict products liability, and the political forces thus mobilized are well served by their linguistic choice. As a campaign slogan, state of the art panders to a consumer society which frequently buys on the basis of that very producer representation. It conjures up the picture of an industry on the brink of financial ruin, despite its suggested presence on the cutting edge of research and development.

In contrast with and outwardly detached from such political concerns, conventional wisdom has long suggested that the admissibility of state of the art evidence in a products liability case should be a relatively straightforward issue. Subject to a few case-by-case exceptions premised on overly prejudicial evidence, the admissibility issue should follow logically from a jurisdiction’s substantive products liability doctrine. However, several factors have conspired to make such a structure elusive. First, there is still considerable confusion as to exactly what state of the art means. Second, the recent examination of state of the art issues by state supreme courts has coincided with a new wave of judicial retrenchment from strict liability. Third, spurred by cyclical supposed insurance crises, state and federal legislatures have shown considerable interest in tampering with all aspects of the common law products liability system, including state of the art issues.

II. Allocation Models and Operational Rules

Products liability regimes which eschew either causation (absolute)¹ or producer conduct (negligence)² liability models signify their acceptance of a strict

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** I am grateful to Jane Eilermann and John Pawloski for their valuable research assistance.
1. See e.g., *Thibault v. Sears, Roebuck & Co.*, 118 N.H. 802, 395 A.2d 843, 845-46 (1978) (“Unlike workmen’s compensation and no-fault automobile insurance, strict liability is not a no-fault system of compensation”). Cf. *Kirkland v. General Motors Corporation*, 521 P.2d 1353, 1363 (Okla. 1974).

This conceptual underpinning also serves to distinguish common law products liability from governmental command-control safety regulations. See e.g., *Chrysler Corporation v. Department of Transportation*, 472 F.2d 659, 671-73 (6th Cir. 1972) (NHTSA is empowered to issue standards which will require development of safer technology).
2. Cf. *Friend v. General Motors Corp.*, 118 Ga. App. 763, 165 S.E.2d 734 (1968) (Pannell, J., dissenting), reversed by Ga. Code Ann. §§ 105-106 (1968). See also *Casrell v. Altec Industries, Inc.*, 335 So.2d 128 (Ala. 1976) (negligence as a matter of law).

liability allocation model by tying risk redistribution ("compensation") to product "defectiveness."³ On a case-by-case, or operational level that defect inquiry involves three aspects: identification, contextualization and evaluation. Typically, the plaintiff has the burden of identifying what went wrong with the product (its "factual" defect⁴), that the defect arose in the context of some intended or foreseeable use of the product,⁵ and that the product was "legally defective."⁶ It is this last, evaluative stage which has engendered the most discussion and the largest number of jurisdictional variations.⁷

The "consumer expectations" test for legal defectiveness,⁸ which first saw duty as the Restatement test,⁹ has had limited appeal as an operational rule for complex design defect cases.¹⁰ Primarily, this is because "the consumer simply does not have adequate information to know what to expect."¹¹ Consistent with that observation, the generally disparaged consumer expectations test continues to see some limited utilization in manufacturing defect

3. See e.g., *Caterpillar Tractor Co. v. Beck*, 593 P.2d 871, 877 (Alaska 1979); *O'Brien v. Muskin Corporation*, 94 N.J. 169, 463 A.2d 298, 303 (1982).
4. See e.g., *Heaton v. Ford Motor Co.*, 248 Or. 467, 435 P.2d 806 (1967); *Williams v. Smart Chevrolet Co.*, 292 Ark. 376, 730 S.W.2d 479 (1987); *Jones v. General Motors Corp.*, 557 So.2d 1259 (Ala. 1990) (negligence action); *McLaughlin v. Michelin Tire Corp.*, 778 P.2d 59, 64 (Wyo. 1989) ("defect in fact"). This issue frequently, and understandably, is intermingled with other, essentially factual, issues such as whether the defect existed at the time the product left the hands of the producer, and the cause-in-fact relationship between the product and the plaintiff's injury. See e.g., *Hebecker v. Copperloy Corp.*, 893 F.2d 49, 54 (3d Cir. 1990). Cf. *Blueflame Gas, Inc. v. Van Hoose*, 679 P.2d 579 (Colo. 1984) (consumer's burden on issue of timing of defect limited to proving existence of defect at time of purchase or first use).
5. See e.g., *McLaughlin v. Michelin Tire Corp.*, 778 P.2d 59, 82 (Wyo. 1989) (*Per Urbigkit, J.*, dissenting and concurring, "It is axiomatically necessary to address intended use in relation to defect"); *O'Brien v. Muskin Corporation*, 94 N.J. 169, 463 A.2d 298, 303 (1983). A jurisdiction's exact choice of use-limiting language will have allocational effects because some uses which are not "intended" by the manufacturer may still be characterized as "foreseeable." Similar terminology reoccurs at the fine-tuning affirmative defence level in determining whether certain consumer uses involve colourable "fault."
6. I describe and distinguish "Factual Defect" and "Legal Defectiveness" at Terry, *Stricter Products Liability*, 52 Mo. L.Rev. 1, 21-24 (1987).
7. See generally Twerski, *From Risk-Utility to Consumer Expectations: Enhancing the Rose of Judicial Screening in Product Liability Litigation*, 11 Hofstra L. Rev. 861 (1983).
8. See, e.g., *De Battista v. Argonaut-Southwest Ins. Co.*, 403 So.2d 26, 30 (La. 1981) ("Unreasonably dangerous" means simply that the article which injured the plaintiff was dangerous to an extent beyond that which would be contemplated by an ordinary consumer").
9. Restatement (Second) of Torts § 402A, comment g.
10. See the forceful critiques in *Dart v. Wiebe Mfg., Inc.*, 147 Ariz. 242, 709 P.2d 876, 878-79 (1985), and *Camacho v. Honda Motor Co., Ltd.*, 741 P.2d 1240, 1245-46 (Colo. 1987), *cert.dismd.*, 485 U.S. 101, 108 S.Ct. 1067, 99 L.Ed.2d 229 (1988). See generally *Nichols v. Union Underwear Co.*, 602 S.W.2d 429 (Ky. 1980). Cf. *Riordan v. International Armament Corp.*, 132 Ill.App.3d 642, 87 Ill.Dec. 765, 477 N.E.2d 1293 (1985); *Rahmig v. Mosley Machinery Co.*, 226 Neb. 423, 412 N.W.2d 56, 69-70 (1987); *Castrignano v. E.R. Squibb & Sons, Inc.*, 546 A.2d 775 (R.I. 1988).
11. *O'Brien v. Muskin Corporation*, 94 N.J. 169, 463 A.2d 298, 308 (1982) (*per Clifford J.*, concurring).

cases¹² and non-complex design cases.¹³ However, jurisdictions which otherwise persist with the consumer expectations formulation treat it, not as the defectiveness ultimate issue, but rather as a thin veneer disguising a risk-utility analysis.¹⁴ That risk-utility test, also described as the "prudent manufacturer"¹⁵ or "hindsight"¹⁶ test, dominates the modern law governing legal defectiveness.¹⁷ A few states have elected to retain the manipulable Restatement-based "defective condition unreasonably dangerous" approach as their ultimate issue.¹⁸ However, the only theoretically respectable competition for the unadorned risk-utility test is the composite, or dual,

12. Where *consumer* expectations may be accurately approximated by the *manufacturer's* expectations. See *Dart v. Wiebe Mfg., Inc.*, 147 Ariz. 242, 709 P.2d 876, 878 (1985).
13. See, e.g., *Dart v. Wiebe Mfg., Inc.*, 147 Ariz. 242, 709 P.2d 876, 882 (1985). Note further that this role in non-complex cases probably explains the continued presence of a consumer expectations component in the dual or composite test for design defect. See text accompanying note 19, *infra*. Cf. *In re Hawaii Federal Asbestos Cases*, 665 F.Supp. 1454, 1456 (D. Hawaii 1986) (viewing the risk-utility prong as the "fall back" position).
14. See e.g., *Nerud v. Haybuster Mfg., Inc.*, 215 Neb. 604, 340 N.W.2d 369, 375-76 (1983), *rev'd in Rahmig v. Mosley Machinery Co.*, 226 Neb. 423, 412 N.W.2d 56, 69-70 (1987); *Seattle-First National Bank v. Tabert*, 86 Wash.2d 145, 542 P.2d 774 (1975) (using risk/benefit to determine the reasonable expectations of the consumer); *Falk v. Keene Corporation*, 113 Wash.2d 645, 782 P.2d 974 (1989); *Sumnitch v. Toyota Motor Sales, U.S.A., Inc.*, 121 Wis.2d 338, 360 N.W.2d 2,15-19 (1984).

It is arguable that some jurisdictions continue to express an interest in the consumer expectations test because it may be massaged to produce a higher level of redistribution. See e.g., *Kisor v. Johns-Manville Corp.*, 783 F.2d 1337 (9th Cir. 1986) (applying law of Washington); *Toliver v. General Motors Corp.*, 482 So.2d 213, 218 (Miss. 1985); *Nesselrode v. Executive Beechcraft, Inc.*, 707 S.W.2d 371 (Mo. 1986). See also *Kams v. Emerson Electric Co.*, 817 F.2d 1452,1459 (10th Cir. 1987) (supplying dubious content to consumer expectations by permitting expert to testify as to that ultimate issue).

15. See e.g., *Phillips v. Kimwood Machine Co.*, 269 Or. 485, 525 P.2d 1033,1036 (1974); *Morningstar v. Black and Decker Manufacturing Co.*, 253 S.E.2d 666, 683 (W.Va. 1979).
16. See e.g., *Dart v. Wiebe Mfg., Inc.*, 147 Ariz. 242, 709 P.2d 876, 881(1985).
17. See e.g., *Haas v. United Technologies Corp.*, 450 A.2d 1173,1176 (Del. 1982); *Radiation Technology, Inc. v. Ware Construction Co.*, 445 So.2d 329, 331 (Fla. 1983); *Thibault v. Sears, Roebuck & Co.*, 118 N.H. 802, 395 A.2d 843, 847-48 (1978); *Cepeda v. Cumberland Engineering Co.*, 76 N.J. 152, 386 A.2d 816, 825-27 (1978); *O'Brien v. Muskin Corporation*, 94 N.J. 169, 463 A.2d 298, 304 (1983); *Voss v. Black & Decker Mfg. Co.*, 59 N.Y.2d 102, 450 N.E.2d 204, 208-209, 463 N.Y.S.2d 398 (1983); *Wilson v. Piper Aircraft Corp.*, 282 Or. 61, 577 P.2d 1322 (1978); *Turner v. General Motors Corp.*, 584 S.W.2d 844, 849 (Tex. 1979).

This approach is neither exclusively a common law one, nor is it perceived necessarily as allocationally biased against producers. For example, some otherwise reformist statutes use the risk-utility approach. See e.g., La. Rev. Stat. Ann. § 9:2800.56 (West Supp. 1989). See also *Falk v. Keene Corporation*, 113 Wash.2d 645, 782 P.2d 974 (1989). Indeed, it was the *defendant* in *Caterpillar Tractor Co. v. Beck*, 593 P.2d 871 (Alaska 1979), who requested the application of a risk-utility analysis, 593 P.2d at 877, only to see defeat snatched from the jaws of victory when the court reversed the burden of proof on that very issue, 593 P.2d at 885-86.

18. See e.g., *Nesselrode v. Executive Beechcraft, Inc.*, 707 S.W.2d 371 (Mo. 1986).

approach, under which the plaintiff may choose consumer expectations or risk-utility.¹⁹

Having identified the risk (factual defect) and contextualized the defect analysis (foreseeable use), the evaluative stage determines whether the product is legally defective. A product is legally defective if:

- (1) Its dangerousness as designed or manufactured outweighs its utility when contrasted with alternate feasible designs or manufacture, or
- (2) Notwithstanding the product's utility and a lack of any alternate design or manufacture, the product's dangerousness is not adequately warned against, or
- (3) Notwithstanding the lack of any alternate design or manufacture its dangerousness, although adequately warned against, outweighs its utility.²⁰

As follows from above,²¹ a products liability regime aspiring to a quantitative risk redistribution somewhere between absolute and negligence

19. See e.g., *Knitz v. Minster Machine Co.*, 69 Ohio St.2d 460, 23 Ohio Op.3d 403, 432 N.E.2d 814, 818 (1982), cert. den. 459 U.S. 857 (1982):

[A] product design is in a defective condition to the user or consumer if (1) it is more dangerous than an ordinary consumer would expect when used in an intended or reasonably foreseeable manner, or (2) if the benefits of the challenged design do not outweigh the risk inherent in such design. Factors relevant to the evaluation of the defectiveness of the product design are the likelihood that the product design will cause injury, the gravity of the danger posed, and the mechanical and economic feasibility of an improved design.

See also *Dart v. Wiebe Mfg., Inc.*, 147 Ariz. 242, 709 P.2d 876 (1985).

A small number of jurisdictions utilize this dual approach, but with a burden shift on the risk/benefit element. See *Barker v. Lull Engineering Co.*, 20 Cal.3d 413, 143 Cal.Rptr. 225, 239, 573 P.2d 443, 457-58 (1978); *Caterpillar Tractor Co. v. Beck*, 593 P.2d 871 (Alaska 1979); *In re Hawaii Federal Asbestos Cases*, 665 F.Supp. 1454 (D. Hawaii 1986).

20. See generally *Thibault v. Sears, Roebuck & Co.*, 118 N.H. 802, 395 A.2d 843, 846 (1978); *Freund v. Cellofilm Properties, Inc.*, 87 N.J. 229, 432 A.2d 925, 930-32 (1981); *Beshada v. Johns-Manville Products Corp.*, 90 N.J. 191, 447 A.2d 539, 544-45 (1982); *O'Brien v. Muskin Corporation*, 94 N.J. 169, 463 A.2d 298, 306 (1983); *Castrignano v. E.R. Squibb & Sons, Inc.*, 546 A.2d 775, 781 (R.I. 1988).

Of these propositions, clearly it is the third which is the most controversial because it contemplates a product which passes the risk-utility test (in the sense of no feasible alternative) and incorporates adequate warnings, but which fails the risk-utility test in the sense that a reasonable manufacturer would conclude that the product should not be produced at all. Indeed, Restatement (Second) of Torts § 402A comment *i* states:

Many products cannot possibly be made entirely safe for all consumption, and any food or drug necessarily involves some risk or harm, if only from over-consumption The article sold must be dangerous to an extent beyond that which would be contemplated by the ordinary consumer who purchases it, with the ordinary knowledge common to the community as to its characteristics. . . . Good tobacco is not unreasonably dangerous merely because the effects of smoking may be harmful; but tobacco containing something like marijuana may be unreasonably dangerous. Good butter is not unreasonably dangerous merely because, if such be the case, it deposits cholesterol in the arteries and leads to heart attacks; but bad butter, contaminated with poisonous fish oil, is unreasonably dangerous.

A frontal attack has been mounted on the Restatement position in the cigarette cases. See, e.g., *Dewey v. R. J. Reynolds Tobacco Co.*, 121 N.J. 69, 577 A.2d 1239 (1990) (rejecting "good tobacco" argument). See also *O'Brien, supra*, 463 A.2d at 310-15 (per Schreiber, J., concurring and dissenting).

21. See text accompanying footnote 2, *supra*.

liability models, traditionally is described in terms of a strict liability allocation model.²² The agreed allocation is realized through the adoption of operational rules (or doctrine) which, in the aggregate, will achieve a quantitative risk redistribution consistent with the allocation model.²³ The relationship between the allocation model and its operational rules is dynamic and informational. This is because the strict liability allocation model is relatively unrefined. Thus, the operational rules serve to inform of jurisdictional variations concerning the exact amount of redistribution to be achieved.

Adoption of the risk-utility test for legal defectiveness as the primary operational rule is consistent with a strict liability allocation model. Primarily, it serves to distance strict from absolute liability. However, it also tends to confuse strict with negligence products liability.²⁴ It may be the case that "[a]lmost since the [strict liability] rule's inception, courts have tended to borrow common law concepts of negligence in determining whether a manufactured product, as designed, is unreasonably dangerous."²⁵ However, it is inaccurate to depict the strict liability risk-utility analysis as "the reasonable care balancing test."²⁶ Courts consistently have distinguished strict liability risk-utility analysis from its negligence manifestation. Conceptually, that distinction is characterized by the statement that strict liability judges the product not the producer;²⁷ *i.e.*, it is not a negligence-style judgment of conduct.²⁸ Indeed, risk-utility analysis is particularly appropriate as a strict liability operational rule because of its intrinsically impersonal characteristics.

22. I take the view that in only strict liability – not absolute liability – it is possible for a plaintiff to fail to make her case, even though she has shown factual defect, foreseeable use and cause in fact. See note 1, *supra*. A pithier summary would be that in strict liability systems "unsafe" products are not always defective. Unfortunately, some apparently strict liability systems use a "safe"-"unsafe" dichotomy as their defectiveness determinant, thus rendering the terminology ambiguous.
An alternative distinction which I do not invoke turns on non-availability in absolute liability systems of certain affirmative defences (*e.g.*, contributory fault) traditionally available in fault and strict liability regimes. See, *e.g.*, *Crislip v. TCH Liquidating Co.*, 52 Ohio St. 3d 251, 556 N.E.2d 1177, 1183 (1990) (specifically noting the defence of comparative fault as the only distinction between strict and negligence warning cases); *Higgins v. E.I. Du Pont de Nemours & Co. Inc.*, 671 F.Supp. 1055, 1060 (D. Md. 1987) (strict liability characterized by immunity from negligence-based affirmative defences).
23. Take, for example, the evolution of design defect products doctrine in California. *Greenman v. Yuba Power Products, Inc.*, 59 Cal.2d 57, 27 Cal.Rptr. 697, 377 P.2d 897 (1963), introduced, for all the traditional meta-legal reasons, a strict liability allocation model. *Greenman*, however, failed to provide any operational rules. Operational rules subsequently were suggested by *Cronin v. J.B.E. Olson Corp.*, 8 Cal.3d 121, 104 Cal.Rptr. 433, 501 P.2d 1153 (1972), but were inconsistent with the allocational model because they redistributed too many product-related risks. As a result the operational rules were re-formulated in *Barker v. Lull Engineering Co.*, 20 Cal.3d 413, 143 Cal.Rptr. 225, 239, 573 P.2d 443, 457-58 (1978). See note 19, *supra*.
24. Primarily because risk-utility analysis emerged as a major negligence liability determinant following *United States v. Carroll Towing Co.*, 159 F.2d 169 (2d Cir. 1947) (*per* Learned Hand, J.).
25. *Kallio v. Ford Motor Company*, 407 N.W.2d 92, 95 (Minn. 1987).
26. *Kallio v. Ford Motor Company*, 407 N.W.2d 92, 95 (Minn. 1987). See also *Albertson v. Volkswagenwerk A.G.*, 230 Kan. 368, 634 P.2d 1127, 1131 (Kan. 1981).
27. See, *e.g.*, *Dart v. Wiebe Mfg., Inc.*, 147 Ariz. 242, 709 P.2d 876, 880 (1985). See also *Blevins v. Cushman Motors*, 551 S.W.2d 602, 608 (Mo. 1977); *Roach v. Kononen*, 269 Or. 457, 525 P.2d 125, 129 (1974).
28. The conduct-oriented/product-oriented dichotomy is a convenient shorthand.

Importantly, an allocation model may be made "strict" other than by making the basic liability determinant more objective. It is axiomatic that negligence liability hinges on the unreasonable running of a foreseeable risk.²⁹ Thus, a negligence allocation model attracts operational rules phrased in terms of both reasonable conduct *and* risk identification. Modification of *either* aspect of that duopoly may result in a shift from a fault-based to a strict liability allocation model.³⁰ In the case of strict products liability, that shift regarding producer foresight has been achieved through a conclusive presumption that the manufacturer knew of the risks associated with her product (imputed foresight).³¹ It is crucial to an appreciation of modern *design defect* doctrine³² to understand that this presumption is *conclusive*, extending beyond the level of an evidentiary presumption. Whether the defendant knew or could have known of the risks is irrelevant.³³

III. State of the Art Terminology

As a frequently encountered, consumer-friendly term state of the art projects a beguiling simplicity. However, it is a schizophrenic concept, the logic of which has faltered in attempting to be all things to all people.³⁴ State of the

29. See, e.g., *Blyth v. Birmingham Water Works Co.*, 11 Exch. 781, 156 Eng. Rep. 1047, 1049, [1843-60] All E.R. Rep. 478 (1856); Restatement (Second) of Torts § 284 (1965). The requirement of actual or constructive foresight of risk is an explicit component of negligence-based products liability. See Restatement (Second) of Torts § 395 (1965).
30. Cf. *Beshada*, *supra*, 447 A.2d at 544, apparently, and erroneously, implying that imputing foresight is a different way to state a shift to a conduct-oriented standard. A similar implication is to be found in the similarly strict(er) approach in *Kisor v. Johns-Manville Corp.*, 783 F.2d 1337 (9th Cir. 1986) (applying law of Washington).
31. See, e.g., *Phillips v. Kimwood Machine Co.*, 269 Or. 485, 525 P.2d 1033, 1036-37 (1974); *Roach v. Kononen*, 269 Or. 457, 525 P.2d 125, 129 (1974); *Nesselrode v. Executive Beechcraft, Inc.*, 707 S.W.2d 371, 375 n.4 (Mo. 1986); *Cepeda v. Cumberland Engineering Co.*, 76 N.J. 152, 386 A.2d 816, 821 (1978). For a civilian phrasing of this concept, see also *Myers v. State Farm Mutual Automobile Insurance Co.*, 493 So.2d 1170, 1171 n.6 (La. 1986). See also Wade, *On the Nature of Strict Tort Liability for Products*, 44 Miss. L.J. 825, 825-26 (1973).
32. Much of this article will be concerned with whether this statement also applies to warning cases. See text accompanying note 73 *et seq.*, *infra*.
33. See e.g., *Beshada v. Johns-Manville Products Corp.*, 90 N.J. 191, 447 A.2d 539, 544 n.3 (1982).
34. See e.g., *Suter v. San Angelo Foundry & Mach. Co.*, 81 N.J. 150, 406 A.2d 140, 151 (1979) ("[T]he state of the art refers not only to the common practice and standards in the industry but also to other design alternatives within practical and technological limits at the time of distribution.") See also *Murphy v. Owens-Illinois, Inc.*, 779 F.2d 340, 342 (6th Cir. 1985) (applying the law of Tennessee) ("In a consideration of the 'state of the art,' available scientific and technological knowledge, customary practice and industry standards are all relevant.")
Cf. Lenhardt v. Ford Motor Co., 102 Wash. 2d 208, 683 P.2d 1097 (1984):
 [W]e must distinguish between two types of evidence that may be introduced in a product liability action, state of the art evidence and evidence of industry custom. These concepts are not always synonymous and, as such, involve different types of evidence. The former relates to the technological feasibility of alternative safer designs in existence at the time the product was originally manufactured while the latter refers to a practice or custom regarding a particular design or manufacturing technique utilized by most manufacturers in that industry.
 (citation omitted).

art is defined by two variables: the substance, or "art" referred to; and the point in time, or "state," at which the art is measured.³⁵ The former includes the practices of a particular industry, available technology and the knowledge and discoverability of product-related risks. Of course, the latter, the timing element, is infinitely variable. In actuality, however, products liability is concerned with the time of marketing and the time of trial. As a composite, therefore, the state of art appellation refers to several time-slice contexts for producer conduct, expertise or cognizance.³⁶ The dominant issues in the admissibility of state of the art evidence are: first, the practice of an industry or its members at the time of marketing (*industry practice*); the available technology at the time of marketing (*industry capability*); and knowledge and discoverability of product-related risks at the time of trial (*industry unknowability*).

Unquestionably, whatever the precise allocation model or operational rule a jurisdiction adopts, producers and consumers are going to have contrasting views as to the admissibility of evidence concerning industry conduct, expertise or cognizance. However, from a structural perspective, state of the art poses three additional questions. First, are the state of the art rules which operate under the strict liability allocation model mere logically derived sub-rules operating to enforce the primary operational rules, or do they exist as independent operational rules? Second, are state of the art rules allocationaly neutral, or do they function as a fine-tuning technique to reflect how "strict" a particular jurisdiction's products liability doctrine will be? Third, if the state of the art rules have an independent operational role, are they consistent with the allocation model or the primary operational rule?

IV. State of the Art as an Evidentiary Rule

For the majority of jurisdictions the state of the art issue has not been reduced to a blanket rule to admit or exclude all such evidence.³⁷ Indeed, any such proscription would fail to do justice to the complexity of the state of art concept. The key factor distinguishing the ways the various state of the art issues are resolved is the type of defect allegation involved. Indeed, there is significant potential for error when a state of the art admissibility question is answered by reference to decisional law dealing with a species of evidence or allegation of defect of a different type from that in the case at bar.³⁸ In the following sections admissibility of state of the art evidence

35. A third variable concerns the party adducing the evidence. Most of what follows concerns defensive evidence. Plaintiffs' utilization of *offensive* state of the art evidence is considered at note 44, *infra*.

36. See e.g., *Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156, 1164 (4th Cir. 1986) (applying the law of Maryland).

37. Cf. *Elmore v. Owens-Illinois, Inc.*, 673 S.W.2d 434, 438 (Mo. 1984).

38. See e.g., *Kisor v. Johns-Manville Corp.*, 783 F.2d 1337 (9th Cir. 1986) (applying the law of Washington) (holding that defendant's proffered evidence of industry *unknowability* in a *warning* case was inadmissible on the basis of *Lenhardt v. Ford Motor Co.*, 102 Wash.2d 208, 683 P.2d 1097 (1984), holding that evidence of industry *custom* was not admissible in *design* defect case). See also *Santiago v. Johnson Machine and Press Corp.*, 834 F.2d 84, 85 (3d Cir. 1987) (arguably excluding industry *capability* evidence on authority of state case excluding evidence of industry *practice*).

is examined in the context of the most problematic of familiar products liability allegations: design defect and failure to warn.³⁹

A. Design Defect

Whatever a jurisdiction's doctrinal approach to the theory of defectiveness for design cases, it is clear that "[c]onsistency with industry-wide practices has never been conclusive in strict liability or negligence actions."⁴⁰ Such a conclusion inevitably flows from the famous opinion of Judge Learned Hand in *The T.J. Hooper*.⁴¹ Notwithstanding, such evidence has always been relevant to a products liability action brought under a negligence theory.⁴² However, at the very least it seems true that "[i]n cases predicated upon strict liability, evidence of industry standards has even less probative value."⁴³ Indeed any attempt to introduce defensive evidence⁴⁴ of industry custom is

39. Manufacturing defect, or quality control, litigation is not examined. In such cases the question of legal defectiveness is answered conclusively by reference to the state of the art evidenced by the producer's own demonstrated ability to manufacture the product absent the defect. To put it another way, state of the art evidence as discussed in this article is irrelevant in manufacturing defect cases. See *Reed v. Tiffin Motor Homes, Inc.*, 697 F.2d 1192 (4th Cir. 1982) ("In manufacturing defect cases courts have excluded evidence of the state of the art because the plaintiff need only show the product does not conform to the manufacturer's specifications to prove it is defective"). See also *Sturm, Ruger & Co., v. Day*, 594 P.2d 38, 44 (Alaska 1979).
40. *Caterpillar Tractor Co. v. Beck*, 593 P.2d 871, 881 n.30 (Alaska 1979).
41. 60 F.2d 737, 740 (2d Cir. 1932) ("[Industry] never may set its own tests, however persuasive be its usages").
42. See e.g., *Rossell v. Volkswagen of America*, 147 Ariz. 160, 709 P.2d 517, 523-24 (1985); *Garst v. General Motors Corp.*, 207 Kan. 2, 484 P.2d 47, 61 (1971).
43. *Sturm, Ruger & Co., Inc. v. Day*, 594 P.2d 38, 45 (Alaska 1979). See also *Carter v. Massey-Ferguson, Inc.*, 716 F.2d 344, 347-49 (5th Cir. 1983) (applying the law of Texas).
44. The plaintiff is *not required* to introduce offensive industry custom evidence. See *Horn v. General Motors Corp.*, 17 Cal.3d 359, 131 Cal.Rptr. 78, 551 P.2d 398, 402 (1976). Many plaintiffs, however, *choose* to introduce such evidence. See, e.g., *Bly v. Otis Elevator Co.*, 713 F.2d 1040, 1043 (4th Cir. 1983) (applying the law of Virginia). Of course, if the plaintiff *does* introduce evidence of industry custom that will open the door for the defendant. See, e.g., *Walker v. Trico Mfg., Co.*, 487 F.2d 595, 600 (7th Cir. 1973), *cert. den.* 94 S.Ct. 1564 (1974); *Kisor v. Johns-Manville Corp.*, 783 F.2d 1337, 1340 n.7 (9th Cir. 1986) (applying the Law of Washington). See also note 54, *infra*.

The fact that a certain type of evidence is admissible does not dispose of the admissibility in a particular case. Consider, for example, plaintiff evidence of *offensive* custom, which may be unfairly prejudicial. See, e.g., *Johnson v. Armstrong Cork Co.*, 645 F. Supp. 764, 767-68 (W.D. La. 1986):

The danger of unfair prejudice is readily apparent. The state-of-the-art evidence which plaintiffs seek to introduce dates back to the 1930s and 40s. This evidence is highly suggestive of the fact that manufacturers knew, or should have known, that friable asbestos products were likely to cause substantial lung injury to those who came in contact with the product. For historical accuracy, the plaintiffs might as well go all the way back to ancient civilization. "The adverse biological effects of asbestos (the word comes from a Greek adjective meaning "inextinguishable") were observed as early as the First Century by the Greek geographer Strabo and by the Roman naturalist Pliny the Elder, both of whom mentioned in passing a sickness of the lungs in slaves whose task was to weave asbestos into cloth." T. Brodeur, *Annals of Law*, "The Asbestos Industry on Trial," *The New Yorker*, at 57 (June 10, 1985).

Thus, for a long period of time (one might even say, "forever," if Strabo and Pliny are to be believed), manufacturers of asbestos knew of the danger to which plaintiffs were exposed. Viewed in this light, plaintiff's exposure to the dangers of asbestos appear needless and senseless; the manufacturer's failure to take steps to minimize these dangers appears callous.

untenable. The following reasoning is compelling:

Introducing evidence of industry and/or manufacturer's customs and practices shifts the jury's focus from what the consumer expects to what the manufacturers are doing. By focusing the jury's attention on the custom of the industry, implicitly the jury's attention is focused on the defendant's design choice and the reasonableness of that choice. In effect, such evidence incorporates negligence concepts and the seller oriented approach we [have] rejected. . .⁴⁵

In a jurisdiction in which risk-utility is the operational rule for legal defectiveness, the defect issue will depend upon whether the plaintiff has introduced sufficient evidence of the existence of an alternative technologically feasible design.⁴⁶ Indeed, the core issues posed by today's accepted definitions of "defective unreasonably dangerous" simply cannot be addressed absent such evidence.⁴⁷ Admitting evidence of industry capability involves neither the admissibility of industry custom nor the abrogation of that basic tenet of products doctrine: to judge the product, not the manu-

45. *Lenhardt v. Ford Motor Co.*, 102 Wash.2d 208, 683 P.2d 1097,1098 (1984).
 46. *See, e.g., Knitz v. Minster Machine Co.*, 69 Ohio St.2d 460, 23 Ohio Op.3d 403, 432 N.E.2d 814, 818 (1982), *cert. den.* 459 U.S. 857 (1982), text accompanying note 19, *supra*; *Vanskike v. ACF Industries, Inc.*, 665 F.2d 188, 195 (8th Cir. 1981) (applying the law of Missouri) *cert. den.* 455 U.S. 1000, 71 L.Ed.2d 867, 102 S.Ct. 1632 (1982); *Rix v. General Motors Corp.*, 222 Mont. 318, 723 P.2d 195, 201 (1986); *Erickson v. Monarch Industries, Inc.*, 216 Neb. 875, 347 N.W.2d 99, 110 (1984); *Johnson v. Clark Equip. Co.*, 274 Or. 463, 547 P.2d 132,136-37 n.1 (1976); *Voss v. Black & Decker Mfg., Co.*, 59 N.Y.2d 102, 450 N.E.2d 204, 209-10, 463 N.Y.S.2d 398 (1983); *Wilson v. Piper Aircraft Corp.*, 282 Or. 61, 577 P.2d 1322 (1978), *reh'g denied*, 282 Or. 411, 579 P.2d 1287 (1978); *Nerud v. Haybuster Mfg., Inc.*, 215 Neb. 604, 340 N.W.2d 369 (1983); *Boatland of Houston, Inc. v. Bailey*, 609 S.W.2d 743, 746 (Tex. 1980); *Church v. Wesson*, 385 S.E.2d 393, 396 (W.Va. 1989). *See also Omnetics, Inc. v. Radiant Technology Corp.*, 440 N.W.2d 177,181 (Minn. Ct. App. 1989) (confirming technologically feasible alternative to be at the root of the legal defectiveness issue and noting counsel's freedom to argue it, but upholding trial court's refusal to give elaborate jury instruction defining and describing the concept).

In a few jurisdictions the defectiveness issue will depend upon whether the defendant has introduced sufficient evidence of infeasibility. *See Barker v. Lull Engineering Co.*, 20 Cal.3d 413, 143 Cal.Rptr. 225, 239, 573 P.2d 443, 457-58 (1978); *Caterpillar Tractor Co. v. Beck*, 593 P.2d 871 (Alaska 1979).

47. *See, e.g., Reed v. Tiffin Motor Homes, Inc.*, 697 F.2d 1192 (4th Cir. 1982) (applying the law of South Carolina); *Norton v. Snapper Power Equip., Div. of Fuqua Industries, Inc.*, 806 F.2d 1545,1549 (11th Cir. 1987) (applying the Law of Florida); *McLaughlin v. Sikorsky Aircraft*, 148 Cal.App.3d 203,195 Cal.Rptr. 764, 767 (1983); *Kerns v. Engelke*, 76 Ill.2d 154, 28 Ill.Dec. 500, 390 N.E.2d 859, 865 (1979); *Falk v. Keene Corporation*, 113 Wash.2d 645, 782 P.2d 974 (1989). *Cf. Couch v. Mine Safety Appliances Co.*, 728 P.2d 585 (Wash. 1986); *French v. Grove Mfg., Co.*, 656 F.2d 295, 298 (8th Cir. 1981) (applying the Law of Arkansas, feasible alternative is not a necessary ingredient of plaintiff's case); *Sumnicht v. Toyota Motor Sales, U.S.A., Inc.*, 121 Wis.2d 338, 360 N.W.2d 2,16-17 (1984). *See also Johnson v. Raybestos-Manhattan, Inc.*, 69 Hawaii 287, 740 P.2d 548, 549 n.3 (1987) (leaving question open).

I admit of two exceptions to this assertion that evidence of industry capability is the key to the design defect case: the first, and not really an exception, is where the product is not technologically complex; the second is where plaintiff's factual defect allegation is that the product is too dangerous notwithstanding its utility. On this latter type of case, see *Kallio v. Ford Motor Co.*, 407 N.W.2d 92, 97 n.8 (Minn. 1987). Note that *Kallio* itself recognized that, as a practical matter, successful plaintiffs introduce evidence of alternative safer designs. *See* 407 N.W.2d at 96 n.6.

facturer.⁴⁸ In any "feasibility" jurisdiction,⁴⁹ there is no viable argument against the admissibility of evidence of industry capability at the time of marketing; it is the key concept which *must* be addressed.

Imputed foresight, the second major operational rule derived from a strict liability allocation model is well established in design defect litigation. As a result of imputing knowledge of a product's dangerous propensity to the manufacturer,⁵⁰ "[t]he quality of the product may be measured not only by the information available to the manufacturer at the time of design, but also by the information available to the trier of fact at the time of the trial."⁵¹ That is, evidence *at the time of trial* of the product's dangerousness is imputed to the manufacturer for the purpose of determining through a risk-utility analysis whether a different design - given industry capability *at the time of manufacture* - should have been utilized.⁵² Because knowledge of the product-related risk is tested at the time of trial, it follows that, in a design defect case, evidence of the unknowability of a product-related risk *at the time of manufacture* (industry unknowability) is irrelevant.⁵³

Thus, in design cases the state of the art answers which are logically derived from the two dominant operational rules (risk-utility and imputed foresight) are that defensive evidence of either industry *practice*⁵⁴ or *unknowability* should be ruled inadmissible, whereas evidence of industry *capability* at the time of marketing is necessarily admissible. The more difficult state of the art questions remaining are those which are not so obviously answered by reference to the operational rules. First, may evidence of industry *practice* be introduced, ostensibly to demonstrate lack of feasibility? Second, does the general rule against the admissibility of explicitly custom-based evidence apply with equal force to evidence of either an industry's self-regulatory standards (industry standards) or standards imposed on the industry by state or federal governmental agencies (regulatory standards)?

48. *Cf. Norton v. Snapper Power Equip., Div. of Fuqua Industries, Inc.*, 806 F.2d 1545, 1549 n.3 (11th Cir. 1987) (suggesting that admission of state of the art evidence always "infuses some measure of 'fault' analysis into the strict liability equation.") *See also Toliver v. General Motors Corp.*, 482 So.2d 213, 218 (Miss. 1985) (apparently rejecting risk-utility because negligence based, but arguably in the context of adopting a stricter allocation model based on "liability for a product *solely* due to its performance").
49. This is true even if the jurisdiction persists in utilizing the consumer expectations test. *See Bruce v. Martin-Marietta Corp.*, 544 F.2d 442, 447 (10th Cir. 1976) ("'State-of-art' evidence helps to determine the expectation of the ordinary consumer").
50. See text accompanying note 31, *supra*.
51. *Dart v. Wiebe Mfg., Inc.*, 147 Ariz. 242, 709 P.2d 876, 881 (1985).
52. *See, e.g., Cepeda v. Cumberland Engineering Co., Inc.*, 76 N.J. 152, 386 A.2d 816, 821, 825 (1978); *Dart v. Wiebe Mfg., Inc.*, 147 Ariz. 242, 709 P.2d 876, 880-81 (1985); *St. Germain v. Husqvarna Corporation*, 544 A.2d 1283, 1286-88 (Me. 1988) (Glassman, J., dissenting).
53. *See, e.g., Johnson v. Raybestos-Manhattan, Inc.*, 69 Hawaii 287, 740 P.2d 548, 549 (1987); *In re Hawaii Federal Asbestos Cases*, 665 F.Supp. 1454, 1456-58 (D. Hawaii 1986).
54. *Cf. D.L. v. Huebner*, 110 Wis.2d 581, 329 N.W.2d 890, 905-909 (1983) (*offensive* evidence of post-manufacture custom admissible to show feasibility). *Accord, Jackson v. Firestone Tire & Rubber Co.*, 779 F.2d 1047, 1056-58 (5th Cir. 1986) (applying the law of Texas).

Two reasons are given to justify the indirect relevance of industry practice. The first is that consumer expectations are partly formed by producer practice. Thus, a jurisdiction which uses the consumer expectations test as its operational rule or which treats those expectations as one aspect of a risk-utility operational rule⁵⁵ will continue to admit evidence of industry practice.⁵⁶ The second reason given for the admissibility of evidence of industry practice in this context is that it demonstrates the lack of feasibility of plaintiff's design alternative.⁵⁷

Courts which recognize a potential correlation between industry practice and infeasibility assert that they carefully police the admissibility of such evidence on a case-by-case basis.⁵⁸ Notwithstanding such policing and the possibility of giving a specific limiting instruction, it seems more than arguable that the prejudicial and misleading effect of such "backdoor" custom outweighs its probative value. If an argument of industry *incapability* truly exists, the producer will have access to better evidence of infeasibility than some inference to be drawn from industry practice.⁵⁹ In the words of one

55. See e.g., *Turner v. General Motors Corp.*, 584 S.W.2d 844, 847 (Tex. 1979).

56. See e.g., *Carter v. Massey-Ferguson, Inc.*, 716 F.2d 344, 347-49 (5th Cir. 1983) (applying the Law of Texas).

57. *Caterpillar Tractor Co. v. Beck*, 593 P.2d 871, 887 (Alaska 1979). Cf. *Hancock v. Paccar, Inc.*, 204 Neb. 468, 283 N.W.2d 25, 35 (1979) (industry custom evidence admissible but not conclusive in strict liability case). *Accord, Chown v. USM Corp.*, 297 N.W.2d 218, 221-23 (Iowa 1980); *Robinson v. Audi NSU Auto Union A.G.*, 739 F.2d 1481, 1485-86 (10th Cir. 1984); *Carter v. Massey-Ferguson, Inc.*, 716 F.2d 344, 347-49 (5th Cir. 1983) (applying the Law of Texas). See also *Smith v. Minster Mach. Co.*, 669 F.2d 628, 634 (10th Cir. 1982) ("Industry custom may be relevant to proof of feasibility of alternatives, but it is not conclusive"). Cf. *Sturm, Ruger & Co. v. Day*, 594 P.2d 38, 45 (Alaska 1979) (stating that industry practice is admissible but without explanation as to purpose).

58. See, e.g., *Carter v. Massey-Ferguson, Inc.*, 716 F.2d 344, 349 (5th Cir. 1983) (applying the Law of Texas).

59. The debate is well represented by *Boatland of Houston, Inc., v. Bailey*, 609 S.W.2d 743, 746 (1980). According to the majority:

Whether a product was defectively designed must be judged against the technological context existing at the time of its manufacture. . . . A plaintiff may advance the argument that a safer alternative was feasible with evidence that it was *in actual use or was available at the time of manufacture*. Feasibility may also be shown with evidence of the scientific and economic capacity to develop the safer alternative. . . . Thus, evidence of the actual use of, or capacity to use, safer alternatives is relevant insofar as it depicts the available scientific knowledge and the practicalities of applying that knowledge to a product's design (emphasis added).

Compare, however, the cautionary views of Justice Campbell, 609 S.W.2d at 752-53:

"State of the art" does not mean "the state of industry practice." "State of the art" means "state of industry knowledge." At the time of the manufacture of the boat in question, the device and concept of a circuit breaker, as is at issue in this case, was simple, mechanical, cheap, practical, possible, economically feasible and a concept seventy years old, which required no engineering or technical breakthrough. The concept was known by the industry. This fact removes it from "state of the art."

. . . What is this Court faced with in this case? Nothing more than a defendant seller attempting to avoid liability by offering proof that [plaintiffs' decedent's] boat complied with industry practice (which it did at that time) but not because of any limitations on manufacturing feasibility at that time. This is an industry practice case. The evidence does not involve "technological feasibility." The law of the majority opinion is that a simple device, not supplied by the manufacturer, is a defence in a strict liability suit, against a retailer, even though the industry practice was created by the manufacturing industry.

court, "[a]lthough customs of an industry may be relevant, because those customs may lag behind technological development, they are not identical with the state-of-the-art."⁶⁰ That "lag" is due to market imperfections involving producer-to-producer and industry-to-consumers information costs.

Similar issues have been raised with regard to close relatives of industry practice, specifically evidence of an industry's self-regulatory standards and governmental command control regulations applicable to that industry. Courts are in general agreement as to the admissibility of the latter. While not conclusive as a matter of substantive products doctrine,⁶¹ such standards consistently are considered to be relevant.⁶² The ostensible reason given by defendants is that the substance of the standard demonstrates the absence of technologically feasible alternate designs at the time of the making of the regulation. However, a more convincing rationale is that the results of an independent, parallel evaluative process, at the least, are not prejudicial.⁶³

Industry standards are more problematic. After all, they will have a basis in the industry's collective view and, hence, in industry custom.⁶⁴ Notwithstanding, such standards tend to be ruled as admissible,⁶⁵ ostensibly because they are probative as to the absence of feasible alternative technologies.⁶⁶ The opposing view was forcefully championed by the Supreme Court of Pennsylvania in a defective design case involving a portable control pendant for an electric hoist.⁶⁷ The plaintiff-hoist operator had stumbled and struck a control button on the pendant, causing the hoist to operate which, in turn,

60. *O'Brien v. Muskin Corporation*, 94 N.J. 169, 463 A.2d 298, 305 (1983) (citations omitted).

61. *See, e.g., Rehler v. Beech Aircraft Corp.*, 777 F.2d 1072, 1083-84 (5th Cir. 1985) (applying the law of Texas); *Bruce v. Martin-Marietta Corp.*, 544 F.2d 442, 446 (10th Cir. 1976); *Blueflame Gas, Inc. v. Van Hoose*, 679 P.2d 579 (Colo. 1984); *Rucker v. Norfolk & W. R. Co.*, 77 Ill.2d 434, 33 Ill.Dec. 145, 396 N.E.2d 534, 537 (1979); *Gryc v. Dayton-Hudson Corp.*, 297 N.W.2d 727 (Minn. 1980), *cert. den.* 449 U.S. 921, 101 S.Ct. 320 (1980); *Wilson v. Piper Aircraft Corp.*, 282 Or. 61, 577 P.2d 1322 (1978).

62. *See, e.g., Bruce v. Martin-Marietta Corp.*, 544 F.2d 442, 446 (10th Cir. 1976); *Rucker v. Norfolk & W. R. Co.*, 77 Ill.2d 434, 33 Ill.Dec. 145, 396 N.E.2d 534 (1979). *Cf. Cover v. Cohen*, 61 N.Y.2d 261, 473 N.Y.S.2d 378, 461 N.E.2d 864, 867-69 (1984) (offensive regulatory standards inadmissible because they post-dated manufacture).

63. The tendency of command-control agencies to use industry practice as a regulatory baseline, and the more serious question of industry "capture" by an industry group have not been addressed in this context.

64. *See, e.g., Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156, 1164 (4th Cir. 1986) (applying the law of Maryland):

Industry standards and state of the art are not synonymous. State of the art includes all of the available knowledge on a subject at a given time, and this includes scientific, medical, engineering, and any other knowledge that may be available. State of the art includes the element of time: What is known and when was this knowledge available.

Industry standards are the practices common to a given industry. They are often set forth in some type of code, such as a building code or electrical code, or they may be adopted by the trade organization of a given industry. State of the art is a higher standard because scientific knowledge expands much more rapidly than industry can assimilate the knowledge and adopt it as a standard.

65. *See, e.g., Dugan v. Sears, Roebuck & Co.*, 113 Ill. App.3d 740, 69 Ill.Dec. 620, 447 N.E.2d 1055, 1057 (1983) (American National Standards Institute (ANSI) standards).

66. *See, e.g., Rexrode v. American Laundry Press Co.*, 674 F.2d 826, 832 (10th Cir. 1982), *cert. den.* 459 U.S. 862, 76 L.Ed.2d 117, 103 S.Ct. 137 (1982).

67. *Lewis v. Coffing Hoist Div.*, Duff-Norton Co., 515 Pa. 334, 528 A.2d 590 (1987).

caused his injuries. The plaintiff's defective design theory was that the possibility of accidental operation of the control pendant could have been avoided either by recessing the buttons into the control panel, or by raising metal flanges around them. At trial the defendant sought to introduce evidence that "at least ninety percent" of such hoists were manufactured without such modified control boxes. The defendant also sought to introduce standards promulgated by the American Society of Mechanical Engineers (ASME) relating to the manufacture of such industrial equipment. The court upheld the trial court's exclusion of the proffered evidence as follows:

Having reached the conclusion that evidence of industry standards relating to the design of the control pendant involved in this case, and evidence of its widespread use in the industry, go to the reasonableness of the appellant's conduct in making its design choice, we further conclude that such evidence would have improperly brought into the case concepts of negligence law. We also conclude that such evidence would have created a strong likelihood of diverting the jury's attention from the appellant's control box to the reasonableness of the appellant's conduct in choosing its design.⁶⁸

The Pennsylvania court, therefore, characterized the state of the art evidence at issue as industry *practice*, and relied upon the expected rationales for its exclusion.⁶⁹

The division in the decided cases suggests that the question of the admissibility of industry *standards*, in contrast to industry *practice*, is not treated as logically deductible from the design defect operational rule. Therefore, a jurisdiction's response to such evidence will tend to have independent operational force further delineating the allocation model in effect. Thus, the Pennsylvania decision may be viewed as consistent with its leading case on defective design,⁷⁰ which defined defect as "lacking any element necessary to make it safe for its intended use or possessing any feature that renders it unsafe for the intended use."⁷¹ Such a primary operational rule marks out the jurisdiction as being committed to a strict liability allocation model. The court's subsequent decision on the admissibility of industry *standards* independently confirmed that commitment.

68. *Lewis*, 528 A.2d at 594. Concurring, Justice Larsen was candid:

The injection of industry standards into a design defect case would be not only irrelevant and distracting, but also, because of the inherently self-serving nature of "industry standards," would be highly prejudicial to the consumer/plaintiff. By our determination today, we have made it clear that a manufacturer cannot avoid liability to its consumers that it injures or maims through its defective designs by showing that "the other guys do it too."

528 A.2d at 595.

69. In contrast, Justice Flaherty, in dissent, considered that industry acceptance of the design (industry practice) went to the ultimate issue of whether the control box was "safe." 528 A.2d at 595, and Justice Hutchinson was of the opinion that the ASME standards were admissible as akin to expert testimony. 528 A.2d at 596.

70. *Azzarello v. Black Bros. Co.*, 480 Pa. 547, 391 A.2d 1020 (1978).

71. *Id.*, 391 A.2d at 1027.

B. Failure to Warn

The state of the art issues raised in failure to warn cases differ fundamentally from those discussed above in the design context. In design cases, the state of the art disputes primarily are resolvable by reference to a jurisdiction's operational rules. In contrast, state of the art in warning cases depends upon the allocation model embraced: the "purity" of the strict liability system adopted as well as applied in a particular jurisdiction.

This question of purity involves two aspects. First, a marketing defect case typically involves a useful, but dangerous product which allegedly lacks any warning or any adequate warning. If the case is of the latter type, the question arises as to the extent the operational rule of *adequacy* shades into *reasonableness*, and *reasonableness* into *negligence*?⁷² Second, while the prevalent view in *design defect* litigation is that the foresight or knowledge of the product-related risk is imputed to the defendant,⁷³ is this proposition accepted in warning cases? These two questions define the state of the art issues arising in warning cases; specifically, the admissibility of evidence of industry practice and industry unknowability.⁷⁴

72. See generally *Freund v. Cellofilm Properties, Inc.*, 87 N.J. 229, 432 A.2d 925, 929-31 (1981). See also *In re Hawaii Federal Asbestos Cases*, 699 F.Supp. 233, 236 (D. Hawaii 1988) ('failure to warn' is misleading because it implies negligent concepts with their attendant focus on the reasonableness of defendants' behavior.').

73. Text accompanying note 31, *supra*.

74. A simplified review of some of the possible operational rules a jurisdiction could adopt is as follows:

ALLOCATION MODEL		OPERATIONAL RULES		
		<i>Foresight Rule</i>	<i>Adequacy Rule</i>	<i>Exclude Evidence Of</i>
Negligence	Actual/constructive		conduct-oriented	n/a
Strict	Actual/constructive		product-oriented	industry custom
Strict	Rebuttable presumption of knowledge by defendant		product-oriented	industry custom
Strict	"Expert" standard—effectively placing burden on defence		product-oriented	industry custom
Strict	Knowledge at time of manufacture imputed		product-oriented	industry custom industry unknowability at time of manufacture
"Stricter"	Imputed		product-oriented	industry custom industry unknowability

Note that the evidentiary exclusionary rule be given in each case is the one *logically derived* from that jurisdiction's substantive rule as to foresight of risk or adequacy of warning, *i.e.*, those exclusionary rules are not independent operational rules. However, a jurisdiction could abandon such logic and achieve a composite (substance plus evidentiary exclusion) rule with subtly different allocational results. For example, although it would be structurally inconsistent, a jurisdiction with a product-oriented adequacy rule could *admit* evidence of industry custom. This would produce a composite rule which should have an allocational effect somewhere between the first two entries on the above chart.

Some jurisdictions slavishly follow the lead of the Restatement,⁷⁵ and explicitly treat warning cases as negligence-based.⁷⁶ Others, at least formally, have adopted a strict liability allocation model in warning cases, yet have measured the producer's knowledge at the time of marketing, not trial.⁷⁷ At the extreme, a few jurisdictions have attempted to carry over both strict liability operational rules – the product-oriented approach and imputed foresight – from the design to warning arenas. For example, according to the Supreme Court of New Jersey:

[A] products liability charge in an inadequate warning case must focus on safety and emphasize that a manufacturer, in marketing a product with an inadequate warning as to its dangers, has not satisfied its duty to warn, even if the product is perfectly inspected, designed, and manufactured. Moreover, and importantly, the charge must make clear that knowledge of the dangerous trait of the product is imputed to the manufacturer. It must also include the notion that the warning be sufficient to adequately protect any and all foreseeable users from hidden dangers presented by the product. This duty must be said to attach without regard to prevailing industry standards. In short, it must be explained that an adequate warning is one that includes the directions, communications, and information essential to make the use of a product safe.⁷⁸

Clearly, this invocation of strict liability orthodoxy suggests tentative answers to state of the art issues identified above.⁷⁹ First, by adopting a product-oriented approach the court implies that evidence of industry custom (*industry practice*) is irrelevant. Indeed the court's express discounting of "prevailing industry standards" also might suggest disavowal of evidence of self-regulatory standards (*industry standards*), or governmental regulations pertaining to the industry (*regulatory standards*). Second, the court imputes knowledge of the risk to the manufacturer. This implies that knowledge of the risk (or lack thereof) which the contended-for warning would have eliminated or reduced ceases to be in issue; in other words, that evidence of *industry unknowability* is irrelevant.

75. See Restatement (Second) of Torts § 402A, comment i.

76. See, e.g., *Crislip v. TCH Liquidating Co.*, 52 Ohio St.3d 251, 556 N.E.2d 1177, 1182-83 (1990).

Under either a negligence or strict liability theory, the important factors for the jury to consider were whether the defendant knew or should have known of the danger and whether the warning allowed the consumer to use the product safely Thus, the standard imposed upon the defendant in a strict liability claim grounded upon inadequate warning is the same as that imposed in a negligence claim based upon inadequate warning.

See also *Higgins v. E.I. Du Pont de Nemours & Co. Inc.*, 671 F.Supp. 1055, 1060 (D. Md. 1987); *Knitz v. Minster Machine Co.*, 69 Ohio St.2d 460, 23 Ohio Op.3d 403, 432 N.E.2d 814, 818 n.5, cert. den. 459 U.S. 857, 74 L.Ed.2d 110, 103 S.Ct. 127 (1982).

77. See note 114 *infra*.

78. *Freund v. Cellofilm Properties, Inc.*, 87 N.J. 229, 432 A.2d 925, 932 (1981). Decisions from New Jersey discussed herein must be read subject to N.J. Stat. Ann. § 2A:58C-1 to 58C-7 (West 1987).

79. Text accompanying notes 72 to 74, *supra*.

This approach is not without merit. It is agreeably strict and guarantees an increased redistribution of product-related injuries. It suffers, however, from two significant flaws: one conceptual, the other involving what may loosely be described as "justice" concerns. The former involves the nature of operational rule necessitated by such an approach. That is, what is the *content* of the adequacy test for the warning if conduct-oriented evidence is excluded? It seems somewhat ingenuous to answer this question with a construct phrased in terms of "safe" *versus* "unsafe."⁸⁰ After all, the only evidence on this issue remaining before the jury is that the plaintiff was injured in spite of the warning, thus seeming to compel the conclusion that the product was unsafe, and hence the conclusory characterization of the warning as "inadequate."⁸¹

Traditional products liability operational rules have struggled to establish themselves in the warning area. At first glance a consumer expectations approach seems appropriate to gauge whether a producer has sufficiently reduced the user's information costs so that the user is a cost-effective accident cost avoider *viz-a-viz* the product.⁸² As an operational rule, however, consumer expectations is only slightly more convincing in warning cases than in design defect litigation. Interestingly, in the warning context, risk-utility has engendered little enthusiasm as a practical decisional tool. Presumably, this is the result of the perception that such an analysis would involve nothing more than a simplistic and lop-sided comparison between the cost of a label and the injuries suffered by the consumer.⁸³ Arguably, such "an invitation to convict" would then be contrary to the allocation model in that it would redistribute too many product-related risks. Yet, a risk-utility analysis *could* be fashioned so as to provide meaningful content for jury decision and still

80. See, e.g., *Freund*, text accompanying note 78, *supra*. *Freund* itself expressed a slightly different explanation for the kinship between negligent and strict liability approaches to warning cases:

The reason for the elusive nature of the differences between the approaches in inadequate warning cases relates to the basic theory of strict products liability. Central to this theory is the risk-utility equation for determining liability. The theory is that only safe products should be marketed – a safe product being one whose utility outweighs its inherent risk, provided that risk has been reduced to the greatest extent possible consistent with the product's continued utility. In the case of a design defect consisting of an inadequate warning, however, imposing the requirements of a proper warning will seldom detract from the utility of the product. It can readily be assumed that if a reasonable manufacturer can make his product safe without impairing its utility, failure to do so would constitute negligence. This explains why, in an inadequate warning case, the product-oriented and conduct-oriented approaches appear similar.

432 A.2d at 930 n.1.

81. See also *Antcliff v. State Employees Credit Union*, 414 Mich. 624, 327 N.W.2d 814, 820 (1982) (in a case decided on the court noted "the information provided must be adequate, accurate and effective").

82. See, e.g., *Little v. PPG Industries, Inc.*, 92 Wash.2d 118, 122, 594 P.2d 911, 914 (1979) ("Was the warning sufficient to catch the attention of persons who could be expected to use the product to apprise them of its dangers and to advise them of the measures to take to avoid those dangers?").

83. See, e.g., *Morningstar v. Black & Decker Mfg. Co.*, 162 W.Va. 857, 253 S.E.2d 666, 682-83 (1979).

be consistent with the allocation model.⁸⁴ Such an analysis would mirror the risk-utility analysis as applied in design defect cases. That is, some cases would involve a comparison of the costs of warning against the risks which occurred, while others would compare the relative costs of plaintiff's contended for warning in contrast to the defendant's actual warning.⁸⁵

In either case, the challenge is to provide the warning cost with sufficient content to provide a sensible and purposeful counterpoint to an easily identified risk. The key to that "cost content" is contained in the rationale for the duty to warn: the producer and consumer should become jointly responsible for accident cost avoidance. The adequacy test as currently applied focuses on the costs of communication of risk information from producer to consumer.⁸⁶ Those costs are important aspects of the mix and should continue to be at issue.⁸⁷ Equally important, however, are the relative information costs as to the existence, quantification and avoidance of the risk incurred by the producer⁸⁸ and the consumer.⁸⁹

The second flaw in this pure, strict liability construct goes to the exclusion of evidence of industry unknowability and undiscoverability. Indeed, at an instinctive level it does seem somewhat discordant to command a manufac-

84. See generally Twerski, Weinstein, Donaher & Pichler, *The Use and Abuse of Warnings in Products Liability-Design Defect Litigation Comes of Age*, 61 Cornell L.Rev. 495, 513-21(1976).

85. See text accompanying note 20, *supra*.

86. This approach probably derives from the discussion of the negligence duty in Restatement (Second) of Torts § 388 comment *n*.

87. For example, physical construction or formulation of a label (see, e.g., *Davis v. FMC Corp.*, *Food Processing Machinery Div.*, 771 F.2d 224 (7th Cir. 1985) (warning inadequate, *inter alia*, because decal easily washed off); method of attachment (see, e.g., *Ilosky v. Michelin Tire Corp.*, 307 S.E.2d 603, 611 (W.Va. 1983); feasibility of warning of a small group of particularly susceptible or hypersensitive users (see, e.g., *Griggs v. Combe, Inc.*, 456 So.2d 790 (Ala. 1984)); labelling which tends to increase the consumer's information costs because of the necessity of reducing type size in order to increase the quantity of information applied to a package of finite size; the costs associated with increasing the size of packaging to accommodate increased information (see, e.g., *Cotton v. Buckeye Gas Products Co.*, 840 F.2d 935 (D.C. Cir. 1988)); increasing information costs by mixing safety representations with warnings (see, e.g., *Gracyalny v. Westinghouse Elec. Corp.*, 723 F.2d 1311,1321 (7th Cir. 1983) (applying the law of Wisconsin)).

88. Note that this cost of discovering probability and severity of risk differs from the issue of actual/constructive/imputed foresight because the courts are not asking whether the manufacturer knew or should have known, but how much it would cost to know. See, e.g., *O'Brien v Muskin Corporation*, 94 N.J. 169, 463 A.2d 298, 305 (1983) ("the risk side of the equation may involve, among other factors, risks that the manufacturer knew or should have known would be posed by the product, as well as the adequacy of any warnings"); *Ilosky v. Michelin Tire Corp.*, 307 S.E.2d 603, 611 (W.Va. 1983) (*in casu* risk information inexpensive). See also *Hayes v. Ariens Company*, 391 Mass. 407, 462 N.E.2d 273, 277 (1984) ("the adequacy of a warning is measured by the warning that would be given at the time of sale by an ordinarily prudent vendor who, at that time, is fully aware of the risks presented by the product").

89. What else could be in issue? The obviousness of the risk, etc.? But what we are then pointing to are occasions of the plaintiff failing to act as an accident avoider and those should be handled with affirmative defences not with the plaintiff's *prima facie* case lower. See, e.g., *Abbot v. American Cyanamid Co.*, 844 F.2d 1108,1115 (4th Cir. 1988), *cert. den.* 488 U.S. 908,102 L.Ed.2d 248,109 S.Ct. 260 (1988) (applying the law of Virginia).

turer to warn against an unknowable hazard.⁹⁰ However, a more oblique approach to the issue is profitable. Why is the abandonment of an imputed foresight operational rule in warning cases dictated by considerations of fairness,⁹¹ insurer rate-setting,⁹² or a lack of conviction of any promotion of social utility?⁹³ In contrast, courts in design cases do not hesitate to impute foresight, to premise liability on hindsight.⁹⁴ What has happened is that most courts have abandoned the search for any meaningful content for the question of adequacy of warning. Faced, therefore, with operational rules (adequacy essentially determined by showing injury and imputed foresight) which seem consistent with an absolute liability allocation model, those courts have "rediscovered" the foresight issue to act as the only meaningful (or "contentful") operational rule in warning cases.

The leading case of *Beshada v. Johns-Manville Products Corp.*,⁹⁵ focused attention on many of these issues. Plaintiffs sought to strike defendants' so-called state of the art defence, which was premised on the scientific unknowability and undiscoverability of the risks of low concentrations of asbestos dust. Plaintiffs argued from the orthodox position on defendant knowledge, that the doctrine of imputed foresight of the risk renders evidence of, and hence any defence based on, unknowability and undiscoverability irrelevant.

Defendants countered with a timing issue, arguing that the imputed knowledge doctrine applied to knowledge existing at the time of manufacture, rather than at trial. In rejecting plaintiffs' motion to strike, the trial judge advanced an intermediate position: that the imputed foresight rule created only a presumption of foresight which could be rebutted by evidence of unknowability and undiscoverability.⁹⁶ Responding, the Supreme Court of New Jersey was unwavering in the face of what it considered to be an attempted dilution of the strict liability concept.

Two aspects of the court's rejection of the proffered evidence and reaffirmation of the doctrine of imputed knowledge are noteworthy. First, the intensity of the court's response serves to emphasize once again the importance of clearly distinguishing between the various species of state of the art evidence. The court stated "[e]ssentially, state-of-the-art is a negligence defence. It seeks to explain why defendants are not culpable for failing to provide a warning."⁹⁷ Yet, taken literally, that blanket exclusion apparently

90. See, e.g., *Moore v. Vanderloo*, 386 N.W.2d 108, 116 (Iowa 1986); *Castrignano v. E.R. Squibb & Sons, Inc.*, 546 A.2d 775, 782-83 (R.I.1988); *Anderson v. Owens-Illinois, Inc.*, 799 F.2d 1, 4-5 (1st Cir. 1986) (applying the law of Massachusetts). See generally Comment, *Requiring Omniscience: The Duty to Warn of Scientifically Undiscoverable Product Defects*, 71 Geo L.J. 1635 (1983).

91. See, e.g., *Heath v. Sears, Roebuck & Co.*, 123 N.H. 512, 464 A.2d 288, 298-99 (1983).

92. See, e.g., *Anderson v. Owens-Illinois, Inc.*, 799 F.2d 1, 5 (1st Cir. 1986) (applying the law of Massachusetts).

93. See, e.g., Henderson, *Coping with the Time Dimension in Products Liability*, 69 Calif. L.Rev. 919, 949 (1981).

94. See text accompanying note 51, *supra*.

95. 90 N.J. 191, 447 A.2d 539 (1982).

96. 447 A.2d at 543.

97. 447 A.2d at 546.

would deny the admissibility of evidence of industry capability in design cases, rather than the evidence of industry unknowability at issue. *Beshada* reinforced its opposition to evidence of industry unknowability and undiscoverability by making reference to the products liability postulate that “[s]trict liability focuses on the product, not the fault of the manufacturer.”⁹⁸ However, risk-identification and legal defectiveness do not constitute an homogenized issue.⁹⁹ Logically, a jurisdiction may adopt a product-oriented standard to judge the adequacy of a warning, yet utilize a risk-identification rule lacking the strictness of imputation.¹⁰⁰

Second, the court was swift to recognize that a state of the art defence phrased in the terms urged by defendant (industry unknowability and undiscoverability at a time prior to trial) constituted a frontal assault on the doctrine of imputed foresight in warning cases. Thus, *Beshada* answered the state of the art issue with a recitation of the conventional rationales for a strict products liability allocation model,¹⁰¹ concluding:

We impose strict liability because it is unfair for the distributors of a defective product not to compensate its victims. As between those innocent victims and the distributors, it is the distributors – and the public which consumes their products – which should bear the unforeseen costs of the product.¹⁰²

Beshada's operational rules are brutally simple. Product performance risks are allocated between producers and consumers on a case-by-case, product-oriented and arguably contentless “adequacy of warning” basis. However, risks associated with risk-identification, notwithstanding their attendant information costs, may not be externalized to the consumer.¹⁰³

The question remains, however, whether an imputed foresight rule in warning cases is consistent with a strict liability allocation model, whether the operational rule is *too* strict?¹⁰⁴ Producers transliterate this concern into

98. 447 A.2d at 546.

99. Text accompanying notes 29 and 52 *supra*.

100. See note 74, *supra*.

101. 447 A.2d at 547-49.

102. 447 A.2d at 549.

103. *Beshada* is not alone. See *Kisor v. Johns-Manville Corp.*, 783 F.2d 1337 (9th Cir.1986) (applying the law of Washington); *In re Hawaii Federal Asbestos Cases*, 665 F.Supp. 1454, 1457-60 (D. Hawaii 1986); *Hayes v. Ariens Company*, 391 Mass. 407, 462 N.E.2d 273 (1984).

104. See, e.g., *O'Brien v. Muskin Corporation*, 94 N.J. 169, 463 A.2d 298, 310-15 (1983) (per Schreiber, J., concurring and dissenting). A risk should be warned about before it is known or definitely established, or even where the manufacturer finds the evidence of risk to be unconvincing. See *Moran v. Johns-Manville Sales Corp.*, 691 F.2d 811, 814-15 (6th Cir. 1982) (applying the law of Ohio). A similar issue arises in malpractice cases premised on an absence of informed consent - a duty to warn attaches “whenever a reasonable man would want to be informed of the risk in order to decide whether to expose himself to it.” *Borel v. Fibreboard Paper Products Corporation*, 493 F.2d 1076, 1089 (5th Cir. 1973) (per Wisdom, J.), *cert. den.* 419 U.S. 869, 42 L.Ed.2d 107, 95 S.Ct. 127 (1974). Thus arises the question whether the adequacy of the information transmitted should be judged by a “need to know” (consumer) test, a custom/subjective manufacturer test, or - the intermediate step - by an expert/objective manufacturer test?

an absolute liability argument.¹⁰⁵ That argument is resisted with an assertion such as, "defendants are not absolutely liable because plaintiffs are never relieved of their primary burden of proof, that of establishing the product's dangerousness by a preponderance of the evidence."¹⁰⁶ But that begs once again the core question: what is the (decisional, evaluative) content of "dangerousness" if it is not, as seems to follow from that rebuttal, simply "causing harm?" Pronouncements on the functional goals of risk spreading and accident cost avoidance are compatible with a movement from a strict to a "stricter" allocation model; however, they do not explain the content of either model's operational rule.

Indeed, except in jurisdictions seeking that "stricter" form of products liability,¹⁰⁷ *Beshada* has not been warmly received. In the words of the Supreme Court of California:

Numerous cases have recognized that a product may be defective because of the absence of a warning that was necessary to allow its safe use. While some decisions apply strict liability principles to such a defect by holding that it is irrelevant whether the manufacturer knew of the danger or should have known of it, most jurisdictions hold to the contrary. That is, liability is conditioned on the actual or constructive knowledge of the risk by the manufacturer as of the time the product was sold or distributed. This rule is consistent with comment j to section 402A, which confines the duty to warn to a situation in which the seller 'has knowledge, or by the application of reasonable, developed human skill and foresight should have knowledge of . . . the danger.'¹⁰⁸

That reaction to *Beshada* and its prodigy has involved an unfortunate renaissance of judicial interest in comment j to the Restatement.¹⁰⁹ Comment j provides an historically proven doctrinal statement rejecting imputed fore-

105. See, e.g., *In re Hawaii Federal Asbestos Cases*, 699 F.Supp. 233, 236 (D. Hawaii 1988) ("Defendants maintain that imposing strict liability on a manufacturer for failure to warn of an unknown risk is tantamount to making the manufacturer an absolute insurer of its product"). See also *Heath v. Sears, Roebuck & Co.*, 123 N.H. 512, 464 A.2d 288, 298 (1983) (describing *Beshada* as involving absolute liability).
106. *In re Hawaii Federal Asbestos Cases*, 699 F.Supp. 233, 236 (D. Hawaii 1988).
107. See, e.g., *Elmore v. Owens-Illinois, Inc.*, 673 S.W.2d 434, 438 (Mo. 1984) ("the law in Missouri holds that state of the art evidence has no bearing on the outcome of a strict liability claim"); *Nesselrode v. Executive Beechcraft, Inc.*, 707 S.W.2d 371, 383 (Mo. 1986) ("liability may be imposed without regard to the defendant's knowledge or conduct"). See also cases cited in note 103, *supra*.
108. *Brown v. Superior Court*, 44 Cal.3d 1049, 245 Cal.Rptr. 412, 751 P.2d 470, 480 (1988) (citations omitted). See also *Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156, 1164-65 (4th Cir. 1986) (applying the law of Maryland); *Church v. Wesson*, 385 S.E.2d 393, 396 (W.Va. 1989); *Anderson v. Owens-Illinois, Inc.*, 799 F.2d 1, 4-5 (1st Cir. 1986) (applying the law of Massachusetts); *Anderson v. Owens-Corning Fiberglas Corp.*, 53 Cal. 3d 987, 810 P.2d 549 (1991).
109. Restatement (Second) of Torts § 402A comment j provides in part:
 . . . Where, however, the product contains an ingredient [which] . . . is one whose danger is not generally known, or if known is one which the consumer would reasonably not expect to find in the product, the seller is required to give warning against it, if he has knowledge, or by the application of reasonable, developed human skill and foresight should have knowledge, of the presence of the ingredient and the danger.

sight in warning cases.¹¹⁰ Inevitably, it prompts courts to search for some middle ground for warning cases. Logically, in jurisdictions committed to a strict liability allocation model, such a search first should alight upon a warning operational rule which combines actual/constructive foresight with a product-oriented adequacy standard.¹¹¹ Instead, courts have a tendency to equate rejection of imputed foresight with movement to a conduct-oriented standard,¹¹² which merely results in a form of "stricter" negligence.¹¹³

The implications for state of the art evidence are serious. Rejection of the imputed foresight operational rule involves no more than the admissibility of defence evidence of scientific *unknowability* and *undiscoverability* at the time of marketing. Indeed, recognition of the product-oriented adequacy standard/foresight rule duopoly is one of the keys to forging an operational rule for warning cases which avoids *Beshada's* possible inconsistency with the allocation model. The other key is continued resistance to the admissibility of evidence of industry custom. Crucial to the strict liability warning allocation model is the maintenance of an operational rule which is product-oriented and, therefore, unsusceptible to custom evidence.¹¹⁴ By homogenizing foresight and conduct-orientation a court opens the door to evidence of industry *practice*.¹¹⁵

Nowhere have these issues, accompanied by a microcosmic illustration of judicial retrenchment from the strict liability allocation model, been more keenly illustrated than in *Feldman v. Lederle Laboratories*,¹¹⁶ decided by the New Jersey Supreme Court two years after its decision in *Beshada*. Clearly

110. See, e.g., *Bernier v. Raymark Industries, Inc.*, 516 A.2d 534, 538 (Me. 1986). Cf. *In re Hawaii Federal Asbestos Cases*, 699 F.Supp. 233, 236 n.3 (D. Hawaii 1988) (comment j "only applies to products which cause allergic reactions in the general population").
111. See note 114, *supra*.
112. See, e.g., *Bernier v. Raymark Industries, Inc.*, 516 A.2d 534, 538-40 (Me. 1986). In a sense this was invited by *Beshada*; see note 30, *supra*. In a sense this was also invited by Restatement (Second) of Torts § 388, which suggests that the content of the warning issue is producer foresight. It was left to Restatement (Second) of Torts § 388 comment n to suggest a content to "adequacy."
113. See, e.g., *Bernier v. Raymark Industries, Inc.*, 516 A.2d 534, 538 (Me. 1986) ("A manufacturer is held to the knowledge and skill of an expert, and is required to test his products and keep abreast of scientific discoveries related to his products, but he has a duty to warn only of dangers that the employment of the reasonable foresight of an expert could reveal."). See also *Borel v. Fibreboard Paper Products Corporation*, 493 F.2d 1076, 1083 (5th Cir. 1973), *cert. den.* 419 U.S. 869, 95 S.Ct. 127, 42 L.Ed.2d 107 (1974); *Feldman v. Lederle Laboratories*, 97 N.J. 429, 479 A.2d 374, 386-88 (1984) ("expert" standard with burden of proof shifted to defendant); *Dartez v. Fibreboard Corp.*, 765 F.2d 456, 461 (5th Cir. 1985).
114. See, e.g., *Bly v. Otis Elevator Co.*, 713 E2d 1040, 1045-46 (4th Cir. 1983) (applying the law of Virginia); *Tomer v. American Home Products Corp.*, 170 Conn. 681, 368 A.2d 35, 38 (1976); *Castrignano v. E.R. Squibb & Sons, Inc.*, 546 A.2d 775, 782-83 (R.I. 1988); *Anderson v. Owens-Illinois, Inc.*, 799 F.2d 1, 4-5 (1st Cir. 1986) (applying the law of Massachusetts); *Feldman v. Lederle Laboratories*, 97 N.J. 429, 479 A.2d 374, 385 (1984); *Anderson v. Owens-Corning Fiberglas Corp.*, 53 Cal. 3d 987, 810 P.2d 549 (1991). See also *Woodill v. Parke Davis & Co.*, 79 Ill.2d 26, 37 Ill.Dec. 304, 402 NE.2d 194, 198 (1980) (combining actual/constructive foresight with product-oriented adequacy standard).
115. See, e.g., *Bernier v. Raymark Industries, Inc.*, 516 A.2d 534, 540 (Me. 1986) ("A strict liability failure-to-warn case does resemble a negligence action because the reasonableness of the manufacturer's conduct is the critical issue.")
116. 97 N.J. 429, 479 A.2d 374 (1984).

failing to recognize the adequacy/knowledge of risk duopoly suggested here, *Feldman* modified *Beshada*'s operational rules to such an extent that the allocation model was implicitly shifted from strict liability to negligence. For *Feldman*, the operational rule for legal defectiveness in warning and design cases was the "reasonably prudent manufacturer" test.¹¹⁷ Contrary to the court's own pronouncement that strict liability was product-oriented,¹¹⁸ and contrary also to the orthodox meaning assigned to the reasonable manufacturer standard in this context, as synonymous with risk-utility,¹¹⁹ *Feldman* reintroduced the reasonableness of the defendant's conduct into the analysis. It was then but a short step to citing the admissibility of evidence of industry *capability* in design cases as persuasive authority for admitting evidence of industry *unknowability* in warning cases.¹²⁰

Yet *Feldman* saved its most stunning contribution for last, when it restricted *Beshada* to "the circumstances giving rise to its holding."¹²¹ Such a product-specific characterization, as bizarre¹²² as it is disturbing for basic "justice" reasons, must be viewed as part of a collective judicial determination that the asbestos industry *did* know of the risks associated with its product, maybe as early as the 1930's.¹²³ This then fed the conclusion that the industry should not be permitted to continue to litigate the issue.¹²⁴ In *Beshada* itself, the court had justified the exclusion of state of the art in part because the availability of such evidence depended on how much the industry was willing to invest in research at a given time.¹²⁵ The evidence would be confusing,

117. "The question in strict-liability-design-defect and warning cases is whether, assuming that the manufacturer knew of the defect in the product, he acted in a reasonably prudent manner in marketing the product or in providing the warnings given." *Feldman*, 479 A.2d at 385.
118. 479 A.2d at 385.
119. *I.e.*, a normative, reasonable manufacturer who always uses the safest, technologically feasible technology. See note 15, *supra*.
120. 479 A.2d at 386.
121. 479 A.2d at 388.
122. It is not, however, a unique occurrence. A similar dynamic has existed in the causation/defendant identification cases with regard to generic type products and multiple potential manufacturers. While the form of causation-burden shifting rule known as market-share liability frequently has been applied in DES cases (see, e.g., *Sindell v. Abbott Laboratories*, 26 Cal.3d 588, 163 Cal.Rptr. 132, 607 P.2d 924, cert. den. 449 U.S. 912, 101 S.Ct. 285, 66 L.Ed.2d 140 (1980)), it has been rejected with regard to other products (see, e.g., *Shackil v. Lederle Laboratories, Div. of American Cyanamid, Co.*, 116 N.J. 155, 561 A.2d 511 (1989) (DPT vaccine), including asbestos (see, e.g., *Celotex Corp. v. Copeland*, 471 So.2d 533 (Fla. 1985)).
123. See, e.g., *Hardy v. Johns-Manville Sales Corp.*, 509 F.Supp. 1353, 1355 (E.D. Tex. 1981). Much of this debate centers on the "Sumner-Simpson" papers; see *Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156, 1159-60 (4th Cir. 1986) (applying the law of Maryland). See also *Moran v. Johns-Manville Sales Corp.*, 691 F.2d 811, 814-15 (6th Cir. 1982) (applying the law of Ohio) (discussion of "Fleischer-Drinker" study); *Dartez v. Fibreboard Corp.*, 765 F.2d 456, 460-63 (5th Cir. 1985) (testimony of senior physician employed by Johns-Manville between 1944 and 1966).
124. Clearly the undiscoverability/unknowability argument is effective in front of a jury in asbestos cases. See, e.g., *Wilson v. Johns Manville Sales Corp.*, 873 F.2d 869, 870 (5th Cir. 1989); *Hardy v. Johns-Manville Sales Corp.*, 681 F.2d 334, 345 (5th Cir. 1982). Cf. *Jenkins v. Raymark Industries, Inc.*, 782 F.2d 468, 472-73 (5th Cir. 1986) (class certification would be consistent with determination of state of the art).
125. 447 A.2d at 549.

making the trial complicated, costly, and time consuming.¹²⁶ The *Beshada* decision subsequently withstood constitutional attacks before the Court of Appeals for the Third Circuit; attacks premised on equal protection and due process grounds.¹²⁷ One of the two judges in that majority felt that elimination of the state-of-the-art defence in asbestos litigation was justified on grounds of administrative convenience, and that the manufacturers probably knew of the danger at all relevant times.¹²⁸ The other judge felt the *Beshada* court had determined the knowability of asbestos dangers as a matter of "legislative fact," or judicial notice.

Therefore, *Feldman* illustrates not simply retrenchment, but also how the ambivalence associated with the strict liability allocation model partly is rooted in the judicial frustration associated with identification of specific classes of cases in which the logically derived operational rules provide for false negatives. The appropriate reaction, of course, is to modify the allocation model, not to distort the operational rules. Louisiana, alone,¹²⁹ adopted a separate, "stricter" category of product defectiveness for case-by-case application to products such as asbestos.¹³⁰ Such a case is premised on whether "a reasonable person would conclude that the danger-in-fact of the product, whether foreseeable or not, outweighs the utility of the product."¹³¹ Demonstrating admirable consistency, a contemporaneously announced operational rule excluded evidence of industry unknowability and incapability.¹³²

V. Conclusion

State of the art did not begin its existence as an explicit operational rule. However, as it became a touchstone for the application of primary operational rules consistent with a strict liability allocation model, so too producers fuelled the concept's departure from its status as an apparently logically derived evidentiary rule derived from a jurisdiction's defectiveness operational rule. Prior to this development, state of the art typically was raised as the plaintiff

126. 484 So.2d at 119.

127. *In re Asbestos Litigation*, 829 F.2d 1233 (3d Cir. 1987), *cert. den.* 485 U.S. 1029, 99 L.Ed.2d 901, 108 S.Ct. 1586 (1988).

128. *See also Feldman* 479 A.2d at 388:

We note, in passing, that, although not argued and determined in *Beshada*, there were or may have been data and other information generally available, aside from scientific knowledge, that arguably could have alerted the manufacturer at an early stage in the distribution of its product to the dangers associated with its use.

129. *Halphen v. Johns-Manville Sales Corp.*, 484 So.2d 110 (La. 1986), *rev'd in part* LA. Rev. Stat. Ann. § 9:2800.59 (West Supp. 1989).

130. *See, e.g., Valenti v. Surgiteck-Flash Medical Engineering Corp.*, 875 F.2d 466, 468 (5th Cir. 1989) (applying the law of Louisiana) (assumed rationale was the reduction of the costs of asbestos litigation).

131. *Halphen*, 484 So.2d at 114.

132. *Id.*, 484 So.2d at 114 "The fact that a risk or hazard related to the use of a duct was not discoverable under existing technology or that the benefits appeared greater than they actually were are both irrelevant."

attempted to exclude certain types of defensive evidence.¹³³ That escalated into a defence interest in an advantageous instruction based on state of the art,¹³⁴ a defence interest that typically has been turned back at the instruction conference.¹³⁵ The process language favored by defendants has not been lost on state legislatures or judges ambivalent to the products liability allocation model. It should be no surprise that legislatures which have "reformed" their products liability law frequently have translated prior semantic inexactitude into doctrinal fact.¹³⁶

What is surprising is the quite dramatic effect that the complexities of state of the art and its allocational possibilities have had on courts apparently once committed to a strict liability allocation model. In design defect cases, the relatively long-standing risk-utility operational rule has been an effective barrier to serious retrenchment from the strict liability allocation model, although dubious claims of the relevance of industry practice and industry standards to the capability issue persist. The state of the art issue in warning cases should have engendered a re-assessment of the suitability of the adequacy operational rule and, possibly, a fine-tuning of the allocation model through the introduction of additional operational rules. Instead, acknowledgment of the challenging issues posed has been followed by an intellectually dissatisfying stampede back to the clutches of a negligence-based allocation model.

133. *See, e.g., Lewis v. Coffing Hoist Div., Duff-Norton Co., Inc.*, 515 Pa. 334, 528 A.2d 590, 594 (1987) ("It is well established that a trial court should exclude evidence which has a tendency to distract the jury from its main inquiry or confuse the issue").

134. *See, e.g., Beshada v. Johns-Manville Products Corp.*, 90 N.J. 191, 447 A.2d 539, 543-545 (1982).

135. *See Boitland of Houston, Inc. v. Bailey*, 609 S.W.2d 743, 749 n.3 Tex. 1980), admitting evidence of industry capability as discussed at text accompanying note 59, *infra*, yet noting:

This opinion, insofar as it holds that certain evidence of the state of the art is admissible on the issue of defectiveness in product design cases, is not intended to suggest that such evidence constitutes a defence, such as do misuse and assumption of the risk. Nor does evidence of the state of the art entitle the defendant to a defensive issue inquiring whether it complied with the state of the art at the time of manufacture. *See also Dreiling v. General Electric Co.*, 511 F.2d 768, 776 n.9 (5th Cir. 1975); *Smith v. Minster Mach. Co.*, 669 F.2d 628, 633 (10th Cir. 1982); *Beshada*, note 134, *supra* at 546: "A state-of-the-art defence would . . . [require] plaintiffs to prove at least that knowledge of the dangers was scientifically available at the time of manufacture" (emphasis added).

136. *See, e.g., Colo. Rev. Stat. § 13-21-403(1)(a)(b)* (compliance with industry capability creates rebuttable presumption of non defectiveness); *Ind. Code § 33-1-1.5-4* (broadly stated state of the art affirmative defence); *Neb. Rev. Stat. § 25-21,182* (1985) (compliance with "the best technology reasonably available at the time" labelled a "defence"); *Mo. Rev. Stat. § 537.764* (1988) (industry unknowability and undiscoverability an affirmative defence in warning cases). *See also La. Rev. Stat. Ann. § 9:2800.59* (West Supp. 1989). *Cf. Colo. Rev. Stat. § 13-21-404* (1989) (makes inadmissible certain types of offensive industry capability evidence); § 13-21-403(2) (1989) (noncompliance with regulatory standard creates rebuttable presumption of defectiveness).

See generally Note, Product Liability Reform Proposals: The State of the Art Defence, 43 Alb. L.Rev. 941(1979); *Heath v. Sears, Roebuck & Co.*, 123 N.H. 512, 464 A.2d 288, 298-99 (1983) (industry unknowability state of the art provision held constitutional in itself but not severable from general products liability reform statute).