The Use of Behavioral Research in Products Liability Litigation

Elizabeth Block

Follow this and additional works at: http://scholarlycommons.law.hofstra.edu/hlr

Part of the Law Commons

Recommended Citation
Available at: http://scholarlycommons.law.hofstra.edu/hlr/vol2/iss2/17

This document is brought to you for free and open access by Scholarly Commons at Hofstra Law. It has been accepted for inclusion in Hofstra Law Review by an authorized administrator of Scholarly Commons at Hofstra Law. For more information, please contact lawcls@hofstra.edu.
THE USE OF BEHAVIORAL RESEARCH IN PRODUCTS LIABILITY LITIGATION

One commentator, in assessing Justice Traynor's "impressive performance" in decisions spanning two decades, cites as his particular contribution, the articulation of a distinct liability theory for consumers as opposed to injured parties in general. This issue of the Hofstra Law Review bears testimony to that contribution. The developing case law in products liability has been increasingly shifting its focus to the expectations of consumers and away from the customs of the trade. It is this development which has suggested the theme of this comment. What is proposed here is an extension of what is already accepted in products liability case law; namely, that eminently foreseeable human behavior may determine the reasonable use of a product and thus define the manufacturer's responsibility. The determination of what is foreseeable however, is typically based on an unconscious reliance on conventional wisdom. Although this would seem to have been adequate in many cases, such a method of acquiring knowledge about human behavior becomes increasingly unreliable as products and the behaviors which they call forth become more complex. Thus, this comment will suggest: (1) How a more sophisticated appreciation of the methods and techniques which have been developed in the behavioral sciences can be applied to tighten the theoretical definition of defectiveness and (2) how knowledge obtained through these methods could be applied in the courts to increase the reliability of the decision making process in specific disputes and to develop general guidelines for the future.

I. THE THEORETICAL AND PRACTICAL FRAMEWORK

The factor which seems to distinguish consumers from other tort victims in Justice Traynor's decisions is the lack of capacity of the injured party to protect himself from harm. In the Traynor view, strict liability in tort is called for in product cases because the consumer has no way of detecting defects in the goods he buys. Kalven, seeing "the germ of a large idea here," explains:

4. Kalven, supra note 1, at 206.
“Perhaps negligence is suited only for cases where there is some parity of risk avoiding ability between actor and victim, where, so to speak, risk avoidance is shared between them.” The “germ” referred to by Kalven has not yet reached full fruition in terms of realigning the equities between producers and consumers. Strict products liability has not disarmed the defenders of the unfettered market place. It has simply forced a change in their tactics. Where once the main barrier in a products liability case was developing enough proof of actual negligence to reach the jury, current emphasis in such a case will be on defectiveness

5. Id.
7. See generally C. Gillam, PRODUCTS LIABILITY IN THE AUTOMOBILE INDUSTRY 206 (1960); [M]odern products-liability law . . . has gone far in bringing about that shifting of risks in sales transactions called for by the conditions of modern industrial society. Yet it cannot be emphasized too strongly that this risk-shifting process, however natural and desirable it may seem to the mid-twentieth-century student of jurisprudence, is bottomed upon and limited by two fundamental conceptions: the idea that products liability follows only from a ‘defect’ in the goods purchased, and the idea that even if a ‘defect’ is proved, liability results only if the ‘defect’ is the ‘proximate cause’ of the plaintiff’s injury. Goods do not have to be ‘defective’ to be dangerous, and the idea of proximateness is a quite significant qualification of the idea of causation. Even the modern law is capable of dealing only with the direct results of ultimate facts, and in practice this means that our society still accepts the principle of caveat emptor as an appropriate justification for the results of a large class of cases.
8. Of primary importance is the fact that contributory negligence is not a defense to an action in strict liability. But cf. James, Assumption of Risk: Unhappy Reincarnation, 78 YALE L.J. 185 (1968); Twerski, Old Wine in a New Flask, 60 IOWA L. REV. 1 (1974) suggesting that on the basis of RESTATEMENT (SECOND) OF TORTS (1965) “the defense now may be an amalgam of assumption of the risk and contributory negligence.”
9. MacPherson v. Buick Motor Co., 217 N.Y. 382, 111 N.E. 1050 (1916) established the principle that the defendant’s liability is based upon a general duty to use reasonable care to avoid injury to those to whom danger from defects in manufacture is reasonably foreseeable, “If the nature of a thing is such that it is reasonably certain to place life and limb in peril when negligently made, it is then a thing of danger.” 217 N.Y. at 389, 111 N.E. at 1053.
10. See, e.g., C. Gillam, supra note 7, at 49:
   Today the consumer’s problem in a tort action against a manufacturer is not so much to show that the goods are dangerous if negligently made as to prove that the manufacturer actually was negligent. The manufacturer’s tort liability turns upon his due care or lack of it; he is negligent only if he fails to use reasonable care under the circumstances. What conduct is required by the standard of due care is a difficult question of fact. But cf. Prosser, The Assault Upon the Citadel (Strict Liability to the Consumer), 69 YALE L.J. 1099, 1114-1115 (1960). In the context of a discussion as to why plaintiffs want strict liability and why defendants are “equally vociferous” in their opposition to it, Dean Prosser says, “. . . there is not one case in a hundred in which strict liability would result
These issues take on a particular significance in litigation involving defective design of a product as opposed to material defectiveness. Obviously, an alleged defect in design brings into sharp focus the question of the intended purpose of the product. Such a product might be completely defect free for one purpose and just as completely unsuitable and defective for another. In other words, defect cannot be defined in the abstract without regard for the human being who will form the other part of the use equation. Thus, a product might serve a purely esthetic function for the consumer and have a useful function or functions, as well. It might have a primary use function as well as a second-

11. Whitford, *Strict Products Liability and the Automobile Industry: Much Ado About Nothing*, 1968 Wis. L. Rev. 83, 114 says in the context of automobile products liability, “regardless of the liability theory advanced, determination of the evidence needed to get to the jury on the issues of defectiveness and causation is probably the most pressing contemporary issue . . . .” Of the 34 personal injury cases litigated on a negligence theory which he examined, 12 were decided for the manufacturer because of insufficient proof of a defect or causation, as compared with only 3 for a failure to prove negligence. *Id.* at 113. Nevertheless, the legal advisors to the three major domestic automobile manufacturers “uniformly were of the view that their principal problem today is the liberality with which courts are defining the quantity of proof needed to get to the jury on the issues of defect and causation . . . .” Chrysler’s lawyers stated that [even *Henningsen v. Bloomfield Motors, Inc.*, 32 N.J. 358, 161 A.2d 69 (1960), a landmark products case which relied upon a breach of implied warranty as the basis of recovery] was appealed primarily on the sufficiency of the evidence issue rather than on the technical defenses to warranty recovery discussed by the New Jersey court.” *Id.* at 118.

12. See, e.g., *Davlin v. Henry Ford & Son*, 20 F.2d 317 (6th Cir. 1927); *Reusch v. Ford Motor Co.*, 196 Wash. 213, 82 P.2d 556 (1938); *Larsen v. General Motors Corp.*, 391 F.2d 495 (8th Cir. 1968); *RESTATEMENT (SECOND) OF TORTS § 398 (1965)*; 2 *HARPER & JAMES, TORTS §§ 28.3-28.4 (1956)* on extending manufacturer’s duty to use due care to the design and specifications of his product. But see C. Gillam, supra note 7 at 104:

‘[T]he words used to create an idea may also confine it. This is what has happened in a number of the design cases, where the word ‘defective’ has tended to become a word of limitation rather than a word of grant. The wheel in *MacPherson . . . was a rotten, atypical, substandard wooden-spoked wheel; the manufacturer fell below the standard he had established for himself, and had to pay for the resulting injury. The wheel simply did not meet a predetermined standard of quality. In this sense it was defective, and under the circumstances dangerously so. But a product which actually does meet the predetermined standards of quality established by its manufacturer is not defective in this sense . . . .’ The law may have the effect of placing a premium upon the adoption of low standards of quality.

13. Cf. *Cronin v. J.B.E. Olson Corp.*, 8 Cal. 3d 121, 501 P.2d 1153, 1157, 104 Cal. Rptr. 433, 437 (1972) in which the court stated: “The design and manufacture of products should not be carried out in an industrial vacuum but with recognition of the realities of their everyday use.”

14. The field known as “human factors engineering”, or “human engineering” or “engineering psychology”, as the various names imply, deals with the attempt to design
ary (or even tertiary) functional value for the user.\textsuperscript{15} To use a simple example, a chair designed to be a reproduction of one used by a primitive society and which will be encased behind glass in a museum might be completely defect free regardless of its stability; if its function were to provide seating, a considerable degree of stability would be required; if it were to be used as a step-stool the requisite stability would be even greater.

Indeed, this principle has been recognized and only the first part of the given example is fictitious (to the author’s knowledge). In Garbutt v. Schechter\textsuperscript{16} the plaintiff, a rather heavy woman, was injured when the chair she attempted to sit on tipped and she fell to the floor. The jury was permitted to find that the design of the chair created an unreasonable risk, since it was “of the type of new fangled creations that are called modern, and which are designed more to please the eye than to provide the stability one expects to find when reposing the anatomy upon a chair in a place of business.”\textsuperscript{17} Recovery was allowed in Phillips v. Ogle Aluminum Furniture Inc.,\textsuperscript{18} when a woman was injured as a result of standing on a chair which was designed in such a way that it would tip forward when weight was placed near the front. It was held that a jury could find that it is to be anticipated that people sometimes stand on chairs.

Both of these decisions were based on the implicit assumption that the manner in which a human being will use a given product is predictable and as such is determinative of the characteristics which will be demanded of the product.\textsuperscript{19} The behaviors involved however—sitting and standing—are perhaps among the least complex activities people engage in, in terms of both the physical and mental processes involved. The fact that people will

\begin{footnotesize}
\begin{enumerate}

It may be noted that a hammer is an implement of beguiling simplicity, and there is probably no artifact with so many uses, real or fancied . . . . A hammer is a hammer to most people and limitations in the implement, or its age, fitness and condition, are not apparent to the unsophisticated. It should be reasonably safe for the purposes for which it is intended and for other uses which are foreseeably probable.


\item[(17)] Id. at 399, 334 P.2d at 227.

\item[(18)] 106 Cal. App. 2d 650, 654, 235 P.2d 857, 859-60 (1951).

\item[(19)] In fact every decision in a product case which holds the defendant liable on the basis that the use (or misuse) of the product was or should have been foreseen is based on this assumption.
\end{enumerate}
\end{footnotesize}
use chairs for sitting and occasionally even to stand upon is clearly of such common knowledge that it is well within the area of factual material of which the courts have traditionally taken judicial notice. 20 Obviously, no sophisticated research or system of data collection is required, nor expert testimony to elucidate upon it. As the interaction between the consumer and the product becomes more complex, it becomes increasingly difficult and unreliable to use such conventional wisdom to aid in prediction.

In 1950, James and Dickinson said:21

Tort law is obviously much concerned with human conduct that produces accidents. For the past thirty years men working in fields such as industrial psychology have been making studies and finding things out about this conduct. To date no one has tried to point out in any systematic and detailed way what implications these studies and findings may have for tort law in accident cases.

The James and Dickinson article focused on the then popular concept of accident proneness and how this related to the viability of retaining the concept of fault as a basis for civil liability. It has been termed as a “bellwether”22 in that its analysis was illustrative of the flexibility tort law has in being able to respond to “social issues posed by the life sciences . . . [and] the rapidly growing body of knowledge about the human psyche.”23 It stressed the vital importance of the human factor in the area of accident control, that “[i]t is not the machine which should be regarded as hazardous so much as the individual who is operating that machine.”24 Based on an extensive review of the psychological literature dealing with such factors as sensory-motor skills,

20. Noel, Defective Products: Abnormal Use, Contributory Negligence and Assumption of Risk, 25 Vand. L. Rev. 93, 96 (1972), citing 2 F. Harper & James, The Law of Torts § 28.6, at 1546 (1956): “So it has been said that ‘automobiles will surely be driven, sometimes at high speed, and often where other vehicles and pedestrians are present; and that hair dye ‘will be applied to hair and will touch the skin; cosmetics will be applied to faces; underclothes will be worn next to the skin; tractors will get mired; food will be eaten . . . ’”


23. Id. at 335.

24. James and Dickinson, supra note 21, at 770, n.10, state that: “[O]nly 3.5 per cent of all cars involved in accidents have been shown to have mechanical defects and in only . . . [less than one per cent] of cars involved in accidents can it be shown that the defect played a part in causing the accident.”; citing Canning, Motor Vehicle Inspection Records Show That Mechanical Defects Play Small Part in Highway Accidents, 74
coordination, perception, reaction time, the conclusion was reached that: "The standard for contributory negligence should be subjective and take the victim's accident proneness into account, for a subjective standard for plaintiffs would both refine the fault principle and compensate more victims."26

The concept of accident proneness grew up in an early period in the development of psychology and was based heavily on clinical impressions that there were some people who almost appeared to be asking for accidents to happen to them. This was related by analytically oriented psychologists to such things as suicide tendency and the need for self-punishment. There is indeed evidence that some people are involved in a disproportionate number of accidents. Their number in the general population, however, account for but a very small percentage of all accidents.27 Although such people should undoubtedly be identified and given some special treatment, this would not begin to resolve the problem of accidents.28

AUTOMOTIVE INDUSTRIES 336 (1936); also citing Cardall, Psychological Factors in Accident Prevention, 26 PERSONNEL J. 288 (1948); T. FORBES, HUMAN FACTORS IN HIGHWAY TRAFFIC SAFETY RESEARCH 3 (1972) says: "It has been clear almost from the first studies that errors, lapses, and limitations of automobile drivers were involved in 75 to 90 per cent . . . of mishaps." D. KLEIN & J. WALLER, CAUSATION, CULPABILITY AND DETERRENCE IN HIGHWAY CRASHES 63 (1970), although rejecting what they see as the underlying assumption of traffic accident reporting—that "every individual is omniscient, omnipotent, and totally rational, and that he becomes culpably involved in crashes through intentional lapses from this state of omniscience, omnipotence and rationality"—cite the National Safety Council's Accident Facts (1968) which reports that "improper driving" was involved in . . . 91% of all crashes.

25. James and Dickinson, supra note 21, at 773 n. 18 (1950), citing Johnson, Detection and Treatment of Accident-Prone Drivers, 43 PSYCH. BULL. 489 (1946) and Miles and Vincent, The Institute's Test for Motor Drivers, 8 HUMAN FACTOR 245 (1934) for the fact that: "[t]here are psychophysical tests for reaction time, resistance to distraction, vigilance, visual co-ordination, vision, judgment of relative size of near and distant objects, judgment of speeds." James and Dickinson also refer to a study by Drake, Accident Proneness: A Hypothesis, 8 CHARACTER AND PERSONALITY 335, 339-46 (1939), in which the author came to the conclusion that, "the person who reacts quicker than he can perceive is more likely to have accidents than the person who can perceive quicker than he can react." Id. at 773 and n.22.


27. Cf. T. FORBES, HUMAN FACTORS IN HIGHWAY TRAFFIC SAFETY RESEARCH 3 (1972): [O]ne of the early theories was that a few "accident-prone" drivers caused most of the trouble, and that if these could be found and eliminated, most of the highway safety problem could be solved. Unfortunately this has not proved to be the case.


It is commonly believed that a small fraction of the driving population is responsible for a large proportion of all crashes and that the removal of this
The contribution psychological research can make in this area is not in identifying the accident prone individual per se, but rather by isolating the sources of human error, it can contribute to identifying the defect in the man-machine system which could be averted through better design. The significance of the James and Dickinson article was not so much its specific focus or even its conclusion, as it was the recognition that the methods and techniques of behavioral science research could be useful in determining which events were foreseeable and in thus narrowing the issue of duty and proximate cause in litigation involving accidents. Since tort law, before the age of mass production, always dealt with unique sets of circumstances and parties, research dealing with the behavior of groups would not have been useful. Thus, logic was the only tool available to the court to determine whether the Long Island Railroad Company should have foreseen that a man carrying a package of explosives would drop them while he was being assisted in boarding a train by a servant of the company and that the resulting explosion would topple some scales at the other end of the platform where a potentially famous tort victim happened to be standing waiting for the train going in the other direction.
In the area of products liability however, we are no longer dealing with such unique situations. The class of potential plaintiffs is relatively similarly situated and the defendant has typically put on the market a vast number of similar if not identical products. As the variables become more standardized, the question of the foreseeability (i.e., the predictability) of an event becomes a proper one for scientific as opposed to purely logical examination. Whether people stand on chairs,\textsuperscript{31} whether they use hammers "not only for carpentry work, but for driving steel pins, metal drills, metal shafts and posts... and for work upon machinery...",\textsuperscript{32} whether as a result of boredom they cease to attend to obvious dangers and put their hands in punch presses,\textsuperscript{33} whether they drive cars when they are not capable of doing so because either temporary emotional stress or intake of alcohol, for example, has interfered with their judgment and performance\textsuperscript{34} are all questions which are particularly suitable to the scientific method of inquiry. The fact that the methodology is available to predict with accuracy how people will behave in relation to a given product—not how a given individual will behave, but how in terms of probabilities, a defined class (whether driver, tractor operator, punch press operator) will behave—establishes a duty on the manufacturer of a product to put this knowledge to use in its design.

It is the thrust of this article that the failure of a manufacturer to take into consideration, in the design of a product, the known or knowable propensities of the person who will use or operate the product, should create a presumption that the product were experienced in their trade and knew the dangerous character of the product therefore entitling the defendant to assume that the product would be handled with caution.


\textsuperscript{34} Cf. Hughey v. Lennox, 142 Ark. 593, 219 S.W. 323 (1920) in which the court held, "[a]n unskilful or inexperienced driver is not to be excused from liability for injuries inflicted because of his inexperience and unskillfulness," on the basis of testimony by a witness who, "showed sufficient familiarity with the subject to qualify as an expert, and... was competent to show within what distance a car could have been stopped...", \emph{Id. at} ---, 219 S.W. at 325. The Court concluded that since, "a car running 5 miles an hour, with the machinery in fairly good working order, could be stopped in [this] distance" the accident which occurred resulted from his own unskillfulness in the operation of the car; \emph{Id.} Drummond v. General Motors Corp., CCH PROD. LIAB. Rptr. §6611 (Cal. Super., 1966), one of many cases involving the design of the Corvair, in which the court concluded:
uct is defectively designed. Further, even behavior on the part of the plaintiff which has traditionally raised such affirmative

[T]hat . . . (the deceased driver's, plaintiffs' son's) speed was not a prudent one and was too fast for the conditions which prevailed. There is no evidence that . . . (the deceased) had ever driven this road at night. He had no real experience with the Corvair and its easy steering. The force he used in turning the steering wheel so far to the left may have resulted from his experience in driving his 1956 Dodge which had no power steering.

Whatever the cause, a speed of 60 miles per hour was excessive for the curves involved and the enormous steering to the left was excessive and without justification. It was simply foolhardy [sic] . . . to have driven the Corvair at night around the right-hand curve and into the left-hand curve at 60 miles per hour without having had more knowledge of, and experience with the Corvair beyond that gained from the few times he had driven the car for a few miles each time. [emphasis added]

See also Tiger v. American Legion Post No. 43, 125 N.J. Super. 361, 311 A.2d 179 (1973) in which the plaintiff who was injured in a hit-and-run accident while admittedly intoxicated and who was claiming that the American Legion Post, through its bartender, negligently served her alcoholic beverages while she was visibly intoxicated, was allowed to get to the jury on the question of her contributory negligence. See also James and Dickinson, supra note 21 at 774, citing Hersey, Emotional Factors in Accidents, 15 PERSONNEL J. 69, 60 (1936) for the proposition that:

In all people there are cycles of exhilaration and depression. Although the period of depression usually lasts for not more than twenty per cent of the time, one investigator found that fifty per cent of industrial accidents happened while the workers were depressed.

35. Sos, Liability of Engineer for Defective Design, 19 CLEV. ST. L. REV. 184, 186 (1970) suggests that the "protective legal structure around architects and engineers which has been sufficient . . . in the past to shelter members of those two professions from any extensive liability . . . was erected on an unfirm foundation and cracks are appearing in the wall . . .." The case of Broyles v. Brown Engineering Co., Inc., 275 Ala. 35, 151 S.2d 767 (1963) is cited as distinguishing engineers from physicians, attorneys and architects in that there are too many elements of judgment to be dealt with in those professions, whereas the elements involved in an engineering problem are ascertainable to the point that it is reasonable and just for the purchaser to expect a specific result. Sos points out that the court is relying upon the concept that there is scientific certainty involved in the work of the engineer, stating:

With the engineering ability demonstrated in the space program, perhaps the courts and the public will demand a higher standard of performance from the engineering profession. The demands may be such that a lack of negligence will no longer suffice to shelter the profession. Id. at 187-88.

. . .

[A] substantial number of engineers, both licensed and unlicensed, are employed by corporations. Although this group is not engaged in the construction of buildings, bridges, or highways, their work affects the public health and safety as much, if not more than their licensed colleagues in the consulting engineering business. [emphasis added] Id. at 191.

Sos however, quotes a "prominent attorney" in the product design liability area as saying, "the corporate structure of marketing, manufacturing, and engineering often dictate what the ultimate design will be, thereby removing authority and responsibility from the design engineer," Id. at 192. He suggests however that managers of engineering sections of corporations "will soon tire of testifying in product liability cases concerned with faulty designs which were substantially altered by the marketing or manufacturing functions."
defenses as contributory negligence or assumption of risk, 36 if it is knowable by the manufacturer, cannot be viewed as an intervening event which breaks the chain of foreseeability. This analysis leads to the contention that even such behavior as drunken driving—under traditional concepts a clear example of behavior which would relieve the manufacturer of liability—is so clearly within the circle of foreseeable risk that automobile manufacturers have an affirmative duty to use all reasonable resources available to them to eliminate or at least diminish the risk. 37

The practical consideration to which such an analysis gives rise is how to expand the knowledge of the courts and attorneys as to the existence and potential value of information which is routinely collected by professionals in the behavioral and social sciences. Every time a court states its holding in terms of the foreseeability of the behavior of the plaintiff, it is, knowingly or not, making use of psychological evidence in that it is saying that human behavior follows a discernable and therefore predictable Id. He proposes that if the engineer is going to be the individual called to account he must have the accompanying authority and control over the product, "so that he can take steps to stem the tide of consumer injury." Id. at 193. He concludes:

As the instruments and background knowledge of the engineering world continue to develop, the unknown and uncontrollable factors involved in engineering projects decrease proportionately. With this decrease, the courts should increase the engineer's liability based upon the success or failure of the engineering project, the fruits of the engineer's services. Id. Cf. Miller v. DeWitt, 37 Ill. 2d 273, 226 N.E.2d 630 (1967) which held an architectural firm liable for contractor's employees on the basis of the fact that it had the right to stop the work and therefore a corresponding duty to effect such stoppage if an unsafe condition was apparent or should have been apparent. The majority view seems to have been that architects and engineers have the superior technical knowledge which requires that they be legally responsible for their work.

36. See generally Twerski, Old Wine in a New Flask, 60 IOWA L. REV. 1 (1974), for a full discussion of the appropriate role of these affirmative defenses. The crux of Twerski's argument is that: "Where defendant's duty is such that he is required to obviate dangers even to those who are fully aware of them, then the law would be self-defeating if it should subsequently relieve a defendant from liability merely because a plaintiff has reasonably and voluntarily encountered the very risk which defendant had no right to put to him in the first instance."

37. If the reader is uncomfortable with the thought of allowing recovery for an individual whose own culpable behavior is at best so socially undesirable and at worst violative of the criminal law, perhaps another more emotionally appealing illustration will make the point. Until recently bottles and vials which contain medicines have not been thought of as defective if they fulfilled their traditional function as containers. Certainly, the manufacturer had fulfilled his responsibility when an adequate warning was placed on the label, e.g., Spruill v. Boyle-Midway, Inc., 308 F.2d 79 (4th Cir. 1962). However, in view of the well known curiosity drive of young children and the great risk of harm if they were inadvertantly to swallow such substances, despite the possible culpability of their parents in leaving such substances within their reach, these containers are increasingly being made with special tops which cannot be removed by children.

Id. He proposes that if the engineer is going to be the individual called to account he must have the accompanying authority and control over the product, "so that he can take steps to stem the tide of consumer injury." Id. at 193. He concludes:

As the instruments and background knowledge of the engineering world continue to develop, the unknown and uncontrollable factors involved in engineering projects decrease proportionately. With this decrease, the courts should increase the engineer's liability based upon the success or failure of the engineering project, the fruits of the engineer's services. Id. Cf. Miller v. DeWitt, 37 Ill. 2d 273, 226 N.E.2d 630 (1967) which held an architectural firm liable for contractor's employees on the basis of the fact that it had the right to stop the work and therefore a corresponding duty to effect such stoppage if an unsafe condition was apparent or should have been apparent. The majority view seems to have been that architects and engineers have the superior technical knowledge which requires that they be legally responsible for their work.

36. See generally Twerski, Old Wine in a New Flask, 60 IOWA L. REV. 1 (1974), for a full discussion of the appropriate role of these affirmative defenses. The crux of Twerski's argument is that: "Where defendant's duty is such that he is required to obviate dangers even to those who are fully aware of them, then the law would be self-defeating if it should subsequently relieve a defendant from liability merely because a plaintiff has reasonably and voluntarily encountered the very risk which defendant had no right to put to him in the first instance."

37. If the reader is uncomfortable with the thought of allowing recovery for an individual whose own culpable behavior is at best so socially undesirable and at worst violative of the criminal law, perhaps another more emotionally appealing illustration will make the point. Until recently bottles and vials which contain medicines have not been thought of as defective if they fulfilled their traditional function as containers. Certainly, the manufacturer had fulfilled his responsibility when an adequate warning was placed on the label, e.g., Spruill v. Boyle-Midway, Inc., 308 F.2d 79 (4th Cir. 1962). However, in view of the well known curiosity drive of young children and the great risk of harm if they were inadvertantly to swallow such substances, despite the possible culpability of their parents in leaving such substances within their reach, these containers are increasingly being made with special tops which cannot be removed by children.
pattern. Typically, the behavior referred to is so simple or so obvious that it is not even recognized as evidence which needs to be formally introduced. Thus, it has been said to be foreseeable that people stand on chairs and that children will put foreign objects in their mouth. As the activity becomes more complex however; as it begins to involve more complex products; as the scope of the interaction between product and consumer becomes broader, the way people will behave in relation to the product is no longer knowable on this “common sense” level. Yet, it is precisely these areas involving complex forms of human behavior, such as driving, flying an airplane, operating a sophisticated piece of machinery—areas in which the consumer actually becomes part of a total system intended to accomplish a specific task—which present the courts with the greatest challenge. These cases no longer represent the settlement of a dispute between two individuals, they deal rather with some of the major social and economic problems created by our technological society. Although products in this class are intended to enhance the enjoyment and efficiency of man, as a result of a design which does not adequately take the capabilities and limitations of man into account, they often actually create a conflict between men and the machines they operate; a conflict which has created, in terms of the automobile, for example, a major foreseeable drain on our human and financial resources. In these cases (although not limited to these), evidence based on competent scientific research could be extremely helpful in developing a standard by which the court or the jury could determine whether the use in question was within the range of “normal” or typical behavior and therefore one which the defendant should have anticipated and provided for in his design. In the remaining portion of this comment, a number of cases are examined. First, the nature of the evidence that has typically been produced in products liability litigation will be considered; and some tentative suggestions will be offered regarding the type of evidence which would have been desirable. This evidence will be looked at from the neutral point of view of increasing the knowledge of the court as to the standards a product would have to comply with in order to be considered defect free. Second, the impact of behavioral research on the manufacturer’s affirmative duty to build in safeguards will be weighed. In conclusion, some of the policy implications of introducing the increased precision of a scientific evidence into court-made determinations of liability will be briefly discussed.
II. The Nature of the Evidence in Products Liability Litigation: Actual and Potential

Traditionally, in a products liability action, part of the plaintiff's burden was to prove that the goods of which he complained were unreasonably dangerous for their intended use either because they were negligently made or because the defendant was strictly liable (in tort or on the basis of implied warranty) for a defect which was in the product when it left his control. It is the contention put forward in this article that the question of defectiveness cannot be adequately determined without first examining the question of whether the product was dangerous for that use which the defendant was obliged to foresee and that this can be determined only by evidence as to how the consumer actually uses a particular product. A study of cases reveals however, that both the element of negligence and the element of defect have been typically regarded as subject to proof by inference and circumstantial evidence and, as the following two cases illustrate, the shifting of emphasis from negligence to defectiveness has not dramatically changed the standards of proof.

Markel v. Spencer is illustrative of the nature of the proof which was required to reach the jury in a negligence action:

38. MacPherson v. Buick Motor Co., 217 N.Y. 382, 111 N.E. 1050 (1916) articulated the standard. But cf. Dyson v. General Motors Corp., 298 F. Supp. 1064 (E.D. Pa. 1969) in which the concept of intended use was systematically explored. The court framed the issue before it as “whether the concept of ‘intended use’ includes foreseeable consequences of unintentional misuse.” Id. at 1068. Since apparently neither counsel nor the court had found any Pennsylvania decisions on point, the court stated the basis of its analysis by citing the rule of Palsgraf v. Long Island R.R. Co., 248 N.Y. 339, 162 N.E. 99 (1928) that “the scope of the duty is coterminous with the foreseeability of risk.” Id. at 1069. The court then turned to the RESTATEMENT (SECOND) OF TORTS § 402A, comment h which says in part that, “a product is not in a defective condition when it is safe for normal handling and consumption . . .” Id. at 1070. The defendant was held to be liable, apparently on the ground that vehicular accidents are incidental to normal or intended uses of motor vehicles on today’s highways. See also Larsen v. General Motors Corp., 391 F.2d 495 (8th Cir. 1968) in which the court declared: “[T]he ‘intended use’ construction urged by General Motors is much too narrow and unrealistic.” Id. at 502. Injuries resulting from failure to use reasonable care in design “are readily foreseeable as an incident to the normal and expected use of an automobile.” Id. The court continued with the oft quoted statement: “While automobiles are not made for the purpose of colliding with each other, a frequent and inevitable contingency of normal automobile use will result in collisions and injury-producing impacts.” Id.

39. It could be argued (and the author is tempted to do so) that the same standard is appropriate in a negligence action in that evidence as to how and under what conditions a product will actually be used is necessary to determine the required standard of care for the manufacturer.

It was \textit{self-evident} that the defect in the bolt must have been caused by \textit{some act or omission} in the process of manufacture or inspection. . . .

The jury had the right to infer that a new car would not have been turned out with a defective bolt if the required degree of care had been exercised by the manufacturer. The manufacturer was chargeable with knowledge that a defect in the braking mechanism would jeopardize the life and bodily security of any person who used the car . . . and the manufacturer was bound to use care commensurate with the risk.\footnote{\textup{\textsuperscript{41}}} [emphasis added]

Circumstantial proof may be sufficient to meet the burden of proof on an issue like negligence even though the inference is equivocal as to just what the party’s specific acts or omissions were. This is so whenever it appears sufficiently likely that defendants conduct included \textit{some} act or omission which a jury could call negligent.\footnote{\textup{\textsuperscript{42}}}

The plaintiff was not as successful in \textit{Jakubowski v. Minnesota Mining and Manufacturing},\footnote{\textup{\textsuperscript{43}}} even though it was five years later and the court focused on what is presumably the consumer doctrine of defect rather than on negligence. The case is a good illustration of the competing considerations before the court when the plaintiff is forced to rely on circumstantial evidence and on the inference that the product was defective because he himself did nothing wrong. The plaintiff, a workman in a Ford plant, was injured when an abrasive disc used for sanding automobiles broke while in use and struck him a severe blow. The court acknowledged that:\footnote{\textup{\textsuperscript{44}}}

It is common knowledge that tools can be damaged in the hands of a novice. Even an expert carpenter will occasionally bend a nail while driving it in and thus destroy its usefulness though it was fit for the purpose intended when the carpenter picked it up. And it is common knowledge that sandpaper intended for rough sanding of wood will tear or break if applied ineptly to a rough surface or if it is overused.

The court continued, however:\footnote{\textup{\textsuperscript{45}}}

\textup{\textsuperscript{[W]}e have here four possible causes of the break, \textit{viz}: manufacturer:}}
turing flaw, inadequate design, misuse, or overuse. The plaintiff has introduced no evidence which indicates that one of these causes is more probable than the others. In order to recover, he must present evidence from which it is reasonable to infer that more probably than not the cause of the break was one for which the defendant is responsible.

The court thus held that “in the absence of evidence tending to show that the product was not mishandled or used beyond its reasonably expected life span after it left the manufacturer's hands”\textsuperscript{46} it could not hold the manufacturer liable. In a strong dissent, Justice Weintraub questioned the majority's insistence that plaintiff was required to exclude the other possible causes for the disintegration of the disc and the fact that he himself did not misuse it. He reasoned that since there was nothing to suggest that “improper or excessive use was realistically involved”\textsuperscript{17} there must have been a defect.

These cases and others like them\textsuperscript{48} illustrate the extremes to which some courts are willing to go to infer what “must have happened” on the basis of what can only be termed speculation; particularly in the latter case, speculation as to the conduct of the plaintiff in relation to the product which caused his injury. In the Markel case, the defendant “must have been” negligent. In Jakubowski, the same set of “facts” led the majority, on the basis of the common knowledge that workmen make mistakes, to hold that causation had not been established; whereas the dissent, not relying on this “common knowledge”, came to the opposite conclusion.

On the basis of the theory which is being suggested in this

\textsuperscript{46} Id.

\textsuperscript{47} Id. at 189, 199 A.2d at 833.

\textsuperscript{48} Cf. Marathon Battery Co. v. Kilpatrick, 418 P.2d 900 (Okla. 1965) in which a battery manufactured by defendant exploded in plaintiff's hand. The defendant argued that plaintiff had failed to prove that the battery was (1) negligently made; (2) defective when sold; (3) harmful when used as intended; or (4) that any negligence or defect was the proximate cause of injury. Relying extensively on Greenman v. Yuba Power Products, Inc., 59 Cal. 2d 57, 377 P.2d 897, 27 Cal. Rptr. 697 (1962) the Marathon Battery court stated that it was "sufficient to establish a manufacturer's liability" [when a plaintiff is injured] “as the result of a defect in design or manufacture which made the machine unsafe.” 418 P.2d at 915. Ignoring the issue of causation, the court stated:

The primary issue involved was whether the battery exploded, and this matter explicitly was submitted to and determined by the jury. We have held consistently that in civil cases the facts are provable by direct or circumstantial evidence, or by both. And it is not required that the proof rise to that degree of certainty which will support only one conclusion to the exclusion of all others. 418 P.2d at 917.
paper, the "common knowledge" that even "expert" workmen will handle a product unskilfully at a particular time and thus take an injury to the workman out of the manufacturer's zone of liability is completely without justification. In fact, it is precisely because even "expert" craftsmen sometimes bend nails and break discs and because these events are predictable and foreseeable that the manufacturer should be liable, if there is evidence that such events could be averted through proper care in manufacture and design. **Jakubowski** would appear to have been an ideal case for either the plaintiff or defendant to produce expert testimony as to how workmen actually do perform the snagging operation in which the plaintiff was injured. There was testimony that discs of the type involved in plaintiff's injury often broke in use, presumably creating potential harm to others who performed the same operation and that this could have been due to the mishandling of the discs. The only expert to testify was a manager of Ford's Engineering Process Department, who testified that on the basis of his experience with "this type of equipment . . . it is not related to the tool that is driving the wheel (disc)".

Any relationship is with the disc itself, rather than the machine. Within my experience, there has been nothing that could contribute to a wheel breakdown or failure that could be attributed to an outside source of the driven type machine like this.

The opinion goes on to state: "The trial court attempted to elicit

---

49. McCormick on Evidence (2d ed. 1954) §200 Other Accidents and Injuries in Negligence and Products Liability Cases cites five purposes for which such evidence may be tendered, all of which might be appropriate for **Jakubowski** and similar cases:

1. To prove the existence of a particular physical condition, situation or defect.
2. To show that the plaintiff's injury was caused by the alleged defective or dangerous condition or situation.
3. To show that the situation as of the time of the accident sued for was dangerous.
4. To prove that the defendant knew of the danger, or ought in the exercise of reasonable care to have learned of it.
5. When the defendant by pleading, opening statement, or by the testimony of his witnesses has asserted that the injury sued for could not have been caused by the defendant's conduct as alleged, then the plaintiff may show other similar happenings to rebut the claim of impossibility.

50. The issue of overuse of the discs was also raised, but need not be of concern for the limited purpose of this discussion, which is intended to be merely illustrative.


52. Id.
some additional basis for this opinion but none was forthcoming...

An analysis of the specific tasks involved in the snagging operation might have revealed a way in which the total system (man - driving tool - sanding wheel) could have been redesigned, keeping in mind that it is generally more efficacious to redesign machinery than people. To use a purely hypothetical illustration, if it had been found that in actual operation the job of snagging involved using the disc at a certain angle or that the workmen tended to apply pressure to a certain point and that this is when the accidents occurred, perhaps the disc could have been redesigned for these specific demands of the task and the worker. On the other hand, analysis of the job and the data on specific task-related mishaps might have revealed that there was no discernible pattern to the occurrence of accidents i.e., no significant relationship could be found between the task, the worker's performance and the breaking of the discs); that the breaking of sanding discs was a pure chance occurrence which could neither be foreseen nor avoided. Under the theory being advanced in this article, the manufacturer under these circumstances would avoid liability.

Although the product involved required a far higher level of training and skill, and the factual controversy was far more complex, Prashker v. Beech Aircraft Corporation was similar to Jakobowski in that it involved the question of whether possible mishandling or lack of experience on the part of the user of the product protects the manufacturer from liability. The actual determination which the court had to make in Prashker was whether evidence of 38 fatal accidents involving the structural failure of planes of similar design was properly excluded by the trial court. In spite of an extensive record, there was no evidence

53. Id.

54. Cf. Lartigue v. R.J. Reynolds Tobacco Co., 317 F.2d 19 (5th Cir. 1963) which relied on a similar case decided a year earlier, Green v. American Tobacco Co., 304 F.2d 70 (5th Cir. 1962). The issue was whether the defendant was liable for the cancerous death of a smoker of its cigarettes. In Green, although smoking had been found to be the proximate cause of death, the court found that defendant could not have known that users of cigarettes would be in danger of contracting cancer prior to the time when it was first discovered that Green had cancer. The Lartigue court, quoting from Green, stated that the defendant "had no opportunity to gain knowledge, or to form a judgment as to the dangerous qualities of the product." 317 F.2d at 39. A manufacturer "could not be held liable as an absolute insurer against consequences of which no developed human skill and foresight could afford knowledge." 317 F.2d at 38 (quoting from Green).

on the question of whether the plane known as the Bonanza had been designed on the basis of adequate knowledge of the skills and fallibilities of the pilots who would complete the system. Although there was some evidence tending to point to defects in the plane which would cause a pilot to lose control, the court concluded that to hold the aircraft responsible when the accidents involved pilots unqualified to fly under instrument conditions “would be utterly to disregard the factor of human fallibility known inevitably to occur in such circumstances . . . .”

Thus, again we see a court, as we did in *Jakubowski*, take notice of the fact that people are fallible and then unfortunately we see it using this “knowledge” as justifying the inference that the planes were not defective. An analysis of the case leads to two conclusions. First, that common knowledge, as has been pointed out previously, is an inadequate method of acquiring valid knowledge about the complexities of the pilot-plant interaction. Secondly, even assuming that appropriate research and data collection techniques had revealed that pilots tended to lose control of planes like the Bonanza under instrument flying conditions, this information rather than relieving the defendant of liability should have created a strong presumption that he was liable on the basis that he had not taken adequate precautions in designing a plane which could be piloted by “typical” pilots. Obviously, when it comes to a task like piloting, our society insures a minimum standard of training and skill through its licensing procedures. Therefore, it can be assumed that the norm established by means

66. *Id.* at 608-09. Note the fact that this case involved what the court would have us believe, on the basis of inadequate evidence, were not one or two but 38 unqualified pilots who had been involved in fatal plane crashes in similar planes. This is on its face incredible.

67. *Cf.* A. CHAPANIS, *Man-Machine Engineering* 1-3 (1965), which discusses another plane disaster, which took place on June 30, 1956 and involved the mid-air collision of two commercial airlines—a TWA Super-Constellation and a VAL DC-7—thus resulting in 128 deaths. In this case there was no issue on the competence of the pilots. Both crews were considered highly qualified on the basis of the standard criterion of number of flying hours. They were known to be rested and in good physical condition. “Conclusive evidence” indicated that the “DC-7 had approached from above and behind at an angle 5 to 10 degrees from the Super-Constellation.” The CAB report concluded that the probable cause of the accident was that “the pilots did not see each other in time . . . .” It is pointed out by the author that aircraft design has made such progress that whereas once “the intrepid aviator of fifty years ago soared into the air . . . . and enjoyed a magnificent view . . . . [I]t was a rare aircraft that did not allow the pilot to see nine-tenths of the space around him”, in the following decades:

[T]he speed of aircraft increased, their contours became more streamlined, the pilot was pushed back behind a console covered with dials, gauges, switches, knobs and other gadgets. And the pilot became more remote from the space
of appropriate research will be based on only those who have already qualified beyond a specified level.\textsuperscript{58}

\textit{De Vito v. United Air Lines},\textsuperscript{59} was a case similar to \textit{Prashker} involving, however, the crash of a commercial airliner in which forty-three people were killed. Among the facts presented, in a record of thirty-three hundred pages, was the fact that the defendant, Douglas Aircraft Company, had conducted tests through which it had been found that the test pilots were adversely affected by carbon dioxide entering the cockpit. The dangerousness of the situation had been further confirmed by Aero-Medical Specialists who had been retained by Douglas and who found that the procedures for ventilating the airplanes might be less than adequate. Under these circumstances, where there was evidence that the defendant had actual knowledge of research results on the effectiveness of the system, the court had little trouble in finding the defendant liable on the basis of negligence. The fact that forty-three people died as a result cannot, however, be dismissed as a factor in the decision.

A more recent case, \textit{Berkebile v. Brantly Helicopter Corp.},\textsuperscript{59} finally confronted squarely the issue of whether the design of the machine had adequately accounted for the human factor. When

\begin{quote}
through which he flew. The pilot of a Super-Constellation can see less than one-eighth of the space around him, the pilot of DC-7, scarcely 10 per cent. \textit{Id.} at 4.

The case described is one in which the cause was apparently discernible. Most accidents are not as thoroughly investigated as those in which, as in this one, a massive loss of life is involved and therefore the immediate cause never becomes known. Automobile accident investigating and reporting is notoriously superficial and unreliable. "Improper driving" has to a large extent become a catch-all on an accident report standing for behavior ranging from conscious risk-taking to a physiological inability to respond quickly enough to an emergency situation. The lesson to be drawn is that rarely do we have the opportunity as we did in the case of the DC-7 and Super-Constellation to see how an accident can result from designed in features of the machine, which so handicap the human part of the system that the ultimate event appears to be the result of human error; \textit{But cf.} North American Aviation v. Hughes, 247 F.2d 517 (9th Cir. 1957), \textit{cert. denied} 355 U.S. 914 (1958) which also involved the question of whether a pilot had had adequate experience in the type of instrument flying required. It was held that while the true cause of the accident would probably remain a mystery, there was substantial evidence that there was a defect in the manufacture of the airplane for which the defendant was responsible.
\end{quote}

\textsuperscript{58} Cf. \textit{Steele v. Rapp}, 183 Kans. 371, 327 P.2d 1053 (1958) in which the plaintiff was a trained and licensed beauty operator who was injured as a result of dropping a bottle containing a "highly inflammable and explosive" chemical apparently known to be dangerous to people in the trade. The defendant argued that he was entitled to assume that as a result of her knowledge and experience, the plaintiff would safely handle the product. The dissent agreed, referring to the licensing requirement, that "such duty (to handle the product safely) is imposed . . . by law." \textit{Id.} at 391, 327 P.2d at 1068. The majority, apparently unmoved by this argument, held the defendant liable.


\textsuperscript{60} 219 Pa. Super. 479, 281 A.2d 707 (1971).
the engine of an airborne helicopter stops, the helicopter will fall to the ground unless the rotor blades are placed in auto rotation. The plaintiff argued that the helicopter designed by defendant was in defective condition because it did not allow the average pilot to go into auto rotation in time to save his life. The court accepted the premise. The remaining issue was whether there was evidence to confirm the allegation that there was insufficient time for the average pilot to go into autorotation. Evidence on pilot response and reaction time seems clearly to have been called for. One cannot tell from reading the appellate decision whether such evidence was in fact introduced. It was held however, in what would appear to be a breakthrough in design cases of products already regulated by governmental standards, that although the administrative criterion was met, this alone did not take the case out of the hands of the jury.

The fact that such standards had been complied with was simply one piece of evidence, not conclusive of the issue.

In *Marshall v. Ford Motor Company*, defective design was claimed because of the failure of the defendant to provide a lock or catch on the folding back of a split front seat. During the injury-causing collision, the plaintiff was restrained by his seat belt and his body was compressed by the intensity of the impact when the rear passenger hit the folding back of the front seat. The defendant claimed that the injuries would not have occurred if the rear seat passenger had been using the seat belt with which the car was equipped. The plaintiff argued that the failure of rear seat passengers to use seat belts was foreseeable and that the Ford

---


[It is fair to assume, there being no evidence in the record to the contrary, that when deceased met his death he was exercising due and proper care for the protection of his person and the preservation of his life. This presumption is sufficient to constitute prima facie evidence that the deceased at the time he was drowned was free from contributory negligence.

62. *Cf.* *Johnston v. Yolo County*, 274 Cal. App. 2d 46, 79 Cal. Rptr. 33 (1969), involving the issue of whether the County was immune from a charge of having defectively designed a road containing a dangerous curve and not posting a warning, held that the trial court's instruction had been "misleading" because it told the jury that the County was entitled as a matter of law to rely upon motorist's compliance with the basic speed law as a sufficient safeguard against "such conditions."

63. 446 F.2d 712 (10th Cir. 1971).
Company minimally had a responsibility to give warning of the consequences on the nonuse. It is of interest that in this case it is the defendant rather than the plaintiff who seeks help by appealing to the “common knowledge” of the court. The court in holding that the manufacturer did not have a duty to warn, declared: “In this day and age the function of seat belts is a matter of common knowledge.” It did not apply the equally “common knowledge” that automobile riders, especially rear seat passengers, simply do not use the seat belts provided. The case uniquely illustrates the futility of relying on common knowledge unless the purpose is merely to rationalize a decision which has already been made. This is particularly true when, as in this case, competent evidence is available as to attitudes and actual practices regarding the use of seat belts. A study consisting of structured personal interviews with a national probability sample of 1,500 licensed drivers aged 16 to 64 years who own or operate automobiles that are equipped with seat belts revealed that only 17% claimed to wear seat belts for short trips.

Another group of cases which cry out for some firm evidence on what constitutes normal use, center around products used in the home and for recreation. Thus, the class of people whose behavior would be relevant becomes larger and broader: No longer industrial employees or pilots, but farmers, who use tractors in excess of recommended speed; homeowners who, in spite of warning, forgetfully turn on faucets which run scaldingly hot water; people who smoke after anointing themselves with Ben-

64. Id.
67. Schipper v. Levitt & Sons, Inc., 44 N.J. 70, 207 A.2d 314 (1965). Cf. A. CHAPANIS, MAN-MACHINE ENGINEERING 109-110 (1965), with respect to controls of common household equipment, and at 116 for a discussion of an experiment reported in A. CHAPANIS AND L. LIRDENBAUM, A REACTION TIME STUDY OF FOUR CONTROL-DISPLAY LINKAGES (1959). It developed out of the fact that various gas and electric kitchen stoves have several different linkages between the controls and the burners:

Subjects were tested to discover how quickly and how accurately they could associate the control on the front panel with the burner on the top surface. Fifteen different subjects (sixty in all) were tested on each stove, and each subject was tested for eighty consecutive trials. When a light appeared near the center of one of the burners, the subject had to respond as quickly as possible by pushing the correct control. A. CHAPANIS, supra, at 117.

The results of this experiment were that there were no errors made with one model; 76 with a second; 116 with the third; and 129 with the fourth. “The average response times
Gay; a fifteen year old boys who drive into thirty inch deep vinyl swimming pools; and women who exercise with “tummy flatteners.” The activities are clearly less standardized than those of a snaggling disc operator or even a pilot, but each presents a question of whether the behavior of the plaintiff was within the normal range of foreseeability; in other words, was it the behav-

agree with the error data: the arrangement on which subjects made no errors gave the shortest average response time.” Id. The author says on the basis of this and other studies cited in the chapter that: “It is clear that control-display arrangements have an important effect on performance.” Id. Although “it is difficult to devise a set of general rules to cover all the possible kinds of control - display arrangements . . . .” nonetheless, some rules seem to be so general and dependable that they could be called principles.” Id. As illustration, the first three of these principles are:

1. Displays and controls that are to be used in a fixed order should be arranged in sequence (a) from left to right, (b) from top to bottom, or (c) in rows from top to bottom, and from left to right within the rows.

2. When a number of displays and controls are each associated with a group of similar components, the arrangement of the controls and displays should correspond with the arrangement of the components. (For example, in a four-engine aircraft, the four throttle controls, RPM indicators, and mixture controls, should be arranged from left to right in the same order as the engines themselves.)

3. Controls associated with specific displays should be located so that the operator’s hand does not prevent him from seeing the display. When a number of associated controls and displays appear on a panel, (a) put each control directly below its corresponding display or (b) group all the displays above and all the controls below, but arrange the controls and the displays in exactly the same order. Id. at 117-18.

To reiterate a point made throughout this comment, the existence of research data such as the above should create a presumption of liability in a case in which a plaintiff has been injured by a product in which the arrangement of control-displays violated these principles.

71. Cf. Dunham v. Vaughn & Bushnell Mfg. Co., 86 Ill. App. 2d 315, 229 N.E.2d 684 (1967). Plaintiff was injured when a chip from the bevelled edge of the face of the claw hammer broke off and struck him in the eye. Defendant alleged that he had used the hammer in a “violent, unreasonable manner in excess of the purpose for which manufactured and that such use brought about the injury . . . .” Id. at 320, 229 N.E.2d at 686. The court, citing HARPER & JAMES, THE LAW OF TORTS, §28.4, stated:

[T]he manufacturer or seller must take reasonable precautions in the light of dangerous propensities that are, or should be known. What, if any, precautions are required, is a question that will vary with the circumstances and will depend upon the balancing of the likelihood of harm, and the gravity of harm, if it happens, against the burden of the precaution which would be effective to avoid the harm. Id. at 327, 229 N.E.2d at 689.

The case is of particular interest in that the plaintiff introduced the testimony of five witnesses as to the “custom of farmers within the community to use claw hammers, not only for carpentry work, but . . . for work upon machinery . . . .” as the plaintiff was doing when he was injured. Id. at 330, 229 N.E.2d at 691.
ior of an average person of that class or group. Although the courts involved have decided each of the above cases on the basis of a common knowledge approach without the guidance of experts, some of the behaviors involved clearly lend themselves to systematic study. For example, in terms of mental processes, how and why people forget; in terms of physical behavior, how they use a rubber exercise rope. In the latter case the rope should have been thoroughly tested to determine whether there were any problems (defects) in design which would not appear before actual normal use. Although, the plaintiff in the case made references to the possibility of safeguards, the court could not deal with this issue because as it stated: "plaintiff tendered no issue of fact on this topic . . . she should have posed a genuine issue

72. Such a standard has traditionally been applied to young children for whose curiosity the courts typically make allowances. Although knowledge of children’s early developmental behavior is a special concern of psychologists, much of it is also in the realm of common knowledge. Thus, it has been held that the fact that a five year old girl might spray her clothing as well as her hair with large quantities of hair spray because she liked the smell and then accidently set herself on fire, although an abnormal use, was not unforeseeable, see Hardman v. Helene Curtis Industries, Inc., 48 Ill. App. 2d 42, 198 N.E.2d 681 (1964). Accord, Crist v. Art Metal Works, 230 App. Div. 114, 243 N.Y.S. 496 (1930), aff’d 255 N.Y. 624, 175 N.E. 341 (1931) (a flame from a toy revolver ignited a Santa Claus costume in which infant plaintiff was dressed); Travell v. Bannerman, 174 N.Y. 47, 66 N.E. 583 (1903) (defendant stored gun-powder in an unfenced lot, “which he knew” plaintiff and other small boys used as a playground); LaGorga v. Kroger Co., 275 F. Supp. 373 (W.D. Pa. 1967) (jacket made for a young child was not treated with flame retardant substances which would have added only a few cents to the cost). The court stated:

To an ever-increasing extent in this day of synthetic living, the population is dependent on mass producers for its wearing apparel . . . Greater care and integrity is required by society from sellers, as well as increased caution for the safety and well-being of all users, especially the child consumer. 275 F. Supp. at 379.

The defendant argued that the charge of the lower court was “imposing on the seller of clothing for children the duty that the parents obviously have to undertake.” Id. at 382.

In upholding the lower court instructions, the court said:

The instructions emphasized that if the jury found that conduct of such children playing with fire was so extraordinary or abnormal, they might find that . . . [defendant] could not have anticipated or have foreseen the harm, and they should exonerate . . . [defendant] from liability; but if they found such conduct on the part of young children could reasonably have been foreseen . . . and such conduct was not abnormal or extraordinary, they might find . . . [defendant] liable . . . foreseeability is a standard to determine fault, but in our opinion it is also an important factor in determining the applicability of §402A. Id. at 383.

Cf. Dewar v. Sears Roebuck & Co., 49 N.Y.S.2d 654 (Sup. Ct. 1944), an early case in which the question of whether it was foreseeable that a small child might reach and handle the exposed parts of a washing machine was treated as a matter of fact to be determined by the jury. Contra, Moran v. Williams, 313 A.2d 527 (Md. Ct. App. 1974) (two teenage girls attempted to scent a burning candle by pouring Tigress Cologne on the candle) held that in the absence of evidence which would tend to show that the cologne manufacturer
of material fact as to the reasonableness and feasibility of a safeguard if she wished to make that contention.”73

III. THE IMPACT OF RESEARCH ON THE MANUFACTURER’S AFFIRMATIVE DUTY

What is feasible in terms of safeguards in relation to a particular product is to a large extent related to the commitment to systematic testing and research in the field. Even under the negligence standard, the test of reasonableness in terms of providing for the safe use of a product, varied greatly and produced widely discrepant results. Reasonable care could mean such rigorous testing and inspection that it is in effect a contractual assurance that no defective units shall pass. On the other hand, reasonableness may be so loosely defined as to excuse almost any lack of care.74

foresaw or should have foreseen such use there was a failure, as a matter of law, to establish any duty on the part of the manufacturer. Appellants had sought reversal by proposing that the question of what constitutes an intended or ordinary use is “more properly answered against a backdrop of community experience, rather than by the pronouncements of the manufacturer and therefore, a question of fact to be decided by the jury.” Id. at 530; Lawson v. Benjamin Anshe1 Co., 180 S.W.2d 751 (Mo. App. 1944) (youngster of five splashed inflammable fingernail polish over his clothes and then set fire to himself); Boyd v. Frenchee Chem. Corp., 37 F. Supp. 306 (E.D.N.Y. 1941) (10 month old child drank poisonous fabric cleaner). In both of above cases it was held as a matter of law that these uses were unforeseeable.

The foreseeability of harm from fire has been an issue in cases other than those involving children. A leading case is Hentschel v. Baby Bathinette, 215 F.2d 102 (2nd Cir. 1954), in which Judge Frank’s strong dissent was expressed in terms of foreseeability. On the basis of the fact that there are approximately a million household fires a year, he felt that the intervening fire which caused the injuries complained of could not be regarded as extraordinary or unforeseeable.

Another area in which recent decisions have held the manufacturer to be responsible for having adequate knowledge of the consumer is that of allergic reactions to a product. Noel, Manufacturer’s Negligence of Design or Directions for Use of a Product, 71 Yale L.J. 816, 865 (1962) explains that: “Ordinarily this duty is fulfilled by a warning or by instructions for making of tests . . . however . . . where a substantial number of people are likely to suffer allergic reactions of a serious character from an ingredient in a product, there might be a duty to eliminate, where feasible, the offending ingredient.” See, e.g., Wright v. Carter Prods., Inc., 244 F.2d 53 (2nd Cir. 1957) (applying New York law); Braun v. Roux Distrib. Co., 312 S.W.2d 758 (Mo. 1958) involving the manufacture and distribution of hair dye, in which the defendant was held to “the skill of an expert in that [his] particular business, ‘to an expert’s knowledge of the arts, materials and processes’ and is bound to keep reasonably abreast of scientific knowledge and discoveries concerning his field and, of course, is deemed to possess whatever knowledge is thereby imparted.” 312 S.W.2d at 763.


74. Reusch v. Ford Motor Co., 196 Wash. 213, 82 P.2d 556 (1938) held that it was
When the issue is design defect as it is defined in this paper (i.e. a product is defective if it has not been designed to fit the foreseeable average consumer) the issue becomes the extent of the manufacturer's affirmative responsibility to build in and to develop additional safeguards. In Witt v. Chrysler Corp., a negligence action, the trial courts' instructions, which were upheld on appeal, were: "The fact that it is not customary to employ certain testing and inspection will not excuse a manufacturer for its failure to provide them, if common prudence requires their use in a particular case." Additionally, a factor which has been held to be of special significance with reference to the amount of testing required is the gravity of the harm threatened.

In Bartkewich v. Billinger the court agreed with plaintiff's contention that the lack of a proper safety device could constitute a defective design and subject the manufacturer to liability under Section 402A of the Restatement. It limited this doctrine however, only to situations in which the absence of such a device caused an injury "of the type that could be expected from the normal use of the product." Thus, the defendant was relieved of liability for not installing a guard rail because the plaintiff had assumed an abnormal, unanticipated work position when he reached into the glass breaking machine and voluntarily assumed so obvious a risk. The court stated: "Appellant [defendant] was entitled to believe that the machine would be used in its usual manner, and need not be an insurer for the extra-ordinary risks an operator might choose to take."

Only three months later however, in the case of Greco v. Bucciconi Engineering Company, under similar facts the defendant was found to be liable. Although the court found that the plaintiff had voluntarily placed his hand under a steel-piler while it was in operation (causing it to unexpectedly release and crush his hand) it distinguished the facts from those in Bartkewich on the grounds that there was evidence that the manufacturer knew

---

76. Id. at 582, 167 N.W. at 103. Cf. Texas & P. Ry. v. Behymer, 189 U.S. 469, 470 (1903) in which Justice Holmes said, "What usually is done may be evidence of what ought to be done, but what ought to be done is fixed by a standard of reasonable prudence, whether it usually is complied with or not."
77. 432 Pa. 351, 247 A.2d 603 (1968).
78. Id. at 354, 247 A.2d at 605.
79. Id. at 356, 247 A.2d at 605.
80. 407 F.2d 87 (3d Cir. 1969).
that employees would have to reach under the pile in order to properly perform their job. Thus, the court concluded that the injury resulted from the normal use of the product. The decision seems to disregard voluntary misuse or assumption of risk as a defense if the defendant had knowledge of the use. The only good defense under the court's ruling would be that the plaintiff had voluntarily made some unreasonable or abnormal use of the product. In effect, the court had imposed a foreseeability test as to whether or not the seller should have anticipated such use and therefore guarded against it.\footnote{81. \textit{Cf.} Wheeler \textit{v.} Standard Tool and Manufacturing Co., 359 F. Supp. 298 (S.D.N.Y. 1973), holding that the absence of a guard at the needle-inserting station of a machine designed to assemble hypodermic syringes was a defect which was unreasonably dangerous to the user. The court relied on the testimony of defendant's own witness who testified that he had strongly urged the defendant to use such guards; accord, Walker \textit{v.} Trico Manufacturing Co., 487 F.2d 595 (7th Cir. 1973) in which the plaintiff had actually extracted an admission from the defendant's president that he had foreseen the possibility of an accident resulting from the absence of a cover to the switch which activated the defendant's machine. In both of the above cases, the defenses of misuse of the product and assumption of risk were rejected.}

The distinction the court made between the facts in \textit{Bartkewich} and \textit{Greco} would have appeared less spurious had the decision in \textit{Greco} been based on concrete behavioral evidence as to how the typical operator of a steel-piler performs his tasks, \textit{i.e.}, standardized observation and experimentation on the nature of the entire work situation and its potential hazards. Similarly in \textit{Bartkewich}, whether the plaintiff did assume an abnormal, unanticipated work position is a question which calls for competent evidence on how other workers perform at the same machine. Such evidence might in fact have borne out the verdict. It is indeed possible that the plaintiff did something which was so far outside the range of the normal behavior of similarly situated workers that there was no way for the defendant to have anticipated and guarded against it. It is in this way that the traditional affirmative defense of obviousness of the danger perhaps has meaning; the test of obviousness would be that a significant majority of similarly situated people did not engage in the behavior which injured the plaintiff, presumably because the risk was obvious and their natural instincts for self-preservation were operating.\footnote{82. \textit{See} Baltimore \& P.R.R. \textit{v.} Landrigan, 191 U.S. 461, 474 (1903).} Under these circumstances the manufacturer would be relieved of liability. Such a rule, however, would be phrased in terms of the foreseeability of the behavior of a class of consumers,
rather than in terms of obviousness of the danger or assumption of risk. The Bartkewich court stated: "The whole point is that there was no need for appellee [the defendant] to be at the spot where the jam occurred to prevent damage to the machine; the switch was easily accessible and would have provided a safe and efficient means of stopping it."\(^8\) As has been suggested by the entire thrust of this paper, such statements, since they are the key to the ultimate decision in a products liability case, must be submitted to available methods of proof.

A remaining question, the answer to which would seem to be implied by the preceding discussion, is whether a manufacturer has an affirmative duty to provide his equipment with fail-safe devices which would give prospective users an absolute guarantee of safety, even against their own inadvertence. Moren v. Samuel M. Langston Co.\(^8\)\(^4\) dealt with this issue in the context of a suit for damages arising out of injuries which the plaintiff sustained in connection with the use of a printer-slotter machine used in the manufacture of paper cartons and shipping containers. Plaintiff's expert, whose testimony had been disqualified at the trial level, was prepared to testify that there were two basic categories of safety device for machines of this type; the first, designed to prevent individuals from entering into or near the moving parts; the second, an electronic eye which would stop the machinery. He would have further testified that there was an electronic eye which would not interfere with the operation of the machine or in the production of the product, which could have been attached to the entrance of the areaway so that if any person either deliberately or accidentally passed the machine would have automatically stopped. The witness himself had disseminated information about such a device by means of bulletins and industry newsletters. The defendant objected to this line of testimony not only on the basis of the witness' qualifications, but also on the ground that no other manufacturer of solid printer-slothers had developed or was using such an innovation and that there was no proof that the defendant had received notice and thus had knowledge of the development of such an electronic eye. In this argument, the defendant relied on two previous Illinois cases\(^8\)\(^5\) which had held that evidence of the fact that there were safety devices

available other than that which the defendant was using was immaterial where, "it is not in itself negligence to supply a certain type of machine though other types of machines might conceivably be safer." The Moren court distinguished both of these previous cases on the ground that neither opinion gave any indication that evidence had been offered "as to standards in the industry, use of other materials or devices, or that the defendants knew or should have known of the existing state of the art in the industries in which the defendants operated." In holding that the excluded evidence should have been admitted, in that it would have aided the jury in deciding "what was feasible and what the defendant knew or should have known" the court stated:

A manufacturer is held to the degree of knowledge and skill of experts . . . This standard imposes upon the manufacturer the duty of an expert to keep abreast and informed of the developments in his field including safety devices and equipment used in his industry with the type of products he manufacturers.

"[A] custom either to take or to omit a precaution is generally admissible as bearing on what is proper conduct under the circumstances, but is not conclusive." Custom is relevant in determining the standard of care because it illustrates what is feasible, it suggests a body of knowledge of which the defendant should be aware . . . But custom should never be conclusive.

As Judge Learned Hand said, . . . "[I]n most cases reasonable prudence is in fact common prudence; but strictly it is never its measure; a whole calling may have unduly lagged in the adoption of new and available devices. It never may set its own tests however persuasive be its usages. Courts must in the end say what is required . . . "

The preceding review of cases has focused on the type of evidence which has been or should have been offered in products liability litigation. It has dealt with cases in which there appeared to be an evidentiary gap and suggested how this might have been

86. 96 Ill. App. 2d 133, 144, 237 N.E.2d 759, 764.
87. Id. at 145, 237 N.E.2d at 765.
88. Id. at 146, 237 N.E.2d at 766.
89. Id. at 145, 237 N.E.2d at 765.
91. Id., citing generally Morris, Custom and Negligence, 42 COLUM. L. REV. 1147 (1942); 2 WIGMORE, EVIDENCE §§459, 461 (3d ed.).
92. Id. at 145-46, 237 N.E.2d at 765-66, citing The T.J. Hooper, 60 F.2d 737, 740 (2d Cir. 1932).
filled by the testimony of behavioral scientists on the dynamics of the man-machine system as it relates to what the defendant-manufacturer should have anticipated and therefore incorporated into the design of his product. Obviously such intensive research and evaluation as has been suggested is feasible and should fill more than a mere evidentiary need. Hopefully it will lead to safer products before serious injuries and costly, time-consuming litigation is required. A few courts, apparently heeding such words as those of Judge Learned Hand, cited in the Moren decision, have begun to move towards articulating standards on the basis of foreseeable risk combined with the availability of the necessary technology.

If other courts were to adopt the holding of Moren, is the day not too distant when a jury would find an automobile manufacturer liable to parties injured as a result of an accident involving a drunken driver? The fact that people drive after they have been drinking (or are otherwise incapable of responding adequately to the driving task) and that alcohol "has been clearly identified as the single most important human factor underlying unsafe actions by drivers . . . in severe and fatal crashes" is both a matter of common knowledge and one that has been verified in many scientific studies. Additionally, technology is available and known within the field and without (it has been widely discussed in the popular media) which would prevent people impaired by alcohol from driving.

94. D. Klein & J. Waller, supra note 24 at 74 citing, e.g., Alcohol and Highway Safety Report of the Secretary of Transportation (1968): "[T]he use of alcohol by drivers and pedestrians leads to some 25,000 deaths and a total of at least 800,000 crashes in the United States each year."
95. E.g., D. Klein & J. Waller, supra note 24 at 76, citing Barmack & Payne, Injury-producing private motor vehicle accidents among airmen: Psychological models of accident-generating processes, 52 J. of Psych. 3 (1961), Selzer, Alcoholism, medical illness, and stress in 96 drivers causing fatal accidents, 14 Behavioral Science 1 (1969); Waller, Chronic medical conditions and traffic safety: A review of California experience, 273 New Eng. J. of Med. 1413 (1965); cf. The State of the Art of Traffic Safety, A Critical Review and Analysis of the Technical Information on Factors Affecting Traffic Safety (Arthur D. Little, Inc. for the Automobile Manufacturers Assoc., Inc. 1966) 28: "Excessive drinking has been clearly demonstrated to be associated with a large share, perhaps over half, of the motor vehicle fatalities in the United States urban areas . . . ."
96. The type of advertising which lauds the achievements of science and industry and what has been done to enhance the enjoyment of living for the average American, typically publicizes such advances as the alcohol interlock system and the possibility of embedding tiny computers into the wheels of automobiles which would detect and prevent skidding thus avoiding a major cause of serious accidents, leaving the typical American to wonder when he will benefit from this progress.
alcohol, drugs, or emotional distress from driving. The present automobile key would be replaced with a device which would detect impairment by measuring performance on psychophysical tasks.\textsuperscript{97}

Whether such liability will ever be imposed on an automobile manufacturer or whether such decisions as \textit{Moren} or \textit{Larsen v. General Motors Corporation}\textsuperscript{98} which held the defendant liable for injuries “incident to the normal expected use of an automobile”\textsuperscript{99} will be more widely adopted is in fact not so much a matter of legal reasoning or evidence as it is a matter of social policy. Foreseeability alone has never created a duty. Under traditional negligence concepts, a legal duty is established only when the law responds to a societal decision that the foreseeable risks in a situation are of such concern to society that they outweigh the possible burdens of precaution imposed on the potential defendant. Strict liability cases seem to have carried over this language. It has been suggested in this paper that the concept of defect itself can only be defined in terms of foreseeable use, \textit{i.e.}, when the risk is foreseeable and means are available by which the manufacturer can correct for that risk the product is presumed to be defective in design. The degree of acceptance of such a theory; the degree to which the consumer will have the right, enforceable in a court of law, to expect the products he purchases to incorporate the benefits of scientific and technological advances which will balance his own fallibilities; the degree to which manufacturers will not be permitted to define the scope of their own responsibility, are questions which will be affected by policy developing outside, as well as inside the courtroom.\textsuperscript{100}

\section*{IV. The Role of the Courts}

A primary policy question and one that cannot be avoided in a discussion dealing with the establishing of realistic rules and standards for courts to determine liability in cases involving products or other civil liability, is whether the courts will take the

\textsuperscript{97} See J. \textsc{Tennant} & R. \textsc{Thompson}, \textsc{A Critical Tracking Task as an Alcohol Interlock System} (Society of Automotive Engineers 730095); E. \textsc{McDowell} & G. \textsc{Smith, Jr.}, \textsc{An Investigation of Serial Choice Reaction Time as the Basis for an Alcohol Interlock}.

\textsuperscript{98} 391 F.2d 495 (8th Cir. 1968).

\textsuperscript{99} \textit{Id.} at 502.

\textsuperscript{100} \textit{Cf.} Noel, \textit{Defective Products: Abnormal Use, Contributory Negligence, and Assumption of Risk}, 25 \textsc{Vand. L. Rev.} 93, 94 (1972) as to the kind of conduct by the plaintiff that should defeat recovery, “a court's choice of policy factors as a basis of strict liability may affect considerably its final decision.”
responsibility at all or whether their decisions will simply ratify the existing distribution of legal rights and responsibilities. Typically, the justification of courts which take the latter route is that they are not legislative bodies and thus should not perform what they choose to appoint as legislative functions. An illustrative case is *Schemel v. General Motors Corporation*,\(^{101}\) in which the plaintiff whose automobile was struck in the rear by one being driven at 115 miles per hour, alleged that the defendant was under a duty to refrain from manufacturing cars with a capacity for being operated at speeds in excess of 100 miles per hour. The court's rely was, "if regulation in this area is to come—and we do not say it should not—it should come in the form of an act which would apply a uniform national standard to a highly centralized national industry, and not be hammered out, higgledy-piggledy, on a case to case basis with all of the disparity which would inevitably result."\(^{102}\)

Other courts, such as the one which handed down the decision in *Larsen v. General Motors Corporation*,\(^{103}\) specifically rejected this view. The court said that where a manufacturer's negligence in design causes an unreasonable risk to be imposed on the user of its products, the manufacturer should be liable for injury caused by his failure to exercise reasonable care in design. The court specifically rejected the contention of the defense that the design of the Corvair was sufficient under the design standards established by the National Traffic and Motor Vehicle Safety Act of 1966, on the grounds that the statute was intended to be supplementary of and in addition to the common law of negligence and products liability and was not intended to create an exemption from common law liability.

It is the belief of many commentators that the judicial process can be an effective instrument in obtaining safer products\(^{104}\) and in shifting the cost of accidents due to unsafe design.\(^{105}\) Further, the fact that the legislature may act in the future does not

---

102. Id. at 136.
103. 391 F.2d 495 (8th Cir. 1968).
104. E.g., Llewellyn, *On Warranty of Quality, and Society II*, 37 Colum. L. Rev. 341, 407-08 (1937) comments on the fact that Coca-Cola's new bottling equipment and system of inspection make the reappearance of the well-known mouse highly unlikely.
condone a court’s refusal to mete out justice in the present. As one commentator has stated:  

This attitude [that the person wronged must await for action by the legislature upon the part of the courts] is evasive of the judicial responsibility which the common law implicitly imposes upon the judge to make the law serve the ends and needs of justice in a changing world. It has been the boast of the common law that it possesses the flexibility to accomplish this end.

Concomitant with the responsibility of courts not to evade their judicial function is the responsibility to perform this function in an atmosphere grounded in reality. Laws, whether statutory or court-made, which do not adequately reflect reality have distorting consequences. In terms of the thesis of this paper, for example, misidentifying the causes of accidents by failing to take notice of existing competent, reliable evidence, relevant to the ultimate question of who ought to bear the financial burden of the injury leads to: (1) misallocation of resources available for accident prevention; (2) miscalculation for actuarial purposes of the factors which predict accidents, i.e., the factors which account for the variance; (3) inappropriate use of criminal sanctions and educational campaigns,  

which as their ineffectiveness becomes generally known, decrease even further in efficacy since they then lose even their prima facie validity.


107. See generally, D. Klein & J. Waller, supra note 24, at 209-10: 

A very substantial proportion of current countermeasures focuses on changing the behavior of the driver, apparently on the assumption that, since the driver is recognized, both in law and in public opinion, as being primarily responsible, countermeasures ought to be concentrated on him. Both the assumption and the policies based upon it, however, are open to serious question . . . . [C]onsiderations of cost-benefit would dictate an emphasis on the most effective means of loss-reduction rather than a choice based on the faulty syllogism that since the driver is responsible for crashes . . . his behavior will reduce the number of crashes.

See also Calabresi, The Costs of Accidents, A Legal and Economic Analysis 303-07 (1970), which points out that most drunken and careless drivers are caught only if they have an accident, and we don’t know how many they may cause without themselves being involved. Thus:

Where conduct can be defined as undesirable with sufficient precision the best way to make those who engage in it pay . . . is to assess them directly and individually - through non-insurable fines if they can be caught regardless of accidents . . . . The burden whether called fine, tax or insurance, would depend on the general wrong-doing or undesirability of the activity, not on the fortuity of an accident occurring to the particular parties.
What then is the appropriate role of the court itself in fashioning standards for the type of evidence necessary to adequately resolve the complex issues in products litigation arising in our highly technical and scientific society?\textsuperscript{108} If the necessary "hard", research-based evidence is not forthcoming from the opposing parties, might it not be appropriate for courts to take judicial notice of the fact that in the years since the end of World War II, research and data on human behavioral propensities in every conceivable situation—from bedroom to schoolroom to factory to highway—have been studied by thousands of investigators spending millions of primarily tax collected dollars.

The Michigan court said in 1872:\textsuperscript{109}

The laws of nature and of the human mind, at least such of them as are obvious to the common apprehension of mankind, as well as the more obvious dictates of common sense and principles of human action . . . constitute a part of the laws of the land, and may, and must be assumed by the court without being found by a jury . . . .

The court spoke before what is commonly thought of as the birth of experimental psychology—the opening of the first experimental laboratory in Germany by Wilhelm Wundt in 1879. What was once thought of as knowable only through the "common apprehension of mankind" is today knowable or at least open to systematic investigation by the methods of science; "common sense" has become suspect and rightly so, for the term has too often been used to cover up after-the-fact rationalization of pre-conceived ideas. Nevertheless, although our methods of acquiring knowledge about the "human mind" have developed and changed, what the court said then is equally apt today. The courts more than ever need to take notice of the principles of human knowledge as a guidepost to resolving twentieth and twenty-first century problems.

\textsuperscript{108} J. Maguire, J. Weinstein, J. Chadbourn * J. Mansfield, Cases and Materials on Evidence 43 (1965) suggest that the scope and nature of judicial proof may depend upon what the court conceives its role to be in settling disputes and laying down guidelines for the future, citing State Commission for Human Rights v. Farrell, 43 Misc. 2d 958, 960, 252 N.Y.S.2d 649, 652 (Sup. Ct. 1964) in which the court declared:

The court approaches this matter not simply as litigation between private parties, but rather views the instant proceedings as raising vital matters filled with greatest public concern. The issue herein . . . . cannot be approached strictly within the conventional confines of an adversary proceeding . . . . groups throughout the country are searching for guidelines in the handling of this volatile problem.

CONCLUSION

This article started with the proposition that the concept of defect which is the essential element in products liability litigation under a strict liability standard can only be defined in terms of the foreseeable behavior of the consumer. Whenever a court frames its holding in terms of the foreseeability of the plaintiff's use or misuse of a product, it is taking judicial notice of psychological evidence. Typically, the behaviors of which courts have taken notice were those that could be anticipated on the basis of common sense or common knowledge alone. As products and the behavior called forth by them become more complex however, more reliable scientific evidence is required to establish whether a plaintiff's behavior was within the normal anticipated range of behavior of consumers of that product.

It has been contended that a manufacturer has an affirmative duty to use available research and data dealing with potential consumers of his product even to the extent of building in safeguards which would protect the potential user against his own inadvertence, misuse or misbehavior. Failure to do so should lead to a presumption that the product is defective. The duty referred to arises as a result of the foreseeability of human behavior (including human fallibilities) and the fact that scientific advances in technology have made such increased consumer protection possible.

The cases which were reviewed were selected because they focused on the evidentiary problems raised by the theoretical discussion. Each was chosen to illustrate how evidence based on behavioral research could have increased the reliability of the decision making process in terms of helping the court to determine legal standards, as well as in terms of giving juries a fuller and more precise factual picture. Examples were given of the types of evidence that appeared to be needed in specific cases e.g., evidence relating to job analyses in cases involving industrial accidents with machines; evidence concerning studies of pilot performance, reaction time, and ability to respond to emergencies; evidence of the results of experiments dealing with the use of household products. Products liability cases abound with expert testimony by engineers, metallurgists etc. as to the capacity of a particular product to withstand stresses and strains; yet rarely if ever do we find comparable evidence as to the stress tolerance of the human part of what has been termed the man-machine system. Thus, the proposition was advanced that as
products and the behavior they demand become increasingly complex the manufacturer has a concomitant responsibility to design products with a built-in allowance for human limitations. Therefore, the review of cases ended with one focusing on the type of evidence needed to sustain a holding that the manufacturer had a duty to install safety devices which would actually insure people against themselves through such devices as electronic eyes which automatically stop machines and alcohol interlock systems which prevent incapacitated people from starting cars.

The problem of accidents however, can no longer be isolated in the context of a dispute between two individuals, with the court determining which one was at fault. Clearly, the loss of human and financial resources suffered yearly in this country as a result of accidents—in the home, in industry, on the highways—demands a societal response and it is against this background that the case law will be hammered out.

Elizabeth Block