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RES IPSA LOQUITUR AND COMPLIANCE ERROR

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INTRODUCTION

In the more than thirty years since Ronald Coase's *The Problem of Social Cost*,¹ John Brown, Guido Calabresi, Robert Cooter, Peter Diamond, Richard Epstein, William Landes, Mitchell Polinsky, Richard Posner, George Priest, Gary Schwartz, Steven Shavell, and others too numerous to mention have developed an extensive

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¹ Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 1-2 (1960) (challenging Pigovian analysis which focuses on the divergence between the net private and social products of a given activity).

economic theory of accident law based on Coase's work.² Nevertheless, we still lack an economic theory of accidents. Indeed, the current economic theory of accident law seems oddly disjointed

² Important works on the economics of tort include GUIDO CALABRESI, *THE COSTS OF ACCIDENTS: A LEGAL AND ECONOMIC ANALYSIS* 14-16 (1970) (developing a theory of accident law); John P. Brown, *Toward an Economic Theory of Liability*, 2 J. LEGAL STUD. 323, 347 (1973) (developing now orthodox game-theoretic model of accident law); Guido Calabresi & Jon T. Hirschoff, *Toward a Test for Strict Liability in Torts*, 81 YALE L.J. 1055, 1084 (1972) (developing a test for strict liability and arguing that this test is more likely than classical negligence calculus to induce minimum social cost); Peter A. Diamond, *Single Activity Accidents*, 3 J. LEGAL STUD. 107, 107 (1974) (developing models to examine how tort law affects resource allocation); Richard A. Epstein, *Defenses and Subsequent Pleas in a System of Strict Liability*, 3 J. LEGAL STUD. 165, 166 (1974) (examining limits of economic analysis of systems of negligence and strict liability); Richard A. Epstein, *A Theory of Strict Liability*, 2 J. LEGAL STUD. 151, 152 (1973) (proposing causal theory of liability); Richard A. Posner, *Strict Liability: A Comment*, 2 J. LEGAL STUD. 205, 205 (1973) (arguing that corrective justice theorists misunderstand the economic consequences of strict liability). Gary Schwartz extended economic analysis to rules of contributory and comparative negligence. See Gary T. Schwartz, *Contributory and Comparative Negligence: A Reappraisal*, 87 YALE L.J. 697, 703-12 (1978).

Although Brown's article was the earliest in the mathematical tradition that now constitutes the orthodox economic theory of tort, Richard Posner offered the first positive economic theory of negligence. See Richard A. Posner, *A Theory of Negligence*, 1 J. LEGAL STUD. 29, 29 (1972) (proposing a theory explaining the social function of negligence and the system of accident liability). Subsequently he and William Landes published a series of articles that refined and extended Brown's equations. See William M. Landes & Richard A. Posner, *Causation in Tort Law: An Economic Approach*, 12 J. LEGAL STUD. 109 (1983) (proposing theory of proximate cause and cause in fact); William M. Landes & Richard A. Posner, *An Economic Theory of Intentional Torts*, 1 INT'L L. & ECON. REV. 127 (1981) (developing theory of law of intentional harms); William M. Landes & Richard A. Posner, *The Positive Economic Theory of Tort Law*, 15 GA. L. REV. 851 (1981) [hereinafter Landes & Posner, *Positive Economic Theory*] (developing general theory of accident law); William M. Landes & Richard A. Posner, *Joint and Multiple Tortfeasors: An Economic Analysis*, 9 J. LEGAL STUD. 517 (1980) [hereinafter Landes & Posner, *Joint and Multiple Tortfeasors*] (developing economic theory of joint and several tort liability); William M. Landes & Richard Posner, *Salvors, Finders, Good Samaritans, and Other Rescuers: An Economic Analysis of Law and Altruism*, 7 J. LEGAL STUD. 83 (1978) (providing unified theory of legal doctrine regulating salvage and rescue). Landes and Posner also extended economic analysis to many liability rules and situations that Brown never considered. See WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF TORT LAW* (1987) (comparing property rights with liability rules, and strict liability with negligence; developing economic model of accident law, intentional torts, joint and multiple tortfeasors, catastrophic personal injury and products liability).

Steven Shavell has also taken a leading role in developing the orthodox theory of liability rules, see generally STEVEN SHAVELL, *ECONOMIC ANALYSIS OF ACCIDENT LAW* (1987) (providing a comprehensive analysis of accident law from an economic perspective), as has George L. Priest. See George L. Priest, *A Theory of the Consumer Product Warranty*, 90 YALE L.J. 1297, 1307-19 (1981) (introducing insurance considerations).

from the underlying behavior that accident law is supposed to regulate. Economically, why do accidents take place? What makes negligent accidents common and what makes them uncommon? In short, what is the economic theory of accidents and how does it connect with the economic theory of accident law?

This Article seeks to extract a theory of accidents from the "grown order" of accident law.³ Indeed, the doctrine of *res ipsa loquitur* is an ideal place to seek this theory, because it assesses liability in the absence of clear evidence of what went wrong. In building the *res ipsa* doctrine, the courts have tried to predict situations in which negligent accidents are especially likely. Since the current economic theory of tort has practically no predictive power about when negligent accidents are likely, *res ipsa* seems a natural place to look for theoretical improvements.

The modern economic theory of accident law is principally a mathematical description of the conditions that will yield zero negligent behavior.⁴ A large literature has now concluded that if

³ Friedrich Hayek coined the terms "grown order" and "spontaneous order" to describe "a self-generating or endogenous order." Biological systems, language, markets, and the common law were the examples he gave. In Hayek's frame, the opposing idea was a "made order," which is "an exogenous order or an arrangement [which] may . . . be described as a construction, [or as] an artificial order." 1 F.A. HAYEK, *LAW, LEGISLATION AND LIBERTY* 37 (1973). Examples of made orders are an order of battle (the deployment of troops or fighting ships), a building, and statute law. To Hayek, these different kinds of human institutions—grown orders and made orders—implied different explanatory principles. If one wants to understand a made order, it truly does make sense to inquire into the design of the maker. Hayek argued that, on the other hand, the sensible thing for grown orders is to devise a positive theory that explains the observations. For instance, the theory of evolution explains much about biological systems, just as modern price theory explains markets: neither theory posits a human design. *See id.* at 38-39. Another legal work in this same tradition is BRUNO LEONI, *FREEDOM AND THE LAW* 23 (1991) (drawing analogies between the market economy and the common law and between planned economies and legislation). *See* Peter H. Aranson, *Bruno Leoni in Retrospect*, 11 HARV. J.L. & PUB. POL'Y 661, 665 (1988) (reviewing Leoni's insights and contributions; updating conclusions by tracing developments since 1961); Leonard P. Liggio & Tom G. Palmer, *Freedom and the Law: A Comment on Professor Aranson's Article*, 11 HARV. J.L. & PUB. POL'Y 713, 713 (1988) (describing the interrelationships between Leoni and the law and economics movement, as well as Leoni's impact on the movement); Tom G. Palmer, *Intellectual Property: A Non-Posnerian Law and Economics Approach*, 12 HAMLINE L. REV. 261, 263 (1989) (presenting an alternative law and economics approach to intellectual property influenced by Hayek and Leoni).

⁴ John Brown modeled the standard of care required under the negligence rule. His model, which has had tremendous influence, suggests that the negligence rule will induce both injurers and victims to use due care. *See* Brown, *supra* note 2, at 328-30. Indeed, under his model, they would both use due care even if there were no

the rule is negligence, if courts and private parties make no errors about the legal standard, if precaution is not random, and if private parties have uniform precaution costs (that is, no one is specially challenged), there will be no negligent behavior.⁵ Modern

doctrine of contributory negligence—a very striking conclusion that most economists now accept. Landes and Posner published a similar model which demonstrates that multiple tortfeasors will also use due care if the rule is negligence. See Landes & Posner, *Joint and Multiple Tortfeasors*, *supra* note 2, at 517. Important recent studies of the multiple tortfeasor problem include Jennifer H. Arlen, *Reconsidering Efficient Tort Rules for Personal Injury: The Case of Single Activity Accidents*, 32 WM. & MARY L. REV. 41, 46 (1990) [hereinafter Arlen, *Reconsidering Efficient Tort Rules*] (criticizing the emphasis on unilateral risk of orthodox economic model of accidents and developing a model which includes bilateral risk activities); Jennifer H. Arlen, *Re-Examining Liability Rules When Injurers as Well as Victims Suffer Losses*, 10 INT'L REV. L. & ECON. 233, 234 (1990) [hereinafter Arlen, *Re-Examining Liability Rules*] (reexamining the issue of efficient liability rules for injuries from bilateral-risk activities when neither party is a priori immune from liability); Lewis A. Kornhauser & Richard L. Revesz, *Sharing Damages Among Multiple Tortfeasors*, 98 YALE L.J. 831, 833-35 (1989) (examining the efficiency of joint and several liability, contribution, and noncontribution rules in the contexts of negligence and strict liability); Avon K. Leong, *Liability Rules When Injurers as Well as Victims Suffer Losses*, 9 INT'L REV. L. & ECON. 105, 110 (1989) (arguing that when injurers also suffer losses, it is more difficult to design liability rules with socially optimal effects). *But see* Mark F. Grady, *Common Law Control of Strategic Behavior: Railroad Sparks and the Farmer*, 17 J. LEGAL STUD. 15, 32-35 (1988) (reasoning that doctrine of avoidance form of contributory negligence is necessary to induce corrective precaution by victims).

⁵ The most sophisticated economic models strive to explain why we can still observe some negligence determinations in a world which has rationally responded to the Learned Hand formula. Landes and Posner give several reasons for expecting a positive number of negligence cases in spite of a rule that is designed to make negligent behavior unprofitable. Their reasons are: (1) a mistake about the legal standard by a court or a party; (2) care has a stochastic, that is, a random component; (3) the averaging inherent in the reasonable person standard; and (4) depreciating precedent. See LANDES & POSNER, *supra* note 2, at 72-73. Shavell theorizes that the chief reasons for observing negligent behavior in the real world are uncertainty, error, and misperception. He also notes that uncertainty can lead actors to overestimate the required standard of care and to use more than due care in response. See SHAVELL, *supra* note 2, at 79-85. Another reason for negligence that is now emerging in the models is the presence of positive litigation costs. When victims face positive litigation costs, injurers will sometimes find it advantageous to be negligent. See Keith N. Hylton, *Costly Litigation and Legal Error Under Negligence*, 6 J.L. ECON. & ORG. 433, 450-51 (1990) (arguing that "underdeterrence must result . . . unless the Hand formula is modified to incorporate litigation costs" and that "[l]egal error can . . . counterbalance the tendency of a negligence regime in which litigation is costly to result in undercompliance and underdeterrence"); Keith N. Hylton, *The Influence of Litigation Costs on Deterrence Under Strict Liability and Under Negligence*, 10 INT'L REV. L. & ECON. 161, 161 (1990) (asserting that strict liability and negligence rules lead to underdeterrence when litigation costs are taken into account); Janusz A. Ordover, *Costly Litigation in the Model of Single Activity Accidents*, 7 J. LEGAL STUD. 243, 257 (1978) (arguing that when litigation costs exceed the expected value of damages, tort liability may have no incentive effect on care taken); Janusz A. Ordover, *On the*

economic tort theory is thus analogous to the traditional economic theory of industrial organization, which posited that prices will be competitive if information is perfect, if buyers and sellers are numerous, if inputs and outputs are divisible, and so forth. For many modern tort theorists, finding an actual instance of negligent behavior is analogous to finding a monopoly price. It suggests an "imperfection."

Res ipsa is a legal rule that lets plaintiffs avoid proving specific negligence when they can show that the type of accident speaks of the defendant's negligence. The courts' surprising premise is that some accidents are usually caused by negligence. When the plaintiff brings his case within the doctrine, the judge tells the jury that it may infer negligence from the accident's very occurrence. This is why the doctrine embodies a theory of accidents. Although res ipsa forms an important part of negligence law, up to this point economic theorists of tort law have scarcely mentioned it in their writings.⁶ The reason for the omission is implicit in their theory. If one's overriding concern is to define the sufficient conditions for zero negligent behavior, one is unlikely to have much interest in a legal doctrine that says that negligent behavior is sometimes probable.⁷

Consequences of Costly Litigation in the Model of Single Activity Accidents: Some New Results, 10 J. LEGAL STUD. 269, 270 (1981) (comparing levels of utility when settlements are permitted and when they are not allowed).

⁶ Landes and Posner's treatment of res ipsa, which is contained in one footnote, argues that the doctrine allows the trier of fact to infer negligence from circumstantial evidence. See LANDES & POSNER, *supra* note 2, at 123 n.2. In his book on accident law, Shavell does not mention the doctrine. See SHAVELL, *supra* note 2.

⁷ Also, economists have inadvertently made it too easy for their models to settle on nonnegligent equilibria. Because the now orthodox models leave out the cause in fact limitation, a person going 26 miles per hour in the school zone is liable for children who dart out so close that even a 10 mile per hour speed would not save them. This inadvertent theoretical omission creates a discontinuity which induces uncertain actors to use too much precaution. Hence, most economic theorists think that actors are likely to use too *much* precaution, not too little. See, e.g., John E. Calfee & Richard Craswell, *Some Effects of Uncertainty on Compliance with Legal Standards*, 70 VA. L. REV. 965, 974-84 (1984) (analyzing ways in which uncertainty about the legal standard can give parties incentives to over- or undercomply with legal rules); Robert D. Cooter, *Economic Analysis of Punitive Damages*, 56 S. CAL. L. REV. 79 (1982) (using orthodox economic model to show that plaintiffs should get punitive damages only where there is intentional fault); Robert D. Cooter, *Prices and Sanctions*, 84 COLUM. L. REV. 1523, 1526-30 (1984) (arguing that the negligence rule under orthodox model contains a discontinuity); Robert D. Cooter, *Unity in Tort, Contract, and Property: The Model of Precaution*, 73 CAL. L. REV. 1, 29-45 (1985) (analyzing the relationship that would exist between tort and contract law if courts could not apply the cause in fact doctrine); Richard Craswell & John E. Calfee, *Deterrence and Uncertain Legal Standards*, 2 J.L. ECON. & ORG. 279, 280 (1986) (stating that

When we take the economic assumptions that yield non-negligent equilibria and try to use them to explain *res ipsa* cases, we get confusion. When a commercial airliner crashes, the courts apply *res ipsa loquitur*.⁸ Even when no one knows anything about how the plane crash occurred—maybe the aircraft disappeared without a trace—courts infer that someone's negligence probably caused the accident.⁹ There is nothing in the current economic theory of tort

uncertainty concerning legal standards is likely to lead to overcompliance). The omission of cause in fact from the modern understanding of negligence has led to false problems. Shavell writes, "If injurers took less than due care they would be exposed to the risk of liability, so that their expected costs would equal total accident costs." SHAVELL, *supra* note 2, at 8. Shavell would be right if there were no doctrine of cause in fact. I have argued that the discontinuity goes away when courts are able to limit negligence liability with the cause in fact requirement. See Mark F. Grady, *Discontinuities and Information Burdens: A Review of the Economic Structure of Tort Law*, 56 GEO. WASH. L. REV. 658, 667-74 (1988) (reviewing LANDES & POSNER, *supra* note 2)); Mark F. Grady, *Proximate Cause and the Law of Negligence*, 69 IOWA L. REV. 363, 391-413 (1984) (arguing that when courts examine untaken precautions and use the cause in fact doctrine, injurers will neither undercomply nor overcomply); Mark F. Grady, *A New Positive Economic Theory of Negligence*, 92 YALE L.J. 799, 818 (1983) (arguing that the cause in fact doctrine eliminates discontinuity in the negligence rule). Using a model of the negligence rule without cause in fact, Haddock and Curran have argued that comparative negligence will reduce or eliminate the discontinuity that might otherwise induce parties to use too much precaution. See David Haddock & Christopher Curran, *An Economic Theory of Comparative Negligence*, 14 J. LEGAL STUD. 49, 59-67 (1985); see also Robert D. Cooter & Thomas Ulen, *An Economic Case for Comparative Negligence*, 61 N.Y.U. L. REV. 1067, 1070 (1986) (arguing that comparative negligence relieves the problem of discontinuity); Michelle J. White, *An Empirical Test of the Comparative and Contributory Negligence Rules in Accident Law*, 20 RAND J. ECON. 308, 325-29 (1989) (asserting that incentives to exercise care to avoid accidents are greater under a contributory negligence regime than under a comparative negligence system and that incentives provided by comparative negligence to avoid accidents are weaker than is economically efficient). *But see* Mark F. Grady, *Multiple Tortfeasors and the Economy of Prevention*, 19 J. LEGAL STUD. 653, 671-72 (1990) [hereinafter Grady, *Multiple Tortfeasors*] (arguing that comparative negligence will induce more precaution than contributory negligence when parties are tempted to behave strategically).

⁸ See *Cox v. Northwest Airlines, Inc.*, 379 F.2d 893, 895 (7th Cir. 1967) (finding that *res ipsa* was available to a survivor when the deceased's commercial flight crashed without explanation), *cert. denied*, 389 U.S. 1044 (1968); *Becker v. American Airlines, Inc.*, 200 F. Supp. 839, 840 (S.D.N.Y. 1961) (holding that despite an earlier tendency to deny application of the doctrine of *res ipsa loquitur* against airlines, the doctrine is now firmly accepted in New York). For a general discussion tracing the development of the *res ipsa loquitur* doctrine in connection with aviation cases, see 1 STUART M. SPEISER & CHARLES F. KRAUSE, *AVIATION TORT LAW* §§ 1:9 to :15 (1978) and Theresa L. Kruk, Annotation, *Res Ipsa Loquitur in Aviation Accidents*, 25 A.L.R.4TH 1237 (1983).

⁹ See, e.g., *Haasman v. Pacific Alaska Air Express*, 100 F. Supp. 1, 2 (D. Alaska 1951) (holding that *res ipsa loquitur* applies when a commercial airliner disappears without a trace), *aff'd per curiam sub nom. Des Marais v. Beckman*, 198 F.2d 550 (9th

to justify this inference while there is much to oppose it. Interestingly, courts have not applied the *res ipsa* doctrine as readily to small plane crashes,¹⁰ and the *res ipsa* puzzle is only compounded if we try to use the standard economic explanations for negligent behavior as a positive tool to distinguish the private plane cases from the commercial ones.¹¹

The current economic theory of tort could suggest either that courts are mistaken about *res ipsa* cases or that the whole doctrine is just a fictional form of strict liability. Based on my informal surveys,¹² most economic theorists of tort opt for the "strict liability in disguise" theory, and usually stress that many *res ipsa* cases, including airplane crashes, are "unilateral care" accidents: only the airline can use precaution;¹³ the victims cannot. Since the 1960s economists have argued that strict liability is appropriate for unilateral care accidents. Coase and Calabresi, both of whom assumed that the unilateral case was normal, said that strict liability should be imposed on the cheaper cost avoider.¹⁴

The "strict liability in disguise" theory does not really explain the *res ipsa* doctrine. For instance, how would it explain why small plane crash cases come out differently than commercial aircraft

Cir. 1952), *cert. denied*, 344 U.S. 922 (1953).

¹⁰ See, e.g., *Kelley v. Central Nat'l Bank*, 345 F. Supp. 737, 741 (E.D. Va. 1972) (stating that *res ipsa* did not apply to the unexplained crash of a small, private airplane); *Crawford v. Rogers*, 406 P.2d 189, 193 (Alaska 1965) (same); *Herndon v. Gregory*, 81 S.W.2d 849, 852 (Ark. 1935) (same); *Rennekamp v. Blair*, 101 A.2d 669, 672 (Pa. 1954) (same), *overruled on other grounds by Griffith v. United Airlines, Inc.*, 203 A.2d 796 (Pa. 1964); *Budgett v. Soo Sky Ways, Inc.*, 266 N.W. 253, 254 (S.D. 1936) (same); *English v. Miller*, 43 S.W.2d 642, 644 (Tex. Civ. App. 1931) (same).

¹¹ Compare *Towle v. Phillips*, 172 S.W.2d 806, 808 (Tenn. 1943) (finding the doctrine inapplicable to a small, private plane crash) with *Capital Airlines, Inc. v. Barger*, 341 S.W.2d 579, 585 (Tenn. Ct. App. 1960) (holding the doctrine applicable to a small, commercial crash and distinguishing contrary private plane cases).

¹² To my knowledge there is no prior written economic theory of *res ipsa loquitur*. Nevertheless, when I presented earlier drafts at workshops, several legal economists told me that they had always thought that *res ipsa loquitur* was just a fictional form of strict liability.

¹³ Maybe the air traffic controllers could use precaution also.

¹⁴ See CALABRESI, *supra* note 2, at 136-39 (coining the term "cheapest cost avoider" and spelling out the economic argument for placing liability on that person); Coase, *supra* note 1, at 33-34 (giving example that shows liability should be placed on the cheaper cost avoider when transaction costs are high). A synonym for the unilateral care case is the alternative care case. The earlier literature assumed that either one party or the other would be using precaution. See Guido Calabresi, *Transaction Costs, Resource Allocation and Liability Rules—A Comment*, 11 J.L. & ECON. 67, 71-72 (1968) (discussing rubber bumpers and fluorescent clothing as alternative precautions to avoid automobile accidents).

ones? Both seem equally unilateral. Moreover, if *res ipsa* is really strict liability, why does the airline get off if it can show that it was not negligent? The doctrine merely shifts the burden of persuasion. Moreover, some applications of *res ipsa* do indeed occur in "bilateral" situations where both injurers and victims could have used precaution and where strict liability is economically inappropriate.¹⁵

I. COMPLIANCE ERROR AND LEARNED HAND NEGLIGENCE

Consider the problem of why drivers hit pedestrians. The answers suggested by current economic theory would be unconvincing to most people.¹⁶ The first reason is that the courts' "reasonable driver" test involves averaging, so that drivers with above average costs find it rational to be negligent.¹⁷ For example, if someone had an unusually high cost of precaution, for instance a

¹⁵ For an example of a case in which a court applied *res ipsa* to a bilateral care accident, see *Miles v. St. Regis Paper Co.*, 467 P.2d 307, 310 (Wash. 1970) (en banc) (holding the defendant liable for a death caused by an unstable load even though the plaintiff's deceased also could have taken precautions against its toppling). Strict liability is inappropriate in the bilateral (or joint care) case, because it encourages one of the parties (whoever is not liable) to throw precaution to the wind. See A. Mitchell Polinsky, *Strict Liability vs. Negligence in a Market Setting*, 70 AM. ECON. REV. 363, 367 (1980) (advocating adding a defense of contributory negligence to a strict liability rule so that the victim takes the correct amount of precaution); Steven Shavell, *Strict Liability Versus Negligence*, 9 J. LEGAL STUD. 1, 7 n.11 (1980) ("It is of course clear that under strict liability without the defense [of contributory negligence] the outcome is inefficient, for victims would have no motive to take care.").

¹⁶ Landes and Posner summarized these reasons in their leading article published in 1981. See Landes & Posner, *Positive Economic Theory*, *supra* note 2, at 879-80; see also Paul J. Heald, *Mindlessness and Nondurable Precautions*, 27 GA. L. REV. 673, 688-95 (1993) (providing psychological theory of why people are negligent).

¹⁷ For instance, about averaging, Landes and Posner write:

A related reason for expecting there to be some negligence cases, also introduced into the economic literature by [Peter] Diamond, is the "average man" or "reasonable man" concept of negligence law. Due care is judged by the capabilities of the average individual rather than by those of the particular defendant (again, presumably because of information costs). If the defendant's capabilities are below average, the costs of his taking care will be above average and he may choose a care level below the average. . . .

If an accident occurs, he will be held liable.

Landes & Posner, *Positive Economic Theory*, *supra* note 2, at 880. It would be especially irrational for most people to choose to be negligent if they operated within the formal terms of the now orthodox economic model, because this model contains no cause in fact limitation. A driver's capabilities would have to be far below average in order to make her want to be negligent.

driver with a neck injury, that person might find it rational sometimes to disobey the negligence rule until her costs became lower, as when her neck heals and she can again cheaply check her blind spot before making lane changes. Nonetheless, it seems fairly certain that low cost drivers (Richard Petty, Al Unser, Jr.?) also fail to look for pedestrians some of the time,¹⁸ so this cannot be the entire reason. Are drivers with sore necks mostly the ones colliding with other vehicles? Another possibility is an error by the driver about the legal standard,¹⁹ although this explanation also seems dubious. Obviously, drivers know that they are supposed to watch for pedestrians. A third account, which is becoming more popular, is that judicial error causes us to think that people have been negligent when they have really used due care.²⁰ In other words, the fault is with the courts, not with private parties: what courts judge to be negligent behavior is not. Nevertheless, despite this theory, drivers sometimes do fail to look for pedestrians; courts are often right to find them negligent. A final economic reason for negligent behavior is that precaution has a stochastic or random component.²¹ Although most provocative, this explanation is also

¹⁸ The evidence indicates that most people, not just a few, make driving errors. As Michael Trebilcock has recently pointed out, studies indicate that people are negligent frequently:

One study estimates that a driver makes 200 observations per mile, 20 decisions per mile, and one error every 2 miles. Those errors result in a near collision once every 500 miles, a collision once every 61,000 miles, a personal injury to some individual once every 430,000 miles, and a fatal accident once every 16 million miles.

Michael J. Trebilcock, *Incentive Issues in the Design of "No-Fault" Compensation Systems*, 39 U. TORONTO L.J. 19, 31 (1989) (reviewing and analyzing studies) (citing LESLIE G. NORMAN, ROAD TRAFFIC ACCIDENTS: EPIDEMIOLOGY, CONTROL AND PREVENTION 51 (1962)).

¹⁹ See Landes & Posner, *Positive Economic Theory*, *supra* note 2, at 880.

²⁰ See *supra* note 2. Landes and Posner write:

Either the court or the injurer may make a mistake in applying the standard to the facts. (Victims may make the same mistake, but their mistakes would result in cases in which negligence was alleged rather than in cases where it was found.) Mistakes give rise to the possibility that the parties will have divergent expectations of the likely outcome of litigation and divergent expectations can lead to litigation.

Landes & Posner, *Positive Economic Theory*, *supra* note 2, at 879.

²¹ Landes and Posner argue that,

[a]s emphasized by Peter Diamond, care has a stochastic (random) element. For example, suppose that a potential injurer tries to achieve a level of care y^* , but his realized care is $y = y^* + e$, where e is a random error term with a mean of zero. Although $E(y)$, the injurer's expected care, is y^* , there will be instances when e will be negative and y will fall below y^* . If an injury

most tautological. It says that drivers do not always look, because at random they do not. Some theorists add that there can be a lack of control that accounts for the occasional lapses. This last reason for negligent behavior also seems odd. Does something like random paralysis afflict drivers, and if so what explanatory power does this assumption add?

In short, the current economic theory of tort makes the prevalence of negligent behavior a mystery, and despite the variety of nonnegligent equilibria that economists have devised, people fail a significant fraction of the time to use the precautions that negligence law ordains for them.²² Economists have not provided convincing reasons to explain why this is the case.

A theory of why negligent behavior is common can be developed by starting with the Learned Hand formula.²³ The formula allows people who have used reasonable precaution to avoid liability. When further precautions would produce more costs than benefits, the formula allows people to stop using precaution. At this point, others (for instance, victims) become liable for any harm that results.

Economists have also stressed the different nature of strict liability. In cases where strict liability is applied, reasonable precaution does not avoid liability; indeed, in many cases even heroic precaution will not. Thus, the rule of strict liability will be violated more often than the negligence rule. The negligence rule immunizes someone who has used all cost-effective precautions; the rule of strict liability does not. Nevertheless, some economists

occurs when $y < y^*$, a court that ignored the stochastic element of care would deem the injurer negligent. Because an omniscient court would take account of the stochastic character of care and decline to find negligence whenever $E(y) = y^*$ even though the realized level of care was below y^* , Diamond's is really a point about the information costs of determining negligence in difficult cases.

Id. at 879-80 (footnote omitted) (citing Diamond, *supra* note 2, at 123-40).

²² See Grady, *Multiple Tortfeasors*, *supra* note 7, at 656-57; Mark F. Grady, *Why Are People Negligent?: Technology, Nondurable Precautions, and the Medical Malpractice Explosion*, 82 Nw. U. L. REV. 293, 310-14 (1988) (explaining how advanced technology increases the amount of negligent behavior).

²³ The Hand formula was described by Judge Learned Hand in the case of *United States v. Carroll Towing Co.*, 159 F.2d 169 (2d Cir. 1947). Under the formula, behavior is deemed negligent when the actor fails to use a precaution if the burden of its use (B) is less than the potential harm discounted by the probability of harm that the precaution would have eliminated ($P \times L$). See *id.* at 173. It is generally expressed $B < PL$.

suggested that the rule lawyers know as negligence really contains a pocket of strict liability.²⁴ This pocket is the beginning of the new theory of negligence. A pocket of strict liability within the negligence rule is a place where violations are likely, because inside the pocket even reasonable and sensible behavior could count as a violation.

The pocket of strict liability within the negligence rule is not what prior theorists have imagined it to be. For instance, Landes and Posner have said that strict liability usually attaches when a driver reasonably aiming at due care uncontrollably strays across the center line.²⁵ Nevertheless, when drivers have sudden attacks or sneeze and crash as a result, courts say that there is no liability; they do not apply strict liability.²⁶ In reality, the pocket of strict liability

²⁴ Guido Calabresi argues that:

A limit to specific deterrence . . . arises from the fact that individuals cannot control all their acts. . . .

It may seem . . . that it would be very good to forbid people from absentmindedly taking their eyes off the road while driving. . . .

Even if the penalty for the act were very severe, if people could not control their behavior the penalty would simply cause them to abstain from the category of acts—i.e., the activity—that might give rise to the proscribed act.

CALABRESI, *supra* note 2, at 109-10. Peter Diamond provides a detailed account of "stochastic precaution." Diamond, *supra* note 2, at 123-25. His idea, similar to Calabresi's, is that "in some circumstances people will be careless some of the time no matter how much effort they invest in trying to be careful." *Id.* at 124. Landes and Posner, who accepted the Calabresi-Diamond analysis, give as an example the case of a driver who "tr[ies] not to stray across the center line, but because he does not have complete control over his attentiveness, the car, road conditions, and the like, the best he can do is to drive so as to make it highly improbable that he will cross the line." LANDES & POSNER, *supra* note 2, at 72. Steven Shavell theorized that people may be negligent because they are unable to control their "momentary levels of care." SHAVELL, *supra* note 2, at 81. He poses as an example a driver who is uncontrollably negligent "because of a lapse of attention, a sudden glare, [or] a sneeze." *Id.* In the 20 years that have elapsed since Calabresi published *The Costs of Accidents*, his theory about the pocket of strict liability has guided practically all thinking on the subject.

²⁵ See LANDES & POSNER, *supra* note 2, at 72.

²⁶ See, e.g., *Zabunoff v. Walker*, 13 Cal. Rptr. 463, 465 (Dist. Ct. App. 1961) (finding that defendant was not liable for crash caused by his sneeze); *Moore v. Presnell*, 379 A.2d 1246, 1247-50 (Md. Ct. Spec. App. 1977) (finding no liability when a driver uncontrollably strayed across the center line due to unforeseen physical incapacitation); *Ballew v. Aiello*, 422 S.W.2d 396, 399-400 (Mo. Ct. App. 1967) (finding no liability for accident caused by defendant's sudden jerking of steering wheel upon waking from sleep); see also *Filippone v. Reisenburger*, 119 N.Y.S. 632, 633-34 (App. Div. 1909) (finding no liability for reflexive act); *Cordas v. Peerless Trans. Co.*, 27 N.Y.S.2d 198, 199-202 (City Ct. 1941) (finding no liability for driver who injured passersby on a sidewalk when he pulled the emergency brake and

comes from making people liable when they have not achieved perfect consistency. Actors are found negligent for committing efficient "compliance errors." Economically, this is a form of strict liability because it is a liability that attaches to social-wealth-maximizing behavior.

The key to understanding the pocket of strict liability is distinguishing between the quality and the rate of precaution. Negligence law uses the Learned Hand formula to assess shortfalls in the quality of precaution. For example, airplanes do not need perfect cargo doors in order for their owners to avoid liability. If a cargo door is reasonably well built but fails on one occasion, an airline will not necessarily be found liable, even though a latch more like the one on the Fort Knox safe would have stayed closed. If a plaintiff suggests an improved design, the court will consider not only its feasibility but also its cost effectiveness.²⁷ When it comes to designing cargo doors, the products liability rule is therefore a modification of the Hand formula.²⁸

The frequency of cargo door inspections is also a product of the Hand calculation. Thus, airlines do not need to inspect cargo doors an infinite number of times in order to avoid liability. Courts decide how many times inspections are needed by balancing the benefits against the burdens. Suppose that the inspector checked the door once, but that just before takeoff it somehow got loose. The question would be whether the expected benefit from a second inspection would be worth the cost. Suppose it would not be. The required rate of inspection would then be once per takeoff. Nevertheless, for each required rate of precaution, there will be an actual rate of compliance that may diverge from it. It seems doubtful that the efficient rate of compliance will be one hundred percent of the required precaution rate. In a lifetime of cargo door inspections, even a reasonable person may forget once or twice.

Within the framework of economic theory there are at least two possible ways of expressing the conclusion that the efficient

jumped out of his car to escape gunman); *Lobert v. Pack*, 9 A.2d 365, 367-68 (Pa. 1939) (finding no liability when defendant kicked in his sleep causing the plaintiff driver to crash the car).

²⁷ Whether products liability is somewhat different from negligence need not detain us here.

²⁸ *Res ipsa* is one theory of liability available in products cases. See, e.g., *Tamura, Inc. v. Sanyo Electric, Inc.*, 636 F. Supp. 1065, 1066 (N.D. Ill. 1986) (holding that *res ipsa* action was available against manufacturer when cassette tape deck started a restaurant fire).

compliance rate is not perfection. One explanation is that because the cost of precaution is higher on some occasions than on others, courts derive an average of these costs. In the above scenario, cargo inspectors will fail to inspect when their actual costs exceed the average. Although plausible, this formulation is ultimately unappealing because many inspectors will still inspect on days when their costs are especially high.

A more appealing formulation is that people face a cost of consistent performance that is greater than the sum of the cost of all individual trials. Nevertheless, courts often behave as if they underestimate the special cost of consistent performance; in other words, they behave as if they underestimate "compliance cost." They do not underestimate precaution cost.

In order to understand how the negligence rule works in practice, the distinction between the precaution rate and the compliance rate must be clear. The law of negligence is similar to the rules of tennis, both of which have large pockets of strict liability. In a championship tennis match, some balls are simply hit too well to be returned even by an opposing player with extraordinary skill. Many missed shots, however, are unforced errors: balls that should be easy to return but for some inexplicable reason are not returned. A possible strategy for a champion tennis player would be to reduce the number of unforced errors to zero. I doubt that even tennis champions strive to reduce unforced errors below some (very low) rate. The perfect avoidance of unforced errors would result in such a lack of daring play that the strategy would become self-defeating. Judging from recent U.S. Open matches, as a player strives to reduce unforced errors below some relatively low level, further reductions evidently become too costly.²⁹

²⁹ Although a player may lose because her low concentration level on a particular day causes unforced errors as well as forced ones, sometimes daring play causes unforced errors. For instance, in an early match from the last U.S. Open, tenth seeded Richard Krajicek beat seventeenth seed Todd Martin. The *New York Times* reported:

But in the end, Krajicek did a little more of everything in this oversized match—bigger serves at the biggest moments, more winners, more unforced errors, 16 break points saved, and 104 visits to the net—and the gambling paid off. Martin, although steadier throughout the early going, was no match for Krajicek's swashbuckling by the end.

Robin Finn, *This Time, Novotna Loses with Less Flair*, N.Y. TIMES, Sept. 6, 1993, § 1, at 25.

Automobile driving is similar. It is impossible to drive a car for any period of time without missing a required precaution. There is evidently a special cost of consistent performance, and people respond to this cost by trying to establish for themselves an efficient rate of error which is (hopefully) low. Nevertheless, in most situations judges do not recognize the special cost of consistency. They assess a penalty for every miss, even for those that must be efficient, judging from the way reasonable people behave. Thus, drivers count on being negligent (they buy insurance) even when they do not intend to be negligent.

The distinction between legally required rates of precaution and legally required rates of compliance opens a new field of study. In most activities, courts require perfect compliance; in others they do not. Two cases will help to illustrate this point. In *Kehoe v. Central Park Amusement Co.*,³⁰ the defendant set up its roller coaster so that an employee stationed at a curve had to apply the brakes before each car came around.³¹ On one occasion the employee missed for some unexplained reason, and the car went off the track.³² In upholding the plaintiff's judgment below, the court said that the miss was negligence in itself.³³

In another case, *Myers v. Beem*,³⁴ the plaintiff sued his personal injury attorney for legal malpractice.³⁵ The defendant represented the plaintiff in a separate claim against a hospital and one of its orderlies for allowing the plaintiff's gurney to crash into a metal beam.³⁶ The attorney visited Myers in the hospital shortly after the incident, agreed to represent him, but forgot to file the complaint until after the statute of limitations had run against the hospital.³⁷ The court in the initial litigation granted the hospital summary judgment on this ground.³⁸ The plaintiff then brought suit against the lawyer, who frankly admitted that he had "screwed up."³⁹ In court on the plaintiff's legal malpractice claim, the defendant

³⁰ 52 F.2d 916 (3d Cir. 1931).

³¹ See *id.* at 916-17.

³² See *id.*

³³ See *id.* at 917 ("It is not necessary for the plaintiff to call for the application of the doctrine of *res ipsa loquitur* in this case. If the brake was not applied to check the speed as the car approached . . . it was clear negligence itself.")

³⁴ 712 P.2d 1092 (Colo. Ct. App. 1985).

³⁵ See *id.* at 1093.

³⁶ See *id.*

³⁷ See *id.*

³⁸ See *id.*

³⁹ *Id.*

attorney testified that he “made a mistake.”⁴⁰ This turned out to be a good strategy for the lawyer, because the jury returned a verdict in his favor. Perhaps he offered evidence that he was normally careful. On appeal, the plaintiff contended that he was entitled to a directed verdict: indeed, the roller coaster case would seem to be a good precedent for that result. Nonetheless, the appeals court held for the defendant, stating that among lawyers there is no requirement of “infallibility.”⁴¹

The concept of a compliance rate seems useful if only to characterize the different rules of law applied in the two cases just reviewed. In the roller coaster case, the court required perfect compliance, whereas in the legal malpractice case, the court gave the noncomplying attorney a break by allowing the jury to excuse his imperfect compliance. Although a survey of the realms of these different rules is in order, no one would be seriously interested in the survey without a fuller description of how important the difference is. That is this Article’s objective. I hypothesize that the roller coaster rule is more common—that courts typically require perfect compliance rates. In support of this hypothesis I offer a modest amount of evidence beyond the roller coaster case.

When a surgeon forgets to count the sponges before she sews up a patient, she may not present a claim of innocent mistake to the jury.⁴² Similarly, I am unaware of any auto accident case in which a driver who failed to stop at a red light or stop sign has been acquitted based on the claim that he simply made an innocent mistake. Courts seem to require perfect compliance from most defendants.

One general exception is the “emergency doctrine.” In this special situation, the plaintiff or another defendant has created an emergency that contributes to the defendant’s compliance error. The courts allow juries to find the defendant nonliable for a lapse that would be clear negligence under other circumstances.⁴³

⁴⁰ *Id.*

⁴¹ *Id.* at 1094 (“An attorney owes his client a duty to employ that degree of knowledge, skill, and judgment ordinarily possessed by members of the legal profession. There is no requirement that he be infallible. . . . Making a mistake is not negligence as a matter of law.”).

⁴² *See, e.g.,* Ravi v. Williams, 536 So. 2d 1374, 1376-77 (Ala. 1988) (holding defendant surgeon liable for attending nurse’s improper sponge count during an operation).

⁴³ *See, e.g.,* Rivera v. New York City Transit Auth., 569 N.E.2d 432, 434 (N.Y. 1991) (finding that defendant was entitled to an emergency doctrine instruction to the jury when the plaintiff created an emergency by staggering onto the tracks when the

Indeed, the very fact that the emergency doctrine is regarded as an exception lends support to the argument that perfect compliance is the general rule. Another exception is the doctrine of momentary distraction. When a defendant has distracted a plaintiff from using a precaution that would have avoided the defendant's hazard, the courts often excuse the plaintiff and allow her to recover notwithstanding her negligence.⁴⁴

Based on the way terms are used in the current economic theory of tort, "compliance error" seems to be the best name for an inadvertent departure from the required rate of precaution. Thus, a compliance error usually yields a conclusion of negligence per se, whereas deficient precaution quality (or deficient precaution rate⁴⁵) has to be judged as negligence under the Hand formula. This terminology preserves a large part of modern economic theory of tort, which can now be seen as addressing situations where compliance error could not be a large factor. For example, consider a fire in which the injurer has failed to install a fire escape and the victim has failed to install a smoke alarm. Current economic theory accurately models this type of accident: neither party has used a reasonable level of precaution, and that is why each is negligent.

subway train came into the station). A person in an emergency situation "cannot reasonably be held to the same accuracy of judgment or conduct as one who has had full opportunity to reflect, even though it later appears that the actor made the wrong decision." W. PAGE KEETON ET AL., PROSSER AND KEETON ON THE LAW OF TORTS § 33, at 196 (5th ed. 1984); see also *Amaro v. City of New York*, 351 N.E.2d 665, 669 (N.Y. 1976) (holding that a firefighter injured during a response to a fire alarm was entitled to emergency doctrine jury instruction). A party requesting the emergency instruction is entitled to have the jury so charged if some evidence of a qualifying emergency is presented. If, under some reasonable view of the evidence, an actor was confronted by a sudden and unforeseen occurrence not of the actor's own making, then the reasonableness of the conduct in the face of the emergency is an issue for the jury. See *Ferrer v. Harris*, 434 N.E.2d 231, 235 (N.Y. 1982) (holding that children darting into the street could be seen as an emergency, and a determination of reasonableness under the circumstances should be left for the jury to decide). Any expansion of the emergency doctrine amounts to a restriction of the strict liability pocket within the negligence rule. See *supra* notes 24-28 and accompanying text.

⁴⁴ See W.E. Shipley, Annotation, *Momentary Forgetfulness of Danger as Contributory Negligence*, 74 A.L.R.2d 950, 960-61 (1960) (stating that "some substantial diverting circumstance must be shown"); see also *Flynn v. City of New York*, 478 N.Y.S.2d 666, 669 (N.Y. App. Div. 1984) (holding that the momentary distraction doctrine was technically inapplicable in a comparative negligence jurisdiction, but that the trial court committed no error in considering the doctrine when calculating fault apportionment).

⁴⁵ Someone could mistake the legal standard and perform a check, for example, testing of smoke alarms, less often than the legal requirement. This would not be a compliance error as I am defining that concept.

Nevertheless, most accidents governed by the negligence rule seem to involve compliance error, which current economic theories leave out.

A compliance error is a special kind of negligence which is not the same as Learned Hand negligence. The Hand concept works best for durable precautions—those that have a low compliance rate. Hence, if the issue before the court is whether a barge company should have hired a bargee, a good model for predicting the outcome is whether the cost of a bargee was less than the reduction in expected harm that a bargee would have yielded under the circumstances. A compliance error is also not a deliberate failure to use due care. If a driver deliberately blinds himself to pedestrians, that would be willful and wanton negligence, and there are special rules that authorize punitive damages and suspend obligations by others to use corrective precaution.⁴⁶ Instead, a compliance error is an inadvertent failure to use a precaution. For reasons to be explained in the next Section, compliance errors are common with high-rate precautions—precautions that must be used repetitively, such as looking for pedestrians, counting sponges, inspecting machinery, and so forth.

In negligence legal doctrine, the perfect compliance requirement strongly correlates with precautions that must be used repetitively. Consider another pair of cases. In *Mackey v. Allen*,⁴⁷ two defendants owned a building that had two exterior doors, one leading into a medical clinic owned by a third defendant and the other leading into a dark storage basement. Several weeks before the accident at issue in the lawsuit, a woman trying to get into the medical clinic entered the wrong door and fell down into the basement. On the day in question, a fourth defendant, who owned a pharmacy in the building, let a delivery person into the basement but forgot to lock the door after the delivery person had left. The plaintiff came along and mistook the basement door for the clinic door and fell down the steps.⁴⁸ The court held the clinic liable for failure to put a warning sign on the door (Learned Hand negligence),⁴⁹ and the pharmacist liable for forgetting to lock the door

⁴⁶ See Mark F. Grady, *Punitive Damages and Subjective States of Mind: A Positive Economic Theory*, 40 ALA. L. REV. 1197, 1200 (1989) (stating that punitive damages are available for willful and wanton negligence).

⁴⁷ 396 S.W.2d 55 (Ky. 1965).

⁴⁸ See *id.* at 57.

⁴⁹ See *id.* at 58.

(compliance error).⁵⁰ The fact that the pharmacist was busy filling prescriptions when he forgot to lock the door was never an issue in the lawsuit.

In the second case, *Ballew v. Aiello*,⁵¹ defendant Gilmore was a passenger in a car driven by defendant Aiello. The two were returning from a large lunch, and Gilmore was dozing in the front seat. Aiello pulled the car onto the right shoulder to avoid a car that was traveling down the middle of the road. Gilmore, roused from his sleep, grabbed the wheel, causing the car to go out of control and strike the automobile in which the plaintiff was riding as a passenger.⁵² The trial court entered judgment against both Aiello and Gilmore as joint tortfeasors.⁵³ On appeal, the court held that Gilmore was not liable for negligence because he was half asleep at the time of his allegedly negligent act.⁵⁴ The court analogized his act to an involuntary faint, for which there would be no liability under numerous precedents that the court cited.⁵⁵

When people, like the *Mackey* pharmacist, fail to observe repetitive precautionary obligations, courts rarely entertain special excuses.⁵⁶ On the other hand, when obligations are not repetitive, courts seem more inclined to consider excuses. Making people liable for understandable (efficient, reasonable) lapses creates an insurance component within the negligence rule. Strict liability for compliance errors does not make people achieve perfect compliance rates; that would not be desirable in any event, given the enormous costs of perfect compliance. Nevertheless, when people are held liable for imperfect compliance they become insurers in some

⁵⁰ See *id.* at 59.

⁵¹ 422 S.W.2d 396 (Mo. Ct. App. 1967).

⁵² See *id.* at 397-98.

⁵³ See *id.* at 397.

⁵⁴ See *id.* at 400.

⁵⁵ See *id.* at 399. Gilmore argued that "a dismissible case of actionable negligence was not made against him because, in grabbing and jerking the steering wheel, he reacted instinctively and instantaneously to the situation confronting him when roused from sleep and his action was involuntary and not volitional." *Id.* The court agreed, explaining that

to create liability for an act alleged to be negligent, it must be shown to have been the conscious act of a person's volition. He must have done that which he ought not to have done, or omitted that which he ought to have done, as a conscious being endowed with a will.

Id. In short, "[t]here cannot be an act [imposing liability for negligence] without volition." RESTATEMENT (SECOND) OF TORTS § 2 cmt. a (1977).

⁵⁶ *Myers v. Beem*, 712 P.2d 1092 (Colo. Ct. App. 1985), the legal malpractice case discussed above, is an exception. See *supra* notes 34-41 and accompanying text.

situations where insurance could be more efficiently provided through the marketplace. It therefore seems reasonable that courts should strive to reduce this insurance component. For reasons that will be suggested below,⁵⁷ and which I have developed elsewhere,⁵⁸ as technology advances and enlarges the insurance component of the negligence rule courts might respond by expanding the emergency doctrine and narrowing negligence duties. Nevertheless, even if we suppose that courts wish to excuse some compliance errors, there are enormous practical obstacles.

Uneconomic compliance errors are rarely distinguishable from economic ones. Suppose a driver has slipped below some theoretically optimum compliance rate for looking out for pedestrians. It would be impossible for a court to say whether the pedestrian was hit during an economic lapse or during an uneconomic one. Typically, compliance opportunities are independent. Which error is the ultramarginal one that is efficient, as opposed to the intramarginal one that is inefficient? In this situation, the two are theoretically, as well as practically, indistinguishable. Even for an errant driver who was at or above the optimum compliance rate for a substantial period of time prior to the error, the problem is scarcely more tractable. How could a plaintiff rebut a defendant's self-serving assertion that, before she lapsed, she was looking carefully for pedestrians?

A legal system that wishes to avoid strict liability for compliance errors—while maintaining deterrence—ultimately has to try the defendant's character. In such a system, an erring driver or surgeon could have friends and colleagues testify that the lapse in question was reasonable given the defendant's normally careful habits. This type of civil justice system would entail a much larger administrative cost than the current system. Ultimately, increasing insurance components (from new technology or other social changes) could drive us to such a legal system, but they have not done so yet.

Judicial measurement costs are especially acute when efficient and inefficient lapses are indistinguishable.⁵⁹ Many slips are like

⁵⁷ See *infra* note 78 and accompanying text.

⁵⁸ See Grady, *supra* note 22, at 332-34 (discussing possible negligence rules which would limit insurance effects); Mark F. Grady, *Better Medicine Causes More Lawsuits, and New Administrative Courts Will Not Solve the Problem*, 86 NW. U. L. REV. 1068, 1092 (1992) (book review) (noting that the common law traditionally limits insurance effects by "loading a more thoroughgoing fault standard into the liability rule" in special situations in which defendants find it particularly costly to insure plaintiffs).

⁵⁹ On the other hand, a faint is distinguishable from some other slip, as is a stupid

so many peas in a pod; the efficient ones look the same as the uneconomic ones. This is the hallmark of what I am calling compliance error. Because courts face positive measurement costs, they impose liability on all compliance errors, both economic (or inevitable) compliance errors and uneconomic (or reasonably avoidable) ones. This is the strict liability component within the negligence rule.

The idea of compliance error gives the concept of negligent behavior a more secure home in economics. The hallmark of economic theory is that people are rational maximizers. Yet, under the current version of the economic theory of tort every time we see negligent behavior we are supposedly witnessing irrational, inefficient, or at least unaccountable behavior. If all negligent behavior truly is irrational, there is enough of it in the real world to challenge economic reasoning generally. Nevertheless, if we add the concept of compliance error to the Hand formula, we get a conclusion more congenial to economic tort theory. Much negligent behavior is efficient. It is compliance error that courts cannot judge as efficient because of their positive measurement costs. Because the consequences of inefficiently low compliance rates are so disastrous and because avoiding them is the chief purpose of negligence liability, they always deserve the greatest emphasis. Nonetheless, courts hold people liable even when they have selected efficient compliance rates but have suffered lapses that an omniscient judge would forgive. Courts do not inquire whether a defendant was looking carefully for pedestrians before she forgot to look for the one she hit.⁶⁰

act by someone roused from sleep as opposed to one by someone who is fully awake. In *Robinson v. Butler*, 33 N.W.2d 821 (Minn. 1948), a case similar to *Ballew v. Aiello*, see *supra* notes 51-55 and accompanying text, the court held that a passenger who grabbed the wheel was liable for the ensuing collision: unlike the defendant in *Ballew*, the defendant in *Robinson* had not been roused from sleep. See *Robinson*, 33 N.W.2d at 822, 824. For faints and other unusual slips, it is possible for courts to judge whether they should have been avoided. Indeed, courts' measurement of unusual slips reintroduces the negligence component back into the negligence rule.

⁶⁰ The efficiency of nonzero levels of compliance error must be one reason why liability insurance for negligence is so freely available. Insurance companies generally seem to avoid covering inefficiently created risks. For example, it would be difficult for someone to buy insurance against the possibility that he will be arrested for bank robbery or become addicted to cocaine. It is important to note, however, that some compliance error is inefficient, and insurance companies seek to exclude it from coverage if they can do so without giving their insureds doubts about whether the company is planning to shirk on its obligations. The inefficient type of compliance error comes from people who have selected inefficiently low compliance rates.

II. WHEN IS NEGLIGENT BEHAVIOR LIKELY?

Assuming that courts impose strict liability for compliance errors, we can predict when (and where) negligent behavior is likely if we can predict when (and where) compliance errors are likely. Indeed, there will be more negligence in places where the rate of compliance is greatest. That is why there is more negligence on Broadway in New York City than on Main Street in Dubuque: the required compliance rate is higher in Manhattan, making the sheer number of efficient compliance errors enormously greater.

The theoretical extension just outlined provides a useful tool for analyzing *res ipsa* cases. Indeed, the foregoing reasoning is embedded in courts' *res ipsa* analysis. As explained above,⁶¹ compliance errors are more common than instances of true negligence.⁶² Nonetheless, both failures count as negligence.

In addition to purchasing third-party insurance for their possible victims, people could respond to strict liability by increasing their personal precaution rates. Someone whose required rate of precaution is 60 times a minute could aim at a precaution rate of 75 times a minute. Nonetheless, even this strategy would still yield some liability, and it also yields a degree of attention that does not pay out from a social point of view. Despite the bad consequences of accidents, obsessive attention to precaution still has its costs. Indeed, one of the main purposes of the cause in fact doctrine is to keep people aiming at a precaution rate that approximates the one assessed by courts. In the absence of a cause in fact doctrine, people would aim for unreasonably high precaution rates because the liability system, as an insurance system, is more costly than first-party insurance. People would try to avoid an inefficient insurance burden through using inefficiently high rates of precaution. Lawyers, judges, and trials cost more than claims adjusters and contracts. See George L. Priest, *The Current Insurance Crisis and Modern Tort Law*, 96 YALE L.J. 1521, 1534-39 (1987) (discussing the shift from first-party to third-party insurance and the concurrent emphasis on additional safety measures); Priest, *supra* note 2, at 1349 (noting that when judicial decisions expand the insurance component of the liability rule, people make inefficient substitutions); Michael J. Trebilcock, *The Social Insurance-Deterrence Dilemma of Modern North American Tort Law*, 24 SAN DIEGO L. REV. 929, 946 (1987) (discussing the high transaction costs associated with torts litigation). Whenever the tort system compels potential injurers to offer third-party insurance, we should observe an incentive to substitute away from the obligation, or at least to limit it. Indeed, if the courts were to eliminate the cause in fact limitation on negligence liability, and all institutional responses had been made, one would predict excessive precaution rates roughly in proportion to the excess of litigation cost over claims adjusting cost. One would also predict excessively durable precaution that economizes on compliance error and its inefficient insurance consequences.

⁶¹ See *supra* text accompanying notes 45-60.

⁶² However, in the world of appellate reporters, Learned Hand-type negligence is disproportionately common because the question of whether failure to install a better air bag was negligent is easier for a court to determine than the negligence of the failure to look for pedestrians.

Therefore, if we can find situations in which compliance errors are especially likely, these should be the instances in which courts apply *res ipsa*.

Consider two cases. In *Haasman v. Pacific Alaska Air Express*,⁶³ the plaintiffs sought to recover damages for their decedents who were passengers on defendant's flight from Alaska to Seattle. The weather was normal the day the plane disappeared. When last contacted, the plane was in the vicinity of Sitka, Alaska. The plane, its cargo, and passengers disappeared without a trace. In *Haasman*, the court held that the case could get to the jury on a *res ipsa* theory.⁶⁴ *Walston v. Lambertsen*⁶⁵ was superficially similar, only it involved a crab fishing boat.⁶⁶ When last seen, the boat "was going along just like a duck, easy, had all the time of the world."⁶⁷ As in *Haasman*, the weather was good. Nevertheless the court held that there was insufficient evidence to establish negligence on the part of the owners.⁶⁸

Why did *res ipsa* apply to the first case, but not to the second? In order to use the theory described above to account for the different results, we have to believe that the plane crash was more likely caused by a compliance error than was the boat sinking. Indeed, there are several reasons for believing this is so.

Modern commercial airplanes are citadels of precaution. Airliners have radars, radios, numerous backup systems, and a tremendous number of monitoring systems and gauges. The number and quality of these precautions ensure that commercial air transportation is extremely safe.⁶⁹ Most of the precautions are durable: they have low required rates of replacement. Once a radar system is installed, years can go by before a new one is needed. Thus, it is unlikely that a compliance error will result from the failure to replace the radar. Nevertheless, in order to be effective,

⁶³ 100 F. Supp. 1 (D. Alaska 1951), *aff'd sub nom.* Des Marais v. Beckman, 198 F.2d 550 (9th Cir. 1952), *cert. denied*, 344 U.S. 922 (1953).

⁶⁴ Actually, the parties had stipulated that if the trial court should decide that this evidence raised a jury question, judgment should be for the plaintiffs. *See id.* at 2.

⁶⁵ 349 F.2d 660 (9th Cir. 1965), *cert. denied*, 382 U.S. 980 (1966).

⁶⁶ *See id.* at 661; *see also* Smith v. O'Donnell, 12 P.2d 933, 936-37 (Cal. 1932) (holding that an air collision in which the plaintiff was riding with a barnstormer was not subject to the doctrine because the accident could have been caused exclusively by the other plane).

⁶⁷ *Walston*, 349 F.2d at 661.

⁶⁸ *See id.* at 663.

⁶⁹ *See generally* Federal Aviation Program, 49 U.S.C. §§ 1421-1443 (1988 & Supp. III 1991) (covering safety regulations and accident investigations).

all the precautions depend on complementary precautions that have much higher required rates. A radar system will warn of an approaching airplane, but the pilot must monitor the screen regularly in order to see it. An altimeter can show that the ground is near, but someone must have remembered to inspect its calibration.

Nondurable precautions such as inspection, maintenance, and monitoring have enormously high required rates on commercial aircraft.⁷⁰ One reason is the dangerous nature of flying. By virtue of its speed, a commercial aircraft can encounter more hazards in a minute than a person on foot might encounter in a day. In addition, many people are aboard a commercial aircraft, which further increases the loss that would result from a crash. For this reason alone, the danger rate on a commercial airliner is a tremendous multiple of what it is on a small, Cessna-sized aircraft. Under the Learned Hand reasoning that courts use for this type of problem, a high danger rate implies a high required rate of precaution.

A second reason why inspection has such a high required rate on commercial aircraft is because there is so much to inspect. The possibilities for compliance error on a Cessna are fewer than on a commercial airliner because there are not as many gauges to watch. At the birth of aviation, when a plane disappeared without a trace—Amelia Earhart's plane for instance—compliance error was much less likely to have been the cause of the disaster than in the *Haasman* crash.⁷¹ The reason is almost tautological: by virtue of the greater safety equipment aboard, the *Haasman* pilots had many more opportunities for compliance error than Amelia Earhart did.⁷² This theory suggests a paradox that we will see confirmed in the cases. In most instances where technology has made an activity unusually safe, that same technology has multiplied the possibilities

⁷⁰ See *supra* text accompanying notes 28-44.

⁷¹ See, e.g., *Smith v. Pacific Alaska Airways, Inc.*, 89 F.2d 253, 254 (9th Cir.), *cert. denied*, 302 U.S. 700 (1937) (holding that evidence of whether pilot was licensed is considered in deciding carrier's negligence); *Smith v. O'Donnell*, 12 P.2d 933, 936 (Cal. 1932) (early decision holding that *res ipsa* did not apply to aircraft collision). See generally Theresa L. Kruk, Annotation, *Res Ipsa Loquitur in Aviation Accidents*, 25 A.L.R.4TH 1237, 1242-1307 (1983 & Supp. 1993) (annotating state and federal cases considering applicability of and liability under *res ipsa* in aviation accidents).

⁷² See *Hargett v. Gastonia Air Serv., Inc.*, 209 S.E.2d 518, 520 (N.C. Ct. App. 1974) (holding that pilot's failure to cancel flight due to adverse weather when the aircraft was equipped for flying in conditions of low visibility did not constitute proof of pilot's negligence), *cert. denied*, 211 S.E.2d 217 (N.C. 1975).

for compliance error relative to those for unavoidable accidents.⁷³ Hence, the paradox: accidents in areas with the most safety equipment are the strongest *res ipsa* cases.⁷⁴ When a modern commercial airliner goes down, it is a much better *res ipsa* case than when a DC-3 disappears. If a nuclear reactor were to melt down, it would be an exceptionally strong *res ipsa* case.

Crab boats are almost the opposite of commercial aircraft. The required rate of precaution is lower because the danger rate is lower. The boat travels more slowly into harm's way and fewer people are on board. Since crab boat technology is so primitive, there are many hazards that will lead to its destruction without anyone having been negligent. Indeed, the cruder safety technology leads to a higher rate of unavoidable accident than there is in the air. Also, with more rudimentary technology, the required rate of precaution is lower than on a commercial aircraft. Hence, the possibilities for compliance error are lower at sea. A strong *res ipsa* case is one in which the expected rate of compliance error is high relative to the normal rate of unavoidable accident. The *Haasman* air crash was that case, but the *Walston* sinking was not.

The following Sections will elaborate and clarify the points just explained. Some readers will have already asked, "Is it not possible for technology to become so good that *res ipsa* cases against an industry actually become weaker?" The answer to this question is a qualified yes. Nowadays airlines are (probably) thinking about installing computers to monitor radar screens and to sound an alarm when a mountain or other hazard approaches. Maybe some have done so already. When radar was first installed on aircraft, the effect was to load risk into the negligence system.⁷⁵ Although radar made air travel safer, it also created a new opportunity for compliance error. When a computerized monitor is installed, one type of compliance error—a human failure to check the screen—is reduced. However, there remains the age old problem of who is watching the watchers. Computers also require inspection and

⁷³ I am using this term in the standard legal sense, which is an accident that is not avoidable through the use of due care. Hence, most unavoidable accidents can indeed be avoided, but at excessive cost.

⁷⁴ See *Higginbotham v. Mobil Oil Corp.*, 545 F.2d 422, 429 (5th Cir.) (noting that modern technology increases the scope for *res ipsa* doctrine), *cert. denied*, 434 U.S. 830 (1977); *Williams v. United States*, 218 F.2d 473, 476 (5th Cir. 1955) (same).

⁷⁵ Cf. *Allison v. Standard Air Lines, Inc.*, 65 F.2d 668, 671 (9th Cir. 1933) (affirming trial court's finding of no liability when pre-radar commercial airliner crashed into mountain during heavy fog).

maintenance, which presents another opportunity for compliance error that could offset the benefit from fewer pilot errors. Nonetheless, the offset cannot be perfect, because then it would not make sense to install the computer, which could well be the sensible thing to do.

Even if the computer reduces on net the probability of a compliance error, its installation could still increase the strength of a *res ipsa* case. The reason is that the computer also reduces the rate of unavoidable accident. Computers can process some information that a reasonable human monitor could not. From this point of view, some midair crashes will more readily be attributed to compliance error than before the computer was installed. Here, then, is the qualification mentioned above: in order for a technological advance to weaken *res ipsa* cases against an activity, it has to reduce the rate of compliance error more than it reduces the rate of unavoidable accident.⁷⁶ Most technological advances have the opposite effect.

There is a technology life cycle. Think of the introduction of the airplane. In the beginning, *res ipsa* cases were weak because the technology was so ambitious that the rate of unavoidable accident was high relative to the rate of compliance error. Then radar was invented, reducing the rate of unavoidable accident, but creating an entirely new opportunity for compliance error when the pilot failed to check the monitor. In this second stage, technology increased the number of negligence claims and the strength of *res ipsa* claims.⁷⁷ In the last stage, *res ipsa* cases again weaken as the computer-monitored radar reduces the rate of compliance error more than it reduces the rate of unavoidable accident. At present, most technological advance seems to occur in the second stage in which *res ipsa* cases become stronger.

In recent debates about the tort system, some commentators have argued that something must be seriously wrong when negligence claims are rising at the same time as objective measures of safety (fatalities per passenger mile) are improving.⁷⁸ Far from indicating flaws in the system, this is a normal and usual relation-

⁷⁶ Another way for an airline to weaken some *res ipsa* cases against itself is to install a flight recorder, which reduces the cost of the exculpatory proof.

⁷⁷ See Grady, *supra* note 22, at 293 (noting that "[r]evolutions in an industry's technology will often impose tremendous new loads on the negligence system").

⁷⁸ See *id. passim*; Priest, *supra* note 60, at 1538-39 (arguing that the extension of tort liability, while leading to additional prevention efforts by service providers, has also led to a reduction in available insurance).

ship when technology progresses. The invention of the dialysis machine saves hundreds of lives each year, but it also adds a number of negligence claims (from compliance error) that did not exist before. The paramount purpose of the negligence system is to regulate compliance error in the use of technology. It is therefore natural that advances in technology tend to increase the number of claims.

We need to distinguish the number of claims from the claims' magnitude. The development of antiseptic techniques generally decreases the magnitude of tort claims. Consider someone accidentally injured in a hunting accident before and after Lister conducted his research on the modern antiseptic.⁷⁹ Once good antiseptic techniques exist, negligent hunters will generally pay lower damages. Although a technology may reduce the magnitude of claims, it can still increase the number of claims. After the development of antiseptic techniques, when someone forgets to use them, there is a new negligence claim—against a doctor—which could not have existed before.

III. THE LEGAL DEFINITION OF RES IPSA

The *res ipsa* doctrine shifts the burden of persuasion in the negligence cases to which it applies.⁸⁰ When a plaintiff brings her case within the doctrine, the court allows the case to go to the jury with less specific plaintiff's evidence about the defendant's untaken precaution.⁸¹ Usually, the defendant must offer exculpatory evidence that she was not really negligent or that any negligence by her could not have caused the plaintiff's injury. The main way that plaintiffs get their cases to juries is by proving that defendants omitted specific precautions.⁸² *Res ipsa loquitur* is an alternative way for plaintiffs to get their negligence cases to juries.⁸³ When a

⁷⁹ See 5 ENCYCLOPEDIA OF THE SOCIAL SCIENCES 510-11 (Edwin R.A. Seligman & Alvin Johnson eds., 1933) (discussing the work of Joseph Lister).

⁸⁰ See, e.g., *McCloskey v. Koplar*, 46 S.W.2d 557, 561-62 (Mo. 1932) (holding that *res ipsa* doctrine creates an inference of negligence, not a presumption).

⁸¹ *Res ipsa* creates an inference of negligence. *Res ipsa* cases are strong or weak, judged by how clearly the plaintiff's proof and the other circumstances suggest that the defendant's negligence was the culprit.

⁸² See Mark F. Grady, *Untaken Precautions*, 18 J. LEGAL STUD. 139, 143-47 (1989).

⁸³ In *Bond v. St. Louis-San Francisco Ry. Co.*, 288 S.W. 777 (Mo. 1926), where the train on which the plaintiff was riding was wrecked as it tried to cross a washed out bridge, the court said:

plaintiff relies on the doctrine she does not have to prove that the defendant omitted a specific precaution.

The doctrine got its name in the famous case of *Byrne v. Boadle*⁸⁴ when Baron Pollock of the English Court of Exchequer allowed a plaintiff who had been struck by a falling barrel to get to a jury without evidence of what precaution the defendant had omitted. Although the plaintiff only learned of how the accident happened after he woke up in a strange bed with a horrible headache,⁸⁵ the defendant asserted that it was the plaintiff's obligation to prove exactly what precaution the workers had failed to use and that such precaution would have prevented the barrel from falling.⁸⁶ At this point Baron Pollock said, in Latin, "The thing speaks for itself."⁸⁷ The most obvious economic interpretation is that the normal proof requirements would yield too many false negatives. If *Byrne v. Boadle*-type plaintiffs had to prove specific negligence, defendants would have too little incentive to use precaution. Nonetheless, William Prosser stressed throughout his career that seeing the reason for the *res ipsa* doctrine is not the same as seeing the cases to which it applies.⁸⁸

The traditional consensus is that the doctrine, though a substantive one of tort, applies to cases in which the plaintiff possesses only circumstantial evidence that the defendant's negligence caused her injury.⁸⁹ Specific negligence cases—like

The rule of law applicable in such cases as this—call it presumption of negligence, or *res ipsa loquitur*—does not purport to relieve the plaintiff of the burden of proving in the first instance that defendant was negligent; it merely relieves him of the necessity of alleging and proving specific negligence.

Id. at 782.

⁸⁴ 159 Eng. Rep. 299 (Ex. 1863).

⁸⁵ The *Byrne* plaintiff testified: "On approaching Scotland Place and defendant's shop, I lost all recollection. I felt no blow. I saw nothing to warn me of danger." *Id.* at 299.

⁸⁶ *See id.*

⁸⁷ *Id.* at 300.

⁸⁸ *See, e.g.,* William L. Prosser, *Res Ipsa Loquitur in California*, 37 CAL. L. REV. 183 (1949).

⁸⁹ *See, e.g.,* KEETON ET AL., *supra* note 43, § 39, at 242-57 (noting that "[n]egligence, like any other fact, may be proved by circumstantial evidence"); Charles E. Carpenter, *The Doctrine of Res Ipsa Loquitur*, 1 U. CHI. L. REV. 519, 529 (1934) (arguing that circumstantial evidence should be sufficient to prove plaintiff's case); James D. Ghiardi, *Res Ipsa Loquitur in Wisconsin*, 39 MARQ. L. REV. 361, 364 (1956) (maintaining that the "principal difference between a *res ipsa* case and a specific negligence case" is that the former relies on the inference of negligence from circumstantial evidence and the latter on direct evidential facts); L. Ellis Griffith &

*United States v. Carroll Towing Co., Inc.*⁹⁰ of the Hand formula—are proved with direct evidence.⁹¹

Since the distinction between circumstantial and direct evidence is murky, the traditional scholars had difficulty defining exactly what a *res ipsa* case is. From an early date, the courts outlined the *res ipsa* doctrine as having three elements: (1) the accident should be one that does not ordinarily occur without negligence; (2) before and at the time of the accident the defendant had exclusive control of the instrumentality that caused the harm; and (3) the plaintiff did not contribute to her own injury or voluntarily encounter the risk that led to it.⁹² In many jurisdictions, pattern jury instructions give

Benjamin E. Griffith, *The Doctrine of Res Ipsa Loquitur in Negligence Actions—Old Solutions for New Problems*, 48 MISS. L.J. 259, 261 (1977) (arguing that circumstantial evidence permits the jury to infer the defendant's negligence); Fleming James, Jr., *Proof of the Breach in Negligence Cases (Including Res Ipsa Loquitur)*, 37 VA. L. REV. 179, 183-85 (1951) (asserting that circumstantial evidence can provide strong inferences of negligence to allow the jury to find negligence); David Kaye, *Probability Theory Meets Res Ipsa Loquitur*, 77 MICH. L. REV. 1456, 1458-59 (1979) (arguing that circumstantial evidence permits the jury to infer the defendant's negligence); Starling T. Morris, *Res Ipsa Loquitur in Texas*, 26 TEX. L. REV. 257, 258 (1948) (positing that "negligence may be established by circumstantial evidence as well as by direct evidence"); John F. Thorne, III, Comment, *Mathematics, Fuzzy Negligence, and the Logic of Res Ipsa Loquitur*, 75 NW. U. L. REV. 147 (1980).

⁹⁰ 159 F.2d 169 (2d Cir. 1947).

⁹¹ Consider the theory presented in the Prosser and Keeton hornbook. See KEETON ET AL., *supra* note 43, at 160-262. The treatise breaks the breach of duty issue into two questions: the "standard of conduct" and "proof." The authors then dedicate a separate chapter to each. The basic point made by these chapters is that determining whether there was a breach of duty is a two-step process: courts first determine the standard of conduct; they then examine whether the defendant's conduct measured up to it. See *id.* The authors say that the key concept for the standard of conduct is the reasonable person, and they canvass her attributes at some length (she never forgets, she is normally intelligent, etc.). See *id.* at 173-85. In the subsequent chapter on proof, the authors describe the different roles of the judge and the jury, define "legal presumption," and then launch into a discussion of *res ipsa loquitur*. The difference between *res ipsa* and the other kind of negligence (which the authors do not immediately name) corresponds to the difference between circumstantial and direct evidence. See *id.* at 242-48. Many pages later, toward the end of the chapter, the authors describe the (waning) rule in some states that the plaintiff cannot rely on *res ipsa* if she has pleaded or proved "specific negligence." *Id.* at 260-61. Here, we finally get the name of the kind of negligence that should be contrasted with *res ipsa*, but the authors do not give it such a large role. Their idea is that negligence can be proven by evidence that is so direct and convincing—in their words, evidence so "specific"—that any application of *res ipsa* would be superfluous.

The same basic division of the negligence question between the standard of conduct and proof exists in RICHARD A. EPSTEIN ET AL., *CASES AND MATERIALS ON TORTS* 119-267 (4th ed. 1984); MARC A. FRANKLIN & ROBERT L. RABIN, *CASES AND MATERIALS ON TORT LAW AND ALTERNATIVES* (4th ed. 1987); and W. PAGE KEETON ET AL., *CASES AND MATERIALS ON TORT AND ACCIDENT LAW* 155-251 (1983).

⁹² The first case that I have found outlining this gloss is *Carpue v. London &*

plaintiffs the opportunity to have the jury instructed on the "conditional res ipsa doctrine." If the jury finds that each element is satisfied, it is entitled, but not required, to find the defendant liable.⁹³ An appellate case upholding this type of a jury instruction

Brighton Ry. Co., 114 Eng. Rep. 1431 (K.B. 1844). A somewhat later English case glossed the doctrine as applicable when "the thing is . . . under the management of the defendant or his servants, and the accident is such as in the ordinary course of things does not happen if those who have the management use proper care." *Scott v. London & St. Katherine Docks Co.*, 159 Eng. Rep. 665, 667 (Ex. 1865). A later American test of the application of res ipsa requires the plaintiff to prove "(1) that there was an accident; (2) that the thing or instrumentality which caused the accident was at the time of and prior thereto under the exclusive control and management of the defendant; (3) that the accident was such that in the ordinary course of events, the defendant using ordinary care, the accident would not have happened." *Larson v. St. Francis Hotel*, 188 P.2d 513, 514 (Cal. Ct. App. 1948); *see also Miles v. St. Regis Paper Co.*, 467 P.2d 307, 309 (Wash. 1970) (en banc) (applying a similar three-part test).

⁹³ An illustrative "conditional" res ipsa case is *Gannon v. Elliot*, 23 Cal. Rptr. 2d 86 (Dist. Ct. App. 1993), in which the plaintiff originally consulted the defendant, a surgeon, to replace part of her right hip joint. For more than a year after the surgery, the plaintiff complained of pain. The plaintiff sought further medical treatment and ultimately had her entire right hip replaced by another doctor. During the second procedure, the doctor found a gray rubber cap from a surgical instrument lodged in plaintiff's hip socket. *See id.* at 87-88. In her negligence action against the first doctor, the trial court instructed the jury under California pattern jury instructions:

No. 6.35:

"You must decide the following questions concerning the injury involved in this case: [¶] Is it the kind of injury which ordinarily does not occur in the absence of negligence? [¶] Whether the injury was one which ordinarily does not occur in the absence of negligence is to be determined from the evidence presented in this trial by physicians and surgeons called as expert witnesses . . . [¶] If, and only if, you find that the plaintiff's injury was of a kind which ordinarily does not occur in the absence of negligence; that it was caused while the plaintiff was exclusively under the care or control of defendant; and that it was not due to any voluntary action or contribution by the plaintiff which was the legal cause of the injury you are instructed as follows: [BAJI No. 4.02.]"

No. 4.02:

"From the happening of the injury involved in this case, you may draw an inference that a legal cause of the occurrence was some negligent conduct on the part of the defendant. [¶] However, you shall not find that a legal cause of the occurrence was some negligent conduct on the part of the defendant unless you believe, after weighing all the evidence in the case and drawing such inferences therefrom as you believe are warranted, that it is more probable than not that the occurrence was caused by some negligent conduct on the part of the defendant."

Id. at 88-89 (alteration in original) (quoting CAL. JURY INST. CIV. 4.02, 6.35). This is a special conditional res ipsa instruction that is proper for cases involving arcane medical injuries in which juries must depend on expert testimony to know whether

is obviously a *res ipsa* one—and that is true whether the evidence of negligence was circumstantial or direct. This jury instruction definition of the doctrine may be too narrow, however. For instance, it excludes *Byrne v. Boadle*,⁹⁴ where the *res ipsa* jury instruction was not given because the instruction had not yet been invented.⁹⁵

At the pleading stage, a modern litigant might plead the elements of the *res ipsa* doctrine, which would make it clear to the other side and to the court that she intends to rely on it.⁹⁶ In some jurisdictions, a plaintiff can plead specific negligence and *res ipsa* as alternative counts.⁹⁷ The oldest practice requires the plaintiff to choose between specific negligence and *res ipsa* at the pleading stage.⁹⁸ Although pleading requirements have generally

the injury is ordinarily caused by the doctor's negligence. After the jury returned a verdict for the defendant, the plaintiff appealed on the ground that the conditional instruction actually given was error because the jury should not have been told in paragraph two of the instruction that it was limited to "the evidence presented in this trial by physicians and surgeons called as expert witnesses." *Id.* at 89. The court reversed the verdict, finding that facts of the case were comprehensible to the jurors, so that they should not have been told to refrain from relying on their own knowledge to determine whether surgical caps are ordinarily left in patient when the surgeons have been careful. *See id.* at 91-92.

⁹⁴ 159 Eng. Rep. 299 (Ex. 1863).

⁹⁵ *See supra* text accompanying notes 84-87.

⁹⁶ In many jurisdictions, a plaintiff does not have to plead the elements of *res ipsa*. *See, e.g.*, *Stalter v. Coca-Cola Bottling Co.*, 669 S.W.2d 460, 462 (Ark. 1984) (rejecting defendant's claim that plaintiff needed to plead *res ipsa loquitur*). Nonetheless, some jurisdictions hold that the plaintiff must give the other side notice at trial that she is relying on the doctrine. *See Lloyde v. West Midlands Gas Bd.*, [1971] 1 W.L.R. 749, 753 (Eng. C.A.) (ordering new trial because plaintiff did not give adequate notice to defendant that he intended to rely on doctrine).

⁹⁷ *See, e.g.*, *Quintal v. Laurel Grove Hosp.*, 397 P.2d 161 (Cal. 1964) (holding that alternative specific negligence and *res ipsa* applies where deceased's heart stopped during surgery and defendants were slow in restarting it).

⁹⁸ *See Bird v. Great Northern Ry.*, 28 L.J. Exch. 3, 3 (1858) (plaintiff who had pleaded specific untaken precaution, namely the defendant's failure to maintain its rails, could not rely on inference of negligence then available in other carrier cases). Later cases held that a plaintiff's pleading of specific untaken precautions bound her to a specific negligence theory. *See CHARLES E. CLARK, HANDBOOK OF THE LAW OF CODE PLEADING* 310-11 (2d ed. 1947); *The Great Northern*, 251 F. 826 (9th Cir. 1918); *White v. Chicago, Great Western R.R.*, 246 F. 427 (8th Cir. 1917); *Pate v. Dumbauld*, 250 S.W. 49 (Mo. 1923); *Thompson v. St. Louis-San Francisco Ry.*, 274 S.W. 531 (Mo. Ct. App. 1925); *Bogrees v. Wabash Ry.*, 266 S.W. 333 (Mo. Ct. App. 1924); *Wichita Valley Ry. v. Helms*, 261 S.W. 225 (Tex. Civ. App. 1924); *see also Forest L. Bedell, Pleading Negligence in Iowa*, 16 IOWA L. REV. 480, 490-93 (1931).

Much of the early law of *res ipsa loquitur* was oriented around the question of when it was permissible for the plaintiff to plead the defendant's negligence in general terms. *See Barbieri v. Law*, 287 P. 464, 465 (Cal. 1930) (upholding a

loosened, the distinction between specific and general negligence still seems the best definition of the *res ipsa* doctrine. With specific negligence the plaintiff relies on particular untaken precautions.⁹⁹ These become the organizers of her case.¹⁰⁰ If the plaintiff had said, "The defendant negligently failed to install a spark arrester on its locomotive," it would be a specific negligence case.¹⁰¹ If she has instead maintained, "The defendant constructed and managed its locomotive so uncarefully and unskillfully that fire escaped to the plaintiff's fields," it is a *res ipsa* case.¹⁰² Under this distinction,

complaint alleging negligence in general terms); Board of Comm'rs v. Huffman, 31 N.E. 570, 571 (Ind. 1892); Grinde v. M. & St. P. Ry., 42 Iowa 376, 377 (1876); Kuchcinski v. Curtis, 231 N.W. 569, 570 (Mich. 1930); McCauley v. Davidson, 10 Minn. 418, 422 (1865); Davis v. Guarnieri, 15 N.E. 350, 351, 358 (Ohio 1887). *But see* Ierardi v. Farmers Trust Co., 151 A. 822, 824 (Del. Super. Ct. 1928) (holding general allegations insufficient); Bogart's Adm'x v. City of Newport, 28 S.W.2d 489, 490 (Ky. Ct. App. 1930) (noting that when pleader attempts to specify negligence, facts so specified must state cause of action).

Other *res ipsa* cases using the general negligence terminology are Gish v. Los Angeles Ry., 90 P.2d 792 (Cal. 1939); Bartol v. City of Boston, 156 N.E. 844 (Mass. 1927); Bibeau v. Fred W. Pearce Corp., 217 N.W. 374 (Minn. 1928); Toroian v. Parkview Amusement Co., 56 S.W.2d 134 (Mo. 1932); Hulen v. Wheelock, 300 S.W. 479 (Mo. 1927); Meade v. Missouri Water & Steam Supply Co., 300 S.W. 515 (Mo. 1927).

⁹⁹ In specific negligence cases, the plaintiff often has alternative theories of the defendant's untaken precaution. *See, e.g.*, Ford v. Trident Fisheries Co., 122 N.E. 389, 390 (Mass. 1919) (defendant failed to put a rail on the steps from which the plaintiff fell and also failed to suspend life boat from davits); Cooley v. Public Serv. Co., 10 A.2d 673, 675 (N.H. 1940) (plaintiff theorizing that defendant power company could have prevented the harm she sustained from a loud noise that came over her telephone wire either by placing a wire mesh basket beneath the defendant power company's wires where they crossed the telephone company's wires or by insulating the wires); Nussbaum v. Lacopo, 265 N.E.2d 762, 764 (N.Y. 1970) (rejecting claim that defendant golfer failed to use due care either in hitting golf ball or in failing to shout "Fore"); Acton v. Reed, 93 N.Y.S. 911, 913-14 (App. Div. 1905) (defendant hotel failed to have standpipe, failed to have maps indicating fire exits, and also failed to unlock interior staircase, although none of these untaken precautions were a cause in fact of plaintiff's death); Stacy v. Knickerbocker Ice Co., 54 N.W. 1091, 1091-92 (Wis. 1893) (holding that although plaintiff, whose horses drowned in ice-cutting operation, alleged that defendant failed to provide a fence around thin ice, a warning to driver, or lifesaving equipment, none of these untaken precautions were simultaneously a breach of duty and a cause in fact of the horses' drowning).

¹⁰⁰ This point is developed at length in Grady, *supra* note 82 (discussing ways in which untaken precautions define the analysis of negligence cases).

¹⁰¹ *See* Sellwood v. London, M. & S. Ry., 175 L.T.R. 366, 367 (K.B. 1946) (referring to plaintiff's negligence allegations as "specific allegations"); *see also* St. Joseph & D.C.R.R. v. Chase, 11 Kan. 47, 55 (1873); Kalbfleisch v. Long Island R.R., 7 N.E. 557, 557-58 (N.Y. 1886); Parker v. London & N.E. Ry., 175 L.T.R. 137, 137 (K.B. 1945); Freemantle v. London & N.W. Ry., 5 L.T.R. 556, 556 (C.P. 1861).

¹⁰² Such a case would be like Aldridge v. Great Western Ry., 133 Eng. Rep. 1246

Byrne v. Boadle was not the first *res ipsa* case. General negligence was well known to the courts prior to 1863 in common carrier cases.¹⁰³ *Byrne* was revolutionary because it was the first non-carrier case in which a plaintiff got to a jury without proving what the defendant's untaken precaution was.

The purely formal distinction just outlined avoids a problem that the traditional theorists did not solve: some negligence cases depend exclusively on circumstantial evidence but are nonetheless tried on a specific negligence theory.¹⁰⁴ How do these cases fit into the traditional dichotomy? The traditional scholars never answered this question.¹⁰⁵

(C.P. 1841). The plaintiff's bean stack was ignited by the defendants' locomotive. The plaintiff's complaint for trespass on the case did not allege any specific acts of negligence but only that

the defendants, by their . . . servants and agents, then and there, *so carelessly, negligently, and improperly managed and directed their . . . steam-carriage and engine, and the said fire and igneous matter therein then contained . . .* that by and through the carelessness, negligence, and improper conduct of the defendants, by their . . . servants and agents in that behalf, divers sparks of fire . . . and igneous matter then and there passed, and flew from and out of the . . . steam-carriage and engine of the defendants to, into and upon the . . . stack of the plaintiff [which was] wholly burnt . . .

Id. at 1247 (emphasis added). After the defendant showed that its engine and boilers were of the customary type, the court refused to direct a verdict for plaintiff, finding instead that the plaintiff's evidence of negligence (simply that there had been a fire) was sufficient to take the case to the jury. *See id.* A similar case is *Piggot v. Eastern Counties Ry.*, 136 Eng. Rep. 92 (C.P. 1846), in which the plaintiff alleged that his cart-lodge burned down in a fire ignited by sparks from defendant's train. *See id.* at 93.

¹⁰³ Some early carrier cases applying the doctrine are *Christie v. Griggs*, 170 Eng. Rep. 1088, 1088 (Nisi Prius 1809) (allowing plaintiff's claims to reach the jury on mere proof that stagecoach wrecked); *Stokes v. Saltonstall* 38 U.S. (13 Pet.) 181, 193 (1839) (holding evidence of stage coach accident and subsequent injuries sufficient to make out a prima facie case of negligence); *Aldridge*, 133 Eng. Rep. at 1249-50 (allowing plaintiff's claims to reach the jury on mere proof that spark from defendant's locomotive landed on his bean stack and burned it); *Piggot*, 136 Eng. Rep. at 92 (similar to *Aldridge*); *Skinner v. London, Brighton & S. Coast Ry.*, 155 Eng. Rep. 345, 345 (Ex. 1850) (allowing plaintiff's claims to reach the jury on proof that he was a passenger on the plaintiff's train when it wrecked).

¹⁰⁴ *See, e.g., Johnson v. Harris*, 530 P.2d 1136, 1138-39 (Ariz. Ct. App. 1975) (explaining that deceased little boy could have entered swimming pool area in several ways, but circumstantial evidence—a telltale peanut butter sandwich—suggested that he entered in a way that made the defendant liable for specific negligence).

¹⁰⁵ Another problem for the traditional scholarship is how to account for the modern rule that cases can sometimes go to the jury on alternative specific negligence and *res ipsa* counts. *See, e.g., Quintal v. Laurel Grove Hosp.*, 397 P.2d 161, 166-67 (Cal. 1964) (allowing jury to find negligence under the *res ipsa loquitur* doctrine or in the doctor's failure to take reasonable care); *Sherman v. Hartman*, 290 P.2d 894, 900 (Cal. Dist. Ct. App. 1955); *Hugo v. Manning*, 441 P.2d 145, 151 (Kan. 1968); *W.E.*

Although the relationship between *res ipsa* and circumstantial evidence is not inevitable, there is a practical connection between the two. *Res ipsa* cases often involve compliance errors, which generally result from the omission of a nondurable precaution—a missed inspection, a forgotten look for pedestrians, and so forth. When a defendant omits this type of precaution, a specific negligence theory is unattractive simply because an omitted inspection usually leaves no direct evidence. Because a plaintiff typically cannot prove with direct evidence that a specific inspection was omitted, the plaintiff relies on *res ipsa*. By contrast, omissions of durable precautions often have equally durable traces. After a fire that destroys a building, it may not be obvious whether a fire escape was inspected, but it will be obvious if no fire escape was ever built. Thus, the Learned Hand formula and specific negligence are generally linked with omissions of durable precaution,¹⁰⁶ whereas

Shipley, Annotation, *Evidence of Specific Negligence as Affecting Reliance on Res Ipsa Loquitur*, 33 A.L.R.2d 791, 805-10 (1954 & Supp. 1989) (discussing cases which allow juries to consider both specific evidence and inference under *res ipsa*). Under the theory explained in the text, with alternative counts the jury is asked to assess the specific negligence alleged using the untaken precaution approach. See Grady, *supra* note 82, at 143-47. Alternatively, they are asked to assess negligence based on general allegations that do not implicate the untaken approach, but which often do involve assessing the elements of the *res ipsa* doctrine, such as exclusive control, and so forth. When the doctrine is not available, specific negligence must be proved, and in some jurisdictions also alleged, with particularity. See *McGhee v. National Coal Bd.*, [1973] 1 W.L.R. 1, 3 (H.L. 1972) (finding lack of specificity in pleading which claimed that defendant should have allowed brick kiln to cool "sufficiently" before sending plaintiff in to remove bricks).

¹⁰⁶ Sometimes an accident's signature will indicate the omission of a particular nondurable precaution. These cases tend to be tried on a specific negligence theory. See, e.g., *Powers v. Huizing*, 157 N.W.2d 432 (Mich. Ct. App. 1968), in which the plaintiff was thrown from a toboggan on the defendant's toboggan course during warm weather. The evidence was that she was thrown where slush had been allowed to accumulate. As the trial court succinctly said: "The finding, by the court, of the presence of slush at the bottom of the slide is tantamount to a finding that the work of creating ice and the inspection made at that time was faulty." *Id.* at 434 (quoting trial court opinion); see also *Kehoe v. Central Park Amusement Co.*, 52 F.2d 916, 917 (3d Cir. 1931) (finding that failure of brake operator on "Sleigh Ride" to hit brakes for plaintiff's car was "clear negligence itself").

Nonetheless, nondurable precaution cases are also tried on a *res ipsa* theory. An example is *Newing v. Cheatham*, 540 P.2d 33 (Cal. 1975), in which a Cessna carrying three men crashed in mountainous terrain, killing the occupants. The clock on the instrument panel was stopped at 5:18 p.m.—the precise time at which the plane should have run out of gas—and investigation of the wreck showed that the plane was out of gas when it crashed. The trial court found the evidence of *res ipsa loquitur* so clear that it directed a verdict for the plaintiff, and the California Supreme Court affirmed. See *id.* at 44. It was obvious from the accident's signature that it had been caused by someone's negligence—namely, that the pilot, who was not licensed, failed to check

many victims of nondurable negligence are obliged to rely on *res ipsa loquitur*.

IV. STOCK AND FLOW

The economist's distinction between stocks and flows can be useful to understand negligence problems, especially *res ipsa* ones. "Stocks" are simply quantities of something (such as inventory) at a particular point in time.¹⁰⁷ A "flow" is the rate of change in some quantity measured per unit of time (such as production).¹⁰⁸ Obviously, economists are not the sole owners of these concepts. If water is flowing into a barrel at a flow of three gallons a second and leaking from it at two quarts a minute, someone who remembers basic algebra could calculate the stock of water in the barrel after ten minutes has passed.

The orthodox theory of negligence presents accidents as stock problems with parties sacrificing stocks of precaution to gain larger stocks of avoided injuries. Indeed, this type of analysis is quite useful for many negligence problems. Nevertheless, the model of negligence needed to understand *res ipsa* depends on three flow concepts: the danger rate, the precaution rate, and the compliance rate.

The "danger rate" is simply the number of hazards per unit of time weighted by the magnitude of these hazards when they materialize. Thus, the danger rate increases when either the hazard rate increases (more lightning bolts per year if the roof is made of copper)¹⁰⁹ or when the magnitude of the hazard increases (greater hazard per lightning bolt if there are explosives in the warehouse).¹¹⁰ *Res ipsa* cases tend to be strongest when the danger

the gas gauge. Had investigators discovered that the plane was out of oil, rather than gas, the court probably would not have granted the plaintiff a directed verdict, since oil problems develop much more quickly and are less preventable by efficient nondurable precaution than gas problems.

¹⁰⁷ See 4 THE NEW PALGRAVE: A DICTIONARY OF ECONOMICS 506-09 (John Eatwell et al. eds, 1987).

¹⁰⁸ See *id.*

¹⁰⁹ Compare *Hellweg v. Chesapeake & Potomac Tel. Co.*, 110 F.2d 546, 549 (D.C. Cir. 1940) (holding defendant negligent for failing to use special precautions against lightning at its installation at the Naval Observatory, which had a copper roof resting on exposed steel beams) with *O'Neill v. Hemenway*, 3 So. 2d 210, 213 (La. Ct. App. 1941) (affirming judgment that defendant was not negligent in failing to use special precautions against lightning at site where strikes were rare).

¹¹⁰ Compare *Prussak v. Hutton*, 51 N.Y.S. 761, 763 (App. Div. 1898) (finding owners liable when lightning blew up their explosives dump located in residential

rate is high. As we will see, high danger rates yield high precaution rates.¹¹¹ These high precaution rates in turn yield the low rates of unavoidable accident and high rates of expected compliance error that epitomize strong *res ipsa* cases.

The "precaution rate" is the number of times per unit of time that a particular precaution must be taken. As already noted, the Hand formula is a good model of how courts determine the precaution rate.¹¹² For any given precaution, the required rate largely depends on its cost (also a flow concept) and the danger rate. Thus, the precaution rate for observing pedestrians is higher on Park Avenue in New York than on Main Street in Smalltown because, assuming that the cost of precaution being roughly the same between the two places, the danger rate is higher in New York.

The "compliance rate," in comparison, is the degree to which someone bound by the negligence rule actually achieves the precaution rate.¹¹³ In most negligence situations, the required compliance rate is 100%. Someone driving down a country road may have a required precaution rate of thirty observations a minute, or 3600 required observations over a two-hour trip.¹¹⁴ If the motorist misses just one observation and an accident results, she will be found negligent even though her compliance rate may have been well above the average motorist's. She behaved efficiently, but is nonetheless liable. This is the pocket of strict liability already referred to.¹¹⁵

The three basic flow concepts just described yield two others that are key to resolving *res ipsa* problems. The first is the "negligent accident rate." Obviously, the higher the rate of compliance error, the higher the negligent accident rate will be. Also important is the "unavoidable accident rate," which is the flow

neighborhood) *with* *Tuckashinsky v. Lehigh & W. Coal Co.*, 49 A. 308, 309 (Pa. 1901) (finding owners not liable when lightning blew up a small quantity of explosives).

¹¹¹ See *infra* text accompanying notes 116-24.

¹¹² See *supra* notes 45-60 and accompanying text.

¹¹³ Sometimes it is easier to think of the rate of compliance error, which is just the arithmetic inverse of the compliance rate. In other words, if someone's compliance rate is 97% (per unit time), her rate of compliance error is three percent.

¹¹⁴ Remember that the compliance rate is different from the precaution rate. If a person is riding a tricycle in a grassy meadow, the precaution rate for lookouts might be three times a minute; on Park Avenue the precaution rate might be 60 times a minute. A 100% compliance rate in the meadow therefore requires much less effort. Perhaps this is why most lawyers would judge a tricycle accident in a grassy meadow to be a poor prospect for the *res ipsa* doctrine.

¹¹⁵ See *supra* note 24-26 and accompanying text.

of accidents that due care (including perfect compliance) would not have prevented. A strong *res ipsa* case is one in which the negligent accident rate is high relative to the rate of unavoidable accident.

V. HIGH PRECAUTION RATES YIELD HIGH RATES OF NEGLIGENT HARM

It may seem that when there is no direct evidence of noncompliance, courts should assume that defendants complied with the standard. After all, why presume that people acted badly? Actually, courts often assume that people acted badly (that they committed compliance errors). Courts require total compliance with the required precaution rate, but they also realize that few people will meet this standard, especially in situations where the standard is most demanding. In *res ipsa* cases courts assume that if perfect compliance with the negligence standard would have been especially difficult, the defendant was probably negligent.

Consider the situation in *Byrne v. Boadle*,¹¹⁶ where workers were using a jigger-hoist to move barrels above a public sidewalk. Because the danger rate was high, so was the rate of required precaution. Once the workers had begun, there could scarcely have been a moment when precautions were not required. Was the rope still taut? Was the jigger-hoist still properly rigged? Was the barrel approaching an obstacle that might jar it loose? These were questions that the workers constantly had to ask if the people below were to remain safe. Yet, so long as the workers complied with the negligence standard, it was unlikely that there would be an accident. When people move barrels above sidewalks, the required rate of precaution is so high that little risk is left for unavoidable accidents. Nonetheless, the *Byrne* court assumed, without evidence, that the defendant was negligent, and therefore sent the case to the jury.¹¹⁷ What made that assumption reasonable?

Economists have a maxim: Tasks are more costly the shorter the period of time given for their accomplishment.¹¹⁸ Courts applying the *res ipsa* doctrine seem to follow this same rule. The economists' explanation is that a longer time period allows use of all available

¹¹⁶ 159 Eng. Rep. 299 (Ex. 1863).

¹¹⁷ The *Byrne* defendant had not produced any exculpatory evidence. See *id.* at 299-301.

¹¹⁸ See Louis De Alessi, *The Short-Run Revisited*, 57 AM. ECON. REV. 450, 452 (1967) (explaining that under orthodox theory, costs rise in the short run because some resources are fixed).

short-term techniques as well as techniques that are only available over a longer period of time.¹¹⁹ Thus, because there is a greater set of techniques available in the longer time period, costs are apt to be lower, as with any task where choice and flexibility are unconstrained.¹²⁰ Applying this maxim to accidents yields a useful generalization: High precaution rates imply low compliance rates.¹²¹

A lapse is more likely for a precaution that has a required rate of sixty times a minute (looking for pedestrians) than for one that has a rate of once every 100 years (replacing a fire escape). The high-rate precaution requires compliance within one second intervals. In contrast, the interval for the low-rate precaution is measured in years (one or two). Accordingly, there are techniques available for remembering the low-rate obligation that are simply unavailable during the one second or one minute intervals of a high-rate obligation. Suppose that negligence law requires a building superintendent to have the boiler inspected once every year. It is unlikely that he will forget, since he has a year to remember and ample opportunities to remind himself. Perhaps he will make a list; maybe his computer will remind him. On the other hand, a driver may have to look for other cars every second or two. Putting such an obligation on a list would be preposterous, and for a computer to beep at her every time she forgets—if that were possible—would simply make things worse. Even relatively low precaution rates can be demanding. For instance, a driver that is obliged to look for pedestrians six times per minute cannot perform all six looks during the last ten seconds of the minute. Nonetheless, even this standard has more flexibility than one that requires sixty looks a minute. The latter standard is so demanding that no rational person would comply with it every single minute.

If courts follow the economists' time maxim, *res ipsa* cases are especially strong when the precaution rate is high. With a stipulated rate of unavoidable accidents, a higher precaution rate implies a higher rate of compliance error and therefore a higher proportion of negligent accidents to unavoidable accidents. In fact, there are

¹¹⁹ See *id.*

¹²⁰ See *id.*

¹²¹ There is an issue as to whether the precaution in question is event-driven or memory-driven. As explained later, leaving the rate of precaution constant, the compliance rate will likely be higher for event driven precautions than for memory driven ones. See *infra* text accompanying note 182.

two other reasons why high precaution rates imply strong *res ipsa* cases. First, a high precaution rate reduces the rate of unavoidable accidents. The more often precautions have to be taken, the smaller the window of opportunity for unavoidable accidents to occur.

The second reason—really the converse of the first—why high precaution rates yield high rates of negligent harm is that a high precaution rate makes it difficult for an accident to slip through required precautions. Suppose that a pedestrian is walking through a museum. The required rate of looking out for people and objects might be five times per minute. If someone or something stumbles into the pedestrian's path and is damaged, there is a substantial possibility that the damage was not negligently caused.¹²² Each minute there would be five relatively long windows in which a nonnegligent collision could occur. Now, imagine that the pedestrian is given an extremely valuable Ming vase to carry from one part of the museum to another. Because of the higher danger rate, the required precaution rate increases, let us say to fifty times a minute. Under these new circumstances it is difficult for a nonnegligent accident to slip through the net of required precautions, because the net is now fine. Hence, as the rate of required precaution increases, the rate of expected compliance error increases, even assuming a relatively obsessive porter and the rate of unavoidable accidents decreases. Each of these effects makes *res ipsa* cases strong. Given a sufficiently high precaution rate, the mere fact of an accident carries an almost irrebuttable presumption that it had a negligent cause. Such would be the case when a nuclear reactor melts down.

Because the *Byrne* workers were moving barrels of flour, and not feathers, above a public sidewalk, the danger rate was high, implying a high precaution rate. That high precaution rate implied a low rate of unavoidable accident and a high rate of (expected) compliance error.¹²³ Therefore, *Byrne v. Boadle* was a strong *res ipsa* case. Consider *Higgs v. Maynard*,¹²⁴ decided by the English Court of Common Pleas just three years after *Byrne* was decided by the Court

¹²² In *Block v. Opera Holding Co.*, 154 N.E. 761 (Mass. 1927), the court held the *res ipsa loquitur* doctrine inapplicable to a case in which someone, probably a concessionaire, spilled a pitcher of lemonade on plaintiff while she was in sitting in defendant's theater. *See id.* at 761-62. Under the theory presented in the text, plaintiff would have had a stronger *res ipsa* case if the liquid had been hot tea.

¹²³ On the other hand, low danger rates will imply low precaution rates, and low precaution rates will imply low compliance error relative to unavoidable accidents.

¹²⁴ 14 L.T.R. 332 (C.P. 1866).

of Exchequer. The defendant and the plaintiff's employer owned adjacent commercial houses in London, between which ran an alley.¹²⁵ At the time of the accident, plaintiff was in the alley loading a truck for his employer when the end of a ladder broke through the window of the defendant's workshop above.¹²⁶ The plaintiff, hearing the noise, looked up and was struck in the left eye by fragments of falling window glass.¹²⁷ Although falling glass seems similar to the falling barrels at issue in *Byrne*, the trial court directed a verdict for the defendant, and the Court of Common Pleas affirmed.¹²⁸

Why did the *Higgs* accident not speak of the defendant's negligence when the *Byrne v. Boadle* one did? When people move ladders within warehouses the danger and precaution rates are much lower than when they move barrels over sidewalks, especially when the only window nearby faces an alley. Unless the ladder could jar a heavy coffee bag loose, the greatest risk would be bumping into a fellow worker, which (unlike a falling barrel) usually does not produce serious injury. The lower danger and precaution rates in *Higgs* imply a lower expected rate of compliance error than in *Byrne*.¹²⁹ As was just noted, in *Byrne* the required precaution rate was so high that it would be difficult for an accident to slip through—assuming perfect compliance. A high (required) precaution rate catches practically every accident and makes it a negligent harm if it slips through. The rate of unavoidable accident in *Byrne* was accordingly low. By contrast, in *Higgs* the lower (required) precaution rate would let a significant proportion of accidents slip through as unavoidable: because accidents can happen between required "looks," if the looks are widely spaced there is a greater chance of unavoidable accidents.

VI. ACCIDENT SIGNATURES

Accidents leave various evidentiary deposits, or "signatures," and a significant part of negligence analysis involves scrutinizing these signatures from different doctrinal points of view. Whether the plaintiff's theory is specific negligence or *res ipsa loquitur*, courts must often analyze circumstantial evidence. Moreover, courts face

¹²⁵ *See id.*

¹²⁶ *See id.*

¹²⁷ *See id.*

¹²⁸ *See id.*

¹²⁹ Remember that there was no evidence of specific negligence in either case.

both stock problems and flow problems when they conduct these analyses.¹³⁰

Consider a specific negligence case first: *City of Piqua v. Morris*,¹³¹ a casebook perennial. In *City of Piqua*, the accident signature was a municipal reservoir that had burst from an overwhelming flood.¹³² The plaintiff suggested that the defendant had not taken the precaution of unclogging the reservoir's overflow wickets.¹³³ The court, however, found that the defendant's conduct was not the cause in fact, because the flood was so great that even if the overflow wickets had been unclogged, the same overflow and bursting would have occurred.¹³⁴ Although *City of Piqua* involved a flow in the most literal sense, it was basically a stock problem—the court got its answer by comparing the accident signature to the untaken precaution. Through precisely this comparison the court concluded that the untaken precaution would have made no difference in the actual event, so there was no cause in fact.¹³⁵ Legal rates (such as the compliance rate, and so forth) did not influence the analysis.

¹³⁰ See *supra* part IV.

¹³¹ 120 N.E. 300 (Ohio 1918).

¹³² See *id.* at 300-01. In the United States, bursting municipal reservoirs fall under the negligence rule, rather than the rule of *Fletcher v. Rylands*, 1 L.R.-Ex. 265, 278 (1866), *aff'd*, 3 L.R.-E. & I. App. 330 (1868) (holding that persons are strictly liable for collecting hazardous materials which are likely to escape on their property). See, e.g., *Albig v. Municipal Auth.*, 502 A.2d 658, 661 (Pa. Super. Ct. 1985) (holding defendant municipality not liable when its reservoir, holding one million gallons of water, leaked into the plaintiffs' basements and houses).

¹³³ See *City of Piqua*, 120 N.E. at 300.

¹³⁴ See *id.* at 302-03.

¹³⁵ See *id.* at 303. In a similar case, the court allowed recovery where a large cinder fell onto a horse from an overhead railway, causing the horse to start and run over plaintiff. See *Lowery v. Manhattan Ry.*, 1 N.E. 608, 609, 613 (N.Y. 1885). Nonetheless, the same court refused to apply the *res ipsa* doctrine when a cinder smaller than a pinhead fell on and injured a plaintiff, since plaintiff had not proven that the proper safety appliance would have prevented the accident. See *Wiedmer v. New York Elevated R.R.*, 21 N.E. 1041 (N.Y. 1889). These cases were decided on specific negligence grounds; indeed, the court envisioned a particular untaken precaution, namely, a better spark arrester. The accident signature—whether the cinder was large or small—had a bearing on cause in fact: if the cinder was large, the accident surely would not have occurred but for the negligence, since a spark arrester would have trapped a large cinder. If the cinder was small, even an improved spark arrester might not have prevented the harm. A sufficiently small cinder could easily have passed through any reasonable spark arrester that the railroad could have installed, and there would have been no cause in fact.

By contrast, in the famous *res ipsa* case of *Ybarra v. Spangard*,¹³⁶ the court was faced with a flow problem. The plaintiff underwent an appendectomy under a general anesthetic. Prior to the operation he had never suffered any chronic pain in his right arm or shoulder, but after the operation he felt a sharp pain about half way between the neck and the point of the right shoulder. Ultimately, his shoulder muscles began to atrophy, and paralysis set in. The plaintiff sued all of the medical personnel who had custody over him during the time he was unconscious. Obviously, the plaintiff was unable to say what their untaken precaution (specific negligence) was, and he was thus unable to present the court with the same type of soluble stock problem that allowed the plaintiff to recover in *City of Piqua*. Nonetheless, the court allowed the *Ybarra* plaintiff to recover on a *res ipsa* theory.¹³⁷

To see the nature of the flow problem confronting the *Ybarra* court, compare *Farber v. Olkon*,¹³⁸ a case decided by the same court about ten years later. In *Farber*, plaintiff submitted to electroshock therapy, which rendered him just as unconscious as the plaintiff in *Ybarra*. As a result of the electroshock treatment, the *Farber* plaintiff suffered several broken bones, and he sued those who had custody over him during treatment.¹³⁹ The court, however, did not allow the injured patient to recover damages.¹⁴⁰

Accident signatures were important in both *Ybarra* and *Farber*, but not in the same way as under a specific negligence theory.¹⁴¹ When, as in *Ybarra*, a patient has suffered trauma unrelated to his surgery, it is highly probable that the cause was some hospital employee's compliance error. A paradigmatically strong *res ipsa* case is one in which a durable precaution¹⁴² is an almost completely effective method of avoiding accidents with the given signature, but where this same durable precaution requires complementary

¹³⁶ 154 P.2d 687 (Cal. 1944).

¹³⁷ See *id.* at 691.

¹³⁸ 254 P.2d 520 (Cal. 1953).

¹³⁹ See *id.* at 522.

¹⁴⁰ See *id.* at 526.

¹⁴¹ If *Ybarra* and *Farber* had been specific negligence cases, the plaintiffs would have identified particular untaken precautions—maybe a better gurney in *Ybarra* and better restraining belts in *Farber*. The question would have been whether the accident signature was consistent with due care—whether a better gurney would have prevented the trauma in *Ybarra* and whether better restraining belts would have prevented the broken bones in *Farber*.

¹⁴² See *supra* text accompanying note 69.

high-rate doses of nondurable precaution¹⁴³ in order to be effective. *Ybarra* was closer to that paradigmatic case than *Farber*. If hospital employees look out for unconscious patients, those patients will rarely experience trauma to undiseased parts of their bodies. Moving unconscious patients involves many repetitive precautions, one of which is to ensure that excessive force is not used. Alternatively, perhaps a hospital employee neglected a critical check of the sidebar of the gurney, and the *Ybarra* plaintiff fell off on the way back from the operating room. Whatever the compliance error, any cause beyond hospital employee negligence seems unlikely.¹⁴⁴

Also notice that the *Farber* result suggests the importance to *res ipsa* of the compliance error concept. It is quite conceivable that better restraining belts or lesser amounts of electricity would sharply reduce the number of broken bones suffered by electroshock victims. Nonetheless, the court seemed to insist that the accident bear a signature of the defendant's compliance error—as opposed to the Learned Hand type of negligence. The *Farber* court noted that electroshock patients often suffer broken bones even when no one has been negligent. Since there was no mention of the durable precautions (better restraining belts, etc.) that could reduce this type of harm, the court seems to have used the concept of negligence in its compliance error sense.

The style of *res ipsa* analysis typified by *Ybarra* and *Farber* is more subtle than the stock problem involved in *City of Piqua*. In *City of Piqua*, the court was required only to compare the magnitude of the actual disaster to the performance capability of an identified untaken precaution. This is stock analysis; the *Ybarra* and *Farber* courts were engaged in flow analysis. In both those cases the question was not “Would a particular precaution have prevented a particular harm?” but instead “What proportion of the time would this signature be produced by compliance error instead of unavoidably?” In *City of Piqua*, technology entered, but only to form the basis for a static comparison of disaster with precaution capability. In *Ybarra* and *Farber* the court's knowledge of the technology had to be more subtle. The court had to estimate how often technology of a given type would produce a compliance error with a particular

¹⁴³ See *supra* text accompanying note 70.

¹⁴⁴ Note that if the *Ybarra* plaintiff's surgical wound had instead become infected, this would not have been a good *res ipsa* case, since infections can result even when there has been no compliance error by hospital employees.

signature relative to how often the same signature would be produced without compliance error or any other type of negligence.

Accidents take their signatures from the context of the technology involved. Cases in which jolts hurt people are good examples because such cases are often brought on *res ipsa* theories. Some jolts lead to *res ipsa* recoveries; others do not. The distinction lies in the technology. In *Kohler v. Aspen Airways, Inc.*,¹⁴⁵ the plaintiff, a passenger on defendant's commercial airliner, suffered neck injuries when the plane suddenly dropped 500 feet after encountering clear air turbulence. The trial court denied the plaintiff's request to have the case sent to the jury on a *res ipsa* theory, and the California Court of Appeals affirmed.¹⁴⁶ Jolts to aircraft passengers often occur even when the crews have committed no compliance error, and consequently these cases almost always result in no liability.¹⁴⁷ If someone invents a device that can warn of approaching wind shears, more aircraft jolts will slip over into the liability category, because then the inference will be stronger that the jolt occurred because someone forgot to watch the readout.

Although to the jolt victim the mode of conveyance probably makes little difference, elevator cases are much stronger for plaintiffs than airplane cases.¹⁴⁸ Although elevator jolt cases were

¹⁴⁵ 214 Cal. Rptr. 720 (Ct. App. 1985).

¹⁴⁶ See *id.* at 721-22, 725; see also *Kelly v. American Airlines, Inc.*, 508 F.2d 1379, 1380 (5th Cir. 1975) (holding that *res ipsa* did not apply to jolt of 747 that caused plaintiff harm, and noting that "[t]he overwhelming weight of authority has declined to invoke *res ipsa loquitur* in air turbulence cases"); *Gafford v. Trans-Texas Airways*, 299 F.2d 60, 61-62 (6th Cir. 1962) (holding *res ipsa* doctrine inapplicable to airplane jolt); *Lazarus v. Eastern Air Lines, Inc.*, 292 F.2d 748, 750 (D.C. Cir. 1961) (denying recovery for jolt resulting in hot tea spilling onto plaintiff); *Cudney v. Midcontinent Airlines, Inc.*, 254 S.W.2d 662, 667 (Mo. 1953) (declining to review jolt in flying airplane as a *res ipsa* case); *Sanchez v. American Airlines, Inc.*, 436 N.Y.S.2d 824, 826 (Civ. Ct. 1981) (holding that *res ipsa* did not apply to unexplained jolt on commercial airliner). But see *Nelson v. American Airlines, Inc.*, 70 Cal. Rptr. 33, 35-36 (Ct. App. 1968) (noting that neither party contested application of *res ipsa* doctrine, given that airplane jolt resulted from malfunction of automatic pilot); *Ness v. West Coast Airlines, Inc.*, 410 P.2d 965, 968 (Idaho 1965) (holding that although *res ipsa* is not available to plaintiff hurt by jolt caused by turbulence, plaintiff was entitled to attempt to prove specific negligence based on airline's failure to turn on seat belt light). See generally D.E. Buckner, Annotation, *Liability of Carrier by Air for Injury or Death of Passenger Due to Downdraft, Updraft, or Turbulence*, 73 A.L.R.2d 379 (1960).

¹⁴⁷ See, e.g., *Kelly*, 508 F.2d at 1381 (finding defendant air carrier not liable for jolt caused by clear air turbulence).

¹⁴⁸ See, e.g., *Conerly v. Liptzen*, 199 N.W.2d 833, 835, 838 (Mich. Ct. App. 1972) (affirming jury award for unexplained elevator drop); *Williams v. Swissotel N.Y., Inc.*, 542 N.Y.S.2d 651, 652 (App. Div. 1989) (holding that *res ipsa* doctrine can be invoked if plaintiff proves a sudden fall followed by an abrupt stop of the elevator he was

weak res ipsa candidates before technological refinements perfected the elevator,¹⁴⁹ today, if elevators are properly maintained, accidents are very unlikely. Nevertheless, in order to prevent plunges, frequent inspections, service calls, and repairs are required. Thus, when an elevator does plunge, the probable reason is compliance error. The jolt cases again demonstrate that plaintiffs' recoveries depend largely on how successfully an area of technology has reduced the incidence of accidents when people are diligent (that is, are using the required rate of nondurable precaution).¹⁵⁰

riding).

¹⁴⁹ See, e.g., *Dobbins v. Brown*, 23 N.E. 537, 537-38 (N.Y. 1890) (holding res ipsa inapplicable where plaintiff's decedent was killed in rudimentary mining elevator).

¹⁵⁰ See, e.g., *Belding v. St. Louis Pub. Serv. Co.*, 215 S.W.2d 506, 511 (Mo. 1948) (holding that res ipsa may be applied to case involving abrupt halt of a bus); *Redmon v. Metropolitan St. Ry.*, 84 S.W. 26, 29 (Mo. 1904) (noting that jolts on streetcar do not normally occur if proper precautions are taken); *Durbin v. Humphrey Co.*, 14 N.E.2d 5, 7-8 (Ohio 1938) (allowing application of res ipsa to case involving plaintiff thrown from ride at amusement park); Annotation, *Presumption of Negligence from Throwing Passenger from Seat*, 5 A.L.R. 1034, 1034-38 (1920) (surveying a number of jolt cases).

Arguing, based on the low proportion of plaintiff victories in the appellate reports, that airline jolt scenarios are weak res ipsa cases and elevator jolt scenarios are strong res ipsa cases may be inconsistent with the Priest-Klein theory of the selection of disputes for litigation. See George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1, 17-22 (1984) (arguing that where the gains and losses are equal for both parties, plaintiff victories will tend toward 50%); see also George L. Priest, *Measuring Legal Change*, 3 J.L. ECON. & ORGANIZATION 193, 207 (1987) (positing that "plaintiffs' success rate is likely to be greater than 50 percent where plaintiffs possess greater litigation stakes than defendants and less than 50 percent where defendants possess greater litigation stakes than plaintiffs"). A literal interpretation of part of that theory would predict that half the aircraft jolt cases would be decided for plaintiffs and half for defendants. Nevertheless, as already noted, the appellate reports reflect a disproportionate number of defense victories in aircraft jolt cases when these cases are brought on res ipsa theories.

Perhaps the reason for the disparity is that the Priest-Klein theory assumes that there is no variation in the quality of attorneys. If some attorneys can predict ultimate appellate results better than others, the success ratio in the appellate cases will reflect the success ratio in the underlying population of claims, which includes settled cases as well as litigated ones. Specifically, if defendants sometimes have better attorneys than plaintiffs, the smarter defense attorneys will reject excessive demands from their less savvy counterparts, and aircraft jolt cases will be litigated and appealed to defense victories. Of course, for any given aircraft jolt, there may be an equal probability that the plaintiff has the smarter attorney. A smart plaintiff's attorney would settle this type of case for more than its expected litigated value (which may be zero). But, the smart plaintiff's victory (a high settlement) does not appear in the appellate reports, whereas the smart defendant's victory does. Hence, the proportion of defense victories in the appellate reports diverges from 50% and approaches the proportion in the underlying population of claims. In situations

Paradoxically, the safer the activity, the stronger the res ipsa case.

VII. FACTORS THAT MAKE RES IPSA CASES STRONG

Anything that increases the required rate of precaution makes res ipsa cases stronger. As already noted, there are two separate reasons for this phenomenon.¹⁵¹ First, a high rate of precaution snags most accidents and makes them avoidable by due care. Indeed, with a high enough required rate of precaution, it is impossible to have a nonnegligent accident. Second, high rates of precaution are especially costly to achieve. Hence, the rate of compliance error increases with the rate of precaution. Therefore, high precaution rates simultaneously reduce the rate of non-negligent accidents and increase the rate of negligent ones. The combination of these two effects produces strong res ipsa cases. Although the precaution rate is key, it is useful to analyze cases using some other factors as well.

A. High Danger Rates

High danger rates usually imply high precaution rates.¹⁵² The correlation between danger and precaution rates explains why dangerous activities, such as moving barrels above sidewalks, make such strong res ipsa cases when they go awry. For instance, the Marine Corps' accidental bombing of the plaintiff's oyster boat during practice exercises over Pamlico Sound presented a strong res ipsa case.¹⁵³ Dropping practice bombs is even more dangerous than moving barrels, and requires such a high rate of precaution that little room is left for unavoidable accidents. Moreover, with

where practically all the appellate cases of a particular type yield the same result (no res ipsa recovery for aircraft jolts), the reports may simply reflect the dispersion of ability in the bar and the positive search costs faced by parties to acquire good attorneys.

Other reasons potentially explain this result. A disproportionate number of defense victories could reflect a gamble by plaintiffs that aircraft technology has recently improved enough so as to sweep some jolts into the liability category. A stock market eliminates foolish investors more ruthlessly than the legal market eliminates foolish attorneys and uninformed clients.

¹⁵¹ See *supra* notes 117-24 and accompanying text.

¹⁵² See *supra* notes 109-11 and accompanying text.

¹⁵³ See *Goodwin v. United States*, 141 F. Supp. 445, 451 (E.D.N.C. 1956) (stating that res ipsa doctrine is sufficient to support finding that vessel was sunk due to negligence of the government); see also *D'Anna v. United States*, 181 F.2d 335, 336-37 (4th Cir. 1950) (stating that plaintiff was entitled to assert res ipsa theory after auxiliary fuel tank dropped from government plane destroying his fruit stand).

such a high rate of precaution, a fair amount of compliance error is inevitable.¹⁵⁴

Cases involving inspection precautions are especially well explained by the danger rate. Compare these two amusement park cases. In *Wodnik v. Luna Park Amusement Co.*,¹⁵⁵ the plaintiff bought a ticket for a carnival attraction, and the defendant's attendant then handed the plaintiff a heavy, long-handled mallet with which to strike a trigger in an attempt to launch a lug high enough to ring a bell. When Mr. Wodnik swung the mallet above his head, the mallet head suddenly flew off, leaving him with a significantly less massive object than he had expected to wield. He then struck himself a painful and injurious blow to his knee with the long handle, for which he sued the concession operator. The court held that Wodnik had stated a good *res ipsa* case.¹⁵⁶ The required inspection rate for carnival mallets is exceptionally high because of the risk that loose mallet heads will cripple unsuspecting bystanders. In the opposite type of case, *Smith v. Caplan*,¹⁵⁷ the plaintiff accompanied her child on a merry-go-round and somehow injured her foot. The court held that the plaintiff was not entitled to recover against the amusement park operator without evidence of specific negligence.¹⁵⁸ *Smith* is distinguishable from *Wodnik* on

¹⁵⁴ See *supra* notes 121-23 and accompanying text.

¹⁵⁵ 125 P. 941 (Wash. 1912).

¹⁵⁶ See *id.* at 942-43; see also *Reinzi v. Tilyou*, 169 N.E. 101 (N.Y. 1929) (involving a similarly high danger rate). In *Reinzi*, the plaintiffs were injured when the stirrup on a mechanical steeplechase horse that they were riding broke off. The court stated that the potential dangers of the steeplechase were serious enough to warrant the defendant taking adequate precautions. See *id.* at 102. Although a steeplechase is similar to a merry-go-round, see *infra* text accompanying note 157, the danger rate is higher. See also *Brennan v. Ocean View Amusement Co.*, 194 N.E. 911 (Mass. 1935) (plaintiff injured while riding a roller coaster). The court in *Brennan* stressed that roller coasters require a high degree of care, since the potential danger is great:

As the cars ran rapidly and without any means of controlling them from the time they left the top until they reached the bottom, it is plain that their safe and successful operation must depend to a large degree upon proper construction of the tracks and their maintenance in good repair and at the proper grade and alinement.

Id. at 912; see also *Martin v. Sentker*, 12 Ohio App. 46, 47-48 (1918) (finding defendant liable under *res ipsa* doctrine when roller coaster fell off track).

¹⁵⁷ 425 S.W.2d 477 (Tex. Civ. App. 1968).

¹⁵⁸ See *id.* at 480. A subsequent inspection supposedly revealed nothing wrong with the merry-go-round. If the danger rate had been higher, this evidence may not have been exculpatory. A case involving a similarly low danger rate was *Nabson v. Mordall Realty Corp.*, 15 N.Y.S.2d 38 (App. Div. 1939), in which the plaintiff was hurt by a small splinter while attending a theater. Since harm from splinters is normally minor, it is understandable that the court held that the plaintiff was not

the ground that the danger rate on merry-go-rounds is lower than the danger rate for "striking" machines. The lower danger rate implies a lower rate of inspection and hence a weaker res ipsa case.¹⁵⁹

B. *Effective Durable Precaution*

Highly effective durable precaution usually increases the productivity of complementary nondurable precaution, and thus its required rate. As a result, the crash of a modern commercial airliner makes a much better res ipsa case than the crash of an airplane that takes place at the birth of aviation. It was more likely that Amelia Earhart's airplane would crash without negligence than it is that a modern airplane will crash without negligence.

*Lewis v. Great Southwest Corp.*¹⁶⁰ is a case in which there was little durable precaution available to the defendant. The plaintiff visited the defendant's petting zoo with her grandchild and was promptly butted by a goat. She sued on a res ipsa theory, but lost.¹⁶¹ Indeed, it is difficult to imagine a weaker res ipsa case. Suppose, however, that someone invents a device that cheaply and reliably monitors billy goats' emotional states and sounds a buzzer when goats are about to charge. After the invention of this effective

entitled to recovery under the res ipsa doctrine and could only recover on a specific negligence theory by proving that the defendant knew of the splinter. *See id.* at 41-42.

¹⁵⁹ In *Korsak v. Atlas Hotels, Inc.*, 3 Cal. Rptr. 2d 833 (Ct. App. 1992), the plaintiff was injured in the defendant's hotel when a shower head popped off and the resulting stream of water hit him in the eye. *See id.* at 834. The court assumed that the doctrine of res ipsa loquitur was inapplicable, and the plaintiff did not even argue for it at the appellate level. *See id.* at 840 n.5. The danger rate from shower heads is so low that a compliance error is unlikely and many of the harms that do occur constitute unavoidable accidents. Compare *Susman v. Mid-South Fair, Inc.*, 176 S.W.2d 804, 805 (Tenn. 1944) (finding plaintiff not entitled to res ipsa instruction when evidence suggested that injury on defendant's amusement device known as "The Whip" may have resulted from her own negligence) with *Berberet v. Electric Park Amusement Co.*, 3 S.W.2d 1025, 1030 (Mo. 1928) (stating that plaintiff was not entitled to use res ipsa doctrine where she slipped on loose board in boardwalk leading from defendant's merry-go-round) and *Freda v. Lake Ariel Park & Amusement Co.*, 36 A.2d 849, 850 (Pa. Super. Ct. 1944) (plaintiff who fell through rotten boards in defendant's comfort station allowed to recover on res ipsa theory). The danger rate, and therefore the required rate of inspection, was higher in *Susman* than in *Berberet*. In *Freda* the danger rate was higher than in *Susman*, because water which was constantly present on the *Freda* boards created a high danger rate that dictated a high rate of precaution (inspection).

¹⁶⁰ 473 S.W.2d 228 (Tex. Civ. App. 1971).

¹⁶¹ *See id.* at 230 ("[W]e cannot indulge a presumption of negligence from the happening of the accident . . .").

durable precaution, future zoo-goers would recover on *res ipsa* theories more often. The buzzer would reduce the rate of unavoidable accidents, which would by itself increase the strength of plaintiffs' cases. The buzzers, however, would probably require periodic inspection and servicing, complementary nondurable precautions with a rate high enough—even with relatively low danger rates—to produce some significant flow of compliance errors. Given the current lack of durable precaution against billy goat attacks, *res ipsa* cases against goat owners remain weak.¹⁶²

If a precaution were perfectly effective and perfectly durable, it would actually reduce the strength of *res ipsa* cases. One of the worst *res ipsa* cases imaginable is the case of the disabled one-hoss shay in Oliver Wendell Holmes's poem by that name.¹⁶³ The one-hoss shay has since become a familiar concept in the economic theory of investment, though not yet in the theory of tort. The deacon's theory of carriage design was that no part of the shay should be weaker than the rest. He scoured New England to get the best oak for the spokes and floor, Settler's elm for the hubs, and the finest steel for the springs and axle. The chaise lasted for 100 years, outliving the deacon and finally passing on to his successor, the parson. Significantly for the doctrine of *res ipsa loquitur*, the one-

¹⁶² Because of the lack of durable precaution requiring high rates of nondurable precaution, horse-related accidents are generally weak *res ipsa* cases. When horses pulling Disneyland's Surrey with the Fringe on Top ran away, injuring a park patron, a California court held that the jury was entitled to conclude that the accident could easily have been unavoidable or the result of the negligence of someone besides the defendant. *See Kohl v. Disneyland, Inc.*, 20 Cal. Rptr. 367, 372 (Dist. Ct. App. 1962). Thus, the defendant was able to rebut the inference of negligence suggested by the *res ipsa* doctrine. *See id.*; *see also Smith v. Great Eastern Ry.*, 2 L.R.-C.P. 4, 9 (1866) (holding that a passenger who was bitten by a dog while waiting at defendant's train platform could not recover by simply proving she had been bitten); *Hammack v. White*, 142 Eng. Rep. 926, 929 (C.P. 1862) (finding defendant not liable on a general negligence theory when his new horse bolted on a busy London street and ran down a hapless pedestrian). A distinguishable case is *McComas v. Barnes Shows Co.*, 12 P.2d 630 (Cal. 1932), where an actress employed to ride an elephant was able to recover damages when the elephant's saddle fell off, apparently because the trainer had failed to check it. *See id.* at 633. Saddles require periodic inspection.

Generally the presence of durable precaution makes *res ipsa* cases strong, even when there is little evidence of what exactly went wrong. *See Killian v. Logan*, 162 A. 30, 32 (Conn. 1932) (finding defendant liable for plaintiff's injuries suffered when she was descending a fire escape and a failure in its mechanism precipitated her fall to the ground); *Harrison v. Southeastern Fair Ass'n*, 122 S.E.2d 330, 335-36 (Ga. Ct. App. 1961) (stating that *res ipsa* theory created jury question when the plaintiff received burns on the defendant's moon rocket amusement ride).

¹⁶³ *See OLIVER W. HOLMES, THE ONE HOSS SHAY* 12-29 (Boston & New York, Houghton, Mifflin & Co. 1891).

hoss shay never required any maintenance.¹⁶⁴ On its one hundredth birthday, when the parson ventured out driving, the chaise suddenly fell completely apart. There was a rumble reminiscent of an earthquake, and the next thing the parson knew he was sitting on a rock. (He turned and saw that the chaise had disintegrated into a heap of dust.¹⁶⁵) Although the chaise, like a commercial airliner, had highly effective durable precautions, the chaise, unlike a commercial airliner, never required maintenance or inspection. How could there be negligence at all under these circumstances? The productivity of nondurable precaution was zero. The example of the one-hoss shay is, however, obviously more fantasy than reality. In the real world, durable precaution usually increases the need for complementary nondurable precautions. Hence, effective durable precaution usually makes res ipsa cases stronger.

C. Low-Cost Nondurable Precaution

Some nondurable precautions are very cheap, and that factor can create strong res ipsa cases. For instance, in *Swiney v. Malone Freight Lines*,¹⁶⁶ the defendant owned an eighteen-wheel truck equipped with dual tandem wheels. As the defendant's driver was travelling down the road, first one wheel, then the second, became detached. The plaintiff, who was driving in his car, avoided the first wheel but was struck by the second and was injured.¹⁶⁷ In its opinion the court stressed that the tractor-trailer wheels required frequent inspections. Moreover, checking whether wheel lugs have loosened was both easy and highly effective.¹⁶⁸ In holding that the evidence was sufficient to send the case to the jury on a res ipsa theory, the court distinguished two other cases in which nondurable precaution was less productive.¹⁶⁹

In *Smith v. Fisher*¹⁷⁰ the same court had found the case for res ipsa insufficient where a universal joint or brake band suddenly

¹⁶⁴ Only toward the end was there: "A general flavor of mild decay,/But nothing local, as one may say./There couldn't be—for the Deacon's art/Had made it so like in every part." *Id.* at 23-24.

¹⁶⁵ "The poor old chaise in a heap or mound,/As if it had been to the mill and ground!" *Id.* at 28.

¹⁶⁶ 545 S.W.2d 112 (Tenn. Ct. App. 1976).

¹⁶⁷ *See id.* at 113.

¹⁶⁸ The evidence indicated that when loose, wheel lugs develop a telltale ring of rust around them. *See id.*

¹⁶⁹ *See id.* at 115.

¹⁷⁰ 11 Tenn. App. 273 (1929).

broke.¹⁷¹ In distinguishing this case the *Swiney* court stressed that frequent inspection of brake bands and universal joints was not nearly as productive as inspection of wheel lugs. Also, the inspection itself was far more costly: universal joints must be dismantled, and brake bands do not reveal defects unless subjected to x-rays.¹⁷²

When compliance error is impossible, *res ipsa* is usually an unsuccessful theory. Consider *Bolton v. Stone*,¹⁷³ in which the plaintiff, standing outside her garden gate on the street that ran between her house and the defendant's cricket grounds, was struck by a particularly well hit cricket ball. Balls were hit out of the park extremely infrequently. The plaintiff alleged two untaken precautions: failing to erect a fence of sufficient height to prevent balls being struck into the road, and placing the cricket pitch too close to the road.¹⁷⁴ Her third claim was that failing to ensure that cricket balls would not be hit into the road amounted to general negligence.¹⁷⁵ In response to this allegation of general negligence the court took up the question of *res ipsa loquitur*, as well as the specific negligence put at issue by the two untaken precaution allegations.¹⁷⁶ The specific negligence counts failed, as did the *res ipsa* count, despite the superficial similarity that the case bore to *Byrne v. Boadle* (the case of the falling barrel).¹⁷⁷ In *Byrne* the harm very probably resulted from compliance error, whereas in *Bolton*, compliance error was impossible: the batter was *trying* to hit the ball out of the stadium. If any precaution was reasonable, it was some durable one, like the two specific untaken precautions mentioned in the plaintiff's declaration.

In cases where nondurable precaution is unproductive, *res ipsa* is a poor legal theory.¹⁷⁸ For instance, in *Ash v. Childs Dining*

¹⁷¹ See *id.* at 282.

¹⁷² See *Swiney*, 545 S.W.2d at 115.

¹⁷³ 1951 App. Cas. 850.

¹⁷⁴ See *id.* at 852.

¹⁷⁵ It was "failure to ensure that cricket balls would not be hit into the said road." *Id.* at 851.

¹⁷⁶ See *id.* at 857-60.

¹⁷⁷ See *supra* note 84 and accompanying text.

¹⁷⁸ See *Toroian v. Parkview Amusement Co.*, 56 S.W.2d 134, 136-37 (Mo. 1932) (upholding verdict in favor of defendant after *res ipsa* instruction in case in which amusement ride would, on occasion suddenly stop after cable went off guides, and it appeared that no amount of inspection or maintenance would prevent this intermittent problem); *Flamm v. Coney Island Co.*, 195 N.E. 401, 402 (Ohio Ct. App. 1934) (defendant not liable for staphylococcal infection that the plaintiff received in defendant's swimming pool after it appeared that defendant used chlorine).

*Hall Co.*¹⁷⁹ the plaintiff was injured after swallowing a tack contained in the defendant's blueberry pie. The tack was of the same type used to fasten the oldtime containers in which the defendant purchased blueberries. In reversing the judgment that the plaintiff received below, the court thought it probable that the tack was actually embedded in a blueberry.¹⁸⁰ The plaintiff's *res ipsa* case was therefore weak because nondurable precaution was unproductive.¹⁸¹ A stronger *res ipsa* case would have resulted if the tack was too large to have been embedded in a blueberry.

D. *Memory-Driven, as Opposed to Event-Driven, Precaution*

One of the costs of compliance is remembering to take repetitive precaution. This cost is reduced if events remind the actor of the need to use precaution. In such situations, compliance error will be less, because the cost of compliance is less.

Besides being more or less durable, precautions also differ according to their stimulus. Some precautions are triggered by events, such as slamming on one's brakes when a child darts in front of one's car.¹⁸² Other precautions, however, are triggered by memory. For instance, a driver must remember to keep a good lookout even if no particular event reminds her of this necessity. As was already noted, the actual compliance rate for memory-driven precaution is especially likely to diverge from the required precaution rate as the latter increases. The rate of compliance error is predictably less for event-driven precaution than for its memory-driven counterpart. Imagine an Indy driver weaving through the field at high speed. Although the reasonable rate of precaution is very high, the compliance rate will be practically perfect. Events—such as another car cutting her off—remind the race driver to apply the brakes. It seems likely that compliance rates are higher when precaution is event-driven rather than memory-driven. When a child darts out in front of a motorist, it is easy for the motorist to remember to stop. Perhaps this is why there are more accidents on straight roads than on curvy ones,¹⁸³ and it may help explain why

¹⁷⁹ 120 N.E. 396 (Mass. 1918).

¹⁸⁰ *See id.* at 397.

¹⁸¹ *See id.* (“[The] color and shape [of the tack] were such that it would naturally escape the most careful scrutiny.”).

¹⁸² Events that prompt precaution are a substitute for memory.

¹⁸³ The act of driving on a curvy road reminds the driver to exercise caution. On a straight road, however, the driver must remember to be careful—nothing about the event itself will prompt her care.

so many accidents occur close to the driver's home.¹⁸⁴ Close to home, precaution becomes memory-driven.¹⁸⁵

Given the fallibility of memory-driven precautions, people search for substitute methods, such as routine or habit. This substitute, however, is itself fallible, and may make it more costly for people to use event-driven precaution. For instance, an airplane pilot who is relying on habit may be less flexible in using event-driven precaution should an unusual occurrence arise. She may become, in effect, the prisoner of routine. Another substitute for frequent memory-driven precaution is a durable precaution that makes failure less costly: for instance, a car with an air bag. Although this method increases the driver's safety when she fails to keep a proper lookout, it may at the same time reduce the safety of everyone else. A third method is mechanical or electronic monitoring. A busy law office installs an automated calendar to ensure that filings are made on time for the same reason that an airline installs an alarm that tells the pilot he is about to fly into a mountain. If the substitutes for memory-driven precaution were always effective, there would be few accidents. Here again, however, we have the problem of who is watching the watchers.

E. *Chronic vs. Acute Danger*

Rapidly accelerating danger rates—acute dangers—imply high rates of unavoidable accident and weak *res ipsa* cases. The reason for this implication is that precaution is cheaper when it can be planned over a longer period of time. The cases bear out the prediction that acute danger situations will not succeed on a *res ipsa* theory. In *Larson v. St. Francis Hotel*,¹⁸⁶ the plaintiff was walking on the street when she was struck by an armchair that someone had thrown out of a hotel window.¹⁸⁷ She was nonsuited.¹⁸⁸ In *Connolly v. Nicollet Hotel*,¹⁸⁹ the plaintiff was struck by a mud-like substance while she was passing the defendant's hotel.¹⁹⁰ Here,

¹⁸⁴ In a foreign setting, the driver is consciously aware of her surroundings and is more likely to exercise the proper precaution rate. However, as the streets become more familiar, the driver does not actively pay attention, and does not exercise due care.

¹⁸⁵ A different reason for a higher rate of accidents that occur close to home is that people drive close to home more often than elsewhere.

¹⁸⁶ 188 P.2d 513 (Cal. Dist. Ct. App. 1948).

¹⁸⁷ *See id.* at 514.

¹⁸⁸ *See id.* at 516.

¹⁸⁹ 95 N.W.2d 657 (Minn. 1959).

¹⁹⁰ *See id.* at 661.

however, the plaintiff was allowed to recover under the doctrine.¹⁹¹ In both cases, the objects were thrown by celebrating guests; thus, the hotels' negligence would consist in the failure to exercise more restraint. In the *St. Francis* case, the cost of this precaution would have been great, due to the fact that the guests were celebrating the end of World War II and their celebration developed rapidly over a few hours.¹⁹² In the *Nicollet* case, however, the rate of unavoidable accident was less because the celebration, a Junior Chamber of Commerce convention, accelerated less rapidly over several days.¹⁹³

Some risks develop over extraordinarily long periods of time. In *Mullen v. St. John*,¹⁹⁴ the court held that the plaintiff did not need evidence of specific negligence when a whole building fell on him as he was passing by.¹⁹⁵ When the period of time is long—buildings deteriorate over long periods of time—and when the evidence of deterioration is obvious, the conclusion of a compliance error is practically ineluctable.¹⁹⁶

¹⁹¹ See *id.* at 669.

¹⁹² See *St. Francis Hotel*, 188 P.2d at 514. For the hotel to have prevented the accident it would have had to monitor its guests 365 days each year—a costly prospect, indeed. A case analogous to *St. Francis Hotel* is *Hutchinson v. Boston Gas Light Co.*, 122 Mass. 219, 219-22 (1877), in which the plaintiff was injured when she jumped from a burning building in Boston. The fire in the building was caused by a gas explosion, which allegedly resulted from the defendant gas company's negligence. Notably, however, the explosion occurred in the immediate aftermath of the great fire of November 9, 1872 that left a large portion of Boston in ruins. The streets were full of rubbish from falling walls, and some areas of the city were under military guard. On the morning of November 10th, there was a large gas explosion near the building from which the plaintiff ultimately jumped, and it was this explosion that started the fire in that building. Upon this evidence, the trial court directed a verdict for the defendant. On appeal, the plaintiff contended that the evidence of defendant's negligence was sufficient to have taken the case to the jury. The court, however, held that the trial court properly directed a verdict for the defendant. As in *St. Francis Hotel*, the court was presented with another rapidly accelerating risk against which precautions would have been expensive. The rate of unavoidable accident was high, and the plaintiff's *res ipsa* case weak. When a gas main blows up under ordinary circumstances, the rate of unavoidable accident is lower and the plaintiff's *res ipsa* case is strong.

¹⁹³ See *Nicollet Hotel*, 95 N.W.2d at 668. The hotel could have taken relatively inexpensive precautions since it had time to react.

¹⁹⁴ 57 N.Y. 567 (1874).

¹⁹⁵ The court said:

Buildings properly constructed do not fall without adequate cause. If there be no tempest prevailing or no external violence of any kind, the fair presumption is that the fall occurred through adequate causes, such as the ruinous condition of the building, which could scarcely have escaped the observation of the owner.

Id. at 569-70.

¹⁹⁶ See *Kearney v. London, Brighton & S. Coast Ry.*, 6 L.R.-Q.B. 759, 761-62 (1871)

Unusual situations can throw into question whether a durable precaution that is normally effective has failed for some reasonable cause—for instance, its reasonable design limits have been exceeded. Thus, if an earthquake had been in progress at the time the *Byrne v. Boadle* accident took place, it would have prevented the case from getting to a jury. Under these unusual conditions, the proportion of unavoidable accident to compliance error increases. *Mullen* also would have been a weak case if the collapse occurred two days after an earthquake.

F. Unusually High Compliance Costs

Someone could be so tired that it would be negligent for that person to drive. Nonetheless, if someone were only moderately tired, this could increase the strength of a *res ipsa* case, because fatigue increases the probability of compliance error. In *Druzanich v. Criley*¹⁹⁷ the plaintiff, who was a sleeping passenger in the automobile that the defendant was driving, prevailed under a *res ipsa* theory because the defendant was sleepy.¹⁹⁸ Her lack of sleep, though not a breach of duty in itself, nonetheless increased her compliance costs and made it more likely that she committed a compliance error.

In *Heans v. Mitchell*¹⁹⁹ the defendant's and plaintiff's cars collided as they were going in opposite directions on a two lane highway. No one was injured, but the plaintiff's car was damaged. The circumstances surrounding the accident were unclear, and the plaintiff brought suit on a *res ipsa* theory. The defendant and his wife had just been married and were on their way to their honeymoon in St. Stephen.²⁰⁰ In holding for the plaintiff, the trial judge stated: "I am forced to believe that [the defendant's] mind was so abstracted by the conditions at the time that he failed to see the approaching car until too late."²⁰¹ If the defendant was

(holding that plaintiff hit by falling brick when walking under defendant's bridge may recover, especially in light of fact that other bricks had fallen before).

¹⁹⁷ 122 P.2d 53 (Cal. 1942).

¹⁹⁸ See *id.* at 56.

¹⁹⁹ [1936] 2 D.L.R. 260 (Can.).

²⁰⁰ See *id.* at 260-61.

²⁰¹ *Id.* at 263. In reversing the judgment for the plaintiff, the New Brunswick Supreme Court came to the opposite factual conclusion: "[T]he fact of marriage instead of rendering the defendant careless might rather have made him more cautious than usual for the sole and direct purpose of protecting the wife he had so recently acquired, particularly when he was proceeding with her on their honeymoon" *Id.* at 263-64.

anticipating some joyous event or had just experienced some grievous loss that may have momentarily taken his mind from his duties, the case for *res ipsa loquitur* becomes stronger.²⁰²

Nevertheless, the courts behave as if they have a restrictive definition of compliance costs, a point illustrated by *Moore v. Presnell*.²⁰³ In that case the plaintiffs were injured when the defendant's deceased unexpectedly came across the center line and crashed into the car in which they were riding. The defendant's deceased died in the accident and was therefore unable to testify about what had caused her to cross over into the opposing traffic. Nevertheless, the defendant offered evidence that strongly suggested that the deceased had unexpectedly lost consciousness. Following drivers testified that her head flopped to one side just before she crossed the line. Also she was suffering from hypertension, which increases the probability of sudden blackouts. There was evidence that she took no evasive action right up to the time of the crash, and that she did not apply the brakes. A police investigation revealed no mechanical problem with her car that would have caused it to crash. The court upheld a jury verdict for the defendant on the ground that the evidence was sufficient to find that the deceased unforeseeably blacked out.²⁰⁴ The case illustrates that judicial measurement costs are lower for blackouts than for forgotten precautions. If the deceased had merely forgotten to stay on her side of the road, there would have been no evidence that would have allowed the court to indicate that she may have been using an efficient level of precaution. Hence, the rule would have been strict liability. In the case of blackout, however, the court was able to judge that the defendant was acting reasonably. She had no prior history of blackouts or fainting spells, and she was taking a prescription drug for her hypertension. The case also illustrates the peculiar nature of the negligence rule. If the police had found a steering problem with her car, or if there was evidence that she was driving when she was tired, the plaintiff would have won. An unexpected blackout is not a compliance error; a forgotten precaution is.

²⁰² In *Hardman v. Younkers*, 131 P.2d 177, 179 (Wash. 1942), the doctrine was available to plaintiff in an otherwise poorly explained accident because it took place while the defendant driver was filling his pipe. Although it was not negligent to fill his pipe, it rendered compliance with the required precaution rate more costly. Hence, with a higher cost of compliance, a rational maximizer would have a higher rate of compliance error. The higher "efficient" error rate for the defendant made the plaintiff's *res ipsa* case stronger.

²⁰³ 379 A.2d 1246 (Md. Ct. Spec. App. 1977).

²⁰⁴ See *id.* at 1250.

VIII. WHOSE COMPLIANCE ERROR?

A. *Different Problems*

Sometimes an accident will speak of compliance error, but it is unclear by whom. The applicability of *res ipsa* in these cases is weaker than in the ones that clearly speak of the defendant's compliance error. The cases can be divided into two categories. The first category consists of alternative causation cases in which it appears that the accident resulted from either the defendant's compliance error or someone else's, but not both. The second category consists of concurrent causation cases in which it appears that both the defendant's negligence and someone else's were joint causes, but that someone else's negligence "cut off" the defendant's. Both types of cases can raise problems with respect to two different traditional *res ipsa* elements: "exclusive control" and "no contribution by the plaintiff." Hence, the analysis below differs somewhat from the traditional type of *res ipsa* inquiry.

B. *Alternative Causation*

In many *res ipsa* cases, the accident's signature is consistent with a compliance error by either one of two separate parties, but probably not by both at the same time. For instance, in *Harrison v. Sutter Street Railway Co.*²⁰⁵ the plaintiff's decedent was a passenger aboard one defendant's streetcar, which collided with the other defendant's brewery wagon. The California court held that the trial court did not err when it refused to instruct the jury on the doctrine of *res ipsa* and ultimately nonsuited the plaintiff.²⁰⁶ A compliance error by each defendant was equally likely.²⁰⁷ Nonsuiting plaintiffs when it is unclear which defendant was causally negligent reduces the strict liability component of the negligence rule. *Ybarra v. Spangard*²⁰⁸ is similar, but probably distinguishable. In *Ybarra*, the defendants had a continuing relationship that discouraged them from defecting from the "conspiracy of silence" that the *Ybarra* court stressed. In *Sutter*, the parties had more reason to defect—and finger the one who was guilty—in the absence of a rule that would hold them jointly liable.

²⁰⁵ 66 P. 787 (Cal. 1901).

²⁰⁶ See *id.* at 787-88.

²⁰⁷ The court apparently found it unlikely that both parties were causally negligent, as might have been the case if one party had been negligent and the other party had failed to get out of the way. See *id.* at 788.

²⁰⁸ 154 P.2d 687 (Cal. 1944).

In *Schroerlucke v. McDaniel Funeral Home, Inc.*²⁰⁹ the plaintiff, who used a wheelchair, attended a funeral arranged by the defendant. The plaintiff's son requested the defendant to transport the plaintiff's wheelchair from her back porch to the church, which the defendant did. The son told the defendant's employee how to collapse the wheelchair and stressed the importance of inspecting it once it was set up. Maybe for this reason the defendant chose not to collapse the wheelchair but rather to carry it in the back of a flower truck in its upright position. When the plaintiff sat on the wheelchair at the funeral, it collapsed after she had been pushed about three feet.²¹⁰ The court held that she could not recover on a res ipsa theory because the chair had not been in the exclusive control of the defendant.²¹¹ The outcome of this case contrasts with the more famous *Benedict v. Eppley Hotel Co.*²¹² in which the plaintiff was injured while she was attending a bingo party at the defendant's hotel. One of the hotel employees gave her a chair, which she took to the bingo table and on which she sat uneventfully for about a half hour. The chair suddenly collapsed, and an inspection revealed that the bolts on one side were missing.²¹³ The plaintiff was able to recover on a res ipsa theory, even though she herself had the most direct control of the chair at the time of the accident.²¹⁴

Although the courts analyze the issue in terms of who had exclusive control of the instrument, the issue at which they seem to be aiming is whose compliance error was more likely, the defendant's or the plaintiff's. In the funeral home case, it is unlikely that the defendant committed a compliance error. It is more likely that the wheelchair was defective due to some compliance error by the plaintiff herself, or maybe by her son,²¹⁵ or even by the manufac-

²⁰⁹ 291 S.W.2d 6 (Ky. Ct. App. 1956).

²¹⁰ See *id.* at 7.

²¹¹ See *id.* at 8-9.

²¹² 65 N.W.2d 224 (Neb. 1954).

²¹³ See *id.* at 226-27.

²¹⁴ See *id.* at 229. As the court remarked:

Here it was the condition of the stool, not the use made of it, that was responsible for the fall. Plaintiff had done no more than sit upon it when it gave way, and there is no suggestion that [her] conduct was in any way improper. So far as construction, inspection, or maintenance of the stool were concerned, defendant had exclusive control. Plaintiff's actions had no more legal significance as a cause of the accident than those of the innocent bystander in the typical res ipsa loquitur case.

Id.

²¹⁵ See *Schroerlucke*, 291 S.W.2d at 8.

turer. On the other hand, in the bingo case, it seems much more likely from the accident's signature that the compliance error was committed by the hotel, especially since the bolts were missing. Given the limited dealings that the plaintiff had with the chair, how was it even possible for her to commit a compliance error?²¹⁶

C. *Joint Causation*

When the plaintiff proves specific negligence on the defendant's part there is still the possibility that a supervening cause—negligence by someone else—will cut off recovery from the defendant. In a *res ipsa* case, the probability can be greater or less that between the defendant's negligence—whatever it was—and the plaintiff's harm, there was a wrongful act by someone else that would cut off the defendant's liability.

In *Kendall v. City of Boston*,²¹⁷ in order to entertain the Grand Duke Alexis upon his visit to the United States, the city of Boston rented the Boston Music Hall for a special concert in his honor. The city authorities appointed a committee to decorate the Hall, and this committee placed various ornaments on the wall, including a bust of Benjamin Franklin, which was placed on or near the balcony. The plaintiff received a ticket to the concert and sat in the seat assigned to her, immediately under the bust of Franklin. At the beginning of the concert, the program directed the audience to rise to sing an anthem, but when the audience did so, the bust of Franklin fell on the plaintiff's shoulder, injuring her.²¹⁸ The plaintiff alleged that

[she] was present in said building upon the invitation and with the permission of the defendants, and while she was rightfully therein, and was in the exercise of due care, said statue or bust fell upon

²¹⁶ In *Rose v. Melody Lane*, 247 P.2d 335 (Cal. 1952), the plaintiff was injured when a swivel bar stool on which he was sitting collapsed. After the accident, the investigation determined that the pin had broken. Although the defendant's expert testified that the fissure in the pin could not be detected without a microscope, the defendant's assistant manager testified that he inspected the seats almost every day. *See id.* at 337. The jury returned a verdict for the plaintiff, and the question for the California Supreme Court was whether the evidence was sufficient to support it. In holding for the plaintiff, the court stressed that the jury was entitled to disbelieve the defendant's expert. It also suggested that chairs of this type had a high required inspection rate, and that the jury was entitled to infer that the critical inspection had been missed. *See id.* at 337-38.

²¹⁷ 118 Mass. 234 (1875).

²¹⁸ *See id.* at 234-35.

her in consequence of the negligence and carelessness of the defendants, and she was thereby greatly injured.²¹⁹

The defendants answered with a general denial.²²⁰ At trial, the plaintiff did not offer any evidence about whether the audience or others had rightful access to the place where the bust was put.²²¹ The Massachusetts court held that the trial court had properly nonsuited the plaintiff because the plaintiff had presented insufficient evidence to warrant sending the case to the jury.²²² Apparently the court was influenced by the possibility that a member of the audience could have knocked the bust down.²²³ The assumption seems to have been that this negligence, or even intentional wrongdoing, by the unknown audience member would have been a supervening cause that cut off the defendant's liability.²²⁴

By contrast in *White v. Boston & Albany Railroad Co.*,²²⁵ a case decided only twelve years later, the plaintiff, a minor about four years of age, was on the defendant's train. The woman who accompanied and had charge of the plaintiff testified that they took the train leaving Boston in the afternoon of April 9, 1885; that the lamps in the cars were not lighted; that before reaching the first station out of Boston, she heard a crash over her head, and, an instant afterward, several pieces of the porcelain shade fell from the upper part of the car into her lap; and that one struck the plaintiff on the face, inflicting injuries. Another witness testified that she saw a piece of the shade fall and saw it strike the child; and that it

²¹⁹ *Id.* at 234.

²²⁰ *See id.*

²²¹ *See id.* at 236.

²²² A similar case is *Greenberg v. Steeplechase Amusement Co.*, 291 N.Y.S. 512 (App. Div. 1936), where it was held that the trial court improperly dismissed the complaint when it appeared that the plaintiff's steeplechase horse ran off the track. The court noted that

[w]hile riding a mechanical horse, the horse came in contact with an iron pipe placed on the rail on which the horse traveled and the horse collapsed and plaintiff was injured. The case was tried on the theory that the doctrine of *res ipsa loquitur* applied. Defendant offered proof that the pipe was inserted through a picket fence by boys who were on the street abutting the raceway.

Id. at 513.

²²³ *See Kendall*, 118 Mass. at 236.

²²⁴ This case would probably not be decided the same way today because courts have expanded duties to anticipate use precaution against foreseeable negligence. *See, e.g., Weirum v. RKO Gen., Inc.*, 539 P.2d 36, 40 (Cal. 1975) (holding radio station liable for the death of passenger who was hit by teenage driver participating in a radio contest sponsored by the defendant because it was foreseeable that the participant would disregard the rules of the road in an attempt to win the game).

²²⁵ 11 N.E. 552 (Mass. 1887).

came from the porcelain shade of an overhead lamp which was a fixture in the car.²²⁶ On appeal, the defendant contended that the evidence of its negligence had been insufficient to warrant sending the case to the jury. The Massachusetts court, holding for the plaintiff, found that the evidence was sufficient to support the verdict.²²⁷ The differing outcomes seem logical as there was a much smaller probability of a supervening cause in the *White* case than in *Kendall*.

In some cases a compliance error by the plaintiff is probable, for instance, where the defendant's precautions, when taken, still leave a substantial chance of accident for the plaintiff's precautions to counter. In *Phillips v. Klepfer*,²²⁸ the plaintiff's heel got caught in a sidewalk upon which the defendant had nailed strips of wood to help people keep their footing. The trial court, in a bench trial, awarded judgment to the plaintiff, but the Indiana Supreme Court reversed, finding that the evidence of *res ipsa* was insufficient to support the verdict.²²⁹

Some accident signatures rule out the possibility of compliance error by the plaintiff. For instance, in *Zappala v. Stanley Co.*,²³⁰ when the plaintiff was ushered through a darkened theater and shown to a seat, there was no opportunity for compliance error on his part when the seat collapsed beneath him. This was a clear case of *res ipsa loquitur* against the defendant, because there was no possibility of a compliance error by the plaintiff.²³¹

CONCLUSION

The preceding positive economic analysis indicates that there is a counterintuitive idea at the very center of *res ipsa* doctrine. The more advanced the safety technology present in the relevant activity, the more loudly an accident speaks of negligence. The orthodox economic theory of tort, with its emphasis on the Learned Hand

²²⁶ See *id.* at 552-53.

²²⁷ See *id.* at 554.

²²⁸ 27 N.E.2d 340 (Ind. 1940).

²²⁹ See *id.* at 341-42. Very early *res ipsa* cases denied the plaintiff the benefit of the doctrine when a compliance error by him could have jointly caused the harm. See *Siner v. Great Western Ry.*, 4 L.R.-Ex. 117 (1869) (plaintiff injured while getting off train that stopped at wrong part of the platform); *Cornman v. Eastern Counties Ry.*, 157 Eng. Rep. 1050 (Ex. 1859) (plaintiff tripped on scales); *Toomey v. London, Brighton & S. Coast Ry.*, 140 Eng. Rep. 694 (C.P. 1857) (plaintiff mistook lamp room for men's room).

²³⁰ 12 A.2d 691 (N.J. 1940) (reversing nonsuit entered against plaintiff).

²³¹ *Res ipsa* was also available to the plaintiff in *Sasso v. Randforce Amusement Corp.*, 275 N.Y.S. 891 (1934), whose theater seat collapsed beneath him.

formula and durable precaution, might suggest exactly the opposite conclusion. Under the conventional analysis, it might seem that the safer the technology is, the less likely is a judicial finding of negligence. Nonetheless, the counterintuitive idea of the actual doctrine makes more sense once we account for the importance of the pocket of strict liability within the negligence rule. Elaborate durable precaution increases the likelihood that a given accident will fall within the pocket, a point that legal economists have, up to this point, neglected to notice.

