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*377 REALITY IN THE ECONOMIC ANALYSIS OF TORT LAW: DOES TORT LAW REALLY DETER?

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INTRODUCTION

The economic analysis of tort law acquired prominence in 1970, [FN1] with the publication of Guido Calabresi's book, The Costs of Accidents. [FN2] In 1971, Richard Posner published his first torts article, [FN3] and a year later he published a more general article espousing A Theory of Negligence. [FN4] Moreover, this article came out in the first issue of the Journal of Legal Studies, *378 then edited by Posner, which turned out to provide a sympathetic forum for large numbers of articles dealing with the economics of torts. [FN5] Ever since the 1970s, the modern movement in economic analysis has been in full swing. [FN6] That analysis has highlighted the deterrence function of tort law. Indeed, even in the works of mainstream scholars, deterrence has now assumed the role of a primary rationale for tort liability rules. [FN7]

Yet almost from its outset, the economic analysis has provoked a large number of critics who claim that tort law does not really influence behavior in the way that the economists suggest. [FN8] These critics identify a number of "realistic" factors that in their view prevent tort law from achieving deterrence. None of those who engage in the economic analysis has done an adequate job in responding to the realists' critique. The goal of this Article is to assess that critique by probing the realities underlying the economics of torts: Are tort rules really successful in deterring dangerous conduct?

In order to respond to this question, the Article conducts a review of the realistic factors. It then considers what information there is on the actual deterrent effectiveness of the tort system. In further pondering the critics' position, the Article distinguishes between the "strong"

form of the deterrence argument--which assumes that tort law does in fact deter as thoroughly as economic models suggest--and the more "moderate" form of the argument--which assumes that tort law provides a significant amount of deterrence, yet considerably less than the economists' formulae tend to *379 predict. Having set forth this distinction and reviewed the evidence, the Article concludes that the strong form of the deterrence argument is unsound but that the argument in its more moderate version can be generally sustained. Having reached these conclusions, the Article considers how much deterrence tort law needs to achieve if the tort system is to provide deterrence benefits that justify its various costs. The Article here develops findings about the medical malpractice system and the auto liability system that are tentatively favorable. Even conceding their tentativeness, these findings highlight the public-policy value that can flow from even the moderate amount of deterrence that the tort system can provide. In addition, the Article reviews how its various evaluations bear on the ways in which an economic analysis of tort law ought to be conducted. In particular, it suggests that legal economists de-emphasize their efforts to fine-tune liability rules in order to achieve perfect deterrence. Given the imprecision in the processes by which tort liability affects behavior, these efforts at fine-tuning, though intellectually challenging, are likely to be socially irrelevant.

Before turning to the evidence on deterrence, I should clarify the relationship between that evidence and the economic theory of tort law. The theory can most easily be interpreted as making claims about the social efficiency of tort liability rules--that is, their actual impact on parties' behavior. [FN9] Insofar as the theory does advance claims about social results, the critics' argument that tort law fails to deter would offer a thorough refutation of the theory. Yet there is another way in which the positive *380 economic theory of tort law can be understood. Whatever the social impact of tort liability rules, economics could be said to explain those rules if the judges who formulated them did so with the purpose or motive of achieving efficient deterrence. [FN10] The thesis that judges are attempting to adopt efficient rules would be quite important, since the thesis would enable scholars to both explain and even predict judicial behavior. For that matter, even if the critics' claims turn out to be correct, this would not undermine the theory. For the theory would still be keenly important in explaining what judges are trying to do. [FN11] Yet even if the economic theory is understood as making claims only about the purpose of judges, the realists' critique would obviously remain highly relevant. For that critique, if found valid, would establish that tort law dramatically fails to achieve its own stated objectives.

The economic writings discussed so far provide "positive" support in one way or another for common-law tort doctrine. It can be noted that certain writers use economics in a "negative" way, relying on economic analysis in order to criticize not only individual tort doctrines but the entire structure of modern tort law. [FN12] To be sure, the leaders among the current "negative" scholars--such as Priest and Epstein--do not believe that modern liability standards are too narrow; rather, their view is that those standards go much too far. [FN13] That is, these scholars suggest that while modern tort rules may well achieve appropriate deterrence, they do so in a *381 way that imposes excessive costs, both monetary and nonmonetary. [FN14] Evidence that even modern tort law fails to deter would thus significantly embarrass their own positions.

As for Priest, he sees modern tort law as having approached absolute liability; and he recommends a retreat to precise risk-benefit-oriented negligence liability regime, which he believes would function effectively in actually "controlling the accident rate." [FN15] Yet my recent review of modern tort doctrine has found that Priest's claims about near absolute liability are quite exaggerated, and that much (though by no means all) of modern tort law is at least roughly consistent with a Posnerian economic analysis. [FN16] Accordingly, if tort law does in fact deter dangerous conduct in the ways that economic models suggest, much of modern

tort law would be generally justifiable. At this point, however, the realists' claims as to tort law's deterrence failure become obviously relevant.

I. THE REALISTIC OBJECTIONS

The economic rationale for tort liability emphasizes the extent to which tort rules can achieve deterrence. The basic point of the deterrence claim on behalf of tort liability is clear: By imposing the threat of liability on tortious conduct, the law can discourage parties from engaging in that conduct. However, ever since the economists' deterrence rationale began to gain prominence, that rationale has been disputed by leading tort scholars who have challenged the economists' claims about the deterrence capacity of tort law. These critics include Richard Abel, [FN17] P.S. Atiyah, [FN18] *382 Izhak Englard, [FN19] John Fleming, [FN20] Marc Franklin, [FN21] Jeffrey O'Connell, [FN22] Richard Pierce, [FN23] William Rodgers, [FN24] Stephen Sugarman [FN25] and G. Edward White. [FN26] Taken together, these critics have advanced a large number of considerations that lead them to deny the reality of liability-rule deterrence. Each of the critics has compiled his own list of realistic points; set forth below are the points that appear on many of these lists.

One set of considerations suggests that tort law may not be a necessary cause in achieving deterrence: That is, tort law may be rendered superfluous as a deterrence measure by other incentives operating on parties to avoid accidents and unduly risky conduct. One such incentive is morality itself: Moral principles may discourage a person from needlessly inflicting risks or harms on others. In addition, a person may be dissuaded from engaging in negligent conduct by the risk this conduct poses to his own safety: If a driver's speeding imperils another motorist, it imperils the driver as well. Also, parties may have first-party market incentives to avoid accidents: If, for example, consumers realize that a manufacturer's product contains an inappropriate risk, they will become unwilling to buy large numbers of that product. Furthermore, many regulatory programs are already in place for the purpose of achieving what society regards as its appropriate safety goals.

In addition, the critics suggest that tort law is not a sufficient cause of deterrence: That is, tort law may be futile in its efforts to achieve deterrence. Liability insurance, for example, intervenes between the defendant *383 and the imposition of liability in a way that reduces or eliminates the incentive effects of the threat of liability. Moreover, much of negligent conduct is inadvertent conduct--lapses by parties that seem genuinely "accidental;" if the party's conduct is not a function of her own mental choices, then liability rules that appeal to the mind will not be influential. Also, individuals operate under cognitive and psychological limitations that can prevent them from acting rationally in the face of liability. For example, they may be simply ignorant of the legal rules (and the applications of those rules) that entail a liability threat; [FN27] or they may psychologically discount the significance of a small chance of a major future liability.

In evaluating these various objections to the claims about tort law's deterrence efficacy, one realizes how difficult it is to generalize about all of tort law. In order to assess the significance of each objection, tort law needs to be disaggregated or sectorized. [FN28] An objection that has ample force in the context of auto accidents, for example, may have little force in the context of products liability (and vice-versa). Consider, for example, morality as a motive for potential injurers that might render liability superfluous. Principles of morality do operate in a powerful way on doctors, who are under a professional obligation to "do no harm." Moral principles operate unevenly, however, on motorists: Many of the motorists one encounters on the highway do not seem greatly concerned about the welfare of others. [FN29] Personal safety is a factor that operates, as noted, quite powerfully on the motorist; similarly, the airplane pilot who performs negligently may be the first to die if the airplane crashes. But outside the context of transportation, the potential defendant's concern for his own safety is simply not a factor. The malpractice of the physician, for example, endangers the health of the patient alo-

ne; the defective product sold by the manufacturer threatens the safety of users and consumers, but not the corporate manufacturer itself, or even its own employees. Market incentives can, of course, be quite important for manufacturers. Typically, however, they acquire significance only when, for whatever reason, the media focus *384 attention on particular product hazards. Furthermore, market incentives have little relevance in situations (for example, highway accidents) when the potential victim and the potential injurer do not stand in a bargaining relationship. Even when there is a pre-existing contract (for example, between doctor and patient), the patient may be in a poor position to appraise the doctor's propensity for malpractice. As far as regulation is concerned, state motor vehicle codes include rules that cover, at least in a general way, most of the negligent mistakes that drivers might make. Yet as far as state and local governments are concerned, the risky conduct they might engage in is generally subject to no public regulation at all. [FN30] Moreover, there are no programs of direct public regulation that cover the mistakes that doctors might make; and most states' systems of license suspension and revocation are quite minimal. [FN31] As for the safety of autos and consumer products, modern federal regulatory programs have adopted standards that govern many features of their designs. Yet those programs have neglected many other product design features; moreover, over the last twenty years some of these programs have all but abandoned their standard-setting function. [FN32]

An added observation is that insofar as there are various safety incentives that might serve as alternatives to tort, tort law has the capacity to interact with those other incentives in a beneficial way. [FN33] For example, a party's basic sense of morality can be reinforced by the prospect of liability: A product designer might say that "this is the right thing to do; besides, it *385 will reduce the risk of my company's liability." Tort actions can generate publicity that can bring product risks to the attention of consumers and hence stimulate an appropriate market reaction. Likewise, tort suits can (first) uncover and (then) dramatize information in a way that can set in motion a regulatory response. [FN34] Moreover, if tort can feed into regulation, regulation can also feed into tort. The important doctrine of negligence per se means that a tort action can serve as the enforcement mechanism for regulatory norms; this is of course routine in auto accident litigation. If the motorist is cited for a regulatory violation, under merit rating this will increase the cost of the tort liability insurance he is required to buy; his desire to avoid the higher cost of tort insurance gives him an added reason to comply with the requirements of the motor vehicle code.

The list of factors that suggest the futility of tort incentives typically begins with liability insurance. It is true that most homeowners and most doctors are broadly covered by liability insurance policies lacking any features of experience rating. [FN35] Yet many potential defendants "self-insure"--that is, do without liability insurance. [FN36] These include many public agencies (for example, the City of Los Angeles), many large manufacturers (for example, Ford), and many other large institutions, such as hospitals. Moreover, major institutions of this sort obviously serve as the defendants in a disproportionate number of tort actions. While many other manufacturers do purchase insurance, their insurance arrangements often include significant deductibles, caps, and methods of experience rating and retrospective rating; similarly, motorists who buy insurance policies are subject to the insurer's merit rating practices. Furthermore, auto insurers, in determining their premiums, take such factors as the driver's age into account; in doing so, tort insurance raises the price of driving for categories of motorists who are most likely to drive negligently.

As far as the phenomenon of inadvertent negligence is concerned, I have long agreed with the idea that it is imperfectly deterrable. [FN37] It does *386 not follow, however, that this category of negligence is not deterrable at all. After all, most of us, appreciating that inadvertence can be disadvantageous, adopt habits or "scripts" that enable us to avoid inadvertence most of the time; [FN38] and the process of adopting scripts may be somewhat within the actor's control. [FN39] Manufacturing defects in products often result from inadvertent assembly-line

errors; yet most of those defects can be detected by manufacturers' programs of quality control. Furthermore, only a portion of the whole of tortious conduct can be classified as inadvertent. Drivers who take their eyes off the road may do so quite absent-mindedly; however, both speeding and drunk driving are frequently the consequences of the drivers' actual choices. Many instances of malpractice are "momentary slipups by doctors [and] nurses." [FN40] However, complying with the obligation of informed consent is generally the result of the doctor's deliberate practices. A roller skate in the front hallway as an invitee arrives may well be a consequence of a homeowner's inadvertence; but the failure to construct a fence around a swimming pool is a matter of the homeowner's considered choice. As far as limitations in knowledge or psychological perception are concerned, here too the analysis needs to be selective. Probably only a *387 small percentage of all apartment dwellers in California are aware of how Rowland v. Christian [FN41] affects their liability exposure; yet motorists who dangerously exceed the speed limit certainly can appreciate that they will bear liability if any accidents result. As far as psychological misperceptions of risk are concerned, the social science literature suggests that if individuals sometimes underestimate the likelihood of a bad result, on other occasions they typically overestimate that likelihood. [FN42] Whatever the problems posed by overestimation, it will not lead to any failure to adopt appropriate precautions. In any event, most of this literature concerns risk assessments by ordinary persons. Yet large institutions are the defendants in a major fraction of all tort actions, and they should be reasonably competent in acquiring and assessing information about their liability exposure.

II. PRELIMINARY ASSESSMENT

In considering what the implications are of the review conducted just above, it is helpful to separate out two distinct forms of the deterrence argument. In its strong form, the argument insists that tort law does indeed deter in the comprehensive, systematic way that economic models suggest. In its more moderate form the argument concedes that tort law does not deter comprehensively, yet still claims that tort practices provide some meaningful amount of deterrence.

My review of the objections identified by the realist critics has suggested that each of those objections has considerable strength. By making it difficult to believe that tort law can fully achieve its deterrence objectives, that review casts real doubt on the strong version of the deterrence argument. However, the review has also indicated that none of the objections is decisive: each of them has substantial force in some settings but little or no force in others. Accordingly, nothing in that review is inconsistent with the deterrence argument in its moderate version.

Distinguishing between the two forms of the argument (and the evidence relevant to each) seems essential. Yet that distinction is often ignored or misunderstood. Take the conclusions reached by various realistic critics. John Fleming, having recited a list of the realistic objections, concludes*388 that the deterrence actually provided by the tort system is "exceedingly marginal." [FN43] Stephen Sugarman, having discussed the realistic objections, concludes that it is "unlikely" that tort law provides anything by way of deterrence. [FN44] The realistic considerations relied on by Fleming and Sugarman may well justify the conclusion that the strong form of the deterrence argument is not tenable. But Fleming and Sugarman go on in essence to deny even the argument's more moderate version. They hence err in failing to recognize that factors which do impugn the argument's strong form can nevertheless be quite consistent with its moderate form. [FN45]

Another critic, Richard Abel, relies on realistic objections (such as the underenforcement of tort claims) as supporting his perception that tort law does not achieve "optimum safety," [FN46] that tort liability facilitates "suboptimal safety." [FN47] In general, Abel exhibits an attitude of disdain for deterrence as a rationale for the current tort system, [FN48] and conclu-

des that this rationale is all but worthless. [FN49] The problem here is that Abel, having *389 correctly perceived the inaccuracy of the deterrence rationale in its strong form, goes on to display an attitude and to reach a conclusion that would be justified only if the rationale's moderate version were also unsound. [FN50] Since Abel expresses the view that deterring accidents before-the-fact is much more important than compensating victims after-the-fact, [FN51] his unwillingness to appreciate the value of "sub-optimal safety" seems especially surprising. [FN52]

Turn now to what economists such as Landes and Posner say about the deterrence efficacy of tort liability rules. They consider the realistic criticisms of the "behavioral assumptions" underlying the economic analysis of torts, and they acknowledge that "there has been little systematic study of the deterrent effect of tort law." [FN53] Still, selectively citing a few studies, they indicate that "what empirical evidence there is indicates that tort law likewise deters" and that tort law is "far from totally inefficacious." [FN54] Their first assessment--that "tort law deters"-- adopts a dichotomous approach to the question of deterrence effectiveness that suppresses the distinction between the strong and moderate forms of the deterrence argument. Their second assessment--that tort law is "far from totally inefficacious" as a deterrence measure--may well be justified. This assessment adequately supports the moderate version of the deterrence rationale. Yet it is the rationale's strong form that is effectively taken for granted in all the complex analyses of parties' incentives that Landes and Posner advance. A similar problem affects William K. Jones' recent article on strict liability. [FN55] In proposing a considerable expansion of common-law strict liability for the sake of achieving efficient deterrence, Jones acknowledges the question of tort law's deterrence efficacy. Addressing this question only in a footnote, he dismisses it by noting that there is "substantial empirical evidence" showing that tort law does deter. [FN56] As it happens, the evidence relied on by Jones at best supports the weaker form of the deterrence argument. [FN57] *390 Yet it is that argument's strong version that Jones' own policy analysis essentially presupposes. [FN58]

III. REAL-WORLD EVIDENCE AND OBSERVATIONS

To be sure, exactly how much deterrence tort law provides is ultimately a question about the real world. Information is needed in order to find out whether tort law, in its various branches, achieves anything by way of deterrence. Information is also needed in order to ascertain whether the deterrence that tort law does afford is less than complete--below the level that economists would expect. The section that follows summarizes and comments on what evidence is available. Some of this evidence is empirical, or at least numerical. [FN59] Other information is merely reportorial, or a consequence of interviews. To be sure, evidence of this latter sort can be called "soft." It is relied on here because it is the best evidence available, [FN60] and because relying on such information is better than advancing *391 generalizations based on no information at all. [FN61] Because the factors bearing on the likelihood (or unlikelihood) of deterrence can vary considerably from one tort sector to another, the evidence below is presented on a sector-by-sector basis. [FN62]

A. Workers' Injuries

Workers' injuries were a major problem faced by the tort system at the turn-of-century. At about that time, a number of states passed employers' liability legislation, which expanded employer liability by modifying various affimative defenses. One study by Chelius found that these employer liability statutes reduced the work fatality rate. [FN63] In 1908 Congress passed the Federal Employers' Liability Act (FELA), [FN64] which broadened the liability of railroads as employers by abrogating the fellow-servant rule and replacing contributory negligence as a full defense with comparative negligence as a partial defense. A current study by Stole [FN65] finds that FELA was effective in significantly reducing the fatality rate for railroad workers; he credits FELA with saving as many as 32,000 lives over a seventy-two year

period. [FN66]
I recently served on a national committee that was considering whether railroad employees should be shifted from FELA to a workers' compensation program. [FN67] In the course of committee service, I interviewed the risk *392 managers of two major American railroads. These interviews convinced me that FELA--as compared to a possible alternative of no employer liability--has had the clear effect of encouraging significant safety efforts by railroads. For example, once hearing impairment problems began giving rise to significant numbers of FELA claims, railroads implemented a variety of hearing-protective measures. [FN68] A concern for liability clearly played a significant role in mobilizing the railroads to take action. [FN69]
In the 1910s many states switched from a negligence system to a workers' compensation regime, which incorporates a rule of strict liability and a practice of limited damages. [FN70] Chelius found that the shift from tort to workers' compensation significantly decreased the work fatality rate; [FN71] a later study by Fishback, largely limited to the coal-mining industry, found that the shift increased the accident rate. [FN72] In any event, workers' compensation, while hardly classifiable as tort, is certainly a system of liability, which provides a particular set of incentives for safety. [FN73] From an economic perspective, it is unclear whether a tort system or workers' compensation provides better incentives for workplace safety; in an odd way, then, neither study is out of line with the general idea that a properly designed set of liability rules can produce beneficial safety results. A recent study by Moore and Viscusi compared the work fatality rate in states before and after those states raised the level of workers' compensation benefits. Extrapolating from these data, the study inferred that workers' compensation (compared *393 to an alternative of no employer liability) reduces the workplace fatality rate by about thirty-three percent. [FN74]

B. Motorist Liability

In 1992, 40,300 Americans were killed in highway accidents, while 2,200,000 suffered disabling injuries. [FN75] It is an obvious fact that most of the accidents resulting in these deaths and injuries are immediately due to the negligence of auto drivers. To be sure, many drivers are injured in accidents in which the only negligence is their own; therefore, they are not the victims of consummated torts. But on an ex ante basis the negligence of the motorist that imperils himself typically imperils others on the road as well; hence this is negligence that the deterrence model for tort liability seeks to deter. [FN76]
Despite, then, an ample tort system, there is a very high volume of motorist negligence. It by no means follows, however, that the level of negligence would be no higher in the absence of tort liability. A 1972 study by Grayston [FN77] reached two empirical findings. First, higher premiums for auto liability insurance decrease the number of drivers, and hence the number of highway injuries and fatalities, most of which are of course due to motorist negligence. This finding suggests how a negligence liability rule interacts with liability insurance to produce a strict-liability-like effect *394 that regulates the decisions of actors to engage in dangerous activities. [FN78] Grayston's second finding is that the more state regulators permit practices such as class rating and merit rating, the lower the number of accidents and injuries. [FN79]
Recent California experience with teenage drivers seems to illustrate Grayston's second point. [FN80] In California in 1980, teenagers comprised seven percent of the driving population yet were involved in nearly seventeen percent of injury accidents. By 1990, the high cost of liability insurance for teenagers (combined with other factors) had reduced to five percent the percentage of all drivers who are teenagers; and in that year, only twelve percent of all accidents involved those drivers. During the 1980s, the overall number of auto injuries and fatalities in California declined; and this was due, at least in part, to the reduction in the number of teenage drivers. [FN81]
Auto no-fault plans adopted by American jurisdictions in the 1970s replace a portion of the

tort system with a no-fault arrangement. These plans might increase the amount of negligent driving in either of two ways: First, by reducing the tort liability of motorists who drive negligently; secondly, by guaranteeing compensation to motorists whose injuries are wholly due to their own negligence. A 1980 study of American no-fault by Elizabeth Landes found that strong no-fault programs increase the auto fatality rate within a state by "more than 10 percent!" [FN82] In the same year, a study by Medoff and Magaddino reached a similar result. [FN83] Of the two studies, Landes relied on a stronger methodology; yet even her methodology *395 has been subjected to serious criticism. [FN84] In any event, between 1985 and 1992 four studies found no increase in the accident or fatality rates in states that have adopted American no-fault; [FN85] the most impressive of these was conducted by Zador and Lund. [FN86] In 1994, however, an empirical study by Sloan and others found that no-fault plans that function so as to bar twenty-five percent of all tort claims have the effect of increasing the auto fatality rate by eighteen percent. [FN87]

Note, moreover, that American no-fault plans displace the tort system only in part. No-fault provides benefits only up to the point of the statutory "cap"; tort liability is preserved for economic losses above the "cap" and for pain-and-suffering damages in accidents whose severity exceeds the statutory "threshold." Auto no-fault in the Canadian province of Quebec is more categorical. It provides unlimited benefits for out-of-pocket losses, and entirely abrogates tort liability for personal injury. Quebec thus provides a more meaningful test than American states for assessing the consequences of the move from tort to no-fault. Before-and-after Quebec studies have been conducted by Gaudry [FN88] and Devlin. [FN89] Both find that the *396 Quebec no-fault plan increased the rate of auto fatalities and accidents. Gaudry's estimate is that fatal accidents went up by seven percent, while injury accidents soared by almost thirty-two percent. Devlin's estimate is that fatal accidents increased by about ten percent while injuries also went up by about ten percent. According to Gaudry, the increase in fatalities was due not so much to no-fault itself but rather to changes in the pricing practices of auto insurance (such as the elimination of higher rates for teenage drivers) that were introduced at the same time as no-fault, but which were (in his view) logically quite distinct from no-fault itself. According to Devlin, however, the increase in fatalities was partly due to the way in which no-fault, unlike tort, provides a guarantee of compensation to drivers injured by their own negligence. That increase was also due in part to changes in insurance practices--such as the elimination of experience rating--that (in her view) flow from the basic logic of a no-fault compensation program. [FN90]

In New Zealand, tort liability for all accidents, including highway accidents, was supplanted in 1974 by a national scheme of accident compensation. As Brown has shown, the number of auto fatalities in New Zealand actually declined after 1974. [FN91] Factors obviously contributing to this decline were the adoption of statutes requiring the wearing of seat belts and motorcycle helmets and the sharp reduction of driving due to the especially severe impact on New Zealand of the world oil crises in 1974 and 1979-80. [FN92] Given the strength of these various causes, Brown's study was unable to isolate the effect of the adoption of the no-fault plan. In 1979, the Northern Territory of Australia approved a Quebec-like auto no-fault plan. Two studies have tried to determine the effect of no-fault on the auto accident rate in both the Northern Territory and New Zealand. McEwin reports that no-fault increased the highway fatality rate by sixteen percent; *397 hence the tort system is "an important factor in promoting road safety." [FN93] Swan found a twenty percent increase in the auto fatality rate [FN94] on account of the adoption of no-fault. [FN95]

C. Medical Malpractice

How common is medical malpractice in America today? A 1988 study [FN96] looked at the medical records of 377 patients admitted to hospitals on account of three causes: heart attacks, strokes, and pneumonia. Of these patients, forty-eight percent died during hospitalization;

more than one-fourth of these deaths were probably caused by either errors in diagnosis or management. [FN97] A current study reviews the treatment of over one thousand patients within a single teaching hospital, and focuses on inculpating information disclosed by medical professionals at work rounds and clinical meetings. [FN98] This study finds that clear "errors" were made in the treatment of forty-four percent of the patients; because of these errors, about fourteen percent of all patients apparently suffered serious injury.
The most comprehensive study of the overall malpractice rate has been conducted by a team of Harvard scholars, performing a commissioned study *398 of the malpractice problem in New York state. This team conducted "an in-depth appraisal" of the medical records of 31,000 patients who were hospitalized in the state during 1984. [FN99] This study found that four of every 100 patients suffered unintended medical injury in the course of their hospitalization. Of these four, one was due to the negligence of the doctor or the hospital. [FN100] The New York study carefully selected its 31,000 patients so that they would be representative of all the patients hospitalized in New York during 1984; the study is therefore able to affirm that in 1984 about 25,000 patients in New York suffered medical injuries that were due to substandard care. [FN101] Insofar as the New York evidence can be extrapolated to the rest of the United States, 75,000 patients are killed each year by medical negligence and many other patients rendered permanently and totally or near totally disabled. [FN102]
Others have looked at particular categories of harms suffered by patients. One recent news article discusses patients who acquire infections on account of their hospitalizations. [FN103] These hospital-acquired infections apparently result in about 80,000 deaths per year. According to experts, almost one-third of these deaths could be prevented "if health care workers strictly followed infection-control procedures--from the appropriate use of technology such as ventilators to something as prosaic as the scrupulous scrubbing of hands." [FN104] An even more recent study looked at the drugs *399 prescribed for persons over the age of sixty-five. [FN105] The study identified twenty drugs which, according to both standard published sources and a consensus of medical analysts, should rarely be prescribed for the elderly, because of their potentially hazardous side effects. [FN106] During 1987, almost one quarter of the elderly persons studied were prescribed at least one of these inappropriate drugs. [FN107] This study underestimated the incidence of malpractice in prescribing drugs for the elderly, since it considered only drugs that should almost never be prescribed. It therefore excluded drugs that are prescribed in excessive doses, for an excessive duration, or with medication interaction problems. [FN108]
Despite the existence of an extensive malpractice liability system, malpractice seems to be committed quite frequently. This does not show, however, that the malpractice system is ineffective in lowering the malpractice rate. Leaving a surgical tool in a patient frequently leads to a malpractice action. According to one recent news article, "[t]o prevent such lawsuits and better protect patients, hospitals are prescribing a variety of new operating-room procedures, from computerizing the way they keep track of surgical tools to bearing down on doctors who seem overly eager to close up a patient before all tools have been accounted for." [FN109] About one-quarter of all hospitals have now installed computer systems in their operating rooms to assist nurses in keeping track of surgical instruments; and nurses themselves are now required by hospitals to count not only larger instruments, but also surgical needles. [FN110]
Tarasoff v. Regents of the University of California [FN111] is a 1976 California opinion that required therapists to warn potential victims (or adopt other reasonable precautions) if in the course of psychotherapy their patients express a serious, credible intent to harm those persons. According to *400 a study by Givelber and colleagues, [FN112] Tarasoff was effective in rendering psychiatrists and psychologists, especially in California, considerably more willing to notify potential victims and also public authorities when dealing with dangerous patients.
Helling v. Carey [FN113] is a 1974 Washington opinion that found malpractice as a matter of law whenever a doctor does not include a glaucoma pressure test within a routine eye exam.

Prior to Helling, many doctors did not provide this test to patients under the age of forty. A study by Wiley found that the level of routine glaucoma testing of patients under forty by ophthalmologists in Washington went up by a substantial percentage between 1973 and 1977. [FN114] But Wiley was reluctant to attribute more than a small fraction of this increase to Helling itself; his reluctance was due to his awareness that jurisdictions other than Washington also experienced an increase in the level of under-forty glaucoma testing. Still, the increase in Washington was about the largest of any state; [FN115] among the seventeen states looked at by Wiley, Washington went from thirteenth in 1973 (in terms of the frequency of routine glaucoma testing in eye exams for patients under forty) to fifth in 1977; and chronologically, the largest increase in Washington took place in the year after Helling was decided. [FN116] Moreover, as Givelber notes, Wiley may have underestimated the extent to which doctors in other jurisdictions could have reasonably believed that the Helling precedent increased the chance of a similar ruling in their own jurisdiction. [FN117]
A leading Canadian opinion that broadened doctors' obligation to give informed consent [FN118] has been reviewed by Robertson. His first article, based on data gathered two years after the court's opinion, [FN119] found that the opinion had resulted in fifteen percent of all surgeons spending more time discussing surgical risks with patients. Only twenty-six percent of all *401 surgeons had heard of the court's opinion; but of these, almost sixty percent had modified their practices. [FN120] Robertson's follow-up review of several years later concluded that the percentage of Canadian doctors who had expanded their informed consent activities in apparent response to legal doctrine had continued to increase. [FN121] Judicial holdings expanding the informed consent doctrine have yielded similar results in the United States. The Harvard study of the malpractice problem in New York included a survey of New York physicians. This survey showed that during the previous decade the threat of liability led almost seventy-eight percent of physicians to spend more time "explaining risks" to patients. [FN122]
What is unusual, however, about all the examples of malpractice discussed above is that each of them concerns a very specific obligation that the malpractice system imposes on doctors. One example involves a particular malpractice obligation that has been well recognized in practice: cases involving surgical tools left in patients are "almost sure-fire winners for plaintiffs." [FN123] The other three examples involve obligations laid down by recent and dramatic court rulings. Such specific malpractice obligations are, however, unusual. As a general matter, doctors face the prospect of liability merely insofar as they can anticipate that some expert witness will be willing to testify that they deviated from professional standards. Yet this general threat of liability clearly affects the behavior of doctors. The Harvard survey of New York physicians confirmed that the prospect of liability is one "factor" influencing the physician's "standards of care." [FN124] On a scale from 1 to 5, the physicians gave this factor a mean rating of 2.54. This was less than the highest factor--continuing medical education--which received a mean rating of 3.73, but more than external organized peer review, which received a mean rating of 1.78. [FN125] In the early 1980s both the rate of malpractice claims and the cost of malpractice insurance began to climb rapidly. Surveys of doctors in 1983, 1984, and 1989 showed that the perceived liability threat had induced large numbers *402 of them to spend more time with patients, to increase the number of follow-up visits, and to prescribe more tests and procedures. [FN126] Over the years, many obstetricians have responded to liability concerns by promptly adopting amniocentesis testing, by increasing their use of electronic fetal monitoring, and by more frequently performing caesarean sections. [FN127] All of these steps can be regarded as instances of "defensive medicine" prompted by the malpractice regime.
The difficult problem is to separate out appropriate defensive medicine (consisting of those intelligent precautions that tort law seeks to encourage) from inappropriate defensive medicine [FN128] (which seems a waste of resources). [FN129] My own sense is that the practice

changes induced by the malpractice system include a substantial measure of both. In the aggregate, then, these changes are beneficial to patients yet certainly costly. In addition, the threat of liability has clearly encouraged doctors and hospitals to do a better job in providing written documentation for the treatment of their *403 patients. [FN130] Much of this effort seems designed merely to strengthen the hospital's ability to defend against later malpractice claims. Given, however, the large number of harmful mistakes that happen within hospitals, [FN131] one can conclude that better documentation plays some role in reducing the rate of patient injury.

If the prospect of liability has influenced physicians' individual levels of care, the threat has also had certain effects on more general patterns of medical practice. For example, a number of general practitioners in rural areas have refused to deliver babies, imposing on their patients the inconvenience of seeking obstetric care in a distant metropolitan area. Yet the injuries to infants that result from inadequate methods of delivery can be exceptionally "costly", and there are obvious performance-quality benefits in the process of medical specialization. Accordingly, as Danzon suggests, this reassignment of patients may well be desirable. [FN132]

The threat of liability has also induced the adoption of certain risk- management programs by hospitals and professional groups. A recent study of these programs finds that they are "associated with a more positive malpractice claims experience" for hospitals. [FN133] This improved claims experience results in part from reducing the number of costly claims that flow from what may be a constant rate of malpractice. [FN134] But the improvement also seems to involve a reduction in the basic number of malpractice incidents. It likewise involves prompter intervention by hospitals that enables them to reduce the amount of the harm that results from some of these incidents.

*404 Injuries resulting from the administration of anesthetics frequently lead to malpractice claims. In the mid-1980s doctors at Harvard-affiliated hospitals studied anesthetic techniques and worked out a meticulous monitoring system that could help prevent injuries. [FN135] This effort was undertaken in large part as a response to the threat of liability. [FN136] These standards went into effect in those hospitals in mid-1985 and sharply reduced the rate of anesthetic-related accidents. [FN137] The Harvard effort prompted a review by the American Society of Anesthesiologists, which in turn promulgated guidelines for anesthesiologists in October 1986 [FN138] and again in January 1990. [FN139] These guidelines have proved so effective that many insurers have recently been able to reduce the malpractice premiums they charge anesthesiologists. [FN140]

The Harvard study of New York hospitals noted that rates of malpractice claims among the regions of the state varied by a factor as large as five. In an effort to discover whether a higher rate of claiming reduces the basic rate of malpractice, the Harvard team compared litigation levels in each of these regions to the underlying malpractice levels within that region's hospitals. [FN141] In his 1991 book, Paul Weiler, a member of the Harvard team, reported that a higher rate of malpractice claims had a "fairly modest" effect in the reduction of malpractice incidents. [FN142] In his 1993 co-authored book, Weiler, extrapolating from the Harvard data, concluded *405 that the rate of negligent patient injuries in New York was about thirty percent less than it would have been were there no liability for medical malpractice. [FN143]

In 1974, New Zealand, as part of its accident compensation plan, altogether repealed its system of malpractice liability. What limited information there is about the consequences of that repeal will be discussed below. [FN144]

D. Products Liability

Modern products liability doctrines are certainly expansive. Given those doctrines' coverage, are manufacturers often guilty of negligence in their design and distribution of products? Unfortunately, notwithstanding the incentives of the products liability system, there seems to be an ample supply of manufacturer negligence.

Asbestos companies are not discussed here, since most of their apparent misconduct took place before 1960, when the modern rules of products liability were still developing. Consider, however, manufacturers of products that have been designed and marketed since the early 1960s. Hundreds of appellate opinions have affirmed verdicts that have in essence found negligence on the part of manufacturers in either designing particular products or affording adequate product warnings. Admittedly, in most of these cases the underlying evidence was in conflict; even when a particular jury's resolution of such conflicts is legally acceptable, one cannot say with confidence that the jury has reached the accurate result. Still, given the large number of jury verdicts affirmed on appeal, it is certainly proper to assume that a significant percentage of these verdicts *406 have been accurate in their findings of manufacturer negligence. In one 1975 case, the manufacturer marketed a "Golfing Gizmo" designed for use by unskilled golfers in order to enable them to improve their games. [FN145] Yet given the Gizmo's design, the ball, when hit in a predictably unskillful way, could easily become entangled with the golf club and could then strike and seriously injure the golfer. This product's design was obviously inept. Moreover, the manufacturer not only failed to warn but actually attached a label to the product stating "COMPLETELY SAFE BALL WILL NOT HIT PLAYER." Not surprisingly, the California Supreme Court found liability as a matter of law under several different products liability theories.

Several examples of more extensive manufacturer negligence can be noted. The first example concerns the Dalkon Shield. The performance of the A.H. Robins Company in designing and marketing this contraceptive between 1970 and 1975 was deplorable. [FN146] Even with the benefits of a Chapter XI reorganization, Robins ended up paying $2.3 billion to the victims of its IUD.

A second example concerns Oraflex, an anti-arthritis drug produced by Eli Lilly. In the early 1980s, Lilly promoted this drug even though it knew of overseas deaths related to the drug. Fifty American deaths later, Lilly withdrew Oraflex from the American market; the company then pleaded guilty to federal statutory violations. [FN147]

A third example of manufacturer negligence is provided by the heart valve produced by Shiley Inc., now a subsidiary of Pfizer. Whether Shiley was negligent in originally designing its heart valve is unclear. However, once Shiley learned of the valve's design problem, it seems to have been guilty of serious negligence in failing to redesign its valves or at least warn the medical community of the design problem, which eventually resulted in over 300 deaths. [FN148] Moreover, there are credible claims that Shiley recycled *407 heart valves that it knew had been defectively manufactured. [FN149] In 1990 Pfizer settled a class action for $200 million. [FN150] Two years later, Pfizer agreed to pay the federal government $10.75 million in civil penalties, and an additional $9.25 million to cover the costs of providing medical monitoring for patients who received the device in Veterans Administration hospitals. [FN151]

A fourth example comes from a heart catheter produced by C.R. Bard Inc., one of the world's largest medical-device companies. [FN152] This heart catheter contained design deficiencies that resulted in at least one death and twenty-two emergency heart surgeries. The heart catheter was originally marketed in 1987. Two years later, the FDA initiated a product recall. In late 1993, the company pleaded guilty to almost 400 counts of fraud and unauthorized human experimentation. The charges involved (among other things) lying to the FDA about past instances in which the devices had failed. [FN153]

In all, then, despite the modern regime of products liability, a significant amount of manufacturer negligence continues to take place, even at the managerial level. [FN154] Would this amount be larger in the absence of that regime? A Rand study published in 1983 reported on interviews conducted*408 with nine large manufacturers. [FN155] This study's executive summary indicated that products liability "exerts a powerful influence on product design decisions"; [FN156] and the study's concluding chapter indicates that "of all the external social

pressures influencing product design decisions (including the market, and the threat of regulation), product liability seems to be the most fundamental." [FN157] Oddly, however, the text of the study imperfectly supports these appraisals. Rather, this text highlights the relevance of both regulation and reputation, and suggests that only one company of the nine was significantly influenced by products liability in improving the safety of product design. [FN158]
In 1987, Egon Zehnder, a well-regarded international consulting firm, interviewed by telephone "101 senior-level corporate executives, representing the largest publicly held companies in America." [FN159] Over half of these executives indicated that their companies had increased their R&D budgets devoted to product safety; likewise, over half indicated that their companies had added safety features to their products as a result of the threat of liability. [FN160]
In 1987 and 1988, the Conference Board conducted surveys of companies' responses to products liability. The first survey (which consisted of a written questionnaire sent to corporate risk managers) found that among 232 major corporations, about twenty-two percent had "[c]hanged manufacturing or operating procedures" on account of products liability, about thirty-two percent had "[i]mproved [the] safety design of a product," and *409 about thirty-seven percent had "[i]mproved [product] labeling." [FN161] The second survey, a written questionnaire sent to 2000 corporate CEOs (of whom only about 270 responded), broke its data down into corporate responses to "actual" liability experience and "anticipated" liability experience. [FN162] In response to "actual" experience, thirty-five percent of companies had "[i] mproved safety of products," thirty-three percent had "[r]edesigned product [[[s]," and forty-seven percent had improved product warnings. In response to "anticipated" liability experience, nineteen percent had "[i]mproved safety of products," thirteen percent had "[r]edesigned product[s]," and twenty-one percent had improved warnings. [FN163] As it happens, in light of the obvious problems of overwarning, [FN164] some of the "improved" warnings noted in the surveys may not have been genuine improvements. Still, it is fair to assume that many of the expanded warnings have provided consumers with useful safety information. Furthermore, there is little reason to be skeptical of manufacturers' statements that liability concerns improved the safety of their products' designs.
The Conference Board's first survey found not only significant safety improvements on account of products liability, but also that the negative effects of products liability were not substantial. [FN165] The second survey was apparently undertaken largely because the business community was dissatisfied with the earlier survey's slighting of negative effects. [FN166] This *410 later survey found that as a result of "actual" liability experience, thirty-six percent of responding firms had discontinued product lines and thirty percent had decided against introducing new products; in response to "anticipated" liability problems, eleven percent had discontinued product lines and nine percent had decided against introducing new products. [FN167] The Egon Zehnder interviews in 1987 had indicated that twenty percent of the relevant companies had foregone the introduction of particular products on account of products liability. [FN168]
The Conference Board regarded the non-introduction of new products and the discontinuation of current products as instances of "adverse impacts" of products liability. [FN169] Yet this evaluation seems initially odd. One of the very goals of products liability is to discourage the marketing of products that are excessively unsafe. To be sure, it can be argued that the products liability system malfunctions in ways that discourage the marketing even of products that are socially advantageous. I am quite willing to believe that such malfunctions occur. Yet even if so, whether the non-introduction of a new product or the withdrawal of an existing product is good or bad depends on an evaluation of that product.
To show the degree of variability, let me discuss several products. Certain consumer products whose chemicals created a risk of explosion have apparently been removed from the market; and one recent study regards this as a product liabiliity success story. [FN170] Bendectin is

the only drug that is apparently effective in treating nausea in pregnant women. Its manufacturer successfully defended against almost all cases alleging that Bendectin causes birth defects; nonetheless, the costs of mounting these defenses induced the manufacturer to withdraw Bendectin from the market. [FN171] *411 This withdrawal probably frustrated the public interest. [FN172] Concern for future liability led Monsanto to decide against marketing an insulation product that would have been a substitute for asbestos. Monsanto regarded the product as a very good one, and identified its own conservative unwillingness to introduce the product as its understandable response to the excesses of the products liability system. [FN173] Yet the EPA had identified the product as a possible carcinogen, and had suggested that the product might be especially dangerous when encountered by workers previously exposed to asbestos. [FN174] Given the evidence available, it is uncertain whether Monsanto's withdrawal of its product impeded or promoted the public interest.

A recent Brookings Institution volume brought together studies of the impact of products liability on the safety performance of several industries. The chapter by Craig on the general aviation industry found that the relevant evidence was quite slim; accordingly, Craig was unable to reach any conclusions about the relationship between products liability and improved safety in aircraft design. [FN175] Yet he also reported that because of successful lawsuits, the flight manuals prepared by manufacturers for pilots "grew in *412 sophistication and utility to pilots, helping them to fly more safely." [FN176] Graham's chapter on the auto industry found that tort liability has frequently been "a contributing factor in achieving safety improvements." [FN177] At the least, liability has accelerated safety: tort verdicts have led manufacturers to immediately implement design changes that probably would have been implemented at later dates for market reasons unrelated to liability. The chapter's case studies focused on the redesign of car models that were already on the road; it did not seek evidence on the process by which new auto models are themselves designed. [FN178] (One does learn that "[m]any companies these days rely on in-house legal help when developing new products.") [FN179] However, Graham developed a multivariate regression equation for auto fatalities over a thirty-eight year period, and was unable to find that products liability has been "a major beneficial factor" in affecting the safety of the activity of motoring. [FN180]

The chapter by Swazey on prescription drug companies reported that products liability has "helped to foster more accurate and timely information about prescription drugs, and thus by inference their safer use." [FN181] The chapter also indicated that "the sparse evidence available, which includes some case studies, does suggest that [products liability] . . . play[s] at least some role in enhancing the design-related safety of drugs"; [FN182] *413 later, the study referred to these design effects as "marginal." [FN183] A chapter by Ashford and Stone looked at the chemical industry and found that "the tort system--in many cases, in combination with regulation--has stimulated the development of safer products and processes." [FN184] This chapter, however, is thin in providing examples in support of its finding. [FN185]

E. Nonprofit and Governmental Agencies

The abolition of charitable and governmental immunity during the era of modern tort law has exposed charities and public agencies to a broad range of tort liability claims. As the cost of liability insurance began to soar in the mid-1970s, many of these non-profit and public institutions set up risk management programs. The responsibilities of a risk manager include arranging for insurance, administering the claims process, and promoting safety, for purposes of preventing those accidents that give rise to claims. I recently interviewed the Director of the Non-Profit Risk Management Center in order to find out what the effects have been of tort liability on non-profit institutions. [FN186] Many organizations that are "youth-serving," such as pre-schools and Big Brother, face the risk of liability for sexual abuse. Because of this, many of these organizations have become "proactive" in screening and supervising the adults who deal with their youthful clients. Indeed, the Center has prepared a three-inch binder on

programs that can be effective in preventing the sexual abuse of children. Non-profits also face an interestingly high risk of liability for vehicular accidents. This risk results from "occasional" drivers operating "difficult" vehicles such as vans. In significant part because of the liability exposure, organizations are now doing a much better job in both screening and training drivers.

I also spoke to several risk managers for public agencies in California. Most are members of the national Public Risk Management Association, which has its headquarters in Arlington, Virginia. A recent issue of the Association's monthly journal contains recommendations as to how to reduce *414 safety risks at public playgrounds, parks, and swimming pools. [FN187] From a Culver City risk manager, I learned that the City provides meter-readers for the City's public utilities with a checklist that they carry with them as they engage in their daily tasks. [FN188] They are expected to record any defects they observe on the City's streets and sidewalks. Once they turn in their lists to the City's risk management office, that office notifies the relevant city department of the need to make repairs; several months later, the office asks for a status report as to the completion of repairs.

Bus drivers in California are required by the state's Department of Motor Vehicles to undergo eight hours of in-service training each year as a condition for license renewal. The Santa Monica bus system has chosen to require ten hours of training rather than eight; moreover, the particular training program developed by Santa Monica places a special emphasis on safety. [FN189] The bus system also hires supervisors responsible for observing the quality of transit services in the field; these supervisors are instructed to be especially alert in noting unsafe practices. Information relating to safety also comes from passengers who complain about improper behavior by drivers. On account of these reports, the city is able to identify problem drivers, to give them counseling, and to have them "tailed" by the road supervisors to find out whether their performance improves. Furthermore, under guidelines established by the National Safety Council, the transit system hosts Sunday buffet luncheons as a reward for drivers with appropriate records of safe driving. Safety "pins" are bestowed in the course of these luncheons. Bus drivers seem impressively influenced by these rewards; they know the rules on eligibility "backwards and forwards."

The Medical Center at UCLA has been largely self-insured for many years. It has an active risk management office. [FN190] This office reviews troublesome events both to minimize the chance of a successful claim on account of that event and also to learn lessons for the prevention of events in the future. In one instance, the office was able to ascertain that a typographical error in a protocol for chemotherapy had led to the misprescription of a medication. The office was easily able to secure the correction of *415 that typo. In another instance, the office found that an error in filling a prescription was due to the fact that two drugs had similar names and were stored in similar-looking bottles. To eliminate the prospect of such errors in the future, the office arranged for the separation of the bottles and changes in their labels. The office also realized that visitors were slipping on metal plates lodged within the brickwork in the Medical Center's plaza. By arranging for the placement of emery sand strips on the metal plates, the office all but eliminated the danger.

The Los Angeles City Department of Transportation reports that "we do a lot of risk management." [FN191] The Department inspects street signs and traffic signals twice a year, to check for problems of vandalism, other damage, and shrubbery growth. [FN192] Moreover, whenever particular work is done at signalized intersections, additional time is spent reviewing the condition of traffic control devices. The state's Department of Transportation has jurisdiction over the Pacific Coast Highway (PCH), which runs along the ocean from Santa Monica to Malibu and beyond. As traffic increased during the 1970s, PCH became a very high-risk thoroughfare. Its "most notorious segment" was then at the McLure Tunnel, where the Santa Monica Freeway, coming in from the west, turns into PCH itself, which then heads north. [FN193] Just above the Tunnel, there are three lanes of traffic going north from the

Tunnel, and three lanes coming south. Over the years, the state Department was urged both by owners of property adjacent to PCH and by the City of Santa Monica to take steps to separate the northern and the southern lanes. In 1983, a jury returned a $2.1 million dollar award to the widow of a motorist who had died in a head-on crash in 1977. Experts at trial testified to a number of similar crashes during the year preceding this accident. Just days after this verdict, [FN194] the Department announced that it would build a 1200-foot median barricade to separate these traffic lanes. [FN195]

In talking with risk managers, I inquired into the extent to which safety efforts may have been motivated by the desire to do the right thing rather than by the desire to avoid tort liability. All of them emphasized *416 that their efforts were due to the combination of both. A risk manager starts with the idea that accident avoidance is good for its own sake. But the prospect of tort liability provides an important reinforcement as well as an essential way to sell the risk manager's proposals to others in the organization. [FN196] The Director of the Non-Profit Risk Management Center advised me that when he first arrived at his job he doubted the efficacy of tort liability; however, his experiences as Director have persuaded him that tort liability exerts a significant influence. [FN197]

F. Landowner Liability, and Miscellany

Modern tort rulings, creating an interesting new category of liability, have often held landlords and commercial establishments liable for failing to provide invitees and customers with reasonable security against the prospect of criminal attacks. [FN198] As a consequence of these rulings, landlords are now making considerable efforts to render their buildings crimeproof, or at least negligence-proof. [FN199] Landlords are hiring extra lobby personnel and security guards, improving lighting in parking lots and lobbies, and training doormen on proper visitor screening. [FN200] As far as fast-food companies are concerned, as a response to their own liability exposure almost every major company has hired a security director; and over a tenyear period these companies' budgets for security approximately doubled. [FN201]

Compare these modern tort rulings to more conventional tort doctrine. The doctrine of false imprisonment has long held retail stores liable when they behave unreasonably in restraining or detaining persons whom they suspect of shoplifting. I spoke recently with the risk manager for a southern California grocery store chain and his counterpart for a chain of *417 department stores. [FN202] Both risk managers were understandably unwilling to disclose the actual policies their companies have adopted for determining who and how to detain. Yet both were emphatic in acknowledging that the concern for liability was a dominant factor as their companies developed their own policies.

Since the nineteenth century, tort cases have held commercial landowners such as grocery stores liable on a negligence basis to customers who slip and fall while shopping. I recently interviewed the risk manager of a second major supermarket chain. [FN203] His office handles both claims administration and the development of safety programs. The office has established a program of hourly store-wide inspections for the chain. Part of this program requires the written recording of each inspection as it occurs. One goal is to document the inspection so that the company can defend itself against any subsequent claims. Another goal is to make sure that inspections get done--to instill discipline in the employees charged with inspection responsibilities. When the risk management office learns of products like fruits falling off shelves at particular stores, it often arranges for the provision of non-slip mats that can absorb the liquids that fruits exude. The office is now experimenting with store-wide "gritty" floor surfaces that are less conducive to customer falls. In addition, the office has arranged for carts filled with cleanup equipment to be easily accessible at all times; and it has made sure that warning signs get posted to advise against temporary hazards. The supermarket chain gives to each store manager an annual bonus, the amount of which depends on the individual store's profitability. By allocating liability costs to the store in which particular

liability incidents occur, the chain gives the store manager a significant incentive to reduce the number of those incidents. [FN204]
The risk-management director for this chain made it clear that his office's efforts were due to the combined goals of good customer relations and the reduction in liability exposure; when asked whether his chain would be doing less for safety in the absence of liability, his answer was *418 "almost certainly." When his office seeks management approval of a new but somewhat costly safety initiative, management often sees customer goodwill as too uncertain a benefit to justify approval. But when the office can show management that a recent instance of tort liability could have been averted had the proposal been in effect, approval is usually forthcoming.
An additional miscellany of liability problems--most of which can be called either landowner or commercial--will be dealt with here. In many states, dram shop rules expose to liability bars that serve drinks to intoxicated patrons. Two recent studies have found that the presence of dram shop liability is statistically significant in reducing the auto fatality rate; [FN205] indeed, according to one of the studies, this liability saves between 800 and 4000 lives per year. [FN206] Also, on college campuses, many fraternities seem to have cleaned up their acts in recent years on account of lawsuits alleging unreasonable dangers in fraternity hazing and drunken fraternity brawls. [FN207] A new entity, the Fraternity Insurance Purchasing Group, was formed in 1987 both to coordinate the purchase of liability insurance and to develop comprehensive plans for risk management; many national fraternities have now hired their own risk manager with high executive rank and broad authority to assure local chapters' compliance with the new national standards. [FN208]
Tort law applies to dangers more disturbing than fraternity events. Chemical firms in America, report Ashford and Stone, dramatically improved their storage of hazardous chemicals after the disaster at Bhopal. [FN209] Companies did so both because of their concern for "massive tort liability" and because of regulatory activities which themselves were partly a response to Bhopal. [FN210] Indeed, the prospect of liability and the reality of new regulations were synergistic. These regulations required companies to report what *419 hazardous materials they were storing at particular sites; and the publication of this information enhanced the companies' own sense of their liability exposure. [FN211]
Domino's Pizza has been well known for its promise to provide home-delivery within thirty minutes after the placement of an order. This promise may well have had the effect of encouraging some of Domino's deliverers to drive negligently. In December 1993, a St. Louis jury returned a $78 million award for compensatory and punitive damages against Domino's, in a suit resulting from a 1989 two-car collision. After the verdict, the company announced that it was withdrawing its thirty-minute guarantee; [FN212] in doing so, the company acknowledged that the verdict had influenced its decision. [FN213] Certainly the jury's verdict was legally acceptable, at least on the issue of compensatory damages; and Domino's change in policy is probably good news for safety purposes. Moreover, having learned from the media coverage of the St. Louis case of Domino's claims that it tries to promote safe driving, I have inquired into the basis for those claims. [FN214] Standards adopted by Domino's require that all drivers have at least two years of driving experience; those standards also establish criteria, based on moving violations and at-fault accidents, that can disqualify drivers from Domino's employment. [FN215] Also, before persons begin driving for Domino's, they must successfully complete a four-hour safe driving program prepared specifically for Domino's by a team of professorial consultants and presented at various locations by Domino's certified instructors. A company official indicates that a primary reason for these various standards and practices is to promote the goodwill of Domino's within the neighborhoods *420 it serves; but a concern for the avoidance of liability also played a significant role in their adoption. [FN216]

In 1974, New Zealand abolished its tort system and replaced it with a compensation program for all personal injuries. This provides a variety of opportunities for reviewing what happens in the absence of tort liability. [FN217] Begin with the problem of medical injuries. Patricia Danzon, having visited New Zealand, reports that "informed observers believe that the elimination of liability has led to laxer standards of medical care." [FN218] Margaret Vennell is a legal academic in New Zealand who also served for many years as a generally supportive administrator of the New Zealand program. [FN219] Still, at a 1992 conference, she described violations of the norm of informed consent by New Zealand doctors. [FN220] On a number of occasions, patients have been placed by their doctors in experimental drug regimens without their knowledge or approval. In another situation, many women with a pre-cancerous cervical condition were given over a ten year period what amounted to placebos, so that their doctors could test the effectiveness of the treatments they were providing to their other patients. Vennell regards such departures from the informed consent norm as undesirable, and she assumes they would not have happened in a jurisdiction with a tort system that includes a meaningful doctrine of informed consent.

Consider now personal injuries in New Zealand in general. Richard Miller, a torts professor from the University of Hawaii, recently spent several months in New Zealand studying its accident compensation program. His observation was that "disgracefully hazardous conditions [are] endemic *421 to that beautiful nation." [FN221] These conditions included an absence of helmets or padding for rugby players; "unfenced and unguarded hazards in busy downtown sidewalks," "debris from demolished buildings . . . spilling onto adjacent sidewalks while children climbed on the rubble . . . ; [and] cranes lifting heavy objects directly over the heads of pedestrians and above moving automobile traffic." [FN222] Moreover, newspaper reports Miller encountered in New Zealand described serious construction hazards, a deterioration in the attitude of drivers, fire hazards in high rises, a very high rate of motorcyclist deaths, and other serious safety problems. [FN223] Admittedly, Miller's article acknowledges that he is not venturing a before-and-after comparison. He is aware that the tort system in effect in New Zealand before 1974 "was in fact fairly ineffectual as a deterrent to accidents" [FN224] and that practices in New Zealand have long been neglectful of safety. His point is therefore a speculative one: dangerous conditions are rampant in New Zealand that one would not expect to find in a country with an American-like tort system.

Vennell's 1992 conference presentation, though praising the administrative efficiency of the New Zealand program, indicated that in New Zealand "people fear that there is a lack of any deterrent element." [FN225] Though her concern for deterrence was largely abstract, she did identify particular problems. [FN226] For example, she described a New Zealand statute requiring homeowners with swimming pools to fence the area around the pool in order to provide protection to neighborhood children. Yet public enforcement of this regulation is quite weak, and Vennell reported that the regulation is being blatantly ignored by many homeowners. [FN227] She suggested *422 that the absence of any prospect of tort liability contributes to this widespread neglect.

IV. APPRAISALS AND IMPLICATIONS

Before proceeding on to ascertain what conclusions are warranted, let me recap the steps this Article has already taken. Part I identified the various objections that realistic critics have advanced in casting doubt on tort law's deterrence efficacy. In subjecting these objections to a preliminary review, Part II found that each of them has considerable strength, though none seems devastating. In line with these evaluations, Part II regarded the strong version of the deterrence argument as unlikely, yet also found plausible the argument in its more moderate form. Part III then reviewed, on a sector-by-sector basis, what information is available concerning the actual deterrence efficacy of tort liability rules. At least in the sectors of auto liability, physician liability, and manufacturer liability, Part III presented evidence that undermi-

nes the argument's strong form. There is a huge amount of motorist negligence and medical negligence, and an ample amount of manufacturer negligence, even at the managerial level. As for other sectors of tort law, there is at least an absence of evidence that might confirm the argument. No sector of tort law can be identified in which the prospect of liability has successfully reduced down to zero, or almost zero, the rate of negligent conduct. This absence of evidence is itself conspicuous. Especially given the dramatic expansion of tort liability since 1960, were the strong version of the deterrence argument sound, one would expect to find an outpouring of reports disclosing tort law's dramatic deterrence successes. [FN228]
*423 Yet however untenable the strong version may be, sector by sector the available information provides adequate support for the argument in its more moderate form. Whether one considers the effect of FELA on railroad conduct, the effect of liability insurance on the number of teen-age drivers, the effect of categorical auto no-fault programs on highway accident rates in several countries, the effect of malpractice liability on particular forms of malpractice (for example, leaving sponges in patients) and on the overall rate of malpractice in states like New York, the effect of products liability on manufacturers' willingness to improve product design, and the effect of liability on the risk management efforts of public agencies, non-profit agencies, and commercial landowners, there is evidence persuasively showing that tort law achieves something significant in encouraging safety.
In short, the relevant information tends to confirm the moderate form of the deterrence argument but not the stronger version. Yet it is the latter that is essentially taken for granted in the overwhelming majority of all torts-and-economics articles. [FN229] These articles assume, at least implicitly, a one-to-one relationship between the incentives afforded by tort liability rules and the resulting conduct of real-world actors. Indeed, in their books, Shavell and Landes and Posner are explicit in appreciating that their basic economic models imply that the rule of negligence liability will always lead parties to avoid negligent conduct. Landes and Posner are hence led to ask, "Why are there any negligence cases?" [FN230] Shavell identifies a similar question. [FN231] Having posed such a question, each book endeavors to explain why there is "a positive number of negligence cases." [FN232] Yet their books *424 suggest that the amount of negligence, while "positive," is not especially large. This suggestion is conveyed partly through the rhetoric the books employ in describing actual negligence, and also by the way in which the books isolate the problem of negligent conduct from the rest of their expositions. Shavell spends a page on the problem, Landes and Posner a page-and-a-half; before and after these passages, their books largely ignore the problem, making very little effort to integrate it into their collection of proofs. [FN233] Consider, for example, the phenomenon of inattentiveness, which both books identify as one explanation for unreasonable conduct. If this phenomenon exists, it might well occur with special frequency in the setting of the contributory negligence of victims. [FN234] Yet the books' elaborate discussions of proper rules of contributory negligence leave out this factor altogether. [FN235]
To be sure, in writing full books about the economic analysis of tort law, Shavell and Landes and Posner demonstrate some concern for how well the positions they take are supported by empirical evidence. [FN236] *425 Landes and Posner briefly consider the realistic criticisms of the "behavioral assumptions" underlying the economic analysis of torts. [FN237] They observe that "what empirical evidence there is indicates that tort law . . . deters" and that tort law is "far from totally inefficacious." [FN238] As noted above, [FN239] this first observation is dichotomous in a way that ignores the distinction between the strong and moderate versions of the deterrence argument. The second observation, while clearly justified, provides support only for the argument in its moderate form.
Shavell's book, in its concluding chapter, identifies the question "does tort law really deter?" and then turns to a related question as to the "level of detail" of liability rules that his economic analysis undertakes to provide. [FN240] In considering the "does it really deter" question, Shavell acknowledges "the relative lack of statistical study," but still responds to the realists'

critique in ways that in essence provide some support for the argument's moderate version. From this, Shavell quite properly concludes that "there is ample reason for theoretical study of the effect of liability on behavior." [FN241] Going on, then, to the "concern" for the "level of detail" that the economic analysis commonly provides, Shavell sets forth his primary "reaction": that "it is intellectually unsatisfactory not to provide complete answers to questions." [FN242]

The modest position Shavell takes seems both sensible and revealing. What it reveals can be elaborated on. As noted, much of the "level of detail" in the modern economic analysis assumes a one-to-one relationship between tort liability incentives and resulting real-world conduct. Given this assumption, economists can proceed ahead with the project of fine-tuning liability rules to achieve the exact result of optimal deterrence. Yet the evidence, by denying the strong form of the deterrence argument, indicates *426 that such fine-tuning is unlikely in fact to affect actors' conduct. [FN243] Instead, what justifies, at least initially, the "level of detail" in much of the modern economic analysis--all the efforts at fine-tuning liability rules--is the economist's own sense of intellectual satisfaction. This is the satisfaction-- indeed, the excitement--that can come along with the development and presentation of an ingenious economic proof.

Much of the modern economic analysis, then, is a worthwhile endeavor because it provides a stimulating intellectual exercise rather than because it reveals the impact of liability rules on the conduct of real-world actors. Consider, then, those public-policy analysts who, for whatever reason, do not secure enjoyment from a sophisticated economic proof--who care about the economic analysis only because it might show how tort liability rules can actually improve levels of safety in society. These analysts would be largely warranted in ignoring those portions of the law-and-economics literature that aim at fine-tuning.

Yet in disparaging here the social significance of fine-tuning, I should make clear that fine-tuning need not be equated with the "high-tech" side of law-and-economics that relies on formal mathematical models. In 1982, Shavell published an article on the economics of liability insurance. [FN244] This article develops the idea that parties, facing a rule of liability, will choose to abstain from negligent conduct rather than bear the cost of purchasing a liability insurance policy. Thus there will be no liability insurance for negligence liability, and for that matter almost no negligent conduct. Shavell's article presents his argument in a highly technical way that renders the argument all but inaccessible to the lay reader. Moreover, insofar as the article makes a claim about the real world, that claim seems plainly false: there are ample numbers of insurance policies in society that primarily cover the risk of negligence liability. Only rarely, for example, do physicians choose to "go bare." Furthermore, in considering the inaccuracy of Shavell's factual claim, the reader is led to appreciate artificialities in the conventional economic conception of negligence on which Shavell relies. [FN245] Yet even taking all these reservations into account, the reader can *427 still realize that Shavell is advancing a major rather than a minor claim; and the reader can likewise realize that while the claim itself is obviously excessive, Shavell's analysis at least succeeds in identifying a tendency at work in a variety of real-world circumstances. The move towards "self-insurance" by many institutions can quite plausibly be seen as embodying their recognition that it is cheaper to self-insure and launch programs of risk-management than to absorb the full cost of liability insurance. [FN246] While Shavell's treatment of liability insurance might be called high-tech, it does not entail the kind of fine-tuning that is unlikely to make a difference in the real world. [FN247]

In further assessing the societal relevance of technical law-and-economics, one can ponder the enterprise of modern mathematics. Much of "pure" mathematics receives its immediate justification from the aesthetics of formal mathematical proofs. [FN248] Moreover, while pure mathematics may be an activity immediately undertaken for its own intrinsic sake, as a quite foreseeable by-product pure mathematics typically yields over time some number of ideas that

are quite important in terms of societal applications. What has been said here of pure mathematics can be extended to modern economics: much of the scholarly enterprise seems driven by the intrinsic drama of the analytic quest. [FN249] Yet even when acknowledging this, the observer can still appreciate that some non-trivial fraction of all theoretical economic writings will provide the real world with significant payoffs.

*428 In this regard, consider law-and-economics articles from the mid-1980s by Calfee and Craswell [FN250] and by Grady, [FN251] each of which deals with the effects of the uncertainty in findings of negligence on the conduct of parties subject to the negligence standard. Both articles engage in a stylized economic analysis, which assumes that actors are exceedingly proficient--"rational"--in assessing all the ways in which this uncertainty affects their own liability exposure. Similarly, the articles are primarily rationalistic in their identification of the sources of uncertainty in the legal system's rendering of findings on the negligence issue. [FN252] Yet even if the articles in these ways may be inadequately realistic, they do draw attention to two very important practical points: determinations of negligence are often quite uncertain, and this uncertainty can produce quite significant effects on the parties' conduct. These points provide, for example, at least part of the explanation why doctors seem frequently to practice excessively defensive medicine. [FN253]

Approving the moderate version of the deterrence argument while disapproving the strong version thus permits an assessment of the social significance of the body of economic-analysis scholarship. Also, this intermediate verdict, by suggesting that the realistic objections have more force in some contexts than in others, enables readers to appreciate that economic reasoning--if it cares about social impacts--should learn to be somewhat selective in the problems it addresses. In an earlier article, I looked at defenses such as contributory and comparative negligence. [FN254] Relying on *429 several factors, such as the inattentiveness of much of the conduct that the law calls contributory negligence, I criticized the economists' conventional treatment of contributory negligence defenses. Indeed, the article has sometimes been read as claiming that such defenses have no impact on the conduct of victims. Yet I acknowledged that "it would be groundless to contend that a contributory negligence rule can have no effect on [victim] conduct." [FN255] My point was that "there is good reason to conclude that this effect is partial and erratic." [FN256] In line with this assessment, assume that the impact of rules of negligence liability on the conduct of potential defendants is twenty-five percent greater than the impact of rules of contributory negligence on the conduct of potential victims. In considering the deterrence wisdom of various alternative rules of contributory and comparative negligence, this twenty-five percent differential in real-world effectiveness almost certainly subordinates most of the other variables that economists have identified in their discussions of the contributory negligence problem. [FN257]

Moreover, if one can be selective in distinguishing between defendants and plaintiffs, one can be even more selective in distinguishing between various kinds of plaintiffs. Consider the farmer who stacks crops close to the railroad tracks, thereby exposing those crops to the risk of being set afire by railroad-engine sparks. This farmer, whether an individual or a firm, is faced with a continuing choice as to the appropriate method of operations. One of the choices entails over time a very high probability of harm; moreover, this is harm which, when it occurs, will predictably give rise to a lawsuit. Consider next the pedestrian whose careless conduct on one occasion exposes him to a risk of injury on a highway, or on railroad tracks. It might well be unrealistic to believe that this pedestrian's behavior would be significantly affected by doctrines of contributory negligence. Even so, it is very plausible to assume that the conduct of the farmer would be influenced by liability rules. Scholars such as Coase [FN258] and Grady [FN259] *430 have thus been quite shrewd in utilizing the railroad-farmer problem as a vehicle for exploring complex issues of contributory negligence.

The observations above have suggested the futility of endeavoring to fine-tune liability rules in order to achieve perfect deterrence. Accordingly, regimes of liability that avoid efforts at

fine-tuning begin to look more desirable. Consider, for example, workers' compensation, which renders the employer liable for most of the economic costs of on-the-job accidents while leaving liability on the employee for the accidents' non-monetary costs. Analyzed in incentive terms, this regime of "shared strict liability" [FN260] takes for granted that there are many steps that employers can take, and also many things that employees can do, to reduce the work accident rate. Yet workers' compensation disavows its ability to manipulate liability rules so as to achieve in each case the precisely efficient result in terms of primary behavior; it accepts as adequate the notion that if the law imposes a significant portion of the accident loss on each set of parties, those parties will have reasonably strong incentives to take many of the steps that might be successful in reducing accident risks. If efforts at finetuning are likely to be unsuccessful, the division of liability affected by workers' compensation, while undeniably crude, is not for that reason undesirable. Rather, this crude division of liability may achieve about as much by way of deterrence as any other liability regime. [FN261]

V. HOW MUCH DETERRENCE DOES TORT NEED?

Part III of this Article endorsed the moderate version of the deterrence argument while finding inaccurate the argument's strong version. Part IV then considered what these evaluations mean in terms of how economic analyses of tort law should be both conducted and interpreted. An additional question raised by this pair of evaluations is important enough to deserve a Part of its own. Whatever its deterrence capacity, tort law certainly imposes a variety of important costs on society and its members. *431 Despite all these costs, were the argument's strong version sound it would be clear enough that tort law is both efficient and in the public interest. Yet if all one can say of the tort system is that it is of some value as a deterrence measure, one needs to consider whether its deterrent achievements are substantial enough to provide the system with a sufficient justification.

To be sure, public opinion might be dissatisfied with this method of framing the issue. Public opinion frequently supports the view that life is of infinite worth, [FN262] that safety is a value that is "hierarchically incommensurable to" or "lexically superior to" economic considerations relating to safety expenditures. [FN263] If these views are sound, then despite its substantial costs the tort system is eminently justifiable, since it certainly saves some number of lives. A different yet somewhat related view can be found in English judicial opinions dealing with tort liability for personal injury. These opinions often take the position that death and injury should always be prevented unless it is quite clear that the costs of prevention are significantly disproportionate to the safety benefits that can be achieved. [FN264] If this position is sound, then again the tort system seems proper: whatever the costs of tort, it cannot be deemed obvious that they overwhelm the safety benefits that the system affords. [FN265]

Most scholars and public-policy analysts, however, are inclined to a more pragmatic approach. Their assumption is that all the advantages of a social or legal practice should exceed all its disadvantages, and that the advantage of safety does not enjoy a categorical priority over various forms of social disadvantage. While aligning myself with this approach, I still want to respect public opinion at least by making an effort to avoid any underestimation of the value of the lives and limbs that tort law is able to protect.

The question of the balance between the safety benefits of the tort regime and its social disadvantages thus seems central. One scholar who has addressed the question is John Donohue. In 1988 he turned to data compiled for the Rand Corporation by Kakalik and Pace to identify the *432 annual overhead of the system of tort litigation at $16 billion to $19 billion in the mid-1980s. [FN266] He then relied on National Safety Council data to identify the annual costs of all accidental personal injuries at $133 billion. [FN267] Donohue hence implied that tort law would need to lower the accident rate by twelve to fifteen percent merely to justify its litigation overhead.

Donohue certainly structured an appropriate inquiry and began to gather the relevant eviden-

ce. Yet his data are not satisfactory. An impressive study completed by Rand shortly after Donohue's effort estimated the economic costs of personal injuries at $176 billion, a figure sharply higher than the National Safety Council estimate on which Donohue relied. [FN268] Moreover, the "true" cost of accidents includes not only economic costs but also non-monetary costs such as pain and suffering and lost enjoyments. Verdicts in tort cases indicate that juries typically evaluate these costs as being at least equal to the victim's compensable out-of-pocket losses. [FN269] *433 Though individual jury verdicts sometimes seem too high to me, my goal of avoiding underestimation of the seriousness of injuries leads me to accept the aggregate of those verdicts as an appropriate indication of community values and valuations. Accordingly, $176 billion can be added to the running accident-cost total. Moreover, while the Rand calculations take full account of injury accidents, they omit fatal accidents. [FN270] Factoring in the annual number of accident fatalities [FN271] along with a reasonably conservative assessment of the value of life [FN272] contributes an additional $190 billion to the overall estimate. Furthermore, the Kakalik-Pace tort-overhead figure relied on by Donohue explicitly includes the overhead of both auto accident litigation and medical malpractice litigation. [FN273] Yet the Rand calculation of the costs of injuries includes neither auto accident property damage nor those harms produced by medical treatments. [FN274] Given what is known about both motor-vehicle property damage [FN275] and the consequences of medical injuries, [FN276] the accident cost estimate can be adjusted upwards so as to reach a total of over $690 billion.
Donohue's estimate of the overhead of the tort system also needs revision. His $16-19 billion number is too high in one sense, since it includes the cost of litigating those products liability claims that deal with problems of disease rather than injury. Because diseases are not included in Donohue's estimate of the cost of accidents, the overhead affiliated with disease litigation should likewise not be taken into account; moreover, in an era of asbestos litigation, this overhead is certainly substantial. But Donohue's overhead figure is in another way much too low. The Kakalik-Pace study calculates only the overhead of tort "litigation," in the sense of lawsuits filed. [FN277] It does not consider the overhead cost of resolving formal or informal "claims" that do not reach the point of actual lawsuits. Yet Kakalik and Pace make clear that the compensation afforded in resolving pre-lawsuit *434 claims is quite substantial. [FN278] Though such claims should consume much less overhead than formal lawsuits, [FN279] the relevant overhead is certainly considerable. On balance, the annual cost of resolving all personal injury and auto damage claims might well be $25 billion. If so, then the minimum reduction in overall injuries and auto property damage that the tort system would need to achieve in order to justify its overhead costs would be less than four percent.
Posing the issue in this way is certainly intriguing: a requirement of a mere four percent reduction seems surprisingly modest. Still, in considering the issue one can appreciate that a large number of accidents do not result from the tortious conduct of any third party. [FN280] More generally, it is obviously perplexing to attempt to size up, even in an intuitive way, the universe of all accidents. A topic as broad as this is bound to baffle analysis.
To narrow the topic and hence facilitate analysis, we can move from the universe of all accidents to the particular sector of highway accidents; this certainly represents one important field of tort liability. The auto liability system, at least in Canada, has been conducive to one recent study of tort law's cost-effectiveness. According to the Devlin review of Quebec, the move from tort to complete no-fault increased auto fatality and personal injury rates by about ten percent, and also increased the property damage rate. [FN281] Given the dollar values that Devlin assigns to death, personal injury, and property damage, [FN282] she concludes that no-fault raised auto accident costs in Quebec by $247 million per year. [FN283] She then compares these added costs to the social benefits provided by the switch from tort to *435 no-fault. The chief benefit considered is the administrative savings produced by the switch. Auto insurance premiums before the change from a negligence system to a no-fault system totalled

about $400 million annually. No-fault eliminated the insurer's need to investigate and litigate the issue of motorist negligence. According to Devlin's calculations, this and other features of the new no-fault regime reduced the cost of supplying insurance by twenty-four percent. [FN284] Because twenty-four percent of $400 million is $96 million, a figure much below $247 million, Devlin concludes that the shift away from tort was "clearly an inefficient move." [FN285] Here it can again be observed that almost all auto accidents are immediately due to motorist (or pedestrian) negligence--negligence that would be all but eliminated if the incentives afforded by the tort system were working perfectly. [FN286] Yet Devlin's analysis affirms that the tort system justifies its overhead even though it succeeds in reducing the accident and fatality rates by only ten percent.

To be sure, Devlin's analysis is burdened by a number of problems. One problem is that even though the shift from tort to no-fault reduces the fees that accident victims need to pay their lawyers, Devlin chooses not to count this as a cost saving. [FN287] Moreover, Devlin's conclusion as to the desirability of the tort system for auto accidents relates only to tort in comparison to the particular alternative of auto no-fault. Were she instead to compare the tort regime to the alternative of simply repealing that regime, her calculations would need to take a different form. In the margin, I offer certain guesses as to what these revised calculations would look like. [FN288] *436 My guesses are concededly rough; yet, if they are roughly correct then the increase in overall accident costs resulting from a direct repeal of tort liability would exceed the substantial savings in system overhead such a repeal would achieve.

My text so far, looking first at all accidents and then at auto accidents, has compared the safety benefits of the tort system to the system's costs. It should be noted, however, that these comparisons have been incomplete. One possible benefit, ignored up until now, will be discussed below. [FN289] On the cost side, the comparisons have considered only the immediate costs of tort liability--the litigation overhead. Yet a fuller assessment also needs to take into account the costs of all the behavioral changes that tort law brings about. [FN290] Clearly these costs are relevant to any assessment of auto accident law. It may be good for society that a driver, fearing liability, decides not to speed; even so, the driver incurs a loss of time. For that matter, the teen-age driver kept off the road by the high cost of tort liability insurance obviously suffers a significant loss of mobility and independence.

What is true of auto liability is also true of other sectors of tort liability: any cost-benefit reckoning needs to include the burdens parties bear in seeking to avoid liability. If the threat of tort liability has indeed resulted in the improved design of many products, [FN291] and if that threat did lead the California Department of Transportation to install a median strip in the Pacific Coast Highway, [FN292] the monetary costs of these improvements need to be taken into account. The prospect of malpractice suits has evidently induced doctors to increase the number of X-rays they take. Some of these additional X-rays may be appropriate precautions, others may be examples of excessive defensive medicine. Yet whenever the X-rays are "caused" by the prospect of malpractice liability, their cost must be reckoned with in considering whether the malpractice system makes adequate social sense.

Yet having acknowledged the general relevance of compliance burdens, one can report the bad news that for most tort sectors the data bearing *437 on these burdens have not been collected so far, and as a practical matter probably cannot be collected at all. Even so, consider one important tort sector: medical malpractice. As it happens, evidence is available--for 1984--on the costs that doctors incur in modifying their conduct so as to avoid the risk of liability. Fortuitously, on account of the Harvard study, estimates are also available--also for 1984--on the magnitude of the safety gains that malpractice law occasions. Moreover, industry sources can provide information on the cost of malpractice insurance for 1984. Given this fortunate combination of data, the 1984 version of the malpractice system permits one case study of the cost-justifiability of tort law.

As for malpractice insurance, its cost for doctors and hospitals in 1984 was $2.22 billion.

[FN293] Self-insurance by hospitals probably added an additional $.55 billion; [FN294] the time physicians spend assisting their insurers in defending against claims, another $.1 billion. [FN295] The total flow of resources into the malpractice system, then, was about $2.87 billion. The conventional understanding is that the malpractice claims process consumes about sixty percent of this inflow in overhead, yielding forty percent in net compensation for accident victims. [FN296] Hence the system's overhead cost in 1984 was about $1.72 billion. As for the overall costs of all changes in medical practices induced by malpractice liability, a leading estimate comes from an article by Reynolds and others, which focuses on 1984. [FN297] This article relied on two methodologies: one led to a cost estimate for practice changes of $10.6 billion, [FN298] while the other produced what the authors deemed a "lower-bound estimate" *438 of $5.4 billion and a "more reasonable" estimate of $9.1 billion. [FN299] This study's estimates of the cost of defensive medicine have often been regarded as the best available. Yet its methodology can be questioned, and most of the relevant questions suggest that its estimates are too high. [FN300] Still, to avoid underestimating the costs of malpractice, it seems prudent to ignore the lower-bound figure and average the other two, yielding a cost of physician practice changes in 1984 of $9.85 billion. One limitation in the Reynolds study was that it looked at the practice changes implemented by physicians, but not hospitals. [FN301] Assume here that physicians are the primary source of such precautions and that the cost of the precautions adopted by hospitals in 1984 was hence about $3.3 billion. [FN302] Combining $9.85 billion and $3.3 billion with the $1.72 billion figure previously provided for system overhead produces an overall cost of about $15 billion for the malpractice system in 1984. [FN303]

With this estimate in mind, we can turn to the Harvard data in order to assess the safety advantages of the malpractice system in 1984. Begin with the Harvard calculation of the gross economic costs of medical injuries. [FN304] Next take into account the non-pecuniary costs of these injuries, such as pain and suffering and lost life enjoyments; the injuries in question of course include fatal injuries, which obviously eliminate all future life *439 enjoyments. [FN305] Acknowledge also a significant number of medical injuries that undoubtedly eluded the attention of the Harvard study. [FN306] Then extrapolate from New York to the rest of the nation. [FN307] This yields an overall cost of medical injuries in 1984 that is now about $130 billion.

Observe now the Harvard finding that in 1984 the malpractice system reduced the number of medical injuries by eleven percent (and the number of negligent injuries by twenty-nine percent). [FN308] This eleven percent finding is equivalent to a finding that without the malpractice system the number of injuries would have increased by twelve percent. [FN309] Consider also the Harvard appraisal that negligent injuries, which the malpractice system is obviously most able to prevent, are on average considerably more serious *440 and costly than non-negligent injuries. [FN310] Assume accordingly that if malpractice liability were absent the overall cost of medical injuries would have increased by fifteen percent. [FN311] Given the $130 billion total for actual medical injuries in 1984, the malpractice system can be understood as having reduced the cost of injuries by $19.5 billion. Since this estimated safety benefit is considerably higher than the $15 billion estimated cost of the medical malpractice regime, that regime seems to have been cost-justified. [FN312]

Now that this evaluation has been ventured, let me qualify it in several ways. First, one or more of its data sources may be inaccurate. Second, there may be errors in the estimates it makes on such matters as the costs of malpractice insurance, the costs of precautions adopted by hospitals, the non-monetary costs of medical injuries, and the average cost of negligent medical injuries. [FN313] Third, even if the evaluation is accurate and the malpractice system was cost-justified in 1984, it is quite possible that the system could have been substantially reformed [FN314] in ways that would have rendered the ratio of benefits to costs even more favorable. [FN315] Fourth, even if the malpractice system was cost-justified in 1984, it does

not follow that it remains cost-justified a decade later. The cost of malpractice *441 insurance, for example, has increased sharply since 1984. [FN316] Finally, even if the medical malpractice system is assumed to be cost-justified, it does not follow that other sectors of tort law, such as products liability, are also cost-justified; what is true of one sector of tort law may not be true of other sectors.

Given all these qualifications, the malpractice case study conducted above thus may be valuable chiefly as a heuristic. All the same, as a heuristic it does have real value. The case study was able to affirm that the malpractice system was cost-justified in 1984 even though it reduced the number of negligent medical injuries by less than thirty percent. Malpractice law can evidently fail seven times out of ten and still produce enough deterrence to justify the malpractice system. [FN317] That is, even though in the medical setting only the moderate version of the deterrence argument is sound, the deterrence provided by tort law has the capacity to provide the malpractice system with an adequate justification.

Furthermore, insofar as my text has considered the costs and benefits of tort law overall, of auto accident law, and finally of malpractice law, there is a category of possible tort benefits that has been largely neglected. These benefits relate to the compensation that tort law furnishes to the accident victim. In considering all of tort law, Donohue treated compensation as merely a transfer payment: overhead apart, what the plaintiff receives is what the defendant has paid. [FN318] For the same reason, Devlin's analysis of systems of auto liability ignored both the compensation that the tort defendant affords to the accident victim and the compensation that nofault plans guarantee to all auto accident victims. Even my own evaluation of malpractice liability did not dwell on the furnishing of compensation to the accident victim. Yet by neglecting the compensation that the tort system affords to accident victims, all of the evaluations above seem incomplete. [FN319] *442 As far as the compensation afforded in tort cases is concerned, the Donohue approach may be consistent with a Posnerian economic analysis. For Posner's purposes, the only reason for compensating plaintiffs is to give them incentives for bringing the lawsuits that will produce the public advantage of deterrence. Yet other economists who evaluate the tort regime appreciate that the compensation furnished by the defendant to the plaintiff can satisfy the plaintiff's own very real insurance needs. [FN320] Patricia Danzon's effort to conduct a cost-benefit review of the malpractice system explicitly acknowledges the economic function that the furnishing of compensation can serve, and included that appreciation in her evaluation methodology. While her recognition of the economic benefits of compensation should be applauded, the methodology she devises to measure these benefits seems unsatisfactory. [FN321] Moreover, in considering its unsatisfactory features, one comes to appreciate what a daunting task it would be to construct a methodology that would adequately measure the actual insurance *443 value of tort compensation payments. [FN322] I do not attempt that task here. For present purposes, it is sufficient to note that a cost-justification analysis that takes into account only the safety benefits of tort law will clearly understate the overall economic advantages of a tort regime.

CONCLUSION

Ever since the early 1970s, economically-minded scholars have advanced a deterrence theory of tort law. Yet critics, citing a list of realistic objections, have countered by claiming that tort law fails to deter. The objections brought forward by the critics are quite plausible, and make it difficult to believe that tort law deters as effectively as the economic analysis suggests. Moreover, the real-world indications of the deterrence efficacy of tort law are not immediately apparent. Tort scholars can easily envy their colleagues who teach courses such an environmental law and property law, in which the beneficial effects of legal rules are often dramatic. [FN323]

Yet between the economists' strong claim that tort law systematically deters and the critics' response that tort law rarely if ever deters lies an intermediate position: tort law, while not as

effective as economic models suggest, may still be somewhat successful in achieving its stated deterrence goals. Having formulated this intermediate position, this Article reviewed what information is available about tort law's effect upon safety efforts and safety results. The information is diverse--including formal empirical studies, surveys of physicians and corporate managers, reports provided by journalists, and my own interview inquiries. The information suggests that the strong form of the deterrence argument is in error. Yet it provides support for that argument in its moderate form: sector-by-sector, tort law provides something significant by way of deterrence.
*444 If, however, only the argument's moderate version is sound, one can wonder about the economists' efforts to fine-tune liability rules in an effort to achieve near-perfect deterrence. These efforts can be sized up as stimulating intellectual exercises that are often lacking in real-world relevance. (Often but not always: over time some fraction of these exercises will probably yield findings with actual social payoffs.) Furthermore, if tort law is only moderately successful in achieving deterrence, the question remains whether its deterrence benefits are large enough to justify all the costs it imposes on society's actors. As it happens, pertinent data are available for medical malpractice in 1984. If these data are reliable, the malpractice system can be judged to have then been cost-beneficial. In addition, when the auto tort system is compared to complete auto no-fault, the relevant data support a finding that the tort system produces safety benefits that provide it with at least partial justification. Moreover, these favorable findings can be rendered even though the malpractice system reduces the malpractice rate by less than thirty percent, and even though the auto liability system (compared to no-fault) reduces the rate of negligent driving only by about ten percent. Admittedly, for most sectors of tort law the pertinent data bearing on safety benefits and defendant compliance costs are now and are likely to remain unavailable. For this and other reasons, most sectors of tort law cannot be subjected to anything resembling a full cost-benefit review. Nevertheless, even if tort law is only moderately successful in deterring negligent conduct, this success has been largely unacknowledged by the realist critics and has a major bearing on any public-policy review of the tort system.

[FNa1]. Professor, UCLA School of Law. An earlier version of one section of this Article was presented to a law & economics seminar at Columbia University; my thanks to Columbia faculty for comments. Thanks also to Richard Abel, Bryan Ellickson, Bruce Rothschild, Hilary Sigman, Marian Sigman, and Steve Winegar.

[FN1]. In hindsight, the modern movement can be seen as having begun in 1961, when Calabresi published his first article on the idea of risk distribution and Ronald Coase published his essay, The Problem of Social Cost. Guido Calabresi, Some Thoughts on Risk Distribution and the Law of Torts, 70 YALE L.J. 499 (1961); R. H. Coase, The Problem of Social Cost, 3 J.L. & ECON. 1 (1960) (dated 1960, but actually published in 1961). During the 1960s, however, these articles did not secure a wide audience among ordinary torts scholars.

[FN2]. GUIDO CALABRESI, THE COSTS OF ACCIDENTS (1970).

[FN3]. Richard A. Posner, Killing or Wounding to Protect a Property Interest, 14 J.L. & ECON. 201 (1971).

[FN4]. Richard A. Posner, A Theory of Negligence, 1 J. LEGAL STUD. 29 (1972).

[FN5]. See, e.g., John P. Brown, Toward an Economic Theory of Liability, 2 J. LEGAL STUD. 323 (1973); Steven Shavell, Strict Liability Versus Negligence, 9 J. LEGAL STUD. 1 (1980).

[FN6]. A landmark year was 1987, in which Posner and William Landes published their book, The Economic Structure of Tort Law [hereinafter LANDES & POSNER], while Steven Shavell published The Economic Analysis of Accident Law [hereinafter SHAVELL]. Reviewers such as John Donohue described the books (and the articles that preceded them) as having "[nurtured a] profound revolution in tort scholarship. . . . " John J. Donohue III, The Law and Economics of Tort Law: The Profound Revolution, 102 HARV. L. REV. 1047, 1073 (1989) (book review). Mark Grady hailed the Landes & Posner book as a "milestone in tort scholarship." Mark F. Grady, Discontinuities in Information Burdens: A Review of the Economic Structure of Tort Law, 56 GEO. WASH. L. REV. 658, 658 (1988) (book review). Michelle White saw the Shavell book as representing "the coming of age of the field of law and economics." Michelle J. White, The Economics of Accidents, 86 MICH. L. REV. 1217, 1217 (1988) (book review).

[FN7]. See, e.g., RESTATEMENT OF THE LAW OF TORTS: PRODUCTS LIABILITY § 2 commentary at 10 (Tentative Draft No. 1, 1994) (listing "creating safety incentives" as the first rationale for products liability doctrines); RESTATEMENT OF THE LAW GOVERNING LAWYERS 5 (Preliminary Draft No. 9, 1993) (citing as rationales for legal malpractice actions the points that liability affords compensation to the victims of malpractice and "deters lawyers from behaving improperly"). To be sure, an interesting minority of tort scholars reject the deterrence rationale in favor of a corrective justice approach. See Symposium, Corrective Justice and Formalism: The Care One Owes One's Neighbors, 77 IOWA L. REV. 403 (1992).

[FN8]. See infra notes 17-26 and accompanying text.

[FN9]. At times, for example, Posner explains the efficiency of the common law in terms of society's interest in enlarging the "nation's wealth," the "size of the pie." RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 255 (4th ed. 1992). Clearly, it is the nation's actual wealth that the public cares about, not some abstract wealth about which professional economists might theorize.
To be sure, at other times Posner (with Landes) states that "[o]urs is a theory of the rules of tort law rather than of the consequences of those rules for behavior." LANDES & POSNER, supra note 6, at 13. These tort rules, Landes and Posner suggest, "create[] incentives for parties to behave efficiently." Id. at 312. Yet what does it mean to say that legal rules "create incentives" for efficient conduct if there is no evidence that they in fact bring that conduct about? Here Landes and Posner can best be interpreted as taking for granted a framework of basic economic assumptions and economic reasoning. Their point is that within this framework tort rules can be seen as making good sense. As far as social effects are concerned, Landes and Posner could easily say that while the specific claims made by the tort economists might currently lack empirical support, the more general framework of economic assumptions and reasoning is frequently confirmed by real-world observations. Interpreted in this way, Landes and Posner are making at least an indirect claim about the likely or presumptive impact of tort liability rules on actual behavior. (This interpretation complies with Tom Ulen's general assessment of economists' reasoning. Thomas J. Ulen, Rational Choice and the Economic Analysis of Law, 19 L. & SOC. INQ. 487, 488 (1994)).

[FN10]. Posner's treatise explains the efficiency of the common law by pointing out that "so many legal doctrines date back to the nineteenth century when a laissez-faire ideology based on classical economics was the dominant ideology of the educated classes." POSNER, supra note 9, at 23. Here Posner's point seems to be that judges, as members of the "educated clas-

ses," shared this ideology and relied on it in approving tort doctrines. This point looks to the attitudes or purposes of the judges themselves. The Landes and Posner book suggests that judges are people who "apply the principles of economics intuitively;" the language judges employ can best be understood as "trying to ascertain" how to minimize the sum of accident-related costs. LANDES & POSNER, supra note 6, at 23. These appraisals suggest that the economic theory concerns the goals that judges adopt, however intuitively.

[FN11]. For a discussion of the extent to which tort judges since 1970 have explicitly relied on modern economic theory, see Izhak Englard, Law and Economics in American Tort Cases: A Critical Assessment of the Theory's Impact on Courts, 41 U. TORONTO L.J. 359 (1991).

[FN12]. See, e.g., PETER HUBER, LIABILITY: LEGAL REVOLUTION AND ITS CONSEQUENCES (1988); Richard A. Epstein, The Risks of Risk/Utility, 48 OHIO ST. L.J. 469 (1987); George L. Priest, Modern Tort Law and Its Reform, 22 VAL. U. L. REV. 1 (1987).

[FN13]. The current "negative" writers can hence be contrasted with Calabresi, the first of the negative writers, whose 1970 book contended that tort liability standards were much too timid and conservative. CALABRESI, supra note 2, at 237-87.

[FN14]. One qualification is in order here. Current "negative" analysts often claim that modern tort law does not affirm a sufficient defense of contributory negligence, and hence does an inadequate job in discouraging the careless conduct of tort plaintiffs. See Priest, supra note 12, at 11. In this way the excessiveness of modern tort law can increase the accident rate.

[FN15]. Id. at 20. For another statement of Priest's views, see George L. Priest, Products Liability Law and the Accident Rate, in LIABILITY: PERSPECTIVES AND POLICY 184, 207-21 (Robert E. Litan & Clifford Winston eds., 1988).

[FN16]. See Gary T. Schwartz, The Beginning and the Possible End of the Rise of Modern American Tort Law, 26 GA. L. REV. 601, 620-34 (1992). Moreover, while there are several tort rules that are not clearly efficient, neither are the rules clearly inefficient: An economic analysis turns out to be indeterminate. See SHAVELL, supra note 6, at 292-93. Accordingly, a tort system that includes these rules is not subject to economic disapproval.

[FN17]. See Richard L. Abel, A Critique of Torts, 37 UCLA L. REV. 785 (1990).

[FN18]. See PETER CANE, ATIYAH'S ACCIDENTS, COMPENSATION AND THE LAW 361-74 (5th ed. 1993).

[FN19]. See Izhak Englard, The System Builders: A Critical Appraisal of Modern American Tort Theory, 9 J. LEGAL STUD. 27, 33, 56 (1980). For a more recent statement of his views, see Izhak Englard, The Philosophy of Tort Law 31-44 (1993).

[FN20]. See John G. Fleming, Is There a Future for Torts?, 44 LA. L. REV. 1193, 1198, 1203 (1984).

[FN21]. See Marc A. Franklin, Replacing the Negligence Lottery: Compensation and Selective Reimbursement, 53 VA. L. REV. 774 (1967).

[FN22]. See JEFFREY O'CONNELL, THE LAWSUIT LOTTERY 23-27 (1979).

[FN23]. See Richard J. Pierce, Jr., Encouraging Safety: The Limits of Tort Law and Government Regulation, 33 VAND. L. REV. 1281, 1288-1307 (1980).

[FN24]. See William H. Rodgers, Jr., Negligence Reconsidered: The Role of Rationality in Tort Theory, 54 S. CAL. L. REV. 1, 16-23 (1980). Rodgers' account focuses on the lack of realism in the economists' assumption that the threat of tort liability can deter ordinary individuals; he seems to concede that liability can be effective in deterring corporations and other institutions. Another scholar, however, has set forth a list of realistic objections that cast specific doubt on the idea that corporations can be meaningfully deterred. John A. Siliciano, Corporate Behavior and the Social Efficiency of Tort Law, 85 MICH. L. REV. 1820 (1987).

[FN25]. See Stephen D. Sugarman, Doing Away With Tort Law, 73 CAL. L. REV. 555 (1985).

[FN26]. See G. EDWARD WHITE, TORT LAW IN AMERICA 279 (1980). Robert Rabin, while not entirely denying the deterrence value of tort law, has nevertheless expressed his real skepticism. Robert L. Rabin, Deterrence and the Tort System, in SANCTIONS AND REWARDS IN THE LEGAL SYSTEM: A MULTIDISCIPLINARY APPROACH 79, 94 (M.L. Friedland ed., 1989) ("[T]he efficacy of tort as a deterrence strategy is in serious doubt.").

[FN27]. Criminal acts generally involve the intentional infliction of harm by persons who are well aware of the law's prohibition. Also, liability insurance cannot protect against criminal punishment. Given all the differences between torts and crimes, tort law's realistic critics generally do not express skepticism of the deterrence capacity of the criminal law. Indeed, many of those critics are strong believers in the effectiveness of safety regulation, backed up by penal sanctions. See, e.g., Sugarman, supra note 25, at 651.

[FN28]. For a concurring view, see Rabin, supra note 26, at 84-94.

[FN29]. In general, moral principles are most effective in guiding conduct when potential injurers and victims are members of the same close-knit group. See ROBERT C. ELLICKSON, ORDER WITHOUT LAW: HOW NEIGHBORS SETTLE DISPUTES (1991).

[FN30]. One example can be offered here. The University of California, as a state agency, is exempt from local regulation. When UCLA built Bunche Hall in the 1960s, it decided to comply with the earthquake safety requirements included in the Uniform Building Code. But it chose not to comply with the tougher requirements that were then found in the Los Angeles City Building Code.

[FN31]. For a description of the situation in California, see Pamela Warrick, Watching a Watchdog, L.A. TIMES, Jan. 31, 1993, at E1. The subcaption of this article is "Despite Criminal Records and Malpractice Judgments, Some Doctors Remain in Practice for Years. Critics Blame the Besieged State Medical Board."

[FN32]. See JERRY L. MASHAW & DAVID L. HARFST, THE STRUGGLE FOR AUTO SAFETY (1990) (assessing the National Highway Traffic Safety Administration). The federal Food & Drug Administration (FDA) possesses the authority to stringently regulate pharmaceutical drugs. But its regulatory authority over many medical devices is relatively weak. In assessing the likely deterrence efficacy of tort law, a recent report prepared for the Rand Corporation hence draws a sharp line between pharmaceutical drugs and medical devi-

ces. See STEVEN GARBER, PRODUCT LIABILITY AND THE ECONOMICS OF PHARMACEUTICALS AND MEDICAL DEVICES 126-28, 188 (1993).

[FN33]. Discussing medical injuries, Patricia Danzon makes about the same point in more formal economic parlance: "in practice liability and other quality control efforts may be complements, not substitutes." Patricia M. Danzon, Liability Reform: Traditional and Radical Alternatives 9 (unpublished manuscript, on file with author).

[FN34]. Consider Linden's discussion of tort law as an "ombudsman." A. M. Linden, Tort Law as Ombudsman, 51 CAN. B. REV. 155 (1973).

[FN35]. However, cooperating with insurance companies typically "costs" doctors at least three days of their time; this cost functions as an implicit deductible, at least on a "per claim" basis.

[FN36]. The remainder of this paragraph draws on Gary T. Schwartz, The Ethics and the Economics of Tort Liability Insurance, 75 CORNELL L. REV. 313, 315-17 (1990).

[FN37]. See Gary T. Schwartz, Contributory and Comparative Negligence: A Reappraisal, 87 YALE L.J. 697, 713-19 (1978).
In a recent article, Mark Grady, writing as a legal economist, acknowledges that people have less than complete control over their inattentiveness; he therefore suggests that the rule of liability for inattentive mistakes entails a form of strict liability. See Mark F. Grady, Why Are People Negligent? Technology, Nondurable Precautions, and the Medical Malpractice Explosion, 82 NW. U. L. REV. 293, 305-06 (1988). Given his method of analysis, Grady would not see a significant rate of inattentive negligence as violating economic norms.
I find Grady's approach extremely interesting, yet still unpersuasive as an exercise in economics. For one thing, Grady assumes that people often do not have immediate control over their own behavior. This assumption seems inconsistent with the basic economic concept of rational behavior. (For discussion of this concept, see Ulen, supra note 9.) In addition, Grady apparently believes that individuals' day-to-day conduct is largely governed by decisions they render in advance as to their preferred "level of advertence." See Grady, supra, at 295, 306. Yet I doubt that this provides a meaningful account of ordinary human action. See Schwartz, supra, at 718.

[FN38]. For discussion of scripts, see Paul J. Heald, Mindlessness and Nondurable Precautions, 27 GA. L. REV. 673 (1993); Paul J. Heald & James E. Heald, Mindlessness and the Law, 77 VA. L. REV. 1127 (1991).

[FN39]. Within the criminal law, the very concept of negligence has been conventionally defined in terms of the accused's inadvertence to the relevant risk. See Model Penal Code § 2.02(2)(d) & cmt. 4 (1985). Criminal law scholars have accordingly debated the deterrability of negligent crimes. Glanville Williams asks the rhetorical question, "How, in the nature of things, can punishment for inadvertence serve to deter?" Glanville Williams, Criminal Law: The General Part § 43, at 123 (2d ed. 1961). The comments to the Model Penal Code respond as follows:
Knowledge that . . . punishment . . . may follow conduct that inadvertently creates improper risk supplies men with an additional motive to take care before acting, to use their faculties and draw on their experience in gauging the potentialities of contemplated conduct. To some extent, at least, this motive may promote awareness and thus be effective as a measure of control.

Model Penal Code § 2.02 cmt. 3 (Tentative Draft No. 4, 1955).

[FN40]. PAUL C. WEILER, MEDICAL MALPRACTICE ON TRIAL 81 (1991). According to Weiler, these slip-ups are rendered just about inevitable by "human fallibility." Id.

[FN41]. 443 P.2d 561 (Cal. 1968) (holding that an apartment dweller can be liable to her guest for failing to warn the guest of a latent hazard in the apartment).

[FN42]. For a provocative assessment of the evidence, see Alan Schwartz, Proposals for Products Liability Reform: A Theoretical Synthesis, 97 YALE L.J. 353 (1988). Schwartz's assessment is sharply criticized in Howard Latin, "Good" Warnings, Bad Products, and Cognitive Limitations, 41 UCLA L. REV. 1193 (1994).

[FN43]. John Fleming, The American System in International Perspective, in RISK, COMPENSATION AND LIABILITY: THE POLICY CHOICES 9, 22 (1986) (proceedings of a conference held at Yale University). For somewhat more guarded assessments, see Fleming, supra note 20, at 1198 ("[O]ne must be skeptical about the effectiveness of tort law in promoting accident prevention . . . . ") and 1199 (referring to "the tort system's residual effects of deterrence . . . such as they are"). See also TERENCE ISON, THE FORENSIC LOTTERY: A CRITIQUE ON TORT LIABILITY AS A SYSTEM OF PERSONAL INJURY COMPENSATION 89 (1967) (characterizing as "negligible" the extent of tort deterrence).

[FN44]. Sugarman, supra note 25, at 590 ("[T]ort law is unlikely to promote more desirable behavior than that which would occur in its absence."). In his subsequent book, Sugarman modifies his language: "[T]ort law is unlikely to promote significantly more desirable behavior . . . . " STEPHEN D. SUGARMAN, DOING AWAY WITH PERSONAL INJURY LAW 23 (1989) (emphasis added).
It should be noted that Sugarman reaches his conclusion after also considering the empirical evidence on deterrence. Id. at 21-23. Yet his review seems incomplete and somewhat partisan as well.

[FN45]. Likewise, the factors relating to corporate behavior identified by Siliciano, supra note 24, at best suggest that tort law functions imperfectly in regulating corporate behavior. At times Siliciano overreacts to these factors: Consider, for example, his assessment that "in some ways, the current operation of the tort system . . . seems so inefficient and flawed that almost any change would be an improvement." Id. at 1854. At other times, however, his article is more balanced. Thus he suggests that tort rules might result in behavior that is "largely efficient, somewhat efficient, or perhaps not efficient at all." Id. at 1859. The concept of "somewhat efficient," though awkwardly worded, is on the right track.

[FN46]. Abel, supra note 17, at 813.

[FN47]. Id. at 816. See also id. at 817 (evidence shows that tort deterrence does not "work perfectly").

[FN48]. See id. at 806-19.

[FN49]. See, e.g., id.; Richard L. Abel, Pounds of Cure, Ounces of Prevention, 73 CAL. L. REV. 1003, 1023 (1985) (the "rationalizations of tort law"--including deterrence--"collapse like a house of cards") (book review).

[FN50]. It is possible that Abel believes that the current tort system does not provide any appreciable deterrence. But his articles do not clearly say this; and the realistic objections those articles (quite usefully) discuss justify only a finding of "sub-optimal" deterrance.

[FN51]. See Abel, supra note 17, at 804.

[FN52]. Mark Kelman identifies certain problems with the economic analysis of tort law. These problems are real enough, but they do not justify Kelman's conclusion that the economic analysis is worthless--that it leaves the problem of accidental harms "wholly unsolved." See MARK KELMAN, A GUIDE TO CRITICAL LEGAL STUDIES 171-76 (1987).

[FN53]. LANDES & POSNER, supra note 6, at 10.

[FN54]. Id. at 10, 13.

[FN55]. William K. Jones, Strict Liability for Hazardous Enterprise, 92 COLUM. L. REV. 1705 (1992).

[FN56]. See id. at 1707 n.7.

[FN57]. Jones cites 1 ALI REPORTERS' STUDY, ENTERPRISE RESPONSIBILITY FOR PERSONAL INJURY 32 (1991). Yet the Reporters' Study emphasizes that "there is a huge gap between the promise and performance of tort law." Id. at 33. The only empirical evidence the Study cites relates to highway accidents and medical malpractice. Id. at 32. As for malpractice, the Study merely claims that liability has "a modest preventive effect." Id. at 32 n.49.

[FN58]. Jones' analysis balances the deterrence gains of strict liability against the administrative costs that strict liability would add to the tort system. Jones, supra note 55, at 1758-59, 1778. As Jones assesses the magnitude of those deterrence gains, he seemingly takes for granted that tort rules do deter in ways that largely accord with economic models.

[FN59]. Many of the relevant studies have been reviewed by a team from the University of Toronto, Michael Trebilcock and Don DeWees. Their first review was published as a chapter in the 1991 ALI Reporters' Study. 1 ALI REPORTERS' STUDY, supra note 57, at 351 (Chapter 13: "Tort and Its Alternatives"). A longer and more recent review is Don DeWees & Michael Trebilcock, The Efficacy of the Tort System and Its Alternatives: A Review of Empirical Evidence, 30 OSGOODE HALL L.J. 57 (1992). My understanding is that an even longer version of this project is due to be published in book form.
The Toronto team and I sometimes discuss the same studies. (Indeed, the team's research first alerted me to the article cited in infra note 83 and to the first of the articles cited in infra note 85.) However, even when we do treat the same studies, we often disagree about what points to emphasize. The topic of my own Article is the deterrence efficacy of tort law. The Toronto project is much more ambitious. It assesses not only tort law's deterrence record, but also the effectiveness of tort law in achieving corrective justice and victim compensation; moreover, that project reviews the effectiveness of various public programs of safety regulation.

[FN60]. See Robert L. Rabin, Impact Analysis and Tort Law: A Comment, 13 LAW & SOC'Y REV. 987, 995-96 (1979) (An inquiry into tort law's effect on safety practices "will generally raise questions that cannot be answered exclusively through recourse to aggregate statistical data. Social scientists will have to use an array of methodological techniques, such

as interviewing, analysis of records, and participant observation . . . . ")

[FN61]. While some of the evidence marshalled in this Article deals with actual safety results, other information focuses on the safety efforts made by potential tort defendants. Clearly, the ratio between efforts and results can be much less than one-to-one. Still, it is reasonable to assume that efforts yield something by way of results. Also, when evidence as to results is unavailable, information as to efforts becomes especially worthy of consideration.

[FN62]. The survey in the Article is limited to sectors of tort law that deal with problems of personal injury. Still, some measure of deterrence can be detected in other tort fields as well. For example, most would agree that the regime of defamation law reduces the rate of negligent (and reckless) errors by the media. Moreover, my own inquiries have satisfied me that the modern regime of attorney malpractice, whatever its costs, is frequently successful in discouraging abuses within the legal profession. On malpractice, see Geoffrey C. Hazard, How Firms Avoid Risk, NAT'L L.J., May 9, 1994, at A2.

[FN63]. See James R. Chelius, Liability for Industrial Accidents: A Comparison of Negligence and Strict Liability Systems, 5 J. LEGAL STUD. 293, 303, 306 (1976).

[FN64]. 45 U.S.C. §§ 51-60 (1988).

[FN65]. Lars A. Stole, The Economic Effects of Liability Rules on Railroad Employee Accidents: 1890-1970 (1992) (unpublished manuscript, on file with author).

[FN66]. Stole's data implicitly criticize the Landes and Posner position that the fellow-servant rule and a full defense of contributory negligence are generally efficient. See LANDES & POSNER, supra note 6, at 308-11.

[FN67]. The committee's report (written by the committee's staff) has recently been published. TRANSPORTATION RESEARCH BOARD, COMPENSATING INJURED RAILROAD WORKERS UNDER THE FEDERAL EMPLOYERS' LIABILITY ACT (1994).

[FN68]. In the early 1980s, one railroad adopted what it regarded as an extensive hearing protection program. The company now tests noise levels at a wide variety of job sites. At those sites where the noise levels exceeded certain standards, the company furnishes hearing protection devices, requires all employees to wear these devices, and enforces this requirement. Also, the company makes a major effort to engage in hearing testing. This effort includes permanent booths, mobile hearing vans, and sophisticated follow-up testing for employees whose initial test results are unsatisfactory.

[FN69]. Hearing loss is the primary occupational illness problem relating to railroad employment. Id. at 73.

[FN70]. Since railroad employees were already covered by FELA, state workers' compensation programs, acknowledging the supremacy of federal law, were not able to render themselves applicable to railroad employees.

[FN71]. See Chelius, supra note 63, at 303, 306.

[FN72]. See Price V. Fishback, Liability Rules and Accident Prevention in the Workplace: Empirical Evidence From the Early Twentieth Century, 16 J. LEGAL STUD. 305 (1987).

[FN73]. The value of workers' compensation as a deterrence measure is questioned by some of the realistic critics. Sugarman, finding comprehensive compensation programs preferable to liability regimes, recommends the abolition of workers' compensation. See SUGARMAN, supra note 44, at 134-48. In taking this position, Sugarman implies that workers' compensation achieves nothing of significance in promoting safety.

[FN74]. See MICHAEL J. MOORE & W. KIP VISCUSI, COMPENSATION MECHANISMS FOR JOB RISKS 133 (1990). Previous studies, discussed in id. at 121-23, 127-28, had found that raising the level of workers' compensation benefits actually increased the number and duration of reported injuries. Moore and Viscusi conclude--correctly, in my view--that these increases reflected not an increase in the actual number of injuries (or of serious injuries), but rather a greater willingness on the part of employees to file claims (or more extended claims) once they have suffered some injury. By focusing on occupational fatalities, Moore and Viscusi are able to eliminate this reporting effect.

[FN75]. NATIONAL SAFETY COUNCIL, ACCIDENT FACTS 1 (1993). The good news is that the auto fatality rate has gone down sharply over a twenty year period. In 1972, 56,278 Americans were killed in highway accidents. Id. at 27. The decrease in fatalities is even more dramatic if fatalities are calculated as a percentage of population or as a percentage of miles driven. See id. at 24, 54, 55.
What role tort law has played in this decline is unclear. Important causes certainly include federal regulation of vehicle design, state laws requiring safety belt use, increased public law sanctions for drunk driving, and changing public attitudes towards both drunk driving and safety belts.

[FN76]. Also, for the economists' analysis of the incentives associated with victim contributory negligence, see infra note 228.

[FN77]. Richard W. Grayston, Deterrence in Automobile Liability Insurance -- The Empirical Evidence, 40 INS. COUNS. J. 117 (1973).

[FN78]. See Schwartz, supra note 36, at 354-55, relying on Shavell's theory of strict liability, which emphasizes the effect of strict liability on parties' choice of activities. See SHAVELL, supra note 6, at 21-25.

[FN79]. See Grayston, supra note 77, at 126-27. A new article finds that permitting more classifications in auto liability insurance reduces the amount of binge drinking and drunk driving. Frank A. Sloan et al., Effects of Tort Liability and Insurance on Heavy Drinking and Drinking and Driving, J.L. & ECON. (forthcoming).

[FN80]. See Anne C. Roark, High Costs Force Teen-Age Drivers to Stay Off the Road, L.A. TIMES, Sept. 8, 1992, at A1.

[FN81]. On the causal relationship between the reduced percentage of teen-age drivers and the lower number of injuries and fatalities, the Times article cites Patricia A. Romanowicz, a research analyst for the Department of Motor Vehicles.

[FN82]. Elisabeth M. Landes, Insurance, Liability, and Accidents: A Theoretical and Empirical Investigation of the Effects of No-Fault Accidents, 25 J.L. & ECON. 49, 62 (1982) (punctuation in the original).

[FN83]. Marshall H. Medoff and Joseph P. Magaddino, An Empirical Analysis of No-Fault Insurance, 6 EVALUATION REV. 373 (1982).

[FN84]. See, e.g., Sugarman, supra note 25, at 539 n.152; Paul Zador & Adrian Lund, Re-Analysis of the Effects of No-Fault Auto Insurance on Fatal Crashes, 53 J. RISK & INS. 226, 236-41 (1986).

[FN85]. The first study finding no increase was Paul S. Kochanowski & Madelyn V. Young, Deterrent Aspects of No-Fault Automobile Insurance: Some Empirical Findings, 52 J. RISK & INS. 269 (1985). Later studies reaching the same finding are U.S. DEP'T OF TRANSP, COMPENSATING AUTO ACCIDENT VICTIMS: A FOLLOW-UP REPORT ON NO-FAULT AUTO INSURANCE EXPERIENCES 159-66 (1985); G. DAVID CUMMINS & MARY A. WEISS, INCENTIVE EFFECTIVE OF NO-FAULT: EVIDENCE FROM INSURANCE CLAIM DATA, CONTRIBUTIONS TO INSURANCE ECONOMICS 445 (Georges Dionne ed., 1992). The methodolgy in the Department of Transportation study was sufficiently crude that it could not acknowledge effects on fatality or accident rates of less than seven percent. See U.S. DEP'T OF TRANSP., supra, at 163 & n.4, 166.

[FN86]. Zador & Lund, supra note 84.

[FN87]. Frank A. Sloan et al., Tort Liability versus Other Approaches for Deterring Careless Driving, 14 INT'L. REV. L. & ECON. 53, 60, 66-67, 68-69 (1994). This study compared fault states to no-fault states; it also attempted comparisons among no-fault jurisdictions, taking into account the extent to which each plan's "threshold" eliminates a larger or smaller number of tort claims.
In a follow-up article, the Sloan team finds that the adoption of no-fault slightly increases binge drinking, which in turn leads to drunk driving. See Sloan et al., supra note 79.

[FN88]. Marc Gaudry, The Effects on Road Safety of the Compulsory Insurance, Flat Premium Rating and No-Fault Features of the 1978 Quebec Automobile Act, in 2 REPORT OF INQUIRY INTO MOTOR VEHICLE ACCIDENT COMPENSATION IN ONTARIO 1 (1988); Marc Gaudry, Measuring the Effects of the No-Fault Quebec Automobile Insurance Act With the DRAG Model, in CONTRIBUTIONS TO INSURANCE ECONOMICS 471 (Georges Dionne ed., 1992).

[FN89]. See Rose Anne Devlin, Liability Versus No-Fault Automobile Insurance Regimes, An Analysis of the Experience in Quebec, in CONTRIBUTIONS TO INSURANCE ECONOMICS, supra note 88, at 494 [hereinafter Devlin 1992]; Rose Anne Devlin, Some Welfare Implications of No-Fault Automobile Insurance, 10 INT'L. REV. L. & ECON. 193 (1990) [hereinafter Devlin 1990]. Actually, Devlin observes that reported injuries went up by 27%; but she concludes that much of this apparent increase was due to the effect of no-fault on reporting practices.
In fact, the Canadian records showed an actual increase in auto fatalities of 11% during the first year of the no-fault program. Telephone Interview with Rose Anne Devlin (Mar. 9, 1994). By controlling for relevant variables, Devlin concluded that most but not all of this increase was due to the change in legal regimes.

[FN90]. In an ongoing research project, I am considering how the pattern of insurance premiums in no-fault can be expected to differ from the pattern of premiums already found in tort.

[FN91]. See Craig Brown, Deterrence in Tort and No-Fault: The New Zealand Experience, 73 CAL. L. REV. 976, 986-89 (1985).

[FN92]. Id. at 989. Moreover, there were other legal changes during these years. The speed limit was lowered in 1973, and a batch of new safety regulations took effect in 1977. Id.

[FN93]. R. Ian McEwin, No-Fault and Road Accidents: Some Australasian Evidence, 9 INT'L. REV. L. & ECON. 13, 23 (1989). McEwin's findings apply as well to the Australian states of Victoria and Tasmania, which adopted "add on" no-fault systems in the mid-1970s. McEwin's explanation of the factors relating to no-fault that bring about his results is somewhat confusing. Id. at 23- 24.

[FN94]. Peter L. Swan, The Economics of Law: Economic Imperialism in Negligence Law, No-Fault Insurance, Occupational Licensing and Criminology, 3 AUSTL. ECON. REV. 92, 103 (1984). To be sure, while calling his findings "highly statistically significant," Swan acknowledges the "possibility" that "this surprisingly strong result is a statistical artifact of the particular specification of the model and the control variables." Id.

[FN95]. The New Zealand results are perhaps surprising. In New Zealand prior to 1974, auto liability insurance for personal injury was compulsory, and was issued pursuant to public regulations that prohibited class-rating and experience-rating: All motorists paid about the same premiums (as they do in Quebec today). A New Zealander could cause three accidents a year by drunk driving yet not face any increase in the cost of liability insurance for personal injury. The way in which New Zealand regulated its tort system in its application to highway injuries rendered that system half-hearted as a device for reducing the rate of negligent driving. However, liability insurance for property damage was voluntary, and its pricing included "no claims" bonuses. See Brown, supra note 91, at 981-82. In addition, see the comments by Gary Schwartz and Sir Geoffrey Palmer in International Workshop, Beyond Compensation: Dealing with Accidents in the Twenty-First Century, 15 U. HAW. L. REV. 523, 645-49 (1993) [hereinafter International Workshop].

[FN96]. Robert W. Dubois & Robert H. Brook, Preventable Deaths: Who, How Often, and Why?, 109 ANNALS INTERNAL MED. 582 (1988).

[FN97]. Id.

[FN98]. Lori B. Andrews, Medical Error and Patient Claiming in a Hospital Setting (Am.B.F. Working Paper No. 9316, 1993).

[FN99]. See PAUL C. WEILER ET AL., A MEASURE OF MALPRACTICE 33 (1993) [[[hereinafter WEILER ET AL.]

[FN100]. Id. at 44. These late 1980s New York findings are in line with early 1970s findings derived from a study of hospital patients in California. See CALIFORNIA MEDICAL ASSOCIATION, MEDICAL INSURANCE FEASIBILITY STUDY (1977), discussed in WEILER ET AL., supra note 99, at 36.
However, the one percent negligent injury rate reported in the New York and California studies is much lower than the 14% negligent injury rate reported by Andrews. See Andrews, supra note 98. True, the Andrews study deals only with one hospital, and does not assess the representativeness of that hospital. Andrews specifically addresses the disparity between her own finding and the earlier Harvard finding. She points out that the Harvard study was based

on patient's hospital records, and that many errors might not be documented in these records. Indeed, she reports that some physicians deliberately withhold from patients' charts information about the physicians' own errors. See id.

[FN101]. See WEILER ET AL., supra note 99, at 44.

[FN102]. Id. at 55-56. Admittedly, many of the victims of fatal injuries were in hospitals because of injuries or diseases that themselves might have proved fatal. See id. at 55.

[FN103]. Janny Scott, Hospitals Can Make You Sick, L.A. TIMES, July 28, 1992, at A1.

[FN104]. Id. at A18. Indeed, handwashing is the single most important prevention standard. Yet it is also the standard most frequently violated. Health-care workers wash their hands only half as often as they should; doctors apparently are among the worst offenders. Id. For scholarly confirmation of the descriptions provided in the Scott article, see articles such as Bradley N. Doebbeling et al., Comparative Efficacy of Alternative Hand-Washing Agents in Reducing Nosocomial Infections in Intensive Care Units, 327 NEW. ENG. J. MED. 88, 90, 92 (1992); Marie Graham, Frequency and Duration of Handwashing in an Intensive Care Unit, 18 AM. J. INFECTION CONTROL 77 (1990).

[FN105]. See Sharon M. Willcox et al., Inappropriate Drug Prescribing for the Community-Dwelling Elderly, 272 JAMA 292 (1994).

[FN106]. Some of these side effects involve adverse health consequences. Others concern the risk of physical injury. For example, when drugs unduly sedate the elderly or impair their cognitive functions, this can easily result in falls and fractures. Id. at 292, 295.

[FN107]. Id. at 293.

[FN108]. Id. at 296.

[FN109]. Edward Felsenthal, Forgotten Surgical Tools Spur Lawsuits, WALL ST. J., Dec. 11, 1992, at B12. This article relies on an interview with Dean Ellen Murphy.

[FN110]. Id. Note that while leaving a sponge in a patient might initially be an inadvertent act on the surgeon's part, quality control techniques are available to hospitals that enable them to correct for such inadvertent mistakes. Note also the combination of concern for patient health and concern for liability avoidance that has evidently motivated hospitals' efforts.

[FN111]. 551 P.2d 334 (Cal. 1976).

[FN112]. Daniel J. Givelber et al., Tarasoff, Myth and Reality: An Empirical Study of Private Law in Action, 1984 WIS. L. REV. 443.

[FN113]. 519 P.2d 981 (Wash. 1974).

[FN114]. Jerry Wiley, The Impact of Judicial Decisions on Professional Conduct: An Empirical Study, 55 S. CAL. L. REV. 345, 360, 363 (1981) (27% of ophthalmologists reported increased testing).
Wiley expresses doubts about the court's conclusion that failing to give the pressure test to younger patients is unreasonable. This question, worthy though it is, is beyond the scope of

this article. I can say that when Helling first came down, I consulted my own Los Angeles ophthalmologist and asked him whether my previous eye exam had included the pressure test. (I had been less than forty at the time of that exam.) His answer was, "Of course."

[FN115]. See id. at 360, 363.

[FN116]. Id. at 360.

[FN117]. See Givelber et al., supra note 112, at 488 & n.131.

[FN118]. Reibl v. Hughes, [1980] 2 S.C.R. 880.

[FN119]. Gerald B. Robertson, Informed Consent in Canada: An Empirical Study, 22 OSGOODE HALL L.J. 139 (1984).

[FN120]. Id. at 144, 146. Of course, the goal of informed consent is not improved patient safety but rather improved patient autonomy. For a recent skeptical discussion as to whether the informed consent doctrine efficiently enables patients to exercise autonomous choice, see Peter H. Schuck, Rethinking Informed Consent, 103 YALE L.J. 899 (1994).

[FN121]. Gerald Robertson, Informed Consent Ten Years Later: The Impact of Reibl v. Hughes, 70 CAN. B. REV. 423, 438-39 (1991).

[FN122]. See WEILER ET AL., supra note 99, at 127; Ann G. Lawthers et al., Physicians' Perceptions of the Risk of Being Sued, 17 HEALTH POL. POL'Y & L. 463, 470 (1992).

[FN123]. See Felsenthal, supra note 109.

[FN124]. See WEILER ET AL., supra note 99, at 128.

[FN125]. See id. The rating for clinical care rules and practice guidelines was 2.52, just below the malpractice rating. Id.

[FN126]. See Lawthers et al., supra note 122, at 470 (81% of physicians ordered more tests or precedures); Roger A. Reynolds et al., The Cost of Medical Professional Liability, 257 JAMA 2776, 2777-78 (1987); Stephen Zuckerman, Medical Malpractice Claims, Legal Costs, and the Practice of Defensive Medicine, 3 HEALTH AFFAIRS 128, 132 (1984).

[FN127]. See Peter A. Bell, Legislative Intrusions into the Common Law of Medical Malpractice: Thoughts about the Deterrent Effect of Tort Liability, 35 SYRACUSE L. REV. 939, 970-73 (1984); Bernard Dickens, The Effects of Legal Liability on Physicians' Services, 41 U. TORONTO L.J. 168, 186 (1991); A. Russell Localio et al., Relationship Between Malpractice Claims and Caesarian Delivery, 269 JAMA 366 (1993).

[FN128]. Of course, defensive medicine is also encouraged by the prevalence of third-party payors for medical services. Doctors might order costly additional tests in order to increase their own income; patients covered by health insurance might lack an adequate reason to resist these expensive additional tests. See Gary T. Schwartz, A National Health Program: What Its Effect Would Be on American Tort Law and Malpractice Law, 79 CORNELL L. REV. (forthcoming 1994).

[FN129]. There is evidence that the tort system does not err when it finds doctors liable for failing to perform caesarian sections. See FRANK A. SLOAN ET AL., SUING FOR MEDICAL MALPRACTICE 34, 42-43, 49, 110 (1993). Amniocentesis has turned out to be a medical technology success story. At acceptable cost and risk, it is very effective in identifying markers of Down syndrome; moreover, its value is increasingly being recognized in identifying markers of other serious disorders. As for electronic fetal monitoring (EFM), nineteenth-century medical research had advanced the theory that cerebral palsy is typically caused by abnormalities of labor and delivery, such as asphyxia. Adherence to this theory made physicians very enthusiastic about EFM when it first became available in the 1970s. However, research conducted since then has found that the etiology of most cases of cerebral palsy cannot yet be determined. Still, about 19% of cerebral palsy cases do seem caused by labor-and-delivery problems such as asphyxia. For these cases, EFM can play a significant role in facilitating interventions that prevent harm. EFM is also of value in preventing a number of central nervous system problems other than cerebral palsy.
Most of the above footnote is based in my interview with Professor Brian Koos, Acting Chair of the Department of Obstetrics and Gynecology at the UCLA School of Medicine (October 18, 1994). The 19% figure comes from James R. Shields & Barry S. Schifrin, Perinatal Antecedents of Cerebral Palsy, 71 OBS. & GYN. 899, 903 (1988), and is generally supported by Professor Koos.

[FN130]. See Bell, supra note 127, at 967.

[FN131]. One recent study of a tertiary-care teaching hospital found that doctors made many errors in writing prescriptions. See Timothy S. Lesar et al., Medication Prescribing Errors in a Teaching Hospital, 263 JAMA 2329 (1990). These errors were often capable of causing serious harm. The authors of the study emphasize "the importance of mechanisms to avoid and avert such errors." Id. at 2333. Even when doctors properly prescribe medications, there are many errors made by hospital pharmacies in dispensing medications and by nurses in delivering them. Id. at 2332. Here, too, adequate record-keeping can be valuable in reducing the error rate.

[FN132]. See Patricia M. Danzon, Malpractice Liability: Is the Grass on the Other Side Greener?, in TORT LAW AND THE PUBLIC INTEREST 176, 194-95 (Peter H. Schuck ed., 1991). Danzon's suggestion rests on the implicit premise that prior to the change in practice patterns, pregnant women in rural areas lacked the information that would have enabled them to adequately appreciate the quality advantages of the less convenient big-city specialist. This premise seems correct.

[FN133]. See Laura L. Morelock & Faye E. Malitz, Do Hospital Risk Management Programs Make a Difference?: Relationships between Risk Management Program Activities and Hospital Malpractice Claims Experience, 54 LAW & CONTEMP. PROBS. 1, 22 (1991).

[FN134]. See Orley H. Lindgren et al., Medical Malpractice Risk Management Early Warning Systems, 54 LAW & CONTEMP. PROBS. 23 (1991).

[FN135]. John H. Eichhorn et al., Standards for Patient Monitoring During Anesthesia at Harvard Medical School, 256 JAMA 1017 (1986).

[FN136]. The effort to establish standards originated with the concerns expressed by the medical malpractice insurance company for Harvard's nine teaching-hospital departments. Id. The primary goal of the standards is "[t]o improve patient care." Id. at 1018. Yet "[a]n additi-

onal secondary result should be a reduction in the number of malpractice claims." Id. When the Harvard team sought acceptance and implementation of its standards, it found that the standards were "accepted with minimal resistance." Id. at 1020. This lack of resistance was partly due to the anesthesiologists' own recognition of "the potential for reduction in malpractice claims and premiums." Id.
In their article's conclusion, the Harvard team emphasizes that "the best way" to counter the increasing cost of malpractice insurance "is to work even harder on patient safety and medical care quality assurance." Id.

[FN137]. See Elizabeth Douglas, General Anesthesia: Balancing Act in Operating Room, L.A. TIMES, Feb. 22, 1988, at B-5.

[FN138]. Id.

[FN139]. See Robert Pear, Insurers Reducing Malpractice Fees for Doctors in U.S., N.Y. TIMES, Sept. 23, 1990, at 1.

[FN140]. See id.

[FN141]. The premise here is that doctors are aware of local claims levels. This premise seems reasonable. The more local claims there are, the more likely doctors are to hear about claims from their professional colleagues. Moreover, general information on claims levels is brought home to doctors by the magnitude of their insurance premiums.

[FN142]. See WEILER, supra note 40, at 88-90.

[FN143]. Given, however, all the methodological problems, this empirical finding is "not conclusive," not "statistical[ly] significan[t]." See WEILER ET AL., supra note 99, at 131. Yet the concept of statistical significance is quite stringent: an empirical finding is said to lack statistical significance if there is at least a five percent chance that it picks up a merely random result. Given this stringency, I agree with Weiler (see id.) that policymakers should be quite willing to take into account findings that might be technically lacking in statistical significance. To be sure, correlation need not show causation. Perhaps underlying demographic factors might explain why a region within New York State would have both a high rate of actual malpractice and a low rate of malpractice claims. The Harvard study, however, made a serious effort to control for the most likely variables.
The findings of the Harvard team have been criticized by the Toronto team of DeWees and Trebilcock. Currently, the level of claims in Canada is only about one-fifth of the United States level. Observing this, DeWees and Trebilcock go on to note that "there appears to be no evidence that Canadian physicians are more careless than their U.S. counterparts." See DeWees & Trebilcock, supra note 59, at 83. On the other hand, there is simply "no evidence" of the underlying malpractice rate in Canada; no Harvard-like studies have been attempted.

[FN144]. See infra text accompanying notes 218-220.

[FN145]. See Hauter v. Zogarts, 534 P.2d 377 (Cal. 1975).

[FN146]. The company was seriously at fault in advertising the Dalkon Shield as "safe and effective" despite a lack of testing, in misreporting the pregnancy rate among the IUD's users, in ignoring the advice of its own medical advisory panel that it market the IUD only to gynecologists, and in repeatedly ignoring a stream of reports suggesting the product's serious dan-

gers. See RICHARD B. SOBOL, BENDING THE LAW: THE STORY OF THE DALKON SHIELD BANKRUPTCY at ix, 1-22 (1991).

[FN147]. See Theresa M. Schwartz, Punitive Damages and Regulated Products, 42 AM. U. L. REV. 1335, 1348 (1993). Professor Schwartz also discusses Opren, another anti-arthritis drug produced by Lilly, and Sulacryn, a medication for high blood pressure. The manufacturer of Sulacryn pleaded guilty to a federal misdemeanor; Lilly withdrew Opren from the American market in the early 1980s. Id. at 1350-51.

[FN148]. See Barry Meier, Designer of Faulty Heart Valve Seeks Redemption in New Device, N.Y. TIMES, Apr. 17, 1990, at B5, B7.

[FN149]. See James M. Gomez, Affidavits Say Shiley Recycled Thousands of Faulty Heart Valves, L.A. TIMES, Aug. 31, 1993, at D1.

[FN150]. This settlement will pay up to $2 million for each fatality caused by the heart valve, and will also make one-time payments of $4,000 to each of 51,000 valve recipients in order to compensate for their emotional distress. See Milo Geyelin, Pfizer Accord on Heart Valve Wins Approval, WALL ST. J., Aug. 20, 1992, at A6.
A year later, a California judge accepted a $26 million settlement in a suit brought by 256 heart-valve recipients who had not participated in the earlier settlement. See James M. Gomez & Debora Vrana, Judge OKs Settlement in Heart Valve Suit, L.A. TIMES, Sept. 3, 1993, at D1.

[FN151]. Barry Meier, Pfizer Unit to Settle Heart Device Charges, N.Y. TIMES, July 2, 1994, at 17.

[FN152]. See Philip J. Hilts, Manufacturer Admits Selling Untested Devices for Heart, N.Y. TIMES, Oct. 16, 1993, at 1.

[FN153]. Another situation can be noted in which the negligence of the manufacturer is probable but not certain. In the mid-1970s, Procter & Gamble (P&G) marketed Rely, a super-absorbant tampon. P&G eventually withdrew Rely from the national market in 1980, after the federal Centers for Disease Control found a statistical link between Rely and toxic shock syndrome. There is information indicating that P&G was alerted to the dangers associated with the design of this product yet continued to sell it without either redesigning it or affording appropriate warnings. See ALECIA SWASY, SOAP OPERA 130-51 (1993). Swasy is a reporter for the Wall Street Journal. The information set forth in her book is clearly significant. Still, since P&G declined to cooperate with Swasy, her book is not in a position to set forth P&G's interpretation of that information. A jury verdict against the company was affirmed in Kehm v. Proctor & Gamble Mfg. Co., 724 F.2d 613 (8th Cir. 1983).

[FN154]. The low solvency of many assembly-line employees can predictably eliminate the direct incentive effects of tort liability. See infra note 232. Vicarious liability may or may not be successful in restoring those incentives. See infra note 233. In any event, company managers earn substantial incomes and typically have substantial wealth. They should be eminently deterrable.

[FN155]. See GEORGE EADS & PETER REUTER, DESIGNING SAFER PRODUCTS: CORPORATE RESPONSES TO PRODUCT LIABILITY LAW AND REGULATION (1983).

[FN156]. Id. at viii. To be sure, the signal sent by products liability is "extremely vague." Id. Manufacturers extract the lesson that "be careful, or you will be sued." Id. This is equivalent to a "negligence" lesson. As vague or general as it may be, it still should have the effect of encouraging more "care" on the part of manufacturers.

[FN157]. Id. at 122.

[FN158]. See id. at 89-119.

[FN159]. Egon Zehnder, Int'l USA, The Litigious Society: Is It Hampering Creativity, Innovation, and Our Ability to Compete?, 2,3 CORP. ISSUES MONITOR 1, 1 (1987).

[FN160]. Id. at 2. Two-thirds of the respondents indicated that "the principal impact of product liability lawsuits has been to force companies to be more careful with their products, not to limit innovation." Id.
The return rate for this survey was excellent. Of the executives interviewed, a plurality were CEOs; the remainder were CFOs, company presidents, and heads of human resource units. Telephone Interview with Gary Matus, Director of the Egon Zehnder study (May 10, 1994). The Conference Board surveys, discussed below, have been frequently reviewed by torts analysts; for some reason, the Egon Zehnder study has been largely ignored. As noted below, the Conference Board surveys seem subject to a variety of biases; also, their return rates were poor. The Egon Zehnder study thus seems especially worthy of attention.

[FN161]. See NATHAN WEBER, PRODUCT LIABILITY: THE CORPORATE RESPONSE 15 (1987). Note that risk managers may have an interest in making their own activities seem effective.
A trustworthy plaintiffs' lawyer lists the Drano can, flammable children' pajamas, and gas tanks on tractors as examples of products that were desirably redesigned on account of tort liability. Robert L. Habush, The Insurance "Crisis": Reality or Myth?: A Plaintiffs' Lawyer's Perspective, 65 DENV. U. L. REV. 641, 649-50 (1988). Drawing on his own experience, another trial lawyer describes liability rulings that evidently contributed to industry changes in designs and warnings. EDWARD M. SWARTZ, SLAUGHTER BY PRODUCT 115-17 (Supp. 1993). On the litigation-induced recall of the Remington Mohawk 600 Rifle for installation of a new trigger assembly, see STEWART M. SPEISER, LAWSUIT 348-55 (1980). On the improved design of the lids of steam vaporizers, see Barbara Bry, Product Liability: Firms Face Rising Costs As Injury Awards Swell, L.A. TIMES, Oct. 22, 1978, at V-1.

[FN162]. See E. PATRICK MCGUIRE, THE IMPACT OF PRODUCT LIABILITY 18-19 (1988).

[FN163]. Id. at 20. The study's array of data makes it difficult to tell how much overlap there is between those companies responding to actual liability and those responding to anticipated liability. Depending on the extent of overlap, the total number of companies improving their products' design could be as low as 33% or as high as 46%.

[FN164]. See Todd v. Societe Bic, S.A., 9 F.3d 1216, 1219 (7th Cir. 1993). For a later decision in the same case, see Todd v. Societe Bic., S.A., 21 F.3d 1402 (7th Cir. 1994).

[FN165]. "For the major corporations surveyed, the pressures of product liability have hardly affected larger economic issues, such as revenues, market share, or employee retention."

WEBER, supra note 161, at 2.

[FN166]. See MCGUIRE, supra note 162, at v. Note that those CEOs who responded to the second survey may have had an interest in making the tort system look excessive and undesirable.

[FN167]. See id. at 19. The dichotomy between "actual" and "anticipated" liability problems is especially awkward here. A company might decide against introducing a new product because of "anticipated" liability problems; why might a company decide against introducing a new product on account of "actual" liability experience?

[FN168]. Egon Zehnder, supra note 159, at 1.

[FN169]. See MCGUIRE, supra note 162, at 19.

[FN170]. See Nicholas A. Ashford & Robert F. Stone, Liability Innovation, and Safety in the Chemical Industry, in THE LIABILITY MAZE 367, 399 (Peter W. Huber & Robert E. Litan eds., 1991).

[FN171]. See Louis Lasagna, The Chilling Effect of Product Liability on New Drug Development, in THE LIABILITY MAZE, supra note 170, at 334, 337-41. Lasagna finds "ambiguous" the scientific studies assessing the safety of Bendectin. Id. at 340. The special problem with products used in pregnancy is that about three percent of all infants are born with congenital abnormalities. Since the explanation for these abnormalities is often unclear, it becomes possible for the family to blame the medication taken by the mother during her pregnancy. See Elyse Tanouye, Suits Involving Defunct Bendectin Killed Development of Pregnancy Medications, WALL ST. J., June 22, 1993, at B1. Does the products liability regime in fact discourage the development of medications for pregnancy? Of the 301 drugs that are now under development for women, only four are for problems that arise in pregnancy. Id. at B6. Even so, companies that specialize in pregnancy products report that their research has not been affected by liability concerns. Id.

[FN172]. A former DuPont official reports that DuPont, having developed an elastomer product, decided not to pursue a business opportunity involving the promotion of the product as an earthquake shock absorber for buildings. He indicates that DuPont was convinced the shock absorber would be technologically proper, yet was concerned that in the aftermath of a disastrous earthquake the company would be exposed to litigation. Alexander MacLachlan, The Chemical Industry: Risk Management in Today's Product Liability Environment, in PRODUCT LIABILITY AND INNOVATION: MANAGING RISK IN AN UNCERTAIN ENVIRONMENT 47, 50 (Janet R. Hunziker & Trevor O. Jones eds., 1994) [hereinafter Hunziker & Jones.]

[FN173]. See Richard J. Mahoney & Stephen E. Littlejohn, Innovation on Trial: Punitive Damages Versus New Products, 246 SCI. 1395, 1395 (1989).

[FN174]. See Ashford & Stone, supra note 170, at 416 nn.113-14. In the late 1980s the G.D. Searle Company, facing litigation, withdrew its Copper 7 IUD contraceptive. In one case against Searle, a verdict in favor of the patient was affirmed on appeal. Kociemba v. G.D. Searle & Co., 707 F. Supp. 1517, 1531 (D. Minn. 1989). An additional 130 cases were settled by Searle for an undisclosed amount. See Deborah R. Hensler & Mark A. Peterson, Understanding Mass Personal Injury Litigation: A Socio-Legal Analysis, 59 BROOK. L.

REV. 961, 987-88 (1993). I attended an American Assembly conference on tort law in June 1990. One discussion group witnessed a heated argument between Michael Ciresi (who represented Copper 7 plaintiffs) and Peter Huber (a critic of modern tort law) as to whether the Searle documents that were discovered in these cases show that the Copper 7 was unduly dangerous. I myself have not seen these documents.

[FN175]. See Andrew Craig, Product Liability and Safety in General Aviation, in THE LIABILITY MAZE, supra note 170, at 456, 457.

[FN176]. Id. at 473. However, an industry representative claims that these flight manuals now partake of overwarning. Bruce E. Peterman, General Aviation Engineering in a Product Liability Environment, in Hunziker & Jones, supra note 172, at 62, 66.

[FN177]. John D. Graham, Products Liability and Motor Vehicle Safety, in THE LIABILITY MAZE, supra note 170, at 120, 181.

[FN178]. Another chapter claimed that American products liability had been ineffective--indeed, counterproductive--in encouraging safety innovations by the American auto industry. See Murray Mackay, Liability, Safety, and Innovation in the Automotive Industry, in THE LIABILITY MAZE, supra note 170, at 191. Brookings' own commentator, however, found that Mackay's evidence poorly supports his conclusion. See Robert W. Crandall, Comments on Chapters Four and Five, in THE LIABILITY MAZE, supra note 170, at 224-25.

[FN179]. See Milo Geyelin & Neal Templin, Ford Attorneys Play Unusually Large Role in Bronco II's Launch, WALL ST. J., Jan. 5, 1993, at A1. The involvement of Ford's lawyers resulted in at least marginal improvements in the safety of the design of the Bronco II, a Ford van. Id.

[FN180]. Graham, supra note 177, at 182-83. This assessment is not surprising, since only a small fraction of all auto accidents seem attributable to product defects. See Schwartz, supra note 16, at 633 (reporting that of every 320 persons suffering serious injuries in auto accidents, only one asserts a serious products liability claim).

[FN181]. See Judith P. Swazey, Prescription Drug Safety and Product Liability, in THE LIABILITY MAZE, supra note 170, at 291, 328. Note that the information in question is provided primarily to physicians rather than to ordinary consumers. Physicians (unlike, perhaps, consumers) are in a good position to make intelligent use of the information that manufacturers' warnings convey.

[FN182]. Id. at 312. One interesting finding is that the safety role of products liability is especially relevant for "me-too drugs" (a new drug by one company that seeks to imitate a successful drug already on the market). If the me-too drug's "safety profile" is worse than the profiles of other drugs in the same classes, this will serve as a "death knell." Id. at 310.

[FN183]. Id. at 328.

[FN184]. Ashford & Stone, supra note 170, at 399.

[FN185]. Two of its examples are discussed in supra text accompanying note 170 and infra text accompanying notes 209-210.

[FN186]. Telephone Interview with Charles Tremper (July 8, 1993).

[FN187]. See Steve Cable, Keeping Aquatic Facilities Afloat, PUBLIC RISK, July 1993, at 20; Ken Kutska, Playground Safety Is No Accident, PUBLIC RISK, July 1993, at 6; R.J. Steele & Bill Runnoe, Leave No Stone Unturned, PUBLIC RISK, July 1993, at 11.

[FN188]. Telephone Interview with Vincent Butt (July 7, 1993). This program also covers other City employees who regularly walk the City's streets.

[FN189]. This paragraph draws on a telephone interview with Robert Ayer (Aug. 4, 1993). He is Assistant Director of the Santa Monica Transportation Department.

[FN190]. This paragraph draws on a telephone interview with Pat Washington (Jan. 14, 1994). She is in charge of claims liason for the Medical Center.

[FN191]. See Penelope McMillan, Effort Launched to Reduce Costs of Liability Suits, L.A. TIMES, Dec. 4, 1992, at B1, B4 (quoting David Royer, a Department engineer).

[FN192]. Telephone Interview with David Royer (Jan. 14, 1994).

[FN193]. See Ronald B. Taylor, Nightmare Ahead, Coast Highway Is Pushed to Limit in L.A. County, L.A. TIMES, March 14, 1990, at B1, B4. The remainder of this paragraph draws on the L.A. Times' account.

[FN194]. During the appeal process, the case was settled for $1 million. Id.

[FN195]. Because other suits were pending, Department representatives were unwilling to explain the reasons for its decision. Id.

[FN196]. A Los Angeles City risk manager described to me the difficulties that risk managers typically face in persuading elected officials to allocate funds for the sake of safety. These officials, he indicated, are not much affected by abstract appeals to safety. Indeed, funding will generally be denied "unless we can tie it to cost savings for the City." Here the prospect of tort liability if improvements are not made often plays a key role in securing funding. Telephone Interview, supra note 192.

[FN197]. See Telephone Interview, supra note 186.

[FN198]. For citations and some discussion, see Schwartz, supra note 16, at 649-50.

[FN199]. See Claudia H. Deutsch, Returning to the Scene of the Crime, to Sue the Owner, N.Y. TIMES, June 3, 1994, at A12.

[FN200]. Id. When precautions such as these are implemented by some landlords but not others, the result probably is some combination of crime reduction and crime diversion.

[FN201]. See Elaine Johnson, Fast-Food Chains Act to Hold Down Crime and Prevent Lawsuits, WALL ST. J., Nov. 8, 1984, at 1.

[FN202]. The former is Bill Caso, whose company, Associated Claims Management, provides risk management services for Lucky's. Telephone Interview with Bill Caso (Mar. 18, 1994).

The latter risk manager requested anonymity.

[FN203]. This person also requested anonymity. He indicated that if I wanted answers with attribution, he would need first to submit his answers to the company's lawyers for review.

[FN204]. Lucky's is another supermarket chain, whose detainment policies have been discussed above. This chain also has a set of safety policies. Acting on the recommendation of its risk-management firm, Lucky's has adopted a computerized program for recording the hourly sweeps of supermarket aisles that the firm recommends. Lucky's also offers store managers a system of bonuses. The size of each bonus is reduced in a way that takes precise account of the claims record of the individual store. Telephone Interview, supra note 202.

[FN205]. See Frank J. Chaloupka et al., Alcohol-Control Policies and Motor Vehicle Fatalities, 22 J. LEGAL STUD. 161, 168, 173, 176, 180 (1993); Sloan et al., supra note 87, at 68. For journalistic confirmation of these studies' findings, see B. Drummond Ayres Jr., Big Gains Are Seen in Battle to Stem Drunken Driving, N.Y. TIMES, May 22, 1994, at 1, 14. But see Sloan et al., supra note 79, in which the Sloan team casts some doubt on its earlier finding.

[FN206]. Sloan et al., supra note 87, at 68.

[FN207]. See Amy Dokser Marcus, Fraternities Act to Lessen Risks of Legal Action, WALL ST. J., May 14, 1991, at B1, B6.

[FN208]. See Jonathan Simon, In the Place of the Parent: Risk Management and the Government of Campus Life, 3 SOC. & LEGAL STUD. 15, 29, 31, 42 nn. 33- 35 (1994).

[FN209]. Ashford & Stone, supra note 170, at 400. In 1984, a leak of poison gas at a Union Carbide plant in Bhopal, India, resulted in more than two thousand deaths and hundreds of thousands of injuries. See Daniel B. Magraw, The Bhopal Disaster: Structuring a Solution, 57 U. COLO. L. REV. 835, 836 (1986).

[FN210]. Ashford & Stone, supra note 170, at 400-01.

[FN211]. Telephone Interview with Nicholas Ashford (Feb. 16, 1994).

[FN212]. See Michael Janofsky, Quick-Pizza Pledge Dropped After Big Award For Accident, N.Y. TIMES, Dec. 22, 1993, at A1.

[FN213]. "That was certainly the thing that put us over the edge." Id. at C15 (quoting Domino's president, Thomas Monaghan).

[FN214]. Domino's practices are set forth in an article in the August 27, 1993 issue of an in-house publication, Standards & Policies, THE PEPPERONI PRESS (Domino's Pizza, Ann Arbor, MI), Aug. 27, 1993, at 6-15 (copy on file with author). Domino's "standards" are binding on both company-owned outlets and franchise outlets; Domino's "policies" are binding on the former and strongly recommended for the latter.

[FN215]. Drivers are disqualified if they have more than two moving violations during the previous year, more than one at-fault accident in the previous three years, or any citations in the previous five years for reckless driving or driving under the influence of alcohol or drugs. There are also various combinations of moving violations and at-fault accidents that can pro-

duce disqualifications. See id. at 7.

[FN216]. Telephone Interview with Tim McIntyre, Domino's National Director for Communications (Feb. 16, 1994). Domino's is directly liable for the torts of its company-owned outlets. Most Domino's outlets are franchisees. Whether the national Domino's is liable for the torts of its franchisees depends on all the applications of the doctrine of apparent agency. Yet even when the national Domino's would not be liable for these torts, it obviously has an economic interest in enabling its franchisees to escape liability. In the St. Louis case, Domino's itself was sued not just because of the driver's negligence, but rather because of its adoption of an allegedly negligent policy (the 30-minute guarantee).

[FN217]. The post-1974 New Zealand experience with auto accidents has been discussed above. See supra text accompanying notes 91-95.

[FN218]. See Danzon, supra note 132, at 203.

[FN219]. See Margaret Venell, Brief Country Reports: New Zealand, in International Workshop, supra note 95, at 568, 569.

[FN220]. See id. at 210-11.

[FN221]. See Richard S. Miller, The Future of New Zealand's Accident Compensation Scheme, 11 U. HAW. L. REV. 1, 37-38 (1989).

[FN222]. Id. at 37 n.10, 38.

[FN223]. Id. at 39-42.

[FN224]. Id. at 6 n.10. Indeed, except for auto accident cases and tort claims by employees against employers, personal-injury litigation was quite uncommon in New Zealand prior to 1974. That is, before 1974 there were very few suits against physicians, manufacturers, landowners, or public agencies. See International Workshop, supra note 95, at 645-49; see also Geoffrey Palmer, Comments: The New Zealand Experience, in International Workshop, supra note 95, at 604, 612 (reporting that medical malpractice premiums in New Zealand in 1970 were no more than NZ$28).

[FN225]. See Vennell, supra note 219, at 571. She also made clear that Sir Owen Woodhouse, the architect of the New Zealand program, "dismissed any value in the tort system without any empirical evidence about the values of the tort system. . . . He just dismissed tort, in particular, negligence out of hand." Id. at 768-69. For substanial agreement, see Geoffrey Palmer, Comments: The New Zealand Experience, in International Workshop, supra note 95, at 621, 649.

[FN226]. For her discussion of medical informed consent, see supra text accompanying note 220.

[FN227]. Vennell, supra note 219, at 712. The swimming pool problem is also mentioned by Miller. Miller, supra note 221, at 41 n.223.

[FN228]. Consider also the findings of a recent Rand survey of accidental injuries. DEBORAH R. HENSLER ET AL., COMPENSATION FOR ACCIDENTAL INJURIES IN THE

UNITED STATES (1991) [hereinafter RAND INJURY STUDY]. Of all injuries suffered by Americans that result in either a visit to the doctor or a restriction in activity, 38%--over 20 million injuries per year--are caused by "people slipping and falling down, walking into inanimate objects, or walking off of ledges, porches, and the like." Id. at 29. In some of these cases the injuries are no doubt due to the negligence of a third party (for example, a landowner) who is responsible for the presence of the "inanimate object." The larger the number of these negligence cases, the more they challenge the deterrence argument in its strong form. Even so, it seems likely that the clear majority of these injuries are exclusively due to the inattentiveness--the contributory negligence--of the victims themselves. According to the economists' theory of contributory negligence, so long as potential victims will not receive tort compensation for their injuries, their rational self-interest in avoiding injury will result in their abstaining from contributory negligence. See, e.g., LANDES & POSNER, supra note 6, at 76; SHAVELL, supra note 6, at 11. The very large number of accidental falls that seem primarily due to victim carelessness is inconsistent with this theory, and hence contradicts the stronger version of the deterrence argument. Admittedly, most Americans do walk carefully most of the time to avoid falling. The overall record of behavior is thus quite compatible with the deterrence argument in its more moderate form.

[FN229]. See, e.g., Jennifer H. Arlen, Re-Examining Liability Rules When Injurers as Well as Victims Suffer Losses, 10 INT'L REV. L. & ECON. 233 (1990); Keith N. Hylton, Costly Litigation and Legal Error Under Negligence, 6 J.L. ECON. & ORG. 433 (1990); Daniel L. Rubinfeld, The Efficiency of Comparative Negligence, 16 J. LEGAL STUD. 375 (1987); Harold Winter, Sequential Torts with Imperfect Information, 14 INT'L REV. L. & ECON. 35 (1994). Arlen is commendably explicit about a number of her assumptions. See Arlen, supra, at 235.

[FN230]. LANDES & POSNER, supra note 6, at 72.

[FN231]. SHAVELL, supra note 6, at 83-84.

[FN232]. LANDES & POSNER, supra note 6, at 72. For the Landes and Posner explanations, see id. at 72-73; for Shavell's explanations, see Shavell, supra note 6, at 84. Both books indicate that parties might make mistakes in estimating what conduct is negligent and thus might allow themselves to behave negligently. Both books also acknowledge that a party's inattentiveness can occasionally lead to negligent conduct. Shavell also refers to low-asset individuals, who might act negligently because they can predict they will escape full liability. The other explanations for "negligence cases" offered by the two books turn out to involve cases in which courts enter mistaken findings of negligence, or in which what looks like a finding of negligence turns out to be an application of strict liability. Hence these are not really cases in which defendants have acted negligently. Interestingly, in their brief discussions of the rate of negligent conduct, neither Shavell nor Landes and Posner mention liability insurance. In other sections of their books that do deal with liability insurance, the authors concede that liability insurance reduces deterrence, yet conclude that this loss of safety is efficient. See LANDES & POSNER, supra note 6, at 13; SHAVELL, supra note 6, at 212-13. But their reasoning in support of this conclusion is clearly inadequate in that it rests on the assumption that victims' tort recoveries are so complete as to leave victims indifferent to the fact of their original injuries. In fact "enforcement costs and limitations on tort damage rules render most victims 'worse off' [when liability insurance converts] injury avoidance into the package of injury-and-compensation." Schwartz, supra note 36, at 352. In truth, the efficiency of liability insurance seems indeterminate. See id. at 350-54. If so, then liability insurance is far more of a problem than Shavell and Landes and Posner are willing to acknowledge.

[FN233]. Both books do explain how the doctrine of employer vicarious liability goes a long way toward solving the problem of employees whose judgment-proof status might encourage them to behave negligently. See LANDES & POSNER, supra note 6, at 120-21; SHAVELL, supra note 6, at 170-71.

[FN234]. See Schwartz, supra note 37, at 713-19.

[FN235]. See LANDES & POSNER, supra note 6, at 74-77, 88-91; SHAVELL, supra note 6, at 9-16.

[FN236]. The relation between theory and evidence is a problem that economists routinely encounter. Many successful fields in economics--such as finance--result from a "symbiosis" between theory and empiricism. See Sam Peltzman, The Handbook of Industrial Organization: A Review Article, J. POL. ECON. 201, 211 (1991). At the least, when economists develop new models about behavior within some market relationship, they typically acknowledge the need eventually to provide those models with some empirical support. See, e.g., Symposium, New Minimum Wage Research, 46 INDUS. & LAB. REL. REV. 3 (1992). The evidence generated by these efforts at confirmation can show whether there are complicating factors or competing points that the economists' models have failed to take into account. Moreover, as the "new" economics has extended economic analysis beyond its normal market contexts, economic practitioners have often felt a special need to provide empirical verification: for in these new contexts the economists' claim that parties' behavior is dominated by self-interested rational choices is precisely the claim that needs both confirmation and clarification. Often, economists begin by observing actual behavior (such as an increase in the divorce rate), and only then seek theoretical explanations. E.g., GARY S. BECKER, A TREATISE ON THE FAMILY 245 (1981). On other occasions, economists begin with their theories and then look for empirical verification. See, e.g., William L. Parish & Robert J. Willis, Daughters, Education, and Family Budgets: Taiwan Experiences, 28 J. HUM. RES. 635 (1993) (testing theories of parental investment in children by considering retrospective data from Taiwan); Duncan Thomas, Intrahousehold Resource Allocation: An Inferential Approach, 25 J. HUM. RES. 635 (1990) (testing model of household resource allocation by considering Brazilian survey data).

[FN237]. LANDES & POSNER, supra note 6, at 10.

[FN238]. Id. at 10, 13.

[FN239]. See supra text accompanying note 54.

[FN240]. SHAVELL, supra note 6, at 292.

[FN241]. Id.

[FN242]. Id. His second response is that details that may be irrelevant now as a real-world matter may become relevant in the future as societal circumstances change. Id.

[FN243]. In high school physics I was taught that when multiplying two numbers each of which is expressed to the nearest decimal point, the product cannot achieve an accuracy that goes beyond that of the least precise of the two. (Thus, when multiplying numbers that have been measured as 2.4 and 8.637, the appropriate result is 20.7 rather than 20.7288.) Similarly,

if the processes by which liability rules affect behavior are rough and blunt, it makes little sense to strive for a high degree of refinement in the liability rules themselves.

[FN244]. Steven Shavell, On Liability and Insurance, 13 BELL. J. ECON. 120 (1982).

[FN245]. See Schwartz, supra note 36, at 346-48 (pointing out that for Shavell all of negligence consists of deliberate risk-taking; none is the result of mere inadvertence).

[FN246]. See id. at 342-43.

[FN247]. Moreover, the tendency to replace liability insurance with the avoidance of negligence would seem counterintuitive to conventional torts scholars. Only an economist such as Shavell could have originally perceived this tendency.

[FN248]. Recent reports that computerization has superseded the traditional processes of mathematical proof are considerably overstated. See Steven G. Krantz, The Immortality of Proof, 41 NOTICES OF THE AM. MATHEMATICAL SOC'Y 10 (1994).

[FN249]. Sam Peltzman's recent review article looks at recent scholarship in the field of industrial organization. See Peltzman, supra note 236. Peltzman observes that "the production of new models and tidying up of old ones seem to be [the] major goals of this research enterprise," an enterprise that is driven by its own "internal needs" rather than the need to explain empirical realities. Id. at 207. He approves the resulting gain in "rigor in the analysis of rational behavior." Id. at 206. Still, he describes "a wide, probably growing, gulf between theoretical and empirical" work, id. at 210, and he identifies industrial organization as one of several fields within economics "that has drifted toward an ingrown fascination with formalism." Id. at 216-217. Given his view that the objective of economics should be to understand the world, Peltzman regards these tendencies as unfortunate.

[FN250]. John E. Calfee & Richard Craswell, Some Effects of Uncertainty on Compliance with Legal Standards, 70 VA. L. REV. 965 (1984).

[FN251]. Mark F. Grady, A New Positive Economic Theory of Negligence, 92 YALE L.J. 799 (1983). In fact, Grady considers how defendants would behave under three different interpretations of the negligence liability rule. Id. at 801-21.

[FN252]. One approach to negligence is the Learned Hand test, pursuant to which a party is negligent if the magnitude of the risk (considering both probability and severity) exceeds the burden of risk prevention. United States v. Carroll Towing Co., 159 F.2d 169, 173 (2d Cir. 1947). The two articles take for granted this Learned Hand test. They hence assume that findings of negligence are most uncertain when the numbers on risk magnitude (probability and severity) are quite close to the numbers on risk prevention burdens.
As a realistic matter, however, it may be that juries sympathize with badly injured victims. Likewise, juries may disfavor certain defendants such as large corporations (though not physicians). Moreover, despite the clear lessons of the Learned Hand test, juries may believe that corporations behave unacceptably when they sacrifice "lives" for the sake of "profits." See Gary T. Schwartz, The Myth of the Ford Pinto Case, 43 RUTGERS L. REV. 1013, 1035-47 (1991).
If observations such as these are correct, the pattern of jury decisions on the negligence issue may differ sharply from the highly rationalistic pattern suggested by Grady and by Calfee and Craswell.

[FN253]. For another part of the explanation, see supra note 128.

[FN254]. See Schwartz, supra note 37.

[FN255]. Id. at 718.

[FN256]. Id.

[FN257]. Consider, for example, two recent articles that assume that plaintiffs and defendants are involved in an elaborate game that can be illuminated by game theory. Tai-Yeong Chung, Efficiency of Comparative Negligence: A Game Theoretic Analysis, 21 J. LEGAL STUD. 395 (1993); Daniel Orr, The Superiority of Comparative Negligence: Another Vote, 20 J. LEGAL STUD. 119 (1992). For a broader review of game theory implications, see DOUGLAS G. BAIRD ET AL., GAME THEORY AND THE LAW 19-23 (1994).

[FN258]. See COASE, supra note 1, at 29-34.

[FN259]. See Mark F. Grady, Common Law Control of Strategic Behavior: Railroad Sparks and the Farmer, 17 J. LEGAL STUD. 15 (1988).

[FN260]. See Chelius, supra note 63, at 304.

[FN261]. Moreover, by adopting this crude approach to allocation, workers' compensation eliminates the need to expensively litigate issues such as negligence and contributory negligence. Also, it satisfies injured workers' basic insurance needs. Admittedly, even if a "shared strict liability" approach is attractive, the exact level of compensation afforded to injured workers under workers' compensation needs to be carefully considered. At this point the relative responsiveness of injurers and victims to the incentives afforded by liability rules (see supra text accompanying notes 254-256) can be taken into account. For a discussion of other relevant factors, see James R. Chelius, The Influence of Workers' Compensation on Safety Incentives, 35 INDUS. & LAB. REL. REV. 235 (1982).

[FN262]. See GUIDO CALABRESI & PHILIP BOBBITT, TRAGIC CHOICES 144 (1978) (discussing public opinion).

[FN263]. See Richard H. Pildes & Elizabeth S. Anderson, Slinging Arrows at Democracy: Social Choice Theory, Value Pluralism, and Democratic Politics, 90 COLUM. L. REV. 2121, 2150, 2151 (1990) (discussing public culture).

[FN264]. The English opinions are discussed in Stephen G. Gilles, Cost-Benefit Analysis in Modern English Tort Law (unpublished manuscript, on file with author). See also Stephen G. Gilles, Inevitable Accident in Classical English Tort Law, 43 EMORY L.J. 575 (1994).

[FN265]. These benefits, as described in Part III above, are significant, but uncertain in their exact amount.

[FN266]. Donohue, supra note 6, at 1047 (citing JAMES S. KAKALIK & NICHOLAS M. PACE, COSTS AND COMPENSATION PAID IN TORT LITIGATION 69 (1986)). According to this data, in 1985 tort litigation incurred this overhead in order to deliver about $15 billion in net compensation to accident victims. Donohue does not regard this $15 billion as a

cost of the tort system; rather, he evidently appraises it as a transfer payment. For discussion of a related issue, see infra note 322.

[FN267]. NATIONAL SAFETY COUNCIL, ACCIDENT FACTS 4 (1988). This figure is for 1987.

[FN268]. See RAND INJURY STUDY, supra note 228, at 52. The Rand data are (roughly) for injuries in 1988. Id. at 13.
In 1993, the National Safety Council revised its methodology for estimating the economic costs of injuries. Given its new methodology, its estimate for the economic costs of accidents in 1992 is up to $399 billion. NATIONAL SAFETY COUNCIL, ACCIDENT FACTS 2 (1993). (Between 1987 and 1992 inflation was low and the accident rate apparently declined. Compare NATIONAL SAFETY COUNCIL, ACCIDENT FACTS 4 (1988) with NATIONAL SAFETY COUNCIL, ACCIDENT FACTS 1 (1992).)
One explanation for the difference between the Rand estimate and the NSC estimate is that the new NSC figure, unlike the Rand figure, includes the economic costs of fatal accidents. See RAND INJURY STUDY, supra note 228, at 8.

[FN269]. I rely here on a study of New York state jury verdicts prepared by Judyth W. Pendell and John R. Evancho, of the Aetna Life and Casualty Company. This study was presented at a conference on Civil Justice Reform in the 1990s held at the New York University Institute of Judicial Administration on October 15, 1993. The papers from that conference, including a revised version of the Aetna study, will be published by the NYU Press.
According to that study, pain and suffering accounts for about half the award in the average traffic accident case, the average products liability case, and the average medical malpractice case. Pain and suffering accounts for about two-thirds of the award in the average "street hazard" case, the average asbestos/environmental case, and the average case against a common carrier.
The notion that the pain-and-suffering harm of accidents is roughly equal to their economic harm seems conservative, given not only the Aetna data but also the statements by personal injury lawyers that "generals" are typically several times "specials." To be sure, the Rand study found that of the $12.9 billion that personal injury victims receive each year from the tort system, $7.7 billion compensates for economic losses, only $5.2 billion for pain and suffering. See RAND INJURY REPORT, supra note 228, at 101. But Rand reached this finding only by assuming that whenever a victim's claim settles for less than the victim's economic losses, the entire settlement should be classified as compensation for economic loss. Telephone Interview with Deborah Hensler (October 31, 1994).

[FN270]. See RAND INJURY REPORT, supra note 228, at 8.

[FN271]. See NATIONAL SAFETY COUNCIL, supra note 267, at 26 (95,000 accident fatalities in 1987).

[FN272]. A figure of $2 million per life is amply supported by MOORE & VISCUSI, supra note 74, at 69-81.

[FN273]. KAKALIK & PACE, supra note 266.

[FN274]. See RAND INJURY REPORT, supra note 228, at 8, 30-31.

[FN275]. See NATIONAL SAFETY COUNCIL, supra note 267, at 4 ($21 billion in 1987).

[FN276]. See infra notes 304-308 and accompanying text, suggesting a 1984 figure of about $130 billion.

[FN277]. See KAKALIK & PACE, supra note 266, at xiv.

[FN278]. In fact, their study finds that the compensation delivered to victims who do not file formal lawsuits is about equal to the compensation received by victims who do submit suits. See id. at 36.

[FN279]. Eighty percent of this pre-lawsuit compensation grows out of auto accidents. Id. Most of these auto claims are processed in a routine, low overhead way. Moreover, evidently because of limitations in the available data, the Kakalik-Pace auto claims figure includes compensation furnished under auto no-fault plans, which are not tort at all. Id. The overhead incurred in processing no-fault claims cannot be assigned to tort law.

[FN280]. Note here the Rand study's finding that almost 40% of all injuries are the result of people slipping and falling, or walking into objects. RAND INJURY REPORT, supra note 228, at 29. Undoubtedly, many of these injuries are exclusively due to the negligence of the victims themselves.
Also, 21% of all injuries are incurred on the job. See id. at 28. These injuries are primarily dealt with by workers' compensation rather than tort-- although injured employees certainly file many tort claims against third-party tortfeasors, such as product manufacturers.

[FN281]. See supra text accompanying note 89.

[FN282]. For death, $1 million; for injuries, an average of $25,000; for property damage, an average of $2036. See Devlin 1990, supra note 89, at 198.

[FN283]. Actually, in making this calculation Devlin relies on a more conservative estimate of the increase in fatalities: six percent. Id. at 197.

[FN284]. Id. at 199. In fact, only 11% of this 24% was due to the elimination of the "negligence" issue. Much of the cost savings was related to the replacement of private insurance companies by a state agency. This replacement eliminated all the commissions previously earned by insurance brokers. Obviously, this cost reduction is logically unrelated to the shift in liability rules as such. Id. at 200.

[FN285]. Id. at 200.

[FN286]. See supra text accompanying notes 75-76, 229-235.

[FN287]. Rather, she regards the lawyer's fee as a mere transfer payment from one party (the victim) to another (the lawyer). Telephone Interview, supra note 89.

[FN288]. No liability would eliminate the entire overhead of auto liability insurance for personal injury. This overhead is about 48% of the cost of that insurance. See KAKALIK & PACE, supra note 266, at xiii. Hence the annual savings in Quebec would be $192 million. Auto accidents would no doubt increase were tort law simply repealed. How would this increase compare to the increase observed when tort law is replaced by no-fault? On the one hand, "no liability" would reduce down to zero the cost of compulsory liability insurance.

Accordingly, it would result in an especially large increase in the number of drivers on the road, and hence the aggregate number of negligent driving incidents. Also, no liability would eliminate insurance experience rating and the incentives it provides for safe driving. On the other hand, no-fault, unlike tort and no liability, extends a guarantee of compensation to negligent drivers. This is the guarantee which, according to Devlin, results in negligence. Assume now that these two factors roughly balance out and that "no liability" would hence yield about the same accident rate as no-fault. If so, the annual $247 million increase in accident costs were liability simply repealed would exceed the annual $192 million decrease in insurance costs associated with that repeal.

[FN289]. See infra note 322.

[FN290]. Donohue fully appreciates this. See Donohue, supra note 6, at 1048 n.10. Devlin apparently does not: she reaches her conclusion that the move away from tort was "clearly inefficient" without considering at all the costs of whatever changes in driving behavior may have accompanied the shift.

[FN291]. See supra text accompanying notes 159-164.

[FN292]. See supra text accompanying notes 193-195.

[FN293]. Telephone Interview with Alison Cooley, A.M. Best Co. (March 21, 1994). The 1984 figure provided by the National Association of Insurance Commissioners is marginally lower: $2.13 billion. Telephone Interview with Jim Bugenhagen (Nov. 29, 1994). These are for "direct premiums." The lower figures for "net premiums" between 1983 and 1992 can be found in A.M. BEST CO., BEST'S AGGREGATES & AVERAGES--PROPERTY-CASUALTY 157 (1993). Net premiums increased from $1.77 billion in 1984 to $2.77 billion in 1985 and then $4.19 billion in 1992.
For a higher estimate of malpractice insurance costs in 1984, see Reynolds et al., supra note 126, at 2776 (reporting $3 billion cost for insurance purchased by physicians). Yet industry data are clearly superior to extrapolations derived from interview forms filled out by some number of physicians.

[FN294]. HEALTH PROGRAM, OFFICE OF TECHNOLOGY ASSESSMENT, IMPACT OF LEGAL REFORMS ON MEDICAL MALPRACTICE COSTS 19 (1993), indicates that the cost of self-insurance is now between 20 and 30% of the cost of actual malpractice insurance. However, self-insurance might have been less substantial in 1984.

[FN295]. See Reynolds et al., supra note 126, at 2778.

[FN296]. See PATRICIA M. DANZON, MEDICAL MALPRACTICE: THEORY, EVIDENCE, AND PUBLIC POLICY 226 (1985).

[FN297]. Reynolds et al., supra note 126.

[FN298]. Id. at 2778. The methodology relied on reports provided by physicians as to how malpractice law had affected their behavior.

[FN299]. Id. at 2780. This methodology relied on analyses of the impact of the risk of malpractice liability "on physician fees and utilization rates for a range of representative services and procedures." Id. at 2778. Actually, the two estimates were $8.4 billion and $12.1

billion. Id. at 2780. These, however, were for the entire cost of malpractice liability for physicians, and hence include the cost of malpractice insurance. I therefore subtract from the two the $3 billion figure the study identifies as the price of physician insurance in order to ascertain the cost of physicians' practice changes.

[FN300]. Danzon, for example, discusses the methodological problems and then reaches the "safe conclusion" that the Reynolds estimates are "certainly" too high. See Danzon, supra note 132, at 193.

[FN301]. See Reynolds et al., supra note 126, at 2781.

[FN302]. Support for the idea that hospital costs are about one-third of physician costs can be found in HEALTH PROGRAM, OFFICE OF TECHNOLOGY ASSESSMENT, DEFENSIVE MEDICINE AND MEDICAL MALPRACTICE 158 (1994) (discussing study prepared by the consulting firm of Lewin-VHI).

[FN303]. Rounding upwards acknowledges that certain costs of the system have not yet been considered. These include the costs entailed when doctors withdraw from certain fields, such as obstetrics. The negative consequences also include the psychological distress doctors feel when they are actually sued, and when they merely consider the possibility of being sued.

[FN304]. See WEILER ET AL., supra note 99, at 95, 98-99, advancing a figure of $3.77 billion for the economic losses incurred by adults in New York state. The economic losses suffered by children as a result of medical injuries contributes an additional $.70 billion. Id. at 103-04. The total of economic losses is hence $4.47 billion.

[FN305]. The Aetna study, discussed supra note 269, finds that pain-and-suffering awards in malpractice cases are about half of the total awards. Since this study looked only at jury verdicts that included some award for pain and suffering, it did not take account of the verdicts in many wrongful death cases, which do not include entries for pain and suffering. Yet in these cases the victim's non-monetary losses--the lost enjoyments of life--are extremely large, even though they are not formally compensable.
About one-third of the economic costs included in the Harvard calculation represent "losses of household production." See WEILER ET AL., supra note 99, at 99, 103. These losses are often included in the "services" branches of loss of consortium claims. Such "derivative" claims were not considered by the Aetna study, which focused on claims for primary injuries. While consortium claims compensate for the economic value of household services, they also afford compensation for non-economic harms, such as the loss of sociability and sexuality.
A further point is that a non-trivial number of malpractice verdicts include punitive damages. The Aetna finding that pain and suffering accounts for about half of aggregate verdicts hence suggests that the average pain-and-suffering award exceeds by some limited margin the average economic-loss award.
On balance, it seems prudent to assume that the non-economic costs of medical injuries are about equal to their economic costs, as the latter are measured by the Harvard study. Accordingly, one can reestimate the running total for medical injury costs in New York at about $8.94 billion.

[FN306]. The Harvard study derived its findings of malpractice from patients' hospital charts. Yet even when malpractice occurs in hospitals, it will not always be revealed by those charts. Moreover, only about 80% of all malpractice takes place in hospitals. See HEALTH PROGRAM, OFFICE OF TECHNOLOGY ASSESSMENT, supra note 294, at 45. The remainder

of malpractice occurs in such locations as doctors' offices. Some of the victims of these instances of malpractice never end up in hospitals; hence, the Harvard study was not able to consider them. Furthermore, even when these victims are eventually hospitalized, their hospital charts might not reveal the prior office malpractice. Assume, then, that the Harvard study underestimated actual medical injuries by 10%. (Especially in light of the Andrews study, supra notes 96 & 98, this assumption seems conservative.) The running New York 1984 total is now about $9.8 billion.

[FN307]. In 1984, the national population was approximately 13.3 times the New York state population. BUREAU OF THE CENSUS, U.S. DEP'T OF COMMERCE, STATISTICAL ABSTRACT OF THE UNITED STATES 28 (1993).

[FN308]. WEILER ET AL., supra note 99, at 131. The actual level of medical injuries was 3.3% of hospital admissions; absent malpractice law, this level would have been 3.7%. The actual level of medical injuries caused by negligence was .89%; absent malpractice law, this level would have been 1.25%.

[FN309]. While 3.3 is 11% less than 3.7, 3.7 is 12% more than 3.3.

[FN310]. WEILER ET AL., supra note 99, at 96. Of all observed medical injuries, slightly more than 25% are due to medical negligence. However, over 50% of fatal injuries and 34% of permanently disabling injuries are the result of negligence. Id. at 44-45.

[FN311]. Given their greater average severity, medical injuries caused by negligence certainly have, on average, much higher "non-economic costs" than medical injuries in general. The book prepared by the Harvard team refers (though somewhat confusingly) to the disproportionate "economic costs" associated with those negligent medical injuries. Id. at 96-97. At my request, Troyen Brennen, a member of the Harvard team, spent a number of hours trying to coax from the New York data a more precise assessment of the overall economic costs of these negligent injuries. The effort, however, was not successful.

[FN312]. Relying on a methodology that I find inadequate (see infra note 321), Danzon suggests that a 20% reduction in the rate of malpractice would justify the malpractice legal regime. See Danzon, supra note 296, at 226. The Harvard team notes that its own finding--a 29% reduction in malpractice-- satisfies the Danzon criterion. See WEILER ET AL., supra note 99, at 134. However, DeWees and Trebilcock misinterpret Danzon, and conclude that the Harvard data show that the malpractice regime produces an inadequate level of deterrence. See DeWees & Trebilcock, supra note 59, at 83.

[FN313]. See supra notes 293, 302, 305, 311 and accompanying text. See also the costs referred to in supra note 303.

[FN314]. "No one who examines the American malpractice . . . system believes that it is performing well." Jerry L. Mashaw & Theodore R. Marmor, Conceptualizing, Estimating and Reforming Fraud, Waste and Abuse in Healthcare Spending, 11 YALE J. ON REG. 455, 485 (1994).

[FN315]. For proposed restrictions on malpractice claims, see Danzon, supra note 132, at 196-99. For a proposed expansion of the malpractice regime, see Paul C. Weiler, The Case for No-Fault Medical Liability, 52 MD. L. REV. 908, 917-18 (1993).

[FN316]. See supra note 293. A recent report released by the Hudson Institute's Competitiveness Center indicates that the cost of defensive medicine for all American hospitals is now roughly $11 billion per year. DAVID M. MCINTOSH & DAVID C. MURRAY, MEDICAL MALPRACTICE LIABILITY: AN AGENDA FOR REFORM 38 (1994). This cost estimate may be restrained by the study's conservative definition of the concept of defensive medicine. An even more recent study prepared by the Office of Technology Assessment cautiously finds that "overall, a small percentage of diagnostic procedures--certainly less than 8 percent--is likely to be caused primarily by conscious concern about malpractice liability." HEALTH PROGRAM, OFFICE OF TECHNOLOGY ASSESSMENT, supra note 302, at 1.

[FN317]. Baseball players have been quoted as making somewhat similar statements: a batting average of only .300 can turn a player into a star.

[FN318]. This is implicit in Donohue, supra note 6, at 1066-1067.

[FN319]. As far as auto no-fault is concerned, the primary policy argument in its favor is that it assures compensation to all auto accident victims, regardless of the cause of their accidents. In her first paper, Devlin mentioned as a possible benefit of no-fault the point that it increases "insurance coverage" for "a portion of the driving population." See Devlin 1990, supra note 89, at 199 n.19. Reasoning, however, that the magnitude of this benefit cannot be quantified, id., Devlin ignored this benefit in declaring that no-fault is "clearly . . . inefficient." Id. at 200. In her later paper, she takes a more guarded position, acknowledging that "before policy implications emerge . . . , all costs and benefits must be evaluated." See Devlin 1992, supra note 89, at 514.

[FN320]. See, e.g., A. Schwartz, supra note 42, at 362-67, 404-11.

[FN321]. See Danzon, supra note 296, at 226. Danzon assumes that victims have a basic need for insurance, and that malpractice liability and first-party insurance are the alternative techniques for delivering insurance benefits. She then notes that first-party insurance consumes as overhead 20 cents of every dollar coming into the system, while the overhead of the tort system is 60 cents. Danzon hence concludes that the malpractice system provides the benefits of compensation/insurance in a comparatively expensive way: 40 extra cents on the dollar. Under her analysis, malpractice law needs to achieve a sufficient amount of deterrence to justify these expenses.
As a technique for evaluating the existing malpractice system, this methodology is interesting, but for several reasons inadequate. First, the malpractice recovery the tort plaintiff receives includes substantial compensation for pain and suffering. First-party insurance does not cover this element of intangible loss; moreover, pain-and-suffering awards do not further the basic economic purposes of insurance. (Elsewhere, Danzon herself recognizes this. Id. at 155-56.) Second, when the malpractice victim already has a first-party insurance policy, under the collateral source rule a tort recovery does not substitute for an insurance recovery; rather, the victim can recover on her insurance policy and then recover a second time in tort. Third, when jurisdictions repeal the collateral source rule, they render first-party insurance primary; hence persons injured by defendants' malpractice recover from their own insurance, not from tortfeasors. Finally, victims lacking first-party insurance coverage may well be risk-neutral; since they are acting rationally in dispensing with insurance, there is no welfare gain in providing them with insurance.

[FN322]. A related point can be brought forward here. Many perceive that the goal of compensatory justice is furthered when negligent defendants are required to furnish compensation

to the victims of their negligence. See Schwartz, supra note 36, at 328-31, 335-36. Obviously, this "justice" attribute of the compensation award is non-utilitarian; and certainly it resists quantification. Even so, this justice "advantage" of the tort award is hard to ignore in considering whether the tort system is on balance socially desirable.

[FN323]. See, e.g., Robert C. Ellickson, Property in Land, 102 YALE L.J. 1315 (1993) (describing effects of property regimes in a variety of societies); Gregg Easterbrook, Winning the War on Smog, NEWSWEEK, Aug. 23, 1993, at 29.
Of course, as substantial as the social benefits of many environmental programs might be, there can still be debate about whether these benefits justify the programs' costs, and whether more efficient programs could be devised. For a sampling of this debate, see ROBERT W. CRANDALL ET AL., REGULATING THE AUTOMOBILE 85-116 (1986); James E. Krier, Irrational National Air Quality Standards: Macro- and Micro-Mistakes, 22 UCLA L. REV. 323 (1974).
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