

2016

Driverless Cars and the Much Delayed Tort Law Revolution

Andrzej Rapaczynski
Columbia Law School, ar5@columbia.edu

Follow this and additional works at: https://scholarship.law.columbia.edu/faculty_scholarship



Part of the [Law and Economics Commons](#), [Law and Philosophy Commons](#), [Science and Technology Law Commons](#), and the [Torts Commons](#)

Recommended Citation

Andrzej Rapaczynski, *Driverless Cars and the Much Delayed Tort Law Revolution*, COLUMBIA LAW & ECONOMICS WORKING PAPER NO. 540 (2016).

Available at: https://scholarship.law.columbia.edu/faculty_scholarship/1962

This Working Paper is brought to you for free and open access by the Faculty Publications at Scholarship Archive. It has been accepted for inclusion in Faculty Scholarship by an authorized administrator of Scholarship Archive. For more information, please contact scholarshiparchive@law.columbia.edu.

DRIVERLESS CARS and the MUCH DELAYED TORT LAW REVOLUTION

*Andrzej Rapaczynski*¹

Abstract

The most striking development in the American tort law of the last century was the quick rise and fall of strict manufacturers' liability for the huge social losses associated with the use of industrial products. The most important factor in this process has been the inability of the courts and academic commentators to develop a workable theory of design defects, resulting in a wholesale return of negligence as the basis of products liability jurisprudence. This article explains the reasons for this failure and argues that the development of digital technology, and the advent of self-driving cars in particular, is likely to force a comprehensive re-thinking of products liability, a large-scale return to the principle of strict manufacturers' responsibility, and a host of other developments of lasting historical and economic significance. The article argues that an integration of manufacturing and insurance industries may be one of these developments.

One of the most remarkable technological developments in recent times is the rapid progress of automobile technology. A host of safety improvements, beginning with seat belts, through airbags, and finally a number of computer-assisted safety devices, such as electronic stability control,² rear view screens, lane-departure and blind-spot warnings,

¹ Daniel G. Ross Professor of Law, Joseph Solomon Professor of Wills, Trusts and Estate Planning, Columbia University. As will become quickly clear to anyone familiar with this field, my work is deeply influenced, indeed inspired, by Guido Calabresi's path-breaking scholarship in the law of torts generally, and his analysis and promotion of strict liability in particular. Judge Calabresi was very kind to read a draft of this article and give me very helpful advice. I have also received a number of helpful comments from my colleagues during a presentation of this paper at a faculty seminar at Columbia. Shayan D. Banerjee, Suparna Reddy, and Brittany K. Sykes provided excellent research assistance.

² "The National Highway Traffic Safety Administration (NHTSA) estimates that ESC saved over 2200 lives among passenger vehicle occupants during the three-year period from 2008 to 2010." John Villasenor, *Products Liability and Driverless Cars: Issues and Guiding Principles for Legislation*, BROOKINGS INST. (Apr. 2014), http://www.brookings.edu/~media/research/files/papers/2014/04/products%20liability%20driverless%20cars%20villasenor/products_liability_and_driverless_cars.pdf (citing NAT'L CENTER FOR STATISTICS & ANALYSIS, NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., REPORT NO. DOT HS 811 634, TRAFFIC SAFETY FACTS: ESTIMATING LIVES SAVED BY ELECTRONIC STABILITY CONTROL, 2008-2010, (Nov. 2012)),

self-parking, and others,³ combined with the electronic global positioning system, have already transformed the experience and safety of modern automobile use. But the truly revolutionary stage is just around the corner: within a few years, digital technology will make completely driverless cars a reality, and no longer a matter of science fiction. Indeed, one research group forecasts that "by 2035, sales of autonomous vehicles will reach 95.4 million annually, representing 75% of all light-duty vehicle sales."⁴

It does not take great expertise to observe that the regime of tort liability will be an important factor in determining how quickly and in what form driverless cars will be put on the market, how much they will cost, etc. Given the potentially enormous significance of this effect for a whole host of very powerful interests, it is also not surprising that a cottage industry of lawyers, law professors, and think tanks is quickly developing to assess the situation and provide advice.⁵ But what *is* perhaps somewhat surprising is that

³ See, e.g., NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., REPORT NO. DOT HS 811 182, THE LONG-TERM EFFECT OF ABS IN PASSENGER CARS AND LTVs, at 47 (July 2010), available at <http://www-nrd.nhtsa.dot.gov/Pubs/812069.pdf> (antilock brake systems reduce the overall crash-involvement rate by 6% in passenger cars and by 8% in light trucks and vans); NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., REPORT NO. DOT HS 811 115, THE EFFECTIVENESS OF AMBER REAR TURN SIGNALS FOR REDUCING REAR IMPACTS, at 12 (Apr. 2009) (change in color of rear turn signals from red to amber reduces rear impacts by 5.3%).

⁴ *Autonomous Vehicles Will Surpass 95 Million in Annual Sales by 2035*, NAVIGANT RESEARCH (Aug. 21, 2013), <http://www.navigantresearch.com/newsroom/autonomous-vehicles-will-surpass-95-million-in-annual-sales-by-2035>. A more conservative estimate by Boston Consulting Group forecasts that one in ten cars sold worldwide in 2035 could be fully automated. *12 Million Driverless Cars to Be on the Road by 2035-Study*, REUTERS (Jan. 8, 2015, 5:35 PM), <http://www.reuters.com/article/2015/01/08/autos-bcg-autonomous-idUSL1N0UN2GQ20150108>.

There is also a difference of opinion among experts whether the cars of the future will be entirely self-driving and to what degree drivers will retain control over the various electronic safety devices in their cars. According to some reports, only Google anticipates future cars to be entirely self-driving, with no steering wheels or brakes, while "other car companies view self-driving technology as a complement, not replacement, for the driver." Joe Nocera, *Look, Ma, No Hands!*, N.Y. TIMES (June 5, 2015), http://www.nytimes.com/2015/06/06/opinion/joe-nocera-look-ma-no-hands.html?_r=0.

⁵ A partial list of publications on this subject includes: Sophia Duffy & Jamie Patrick Hopkins, *Sit, Stay, Drive: The Future of Autonomous Car Liability*, 16 SMU SCI. & TECH. L. REV. 101 (2013), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2379697; Andrew P. Garza, *Look Ma, No Hands!: Wrinkles and Wrecks in the Age of Autonomous Vehicles*, 46 New Eng. L. Rev. 581 (2012), available at <http://newenglev.com/volume-46-issue-3/v46b3garza/>; Kyle Graham, *Of Frightened Horses and Autonomous Vehicles: Tort Law and its Assimilation of Innovations*, 52 SANTA CLARA L. REV. 1241 (2012), available at <http://digitalcommons.law.scu.edu/lawreview/vol52/iss4/4/>; Gary E. Marchant & Rachel A. Lindor, *The Coming Collision Between Autonomous Vehicles and the Liability System*, 52 SANTA CLARA L. REV. 1321 (2012), available at <http://digitalcommons.law.scu.edu/lawreview/vol52/iss4/6/>; Kyle Colonna, Note, *Autonomous Cars and Tort Liability*, 4 CASE W. RES. J.L., TECH. & INTERNET 81, (2012), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2325879; NIDHI KALRA, JAMES M. ANDERSON, MARTIN WACHS, RAND CORP., LIABILITY AND REGULATION OF AUTONOMOUS VEHICLE TECHNOLOGIES, UCB-ITS-PRR-2009-28, CAL. PATH RESEARCH REPORT (Apr. 2009); JAMES M. ANDERSON, NIDHI KALRA, KARLYN D. STANLEY, PAUL SORENSEN, CONSTANTINE SAMARAS & OLUWATOBI OLUWATOLA, AUTONOMOUS VEHICLE TECHNOLOGY: A GUIDE FOR POLICYMAKERS (2014), available at http://www.rand.org/pubs/research_reports/RR443-1.html. A growing number of newspaper articles also

the attention of commentators has been focused primarily around the idea that products liability law can have a seriously deleterious effect on the adoption of the new technology. Indeed, although an occasional voice can be heard that the tort system is capable of handling the new challenge of driverless cars,⁶ most commentators argue for one or another method of insulating the manufacturers from the impact of products liability law and propose various forms of immunity for the industry, including preemptive federal legislation.⁷

I do not deny that the existing tort law may slow down technological progress and that a reasonable reform is necessary. But I would like to focus not on what tort law can do for driverless cars, but on what they can do for the tort law, i.e., on their revolutionary potential for bringing new life and innovation into the products liability law. As I will show, the law regarding civil responsibility for the enormous cost of accidents involving industrial products – and perhaps the cost of automobiles accidents above all⁸ – has regressed in comparison to where it had been heading several decades ago, and the advent of driverless cars is likely to force us to retrace its wayward ways and provide an occasion to rethink the whole issue of the proper basis of liability for accidents due to the use of industrial products. Several propositions for which I shall argue in the rest of this paper should help us realize why this focus may allow us to address some of the most significant issues concerning the direction of future tort-law development.

First, under the present circumstances, the extent of potential liability connected with the introduction of the driverless cars is actually much smaller than that to which car manufacturers would have been exposed if the tort law in the area of products liability had not evolved as dramatically as it did in the last thirty years or so by abandoning the widespread judicial and legislative effort of the previous

deal with this issue: Douglas Newcomb, *Will Lawsuits Kill the Autonomous Car?*, MSN (Apr. 15, 2013), <http://editorial.autos.msn.com/blogs/autosblogpost.aspx?post=577eb20f-399d-4124-a245-2a42b032f94c>; Chris Nichols, *Liability Could Be Roadblock for Driverless Cars*, SAN DIEGO UNION-TRIB. (Oct. 30, 2013), <http://www.utsandiego.com/news/2013/Oct/30/liability-driverless-car-transovation-google/>; Dan Strumpf, *Liability Issues Create Potholes on the Road to Driverless Cars*, WALL ST. J., (Jan. 27, 2013), <http://online.wsj.com/news/articles/SB10001424127887323854904578264162749109462>.

⁶ Garza, *supra* note 5.

⁷ Cf. Colonna, *supra* note 5 (advocating liability limits); Duffy & Hopkins, *supra* note 5 (advocating car owners' liability); Kevin Funkhouser, Note, *Paving the Road Ahead: Autonomous Vehicles, Products Liability, and the Need for a New Approach*, 2013 UTAH L. REV. 437, 458–62 (2013) (advocating a no-fault compensation scheme).

⁸ According to National Highway Traffic Safety Administration, in 2013, auto accidents were responsible for 32,719 deaths and 2.3 million injuries. NAT'L CENTER FOR STATISTICS & ANALYSIS, NAT'L HIGHWAY TRAFFIC SAFETY ADMIN, REPORT NO. DOT HS 812 101, 2013 MOTOR VEHICLE CRASHES: OVERVIEW (Dec. 2014), <http://www-nrd.nhtsa.dot.gov/Pubs/812101.pdf>. The economic cost of these accidents was estimated at \$242 billion, NAT'L CENTER FOR STATISTICS & ANALYSIS, NAT'L HIGHWAY TRAFFIC SAFETY ADMIN, REPORT NO. DOT HS 812 139, TRAFFIC SAFETY FACTS 2013, <http://www-nrd.nhtsa.dot.gov/Pubs/812139.pdf>, – a figure higher than the *combined* federal expenditures for education, environment, energy, foreign affairs, and science and technology.

decades to make strict liability into the governing principle of manufacturers' responsibility. Indeed, the wholesale return to negligence as the principle governing liability in the area of design defects has in fact dramatically decreased the liability of car manufacturers for most of the huge human and property losses directly traceable to potentially avoidable automobile accidents.

Second, had the products liability system stayed with the strict liability principle, especially if the courts and/or legislatures had developed it in a proper way to vindicate the promise of using market incentives in order to improve the safety of industrial products, this fact, while making the car manufacturers' liability larger than it is now in absolute terms, would have also provided infinitely greater incentives to invest in research and production of safer driverless cars and, if anything, dramatically accelerated their introduction.

Third, while consumers have an independent incentive to care for their own safety, the market for safety may be quite imperfect because of the consumers' notorious tendency to misvalue the expected cost of future accidents, and this market failure is likely to delay the adoption of new automobile technologies. A well designed strict liability regime, by contrast, would combine a much more comprehensive system of compensation for the victims of car accidents with a significant change of the car buyers' access to safety information, better incentives to adopt new safety devices, and greater willingness to pay for them. Strict liability would also enable (indeed force) car manufacturers to put significant pressure on drivers to purchase automobiles with better safety record, and thus further lessen their resistance to the adoption of driverless cars.

Fourth, one of the most important reasons why the present products liability regime is apt to retard the introduction of safer driverless cars is not that the manufacturers' liability is too high in absolute terms, but because it is to a significant extent arbitrary. The tort system, as we know it, leaves the ultimate decision concerning the extremely complex technical questions about how safe automobiles and other products can and should be made to twelve more or less randomly chosen people, who are, if anything, pre-selected for their lack of any specialized knowledge or the ability to understand the complex issues involved.⁹ Because this process is not only arbitrary, but also extremely costly, judges have introduced various defenses, such as "state-of-the-art," designed to insulate defendants from some of the vagaries of a jury trial, but these defenses also allow the manufacturers to shift onto consumers much of the cost that the manufacturers are in the best position to avoid. When such defenses are less likely to apply, as in the case of new and very novel products, of which driverless cars may be the best example, the manufacturer becomes open again to unpredictably large verdicts for the consumer.

⁹ An entertaining, as well as instructive, exposition of the vagaries of the American jury system is presented in Arthur Allen Leff, *Law and*, 87 Yale L.J. 994, 995ff (1978).

For these and other reasons that will become clear in the further course of the argument, the advent of driverless cars provides a great opportunity to reconsider the development of products liability law in the last few decades, reassess its effects, and examine the roads not taken that, in today's changed conditions, could produce significantly better results. Indeed, the advent of self-driving cars is likely to force such reconsideration.

The early promise of strict liability

Much of the history of tort law in the 19th century was characterized by the increasing dominance of negligence as the main, indeed nearly exclusive, principle of liability for unintentional harms. By contrast, the later progress of tort law, until the last decades of the 20th century, seemed to signal a gradual replacement of negligence with various no-fault schemes and a transition to strict liability as the dominant principle of tort responsibility.¹⁰ More generally, the apparent promise of strict liability for the allocation of responsibility for the huge cost of accidents generated by the modern "American way of life" seemed in tune with the broader acceptance of social insurance as *the* 20th-century way of dealing with all kinds of adversity affecting individuals, be it unemployment, poverty, health problems, or old-age drain on savings and family resources.

The early major penetration of strict liability into the traditional negligence regime occurred in the field of workplace accidents. While it has been claimed that the negligence regime, by placing the burden of no-fault accidents on the victims, had been introduced as a form of subsidy for the increasingly dominant industrial interests,¹¹ the reason why its abandonment started in the area of workplace accidents had originally more to do with an inherent jury bias of the negligence system *against* the industry: once an injured worker's case could go to the jury, the employer, especially a large corporate employer, had next to no chance of winning the verdict. Faced with this reality, judges developed various doctrines – above all assumption of risk and the fellow servant rule – that in turn left the employee essentially with no tort recourse against the employer.¹² It is this judicially introduced form of "reverse strict liability" that was replaced by modern workers' compensation schemes.

Be that as it may, strict liability did permanently replace negligence as the principle governing work-related accidents, and an administrative scheme of compensation, backed by a greatly expanded regulatory apparatus on both state and federal levels, largely

¹⁰ Dix W. Noel, *Manufacturers of Products-The Drift Toward Strict Liability*, 24 TENN. L. REV. 963 (1957); William L. Prosser, *The Fall of the Citadel*, 50 MINN. L. REV. 791 (1966).

¹¹ The main proponent of this view was MORTON J. HORWITZ, IN *THE TRANSFORMATION OF AMERICAN LAW, 1870-1960: THE CRISIS OF LEGAL ORTHODOXY* (Oxford Univ. Press 1992).

¹² This kind of unhappy judicial correction of the juries' inherent anti-corporate bias, usually resulting in at least equally unjust legal bar against plaintiffs' recovery, is also most likely at bottom of the famous *Baltimore & O. R. Co. v. Goodman* case, in which Justice Holmes set the notoriously flawed "Stop, look, and listen" rule. 275 U.S. 66 (1927)

replaced court-administrated case-by-case adjudication. But workers' compensation remained merely another exception from the general dominance of negligence in the American tort law until another, very differently motivated movement arose in the wake of World War II to make strict liability into a *judicially-administered* principle governing manufacturers' liability for the harms caused by their products. Ever since Justice Traynor, in his famous concurring opinion in *Escola v. Coca Cola Bottling Co. of Fresno*,¹³ proposed abandoning negligence as the principle governing manufacturers' responsibility, strict liability was seen by many as promising radical improvements in several important dimensions.

1. On the most general level, strict liability was seen as backed by a superior economic theory, placing the incentive to invest in research and the implementation of safety improvements of mass-produced goods on the parties in the unique position to undertake them, and to undertake them to the socially optimal extent.¹⁴ Manufacturers, in this view, have by far the best access to information about the safety of their products, the best technical expertise necessary to assess the areas of possible improvement, and the best ability to devise new technological solutions to safety problems. On top of this, they also have access to the capital necessary for the implementation of all the safety decisions. As a result, they were seen by the proponents of a shift toward strict liability as *the cheapest cost avoiders* with respect to most accidents resulting from the use of modern industrial products, so forcing them to internalize all the costs of product-related accidents was seen as giving them the right incentive to use their ability to conduct a proper cost/benefit analysis of the various safety measures and to implement them in the most efficient manner.
2. A particular advantage of the strict liability regime was seen to lie in its ability to create a well-functioning *market* for safety and to rely on its superior efficiency, as compared to the "command and control" regime of negligence in which the courts, often lacking proper expertise and subject to a completely different incentive structure, have the last word on what safety precautions should be undertaken by the parties engaged in productive activities.
3. The strict liability regime was believed to be especially effective in stimulating the right amount of safety research -- something that the negligence regime is nearly completely unable to police. Because courts cannot credibly decide what investments in research are *ex ante* justified by the necessarily very imperfect assessment of future scientific and technological innovation, "state of the art" is a standard negligence defense. Consequently, while a manufacturer can be found liable for not

¹³ 150 P.2d 436, 440 (Cal. 1944) (Traynor, J., concurring).

¹⁴ While the rudiments of the economic theory of strict liability are already present in Justice Traynor's opinion in *Escola*, its full development was mostly provided by scholarly work in the wake of the *Escola* decision. By far the most important contribution in this area has been the scholarship of G. Calabresi, culminating in his *THE COST OF ACCIDENTS: A LEGAL AND ECONOMIC ANALYSIS* (Yale Univ. Press 1970). I indicated already that I am deeply indebted to Calabresi's work. In a way, I am trying to vindicate here some aspects of it that had not been sufficiently well understood.

incorporating the most recent technology in its products, no court will ever claim to know that some “reasonable” additional research investment in the past would have produced a still unknown safety improvement that would have prevented the accident in question. Thus, no manufacturer can ever be found to have been negligent for underinvesting in safety research that would have moved the relevant frontiers of science and technology beyond the “state of the art” at the time. The same problem does not exist in strict liability, however, because under that regime, all research investment decisions are decentralized, and lie with the manufacturers who make various entrepreneurial guesses about future discoveries. The prospect of a reduction in the costs of still-unavoidable accidents, which strict liability places on the manufacturers, provides the required incentives for making the best decision, and the resulting research investments by private parties under competitive market conditions are much more likely to be efficient than any comparable judgments of state officials in charge of “planning” the development of science in the future. Indeed, even if, because of the absence of well-functioning markets, state officials may sometimes be called on to make research investment decisions, the idea that such decisions could be meaningfully made by judges or juries is simply too outlandish to be seriously entertained.

4. According to Justice Traynor at least, the move from negligence to strict liability was also designed to correct a malfunctioning of the tort system in which manufacturers were seen as notoriously exposed to a systematic pro-plaintiff bias in jury trials.¹⁵ Much as had happened earlier in the area of employers’ liability, the move away from negligence in product-liability cases was seen as not only more efficient, but also more just, in the sense of delivering real-world outcomes more faithfully reflective of the policies embodied in the letter of the law.
5. Another advantage of strict manufacturers’ liability, along both efficiency and broader justice dimensions, was seen in the fact that it would nearly automatically socialize the costs of accidents involving industrial products and spread them among the consumers who directly benefited from their use. Strict liability would thus make the manufacturers into the insurers of the users of their products, but like most insurers, the manufacturers would then pass on the cost of this insurance to the consumers, most likely by raising the initial purchase price of their products.¹⁶ With

¹⁵ *Escola*, 150 P.2d at 441 (“In leaving it to the jury to decide whether the inference [of negligence] has been dispelled, regardless of the evidence against it, the negligence rule approaches the rule of strict liability. It is needlessly circuitous to make negligence the basis of recovery and impose what is in reality liability without negligence. If public policy demands that a manufacturer of goods be responsible for their quality regardless of negligence there is no reason not to fix that responsibility openly.”).

¹⁶ It is very important to note, however, that other options, preserving to some extent the separation of the sale of the product from that of insurance, are also possible. In fact, they may be instrumental in situations in which the insurer may want to “purchase” the consumers’ safer use of the product by monitoring their post-sale conduct and adjusting insurance premium to the post-sale safety record. I will argue, *infra* p. 32, that this option is likely to dominate in a regime of strict manufacturers’ liability for the costs of auto accidents.

respect to some products (but not with respect to cars), this would introduce a new compulsory insurance requirement and force consumers to purchase protection against various harms not due to manufacturers' negligence.¹⁷ How efficient such compulsion could be would of course depend on how well the legal system apportioned liability on the manufacturers, and how much the consumer himself can do to reduce the cost of accidents involving a given product.¹⁸ But to the extent that consumers often underestimate the chances of accidents involving otherwise very desirable industrial products, they may also underestimate the full cost of the products themselves, thus over-consuming them and taking on more risk than is optimal. If this is the case, mandatory insurance may correct an important market failure.

Promise unfulfilled

In the wake of the *Escola* case, tort law seemed poised to revolutionize the way we dealt with the growing cost of accidents in an industrial society and extend the principle of strict liability beyond the limited field of workplace injuries, and into the much wider area of responsibility for accidents involving the use of industrial products. Indeed, it looked for a while like negligence would be relegated to an altogether marginal principle of torts liability, much as strict liability had been a century before.

Yet, the most crucial development in the American tort law of the late 20th century was not so much the spread of strict liability as its relatively quick rejection in the most important areas of tort responsibility. In just a few years, with a few narrow exceptions, the regime of liability for defective products largely reverted to the old order of negligence-based responsibility, with judges and juries in every state again (often inconsistently) telling manufacturers how to make cars, airplanes, printing machines, medicines, lawnmowers, and kitchen appliances.

¹⁷ Because insurance is already compulsory in the automobile area, moving to strict liability would be less of a "revolution" here. But it would make the manufacturer, rather than a third-party insurance company into the "default" insurer. See *infra* p. 26. I will also argue later, *infra* p. 32ff, that the extensive negotiations that usually accompany automobile purchase also open a possibility of more meaningful negotiations concerning the terms of auto insurance under a strict liability regime.

¹⁸ Even under a strict liability regime, manufacturers are not made liable for all accidents involving their products, but only those for which they are the cheapest cost avoiders. Some accidents may be so unlikely as to make it unwise to incentivize anyone to prevent them. With respect to others, consumers or other parties may be in a better position to avoid them than the manufacturers, so exclusions or defenses may have to be provided under any well-designed manufacturers' liability system. The mandatory insurance that a strict liability system imposes on the consumers will thus be inefficient if it shifts to the manufacturers the liability for accidents for which they are not the cheapest cost avoiders.

But note that the available defenses to strict liability may also change over time. In, say, 1950, drunken driving or speeding might have been causing accidents for which it did not make sense to hold the manufacturers liable. But once the prospect of new technologies, say, devices not allowing a drunken driver to start his car or controlling the speed at which a vehicle moves under certain road conditions, is on the horizon (even if the horizon is still quite remote), it might make the driver no longer the *cheapest* cost avoider with respect to these kinds of accidents.

There may have been various reasons why strict liability did not “take” in most areas of product-related accident law. The fact that, under strict liability, industrial interests would have to bear the cost of many non-negligently-caused, indeed largely unpreventable, accidents related to the use of their products was clearly not without significance: the industry had a huge stake in making sure that the reach of strict liability was drastically limited, and a battery of highly paid experts, lawyers, and lobbyists was deployed to nudge the law back into negligence. But there were also other important reasons, and I want to begin by focusing on the doctrinal grounds for this retreat, primarily because it can throw light on the problems our tort law faced in trying to come up with a satisfactory delineation of no-fault tort liability, as well as help explain why the advent of self-driving cars may quite dramatically change this situation, and perhaps usher in a long-delayed rethinking of the way we deal with the growing social losses due to the use of industrial products.

Defective jurisprudence of design defects

Perhaps the most important source of doctrinal confusion that largely prevented the expected expansion of strict liability for accidents involving industrial products was the complex, and mostly misunderstood, relation between strict liability and the concept of the “defect.”

“Defect” was a straightforward enough idea in the early strict liability cases in which, as in *Escola*, some manufacturing flaw in the product was the cause of the accident. It had been obvious from the beginning that strict liability could not amount to “absolute” liability: given the wide sweep of the standard concept of “but for” causation, clearly not all harms “caused” by a product should generate the liability of its manufacturer. For example, the fact that a knife, by virtue of its sharpness, would foreseeably cause fingers to be accidentally chopped off, or even be used by people to settle accounts with their enemies, was not enough to make the manufacturer liable for these kinds of harms to the public. Something more was thought to be required, and this “something more” was a feature of the product that would not only be a causal factor in the occurrence of the harm, but also make the product, in a more robust sense, “responsible” for the injury – something that, while perhaps not involving anyone’s negligence or intent, would still identify an element of “wrongness” in the product that would *justify* making the manufacturer bear the cost of the harm in question.

Thus, what justified making the manufacturer responsible for the harm suffered by Ms. Escola, in the case bearing her name, was, according to Justice Traynor’s concurrence, the fact that there was something obviously “wrong” with the bottle that exploded in her hand. Indeed, the whole point of a Coke bottle is that it is supposed to allow the consumer to enjoy the drink without anyone’s ending up in the emergency room of a nearby hospital. So when the bottle exploded in the waitress’s hand, it was clearly “defective”: it did not work the way such bottles were *supposed* to work. And this remained true even if the manufacturer had not *done* anything wrong: the bottle at issue was a useful product that had probably been produced and filled according to state-of-

the-art technology (at least as of 1944) and, barring the *res ipsa* reasoning of the *Escola* majority, there was no evidence of any unreasonable failure in the inspection process or any other negligent action anywhere along the way of getting the bottle into the hands of Ms. Escola. It is just a feature of mass-produced objects that even if everything is done carefully and in accordance with the most modern technology, not all imperfections in the manufacturing process can be eliminated at a reasonable cost, and a certain number of products will malfunction, potentially causing serious injuries to the users. But the fact that the bottle in *Escola* “malfunctioned,” *i.e. did not behave in conformity with its own design*, was enough, for Justice Traynor at least, to label it “defective,” and make the manufacturer responsible for the injury it had caused, without burdening it with responsibility for absolutely every harm that may be related, no matter how incidentally or remotely, to the use of its products. (The same bottle would not, for example, have been thought “defective” if it had caused the *same* injury to Ms. Escola’s hand by having fallen on her from a nearby balcony.)

Now what may explain a good part of the confusion in the strict liability doctrine that followed was the *deceptive clarity* of the intuition that the bottle could be “defective,” *i.e.*, that there could be something “wrong” with it, while no one was “at fault” (*did* anything wrong) in producing it, bringing it to market, or using it in the way in which it was used. By identifying the defect as non-conformity with the objective standard set by the product’s design, the court could pinpoint some sort of *fault-like* feature in the product itself, even if not in any party involved. The term “fault” was of course not used in this context, but the language of negligence-like blame did come through in the very term “defect,” as well as in the statement that the product did not work the way it “should” have. The “wrongness” of the product thus justified making the manufacturer liable for the harm caused by it, but at the same time *limited* the liability of the manufacturer to only those cases in which such a “defect” (defined independently from the causation of the injury) had been proven to exist.

The problem with this way of thinking was that its intuitive clarity quickly began to unravel when the courts moved from “manufacturing” to “design” defects. In the former cases, it was easy to say what was “wrong” with a defective product, *in addition* to the fact that it caused an accident: the product itself was an *exception* in its line, something “abnormal,”— it did not work the way it was supposed to *according to its own design*. Once this is not the case, however, and a product does function in the way it was designed, could it still be said to be “defective” because of something wrong about the design itself, without *eo ipso* implying the fault (negligence) of the designer? To be sure, it is often well known that a product, even if produced without any manufacturing defects and used without any negligence, will result in a number of accidents that will inflict significant harms on the consumers. The best kitchen knives will sometimes result in chopped-off fingers, delicious butter will cause heart attacks, and wonderful vaccines that save thousands of lives will sometimes cause, in a small and predictable number of *ex ante* unidentifiable patients, the very disease they are supposed to prevent. But is there something “wrong” with these products? Are they “defective?” Perhaps one *could* say that there is something “wrong” with butter merely because it causes heart attacks, but this *façon de parler* would not by itself point to the kind of “wrongness” or “defect” that

would justify making butter manufacturers liable for the heart attacks involved. Unlike a manufacturing defect, which is defined as an exceptional, abnormal departure from a standard defined independently from the injury caused by the product, the “defect” of butter would simply *reduce* to the fact that it causes heart attacks, without specifying any other standard of performance that could limit the manufacturer’s responsibility for all the accidents “caused” by butter. Were we to go that way, butter manufacturers would have to pay not only for those heart attacks, but also for the broken bones of people who slipped on butter slides and other mishaps in which butter played some causal (“but for”) role. Liability would soon extend beyond “no fault,” or even “strict,” and move into the realm of “absolute.”¹⁹

So how can one define the concept of “defective design,” without marking butter as “defective” because it causes heart attacks, and still capture a “problem” with the product itself that does not imply the manufacturer’s negligence, but nevertheless points to a feature that *justifies* making the manufacturer liable for the consequences?

This difficulty in the very concept of “design defect” appeared relatively early in the development of products liability doctrine, and the early attempts to solve it quickly veered in the direction of identifying design defect with “wrong design,” which could only be understood in terms of the negligence of the designer. As early as 1965, the *Restatement (Second) of Torts* (Section 402A), limited the seller’s liability to “product[s] in a defective condition unreasonably dangerous to the user or consumer.” While the Restatement also said that this liability persisted even if “the seller has exercised all possible care in the preparation and sale of his products,” in the context of *design* defects the “unreasonably dangerous” formulation was very soon seen as bringing back the concept of negligence and undermining the whole idea of strict products liability. Indeed, California courts, which were the main laboratory in which the new products liability doctrine was being worked out, resisted the Restatement’s assimilation of the idea of a product’s defect to some form of “unreasonably dangerous” condition that would lead to an implication of negligence on the part of the manufacturer.²⁰ But despite the California Supreme Court’s confidence that there was “no difficulty” in extending the original idea

¹⁹ To anticipate later discussions, we might note that the same argument does not apply to the other case I cited above. Are the wonderful vaccines that save thousands of lives defective because they sometimes cause the very disease they are supposed to prevent? The often cited example is that of the oral polio vaccine. While there could not be a cleaner case of non-negligence, and there is a great temptation to release the manufacturer from the liability for such mishaps, we shall see, *infra* note 48 and accompanying text, that this is in fact a very good case for the presence of a “design defect” in a “true” strict liability system. The consumer has no alternative and no means to protect himself, and if anyone is likely to improve the product’s safety over time it is the manufacturer, who is therefore the clear “cheaper cost avoider.” Unless the state wants to subsidize the manufacturer, the predicable, or “expected,” cost of the accidents involved then should be included in the price of the product.

²⁰ The California Supreme Court, in *Cronin v. J.B.E. Olson Corp.*, 501 P.2d 1153 (Cal. 1972), rejected the “unreasonably dangerous” formulation and affirmed that “the necessity of proving that there was a defect in the manufacture or design of the product” was enough to limit the liability of the manufacturer without moving back toward negligence. *Id.* at 1162.

of product defect “to the full range of products liability situations, including those involving ‘design defects,’”²¹ the same court, only a few years later, in *Barker v. Lull Engineering Co.*²² and its progeny, started receding from this position and, despite some protestations to the contrary, in fact brought the concept of design defect nearly all the way back to that of the negligence of the designer.

The *Barker* court’s definition of design defect set up a two-pronged test.²³ As we shall see, the first prong, requiring a showing that the product causing injury “has failed to perform as safely as an ordinary consumer would expect when used in an intended or reasonably foreseeable manner,” still contained a significant element of “true” strict liability. However, the consumer expectations test was also said not to apply when the consumer “would have no idea how safe the product can be made,”²⁴ and in such cases, the consumer could prevail only if the second prong applied, i.e. “if through hindsight the jury determines that the product’s design embodies ‘excessive preventable danger’ or, in other words, if the jury finds that the risk of danger inherent in the challenged design outweighs the benefits of such design.”²⁵

To be sure, even this second prong is not exactly equivalent to requiring a proof of negligence, at least not in its canonical version, because the “through hindsight” clause eliminated the “state-of-the-art” defense inherent in the very concept of fault: even if “the manufacturer took reasonable precautions in an attempt to design a safe product or otherwise acted as a reasonably prudent manufacturer would have under the circumstances,” thus precluding liability under the traditional negligence standard, *Barker* still imposed liability on the manufacturer if, perhaps because of some technological advances between the time of production and the time of the trial, “the trier of fact concludes that the product’s design is unsafe to consumers.”²⁶

But apart from thus revoking the state-of-the-art defense (and tipping the scales still further toward the consumer by shifting the burden of proof to the defendant manufacturer²⁷), the second prong of the *Barker* test of design defect effectively placed product-liability law back in the realm of negligence. For the cost/benefit analysis at the core of *Barker*’s second prong – weighing the design’s “benefits” against its “inherent

²¹ *Id.* at 1162.

²² 573 P.2d 443 (Cal. 1978).

²³ *Id.* at 446.

²⁴ *Id.* at 454 (citing John W. Wade, *On the Nature of Strict Tort Liability for Products*, 44 Miss. L.J. 825, 829 (1973).

²⁵ *Id.*

²⁶ *Id.* at 457.

²⁷ *Id.* at 455.

risk of danger” – is the gold standard of the negligence calculus, and the conclusion that a design ultimately entailed an “excessive preventable danger” simply amounts to a finding that, at least at the time of the trial, bringing the product to the market would involve an act of negligence on the part of the manufacturer (even if the defendant itself may not have yet had sufficient information when the product was in fact produced). Thus, even though the hindsight clause does expand the manufacturer’s liability beyond the narrow confines of *its* negligence, the requirement of proof that the design does not pass a cost/benefit analysis test at the time of the trial makes this departure insignificant in terms of developing a viable doctrinal basis (theory) of true no-fault liability. An analogy may be helpful here: much as *respondeat superior*, by holding a non-negligent employer liable for his employees’ negligent actions, did not amount to any significant theoretical advance over the standard doctrine that required a proof of *someone’s* negligence, neither does the second prong of *Barker* move beyond the idea that failing the negligence calculus is the foundation of the manufacturer’s responsibility.

Torts, contracts, and the short life of consumer expectations

But what about the first prong of the *Barker* test which, with its evocation of the warranty law’s notion of consumer expectations, seems to be in line with the manufacturing defect doctrine of products liability, and opens the possibility of a strict liability basis of design defect jurisprudence?

The meaning of the consumer expectations test in *Barker* was not entirely clear to begin with, mainly because of the already explained limitation on its applicability in situations in which the consumer “has no idea how safe the product can be made.” This formulation, taken from John W. Wade’s influential 1973 article *On the Nature of Strict Tort Liability for Products*,²⁸ suggests that consumers can have reasonable expectations with respect to a product’s safety only when they know “how safe [it] can be made,” and this in turn suggests that they must be familiar with the technology involved in the product’s design. In Wade’s own words, a product’s failure to pass the consumer expectations test simply meant that the product was unsafe “because of a poor design or the failure to attach a warning or suitable instructions”²⁹ – about as close to the negligence standard as one might come. Indeed, Wade himself is quite clear that this is how the test should be understood,³⁰ with the “consumer expectations” language providing at most a helpful analogy, but not being “attuned to tort recovery”³¹ (which presumably requires a proof of negligence).

²⁸ See *supra* note 24.

²⁹ Wade, *supra*, note 24, at 830.

³⁰ “The simplest and easiest way, it would seem, is to assume that the defendant knew of the dangerous condition of the product and ask whether he was then negligent in putting it on the market...” *Id.* at 834. The only extension of the negligence basis of liability in this understanding is the already discussed “hindsight” issue.

³¹ *Id.* at 829.

But even while citing Wade's limitation on the applicability of the first prong of the design-defect test, *Barker* clearly does not share Wade's disparagement of the appropriateness of the consumer expectations language in the context of manufacturer's tort liability. It was one of the truisms of the early post-*Escola* doctrine that strict liability in the products area derived from the commercial warranty doctrine, and *Barker*, which specifically affirmed the affinity between strict products liability and the concept of warranties,³² intended to use the tried and true no-fault warranty standard in order to define the seller's liability for design defects.

The warranty context of the consumer expectations test is indeed quite enlightening here. The commercial law of warranties provides relief to consumers in cases in which the consumer expects a product to be suitable for its intended use, and the law makes the manufacturer bear the risk of this not being the case. Thus, if one buys a TV set that turns out not to work or distorts the colors of the picture, the manufacturer is required to repair or replace it, even if the problem does not result from any negligence in design or the production process. There may of course be things with respect to which a consumer cannot have reasonable expectations, but the fact that such expectations are legitimate does not mean that the consumer is familiar with the technology involved in the product's design or the production process: the expectation that a TV will have a picture or that butter will not be stale in no way assumes that the consumer knows how TVs are made or understands the details (or even the principles) of the cooling technology that keeps butter fresh in most situations. What these "expectations" amount to is in fact not even an empirical question about what the parties themselves *really* thought, but a *contract default* position, i.e., a reconstruction of what rational consumers and sellers would have been likely to agree upon if they had invested the time and effort required to contract about this aspect of the transaction, specifying in particular what kinds of risks are to be borne by the buyer or the seller. An empirical investigation into what consumers actually expect (or what the manufacturers explicitly represent) may be of some relevance in this context, but mostly as a piece of evidence with respect to how rational parties would apportion the risks involved.³³ It is the latter apportionment, rather than an empirical inquiry into the parties' state of mind, that the warranty law prescribes as a default.

Thus, so far as *Barker* intended to extend to the design-defect area the warranty law's standard of consumer expectations, which had already been used previously to define manufacturing defects, the first prong of *the Barker* test did indeed constitute an attempt to define design defects in a way that preserved the idea of strict liability, and did not resort to requiring a proof of negligence. The contracts context of the warranty concept

³² "This initial standard [consumer expectations test], somewhat analogous to the Uniform Commercial Code's warranty of fitness and merchantability (Cal.U.Com. Code, § 2314), reflects the warranty heritage upon which California product liability doctrine in part rests." *Barker*, 573 P.2d at 454.

³³ In some cases, the actual contract, if freely negotiated, may also shift legal defaults and indicate that a consumer (or perhaps the manufacturer) assumed a certain risk that is usually placed on the other party.

does of course have some special features that are not fully applicable in torts situations. In particular, the extent to which commercial law is willing to exempt the parties from the privity requirement is narrower than in the products liability area, and there may be some important public policy consequences of this difference.³⁴ But the distance between contract and torts is less in the products liability area than in most other parts of accident law, where the parties to an accident do not know each other and had no opportunity to negotiate their relative risks and responsibilities. Even though modern tort law opens manufacturers to liability with respect to third parties, including not only a secondary purchaser, but also a bystander with no contractual relation in the consumers' chain of the product in question, the original attraction of the warranty concept in the products liability area was due to the fact that, while the idea of hypothetical *ex ante* negotiations between parties to a torts suit is, in most cases, a not very helpful exercise in pure fiction, the underlying reality of the *products* liability situations does involve real contracts between buyers and sellers, which often (especially in car sales!) involve rather extensive negotiations. For this reason, the question that the warranty law asks is the same as the one strict products-liability law should ask: if the original transaction between the seller and the consumer of the product had been fully negotiated, how would rational parties have distributed the risks involved in the use of the product? An answer to this question, instead of focusing on negligence, would point to considerations involving the parties' *relative ability to lower the expected cost of accidents and to bear the remaining risks involved*, with the liability for accidents that do happen placed on the "cheapest cost avoider," i.e., the party who is *ex ante* in the best position to optimize the costs in question.³⁵ As in the warranty area, actual consumer expectations (especially when they are clear) may be taken as good direct evidence of what one side at least may believe to have been *actually* agreed upon, or as some indirect evidence of what the parties might have agreed upon in an ideal bargaining situation, thus providing a very attractive, but not conclusive, token for the underlying economic reality.

In the wake of *Barker*, California lower courts did begin to use the consumer expectations test to sustain the idea that manufacturers were indeed strictly liable for design defects of their products. Perhaps the most interesting of these cases was *West v. Johnson & Johnson Products, Inc.*³⁶ in which both the trial and the appellate courts affirmed the applicability of the consumer expectations test to a case in which the plaintiff suffered toxic shock from using tampons produced by the defendant, without

³⁴ Cf. Thomas C. Galligan Jr., *Contortions along the Boundary between Contracts and Torts*, 69 TUL. L. REV. 457, 487 (1995).

³⁵ The legal default may, but does not necessarily have to, include some provisions about what level of care the parties would expect each other to exercise and how the violation of some negligence-like standard may perhaps relieve the other party of liability that the same party would otherwise have to bear. In other words, tracking this kind of hypothetical bargain, products liability law may make negligence relevant in some situations (possibly recognizing it as a defense in most cases) without violating the basic principle of strict liability.

³⁶ 220 Cal. Rptr. 437 (Cal. Dist. Ct. App. 1985)

requiring any specialized medical knowledge on the part of the consumer, and basing the decision on the simple fact that “an ordinary consumer of tampons would not expect to become seriously ill from their use.”³⁷

But whatever intellectual potential may have been contained in the first prong of the *Barker*'s test was never fully realized, and the doctrinal opening created by *Barker* was quickly closed in subsequent cases, nearly without a trace in most states, and to a large extent in California as well. Indeed, as early as 1994, in *Soule v. General Motors Corporation*,³⁸ the California Supreme Court itself effectively emasculated the consumer expectations test by an extremely restrictive reading of its applicability, de facto transforming its remaining trace into a rarely applicable form of a *res ipsa loquitur* proof of negligence. Perhaps not coincidentally – and I will have more to say about this later³⁹ – much of this retreat took place in cases dealing with automobile accidents.

Soule was a rather straightforward “crashworthiness” case. The plaintiff, who was hurt in an automobile collision, claimed that her car had a design defect that was responsible for her ankle injury. The trial court gave the jury instructions on the *Barker* test and the defendant appealed, claiming that the consumer expectations prong was inapplicable in a complex design-defect case of this kind. The state Supreme Court in *Soule* accepted the defendant's position.

Soule's conclusion that the “complexity” of the design makes the consumer expectations test inapplicable misconceived the basic idea of the *Barker* test. The consumer expectations test must of course set some limits to the manufacturer's liability. The most obvious one is that the product *meets* the test because the consumer understands that there are certain dangers implicit in the product's use with respect to which the manufacturer is not the cheapest cost avoider. The already cited example of the risk of heart attacks from

³⁷ The courts in *West* clearly also believed that the defendant was in fact negligent, and they allowed a punitive damages award. But the decision on consumer expectations is actually based on the realization that (1) short of not using tampons at all, the consumer cannot really do anything to minimize the incidence of toxic shocks associated with a product that provides significant convenience to the consumer, and (2) any improvement in the safety of tampon use can come only from further research and design modifications, which are entirely under the control of the manufacturer. A finding of negligence is not relevant to this aspect of the case. *Cf. also Rosburg v. Minn. Mining & Mfg. Co.*, 226 Cal. Rptr. 299 (Cal. Dist. Ct. App. 1986), where the court found that a failed breast implant satisfied the consumer expectations test because “an ordinary consumer should expect a possibility of eventual deflation,” but did not preclude the application of the test on the basis of the matter being beyond the technical knowledge of ordinary consumers. (*West* and *Rosburg* raise an interesting question of the relation between design defects and warnings. The fact of the consumer's knowledge that a product involves some danger does not yet make the consumer into the cheapest cost avoider. It is only when the knowledge puts the consumer in a better position to avoid the harm that the consumer expectation test is met. The outcome of the two cases may perhaps be reconciled by the fact that breast implants are optional and may involve an assumption of risk, while the consumer has no suitable alternative to the use of tampons. But it is also possible that, under a proper understanding of the consumer expectations test, *Rosburg* may have been wrongly decided.)

³⁸ 882 P.2d 298 (Cal. 1994).

³⁹ *Infra* p. 21

butter consumption is a good case in point. While butter clearly causes heart attacks in some people, trying to “improve” its “design” is not seen as the best (cheapest) way of avoiding such accidents. Indeed, many people can consume butter quite safely, and those under threat are themselves the cheapest cost avoiders: they can identify themselves as potential victims, have periodic cholesterol and blood pressure tests, control the amounts they consume, undertake other standard precautions (including the use of substitutes), etc.

There may also be other types of cases in which consumers do not have any legitimate expectations with respect to some safety aspects of a product, not because it is clear that the consumer, rather than the manufacturer, is the cheapest cost avoider, but because it is in fact unclear who is in a better position to avoid. This may perhaps be in some cases related to the complexity of the product, but the main reason for this type of situation is that the product is too new or a certain use is not common enough for the parties to form a standard set of expectations as to who should bear the risks involved. While liability in such cases cannot be determined by the consumer expectations test, Barker’s move toward an essentially fault standard in its second prong may not have been necessary even in those situations: it was still possible to uphold the principle of strict liability by simply instructing the courts to engage in a still more searching inquiry as to who is in fact the cheaper cost avoider, i.e., an inquiry into whether future design improvements or consumer’s use modifications offer the best hope of lessening the cost of the accidents involved.

As we know, this was not to be; instead, in the second prong of its test, *Barker* moved in the direction of requiring a proof of fault in the design. But what really spelled the end of strict liability in design defect cases was *Soule*’s further reduction of the consumer expectations test to a standard that was applicable only in the simplest of cases, in which an ordinary consumer sufficiently understands the design of the product to know that it can, and should, be made safe enough to avoid the accidents of the kind that affected the plaintiff. In such cases, the *Soule* court says, we can simply dispense with expert evidence and the explicit cost/benefit analysis of the second prong of *Barker* test that are required to prove fault in the usual case of a more complex design.⁴⁰ But what this means is that a product’s failing the consumer expectations test is now seen as simply amounting to a *self-evident* flaw in the design; in other words, *Soule* reduces the consumer expectation test to a *res ipsa loquitur* finding of fault, and no longer any no-fault liability. The examples given by the court make this emasculation of the first prong of *Barker* explicit: “[T]he ordinary consumers of modern automobiles may and do expect that such vehicles will be designed so as not to explode while idling at stoplights, experience sudden steering or brake failure as they leave the dealership, or roll over and catch fire in two-mile-per-hour collisions.”⁴¹ In such obvious cases, says the court, “the defect is

⁴⁰ “In some cases [...], ordinary knowledge [...] may permit an inference that the product did not perform as safely as it should. If the facts permit such a conclusion, [...] a finding of defect is warranted without any further proof. 882 P.2d at 308. “[T]he consumer expectations test is reserved for cases in which the everyday experience of the product’s users permits a conclusion that the product’s design violated minimum safety assumptions, and is thus defective regardless of expert opinion about the merits of the design.” *Id.*

⁴¹ *Id.* at 308 n.3.

apparent to the common reason, experience, and understanding of . . . ordinary consumers,”⁴² and despite *Soule* court’s cursory adherence to the rejection of the Restatement’s “unreasonable danger” language,⁴³ the very concept of “defect” comes to be again inextricably associated with the intuitive sense of *faulty* design.

Soule’s misidentification of “defect” with “fault” in the context of the consumer expectations test is perhaps the clearest sign of the judicial retreat from strict liability jurisprudence. Indeed, the fact that manufacturers’ “are liable in tort only when ‘defects’ in their products cause injury” means for the *Soule* court that “manufacturers are not insurers of their products.”⁴⁴ But this is the exact opposite of what a defect implies. As we have seen, the concept of defect was introduced to limit the scope of manufacturers’ liability. Still, despite the superficial association of defect with a failure of some sort, the “wrongness” of a defect was never supposed to have “negligence” implications. Instead, the very heart of the true strict liability doctrine was the identification of the defect with the idea of the *manufacturer’s being the cheapest cost avoider* with respect to the type of accident in question, and the placing of liability on the party in the best position to avoid such accidents in the future. Thus, the presence of a “defect,” did not imply that the manufacturer *did* anything wrong, but only that improvements in manufacturing (and perhaps marketing), including those that are still unknown and involve technologies not yet discovered, rather than some future modifications in the behavior of the consumer, were seen as the best hope of reducing the cost of similar accidents in the future. The whole point of strict liability is that until such improvements succeed, the manufacturer should be made into an *insurer* with respect to the type of accidents in question – indeed, being an insurer is the very essence of what it means that the manufacturer is liable *without fault*.

Deeper sources of doctrinal failures

With *Soule* and its progeny, design defect jurisprudence has turned around 360 degrees and returned to its starting point of full-fledged negligence-based liability, with judges and juries again having the last word on how to build safe cars and other products, and manufacturers being told that they would be fully protected from design-defect liability for any accidents that may be caused by their “state-of-the-art” machines. Perhaps surprisingly enough, the legal academe, which had played such an important role in opening the way to replacing negligence with a more market-oriented strict products liability regime, barely noticed the quick demise of this opening, and did next to nothing to prevent or reverse it. Part of the reason for this may have lied in the fact that the job of translating the novel ideas advanced in Justice Traynor’s *Escola* concurrence into a viable judicial doctrine that would have grounded a workable regime of products liability may

⁴² *Id.* at 310.

⁴³ *Id.*

⁴⁴ *Id.* at 309 n.5.

have turned out to have been objectively much more difficult than most judges and scholars had originally expected. Indeed, even if confusion played some role in this doctrinal failure, and even if special interests may have also contributed to the same result, focusing on the more objective difficulties will help us understand why the prospect of self-driving cars is potentially such a significant landmark on the way to another rethinking of the principles underlying products liability in the future.

The original proponents of strict liability had argued that the ease of application was going to be one of its principal advantages, and that it would significantly lower the costs of adjudication.⁴⁵ The main reason for this claim was the true observation that the most time-consuming, error-prone, and hence also the most costly, part of traditional torts adjudication was the finding of the presence or absence of fault, involving as it did complex investigations concerning the precautions actually undertaken by each party and an evaluation of them in light of what would be “reasonable” to do under the same circumstances. Under a strict liability regime, it was believed, this whole exercise would be dispensed with, and the much less problematic finding of causation would be all that was necessary to assign liability.

This belief turned out to have been quite naïve. The assignment of liability in any system of case-by-case adjudication, even assuming that the plaintiff’s allegations regarding causation have been proven to be true, was obviously going to require an additional decision whether the product involved was “defective,” so that the defendant should indeed be held liable for the plaintiff’s injury. As I have explained, the reason for this was that basing liability on causation alone would have made manufacturers “absolutely” liable for all the accidents that would not have happened without some involvement of their products, and any limitation on this potentially huge liability had to come from an additional finding of a defect in the product involved.⁴⁶ But in most design-defect situations, this determination turned out to be extremely complicated as well, indeed much more difficult than a finding of negligence, and well-nigh impossible to handle

⁴⁵ See, e.g., Guido Calabresi & Jon T. Hirschoff, *Toward a Test for Strict Liability in Torts*, 81 YALE L.J. 1055, 1075–76 (1972) (“Hard though the strict liability test may be to apply correctly, it is nonetheless easier to apply than is the calculus of fault.”). Calabresi himself, however, also expressed serious doubts about the appropriateness of the courts’ applying strict liability in case-by-case adjudication. *The Cost of Accidents*, *supra* note 14, at 250ff.

⁴⁶ One might be tempted to say at this point that a requirement of proximate causation, in addition to the “but for” cause, is enough to solve this problem. But the answer is unavailing. In the context of negligence, proximate causation is a question of the foreseeability of the effects of the defendant’s course of action, and, as has been amply demonstrated in cases like the famous *Palsgraf v. Long Island Railroad Co.*, 162 N.E. 99 (N.Y. 1928), a finding of foreseeability is extremely closely bound with that of negligence itself: the reason why foreseeability limits the extent of liability is because the defendant who was not supposed to foresee the injury was under no obligation to have undertaken the appropriate precautions to avoid it. Such a close link to negligence will not do in the context of strict liability. In this situation, a finding of proximate cause would have to be linked to the identification of the cheapest cost avoider with respect to the accident in question, and thus to a much more complicated (and costly) finding of a defect.

effectively by a jury of twelve lay people, typically chosen, at least in part, for their ignorance of nearly all of the issues involved.

Part of the difficulty may have been the already discussed lack of intuitive clarity in the novel concepts needed to apply the doctrine correctly. While the legal concept of negligence may also be significantly more complicated than the vague idea that laymen tend to associate with it, juries were at least familiar with the concept. But both the laymen's and judges' intuitive associations with the concept of a defect were too closely tied to negligence, and were mostly confusing with respect to its proper meaning in the context of strict-liability doctrine, where a product's "defect" resolved to identifying the manufacturer as the cheapest cost avoider with respect to the type of the accident in question.

Being essentially an economic term of art, the concept of the cheapest cost avoider also needed to undergo some "translation" to make it a viable part of legal vocabulary. Calabresi himself defined it as referring to the person in the best position to make the relevant cost/benefit analysis and to act on it,⁴⁷ but, perhaps not surprisingly, this operationalization never penetrated into the language of the law. The courts, having made a valiant effort to define the cheapest cost avoider by reference to "consumer expectations," were quickly sidetracked by the fault-sounding implications of this concept. Perhaps the simplest way to operationalize the idea at stake would have been to ask the decider to identify the party who was most likely to be able to bring about safety improvements in the future, even if such improvements were not yet possible and even if we could not as yet specify them with any degree of precision. In other words, the relevant question is: Do we expect technical improvements in the design and/or the manufacturing process to be the best way of lowering the future cost of accidents of the type at issue, or do we expect such improvements to come from a more skillful or better calibrated use by the consumers,⁴⁸ from medical advances in predicting or treating the injuries,⁴⁹ or perhaps from some other inventions or behavior modifications?

To pose this question is to see immediately that the problem is more deep than just the absence of conceptual clarity. The answer may not only be very complex, but also require significant expertise, going well beyond anything expected of either juries or legally-trained deciders. Even for an expert familiar with the technical issues involved, there may be a large area of uncertainty about the prospects of future technological progress, and the judgment in question may be more a matter of policy choice, perhaps even a bet, than

⁴⁷ Calabresi & Hirschhoff, *supra* note 45, at 1060.

⁴⁸ This is the reason why vaccine manufacturers, even of such wonderful ones as that against polio, should be strictly liable for the still unavoidable cases in which the vaccine may cause the very disease it is supposed to prevent. See *supra* note 19 and accompanying text.

⁴⁹ Medical advances in detecting and treating heart attacks, for example, are clearly more likely to reduce the cost of eating butter than relying on healthier substitutes that do not carry the huge cost of ruining the pleasure of a good *sauce hollandaise*...

an application of some established principles of knowledge. Indeed, while determining who is the cheapest cost avoider is very different from deciding whether a given technology is “state-of-the-art,” it is a task that also has a historical dimension and the answer may change over time depending in part on technological change. In 1950, for example, drunken driving, grossly excessive speed, etc., might have been causing accidents for which it did not make sense to hold the manufacturers liable. But once the prospect of new technologies, say, devices not allowing a drunken driver to start his car or ones controlling the speed at which a vehicle moves under certain road conditions, is on the horizon (even if the horizon is still quite remote), it might make the driver no longer the cheapest cost avoider with respect to these kinds of accidents.⁵⁰

At the time when the idea of strict liability started to penetrate the torts doctrine, the area of car accidents was in fact one in which pinpointing the cheapest cost avoider was a particularly perplexing task, and the concept of “crashworthiness” at the heart of the controversy in *Soule*, may nicely illustrate the uncertainty and the stakes involved. Suffice it to say that a policymaker in charge of the applicable legal and regulatory framework could very well have looked to *both* the manufacturer and the consumer for significant future reductions in the enormous cost of accidents involving the use of automobiles. Even a few decades ago, the speed of technological progress was fast enough to give hope that technical improvements would someday make driving much safer.⁵¹ At the same time, however, the ability of the drivers to mitigate the costs of auto accidents was also indubitable: a huge proportion of accidents was due to drunk driving, speeding, and other forms of poor driving, as well as perhaps to excessive reliance on the automobile by the American public and the neglect of public transportation. In a judicial context, retrying this issue in every case, with arcane and technical expert testimony likely to be indispensable for every decision, as well as a complex interplay of various liability claims and defenses reflecting the fact that both plaintiffs and defendants could have a role in reducing the cost of the same type of accidents, clearly raised the prospect of extremely costly and highly unreliable adjudication, in fact perhaps exceeding the cost of determining the presence or absence of negligence.

For reasons such as these, the most farsighted advocates of strict manufacturers’ liability proposed early on to follow the example of workers’ compensation in replacing judicial determination by a special administrative procedure involving broad category-by-

⁵⁰ It needs to be remembered, however, that the state-of-the-art defense remains not germane to strict liability. The fact that a technological solution to a given problem does not yet exist does not mean that technological progress may not to be seen as the most likely, and the cheapest, way to reduce the cost of accidents involving a given product. A driverless car is not within the present “state of the art,” but it is not a matter of science fiction and car manufacturers should be given every incentive to make it a reality as soon as practicable. On the other hand, the same driverless car was so far from being on the technological horizon in the 1950s that making manufacturers liable for accidents due to drunken driving or speeding would have likely placed liability on a party that was probably not yet the cheapest cost avoider at the time.

⁵¹ Innovations in automobile technology did indeed produce very significant safety improvement in the still rather short history of the industry, and many of the most significant of these improvement occurred since the shift in the direction of strict liability in the wake of Justice Traynor’s *Escola* concurrence.

category, rather than case-by-case, determinations of the types of accidents for which manufacturers would be strictly liable, and using a routinized assessment of damages to replace the widely varying and often unpredictable, as well as biased, jury awards.⁵² But even such an administrative scheme might have involved more difficult and controversial liability determinations than the relatively simple procedure designed to deal with accidents at work. Employers have much greater control over their employees' behavior than car manufacturers ever had in the pre-driverless-car days over the behavior of drivers, pedestrians, and other parties injured by their products. The internalization of workers' injuries into the general cost of production thus looked much less problematic than charging the car makers with most costs of auto accidents.

High price of abandoning strict liability

The disadvantages of a regime of strict products liability, particularly in terms of the cost and accuracy of adjudication, had thus been very real (and obvious) before the recent advances in digital technology moved the idea of self-driving cars from the realm of science fiction to near-reality and made it much more likely that the manufacturers may be seen as the cheapest cost avoiders with respect to a much wider range of accidents than in the pre-digital age. Nevertheless, it is still worth noting that even before the recent digital revolution, the price of reverting to negligence as the basis of design-defect liability was also potentially enormous. Indeed, it is not implausible that many of the safety devices now experimented with might have already been in common use by now if auto manufacturers had been liable for accidents caused by their absence.

An example may give us an idea of the potential difference that could have been made by sticking with a regime of strict liability: a simple and cheap device preventing a driver from starting his car while intoxicated. This device has been available for many years,⁵³ but outside of a narrow context of post-DWI-conviction,⁵⁴ it is not in wide use anywhere, despite the fact that as recently as 2012 drunk driving was still responsible for over 10,000 fatalities (31% of the total), i.e., one death every 51 minutes!⁵⁵ To be sure, drunk

⁵² Calabresi, *The Cost of Accidents*, *supra* note 14, at 258.

⁵³ Interlock devices preventing ignition by an intoxicated driver were first developed in 1969. Their use is effectively limited to post-DWI-conviction situations. See R.B. Voas, & P.R. Marques, *History of Alcohol Interlock Programs: Lost Opportunities and New Possibilities*, *Proceedings of the 8th Annual Ignition Interlock Symposium* (2007), available at http://www.researchgate.net/publication/242204156_History_of_Alcohol_Vehicle_Interlock_Programs_Lost_Opportunities_and_New_Possibilities, and the sources cited therein.

⁵⁴ The installation of interlock devices is sometimes mandated as an alternative to license suspension. See Joseph Marutollo, *No Second Chances: Leandra's Law and Mandatory Alcohol Ignition Interlocks for First-Time Drunk Driving Offenders*, 30 PACE L. REV. 1090, 1098 (2010); *State Ignition Laws*, NAT'L CONFERENCE OF STATE LEGISLATURES (Aug. 2015), <http://www.ncsl.org/research/transportation/state-ignition-interlock-laws.aspx>.

⁵⁵ *Impaired Driving: Get the Facts*, CENTERS FOR DISEASE CONTROL AND PREVENTION (last updated Nov. 24, 2015), http://www.cdc.gov/motorvehiclesafety/impaired_driving/impaired-driv_factsheet.html

driving is a criminal offense in every American jurisdiction, as well as a *per se* failure to exercise reasonable care, which exposes the driver to serious tort liability. It is also a subject of extensive public-education campaigns designed to lower its incidence.⁵⁶ Nevertheless, incontrovertible evidence from many years of experience has shown that both criminal and civil responsibility do not go nearly far enough to eliminate (or even sufficiently reduce) the enormous cost of drunk driving. We also know that opposition to the laws making installation of anti-drunk-driving devices mandatory (perhaps based on the belief that responsible drivers do not need such devices) was strong enough to prevent their enactment.⁵⁷ Indeed, perhaps surprisingly, no court in the U.S. ever found a manufacturer liable in negligence for a design defect arising out of the failure to install an anti-drunk-driving device, despite the fact that (a) such devices have been technologically possible for a long time, (b) the probability of a drunk driver's causing serious harm to a third party is *ex ante* very high, and (c) the cost of the device is low enough to make its absence into a self-evident violation of the Learned Hand's formula defining reasonable care.⁵⁸

Suppose then that the cost of alcohol-related accidents, which still amounts to the staggering sum of \$44 billion per annum,⁵⁹ had been placed on the manufacturers. Isn't it likely that they would have come up with an effective disabling device much earlier, invest in persuading the public that its use is appropriate, and indeed force consumers to accept it by either making cars without it unavailable or by adding a large insurance component to the price of a car not equipped with one?

This last possibility of front-loading the expected cost of drunk-driving by adding it to the initial cost of a car without an anti-drunk-driving device points to an underappreciated,

⁵⁶ To say nothing of laws barring sales or serving of alcohol to people old enough to vote in all U.S. elections, as well as to serve and die in the U.S. army. On the success of anti-drunk-driving campaigns, data from Foundation for Advancing Alcohol Responsibility indicate that fatalities related to drunk driving have decreased 52% since 1982, while total traffic fatalities have declined only 24%. *Drunk Driving Fatalities*, FOUNDATION FOR ADVANCING ALCOHOL RESPONSIBILITY, <http://responsibility.org/get-the-facts/research/statistics/drun-driving-fatalities/>.

⁵⁷ As early as 2005, lawmakers in New Mexico, New York, New Jersey, Connecticut, and Washington proposed legislation that would require all new cars to have anti-drunk-driving devices. Haya El Nasser, *States Turn on to Idea of Ignition Locks*, USA TODAY (June 23, 2005, 10:33 PM), http://usatoday30.usatoday.com/news/nation/2005-06-23-drun-driving_x.htm. Still, a decade later, no state has adopted such a requirement.

⁵⁸ According to University of Michigan researchers, installing alcohol ignition interlock devices in newly purchased vehicles would avoid 59,000 deaths over a 15-year period, amounting to 85% of all alcohol-involving crash deaths, and produce \$343 billion in total economic savings. Patrick M. Carter et al., *Modeling the Injury Prevention Impact of Mandatory Alcohol Ignition Interlock Installation in All New US Vehicles*, 105 AM. J. PUB. HEALTH 5, 1028 (May 2015).

⁵⁹ NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., REPORT NO. DOT HS 812 231, TRAFFIC SAFETY FACTS: 2014 DATA (Dec. 2015), available at <http://www-nrd.nhtsa.dot.gov/Pubs/812231.pdf>.

and often unnoticed, feature of strict products liability. Driving sober is of course a duty of every car user, and failing to fulfill this duty is subject to both criminal and civil sanctions in every state. Nevertheless, consumers may improperly discount the probability of future driving accidents, and not value correctly the expected cost of drunk-driving and of the penalties involved. They may therefore be unwilling to invest enough in reasonable precautions, which results in a serious market failure in this area.

This market failure is what strict liability fixes, and the main reason why it works in this context is not just because the manufacturers can directly prevent the accidents in question by making a “better” car that no longer requires the consumers to take the precautions they should, but do not, take. What makes the manufacturer into the cheapest cost avoider in many cases of this kind is that (1) the manufacturer is much more sensitive to market incentives than the consumers, and (2) when the expected cost of accidents is shifted to it, the manufacturer is in a position to change the behavior of the consumers by a simple device of converting the so-shifted *future* cost into a *present* monetary outlay by the consumers. By including up-front the expected cost of drunk driving in the price of a car without an anti-drunk-driving device, the manufacturer forces the consumer to consider the real cost he is otherwise prone to ignore, and gives him an effective incentive to purchase the device that will disempower him from driving “under the influence.” Interestingly enough, this way of proceeding may often be more effective than most attempts at direct compulsion through legal regulation, even when the penalties for the reprehensible behavior (such as drunk driving) are very high.

The coming revolution

Whatever the costs and benefits of strict products liability for design defects of automobiles may have been a few decades ago, the whole calculus is changing as we speak because the advent of digital technology makes it ever more realistic that the manufacturers are indeed the cheapest cost avoiders with respect to an overwhelming majority of auto accidents (and perhaps with respect to accidents caused by a broad range of other industrial products as well). There may still be quite a number of things that a driver can do to avoid accidents, especially in the transition period during which many non-self-driving cars are still on the road, or as long as the driver may be able to override the various aspects of mechanized control. Moreover, only the driver himself can calibrate the total amount of his car use, foregoing some trips, using public transportation for others, and driving only when it is important enough to cover *all* the societal costs involved, including the often underestimated expected cost of accidents. But the main objective difficulty of picking the cheapest cost avoider for the purpose of determining responsibility under a strict liability regime for auto accidents is increasingly behind us. Indeed, it is quite clear that it is only a matter of time – and not a very long time at that⁶⁰ -

⁶⁰ Toyota, Nissan, and Google all expect to make driverless cars available to the public by the year 2020. Nathan Bomey, *Toyota Testing Self-Driving Cars Since the 1990s*, USA TODAY (Oct. 6, 2015, 4:51 PM), <http://www.usatoday.com/story/money/cars/2015/10/06/toyota-driverless-cars-automated-highway-driving/73448028/>; Thomas Halleck, *Google Inc. Says Self-Driving Car Will Be Ready By 2020*, INT’L BUS. TIMES (Jan. 14, 2015, 8:40 PM), <http://www.ibtimes.com/google-inc-says-self-driving-car-will-be-ready->

- until various technological innovations in car design will eliminate driver error as a major cause of accidents, and will do that at a cost well below that which it would take to modify driver behavior through legal and educational means.

The establishment of a workable strict liability regime in the automobile area might thus be a realistic possibility these days, no longer hindered by the whole gamut of doctrinal and practical obstacles that contributed to its abandonment in the past. Moreover, given the potential advantages of such a regime, be it in terms of increased safety, more efficient administration, or a more equitable distribution of the social cost of accidents, it might be very important to ask as early as possible what such a regime would look like and what would be its legal, economic, and social consequences. This task may be even more urgent in light of the fact that the question concerning the ability of the present torts system to handle the introduction of self-driving cars, without unduly delaying it or making it prohibitively costly, seems to be generating some anxiety among the experts and the industry, and has already led to calls for legislative action designed to limit the manufacturers' exposure to unforeseeably expanded liability.⁶¹ If changes are to come, we better get them right. And to get them right, we need to be much more clear about the available alternatives, including especially the possibility of going back to a more efficient regime of strict products liability.

Manufacturing and insurance

Developing the details of such a new comprehensive legal regime, capable of handling what may be the most radical change in American tort law, goes well beyond my ambitions (as well as ability) at this stage. Of necessity, I focus on the "big picture," without aspiring to more than adumbrating a few significant changes and pointing to some directions of further development.

A move toward strict liability would generally make manufacturers into the insurers of their products, at least with respect to a range of expected uses. The manufacturers would then of course pass on the cost of this insurance to their customers. In the case of most products, such a move would make the product significantly more expensive by forcing the inclusion of mandatory insurance in the price of the product. In some sense, most of the expected costs of accidents involving the product are of course a part of the product's cost to the consumer in any case: a truly rational consumer would clearly consider the present value of such accidents when buying the product, and think of it as part of the cost of the product itself. But consumers are in fact notorious in undervaluing such costs, and a portion of them is also not borne by the consumer, but externalized through various forms of private and social insurance, including employer-paid medical and disability

[2020-1784150](http://www.wsj.com/articles/nissan-speeds-ahead-of-rivals-with-plans-for-autonomous-car-1446121737); Mike Ramsey, *Nissan Speeds Ahead of Rivals with Plans for Driverless Car*, WALL ST. J. (Oct. 29, 2015 8:43 PM), <http://www.wsj.com/articles/nissan-speeds-ahead-of-rivals-with-plans-for-autonomous-car-1446121737>. For longer-term estimates see the sources cited in *supra* note 4.

⁶¹ See *supra* note 7.

coverage, Medicaid and Medicare, Social Security disability payments, etc. To the extent that the consumer does not bear or does not properly value the expected cost of accidents, they are also not properly taken into account in the consumer's purchasing decisions, constituting instead a form of subsidy for the product in question. By including the expected cost of accidents in the very price of the product, strict products liability might seriously affect the demand for various products, especially those that are relatively more dangerous (and would thus be made significantly more expensive).

Mutatis mutandi, the same applies of course to automobile purchases as well, but the situation here is also quite different because car use is one of the few activities with respect to which insurance is already mandatory. In this sense, although the cost of insurance is not included in the "price" paid to the dealer, most people already think of it as part of the cost of owning an automobile. To be sure, auto insurance does not cover the entire social cost of driving, and thus strict liability, by internalizing the entire expected cost of accidents to the manufacturers, would genuinely affect (raise) the perceived price paid by the consumers. But to the extent that strict liability might simply shift to the manufacturer the initial responsibility for the already existing mandatory insurance, the cost of which the manufacturers would then pass back to the consumer, the price of the car from the point of view of the consumer would not change at all,⁶² indeed, in fact probably fall, as self-driving cars are likely to be much safer than the traditional ones. Nevertheless, the role played by auto insurance is also likely to change, perhaps beyond recognition.

The main reason for mandatory auto insurance is probably the protection of third parties from the negligence of the insured driver. But first-party insurance is also included in most policies, even if some parts of it (e.g. damage to the insured's own car) may be optional or carry large deductibles. Indeed, a number of states, including New York, have moved partly away from the third-party protection principle with respect to relatively small claims, and entitled the injured persons to recover on a no-fault basis from their own carriers, without having to bring a claim against any other party.⁶³ Even then, however, the insurance companies track the negligence regime by settling among themselves and making the insurer of the negligent party, if any, cover all the damage up

⁶² There might still be a perceived difference if the whole present value of insurance premiums over the life of the car is included up front in the price of the car. But the manufacturer might also structure the insurance payment separately and charge it in installments. Indeed, this might also be more efficient for other reasons. *See infra* p. 32.

A shift of the cost of insurance to the manufacturers would also make a difference by tying it to the price of a particular car, rather than serving as a more or less "lump sum" tax on any car purchase. Under the present system, the manufacturer does not derive all the benefits of improving the safety of its products: the resulting decrease in the cost of accidents is likely to be spread among the insurance premiums for all cars, not just the ones that are in fact safer. Strict liability eliminates this "externality," and gives better incentives to the manufacturer.

⁶³ No-fault insurance laws are currently in force in twelve states. *No-Fault Auto Insurance*, INS. INFO. INST. (Feb. 2014), <http://www.iii.org/issue-update/no-fault-auto-insurance>.

to the maximum policy amount.⁶⁴ The premiums charged by the insurance companies are then adjusted to the results of such settlements, as well as to the record of traffic violations, and are thus sensitive to the driver's negligence, even though factors unrelated to negligence also affect the cost of insurance for an individual car owner.⁶⁵ On top of this, for drivers with sufficient assets to make them non-judgment-proof, there is an additional, potentially very significant, personal exposure for negligently caused accidents in which damages exceed the insurance policy amount. But crucially, with the exception of accidents due to manufacturing defects, if damages from non-negligently caused accidents exceed the injured person's insurance coverage, the torts and auto-insurance systems leave them where they happen to fall.⁶⁶

Much of this is bound to change with the advent of self-driving cars, regardless of how the regime of torts liability is affected. Suppose for an instant that the fault regime for design defects remains in place. Even under the present regime, not all car accident costs are borne by the consumers. Whenever an accident victim or a driver-defendant, can show – to a generally rather sympathetic jury – that the accident was even in part due to a defect in the car, the manufacturer has to bear a share of the cost. But even if juries may often assess greater damages against car companies than they might against individuals,⁶⁷ the requirement of proving fault in all design defect cases assures that the proportion of the total cost of automobile accidents paid by the manufacturers is still quite low. Still, as drivers become less and less important, it seems inevitable that manufacturing or design defects will be found responsible in a much greater proportion of cases – indeed, once drivers play no role, the application of something like *res ipsa loquitur* may make the manufacturers start picking up most of the costs that now still fall on the consumers and other victims, *de facto* pushing the principle of torts responsibility ever closer to strict liability. The fear of such a development may very well be at bottom of the already noted recent calls for legislative interventions to limit the manufacturers' exposure in the name of not slowing down the introduction of driverless technology.⁶⁸

⁶⁴ The determination of negligence for these purpose tracks a special procedure prescribed by the statute, leaving out the courts and saving on the costs of adjudication. [Cite NY statute?]

⁶⁵ Among the non-negligence factors taken into account in setting insurance premiums are: location, the type of car and safety devices, the age of the insured, and the amount of driving done by the insured, although the annual mileage allowances are rather crude and not *de facto* policed.

⁶⁶ Such damages may still be socialized by life, medical, and disability insurance, and, especially when the victim becomes indigent, government-run systems of social insurance. Having no significant impact on auto safety, they are left out of this account.

⁶⁷ Robert J. MacCoun, *Differential Treatment of Corporate Defendants by Juries: An Examination of the "Deep-Pockets" Hypothesis*, 30 LAW & SOC'Y REV. 121, 136-37 (1996); Chris Denove, *Quantifying the Juror Bias Against Corporate Defendants*, PLAINTIFF MAG., Aug. 2013, available at http://www.plaintiffmagazine.com/Aug13/Denove_Quantifying-the-juror-bias-against-corporate-defendants_Plaintiff-article.pdf (juries award 42 percent greater damages against large businesses).

⁶⁸ *Supra* note 7 and accompanying text.

Whether or not an informal move toward de facto strict liability becomes entrenched in legal practice, the role that insurance plays with respect to the safety of automobile use will be very seriously affected. Although loss spreading, which is the essence of insurance, theoretically diminishes an individual's safety incentives; in fact, insurance often does reinforce such incentives by making premiums adjusted to individual safety record and investment in accident prevention. If the adjustment is reliable enough, insurance prices the risk involved and converts the merely "expected" cost of future accidents into a present expense for the insured. So if, as seems likely, consumers often apply too high a discount rate to the cost of future accidents, mandatory insurance, like strict liability (of which insurance is always a part⁶⁹), may not only spread, but also effectively lower, the cost of accidents.⁷⁰ Still, as the driver's ability to affect the probability or the seriousness of the accident diminishes with the car's taking over an ever greater role in controlling its own behavior, the whole idea of mandatory owner/driver insurance, at least insofar as its safety effects are concerned, becomes problematic.

To begin with, the importance of the third-party protection aspect of car insurance clearly diminishes, as accidents are increasingly less often – and ultimately probably close to never – caused by the negligence of a driver. As long as the regime does not formally move into strict liability, and as long as many drivers do not carry collateral life, medical, and disability insurance, it may still make sense to require mandatory first-party insurance. But by the same token, the safety impact of such a requirement, in terms of its influence on consumer behavior, becomes attenuated.

To be sure, insurance premiums will not lose all significance with respect to providing safety incentives for the drivers. Clearly, the transition to self-driving cars will be a protracted process, so there will be a long time when many types of cars will co-exist, and the role of the driver's negligence will not be entirely eliminated overnight, if ever.⁷¹ More importantly, even when most driving is no longer done by the people in the car, there are still other, non-negligence aspects of car use that have an impact on the number and cost of accidents. For example, while the judicial standard of "reasonable care" is

⁶⁹ Because strict liability makes the manufacturer into an insurer with respect to certain types of accidents and the manufacturer will necessarily include the cost of such insurance in the price of the product. The only costs that the manufacturer may not be able to include in the price are those which, because of unnecessary dangerousness of the product, exceed those of his competitors.

⁷⁰ The situation is in fact more complicated because the expected cost of an accident to the consumer is affected not only by the size of the future loss and the accident's probability, but also by the risk attitude of the insured, as well as by his ability to shift part of that risk onto other parties by means other than insurance. Thus, in the absence of insurance, a risk averse person might be more careful because his risk aversion may compensate to some extent for the excessive discounting of the probability of an accident. The same insured may be less careful because the fact of being judgment-proof with respect to large claims may make the expected cost of accidents much lower.

⁷¹ As noted *supra* note 4, it is a matter of controversy whether humans will always have some role in driving.

capable of reaching only certain aspects of driving behavior, other means, including the pressure of properly attuned insurance premiums, may influence the amount of driving, the willingness to pay more for cars with better safety record, and other aspects of car use that have significant safety effects. But as long as insurance is purchased from independent insurance firms, the impact of mandatory car insurance on some of these aspects may become less significant because of potential conflicts between the insurers and the manufacturers. The most obvious example is the insurers' interest in decreasing the cost of accidents by giving consumers an incentive to buy cars that have better safety records. As manufacturers gradually become the cheapest cost avoiders with respect to most car accidents, this aspect of insurance is of potentially ever greater importance. Nevertheless, as long as less safe, but otherwise attractive and still "state-of-the-art," cars are not seen as containing a design defect, and as long as consumers underestimate the expected cost of future accidents, manufacturers may be able to externalize onto the consumer the increase in the expected cost of accidents involving such machines.⁷² If insurers were to adjust premiums to the safety record of a car model (or even the manufacturer's overall record!), they would then correct the consumers' market distortion by converting the expected cost of future accidents into a present expense, and raise the car price as perceived by the consumers, thus directly affecting the sales and profits of the manufacturers. Not surprisingly, however, while insurers will sometimes lower the premiums for cars with certain generic safety and antitheft devices,⁷³ they are understandably reluctant to get involved in "rating" particular car models and entering into serious conflicts with car manufacturers whose sales may be seriously affected. The reluctance to enter such conflicts may be particularly strong as long as the clientele of mandatory insurance is essentially captive and not very well informed, which makes spreading the extra costs more widely less troublesome than trying to lower them by placing them on the parties who buy the machines with higher expected accidents costs.

The really interesting and potentially revolutionary changes in the role played by auto insurance are likely to occur if strict liability is formally adopted as the principle governing responsibility for car accidents. Indeed, strict liability would *ipso facto* immediately transform the manufacturers into the insurers with respect to all accidents for which they would be the cheapest cost avoiders, thus making the present form of auto insurance immediately obsolete. While the situation might be somewhat complicated if the defenses available to the manufacturers still cover a substantial proportion of

⁷² Clearly, not all decreases in safety are "design defects" even in a "true" strict liability regime. Fast sports cars and convertibles, for example, may involve tradeoffs between safety and other attractive features that some rational consumers may legitimately prefer. Indeed, the consumer may also be the party in the best position to bear some of these increased risks: sports cars may be bought by people who are "risk preferrers" or perhaps better drivers. When the parties are well informed and the purchase is freely negotiated, assumption of the increased risk on the part of these consumers may be appropriate.

⁷³ Insurers commonly offer discounts for passive restraints, anti-lock brakes, anti-collision systems, daytime running lights, and anti-theft systems. See Sophia H. Duffy & Jamie Patrick Hopkins, *Sit, Stay, Drive: The Future of Autonomous Car Liability*, 16 SMU SCI. & TECH. L. REV. 453, 478 (2013). Insurers also charge more for collision coverage of expensive cars.

accidents, let us assume a baseline situation in which totally self-driving cars are a technological reality, so that an auto maker is in a position to limit the customer's options to one in which the consumer is a purely passive figure in controlling the car, and the manufacturer is clearly the cheapest cost avoider with respect to – and thus initially charged with – all the accidents that can happen as long as the vehicle is used in a normal (expected) fashion and in accordance with the instructions.

Now it is, of course, possible that car manufacturers will not self-insure for the total amount of their huge liability under such circumstances, and will outsource all or part of their risk exposure coverage by purchasing insurance with a separate insurance industry. However, even then the externalization of the excess risk imposed by less safe cars is no longer likely to occur. The manufacturer will now be primarily liable for all accidents due to a specific car model. If it wishes, it may be able to spread any such cost among its various models, but whether it self-insures or buys insurance on the market, it will not be able to impose any part of the expected cost of accidents involving its cars on other manufacturers, and hence also not on car buyers generally, or on the public. What this means is that the move to strict liability will correct an important market failure, and give the manufacturers proper incentives to consider fully the whole social cost of each of their machines.

Even under a strict liability regime, a separate insurance industry may have some advantages over the manufacturers because of specialized skills, experience, access to capital markets, etc. But car companies are probably big enough, as well as sufficiently diversified among a large number of car models and a great variety of consumers, to internalize all or most of the risks involved.⁷⁴ Moreover, were they to purchase insurance from an independent business, the latter's cost of monitoring the behavior of the auto makers would likely be much higher than the self-monitoring cost of the manufacturers themselves, making self-insurance significantly less expensive. Finally, auto makers will also enjoy another significant advantage over the existing insurance industry because of their superior ability to negotiate the details of the insurance terms with their buyers,⁷⁵ and to monitor each customer's post-sale use of the purchased machine.

⁷⁴ Major car manufacturers already self-insure for workers' compensation purposes. The extent of risk involved in auto insurance may also go down significantly as cars become safer as a result of self-driving. Indeed, insurers expect their auto insurance business to dwindle by as much as 80% in the next 20-25 years. http://www.nytimes.com/2016/01/08/automobiles/insurers-brace-for-the-self-driving-future-and-fewer-accidents.html?_r=0. To be sure, self-insurance may be less common among smaller and less diversified manufacturers of other products, whose exposure to tort claims would be significantly raised by a broader movement toward strict design-defect liability.

⁷⁵ Insurance contracts are now offered to car owners on essentially boilerplate take-it-or-leave-it terms. Car purchases, on the other hand, involve rather detailed negotiations concerning the vehicle model, price, as well as numerous options concerning the car's appearance and equipment. As we shall see, if insurance terms become one of the items discussed, there is also a possibility of more flexible arrangements and more detailed negotiations between the parties.

Indeed, this ability to monitor the post-sale use of industrial products is in itself a very important technological advance because the computerization involved is also likely to enable the manufacturers to maintain a detailed driving record of each self-driving automobile, registering (and perhaps storing in a general database) not just the amount of driving, but also its quality, external conditions, passenger behavior, and a host of other potentially relevant factors.⁷⁶ Equally importantly, the new technology might allow the manufacturers to *control*, and not just monitor, the owner's use of the automobile, including remotely enabling various extraordinary safety devices, disabling certain features, or even immobilizing the vehicle whose owner defaults on his obligations⁷⁷ under the sale/insurance contract.⁷⁸

It is not part of my subject here to consider the broader economic significance of the potential integration of manufacturing and insurance industries that the introduction of self-driving cars may bring about, although it should be noted that this may be a development of historical proportions, especially if strict manufacturers' liability extends beyond the auto industry and, over time, is also applied to other products.⁷⁹ What is of

⁷⁶ While not offered to the general public in this country, insurance companies in Great Britain already provide an option for automobile owners to install a special "black box" in their cars that allows the insurance company to monitor the time of day when the car is driven, the average speeds on different types of roads, the number of miles driven, and even such factors as acceleration, braking, and cornering. The insurance rates are then adjusted for these factors, resulting in significant savings for the more careful drivers. See <http://www.which.co.uk/money/insurance/guides/black-box-car-insurance/black-box-car-insurance-how-it-works/>

⁷⁷ The importance of post-sale monitoring made possible by advances in digital technology goes of course well beyond the automobile area, and may have still more significant results in some of these broader areas. Think, for example, of guns that check the user's fingerprints and do not fire unless the user is authorized to handle the gun. Based on such considerations, an argument could be made that gun manufacturers are these days the cheapest cost avoiders with respect to many injuries related to improper gun use and that making them strictly liable with respect to such injuries would greatly lower the social cost associated with gun use in the United States. I would like to thank Guido Calabresi for making me aware of the potential use of digital technology to monitor post-sale gun use. For a more general discussion of the impact of digital technology on post-sale contract enforcement, see Saifedean Ammous, *Economics beyond Financial Intermediation: Digital Currencies' Possibilities for Growth, Poverty Alleviation, and International Development*, J. OF PRIV. ENTERPRISE, Fall 2015, at 19–50.

⁷⁸ To be sure, with the decreased importance of driving (and thus of what the buyer can do to increase the safety of automobile use), some of the potential benefits of post-sale monitoring will be lost. But still, the fact of its availability opens a very important window for the increased scope of pre-sale negotiations and post-sale enforcement.

⁷⁹ I use the term "insurance" here in its proper economic sense, and abstract from the technical issue of when a given practice qualifies as "insurance" under the applicable state laws. In the former sense, the fact that a manufacturer will include the expected cost of accidents, for which it is strictly liable, in the price of a product means that, in addition to the cost of capital, labor, and materials, the product's price will now include an insurance premium. But in a legal sense, the manufacturer's obligation to compensate the consumer for his accident damages derives from a tort-law entitlement of the consumer, and not from an insurance contract between the two parties, so the transaction might not be regulated by the laws governing insurance. Indeed, even to the extent that the consumer's rights derive from the sale contract, they may still be classified, from a legal point of view, as "warranties," rather than "insurance."

more direct significance in the context of the present inquiry, however, is that the very prospect of the auto makers' selling insurance together with their machines is likely to introduce very significant changes not only in the way car business is done, but also in the legal framework governing the relationship between the manufacturers and the consumers or other potential victims of auto accidents.

Will auto accidents remain part of the tort system?

Perhaps the most significant aspect of the prospective integration of auto manufacturing and sales with the insurance business is that the extensive negotiations normally accompanying car sales might now involve not only the kind of car, options, payment structure, etc., but also the terms of the insurance included (by strict-liability law) in the price of the product. The fact that the seller will also have a dramatically expanded ability to monitor the buyer's after-sale compliance will affect both the terms of the insurance/warranties sold with the product and their effectiveness.⁸⁰

To maximize their ability to modify drivers' behavior in ways that would be expected to lower the cost of accidents, even though the legal default would now place the initial responsibility for these costs on the manufacturers, the sellers are likely continue the present practice of separating insurance premiums, to be paid over time, from the basic recovery of the manufacturing and marketing investment, thus not charging the whole price of the automobile at the time of purchase. The insurance premiums might then be tied to the amount of driving, as well as perhaps the conditions under which the car is used, maintenance level, etc. A failure to adhere to some of these conditions by the owner is surely not acceptable as a reason for modifying the default of the manufacturers' liability, but the parties may now be able to replace the legal incentives provided by a threat of torts or contracts liability with various market incentives and the already mentioned private, maybe even mechanical, enforcement measures, such as an automatic rise of the insurance premiums or the disabling of certain car features, perhaps even immobilization or repossession of the car when the contractual use conditions are broken.

Beyond these relatively uncontroversial market arrangements affecting the safety of industrial products, the rather detailed negotiations accompanying car purchase also open, at least theoretically, the possibility of the parties' negotiating in advance their

Be that as it may, making the manufacturer into an insurer in the economic sense is of primary significance in the real world. As soon as the consumer does not need to purchase separate insurance from an independent insurance company and is *de facto*, even if not *de iure*, insured by the manufacturer, the real insurance business has now been integrated into the manufacturing business. To be sure, if the auto manufacturers want to depart from the legal default and begin to negotiate the actual insurance terms with the customers, the insurance law may at some point kick in again, or it might have to be adjusted to take into account what has now become of the old "auto insurance" concept.

⁸⁰ Extensive data gathering related to people's driving habits may also raise serious potential privacy concerns which cannot be discussed in the present context.

responsibilities for certain special type-of-accident damages, including potential departures from the legal default of general manufacturer's liability and replacing it with some special obligations of either party or an assumption of additional risks with respect to certain situations that the parties may consider to fit better their needs and capabilities.

There are of course dangers in these kinds of contractual departures from standard liability defaults, especially when the contracts are between powerful corporate players and members of the general public. Clearly, any agreements to release the manufacturers of responsibility for their negligence would be presumptively invalid and call for very careful scrutiny.⁸¹ Other agreements, which might be beneficial in a large number of situations, but follow a general pattern that suggests not truly negotiable "boilerplate" provisions, might make sense only in a highly (and skillfully) regulated environment (which is unlikely to result from case-by-case-adjudication) and are likely to call for legislative and/or administrative regulatory oversight.

Still, given the extensive negotiations that usually accompany car sales, contractual departures from legal defaults may make sense in some cases. Imagine, for example, that a prospective car buyer does not want a mere "means of transportation," but is interested in being able to override the self-driving defaults and assume personal control, be it because the buyer's intends to a make a special use of the car or has a preference for a certain kind of driving experience. The manufacturer may be ready to offer such customers a vehicle with, say, certain off-road capabilities, or something resembling an old-fashioned sports car, rather than a self-driving equivalent of a family station wagon. The parties may at the same time agree to release the manufacturer from liability for certain types of accident damages when the owner is in control.⁸² Perhaps most interestingly, the parties might wish to remove themselves, partly or totally, from the vagaries of the judicially administered torts system and replace it by a simpler, cheaper, and more expeditious system in which liability questions are quickly disposed of by a special body applying broad categories across vary large swaths of accident damages, and damages are paid in accordance with a pre-established schedule.

Contracting out of the expensive judicial resolution of private disputes is by now a widely established practice; indeed, in many sectors, including banking, software, and others, arbitration has, for all practical purposes, become the dominant form of dispute resolution.⁸³ Moreover, once the parties are successful at removing themselves from the

⁸¹ The leading case concerning negligence disclaimers is *Tunkl v. Regents of the Univ. of Cal.*, 383 P.2d 441 (Cal. 1963). Virginia goes so far as to make such contracts generally unenforceable. *Hiatt v. Lake Barcroft Cmty. Ass'n*, 418 S.E.2d 894 (Va. 1992).

⁸² See *supra* note 72. Even if this kind of assumption of risk is allowed, the manufacturer clearly could not effectively disclaim liability with respect to accident victims who are not parties to the sales contract.

⁸³ Inka Hanefeld, *Arbitration in Banking and Finance*, 9 N.Y.U. J.L. & BUS. 917, 922–23 (2013) (increasing prevalence of arbitration in banking and finance industry); Florencia Marotta-Wurgler & Robert Taylor, *Set In Stone? Change and Innovation in Consumer Standard-Form Contracts*, 88 N.Y.U. L. REV. 240, 244 (2013) (ubiquity of arbitration clauses in end user license agreements); Floyd D. Weatherspoon,

judicial system, substantive legal defaults are also easier to modify or replace by various contractual substitutes. The practice has generated its share of controversy, and some commentators see it as exploitative with respect to consumers, as well as subversive with respect to public policies in a number of areas.⁸⁴ In particular, the idea of genuine consumer consent to most of the usually non-negotiable waivers of legal defaults is subject to serious questions that may undermine their legitimacy. The expansion of such private agreements into the auto accident area, where life and death are often at stake and where consumers may systematically misvalue the expected cost of various future events, is likely to lead to even more serious problems. Thus, even if there is some room for a “market” for dispute resolution mechanisms with respect to controversies between consumers and large manufacturers, the imperfections of such a market, especially when basic safety and colossal social losses are at issue, as they clearly are in the auto accidents area, are obvious enough to require an extensive and well-designed regulatory infrastructure.

The key point concerning such infrastructure is to rethink the way the torts system now deals with the huge social losses due to auto accidents, and perhaps all accidents involving industrial products. The very extent of these losses⁸⁵ makes case-by-case adjudication problematic, and the problem goes beyond the usual objection to the expense of this form of resolution. Indeed, we have seen that in their struggle with the concept of design defect, the courts were, on the whole, unsuccessful in designing properly the very doctrinal framework for an effective handling of strict products liability cases. To be sure, I also argued that this task will become easier in the era of self-driving cars, when the new technology will make the manufacturers into the cheapest cost avoiders in most auto accident cases. Continuing with judicial case-by-case determinations of liability is therefore a distinct possibility. But a common-law movement from the *status quo* toward a properly understood regime of strict liability is likely to involve a very protracted trial-and-error evolution that would probably call for serious legislative intervention in any case. Even then, the tort system is likely to be very costly and produce less predictable outcomes than could be expected from a specialized public or private body designed for the purpose of dealing with the auto accidents area.⁸⁶

Incorporating Mandatory Arbitration Employment Clauses into Collective Bargaining Agreements: Challenges and Benefits to the Employer and the Union, 38 DEL. J. CORP. L. 1025, 1070–71 (2014) (employer preference for mandatory arbitration provisions in collective bargaining agreements).

⁸⁴ Cf. Jessica Silver-Greenberg & Robert Gebeloff, *Arbitration Everywhere, Stacking the Deck of Justice*, N.Y. TIMES (Oct. 31, 2015), <http://www.nytimes.com/2015/11/01/business/dealbook/arbitration-everywhere-stacking-the-deck-of-justice.html>

⁸⁵ See *supra* note 8.

⁸⁶ I abstract here from the special problems generated by the device of contingency fee which allows tort lawyers to take a 30-40% cut of the enormous sums involved in auto accident cases, most of which are resolved without trial. LESTER BRICKMAN, *LAWYER BARONS: WHAT THEIR CONTINGENCY FEES REALLY COST AMERICA* (Cambridge Univ. Press 2011); Christopher R. McLennan, *The Price of Justice: Allocating Attorneys' Fees in Civil Litigation*, 12 FLA. COASTAL L. REV. 357, 368 (2011). The huge special interest of

We are, of course, not without experiences with administrative alternatives to the torts system and the one that most readily comes to mind is the workers' compensation regime established in all states. There is clearly much to learn from this experience, but the pitfalls of workers' compensation history are also considerable. Liability determinations, involving changing understandings of who is covered and for what injuries, have at times led to controversial (and costly) extensions of coverage.⁸⁷ Fraud is sometimes thought to be a serious issue,⁸⁸ and the way damages are calculated in most workers' compensation schemes, with compensation for various injuries often tied to rigid multiples of the minimum wage, would probably be much less appropriate if applied to the auto accident area.⁸⁹ Decentralization of the workers' compensation system, and indeed of the tort law generally, is also to create problems in the auto accident area. Although some federalism issues may arise in all local schemes of this kind, compensation of the victims of automobile accidents by mostly out-of-state manufacturers would likely raise a serious bias possibility.

Be that as it may, the most important objectives of an auto-accident compensation scheme, whether set up directly under (state or federal) law or resulting from comprehensively regulated market transactions, would be (1) to bring in genuine expertise into the administration of the scheme; (2) establish a clear set of foundational principles for deciding the basis of responsibility, and (3) produce a workable, yet exhaustive, classification of accidents for which responsibility, at any given time, lies with the manufacturer. To be sure, there will still have to be some procedure for examining special circumstances of each particular case, including perhaps the possibility of appealing individual decisions to a court. Most importantly, unlike workers' compensation schemes, the auto-insurance scheme would have to contain a mechanism for continuous reevaluation and an evolving improvement of the general rules in light of new technologies and experiences. But essentially removing most complex factual determinations from the resolution of individual cases, and replacing them with a relatively straightforward application of general rules that would not be open to review in

the trial lawyers' lobby in maintaining the *status quo* is also certain to be one of main obstacles to any rationalization of the present system that would move away from judicial case-by-case determinations.

⁸⁷ See ORIN KRAMER & RICHARD BRIFFAULT, *WORKERS' COMPENSATION: STRENGTHENING THE SOCIAL COMPACT* 16–43 (1991).

⁸⁸ See, e.g., 2 Compensation and Benefits § 22:123 (2016) (estimating that 10 to 25% of all workers compensation claims involve fraud); cf. also Gary T. Schwartz, *Waste, Fraud, and Abuse in Workers' Compensation: The Recent California Experience*, 52 MD. L. REV. 983 (1993).

⁸⁹ The tie to minimum wages was designed to resolve the earlier problem with inflation's effects on legislatively established (and not updated) tables of damages in most workers' compensation schemes. But in addition to counteracting the effects of inflation, any "mechanical" compensation schemes replacing judicial case-by-case determinations must also be attuned to other factors, such as changing societal views concerning the value of life and limb. Perhaps some attention to the evolving recoveries in other areas of tort law, which are not covered by such schemes, may be of some help in updating the relevant information. (I am indebted to Judge Calabresi for turning my attention to this issue.)

each case, should be one of the main features of any efficient solution. A standardization of damages would also dramatically lower the cost of resolving individual cases and bring much greater predictability that would, in turn, allow the manufacturers to estimate reliably their liability exposure and calculate the costs and benefits of various safety improvements. However, given the much greater variety of the victims of auto accidents, as compared to people injured in the workplace, it is unlikely that following the workers' compensation schemes in tying compensation to minimum wage would do the job.

Conclusion

We need to leave for another day a fuller discussion of what the tort law might look like in a couple of decades, after the impact of the digital revolution is felt throughout the products liability area. But I have argued here that introduction of driverless cars will be the first line of transmission through which the revolutionary potential of the new technology will force important changes in the law of torts as it has been formed in the last few decades. Above all, the new technology, by making manufacturers into the cheapest cost avoiders with respect to most accidents resulting from the use of industrial products, is likely to eliminate one of the main difficulties that the law had faced in the past when it had looked like it was moving in the direction of strict liability as the main principle of manufacturers' responsibility. I have also argued that moving back to strict products liability in the design defect area, which has been abandoned after the courts misinterpreted the concept of "defect" and failed to develop a proper doctrinal and institutional infrastructure of no-fault responsibility, far from having serious negative consequences for the American industry, will in fact accelerate technical progress, increase general safety, and open entirely new business horizons, such as an integrated manufacturing and insurance industry. It will also bring more market mechanisms into the area of consumer safety, speed up innovation, and ultimately make industrial products less expensive.