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Meaning of Defect in Products Liability Law-A Review of Basic Principles, The

W. Page Keeton

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THE MEANING OF DEFECT IN PRODUCTS LIABILITY LAW— A REVIEW OF BASIC PRINCIPLES

W. Page Keeton*†

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I. KEEPING UP WITH TECHNOLOGY

The United States, Japan, and the Common Market countries, among other advanced and industrialized societies of the modern world, have been confronted with an unparalleled profusion of new products resulting from seventy-five years of advances in technology and scientific know-how

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†The following is adapted from a speech given by Professor Keeton at the University of Missouri-Columbia School of Law on March 19, 1980, as the Adler Foundation Lawyer-in-Residence Lecture. With the speaker's assistance, the editors have restructured the speech given in Professor Keeton's colloquial style into article form. Footnotes have also been added by the editors and Professor Keeton. The editors realize that there is a risk of losing emphasis and context by reorganizing a presentation which can best be described as "vintage Keeton" into an article for publication. With the assistance of Professor Keeton, however, the editors feel that such loss has been kept to a minimum.

Although some of the material contained within the text of Professor Keeton's speech has been previously published, *see* note 1 *infra*, the editors believe that the following is a useful review of basic principles in products liability law. Additionally, Professor Keeton takes a new and fresh approach to some of the issues discussed. One point in particular is his discussion of the "state of the art."

Readers who desire to pursue Professor Keeton's analysis and theories in greater detail are referred to the following materials: P. KEETON & R. KEETON, *CASES AND MATERIALS ON THE LAW OF TORTS* (1971); Keeton, *Manufacturer's Liability: The Meaning of "Defect" in the Manufacture and Design of Products*, 20 SYRACUSE L. REV. 559 (1969); Keeton, *Product Liability and the Automobile*, 9 FORUM 1 (1973); Keeton, *Product Liability and the Meaning of Defect*, 5 Sr.

that have exceeded those which occurred in all the preceding history of the human race.¹ We probably have not seen anything yet to compare with what we will see in the way of future technological advances in the world. As a motto on the Museum of Natural History in Washington, D.C., reads, "All the past is but a prologue." If nothing else, this unrestrained technological change has been a boom to lawyers as well as an awesome challenge to the legal profession.

One result of this proliferation of new products has been the great growth of new categories and dimensions of injuries, attributable to a variety of damaging events, that we did not know existed when the law began its development in the nineteenth century. Previously unknown dangers such as traffic accidents, airplane accidents, workplace accidents with machinery, home accidents with appliances, and medical mishaps with drugs are now commonplace. For example, 20,000,000 Americans are injured each year in their homes with consumer products. Of those injured, 30,000 are killed and 110,000 are permanently disabled.² Another 7,000,000 are injured in work-related accidents.³

This proliferation of products has created two serious problems for the social order. The first is that of accident prevention.⁴ The second is that of allocating the costs of accidents after they occur.⁵

MARY'S L.J. 30 (1973); Keeton, *Products Liability—Design Hazards and the Meaning of Defect*, 10 CUM. L. REV. 293 (1979); Keeton, *Products Liability—Drugs and Cosmetics*, 25 VAND. L. REV. 131 (1972); Keeton, *Products Liability—Inadequacy of Information*, 48 TEX. L. REV. 398 (1970); Keeton, *Products Liability—Liability Without Fault and the Requirement of a Defect*, 41 TEX. L. REV. 855 (1963); Keeton, *Products Liability—Problems Pertaining to Proof of Negligence*, 19 SW. L.J. 26 (1965); Keeton, *Products Liability—Proof of the Manufacturer's Negligence*, 49 VA. L. REV. 675 (1963); Keeton, *Products Liability—Some Observations About Allocation of Risks*, 64 MICH. L. REV. 1329 (1966); Keeton, *Products Liability—The Nature and Extent of Strict Liability*, 1964 U. ILL. L.F. 693; Keeton, *Some Observations About the Strict Liability of the Maker of Prescription Drugs: The Aftermath of MER/29*, 56 CALIF. L. REV. 149 (1968).

1. Professor Keeton's March speech at the University of Missouri-Columbia parallels his most recent law review article, *Products Liability—Design Hazards and the Meaning of Defect*, 10 CUM. L. REV. 293 (1979). While the *Missouri Law Review* editors have provided footnotes to Professor Keeton's speech in order to furnish the reader with a solid foundation for further investigation of the points discussed, the reader is referred to the *Cumberland Law Review* article for a well developed explanation of many of the same issues.

2. A. WEINSTEIN, A. TWERSKI, H. PIEKLER & W. DONAHER, *PRODUCTS LIABILITY AND THE REASONABLY SAFE PRODUCT: A GUIDE FOR MANAGEMENT, DESIGN, AND MARKETING* § 3 (1978).

3. *Id.*

4. The reduction of the incidence of harm resulting from unsafe products is often given as a justification for the imposition of liability without fault on the manufacturer and retailer. See *Escola v. Coca-Cola Bottling Co.*, 24 Cal. 2d 453, 460, 150 P.2d 436, 439-40 (1944); *Jacob E. Decker & Sons v. Capps*, 139 Tex. 609, 612-13, 164 S.W.2d 828, 829-30 (1942); Prosser, *The Assault Upon the Citadel (Strict Liability to the Consumer)*, 69 YALE L.J. 1099, 1119 (1960). For a discussion of the fallacies of this reasoning, see Keeton, *Products Liability—Some Observations About Allocation of Risks*, 64 MICH. L. REV. 1329, 1333 (1966).

5. Costs of product accidents are generally placed upon the manufacturer. The principal reason given for shifting losses from consumers to manufacturers is

Accident prevention has been directly attacked in this country, especially in the last fifteen or twenty years, through government regulation of standards for products that we buy,⁶ and government regulation of the conditions under which products are made and sold.⁷ While we have experienced this host of government regulations to prevent accidents, there has also been a great revolution in the law dealing with the allocation of the cost of accidents.

Until about thirty years ago, recovery on behalf of those victimized in society was obtainable primarily against those who misused products.⁸ A theory of negligence or fault generally provided the exclusive basis for this recovery.⁹ Occasionally, but only occasionally, claims were successfully maintained against product manufacturers and retailers.¹⁰ This most likely occurred when a damaging event was proven to be attributable to negligence in the sale of a product with a flaw therein,¹¹ or when there had been some kind of miscarriage in the construction process, as in the celebrated

that those engaged in the manufacturing process have the capacity to distribute the losses of a few among many purchasers. The assumption is that the manufacturer can shift losses to consumers by charging higher prices for its products. See *Greenman v. Yuba Power Prods., Inc.*, 59 Cal. 2d 57, 63-64, 377 P.2d 897, 901, 27 Cal. Rptr. 697, 701 (1962); *Suvada v. White Motor Co.*, 51 Ill. App. 2d 318, 325, 201 N.E.2d 313, 317 (1964); *Henningsen v. Bloomfield Motors, Inc.*, 32 N.J. 358, 370-74, 161 A.2d 69, 76-78 (1960); *Goldberg v. Kollsman Instrument Corp.*, 12 N.Y.2d 432, 437, 191 N.E.2d 81, 83, 240 N.Y.S.2d 592, 595 (1963); *Price v. Gatlin*, 241 Or. 315, 317, 405 P.2d 502, 503 (1965). See generally Calabresi, *Transaction Costs, Resource Allocation and Liability Rules—A Comment*, 11 J.L. & Econ. 67 (1968); Coase, *The Problem of Social Cost*, 3 J.L. & Econ. 1 (1960); Keeton, *supra* note 4; Ruud, *Manufacturer's Liability for Representations Made by Their Sales Engineers to Subpurchasers*, 8 U.C.L.A. L. REV. 251 (1961).

6. See, e.g., 15 U.S.C. § 1193 (1976) (flammability standards); 15 U.S.C. §§ 1391-1420 (1976) (motor vehicle safety standards); 15 U.S.C. §§ 1421-1426 (1976) (tire safety standards); 15 U.S.C. §§ 1471-1476 (1976) (packaging of household substances for protection of children).

7. See, e.g., 15 U.S.C. § 1232 (1976) (new car sticker information); 15 U.S.C. §§ 1331-1340 (1976) (cigarette labeling and advertising); 15 U.S.C. § 1421 (1976) (labeling for pneumatic tires); 15 U.S.C. § 1451-1461 (1976) (fair packaging and labeling); 21 U.S.C. § 16 (1976) (false labeling on food or dairy products); 21 U.S.C. § 343 (1976) (misbranded food).

8. See generally Keeton, *Manufacturer's Liability: The Meaning of "Defect" in the Manufacture and Design of Products*, 20 SYRACUSE L. REV. 559 (1969); Keeton, *Products Liability—Liability Without Fault and the Requirement of a Defect*, 41 TEX. L. REV. 855 (1963); Keeton, *Products Liability—Proof of the Manufacturer's Negligence*, 49 VA. L. REV. 675 (1963).

9. See *Brown v. Kendall*, 60 Mass. (6 Cush.) 292, 295-96 (1850); Keeton, *supra* note 4, at 1330.

10. See, e.g., *Boeing Airplane Co. v. Brown*, 291 F.2d 310 (9th Cir. 1961) (defect in airplane component); *Evangelio v. Metropolitan Bottling Co.*, 339 Mass. 177, 158 N.E.2d 342 (1959) (bottle of carbonated beverage exploded); *Comstock v. General Motors Corp.*, 358 Mich. 163, 99 N.W.2d 627 (1959) (defective brakes); *Standard Motor Co. v. Blood*, 380 S.W.2d 651 (Tex. Civ. App. 1964) (defective braking system).

11. See generally *Vandermark v. Ford Motor Co.*, 61 Cal. 2d 256, 391 P.2d 168, 37 Cal. Rptr. 896 (1964); *Comstock v. General Motors Corp.*, 358 Mich. 163, 99 N.W.2d 627 (1959).

MacPherson case.¹² In that case, there was a *flaw* in the product, rather than a *design hazard*.¹³ In *MacPherson*, the flaw was in the wheel of an automobile.¹⁴ But *MacPherson* was a unique development for its time and such claims against a manufacturer, even as regarding flaws, were rare.

During the last twenty years, however, due in part to a more sophisticated approach by the trial bar to allocate the cost of damaging events,¹⁵ and in part to changes in the substantive law relating to the liability of those who are in the business of supplying products for the use of others,¹⁶ claims *made* and claims *paid* against suppliers have increased dramatically.¹⁷ A large part of these claims have been based on events resulting from the way products are *designed*, and not simply as a result of *flaws* attributable to miscarriages in the manufacturing process.¹⁸ This revolution in the law has been spearheaded by the judiciary, not the legislatures.¹⁹ In fact,

12. *MacPherson v. Buick Motor Co.*, 217 N.Y. 382, 111 N.E. 1050 (1916). Other cases predicating liability upon defective products resulting from a miscarriage in the manufacturing process are: *Putnam v. Erie City Mfg. Co.*, 338 F.2d 911 (5th Cir. 1964) (defective fork stem of wheelchair); *Gottsdanker v. Cutter Labs.*, 182 Cal. App. 2d 602, 6 Cal. Rptr. 320 (1960) (live virus in polio vaccine); *Noonan v. Buick Co.*, 211 So. 2d 54 (Fla. Dist. Ct. App. 1968) (seat not secured to floor of car); *Townsend v. Cleve Heyl Chevrolet-Buick, Inc.*, 318 So. 2d 618 (La. Ct. App. 1975) (bolt worked loose or failed); *Campbell Soup Co. v. Dusek*, 242 Miss. 450, 135 So. 2d 414 (1961) (piece of metal in soup); *Goldberg v. Kollman Instrument Corp.*, 12 N.Y.2d 432, 191 N.E.2d 81, 240 N.Y.S.2d 592 (1963) (defective altimeter in airplane); *Griggs Canning Co. v. Josey*, 139 Tex. 623, 164 S.W.2d 835 (1942) (contaminated spinach); *Shamrock Fuel Oil & Sales Co. v. Tunks*, 406 S.W.2d 483 (Tex. Civ. App. 1966) (adulterated kerosene exploded at low flash point).

13. 217 N.Y. at 390-91, 111 N.E. at 1053.

14. *Id.* at 385, 111 N.E. at 1051.

15. See Keeton, *supra* note 1, at 294 n.5.

16. See Keeton, *Product Liability and the Meaning of Defect*, 5 ST. MARY'S L.J. 30, 33 (1973) ("The change in the substantive law . . . has been from fault to defect."). See generally Keeton, *Products Liability—Liability Without Fault and the Requirement of a Defect*, 41 TEX. L. REV. 855 (1963); Owen, *Rethinking the Policies of Strict Products Liability*, 33 VAND. L. REV. 681 (1980).

17. See Keeton, *supra* note 1, at 294 n.7.

18. See, e.g., *Passwaters v. General Motors Corp.*, 454 F.2d 1270 (8th Cir. 1972) (unshielded metal flanges on wheel cover); *Larsen v. General Motors Corp.*, 391 F.2d 495 (8th Cir. 1968) (defective steering assembly in automobile); *Cronin v. J.B.E. Olson Corp.*, 8 Cal. 3d 121, 501 P.2d 1153, 104 Cal. Rptr. 433 (1972) (fragile metal hasp holding cargo in delivery truck); *Self v. General Motors Corp.*, 42 Cal. App. 3d 1, 116 Cal. Rptr. 575 (1974) (fuel tank on station wagon defectively designed); *Westinghouse Elec. Corp. v. Nutt*, 407 A.2d 606 (D.C. 1979) (lack of toe guard on elevator); *Hancock v. Paccar, Inc.*, 204 Neb. 468, 283 N.W.2d 25 (1979) (automobile bumper of insufficient strength); *Suter v. San Angelo Foundry & Mach. Co.*, 81 N.J. 150, 406 A.2d 140 (1979) (failure to install rotary guard on sheet-metal rolling machine); *Wilson v. Piper Aircraft Corp.*, 282 Or. 411, 579 P.2d 1287 (1978) (failure to use fuel-injected engine); *Young v. Tide Craft, Inc.*, 270 S.C. 453, 242 S.E.2d 671 (1978) (absence of kill switch in motorboat); *Lamon v. McDonnell Douglas Corp.*, 19 Wash. App. 515, 576 P.2d 426 (1978) (lack of spring device on airplane escape hatch).

19. See Keeton, *supra* note 4, at 1330. See generally Henderson, *Renewed Judicial Controversy Over Defective Product Design: Toward the Preservation of an Emerging Consensus*, 63 MINN. L. REV. 773 (1979); Keeton, *Creative Continuity*

legislators have responded with a counterrevolution, a development to which I, as a supporter of most of the revolutionary changes herein discussed, do not subscribe. This counterrevolution, taking place in Congress and in the state legislatures, focuses on efforts to undo what the courts have done;²⁰ the belief being that liability has expanded beyond what society can afford.²¹

It is not yet possible to fully assess the impact of this counterrevolution. It is more important for now to discuss the revolution which has occurred in this area of the law and to formulate direction for new developments consistent with these innovative changes.

II. BASES FOR PRODUCTS LIABILITY

Presently there are two systems for liability under our legal structures: one applicable to those who supply products for the use of others, and one applicable to those who use products. Prior to 1960, recovery was sometimes available against the merchant-seller or manufacturer of a "defectively dangerous product" pursuant to a so-called contract-warranty theory or a tort-negligence theory.²²

A person who was physically harmed seldom recovered, however, on contract-warranty theory because of two obstacles. The first obstacle resulted from the fact that under contract law it was recognized that a party to the contract could disclaim all warranty obligations,²³ could limit the duration of those warranty obligations,²⁴ and could limit the remedy for those warranty obligations, such as agreeing only to replace defective

in the Law of Torts, 75 HARV. L. REV. 463 (1962); Owen, *supra* note 16. For a discussion of the development of tort law leading up to strict liability, see *Daly v. General Motors Corp.*, 20 Cal. 3d 725, 731-33, 575 P.2d 1162, 1165-66, 144 Cal. Rptr. 380, 383-84 (1978).

20. See generally Keeton, *supra* note 1; Prosser, *supra* note 4.

21. While not participating in this counterrevolution, Professor Keeton has recognized that "[s]hifting losses . . . in every situation would be an arbitrary process, and it would involve a net loss to society because of the economic and sociological costs of adjudications." Keeton, *Products Liability—The Nature and Extent of Strict Liability*, 1964 U. ILL. L.F. 693, 693 (footnote omitted). See also Keeton, *Products Liability—Inadequacy of Information*, 48 TEX. L. REV. 398, 401-02 (1970); R. Keeton & O'Connell, *Basic Protection—A Proposal for Improving Automobile Claims Systems*, 78 HARV. L. REV. 329, 330-31 (1964).

22. See, e.g., *Crystal Coca-Cola Bottling Co. v. Cathey*, 83 Ariz. 163, 317 P.2d 1094 (1957) (warranty theory); *Escola v. Coca-Cola Bottling Co.*, 24 Cal. 2d 453, 150 P.2d 436 (1944) (tort-negligence theory); *Worley v. Proctor & Gamble Mfg. Co.*, 241 Mo. App. 1114, 253 S.W.2d 532 (St. L. 1952) (upholding validity of warranty theory but reversing consumer's verdict on causation grounds); *Madouros v. Kansas City Coca-Cola Bottling Co.*, 230 Mo. App. 275, 90 S.W.2d 445 (K.C. 1936) (warranty theory); *Henningesen v. Bloomfield Motors, Inc.*, 32 N.J. 358, 161 A.2d 69 (1960) (warranty theory); *MacPherson v. Buick Motor Co.*, 217 N.Y. 382, 111 N.E. 1050 (1916) (tort-negligence theory).

23. See Keeton, *Manufacturer's Liability: The Meaning of "Defect" in the Manufacture and Design of Products*, 20 SYRACUSE L. REV. 559, 560 (1969).

24. See *id.*

parts.²⁵ Under warranty law, the parties were free to contract out all liability for harm resulting from defective products because of notions about "freedom of contract."²⁶

The second obstacle to recovery, which could be even more profound for those victimized by dangerous products, was that under contract law only those who were privy to a contract of purchase or sale could recover for breach of warranty.²⁷ Thus, a manufacturer was virtually immune from all responsibility because he seldom sold his product directly to the people who were victimized by the product.²⁸ These two obstacles to recovery virtually made contract law a worthless remedy in products cases.²⁹

There were also two serious obstacles to recovery on a tort-negligence theory. One was the difficulty of proving negligence in a products liability case. In some situations, such as with traffic accidents, it is not too difficult to prove existing negligence. But even when negligence is present in defective products cases, the job of proving it can be quite difficult.³⁰

Another serious obstacle to recovery on a tort-negligence theory was that, at least prior to 1960, the defendant could satisfy any duty of care that he owed as regards design hazards by warning about nonobvious dangers.³¹ No recovery was allowed for harm resulting from an obvious

25. See *id.* The Uniform Commercial Code contained a specific provision allowing a seller to disclaim both express and implied warranties. U.C.C. § 2-316 (1966 version).

26. See generally Keeton, *Products Liability—Proof of the Manufacturer's Negligence*, 49 VA. L. REV. 675 (1963).

27. See Keeton, *supra* note 23, at 560. The first reported case to extend liability of the seller beyond those in privity was *Mazetti v. Armour & Co.*, 75 Wash. 622, 135 P. 633 (1913). Almost fifty years later the landmark case of *Henningsen v. Bloomfield Motors, Inc.*, 32 N.J. 358, 161 A.2d 69 (1960), eliminated privity of contract, in a marketing sense, as a limitation for recovery on a warranty theory. *Accord*, *Drayton v. Jiffee Chem. Corp.*, 591 F.2d 352 (6th Cir. 1978) (breach of warranty coupled with physical injury); *Inglis v. American Motors Corp.*, 3 Ohio St. 2d 132, 209 N.E.2d 583 (1965) (express warranty); *Rogers v. Toni Home Permanent Co.*, 167 Ohio St. 244, 147 N.E.2d 612 (1958) (false safety warnings). *Cf.* *Allied Aviation Fueling Co. v. Dover Corp.*, 287 N.W.2d 657 (Minn. 1980) (buyer with knowledge of alleged defect and means to correct it could not recover economic loss on a strict liability theory); *Vetovitz Bros. v. Kenny Constr. Co.*, 60 Ohio App. 2d 331, 397 N.E.2d 412 (1978) (where no privity, no recovery for economic loss under either express or implied warranty).

28. See Keeton, *supra* note 23, at 560.

29. See *id.*

30. See *id.* See generally *Ashe, So You're Going to Try a Products Liability Case*, 13 HASTINGS L.J. 66 (1961); articles cited note 8 *supra*.

31. *Messina v. Clark Equip. Co.*, 263 F.2d 291, 292-93 (2d Cir. 1959); *Campo v. Scofield*, 301 N.Y. 468, 472, 95 N.E.2d 802, 804 (1950) (*Campo* was overruled in *Micallef v. Miehle Co.*, 39 N.Y.2d 376, 348 N.E.2d 571, 384 N.Y.S.2d 115 (1976)). *But see* *Wright v. Massey-Harris, Inc.*, 68 Ill. App. 2d 70, 215 N.E.2d 465 (1966) (no safety shield in obvious place on cornpicker—recovery permitted); *Stenberg v. Beatrice Foods Co.*, 576 P.2d 725 (Mont. 1978) (no safety shield on grain auger—judgment for manufacturer reversed); *Palmer v. Massey-Ferguson, Inc.*, 3 Wash. App. 508, 476 P.2d 713 (1970) (no safety guard on hay bailer drawbar—recovery permitted).

For a discussion of the manufacturer's duty to warn, see generally *Dillar & Hart, Products Liability: Directions for Use and the Duty to Warn*, 41 VA. L. REV.

hazard.³² If the danger or defect was latent, the duty of care could be satisfied by warning about it.³³ There are many cases prior to 1960 where the jury was entrusted with evaluating design hazards, but nearly all of them are failure to warn cases.³⁴ The basic theory was that if the purchaser knew what he was buying in terms of the risk or hazard, then the manufacturer had fulfilled his duty under the law.³⁵

Today, however, in nearly all states, the supplier (merchant-seller or manufacturer) of a product that was defective and unreasonably dangerous at the time possession was surrendered is subject to liability without proof of negligence to all those to whom harm is likely to result from the kind of defect that is established.³⁶ As I have expressed the matter for some years, the product must be defective as marketed.³⁷ It can be defective as marketed for one of three reasons.

First, the product can be defective as marketed because of a *flaw*. Courts will often use the term "construction defect" to refer to what is best characterized as a flaw. Flaws can develop in the marketing process, as distinguished from the construction process. For example, when bottles are cracked as a result of mishandling and an explosion results, the flaw

145 (1955); Noel, *Manufacturer's Negligence of Design or Directions for Use of a Product*, 71 YALE L.J. 816 (1962).

32. A similar limitation on recovery is presently used in many jurisdictions. See RESTATEMENT (SECOND) OF TORTS § 388, Comment k (1965). See also *Messina v. Clark Equip. Co.*, 263 F.2d 291 (2d Cir. 1959) (liability limited to hidden defects and concealed dangers); *Schemel v. General Motors Corp.*, 384 F.2d 802 (7th Cir. 1967), *cert. denied*, 390 U.S. 945 (1968) (no duty to warn about automobile's capability for excessive speeds) (*Schemel*, insofar as it relied on *Evans v. General Motors Corp.*, 359 F.2d 822 (7th Cir.), *cert. denied*, 385 U.S. 836 (1966), was overruled in *Huff v. White Motor Corp.*, 565 F.2d 104 (7th Cir. 1977)); *Sowles v. Urschel Labs., Inc.*, 595 F.2d 1361 (8th Cir. 1979) (no duty to warn of obvious danger); *Murphy v. Cory Pump & Supply Co.*, 47 Ill. App. 2d 382, 197 N.E.2d 849 (1964) (obvious that no guard was in front of lawnmower blades).

33. See cases cited note 31 *supra*.

34. See, e.g., *National Pressure Cooker Co. v. Stroeter*, 50 F.2d 642, 644 (7th Cir.), *cert. denied*, 284 U.S. 674 (1931). See generally cases cited in Annot., 76 A.L.R.2d 9 (1961). For post-1960 decisions which also made use of the failure to warn theory, see *Land O' Lakes Creameries, Inc. v. Hungerholt*, 319 F.2d 352 (8th Cir. 1963); *Toole v. Richardson-Merrell, Inc.*, 251 Cal. App. 2d 689, 60 Cal. Rptr. 398 (1967); *La Plant v. E.I. DuPont DeNemours & Co.*, 346 S.W.2d 231 (Mo. App., Spr. 1961).

35. See generally Keeton, *Products Liability—Inadequacy of Information*, 48 TEX. L. REV. 398 (1970).

36. A landmark case in the development of strict liability recovery is *Greenman v. Yuba Power Prods., Inc.*, 59 Cal. 2d 57, 377 P.2d 897, 27 Cal. Rptr. 697 (1962). See generally RESTATEMENT (SECOND) OF TORTS § 402A (1965); Prosser, *supra* note 4.

Missouri abandoned the restrictive rule of privity of contract under an implied warranty theory in *Morrow v. Caloric Appliance Corp.*, 372 S.W.2d 41 (Mo. En Banc 1963).

37. See Keeton, *Product Liability and the Meaning of Defect*, 5 ST. MARY'S L.J. 30, 33 (1973) ("The plaintiff is no longer required to impugn the maker, but he is required to impugn the product. Simply stated, the product must be defective as marketed . . ."); Keeton, *Products Liability—Liability Without Fault and the Requirement of a Defect*, 41 TEX. L. REV. 855, 858 (1963).

is in the marketing process, not the construction process. A flaw in a product is defined as an abnormality or a condition that was unintended, and makes the product more dangerous than it would have been as intended.³⁸ This is a very important definition even though it often requires drawing a difficult line or making a hard distinction.

An example of a flaw under this definition would be the rotten wood in the wheel in *MacPherson*.³⁹ Other examples are a bubble in a tire that causes it to blow out,⁴⁰ an "uningredient" in a drug that causes it to be toxic and poisonous,⁴¹ broken glass in a bottle of Coca-Cola,⁴² or a decomposed mouse in the bottom of a bottle of Coca-Cola.⁴³ A flaw is unreasonably dangerous per se, *i.e.*, to recover, a plaintiff need not prove anything more than a flaw in the product which caused the accident.⁴⁴

Second, a product may be defective as marketed because of a *failure to adequately warn*, or a failure to use proper means to warn about a risk or hazard related to the way the product was designed.⁴⁵ Although this begins to involve design hazards, liability is imposed on the ground that the seller or manufacturer failed adequately to warn about some risk or hazard, or failed adequately to instruct about how to avoid the risk or harm. Under this approach, the product is allegedly defective as marketed because of the failure to properly present it to purchasers and users.

Notwithstanding what some courts have said,⁴⁶ in establishing this ground of recovery, the plaintiff in most states must prove negligence in the failure to warn properly.⁴⁷ There will be no liability in these cases

38. See Keeton, *supra* note 1, at 297.

39. *MacPherson v. Buick Motor Co.*, 217 N.Y. 382, 111 N.E. 1050 (1916).

40. *McLean v. Goodyear Tire & Rubber Co.*, 85 F.2d 150 (5th Cir.), *cert. denied*, 299 U.S. 600 (1936).

41. *Reyes v. Wyeth Labs.*, 498 F.2d 1264 (5th Cir.), *cert. denied*, 419 U.S. 1096 (1974).

42. *Coca-Cola Bottling Works v. Lyons*, 145 Miss. 876, 111 So. 305 (1927).

43. *Paul v. Rodgers Bottling Co.*, 183 Cal. App. 2d 680, 6 Cal. Rptr. 867 (1960).

44. See generally Keeton, *Product Liability and the Meaning of Defect*, 5 ST. MARY'S L.J. 30 (1973); Owen, *supra* note 16; Wade, *Strict Tort Liability of Manufacturers*, 19 Sw. L.J. 5 (1965).

45. See *Palmer v. Avco Distrib. Corp.*, 75 Ill. App. 3d 598, 603-04, 394 N.E. 2d 480, 484-85 (1979); *Owens v. Allis-Chalmers Corp.*, 83 Mich. App. 74, 81, 268 N.W.2d 291, 294 (1978); *Dover Corp. v. Perez*, 587 S.W.2d 761, 765 (Tex. Civ. App. 1979); *Haugen v. Minnesota Mining & Mfg. Co.*, 15 Wash. App. 379, 387, 550 P.2d 71, 76-77 (1976).

46. See, *e.g.*, *Teagle v. Fischer & Porter Co.*, 89 Wash. 2d 149, 155, 570 P.2d 438, 442 (1977) (failure to warn can be a "defect").

47. See generally *Parke-Davis & Co. v. Stromsodt*, 411 F.2d 1390 (8th Cir. 1969); *Sterling Drug, Inc. v. Yarrow*, 408 F.2d 978 (8th Cir. 1969); *Tinnerholm v. Parke, Davis & Co.*, 285 F. Supp. 432 (S.D.N.Y. 1968), *modified*, 411 F.2d 48 (2d Cir. 1969); *Rumsey v. Freeway Manor Minimax*, 423 S.W.2d 387 (Tex. Civ. App. 1968); *Dillar & Hart*, *supra* note 31; Keeton, *supra* note 35; Noel, *supra* note 31; Noel, *Products Defective Because of Inadequate Directions or Warnings*, 23 Sw. L.J. 256 (1969); Noel, *Recent Trends In Manufacturer's Negligence as to Design, Instructions or Warnings*, 19 Sw. L.J. 43 (1965). See also notes 31-35 and accompanying text *supra*.

without a showing that the defendant knew or should have known of the risk or hazard about which he failed to warn. Moreover, there will be no liability unless the seller or manufacturer failed to take the precautions that a reasonable person would take in presenting the product to the public.⁴⁸

Although this ground of recovery is sometimes referred to as strict liability,⁴⁹ it is really nothing more than a ground of negligence liability better described as the sale of a product in a defective condition. For example, in *Moran v. Williams*,⁵⁰ a bottle of cologne contained an ingredient which was pleasantly scented, but highly inflammable. A group of teenage children were having a good time after a party and decided that a few burning candles would be improved if they gave off nice odors. The teenagers poured the cologne on the lighted candles. One of the teenagers was seriously burned and disfigured as a consequence. The product, as designed, was not defective per se, but there was no warning about the inflammability of the cologne. A good warning would have prevented liability.⁵¹

This is a difficult problem for manufacturers because there is hardly any warning that could not be improved. The plaintiff nearly always can allege with some certainty that the warning could have been made better. On the other hand, if you had warnings to take care of all the risks in products, you would have two or three pages that no one would read, *i.e.*, the warning that goes into too much detail would be counterproductive. Probably the best warning for the cologne in *Moran v. Williams* would have been printed in large letters as follows: HIGHLY INFLAMMABLE. DON'T GET NEAR FLAMES.⁵²

Finally, a product may be defective as marketed because of a *defective design*. There has been great confusion, controversy, and uncertainty among judges and commentators with respect to the scope of liability for harm flowing from hazards attributable to the way products are designed.⁵³ Appellate judges have often been imprecise and vague in their opinions about the standards for evaluation of product designs and about the respective functions of judge and jury in determining whether the

48. See, *e.g.*, *Torrogrossa v. Towmotor Co.*, 44 N.Y.2d 709, 376 N.E.2d 920, 405 N.Y.S.2d 448 (1978) (no liability for absence of warning about careful driving).

49. See Keeton, *supra* note 23, at 563; Keeton, *supra* note 35, at 399-412.

50. 19 Md. App. 546, 313 A.2d 527 (1974).

51. See, *e.g.*, *Teagle v. Fischer & Porter Co.*, 89 Wash. 2d 149, 155, 570 P.2d 438, 442 (1977) (product may be flawless but still not reasonably safe without adequate warning).

52. See generally Dillar & Hart, *supra* note 31; Keeton, *supra* note 35; Noel, *supra* note 31; Noel, *Products Defective Because of Inadequate Directions or Warnings*, 23 Sw. L.J. 256 (1969); Noel, *Recent Trends In Manufacturer's Negligence as to Design, Instructions or Warnings*, 19 Sw. L.J. 43 (1965).

53. See generally Carsey, *What Constitutes a Design Defect in Products Liability Cases*, 21 FED'N INS. COUNSEL Q. 107 (1970); Henderson, *Design Defect Litigation Revisited*, 61 CORNELL L. REV. 541 (1976); Keeton, *supra* note 23; Keeton, *supra* note 44; Keeton, *supra* note 35.

design hazard in a product is more dangerous than it should be.⁵⁴ A large part of the difficulty regarding design hazards is a consequence of the fact that liability was originally based on a breach of warranty theory.⁵⁵ The whole notion underlying warranty was that the seller was representing something that was not true about his product, that he was misrepresenting the safety characteristics of his product.⁵⁶ These early cases held that the warranty disclaimer was unconscionable and unenforceable, and that the usual privity of contract rules would not apply.⁵⁷ A source of considerable confusion was that the language used to articulate the kind of hazardous condition that would constitute a defect for a prima facie torts claim was often the same language that was used to describe a breach of warranty claim.⁵⁸

It is imperative that a test for defectiveness of design be well reasoned and clearly articulated if this confusion is to be resolved. To that task, I now turn.

III. A TEST FOR PRODUCT DEFECTIVENESS

There are essentially two different approaches to the question of how to evaluate design hazards in determining whether or not they are more dangerous than they should be.⁵⁹ One is the so-called purchaser or consumer contemplation test, and the second is what I refer to as the danger versus utility balancing test or risk-utility test.

A. *The Consumer Contemplation Test*

Under the consumer contemplation test, and as so stated in section 402A of the Restatement (Second) of Torts, a product is defectively dangerous if it is dangerous to an extent beyond that which would be con-

54. *Cronin v. J.B.E. Olson Corp.*, 8 Cal. 3d 121, 501 P.2d 1153, 104 Cal. Rptr. 433 (1972), discussed in Keeton, *supra* note 44, at 30-32. See also Traynor, *The Ways and Meanings of Defective Products and Strict Liability*, 32 TENN. L. REV. 353, 373 (1965).

55. Tort and warranty theories still often arise under the same fact situations. See, e.g., *Greenman v. Yuba Power Prods., Inc.*, 59 Cal. 2d 57, 377 P.2d 897, 27 Cal. Rptr. 697 (1962); *Mendel v. Pittsburgh Plate Glass Co.*, 25 N.Y.2d 340, 253 N.E.2d 207, 305 N.Y.S.2d 490 (1969); *McKisson v. Sales Affiliates, Inc.*, 416 S.W.2d 787 (Tex. 1967). It is still argued by some that the two theories can be used compatibly. See, e.g., *Wininger & Lee, Breach of Warranty and Strict Liability—A Unified Approach to the Preparation and Trial of a Product Liability Case*, 3 AM. J. TRIAL ADVOCACY 29 (1979). Professor Keeton disagrees. See Keeton, *supra* note 44, at 35-36.

56. See generally *Williams v. Brown Mfg. Co.*, 45 Ill. 2d 418, 261 N.E.2d 305 (1970); *Henningsen v. Bloomfield Motors, Inc.*, 32 N.J. 358, 161 A.2d 69 (1960).

57. See generally *Crystal Coca-Cola Bottling Co. v. Cathey*, 83 Ariz. 163, 317 P.2d 1094 (1957); *Worley v. Proctor & Gamble Mfg. Co.*, 241 Mo. App. 1114, 253 S.W.2d 532 (St. L. 1952); *Madouros v. Kansas City Coca-Cola Bottling Co.*, 230 Mo. App. 275, 90 S.W.2d 445 (K.C. 1936); *Henningsen v. Bloomfield Motors, Inc.*, 32 N.J. 358, 161 A.2d 69 (1960); *Walsh v. Ford Motor Co.*, 59 Misc. 2d 241, 298 N.Y.S.2d 538 (Sup. Ct. 1969).

58. See Keeton, *supra* note 44, at 35-36.

59. See generally Keeton, *supra* note 23; Keeton, *supra* note 1; Keeton, *supra* note 44.

templated by the ordinary consumer who purchased it with the ordinary knowledge common to the community as to the product's characteristics.⁶⁰ In other words, if the product was more dangerous than the consumer contemplated in some respect, then it is defective in that respect. This test reflects the origins of strict liability, and unfortunately, those origins were rooted in contract law and were designed to deal with commercial losses. The test is a good test for dealing with commercial losses.⁶¹ It is inadequate, however, for dealing with the problem of personal injuries resulting from accidents. The warranty of merchantability was an obligation imposed on the seller to protect against intangible economic losses and commercial losses.⁶² The theory behind the warranty was that a merchant, in offering his goods for sale, was making an implied representation that his goods were fit for the ordinary purposes for which those goods were intended.⁶³

One of the difficulties with products liability law today is that the consumer contemplation test has been used repeatedly in judicial opinions. Section 402A of the Restatement (Second) of Torts and its sponsor, the American Law Institute, is much to blame for this.⁶⁴ The consumer contemplation test is inadequate as a test for defectiveness for at least three reasons.

First, under this test a victim could never recover for harm suffered as a result of a design hazard that was open or obvious, or one with respect to which the purchaser was adequately informed, because under these conditions he could not have been deceived about what he was buying. The purchaser received what he expected to buy, regardless of injurious results. This indeed has been the result reached by many courts.⁶⁵ Fortunately, however, there is a trend away from this conclusion.

60. RESTATEMENT (SECOND) OF TORTS § 402A, Comment i (1965). Section 402A reads:

(1) One who sells any product in a defective condition unreasonably dangerous to the user or consumer or to his property is subject to liability for physical harm thereby caused to the ultimate user or consumer, or to his property, if

(a) the seller is engaged in the business of selling such a product, and
(b) it is expected to and does reach the user or consumer without substantial change in the condition in which it is sold.

(2) The rule stated in Subsection (1) applies although
(a) the seller has exercised all possible care in the preparation and sale of his product, and
(b) the user or consumer has not bought the product from or entered into any contractual relation with the seller.

61. See Fischer, *Products Liability—The Meaning of Defect*, 39 Mo. L. Rev. 339, 348 (1974).

62. See Keeton, *supra* note 1, at 301-02.

63. *Id.* See generally Fischer, *supra* note 61.

64. See Keeton, *supra* note 44, at 32.

65. See, e.g., *Morocco v. Northwest Eng'r Co.*, 310 F.2d 809 (6th Cir. 1962); *May v. Allied Chlorine & Chem. Prods., Inc.*, 168 So. 2d 784 (Fla. Dist. Ct. App. 1964); *Stevens v. Durbin-Durco, Inc.*, 377 S.W.2d 343 (Mo. 1964); *Baker v. Stewart Sand & Material Co.*, 353 S.W.2d 108 (Mo. App., K.C. 1961); *Schild v. Schild*, 176 Neb. 282, 125 N.W.2d 900 (1964).

As previously discussed, on a negligence theory it was commonly held that a seller's duty could be satisfied by giving adequate warnings of risks and hazards that were not otherwise obvious.⁶⁶ The idea supporting this result was that a seller's responsibility for design hazards was satisfied so long as people knew what they were getting.⁶⁷ The manufacturer's responsibility was to see to it that the purchaser was an informed purchaser, and that satisfied his duty.⁶⁸ There are many today who still urge that judges and juries should not be attempting to determine how safely farm machinery should be designed, how safely industrial machinery should be designed, and how safely motor equipment should be designed, so long as purchasers know what they are buying.⁶⁹ That is a reasonable argument to make, but one with which I do not agree. I do not think the marketplace will give us the kind of safety that we need to have.

The idea that was behind the law, and the idea that many people now have, is that as long as the purchaser knows what he is buying, it is his responsibility in using the product to avoid accidents. But what if it just takes a few dollars more to make something safer? For example, what if a ten-thousand dollar piece of machinery is being produced and it takes only two or three hundred dollars more to prevent a number of accidents? The consumer contemplation test is inadequate for not taking into account this kind of situation. Using this test, the manufacturer is not responsible for failing to add the relatively inexpensive safety device if the purchaser knows that it does not exist and that there is a resulting danger.

Second, this test can result in the identification of products as being defectively dangerous which are clearly not.⁷⁰ For example, consider the situation where a product, such as a drug, produces a harmful side effect which was unknown by either the seller or the user.⁷¹ There is hardly any drug that does not have side effects which are unknown when it first is put on the market. So there is an unknown risk, a hazard that is not contemplated. Penicillin was that kind of a product, but it was also a great benefit to humanity. Was it a bad product? By any reasonable definition it was not, but it had a risk about it—now knowable—which made it more

66. See notes 31-35 and accompanying text *supra*.

67. See Keeton, *supra* note 35, at 400-12.

68. *Id.*

69. See *Carmen v. Eli Lilly & Co.*, 109 Ind. App. 76, 85-86, 32 N.E.2d 729, 732 (1941). Some courts have accepted the defense of assumption of the risk where the plaintiff knew the dangers of the product. See generally *McCarty v. F.C. Kingston Co.*, 22 Ariz. App. 17, 522 P.2d 778 (1974); *Williams v. Brown Mfg. Co.*, 45 Ill. 2d 418, 261 N.E.2d 305 (1970); *Collins v. Musgrave*, 28 Ill. App. 3d 307, 328 N.E.2d 649 (1975); *Keener v. Dayton Elec. Mfg. Co.*, 445 S.W.2d 362 (Mo. 1969); *Kirkland v. General Motors Corp.*, 521 P.2d 1353 (Okla. 1974); *Findlay v. Copeland Lumber Co.*, 265 Or. 300, 509 P.2d 28 (1973); *Ernest W. Hahn, Inc. v. Armco Steel Co.*, 601 P.2d 152 (Utah 1979).

70. See *General Motors Corp. v. Simmons*, 545 S.W.2d 502 (Tex. Civ. App. 1971), *rev'd*, 558 S.W.2d 855 (Tex. 1977).

71. See generally Keeton, *Products Liability—Drugs and Cosmetics*, 25 VAND. L. REV. 131 (1972).

dangerous than contemplated, and some people were victimized by this danger. The danger still exists, only now we are aware of it. One can argue that we ought to have liability in such cases, but that is a rather far-reaching argument to which I do not subscribe.

Third, there is a fallacious assumption underlying the consumer contemplation test that the ordinary purchaser knows what he is buying.⁷² In most cases, the purchaser does not have any idea about the safety or danger of what he is buying. He is generally buying on price, on beauty, and on function.

Consider the case of *Heaton v. Ford Motor Co.*⁷³ as an example. Plaintiff was injured in an accident caused by the rim of a wheel separating from the interior portion of the wheel. There was evidence at trial that a short time prior to the accident a rock about five inches in diameter hit the wheel. It was the plaintiff's theory that the wheel was defectively designed if it could not withstand the impact of the rock. The court was trying to use the consumer contemplation test, but finally realized that this test might not apply to all fact situations.⁷⁴ Thus, one major defect with the test is that sometimes consumers have no definite expectations about what they are purchasing, and in these instances the jury can only speculate as to a product's defectiveness. It is, however, possible to get expert testimony about such products as the wheel and rim to assist the jury in making a determination as to whether the product was defectively designed, an approach suggested by the court in *Heaton*.⁷⁵

In *General Motors Corp. v. Simmons*,⁷⁶ a Texas case which was decided in 1976, but which does not represent the current law in Texas,⁷⁷ the plaintiff lost his eyesight when the side window of his automobile shattered and small, dull particles of glass became lodged in his eye. The side window of the car involved in the collision was made of so-called tempered glass, as are virtually all side windows of automobiles. This kind of glass shatters, but unlike plate glass, it shatters into small, dull particles. The trial judge charged the jury pursuant to the consumer contemplation test, and the jury found for plaintiff and awarded damages of one million dollars. The appellate court upheld the verdict, reduced the damage award to five hundred thousand dollars, and concluded that "[t]here is testimony from which the jurors as reasonable persons could have concluded that

72. See generally Hubbard, *Reasonable Human Expectations: A Normative Model for Imposing Strict Liability for Defective Products*, 29 MERCER L. REV. 465 (1978); Keeton, *supra* note 44; Rheingold, *What Are the Consumer's "Reasonable Expectations"?*, 22 BUS. LAW. 589 (1967).

73. 248 Or. 467, 435 P.2d 806 (1967) (appellate court affirmed trial court's dismissal of plaintiff's suit on ground that evidence was insufficient to establish defectiveness).

74. *Id.* at 472, 435 P.2d at 808.

75. *Id.* at 473-74, 435 P.2d at 809.

76. 545 S.W.2d 502 (Tex. Civ. App. 1976), *rev'd*, 558 S.W.2d 855 (Tex. 1977).

77. 558 S.W.2d 855 (Tex. 1977), *rev'g* 545 S.W.2d 502 (Tex. Civ. App. 1976).

General Motors made a decision in designing its 1962 model cars to use tempered glass rather than laminated glass in the door windows of all cars it assembled."⁷⁸ The court went on to point out that "[t]he jury could have concluded that as a result of a slight collision the tempered glass shattered and flew about in the car with sufficient force to penetrate Mr. Simmons' eyes."⁷⁹

It is clearly true that the injury would not have been suffered had laminated glass been used. The jury apparently concluded that the tempered glass would be unknown to the ordinary user and therefore more dangerous than would be contemplated. In other words, all plaintiff had to prove was an unanticipated accident for the jury to find liability.

I called an engineer when I read this case and asked him why a manufacturer would make side windows out of tempered glass instead of laminated glass. He answered simply, "It costs a good deal less." His answer raises a very good question. How much are we willing to pay for safety features in products? The consumer contemplation test fails to take into account such factors as the cost of additional safety features, and the test is inadequate for that reason.

B. *The Risk-Utility Test*

The second test, and in my opinion the preferred test, for finding a defective design is the risk-utility test, sometimes called the danger versus utility balancing test. The theory underlying this approach is that virtually all products have both risks and benefits.⁸⁰ I propose that there is no way to go about evaluating design hazards without weighing these factors. Some form of the risk-utility approach has been adopted in recent years as the sole basis for ascertaining whether or not a product is unreasonably dangerous as designed in at least two states, Pennsylvania and Texas.⁸¹ Under the test a product is defective as designed in some aspect if a reasonable person would conclude that the magnitude of the danger-in-fact, as proved at trial, outweighs the utility of the product.⁸² In other words, if a reasonable person would conclude that the danger-in-fact in using the product outweighs the utility, then the product is defective. Please note that the test considers the danger-in-fact, not whether the manufacturer perceived the danger, because the purpose is to evaluate the product itself, not the manufacturer's conduct.

The utility of the design is affected by three important considerations. The first and most important consideration is an evaluation of the needs,

78. 545 S.W.2d at 515.

79. *Id.*

80. See Keeton, *supra* note 44, at 37-39.

81. See *Azzarello v. Black Bros.*, 480 Pa. 547, 558-59, 391 A.2d 1020, 1026-27 (1978); *Turner v. General Motors Corp.*, 584 S.W.2d 844, 850-51 (Tex. 1979).

82. See Keeton, *supra* note 44, at 37-39.

wants, or desires that are served by the product.⁸³ For example, a drug often satisfies a very important need; therefore, the mere fact that it has some side effects which are harmful does not automatically mean that the danger outweighs the great benefits. I mentioned to a student in class that cigarettes are probably the worst product on the market. I was challenged on that, and rightly so. I had overlooked the fact that many people derive considerable pleasure and satisfaction from smoking. The needs, wants, or desires that a product serves should always be taken into account in evaluating defectiveness. Even breathing has its hazards, but it has not yet been declared defective.

Second, utility of design is affected by the technological and economic feasibility, and practicability, of serving the need with alternative products.⁸⁴ For example, consider cosmetics, to which three percent of the population is allergic.⁸⁵ If you could devise a cosmetic that would serve the need just as well, to which only one percent of the people would be allergic, then one would be more likely to conclude that cosmetics as presently designed are defective products. The extent to which the needs or wants of society can be satisfied by alternative products which produce less harm is quite relevant.

Third, utility of design is affected by the technological and economic feasibility of serving society's needs with a safer product.⁸⁶ The standard meat-cutting machine could be designed with a safety device that would make it virtually impossible for a person's hand to get caught in the cutting mechanism. The device might, however, impair the usefulness and serviceability of the machine. This is certainly an important consideration in evaluating product utility. In my opinion, eighty percent of the design cases ought to be litigated on the question of whether or not it would have been feasible, technologically and economically, to do a better job in designing the product.

In essence, the risk-utility test directs the attention of attorneys, trial judges, and juries to the necessity of weighing the danger-in-fact of a particular feature of a product against its utility.⁸⁷ The only way to ascertain whether or not a design is good or bad is to inquire about the danger inherent in it and the justification for this danger.

83. *Ross v. Up-Right, Inc.*, 402 F.2d 943, 946 (5th Cir. 1968).

84. *See Keeton, supra* note 44, at 38.

85. *See H. RAPAPORT, THE COMPLETE ALLERGY GUIDE* 241 (1970) ("estimated that more than 3,000,000 Americans are allergic to cosmetics"); *H. SWARTZ, THE ALLERGY GUIDE BOOK* 111 (1961) (estimated that seven million American women are allergic to cosmetics); *R. WINTER, A CONSUMER'S DICTIONARY OF COSMETIC INGREDIENTS* 4 (1974) (one out of every ten Americans is susceptible to cosmetic allergies). *See generally Keeton, supra* note 71.

86. *See Metal Window Prods. Co. v. Magnusen*, 485 S.W.2d 355, 358 (Tex. Civ. App. 1972) (transparent glass door not defective because plaintiff aware of the danger).

87. *See generally Keeton, supra* note 1; *Keeton, supra* note 44.

IV. "STATE OF THE ART"

As can be seen by a review of the cases, the risk-utility test is not always the test used to determine liability.⁸⁸ In fact, it is often difficult to tell whether or not any particular test is used at all.⁸⁹ It, therefore, seems worthwhile to digress from my discussion on defining defectiveness and address a problem which is presently hindering litigation in the area of products liability. The problem centers around the use of the term "state of the art."

"State of the art" is a term used very frequently in products liability litigation.⁹⁰ The problem is that the term is used to mean different things at different times; the resulting confusion is not surprising. It has been urged, both in the courtroom and in legislative halls, that if a machine, drug, or any other product has been designed in conformity with the "state of the art" at the time possession was surrendered by the manufacturer, then either (1) the product should not be regarded as defective,⁹¹ or (2) if the product is found to be defective, then the manufacturer should be excused from strict liability on the ground that he conformed to the "state of the art" as best he could.⁹² The validity of this argument depends on how the term "state of the art" is used. I have perceived at least three different usages of the term.

"State of the art" has often been used to refer to the customary practices employed in designing a product. In *Gonzales v. Caterpillar Tractor Co.*,⁹³ for example, a Caterpillar tractor was designed with a step to assist the employee in getting up into the rider's seat. The problem with the step was that it became muddy when the tractor was used in wet weather. The step was the only way the user had of getting on and off the tractor. In this case, the plaintiff fell when getting off the tractor, and seriously injured his back. At trial, the defense presented evidence that this tractor was designed exactly like all other tractors. There was also evidence in the record presented by plaintiff's safety expert, who testified that for about the same cost and without impairment of the use of the tractor, a retractable step could have been designed to eliminate this hazard. The trial court held, correctly in my opinion, that custom does not control as regards the issue of negligence, and the manufacturer was found liable. Business or industrial custom should not control the determination as to whether a product has been properly designed. A defendant's conformance with the "state of the art," when the term is used in the sense of business or industrial custom, should not absolve him from liability for a defective product.

88. *Cronin v. J.B.E. Olson Corp.*, 8 Cal. 3d 121, 501 P.2d 1153, 104 Cal. Rptr. 433 (1972), discussed in Keeton, *supra* note 44, at 30-32.

89. See generally Keeton, *supra* note 44; Traynor, *supra* note 54.

90. See Keeton, *supra* note 26, at 677-78.

91. See generally Keeton, *supra* note 26.

92. *Id.*

93. 571 S.W.2d 867 (Tex. 1978).

"State of the art" is also frequently used to mean that which is feasible in light of the technology which existed at the time the product was designed. This is the definition that I use. This definition requires consideration of what was reasonably capable of being done technologically and economically to reduce the risk of hazard.⁹⁴ While a defendant's compliance with what was technologically and economically feasible does not necessarily mean that his product is not defective, a product's design should normally be measured in terms of whether or not it was feasible to do a better job in the light of the technology that was available at the time. In other words, while not conclusive, this is a relevant factor.

"State of the art" is also sometimes used to refer to the technological capability of an industry to discover a risk or hazard in a product. In my view, however, it does not necessarily make any difference whether a hazard is discovered or not. The fact that a manufacturer may be incapable of discovering a risk is irrelevant. We judge the effectiveness of a product on the basis of the danger-in-fact, whether realized or not.⁹⁵ For example, there was a vaccine that was put on the market some years ago called quadrigen; it was a four-in-one vaccine, for whooping cough, diphtheria, tetanus, and polio.⁹⁶ Prior to the time this vaccine was composed, there was a three-in-one vaccine for whooping cough, diphtheria, and tetanus. It was then decided to add polio to the list of diseases which one vaccine would protect against. The new vaccination gave some children a high fever, and even caused mental retardation in some. Assume that there was room for the jury to believe that it was scientifically unknowable that this would happen. In my opinion, that would not matter because it was such a dangerous product. The harm done just to a few people outweighed all the benefits because the only benefit was that the vaccine could be given once, instead of on two different occasions.⁹⁷

V. CONCLUSION

Weighing benefit against harm is not peculiar to products liability law. If you have a dangerous railroad crossing, you measure benefits against danger in making a decision as to whether or not there should be

94. For a state products liability statute which bears resemblance to Professor Keeton's preferred use of the term "state of the art," consider the following language from NEB. REV. STAT. § 25-21,182 (1979):

In any product liability action based upon negligent or defective design, testing, or labeling, proof establishing that such design, testing, or labeling was in conformity with the generally recognized and prevailing state of the art in the industry at the time the specific product involved in the action was first sold to any person not engaged in the business of selling such product shall be a defense. State of the art as used in this section shall be defined as the best technology reasonably available at the time.

95. See generally Keeton, *supra* note 44.

96. See *Tinnerholm v. Parke, Davis & Co.*, 411 F.2d 48 (2d Cir. 1969) (liability predicated on warranty theory); *Parke-Davis & Co. v. Stromsodt*, 411 F.2d 1390 (8th Cir. 1969) (liability predicated on tort and warranty theory).

97. See Keeton, *supra* note 71, at 143.

an overpass. It costs a great deal of money to have an overpass. How many people will be killed before the decision is made to build? It is a difficult problem. As far as products liability law is concerned, we should be talking about what the danger-in-fact really was, and not what was perceived to be the danger under the "state of the art."

While many factors are relevant in determining whether a product is defectively designed, the focus must be on two points: the risk inherent in the product and the utility of the product. By weighing these factors, attorneys, judges, and juries can reach fair and reasonable conclusions in products liability cases.