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A REVIEW OF CRASHWORTHINESS

GEORGE GALERSTEIN*

I. WHEN DOES THE CRASH BEGIN AND WHAT DIFFERENCE DOES IT MAKE?

WITH ITS understandably injury-directed concentration, the courtroom has failed to adequately reflect the realities of the manufacturer's conscious design choice, particularly that involving crashworthiness. One reason for this has been the separate consideration of crashworthiness design apart from the design of the total vehicle, a courtroom process that evolves from the traditional crash analysis which starts with the aircraft hitting the ground.

Traditional inquiry asks at what speed did the aircraft impact the ground, at what angle, etc. The inquiry is also directed toward determination of the sequence of events from some time prior to impact with the ground, perhaps that time at which a deviation from a normal flight pattern may have been experienced, or when a warning signal of some sort may have been recognized by the pilot. Inquiry into these points, however, is principally for the purpose of ultimately establishing the circumstances (speed, attitude, etc.) at the time of impact with the ground. Once having established these facts, the crashworthiness of the aircraft is judged essentially by the manner in which the aircraft withstood the impact under the determined circumstances. For example, if it landed upside down, did the roof collapse on the occupants; if it landed on its nose, did the nose structure collapse?

It is our contention that such an approach, at least insofar as the helicopter is concerned, is myopic or, better stated, excessively

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focused in a manner that does not best serve the purpose of products liability law. This purpose should not be solely to find a way to penalize the manufacturer, nor solely to serve as a compensating device for the injured plaintiff. If either of these is the *raison d'être* for products liability law, we would be better off cancelling the charade and simply instituting a system of automatic payouts in the event of crashes and injuries, perhaps leaving only a determination of the extent of damages to the discretion of judge or jury. In addition to the compensation of injured parties by the wrongdoer, the purpose of products liability law should be to encourage the design, construction, and sale of aircraft of the types that society would want available on the market. These types of aircraft will neither be the cheapest, the fastest, the most comfortable, the most stylish, the most useful, the most flightworthy nor the most crashworthy.

Traditional crashworthiness analysis—considering the crash as beginning with ground impact—encourages the focusing of attention on single aspects of design and fails to adequately consider the numerous and complex factors and tradeoffs that must enter into a designer's decisions. If performance is the sole consideration, every aircraft will be found lacking or defective; if cost is the only factor, the same is true. If all that is being considered is safety, again, every aircraft will be found defective. Our complaint concerns the simplistic manner in which some courts have permitted these matters, particularly complex crashworthiness issues, to be presented to the jury for consideration of whether there has been a defective design.

If the crash does not begin when the helicopter impacts the ground, when does it begin? One possibility is that the crash begins at the time in flight when a part has failed or the pilot has received some warning signal that all is not well. This alternate approach could well determine whether a helicopter lands safely with relatively slight impact or in what could be termed a "non-survivable" crash. If the crash is deemed to begin at the first sign of malfunction, design choices beyond the aircraft's ability to withstand ground impact will become relevant in determining the helicopter's crashworthiness. For example, the rotor will have been selected for the particular helicopter model. Certain of its char-

acteristics may affect the manner in which the helicopter descends from its position in the air at the time of part failure until its impact with the ground. The rotor may have qualities that enable it to more effectively control or slow the rate of descent so that, as compared with another helicopter model, it will strike the ground at a lesser velocity. These rotor characteristics should be considered as crashworthiness features. A rotor that can slow the rate of descent may be heavier than other types. Because every pound is important if the helicopter is to adequately perform its function, the type of rotor should be viewed as a reasonable tradeoff for some of the weight that might be dedicated to structure capable of withstanding a faster rate of descent.

There is a recognizable analogy to this in the automobile. Consider two automobiles of the same weight traveling at the same speed approaching a brick wall. If both drivers appreciate the danger at the same time and apply brakes at the same time, the automobile with the better brakes is going to hit the wall at a lesser speed than the other. Depending upon the speed and the brakes, one driver may escape with his life while the other may not. Is the quality of the brakes a proper consideration in determining the relative crashworthiness of these automobiles? It is submitted that the "braking" quality of a rotor is proper consideration in the crashworthiness of helicopters.

It is contended, however, that a crash must be considered to have begun even before the part failed or the pilot recognized that all was not well. In order to properly evaluate the design of the helicopter, its performance, its utility, and particularly its crashworthiness, one must retreat to the time the particular model in question was designed so that each of these features may be evaluated with full awareness of the choices and limitations that must necessarily be part of a designer's judgment in conjuring up the total helicopter. When one does this, the narrow focus upon the particular circumstances of the accident in question—which may be foreseeable in the abstract but not in the specific—widens into a broad perspective that includes the myriad of design choices facing the designer. Insofar as potential crashes are concerned, therefore, the buzzword of "crashworthiness" translates into the fuller and more significant word "safety." It is the total safety of

the helicopter that should be at issue, not any particular characteristic or component. For example, all helicopters have power limitations; there are certainly instances in which crashes could have been avoided had the helicopter had an engine with more power. All helicopters have rotor limitations; there are certainly crashes that could have been avoided had the rotor capability been extended. Likewise, all helicopters have crashworthy limitations; there are certainly injuries that could have been avoided had the crashworthiness of the helicopter been greater for the conditions of that particular accident.

What is the proper blend of all of these design factors? This is the vital question, and one cannot hope to begin to answer it reasonably without considering the *total* vehicle, be it helicopter, fixed wing aircraft or automobile, at the time of its design. Because complex design choices are never a matter of unanimity, even among the most expert in the field, one must tread with extreme care in pursuing this inquiry lest all that is accomplished is the substitution at a later date of another group's arbitrary value judgment.

II. DEVELOPMENT OF CRASHWORTHINESS: EVANS AND LARSEN

Since the avalanche of commentary following the introduction of strict liability into the products liability field in 1963 via the case of *Greenman v. Yuba Power Products, Inc.*,¹ there has probably been no subject in products liability more the object of comment and analysis than crashworthiness. The deluge began slowly in 1966 with the case of *Evans v. General Motors Corp.*² in which the Seventh Circuit held:

The intended purpose of an automobile does not include its participation in collisions with other objects, despite the manufacturer's ability to foresee the possibility that such collisions may occur. As defendant argues, the defendant also knows that its automobiles may be driven into bodies of water, but it is not suggested that defendant has a duty to equip them with pontoons.³

and

¹ 59 Cal. 2d 57, 377 P.2d 897, 27 Cal. Rptr. 697 (1963).

² 359 F.2d 822 (7th Cir. 1966).

³ *Id.* at 825.

A manufacturer is not under a duty to make his automobile accident-proof or fool-proof; nor must he render the vehicle 'more' safe where the danger to be avoided is obvious to all. Perhaps it would be desirable to require manufacturers to construct automobiles in which it would be safe to collide, but that would be a legislative function, not an aspect of judicial interpretation of existing law.⁴

In the *Evans* case, the plaintiff's decedent was killed when his station wagon was struck broadside by another vehicle. There was no contention that the station wagon caused the collision or that it was in any respect unfit for its normal highway use. Rather, the claim was based on the fact that the car had been designed and constructed with an X frame that offered inadequate protection to the car occupants against a high speed, broadside collision.

Since *Evans*, courts in various jurisdictions have applied the principles there enunciated to a variety of situations, including those where injuries were suffered as a result of failure to design the car to withstand a crash at 115 mph, the speed at which the car was capable of being driven;⁵ separation of the chassis of a truck from the cab during an accident;⁶ breaking up of a police car during a high speed collision;⁷ failure to install a noncollapsible steering column;⁸ failure to make the vehicle crashworthy to withstand a head-on impact at forty miles per hour;⁹ and many others. In general, these courts repeated and expanded upon *Evans* to the effect that the manufacturer was not liable for injury arising from those defects in the automobile which did not cause or contribute to the cause of the accident. Given the limitless variety and conditions under which automobile collisions occur in terms of impact, speed, direction of impact, multiple impacts, type of impact, and location of impact, these courts reasoned that it would be unfair to impose upon the manufacturer the duty of anticipating the limitless variety of possible accidents and providing for them all.

⁴ *Id.* at 824.

⁵ *Schemel v. General Motors Corp.*, 261 F. Supp. 134 (S.D. Ind. 1966), *aff'd*, 384 F.2d 802 (7th Cir. 1967).

⁶ *Perez v. Ford Motor Co.*, 497 F.2d 82 (5th Cir. 1974).

⁷ *Willis v. Chrysler Corp.*, 264 F. Supp. 1010 (S.D. Tex. 1967).

⁸ *McClung v. Ford Motor Co.*, 333 F. Supp. 17 (S.D. W.Va. 1971), *aff'd*, 472 F.2d 240 (4th Cir. 1973).

⁹ *Dreisonstok v. Volkswagenwerk*, 489 F.2d 1066 (4th Cir. 1974).

In addition, it was argued that any part of an automobile which causes injury to an occupant upon impact with that part can be said, after the fact, to have been capable of 'safer' design.

In 1968, however, two years after the *Evans* decision, the matter was considered by the Eighth Circuit in *Larsen v. General Motors Corp.*¹⁰ in a case which has been described as "the judicial genesis of the 'crashworthiness' theory."¹¹ The *Larsen* case involved a head-on collision, the impact causing a rearward thrust of the steering mechanism into plaintiff's head. Plaintiff did not contend that the design of the steering assembly caused the accident, but he argued that because of the design he sustained injuries that he would not otherwise have sustained or, in the alternative, his injuries would not have been as severe.

In the *Larsen* case, the Eighth Circuit view was directly contrary to that of the Seventh Circuit in the *Evans* case, holding that while automobiles are not made for the purpose of colliding with each other, collisions and injury-producing impacts are a frequent and inevitable contingency of normal automobile use.¹² The court continued:

[While w]e do agree that . . . an automobile manufacturer is under no duty to design an accident-proof or fool-proof vehicle . . . such manufacturer is under a duty to use reasonable care in the design of its vehicle to avoid subjecting the user to an unreasonable risk of injury in the event of a collision. Collisions with or without fault of the user are clearly foreseeable by the manufacturer and are statistically inevitable.¹³

As to the liability for resulting damages, the court said:

Any design defect not causing the accident would not subject the manufacturer to liability for the entire damage, but the manufacturer should be liable for that portion of the damage or injury caused by the defective design over and above the damage or injury that probably would have occurred as a result of the impact or collision absent the defective design.¹⁴

¹⁰ 391 F.2d 495 (8th Cir. 1968).

¹¹ Hoenig & Goetz, *A Rational Approach to "Crashworthy" Automobiles: The Need for Judicial Responsibility*, 6 Sw. U. L. REV. 1, 12 (1974).

¹² *Larsen v. General Motors Corp.*, 391 F.2d 495, 502 (8th Cir. 1968).

¹³ *Id.*

¹⁴ *Id.* at 503, often referred to as the "enhancement" of injuries. See *Fox v. Ford Motor Co.*, 575 F.2d 774, 783 (10th Cir. 1978), in which the Tenth Circuit

In the early years following these two decisions, there was a slight trend in support of *Larsen*, which has since developed into a stampede. Even the Seventh Circuit, which handed down the *Evans* decision, reversed itself late in 1977,¹⁵ acknowledging that, "Our rule in *Evans* is in a distinct minority."¹⁶ At the time of this writing the overwhelming majority of states follow the *Larsen* approach, although it should be noted that many, if not most, are federal court decisions stating what they believe the state courts would hold. When state courts have clearly rejected the crashworthiness theory, federal courts have dismissed claims based on crashworthiness.¹⁷

As set forth in *Larsen*, the heart of the theory of the manufacturer's general responsibility for the crashworthiness of his vehicle is the fact that, "Collisions . . . are clearly foreseeable by the manufacturer."¹⁸ It takes little penetrating thought to realize that while this statement of the general foreseeability of accidents may be sufficient to introduce the doctrine into the products liability arena, it does not constitute a touchstone by which the responsibility of crashworthiness under all circumstances should be automatically attributed to the manufacturer.¹⁹

Erie guessed that the state of Wyoming would adopt the majority crashworthiness doctrine and instructed the jury that defendant, if liable, would be responsible for *all* damages resulting from the death of plaintiff's decedent rather than only for the enhancement of injuries which would have been suffered as a result of the "original" collision. "Death is a different matter," said the court, "[i]t is not a divisible injury in which apportionment is either appropriate or possible." 575 F.2d at 787.

¹⁵ *Huff v. White Motor Corp.*, 565 F.2d 104 (7th Cir. 1977).

¹⁶ *Id.* at 107.

¹⁷ See *Williams v. Cessna Aircraft Corp.*, 176 F. Supp. 603 (N.D. Miss. 1974).

¹⁸ *Larsen v. General Motors Corp.*, 391 F.2d 495, 502 (8th Cir. 1968).

¹⁹ See discussion in Hoenig & Werber, *Automobile 'Crashworthiness': An Untenable Doctrine*, 20 CLEV. ST. L. REV. 578, 587-90 (1971). The Fourth Circuit issued a warning on this point:

The mere fact, however, that automobile collisions are frequent enough to be foreseeable is not sufficient in and of itself to create a duty on the part of the manufacturer to design its car to withstand such collisions under any circumstances. Foreseeability, it has been many times repeated, is not to be equated with duty; it is, after all, but one factor, albeit an important one, to be weighed in determining the issue of duty.

Dreisonstok v. Volkswagenwerk, 489 F.2d 1066, 1070 (4th Cir. 1974).

III. AREA OF APPLICATION

The crashworthiness doctrine has been applied extensively in the automotive field with emphasis on five general areas:

1. Structure—the ability of the vehicle to maintain living space for occupants throughout the crash sequence.
2. Containment—retention of occupants within the living space through the crash sequence.
3. Occupant acceleration environment—the rate of onset, magnitude, duration, and direction of accelerations experienced by occupants as a result of the crash.
4. Postcrash hazard—the threat to occupant survival posed by fire, etc. following the impact sequence.
5. Environment hazards—barriers, projections and loose equipment which during a crash sequence may cause injury.

On the basis of the *Larsen* doctrine, automobile manufacturers have been held liable for a multitude of "noncrashworthy" design features, including latent defects in the design of the fuel system and/or fuel tank;²⁰ lack of head restraints;²¹ impaling of a passenger on a gearshift lever which included a protective knob made of unsuitable plastic;²² failure of the roof of the car to support the car's weight during a rollover;²³ disengagement of a seat assembly;²⁴ failure to equip with seat belts;²⁵ and inclusion by a motorcycle manufacturer of a luggage rack in front of and higher than the operator's seat.²⁶

As stated recently, "The categories of crashworthiness are never

²⁰ *Nanda v. Ford Motor Co.*, 509 F.2d 213 (7th Cir. 1974); *Bremier v. Volkswagen of America, Inc.*, 340 F. Supp. 949 (D.D.C. 1972); *Grundmanis v. British Motor Corp.*, 308 F. Supp. 303 (E.D. Wis. 1970).

²¹ *Buccery v. General Motors Corp.*, 60 Cal. App. 3d 533, 132 Cal. Rptr. 605 (1976).

²² *Mickle v. Blackmon*, 252 S.C. 202, 166 S.E.2d 173 (1969).

²³ *Dyson v. General Motors Corp.*, 298 F. Supp. 1064 (E.D. Pa. 1969).

²⁴ *Evancho v. Thiel*, 297 So.2d 40 (Fla. Dist. Ct. App. 1974), *aff'd sub nom.* *Ford Motor Co. v. Evancho*, 327 So.2d 201 (Fla. 1976); *Volkswagen of America v. Young*, 272 Md. 201, 321 A.2d 737 (1974); *Rutherford v. Chrysler Motors Corp.*, 60 Mich. App. 392, 231 N.W.2d 413 (1975).

²⁵ *Gleich v. General Motors Corp.*, 29 Ohio App. 2d 28, 277 N.E.2d 566 (1971).

²⁶ *Bolm v. Triumph Corp.*, 33 N.Y.2d 151, 305 N.E.2d 769, 350 N.Y.S.2d 644 (1973).

closed."²⁷ Although this gleeful sounding expression may be true to some degree, courts have placed limitations on the extent to which the doctrine will be applied. For example, while embracing the *Larsen* doctrine, courts have held that the crashworthiness duty did not extend to protection against injuries received as a result of impact with a gear-shift lever knob;²⁸ absence of a roll-over bar on a twenty ton earth moving machine;²⁹ failure to provide a bulldozer with an overhead protective canopy;³⁰ failure to equip the car with a collapsible steering column and a proper windshield.³¹ Manufacturers have also withstood crashworthiness challenges where plaintiff does not offer some method of determining what additional injuries were attributable to the defective design;³² where the facts wholly preclude any demonstration of substantial probability of a causal link between the design of the seat belt and the enhancement of plaintiff's injuries;³³ where the manufacturer failed to install crash bars on a motorcycle;³⁴ and where the manufacturer complied with United States Army plans and specifications for a jeep that did not provide for seat belts or roll bars.³⁵

Relatively few aircraft crashworthiness cases have been reported, but the courts have not, in principle, distinguished between the automobile and aircraft. They have allowed or rejected enhanced injury in aircraft cases based upon the law applicable to automobile collisions. Aircraft manufacturers have been held liable for failure to install shoulder harnesses for rear seat passengers;³⁶

²⁷ 21 AM. TRIAL A. L. REP. 296 (1978).

²⁸ *Friedrich v. Anderson*, 191 Neb. 724, 217 N.W.2d 831 (1974).

²⁹ *Vineyard v. Empire Mach. Co.*, 119 Ariz. 502, 581 P.2d 1152 (1978).

³⁰ *Orfield v. International Harvester Co.*, 535 F.2d 959 (6th Cir. 1976).

³¹ *Gray v. General Motors Corp.*, 434 F.2d 110 (8th Cir. 1970).

³² See *Huddell v. Levin*, 537 F.2d 726 (3d Cir. 1976); *Yetter v. Rajeski*, 364 F. Supp. 105 (D.N.J. 1973).

³³ *Endicott v. Nissan Motor Corp.*, 73 Cal. App. 3d 917, 141 Cal. Rptr. 95 (1977).

³⁴ *Hunt v. Harley-Davidson Motor Co.*, 147 Ga. App. 44, 248 S.E.2d 15 (1978).

³⁵ *Sanner v. Ford Motor Co.*, 144 N.J. Super. 1, 364 A.2d 43 (1976), *aff'd*, 154 N.J. Super. 407, 381 A.2d 805 (1977), *cert. denied*, 75 N.J. 616, 384 A.2d 846 (1978).

³⁶ *Eichstedt v. Cessna Aircraft Corp.*, No. 282,029 (Nev., Washoe Dist. Ct. Aug. 29, 1977).

failure of a seat belt;³⁷ and lack of energy absorption capability of a landing gear.³⁸ They have been held *not* liable for failure to provide shoulder harnesses when the plaintiff failed to use the available seat belt.³⁹

As is evident from the above, the term "crashworthiness" is generally used in a broad sense, inclusive of what at times is more precisely defined as the "second collision"—the collision of occupants with a protruding item in the interior of the vehicle for which there may be no purpose save style. Comments offered here with respect to crashworthiness are not meant to apply to that type of simple "second collision," but rather to those complex and complicated crashworthiness design issues that involve numerous and subtle tradeoffs among societal objectives.

IV. RECENT DEVELOPMENTS

Recent developments of the crashworthy doctrine are perhaps best illustrated by several 1978 cases in the California courts. These cases must be examined in the light of the 1972 case of *Cronin v. J.B.E. Olson Corp.*⁴⁰ from which they derive.

In the *Cronin* case, the driver of a bread delivery truck was injured during an accident when a metal hasp holding the trays of bread in place broke, allowing the trays to move forward, strike the plaintiff, and push him through the windshield. The trial court entered judgment for the plaintiff on the theory of strict liability for manufacture of the hasp which, while not causing the original collision, had substantially contributed to the plaintiff's injuries. Defendant appealed on the grounds that the trial court committed error in refusing to include a statement in instructions to the jury that the defect in the product must be "unreasonably dangerous." The California Supreme Court held that to require plaintiff to show that the defect made the product "unreasonably dangerous," as required in Section 402A Restatement Second of Torts, would burden the injured plaintiff with proof of an element that "rings in negligence" which is not appropriate to strict liability.

³⁷ *Fuller v. Capitol Skypark*, No. 20364 (Cal. Super. Ct., Sacramento Div. Feb. 1973).

³⁸ *Powell v. Brantly Helicopter Corp.*, No. 6522 (Tex. Civ. App. Feb. 1974).

³⁹ *Cousins v. Instrument Flyers, Inc.*, 58 A.D.2d 336, 396 N.Y.S.2d 655 (1977).

⁴⁰ 8 Cal. 3d 121, 501 P.2d 1153, 104 Cal. Rptr. 433 (1972).

The *Cronin* case is cited repeatedly as the case which extended the strict liability concept in crashworthiness, but *Cronin* was not a crashworthiness case in any sense of the word. The actual crash or collision with another vehicle was completely incidental to the fact that a hasp, which was supposed to hold the bread trays in place, had failed to do so. The hasp failed, not because it was inadequately designed so as to provide a sufficient degree of crashworthiness. There was no such allegation. The hasp failed, as the court noted repeatedly, quoting plaintiff's expert witness, because of defects in its manufacture, because the metal of the hasp was " 'extremely porous,' . . . full of holes, voids and cracks and 'just a very, very bad piece of metal.'"⁴¹ Plaintiff admitted that the design was sufficiently crashworthy when his expert witness testified that, "if the hasp had not been porous, it would have withstood the impact and kept the trays in place."⁴² It was simply a matter of chance that the failure occurred during the crash instead of during a quick stop of the vehicle to avoid an accident, or at a traffic light, or as the result of fatigue experienced during the normal everyday vibrations of the truck. The issue was not the crashworthiness of the vehicle, which is a matter of design; the issue concerned a simple manufacturing defect, use of a metal full of holes, voids and cracks.

Why then is the *Cronin* case cited for extending strict liability principles to designs, including crashworthiness? The following dictum provides the answer: "We can see no difficulty in applying the *Greenman* formulation to the full range of products liability situations, including those involving 'design defects.' A defect may emerge from the mind of the designer as well as from the hand of the workman."⁴³

V. BARKER V. LULL ENGINEERING CO.

In January, 1978, crashworthiness was again brought to the attention of the California Supreme Court in the case of *Barker v. Lull Engineering Co.*⁴⁴ The plaintiff was injured when a high

⁴¹ 8 Cal. 3d at 126, 501 P.2d at 1157, 104 Cal. Rptr. at 437.

⁴² 8 Cal. 3d at 127, 501 P.2d at 1157, 104 Cal. Rptr. at 437.

⁴³ 8 Cal. 3d at 134, 501 P.2d at 1162, 104 Cal. Rptr. at 442.

⁴⁴ 20 Cal. 3d 413, 573 P.2d 443, 143 Cal. Rptr. 225 (1978).

lift loader that he was operating began to overturn. He jumped from the loader and was struck by a piece of falling lumber. Plaintiff contended that the loader was defectively designed because it was not equipped with seat belts or a roll bar and the absence of this safety equipment forced the plaintiff to leap from the loader as it began to tip and be struck by the falling lumber. The trial court instructed the jurors that, "strict liability for a defect in design . . . is based on a finding that the product was 'unreasonably dangerous' for its intended use."⁴⁵ The jury returned a verdict for defendant, and plaintiff appealed.

The California Supreme Court reviewed its decision in *Cronin* and agreed with defendants that the problem of plaintiff's dual burden (proving the product both defective and unreasonably dangerous) would be averted in a design defect case if "unreasonably dangerous" were used simply as a definition of defective condition. The court, however, rejected the Restatement "unreasonably dangerous" standard for design cases on the "more fundamental" reason that the manufacturer's responsibility should not be diminished by the public's failure to recognize a danger when it sees it:

[O]ur objection to the 'unreasonably dangerous' terminology in *Cronin* went beyond the 'dual burden' issue, and was based, more fundamentally, on a substantive determination that the Restatement's 'unreasonably dangerous' formulation represented an undue restriction on the application of strict liability principles.

As we noted in *Cronin*, the Restatement draftsmen adopted the 'unreasonably dangerous' language primarily as a means of confining the application of strict tort liability to an article which is 'dangerous to an extent beyond that which would be contemplated by the ordinary consumer who purchases it, with the ordinary knowledge common to the community as to its characteristics.' (Rest. 2d Torts, §402A, com. i) In *Cronin*, however, we flatly rejected the suggestion that recovery in a products liability action should be permitted only if a product is more dangerous than contemplated by the average consumer, refusing to permit the low esteem in which the public might hold a dangerous product to diminish the manufacturer's responsibility for injuries caused by that product.⁴⁶

This "more fundamental" reason posed by the court as the basis

⁴⁵ 20 Cal. 3d at 422, 573 P.2d at 449, 143 Cal. Rptr. at 231.

⁴⁶ 20 Cal. 3d at 425, 573 P.2d at 451, 143 Cal. Rptr. at 233.

for rejecting the Restatement's "unreasonably dangerous" standard for design defect is peculiarly inappropriate in the context of aircraft crashworthiness, for it is difficult, if not impossible, to conceive of an ordinary consumer of air travel holding the danger of an aircraft crash in low esteem or underestimating the danger involved in an aircraft crash. The court, at least insofar as aircraft crashworthiness is concerned, and probably also as to high-speed auto crashes, engaged in the time-worn metaphor of throwing the baby (the unreasonably dangerous standard which the court admits is applicable as a measuring stick to design defects) out with the bathwater (the ordinary consumer's expectations)—which have no need for protection in aircraft crash cases.

The court might have more logically preserved the "unreasonably dangerous" language as a measure of design defect and simply denied defendant the defense of the ordinary consumer's expectations.⁴⁷ Such an approach would have preserved the single necessary standard for measurement of a design defect and would have served to protect the unknowing public from its own possible underestimation of the dangers involved.

The *Barker* court went on to list two alternative ways in which a product may be held defective in design under strict liability: "(1) if the plaintiff proves that the product fails to perform as safely as an ordinary consumer would expect⁴⁸ or (2) if the plaintiff proves that the product's design caused the injury and the defendant fails to prove that the benefits outweighed the risk of danger."⁴⁹ Note that there is an obligation imposed on the plaintiff in alternative (2) to first prove that the product's design caused the injury. Such an obligation in aircraft crashworthiness cases, however, is effectively *no* obligation. There is no aircraft crash in which the injured party cannot "prove" that had the aircraft been designed differently, the injury would not have been caused or enhanced. If the cabin collapsed, it could have been made stronger; if the landing gear was crushed, it could have been constructed with more energy absorption characteristics; etc.

⁴⁷ "The only real problem is whether the product is 'unreasonably dangerous' because 'defective condition,' if it is to be applied at all, depends on that." Wade, *Strict Tort Liability of Manufacturers*, 19 Sw. L.J. 5, 15 (1965).

⁴⁸ *Barker v. Lull Eng'r Co.*, 20 Cal. 3d 413, 432, 573 P.2d 443, 455-56, 143 Cal. Rptr. 225, 237-38 (1978).

⁴⁹ 20 Cal. 3d at 432, 573 P.2d at 456, 143 Cal. Rptr. at 238.

Thus, as to every aircraft crashworthiness case, the net effect of the *Barker* decision is that the defendant almost automatically must prove to a lay jury, under alternative (2), that the complex trading off of objectives in the design of an aircraft was the "right" choice. One trial attorney for the defense takes the position that where it is likely that plaintiff can "prove" that the product's design caused the injury, defendant should admit that the product caused the injury. Then, having the burden of proof with regard to liability the defendant should be entitled to open and conclude the final arguments to the jury.

Finally, the *Barker* court attempts to clarify the point that determination of a design defect should be made under strict liability and not under negligence principles. The court insists that the jury should *not* direct its attention to the reasonableness of the manufacturer's conduct, *i.e.*, whether the manufacturer made a reasonable choice in the performance of its risk-balancing at the time of the design. The jury should instead perform that risk-balancing *itself*, focusing its attention directly on the product, including among other relevant factors, the gravity of the danger posed by the challenged design, the likelihood that such danger would occur, the mechanical feasibility of an improved design, and the adverse consequences to the product and to the consumer that would result from an alternative design. This risk-balancing allows the jury, "upon hindsight," to conclude that the product's design is unsafe to consumers, users or bystanders.⁵⁰

VI. MCGEE V. CESSNA AIRCRAFT CO.

Shortly after the *Barker* case, the California Court of Appeal decided *McGee v. Cessna Aircraft Co.*⁵¹ Plaintiff charged the defendant with having designed a noncrashworthy aircraft in that the fuel lines and fuel retaining equipment were exposed to damage during a "survival crash," resulting in the spewing of inflammatory fuel on the occupants. Also, failure by the defendant to install a shoulder harness was claimed to have caused the plaintiff to have been rendered unconscious when thrown forward during the crash, leaving him unable to evacuate the aircraft before the fire spread.

⁵⁰ 20 Cal. 3d at 434, 573 P.2d at 457, 143 Cal. Rptr. at 239.

⁵¹ 82 Cal. App. 3d 1005, 147 Cal. Rptr. 694 (1978).

In response to the special verdict question: "Do you find the negligence of the defendant regarding the crashworthiness of the subject aircraft was a proximate cause of the injuries to the plaintiff?",⁵² the jury responded in the negative, and judgment was entered in favor of the defendant.⁵³

Plaintiff appealed on the grounds that the failure of the court to instruct the jury, as requested, that crashworthiness was a strict liability concept constituted reversible error. The trial court had ruled:

It is my opinion and I am going to find that crashworthiness would be a matter of exercise of care by a manufacturer in putting his product on the market so as to avoid any injury that might result in the use of the product in the event of a crash. And a more logical and realistic approach would be one of negligence and not strict liability.⁵⁴

In extensive briefing on the subject, plaintiff-appellant argued that manufacturers are strictly liable for defects in design, that lack of crashworthiness is a matter of design, and that the theory of strict liability includes all design defects including those related to crashworthiness.⁵⁵ In California, at least, a plaintiff need not prove that the product incorporating the design defect is "unreasonably dangerous," a burden that "rings of negligence," as that principle was expressly determined not to apply in California to crashworthy cases (citing *Cronin*).⁵⁶

Defendant responded by agreeing that the duty of a manufacturer to design and produce a crashworthy vehicle does in fact exist, but that this duty must properly be measured by principles most closely akin to those associated with the general principles of negligence. Even where the courts have placed a strict liability label on their findings, the manufacturer's duty has always been measured by principles of negligence. Admitting that the modern trend follows the *Larsen* decision, as opposed to *Evans*, defendant argued that examination of the cases reveals that, regardless of what appellation is used, the basis for liability is founded on prin-

⁵² 82 Cal. App. 3d at 1011, 147 Cal. Rptr. at 697 n. 1.

⁵³ 82 Cal. App. 3d at 1005, 147 Cal. Rptr. at 694.

⁵⁴ 82 Cal. App. 3d at 1011, 147 Cal. Rptr. at 697.

⁵⁵ Brief for Appellant at 16.

⁵⁶ *Id.* at 19.

ciples of negligence and not strict liability. The balancing test—the weighing of the benefit of reducing injuries against the cost of removing the danger—is essentially a negligence concept and is a measure of whether the manufacturer has acted reasonably.⁵⁷

The court ruled for the plaintiff-appellant, reasoning that *Greenman* imposed strict liability upon the manufacturer for a manufacturing defect and that *Cronin* extended this strict liability doctrine to design defects, including those relating to postcrash injuries. *Cronin* also held that a plaintiff satisfies his burden of proof when he proves the existence of a defect and proves that such defect was a proximate cause of his injuries. In holding the “unreasonably dangerous” language inapplicable to strict liability cases because it “rings of negligence,” *Cronin* dispensed with negligence as the basis of recovery in defective products cases. *Buccery v. General Motors Corp.*⁵⁸ and others approved the use of a balancing test as a means of determining whether the design was defective, but this use of the balancing test does not determine what standard—negligence or strict liability—should be followed as a basis for determining liability. Its use by the jury in no way changes the *Cronin* rule of strict liability in the defective design case. The court rejected the defendant’s contention that determination of defect in a crashworthiness case necessarily involves defendant’s conduct and hence necessarily involves negligence principles, whether or not they are labeled as such. Despite defendant’s argument, the California court clearly held that determination of defect in a crashworthiness case *can* be made under principles of strict liability that are distinct from principles of negligence.⁵⁹ The jury should look to the product, not the conduct of the defendant, to evaluate crashworthiness, just as it would in a strict liability case involving a manufacturing defect. In a manufacturing defect case the measuring rod is the manufacturer’s drawing and specifications, and in a design defect case the measuring rod is the jury’s determination of whether the risks are worth the benefits. In both instances the principle of strict liability focuses the jury’s

⁵⁷ Brief for Respondent at 10, 17-19.

⁵⁸ 60 Cal. App. 3d 533, 132 Cal. Rptr. 605 (1976).

⁵⁹ “If the doctrine is to be applied at all, it can be applied *only* in negligence, where a full consideration by the court and jury can be made on the question of the ‘unreasonable’ nature of the risk or hazard presented.” Hoenig & Goetz, *supra* note 11 at 40.

evaluation on the product rather than on the defendant. The bedrock of this approach is the previously noted dictum of the court in the *Cronin* case:

We can see no difficulty in applying the *Greenman* (strict liability) formulation to the full range of products liability situations, including those involving 'design defects.' A defect may emerge from the mind of the designer as well as from the hand of the workman.⁶⁰

There are profound differences, however, between a strict liability "looking at the product" approach in manufacturing defect cases and in design defect cases. For example, the court advises that it is the jury's function to determine by hindsight whether the product's design is unsafe. Is this hindsight to consider the product under the circumstances and state of the art as it existed at the time of design or at the time of judgment by the jury? In the case of a manufacturing defect it makes no difference; in the case of the design defect it makes all the difference in the world. A manufacturing defect that causes fatigue failure is, under strict liability, clearly a defect. This is true whether the part was manufactured ten years ago or yesterday and regardless of the changes in the state of the art over that period. Were juries to be instructed to use present day state of the art to evaluate a ten year old *design*, then it would merely be a matter of time before all designs became "defective" and all manufacturers or their successors would ultimately be held liable for everything they produce if they design competently enough and are unfortunate enough to have their products in operation for an extended period of time. At that point, the jury certainly *must* consider state of the art in the design defect (crashworthiness) case, whereas it need not consider state of the art in the manufacturing defect case. If state of the art must be considered, the question arises whether negligence or strict liability principles are really being applied. Does the necessary involvement of state of the art with the risk-balancing formula mean that it is the conduct of the defendant that the jury is really evaluating?

According to the court in the 1976 aircraft crashworthiness case

⁶⁰ *Cronin v. J.B.E. Olson Corp.*, 8 Cal. 3d 121, 134, 501 P.2d 1153, 1162, 104 Cal. Rptr. 433, 442 (1972).

of *Bruce v. Martin-Marietta Corp.*,⁶¹ "[s]tate-of-art evidence helps to determine the expectation of the ordinary consumer. A consumer would not expect a Model T to have the safety features which are incorporated in automobiles made today. The same expectation applies to airplanes."⁶² The California Court's attempt to employ the same risk-balancing to the product as that applied under negligence to the conduct of the defendant raises the question of whether this approach can ever mean more than a redesign of the product by lay juries on a case-by-case basis.

VII. WILSON V. PIPER AIRCRAFT CORP.

California's rejection of the "unreasonably dangerous" terminology in a strict liability action was in turn rejected by the Oregon Supreme Court in the case of *Wilson v. Piper Aircraft Corp.*⁶³ which held that, "when a design feature of a manufactured product creates a risk of injury, the test for strict liability in tort, if that injury results, is whether a 'reasonably prudent manufacturer would have so designed and sold the article in question had he known of the risk involved which injured plaintiff'."⁶⁴ Plaintiff's theory was that the crash of the aircraft was caused by engine failure resulting from carburetor icing and that the deaths of the passengers were caused by the lack of crashworthiness of the rear passenger compartment, *i.e.*, that the aft-seat belt attachments were of insufficient strength and that no shoulder harnesses nor other upper torso restraint system was provided to protect the aft-seat passengers in an otherwise survivable accident. The jury found for plaintiffs and the defendant appealed. Although the court based its decision almost entirely on the charge of defective design of defendant's airplane because it was provided with a carbureted engine rather than the less icing-prone fuel injection engine, its reasoning is applicable to crashworthiness.

The court considered that it was part of the required proof of a design defect to present evidence that there are alternative designs that are technically feasible and practicable in terms of cost

⁶¹ 544 F.2d 442 (10th Cir. 1976).

⁶² *Id.* at 447.

⁶³ 282 Or. 61, 577 P.2d 1322 (1978).

⁶⁴ 282 Or. 61, 577 P.2d at 1325, quoting the holding in *Phillips v. Kimwood Mach. Co.*, 269 Or. 485, 494, 525 P.2d 1033, 1037 (1974).

and the overall design and operation of the product. In this case, the consideration was of the effect the substitution of a fuel injected engine in this airplane design would have upon the airplane's cost, economy of operation, maintenance requirements, over-all performance, and safety in respects other than susceptibility to icing. The decisive issue was whether "a reasonably prudent manufacturer who was aware of the risks of carburetor icing would not have designed this model of aircraft with a carbureted engine . . ."⁸⁵

Defendant urged that it is not the function of lay courts and juries to determine the design features of aircraft on a case-by-case basis, that they are not equipped with the technical knowledge to pass upon conscious design choices made by experts, and that such matters ought to be left to the expertise of the FAA and aircraft manufacturers. Where the FAA has discharged its responsibility in establishing adequate safety standards in design features, that ought to be the end of the argument, and the courts ought not to interfere. While the court declined to hold that the FAA approval of the model design or the airworthiness of the particular aircraft is a complete defense to civil liability for faulty design, it did redefine the role of the court where claims of faulty design are made.

The Oregon Supreme Court said that courts, "should balance the utility of the risk against its magnitude in deciding whether to submit a design defect case to the jury."⁸⁶ Using the fuel injected engine as an example, the court further clarified its position:

Plaintiff's allegations amount to a contention that an airplane furnished with a standard aircraft engine is defective because an engine of a different type, or with a different carburetor system, would be safer in one particular. It is not proper to submit such allegations to the jury unless the court is satisfied that there is evidence from which the jury could find the suggested alternatives are not only technically feasible but also practical in terms of cost and the over-all design and operation of the product. It is part of the required proof that a design feature is a 'defect' to present such evidence. . . .

There is not . . . any evidence about what effect the substitution of a fuel injected engine in this airplane design would have had upon the airplane's cost, economy of operation, maintenance re-

⁸⁵ 282 Or. 61, 577 P.2d at 1328.

⁸⁶ 282 Or. 61, 577 P.2d at 1326.

quirements, over-all performance, or safety in respects other than susceptibility to icing.⁶⁷

Plaintiff's petition for rehearing, based largely on the *Barker* case, evoked the court's following comment:

We have considered that decision and do not find it persuasive.

In recent years California's law of products liability and our own have developed along different lines. We regard the *Barker* decision as additional evidence of those differences. Under that decision it appears that a design defect case will always go to the jury if only the plaintiff can show that the product caused the injury. In this jurisdiction, however, it is part of plaintiff's case to show that a product which caused an injury was dangerously defective.⁶⁸

VIII. FEDERAL SAFETY STANDARDS

Most courts have held that compliance with federal safety standards is not conclusive to the determination that acceptable design standards have been employed by the defendant. For automobiles, as noted in *Roberts v. May*,⁶⁹ the act under which the Department of Transportation's safety standards were promulgated specifies that compliance "does not exempt any person from any liability under common law [and]. . . (t)hus, the standards . . . are not conclusive on the question of a manufacturer's liability."⁷⁰ While the Federal Aviation Regulations contain no such statement regarding nonexemption from liability under common law, courts have reached the same conclusion on the basis that the Federal Aviation Act authorizes the Administrator to "promote safety of flight . . . by prescribing . . . minimum standards governing the design of . . . aircraft."⁷¹ These standards include rotorcraft design.⁷²

The *Wilson*⁷³ court agreed that compliance with the FAA safety

⁶⁷ 282 Or. 61, 577 P.2d at 1327.

⁶⁸ 282 Or. 411, 579 P.2d 1287, 1288 (1978).

⁶⁹ 583 P.2d 305 (Colo. App. 1978). This is the case that adopted the *Larsen* crashworthiness position for Colorado.

⁷⁰ *Id.* at 308.

⁷¹ 49 U.S.C. § 1421(a)(1) (1976).

⁷² The design regulations covering rotorcraft are set forth in Part 29, Airworthiness Standards: Transport Category Rotorcraft of the Federal Aviation Regulations. 14 C.F.R. §§ 29.1 *et seq.* (1979).

⁷³ *Wilson v. Piper Aircraft Corp.*, 282 Or. 61, 577 P.2d 1322 (1978). Regard-

standards does not preclude the possibility of a design defect, but it observed that in a field as closely regulated as aircraft design and manufacture, it is proper to take into consideration whether the regulatory agency has approved the very design of which the plaintiff is complaining after considering the dangers involved.⁷⁴ The concurring opinion by Justice Linde elaborated on the role of the FAA:

[W]hen liability is predicated on finding a design 'dangerously defective,' not 'duly safe' or short of some similarly phrased standard of safety, then a careful comparison of that standard and the one attested to by the certificate becomes important. Under such a test for civil liability, as well as under government regulation, the question, at least within the limits of the state of the art, is 'how much safety is enough.'⁷⁵

Justice Linde then developed the specifics of the relationship between the courts and the FAA:

The difficulty in the present case springs from the fact that most of these factors—briefly summarized, the safety risks, the availability of safer designs, the financial and other costs of the safer alternative, and the user's awareness of and ability to avoid the risks—are at least very similar to the factors that are presumably meant to enter into the FAA's judgment whether an aircraft design is safe enough.⁷⁶

According to Justice Linde, whether compliance with the government safety standards will negate a claim of "dangerously defective" design will depend upon whether the balance struck by the government standards between safety and its costs has been set higher or lower than that set by rules governing the producer's

ing crashworthiness and federal regulation, the court in *Schemel v. General Motors Corp.*, 261 F. Supp. 134 (S.D. Ind. 1966), stated:

Obviously, 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 hammered out, higgeldy-piggeldy, on a case basis with all of the disparity which would inevitably result.

261 F. Supp. at 136. See also Galerstein, *Aircraft Crashworthiness: Who Sets the Standard*, 28 FED'N INS. COUNSEL Q. 258 (1978).

⁷⁴ 282 Or. 61, 577 P.2d 1322, 1333 (1978). See also Tetelman & Besuner, *How Safe is Safe Enough*, Failure Analysis Associates, June 1977 (to be published in SOCIAL CONSEQUENCES OF ENGINEERING).

⁷⁵ 282 Or. 61, 577 P.2d at 1334.

⁷⁶ 282 Or. 61, 577 P.2d at 1333.

civil liability.⁷⁷ He observed that the government regulations for the design of aircraft place much greater weight on the side of safety than for most other products. If the factors considered by the government agency are at least very similar to the factors that would enter into the court's consideration of whether there is or is not a defect, "it becomes very problematic to assume that one or a sequence of law courts and juries are to repeat that underlying social judgment de novo as each sees fit."⁷⁸ Rather, he contends, when the design of a product is subject not only to prescribed performance standards but also to government supervised testing and specific approval or disapproval on safety grounds, no further balance need be struck by a judge or jury to determine whether the product design is "unreasonably dangerous" for its intended or foreseeable use under the conditions for which it is approved. Such a balancing would be necessary only if one of two things can be shown: either that the standards of safety and utility assigned to the regulatory scheme are less inclusive or demanding than the premises of the law of product liability, or that the regulatory agency did not address the allegedly defective element of the design or in some way fell short of its assigned task.⁷⁹

IX. DALY V. GENERAL MOTORS CORP.

From the manufacturer's point of view, one of the most significant decisions handed down over the past year was *Daly v. General Motors Corp.*⁸⁰ Having decided in *Li v. Yellow Cab Co.*⁸¹ that comparative negligence of the plaintiff was applicable in cases where the defendant was charged with negligence, the Supreme Court of California struggled in *Daly* with the question of whether comparative fault might be applied to actions founded on strict liability.⁸²

⁷⁷ 282 Or. 61, 577 P.2d at 1334.

⁷⁸ 282 Or. 61, 577 P.2d at 1335.

⁷⁹ *Id.*

⁸⁰ 20 Cal. 3d 725, 575 P.2d 1162, 144 Cal. Rptr. 380 (1978).

⁸¹ 13 Cal. 3d 804, 532 P.2d 1226, 119 Cal. Rptr. 858 (1975).

⁸² For a list of jurisdictions applying comparative negligence to strict liability and commentary on the subject and considerations pro and con, see Bowman, *Contribution in Products Liability Cases*, The Defense Research Institute, Inc., New Orleans, La., January 19-20, 1979.

The plaintiff's automobile had struck a fence causing the door to be thrown open and the driver to be ejected from the vehicle, suffering fatal head injuries. Plaintiff alleged faulty design of the door latch. It was agreed that had the deceased remained in the car, his injuries probably would have been minor. The auto was equipped with a seat belt/shoulder harness system that the driver had failed to use.

The court concluded that "equitable apportionment or allocation of loss,"⁸³ a term that the court preferred over "comparative fault," would not subvert the foundational reasons underlying the creation of strict liability. Plaintiff would continue to be relieved of proving that the manufacturer was negligent. The court reasoned that there is more "shadow than substance"⁸⁴ to the argument that the manufacturer's incentive to produce safe products would be reduced or removed; and, jurors would indeed be able to compare plaintiff's negligence with defendant's strict liability and undertake a fair apportionment of liability.⁸⁵

Several other states had previously extended, by judicial action, comparative negligence principles to strict liability.⁸⁶ Five states have adopted comparative fault statutes which are not limited in their language to negligence actions.⁸⁷

In addition, the *Daly* case recognizes the admissibility in evidence, under proper instructions, of the failure of plaintiff to employ seat belts,⁸⁸ thus introducing still another question-raising

⁸³ *Daly v. General Motors Corp.*, 20 Cal. 3d 725, 736, 575 P.2d 1162, 1168, 144 Cal. Rptr. 380, 386 (1978).

⁸⁴ 20 Cal. 3d at 737, 575 P.2d at 1169, 144 Cal. Rptr. at 387.

⁸⁵ 20 Cal. 3d at 738, 575 P.2d at 1170, 144 Cal. Rptr. at 388.

⁸⁶ 20 Cal. 3d at 739, 575 P.2d at 1170, 144 Cal. Rptr. at 388.

⁸⁷ *Id.*

⁸⁸ 20 Cal. 3d at 745, 575 P.2d at 1174, 144 Cal. Rptr. at 392. This is discussed in Foland, *Enhanced Injury: Problems of Proof in "Second Collision" and "Crashworthy" Cases*, 16 WASHBURN L.J. 600, 619-20 (1977):

In a crashworthiness case the plaintiff is challenging the integrity of the entire vehicle in a collision. The manufacturer must provide an automobile designed to be reasonably safe for such unintended use. Each and every safety device for the protection of the occupant or other injured party is a material element of the defense to the issue being raised by the plaintiff. . . . [T]he defense counsel should simply assert that non-use of a seatbelt by an injured party is an affirmative negation of the plaintiff's theory of 'defect'—that the vehicle is not crashworthy—and is also positive evidence the 'defect' is not the proximate cause of any enhanced injury.

element into the apportioning of fault under comparative negligence or, better stated, comparative fault. Is accident-causing fault to be compared with injury-causing fault in determining the proportion of total fault (damages) to be attributed to each party? Assume an accident caused by the negligence of the pilot with injuries enhanced both by failure of the manufacturer to provide sufficient structure of a given part and by failure of the passenger-plaintiff to use the available seat belt. In this situation, are the accident-causing fault of the pilot and the injury-causing faults of the manufacturer and passenger all to be compared equally? While there may still be some smoldering dispute as to whether an accident is really a foreseeable use of a vehicle, the position of plaintiffs and defendants on this point is clearly foreseeable and will follow each party's economic interests dictated by the circumstances of the particular accident. For example, where the plaintiff caused the accident and had not been provided with a seat belt, the absence of which enhanced or substantially caused the injuries, plaintiff's argument will be that the accident-causing fault and the injury-causing fault are qualitatively different and must be considered separately. Where the plaintiff has not caused the accident but has failed to use a seat belt which would have prevented the injuries, he will then argue to the contrary. The manufacturer will, of course, act in a similar fashion.

The thrust of *Daly*, however, appears to be that total fault or damages includes all factors that may have contributed to the event that resulted in the injury, whether they be what is identified as "accident-causing" or "injury-causing," and that the damages will be apportioned on the basis of what the jury considers to be properly representative of the proportion of fault of each party. This is consonant with the court's comprehensive view of product design as an "integrated whole":

The jury could properly determine whether the Opel's overall design, including safety features provided in the vehicle, made it 'crashworthy,' thus rendering the vehicle nondefective. Product designs do not evolve in a vacuum, but must reflect the realities of the market place, kitchen, highway and shop. Similarly, a product's components are not developed in isolation, but as part of an integrated and interrelated whole. Recognizing that finished products must incorporate and balance safety, utility, competitive merit,

and practicality under a multitude of intended and foreseeable uses, courts have struggled to evolve realistic tests for defective design which give weight to this necessary balancing. Thus, a number of California cases have recognized the need to 'weigh' competing considerations in an overall product design, in order to determine whether the design was 'defective.' (Citations omitted)

The danger of piecemeal consideration of isolated components has been expressly recognized (citations omitted). Specifically, it has been observed that a design rendered safe in one situation may become more dangerous in others (citations omitted). However phrased, these decisions emphasize the need to consider the product as an integrated whole.⁸⁹

Comparative fault, as enunciated in *Daly*, may be the "quenching oil" that tempers the frustration of the manufacturer who has come to find himself responsible not only for his own conduct and product, but also for the conduct of those over whom he has no control and who fail to take reasonable acts to protect themselves.

The foreseeability of the accident, which imposes an obligation on the manufacturer to design an appropriate amount of crashworthiness into his product, does not or should not excuse the negligent conduct that brings about the accident and the subsequent injury. Each party, manufacturer and user, has responsibilities when, but for the action of both, there would have been no or lesser injury. It seems logically to follow that each should bear responsibility for his share of fault.⁹⁰

X. KORLI V. FORD MOTOR CO.

*Korli v. Ford Motor Co.*⁹¹ was an action in strict liability for the wrongful death of plaintiff's daughter who had opened the rear door of an automobile and fallen into oncoming traffic. The jury found for plaintiff who claimed that the rear hinged doors and easy accessibility of the unlatching lever were design defects because the accessibility of the lever permitted the child to unlock the door and the rear hinging permitted the relative wind to push

⁸⁹ *Daly v. General Motors Corp.*, 20 Cal. 3d 725, 747, 575 P.2d 1162, 1175, 144 Cal. Rptr. 380, 393 (1978).

⁹⁰ See Foland, *supra* note 88 at 620: "To allow a plaintiff to ignore every safety device furnished him, and then bring suit when injured alleging the product was unsafe, would be ludicrous."

⁹¹ 84 Cal. App. 3d 895, 149 Cal. Rptr. 98 (1978) (withdrawn from publication in California Reporter by Order of the Court).

the door open. The evidence established that the cause of the accident was either that the door was unlocked or that the child had unlatched it.⁹²

The court of appeals reversed, directing an entry of judgment for defendant.⁹³ While the case was pending, the California Supreme Court decided the *Barker* case and returned *Korli* to the appellate court for reconsideration in view of *Barker*. The appellate court decided that the precepts in *Barker* confirmed their previous decision.⁹⁴

The *Korli* court concluded that the prophecy in *Self v. General Motors Corp.*⁹⁵ that "prosecution of a lawsuit is a poor way to design a motor vehicle, for the suit will almost invariably emphasize a single aspect of design to the total exclusion of all others"⁹⁶ had been realized in this case. The jury's findings that it would have been better under the circumstances of this accident to have forward hinging doors and less accessible latches were considered in the light of other foreseeable accident circumstances such as head-on collisions in which, "rear door hinging would provide better containment than front hinging and, in case of fire, easier egress would be beneficial in preventing the trapping of occupants inside."⁹⁷ It was concluded that Ford had made conscious design choices on the basis of competing safety considerations only to have that choice rejected by a lay jury which was undoubtedly influenced by the stark horror of the case.⁹⁸

The court pondered the two-pronged approach to design defect set forth in the *Barker* case.⁹⁹ As to the first, it held that the rear hinged doors matched the quality of most like products, did not render the car unfit for its ordinary purpose, and thus did not fail to perform as an ordinary consumer would expect when used in an intended or reasonably foreseeable manner. As to the second,

⁹² *Id.*

⁹³ *Id.* at 899.

⁹⁴ *Id.*

⁹⁵ 42 Cal. App. 3d 1, 116 Cal. Rptr. 575 (1974).

⁹⁶ *Korli v. Ford Motor Co.*, 84 Cal. App. 3d 895, 901, 149 Cal. Rptr. 98 (1978) (withdrawn from publication in California Reporter by Order of the Court).

⁹⁷ *Id.*

⁹⁸ *Id.*

⁹⁹ See notes 48-49, *supra*, and accompanying text.

plaintiff had not made a prima facie showing that the design was the proximate cause of the injury:

In order to invoke the second prong of the *Barker* test a plaintiff must do more than show that an injury resulted during the use of the product. What is required is a prima facie showing that some feature of the product other than its simple generic quality caused the injury at a time that the product was being put to its intended or reasonably foreseeable use. In fact, the court in *Barker* speaks of a 'risk of danger inherent in [the] design. . . .'

To permit a jury on these facts to decide that the design was defective would establish an open-ended liability for manufacturers which is unwarranted and unjust. . . .

We do not believe that the doctrine of strict liability was conceived to permit lay juries to simply make value judgments as to the relative desirability of one design over another.¹⁰⁰

XI. GENERAL MOTORS CORP. V. TURNER

An important crashworthiness decision in 1979 was a Texas case, *Turner v. General Motors Corp.*,¹⁰¹ involving a strict liability suit in tort to recover injuries received when a car roof collapsed in a roll-over. The trial court had instructed the jury as to the meaning of "unreasonably dangerous" in accord with the ordinary consumer test, i.e., that the term "unreasonably dangerous" meant "dangerous to an extent beyond that which would be contemplated by the ordinary customer who purchased it, with the ordinary knowledge common to the community as to its characteristics."¹⁰² Defendant General Motors had objected to this instruction and had tendered its requested instruction that "unreasonably dangerous" should be defined using the most ordinary consumer test in the disjunctive with the prudent manufacturer test, that is as meaning "dangerous to the extent that any automobile so designed would not be placed in the channels of commerce by a prudent manufacturer aware of the risks involved in its use or to the extent that the automobile would not meet the reasonable expectations as to safety of the ordinary consumer with the ordinary knowledge

¹⁰⁰ *Korli v. Ford Motor Co.*, 84 Cal. App. 3d 895, 905-06, 149 Cal. Rptr. 98 (1978) (withdrawn from publication in California Reporter by Order of the Court).

¹⁰¹ 22 Tex. Sup. Ct. J. 272 (March 21, 1979).

¹⁰² *Id.*

common to the community as to its characteristics."¹⁰³ Plaintiff contended that the "prudent manufacturer" test was available only to the plaintiff¹⁰⁴ under the court's previous decisions in *Henderson v. Ford Motor Co.*¹⁰⁵ and *General Motors Corp. v. Hopkins*.¹⁰⁶

The Texas Supreme Court held that *Henderson* and *Hopkins* clearly established that the ordinary consumer and prudent manufacturer tests were intended to be alternatives available to both plaintiff and defendant.¹⁰⁷ The court continued, however:

[W]e have reexamined our previous decisions [and]. . . we have determined that a definition of 'unreasonably dangerous' is unnecessary when asking a jury to determine if a product as designed is unreasonably dangerous to the user or consumer. Implicit in any definition of the phrase 'unreasonably dangerous' is a fictitious standard that may be meaningless, or confusing, to the jurors, or unduly restrictive as to some while open-ended as to others. . . . Unreasonably dangerous is a concept that necessarily implies a balancing of the utility of a product against the danger in its use. [citation omitted]. This means, of course, that the bifurcated test set forth in *Henderson* and *Hopkins*, which is unique to our jurisdiction, will no longer govern. We are persuaded to these conclusions by the inconclusiveness of the idea that jurors would know what ordinary consumers would expect in the consumption or use of a product, or that jurors would or could apply any standard or test outside that of their own experiences and expectations. [citation omitted]. There is even more reason why the prudent manufacturer test has no logical place in a strict liability submission to the jury. It is a negligence concept that necessarily requires proof of the considerations and reasons leading the manufacturer to the adoption of the design, and further requiring evaluation by the fact finders of the acts and conduct of the manufacturer to determine if due care was exercised."¹⁰⁸

¹⁰³ *Id.* at 275-76.

¹⁰⁴ *Id.* at 276.

¹⁰⁵ 519 S.W.2d 87 (Tex. 1974).

¹⁰⁶ 548 S.W.2d 344 (Tex. 1977).

¹⁰⁷ 22 Tex. Sup. Ct. J. 272, 276 (March 21, 1979).

¹⁰⁸ *Id.* at 277. See also Donaher, Piehler, Twerski & Weinstein, *The Technological Expert in Products Liability Litigation*, 52 TEX. L. REV. 1303, 1307 (1974):

It is time to abandon the perspective of the reasonable consumer and the reasonable seller and formulate the strict liability question for what it is. The issue in every products case is whether the product *qua* product meets society's standards of acceptability. The unreasonable danger question, then, is posed in terms of

XII. JUHLIN V. BEMIS; BROWN V. KEILL

In another recent crashworthiness case, *Juhlin v. Bemis*,¹⁰⁹ the defendant-manufacturer, in the light of a clearly liable, accident-causing pilot co-defendant, urged that its injury-causing fault be compared by the jury with the accident-causing fault of the pilot and other co-defendants so as to yield a single set of fault percentages totaling 100% for all of the defendants. The Minnesota District Court rejected these urgings and required the jury to determine three issues: (1) the amount of money that would compensate plaintiffs for their injuries, (2) the percentage of the plaintiffs' total damages caused by the manufacturer's defective seat, and (3) taking all of the negligence contributing to the crash as 100%, the percentage of fault attributable to each of the three accident-causing defendants. The jury found the answer to (2) to be 33-1/3%, thus making the manufacturer liable for one-third of the total damages and the other three defendants liable for the remaining two-thirds in the proportion of the percentages set forth by the jury.¹¹⁰

The merger of accident-causing and injury-causing fault certainly will be a favored approach of the injury-causing defendant when the plaintiff is the accident causer. When the accident causers are possibly insolvent co-defendants, however, and joint and several liability is an applicable doctrine of law, such an approach may be disadvantageous. Under these circumstances, 1% fault can mean 100% payment. Kansas has eliminated the possibility of a 1% tort-feasor being held for 100% of the damages by its holding in the case of *Brown v. Keill*¹¹¹ that the Kansas comparative negligence statute effectively abrogates the common law principles of joint and several liability.¹¹²

whether, given the risks and benefits of and possible alternatives to the product, we as a society will live with it in its existing state or will require an altered, less dangerous form. Stated succinctly, the question is whether the product is a reasonable one given the reality of its use in contemporary society. [footnote omitted]

¹⁰⁹ No. 5-76-68 (D. Minn.), settled, no appeal taken.

¹¹⁰ As per telephone conversation with Mr. Ludwig B. Gartner, Jr., Faegre and Benson, Minneapolis, Minnesota, attorney for the plaintiff.

¹¹¹ 224 Kan. 195, 580 P.2d 867 (1978).

¹¹² 224 Kan. 195, 580 P.2d at 874.

CONCLUSION

It is evident from a review of recent court pronouncements¹¹³ and the writings of commentators¹¹⁴ that the subject of crashworthiness is one of extreme complexity involving subtle tradeoffs and balancing of numerous antithetical, socially desirable values. Professor Henderson¹¹⁵ observes that to assign the courts the task of reviewing manufacturers' conscious design choices (conscious, knowing decisions of the designer to accept the risks associated with the intended design in exchange for the increased benefits)¹¹⁶ would, in effect, be to send them on a suicide mission.¹¹⁷ The ultimate question, he suggests, is to determine "[w]hat portion of society's limited resources are to be allocated to safety, thereby leaving less to be devoted to other social objectives?"¹¹⁸ Obviously, the role of the courts in evaluating crashworthiness is worthy of continued analysis and debate.

¹¹³ In addition to the cases cited in the text, see also *Bowman v. General Motors Corp.*, 427 F. Supp. 234 (E.D. Pa. 1977); *Self v. General Motors Corp.*, 42 Cal. App. 3d 1, 116 Cal. Rptr. 575 (1974); although not a crashworthiness case, *Garst v. General Motors Corp.*, 207 Kan. 2, 484 P.2d 47 (1971).

¹¹⁴ See, e.g., Schaden, *Aircraft Crashworthiness*, 14 TRIAL 40 (1978).

¹¹⁵ Henderson, *Judicial Review of Manufacturers' Conscious Design Choices: The Limits of Adjudication*, 73 COLUM. L. REV. 1531 (1973).

¹¹⁶ *Id.* at 1540.

¹¹⁷ *Id.* at 1577-78.

¹¹⁸ *Id.* at 1540.