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Pricelessness and Life: An Essay for Guido Calabresi

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Pricelessness and Life: An Essay for Guido Calabresi

Gregory C. Keating

Abstract

This paper - written for a conference celebrating "The Costs of Accidents," three and half decades after its publication - pays tribute to Calabresi's remarkable exploration of the deepest, most disturbing and most difficult problem in the law of accidents. Throughout his long and distinguished career, Guido Calabresi has insisted that a tragic conflict of irreconcilable values lies at the heart of our law of accidents. We are profoundly committed both to "the ideal that life is a pearl beyond price" and to the practice of valuing people's lives in market terms - to the practice of pricing life. We know "that not every safety measure is worth paying for and that some accidents - however horrible - are 'worth having.' We therefore place a price on life, implicitly or explicitly, and rightly so. We must trade lives off against other goods - goods as mundane as mere convenience. And because we cannot abide this harsh truth, we avert our eyes from the real terms on which we "accidentally" deal out death.

"Pricelessness and Life" argues that our predicament is deep and difficult, but not tragic. We are not faced with a conflict of irreconcilable values, neither of which can be given up. We must indeed trade safety (and with it life) against other goods, but the criteria that we use to make those trades need not be market ones. The tragic predicament of accident law as Calabresi describes it is defined by a conflict between a moral absolute and a practice modeled on market rationality. When we conceptualize "the decision for accidents" in market terms, we conceive of human life as a good that is commensurable with innumerable other goods at some ratio of exchange. Market terms of trade, however, are neither inevitable nor universal in our law. Lives must indeed be exchanged for other goods, but these exchanges need not - and often are not - be made in accordance with the precepts of market rationality.

Indeed, our own law of accidents encompasses norms that prescribe especially stringent precaution - more than efficient precaution - against ”significant” risks of accidental death. These norms require that the risks of some activities be reduced either to the greatest extent ”feasible,” or to the point where the activity can be called ”safe.” ”Feasible” and ”safe” precaution embrace nonmarket criteria for trading life against other goods and embody a moral value different from the value of efficiency embraced by the market. The market embodies the idea of efficiency, and efficiency in turn expresses an idea of the general welfare. Efficiency is concerned with the relationship between the aggregate benefits and the aggregate costs of an arrangement. An arrangement is efficient when it maximizes benefits and minimizes costs - when it maximizes the size of the pie. The pie itself -the value being maximized - is human well-being or welfare, as expressed by persons' subjective preferences and as measured by the metric of money. Goods are measured by their contribution to human welfare and everything - from life to convenience - is fungible at some ratio of exchange. Efficient precaution thus licenses sacrificing the lives of some for the convenience of others, if the some are few enough and the others plentiful enough. When the some are few enough and the others plentiful enough, sacrificing the lives of some maximizes value.

Feasible and safe precaution are animated by the competing value of interpersonal fairness. They flow from the proposition that the burdens and benefits of risky activities must be justifiable to those who are burdened by those activities. Feasible and safe precaution take safety to be an especially important good - a precondition of a decent life. They insist that it is unfair to put anyone's urgent interest in undevastated life at significant peril for the sake of trivial gains to others. It is fair to put lives in significant danger only when something comparably valuable stands to be gained, either by those whose lives are endangered or by others. Feasible and safe precaution reject the idea that the price system is the proper measure of precaution when significant risks to life are at stake. They express the ”pricelessness” of life not by demanding - absurdly - that no tradeoffs involving life are ever acceptable, but by rejecting the market model of justified precaution and insisting that lives be imperiled only for the sake of comparably valuable goods, and so only on terms that could be justified to those whose lives are ultimately lost. When we trade lives on these terms, the accidental deaths that we inflict are cause for grief and regret, but they are not the scene of a collective tragedy.

PRICELESSNESS AND LIFE: AN ESSAY FOR GUIDO CALABRESI

GREGORY C. KEATING*

At the heart of accident law, Guido Calabresi has long insisted, lies a tragic conflict of irreconcilable values. Our law of accidents is profoundly committed both to "the ideal that life is a pearl beyond price"[1] and to the practice of valuing people's lives in market terms—to the practice of pricing life. We know "that not every safety measure is worth paying for and that some accidents—however horrible—are 'worth having.'"[2] We therefore place a price on life, implicitly or explicitly, and rightly so. We must trade lives off against other goods—goods as mundane as mere convenience. Placing a price on life enables us to make the necessary exchanges in a rational and systematic way.[3]

This hard and bold lesson surfaces early in the course of Calabresi's remarkable writings, and it blossoms into one of the principal themes in the finest body of writing on the law of accidents in our time. The tragic predicament of accident law is a theme in Calabresi's thinking prior to *The Costs of Accidents*;[4] it figures conspicuously in

* William T. Dalessi Professor of Law, University of Southern California Law School. I am indebted to Lewis Sargentich for illuminating conversations on the topics of this Essay over the course of many years; to Ben Zipursky for suggesting this Essay topic to me; to Don Gifford for organizing the conference; and to the participants in the conference—especially Hanoch Sheinman, for many illuminating exchanges, and Richard Posner for commenting graciously on the paper by e-mail. Most of all I am indebted to Guido Calabresi for having written so provocatively on the subject of this Essay over the course of his career and for commenting on a draft of this paper as well. Portions of this Essay are adapted, with some changes, from Gregory C. Keating, *Pressing Precaution Beyond the Point of Cost-Justification*, 56 VAND. L. REV. 653 (2003) [hereinafter *Pressing Precaution*].

1. Guido Calabresi, The Complexity of Torts—The Case of Punitive Damages 10 (Nov. 12, 2003) (unpublished manuscript, on file with author) [hereinafter Complexity].

2. *Id.*

3. "[T]he decision whether or not to take lives in exchange for money or convenience is sometimes made . . . through the market," by "balancing . . . the money value of the lives taken against the money price of the convenience." Guido Calabresi, *The Decision for Accidents: An Approach to Nonfault Allocation of Costs*, 78 HARV. L. REV. 713, 717 (1965) [hereinafter *The Decision for Accidents*]. This sentence occurs in the course of Calabresi's first extended discussion of what he later calls the "myth . . . that our society wants to avoid accidents at all costs." GUIDO CALABRESI, THE COSTS OF ACCIDENTS: A LEGAL AND ECONOMIC ANALYSIS 17 (1970) [hereinafter THE COSTS OF ACCIDENTS].

4. See the extended discussion in Calabresi, *The Decision for Accidents*, *supra* note 3, at 716-21. This discussion did not go unnoticed; it was one of the two principal provocations for Charles Fried's challenge of the economist's perspective on "rational choice in respect to life and death." Charles Fried, *The Value of Life*, 82 HARV. L. REV. 1415, 1416 & n.2 (1969); *see also* CHARLES FRIED, AN ANATOMY OF VALUES: PROBLEMS OF PERSONAL AND SOCIAL **R**

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Costs[5] itself; and it becomes even more salient in Calabresi' s writing after *Costs*.[6]

My aim in this Essay is to pay tribute to Calabresi's remarkable exploration of this conflict between moral conviction and practical necessity by disagreeing—partially—with him. I shall argue that though we must indeed trade safety (and with it life) against other goods, the criteria that we use to make those trades need not be market ones. The predicament as Calabresi describes it is defined by a conflict between a moral absolute and a practice modeled on market rationality. When we conceptualize "the decision for accidents" in market terms, we conceive of human life as a good that is commensurable with innumerable other goods at some ratio of exchange.[7] Lives must indeed be traded off against other goods—as Calabresi has always so forcefully reminded us—but lives need not be exchanged for other goods in accordance with the precepts of market rationality.

More particularly, I shall argue that our own law of accidents encompasses norms that prescribe especially stringent precaution—more than efficient precaution—against "significant" risks of accidental death. These norms require that the risks of some activities be reduced either to the greatest extent "feasible," or to the point where the activity can be called "safe." These norms embrace nonmarket criteria for trading life against other goods and embody a moral value

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CHOICE 207-36 (1970). T.C. Schelling, *The Life You Save May Be Your Own*, *in* PROBLEMS IN PUBLIC EXPENDITURE ANALYSIS 127 (Samuel B. Chase, Jr. ed., 1968), *reprinted in* THOMAS C. SCHELLING, CHOICE AND CONSEQUENCE 113 (1984) [hereinafter *The Life You Save* (page citations to the reprinted version)], was the other provocation for Fried's article. Schelling's paper formulates the influential distinction between actual and "statistical" lives. That distinction is implicit in Calabresi's early discussions of our practices with respect to risks of death.

5. *The Costs of Accidents* includes the preservation of life "at all costs" as the first of four "myths" that "will make our analysis difficult if not cleared up." THE COSTS OF ACCIDENTS, *supra* note 3, at 17. R

6. In his writings since *The Costs of Accidents*, Calabresi has worried especially and eloquently about the apparent irrationality of "spend[ing] millions of dollars to save the lives of clearly identified individuals who are in immediate danger—dollars, which, if applied to generalized safety, would protect and preserve many more." GUIDO CALABRESI, IDEALS, BELIEFS, ATTITUDES AND THE LAW: PRIVATE LAW PERSPECTIVES ON A PUBLIC LAW PROBLEM 6 (1985). *But see* GUIDO CALABRESI & PHILIP BOBBITT, TRAGIC CHOICES 39 (1978) (stating that "[t]o the extent that our lives and institutions depend on the notion that life is beyond price, . . . a refusal to save lives is horribly costly").

7. "[E]conomics . . . envisages rational man as seeking many goals, all substitutable at the margin. On the margin, economic man is prepared to trade off some freedom for some security, some privacy for some wealth, some freedom for some paternalism, and vice versa . . . ." Harold Demsetz, *Professor Michelman's Unnecessary and Futile Search for the Philosopher's Touchstone*, *in* NOMOS XXIV: ETHICS, ECONOMICS, AND THE LAW 41, 44 (J. Roland Pennock & John W. Chapman eds., 1982).

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different from the value of efficiency embraced by the market. The market embodies the idea of efficiency, and efficiency in turn expresses an idea of the greatest good or general welfare. Efficiency is concerned with "the relationship between the aggregate benefits of a situation and the aggregate costs of the situation."[8] An arrangement is efficient when it maximizes benefits and minimizes costs—when it "maximize[s] the size of the pie."[9] The pie itself—the value being maximized—is human well-being or welfare as expressed by persons' subjective preferences and as measured by the metric of money.[10] Goods are measured by their contribution to human welfare and all goods and all goals are "substitutable at the margin."[11] Everything—from life to convenience—is fungible at some ratio of exchange. Efficient precaution thus licenses sacrificing the lives of some for the convenience of others, if the some are few enough and the others plentiful enough. When the some are few enough and the others plentiful enough, sacrificing the lives of some maximizes value.

Feasible and safe precaution are animated by the competing value of interpersonal fairness. They flow from the proposition that the burdens and benefits of risky activities must be justifiable to those who are burdened by those activities. Feasible and safe precaution take safety to be an especially important good—a precondition of a decent life. They insist that it is unfair to put anyone's urgent interest in undevastated life at significant peril for the sake of trivial gains to others. It is fair to put lives in significant danger only when something comparably valuable stands to be gained, either by those whose lives are endangered or by others. Feasible and safe precaution reject the idea that the price system is the proper measure of precaution when significant risks to life are at stake. They express the "pricelessness" of life not by demanding—absurdly—that no tradeoffs involving life are

8. A. MITCHELL POLINSKY, AN INTRODUCTION TO LAW AND ECONOMICS 7 (2d ed. 1989).

9. *Id.*

10. *See, e.g.*, Richard Craswell, *Passing On the Costs of Legal Rules: Efficiency and Distribution in Buyer-Seller Relationships*, 43 STAN. L. REV. 361, 368-69 (1991) ("I adopt the consumer sovereignty position that consumer welfare is to be judged solely by reference to consumers' own tastes and preferences. I also assume that those tastes and preferences can be meaningfully translated into a dollar amount and that the appropriate amount is whatever each consumer is willing to pay to satisfy those preferences."). Louis Kaplow and Steven Shavell also make these assumptions. *See, e.g.*, LOUIS KAPLOW & STEVEN SHAVELL, FAIRNESS VERSUS WELFARE 88 n.5 (2002) (indicating that "the importance of liberty to an individual" should be "determined by the amount by which the individual values it"); *id.* at 100 n.32 (endorsing "the convention of placing a dollar value on harm" as a way of measuring "the implicit valuations of individuals reflected in the choices they make"). *See also* Gregory Keating, *Reasonableness and Rationality in Negligence Theory*, 48 STAN. L. REV. 311, 334 n.78, 335 n.81 (1996) [hereinafter *Reasonableness and Rationality*].

11. Demsetz, *supra* note 7, at 44. R

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ever acceptable, but by rejecting the market model of justified precaution and insisting that lives be imperiled only for the sake of comparably valuable goods. Just as we show due respect for human dignity by treating others in accordance with principles of right and justice,[12] so too we show due respect for the pricelessness of life by sacrificing lives only in accordance with appropriately stringent principles of precaution.

Part I of this Essay traces the conflict between ordinary moral intuitions of fairness and economic prescription; it argues that powerful and coherent ideas of fairness support the ordinary moral intuition that the norm of cost-justified precaution requires insufficient precaution in cases where death or devastating injury is risked. Part II explains the safety and feasibility norms found in aspects of federal statutory risk regulation. Parts III and IV argue that the best interpretation of the safety and feasibility standards shows them to be conceptually coherent alternatives to cost-justified precaution. These standards constructively embody the objections of fairness that underlie the ordinary moral intuition that significant risks of death demand more than cost-justified precaution. Part V grapples with the fact that the reach of the feasibility norm is limited in a very important way by the operation of the market. Feasible risk reduction ceases at the point where further risk reduction would jeopardize the long-run survival of the activities to which it applies. The value of those activities is vouched for by the fact that they flourish in our market economy—by the fact that they are "efficient activities" in some rough and ready way. This role of the market in limiting the reach of feasible precaution is a powerful challenge to fairness ideals. Part V considers how this challenge might be met.

I. THE TRAGIC PREDICAMENT OF ACCIDENT LAW

A. Economic Sense and Moral Sensibility

The economic tradition in the law of accidents asserts that justified precaution is, and ought to be, economically efficient precaution. When Learned Hand devised his famous "formula" for determining the amount of care due, Richard Posner argues, he was both "adum-

12. As Rawls notes:

> [T]o respect persons is to recognize that they possess an inviolability founded on justice that even the welfare of society as a whole cannot override. It is to affirm that the loss of freedom for some is not made right by a greater welfare enjoyed by others. The lexical priorities of justice represent the value of persons that Kant says is beyond all price.

JOHN RAWLS, A THEORY OF JUSTICE § 87, at 513 (rev. ed. 1999) [hereinafter THEORY].

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brating, perhaps unwittingly, an economic meaning of negligence," and attempting nothing more novel than "to make explicit the standard that the courts had long applied."[13] Judge Hand, as Robert Cooter and Thomas Ulen explain, "set the legal standard of care by explicitly balancing the benefits and costs of precaution, just as an economist would have done."[14] So conceived, reasonable care is the level of precaution that minimizes the combined costs of preventing and paying for accidents, thereby maximizing the wealth at society's disposal. Precaution should be taken until a penny more spent to prevent accidents yields less than a penny's reduction in expected accident costs.

This economic interpretation of due care has been enormously influential, but it remains deeply problematic. It equates reasonable care with rational care, and spells rationality out in economic terms.[15] The average reasonable person thinks and acts as a single, economically rational actor would, if she bore both the costs and the benefits of precaution. An unreasonable person, by contrast, gives more

13. Richard A. Posner, *A Theory of Negligence*, 1 J. LEGAL STUD. 29, 32 (1972) (footnote omitted). In marked contrast to Posner, Calabresi has been more preoccupied with—and more favorably disposed toward—strict liability than negligence. Indeed, within the law and economics movement, Calabresi may be *the* preeminent *critic* of negligence liability. Part IV of *The Costs of Accidents*, for example, is a systematic indictment of negligence liability. Nevertheless, Calabresi's writings suggest a provisional acceptance of an account of negligence liability along the general lines of the orthodox economic interpretation, even as those writings argue for the superiority of strict liability as an engine of "primary accident cost reduction." Guido Calabresi & Jon T. Hirschoff, *Toward a Test for Strict Liability in Torts*, 81 YALE L.J. 1055, 1058 (1972). Calabresi and Hirschoff start with the assumption "that the traditional test for fault, as given expression in Learned Hand's formula, was designed to do what Professor Posner says it was designed to do, namely to minimize the sum of accident costs and the costs of accident avoidance." *Id.* at 1057 (footnote omitted). They go on to clarify: "Our assumption, more precisely, is that the object is optimization of primary accident costs." *Id.* at 1057 n.10 (citing THE COSTS OF ACCIDENTS, *supra* note 3, at 26-31). R

Perhaps more importantly, a market account of the way that we do and should sometimes trade life for convenience and other mundane advantages is one prong of the tragic predicament of accident law as Calabresi frames it. *See, e.g.*, Calabresi, Complexity, *supra* note 1, at 9-11. In the course of explicating the "tragic choice" function of punitive damages, Calabresi focuses on Ford's decision not to redesign the gas tanks in Ford Pintos because the company concluded that the cost of such redesign would be "too high . . . in relation to the number of lives that would be saved by doing so." *Id.* at 9. Calabresi then asks: "Why, after all, doesn't the Learned Hand test for negligence presume just such a cost/benefit test?" *Id.* at 10. R

14. ROBERT COOTER & THOMAS ULEN, LAW AND ECONOMICS 360 (1988) [hereinafter 1st ed.]. In the most recent edition of their textbook, Cooter and Ulen take the same position, albeit a bit less explicitly. *See* ROBERT COOTER & THOMAS ULEN, LAW AND ECONOMICS 314-15 (3d ed. 2000) [hereinafter 3d ed.] (noting that "[r]epeated application of the Hand rule enables adjudicators to discover the efficient level of care").

15. *See* Keating, *Reasonableness and Rationality*, *supra* note 10, at 325-27, 337-39. R

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weight to the benefits she gains by imposing risks on others than to the costs that her risks impose on others.[16] This core claim is at once a confirmation of our fundamental moral convictions and an affront to them. It is a confirmation of our moral convictions because—if anything is unreasonable—assuming that my interests are *objectively* more important than other people's interests is unreasonable. From a truly impartial point of view, my life is only one life among many equally important lives, and my well-being has no claim to special importance.[17]

If the economic interpretation captures something fundamental about the moral point of view when it insists that judgments of reasonable care must count every affected person's interests equally, it affronts our moral sensibility in an equally fundamental way when it comes to conceptualizing the value of life itself. Cost-benefit analysis treats all human interests—urgent ones like physical integrity and adequate nutrition, and luxuries like the consumption of fine wines—as fungible at some ratio of exchange and insists that the cost-justified level of precaution is the only level of precaution that is ever justified.[18] Our common law of negligence, by contrast, treats the physical integrity of the person as an especially urgent interest,[19] and our juries

16. Cooter and Ulen note that

> reasonableness requires the decisionmaker to give similar weight to the cost of more precaution, which he bears, and the benefit of more precaution in terms of the reduced frequency and severity of accidents, which others enjoy. His behavior is unreasonable and his precaution is faulty when he gives more weight to the costs he bears than to the benefits it creates for others.

COOTER & ULEN, 1st ed., *supra* note 14, at 360. This exact passage is not found in the third edition of the book. However, nothing in the third edition suggests that Cooter and Ulen have or would repudiate the ideas expressed in the passage. **R**

17. *See, e.g.*, KAPLOW & SHAVELL, *supra* note 10, at 437-43 (emphasizing the normative appeal of the "ex ante perspective" and its importance to the "welfare economic view"); THOMAS NAGEL, EQUALITY AND PARTIALITY 10-11 (1991) (asserting that ethics and political theory begin from the "impersonal standpoint" and that "the basic insight that appears from the impersonal standpoint is that everyone's life matters, and no one is more important than anyone else"); Richard H. Fallon, Jr., *Should We All Be Welfare Economists?*, 101 MICH. L. REV. 979, 1009 (2003) ("As affirmed by a tradition of liberal or 'impartialist' theories, the foundation of moral thought lies in an 'impersonal standpoint' from which each of us must recognize that, objectively speaking, we are no more important than anyone else." (footnote omitted) (citing NAGEL, *supra*, at 10-11)). **R**

18. *E.g.*, Herman B. Leonard & Richard J. Zeckhauser, *Cost-Benefit Analysis Applied to Risks: Its Philosophy and Legitimacy*, *in* VALUES AT RISK 31, 35 (Douglas MacClean ed., 1986). Leonard and Zeckhauser argue that centralized decisions of whether or not to impose a risk should be made by choosing the "alternative . . . for which benefits most exceed costs. This standard is often referred to as 'efficiency.' The underlying notion is that it is wasteful to choose alternatives that do not provide the maximum possible 'net benefits' or 'surplus.'" *Id.*

19. Keating, *Reasonableness and Rationality*, *supra* note 10, at 364-67. **R**

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are repulsed by the claim that accidental deaths should not be prevented whenever the costs of prevention exceed the value—economically conceived—of the lives at risk.[20] According to the folk wisdom of products liability lawyers:

> [O]ne argument that you should almost never make is that the manufacturer deliberately included a dangerous feature in the product's design because of the high monetary cost that the manufacturer would have incurred in choosing another design. If you do argue this, you're almost certain to lose on liability, and you can expose yourself to punitive damages as well.[21]

Jury practice and economic prescription are at odds with one another.

For Calabresi, this conflict between the moral sensibilities of jurors and economic science is a tragic clash of values in Isaiah Berlin's sense.[22] In coping with accidental injury, we cannot abandon either our commitment to economic rationality or our commitment to the pricelessness of life. Paradoxically, we must cling to our belief in the pricelessness of life even though the "first myth" likely to cloud rational analysis of accidental harm is the myth that our society wants to avoid accidents at all costs:

> Our society is not committed to preserving life at any cost. In its broadest sense, the rather unpleasant notion that we are willing to destroy lives should be obvious. Wars are fought. The University of Mississippi is integrated at the risk of losing lives. But what is more pertinent to the study of accident law, though perhaps equally obvious, is that lives are spent not only when the *quid pro quo* is some great moral principle, but also when it is a matter of convenience. Ventures are undertaken that, statistically at least, are certain to cost lives. Thus we build a tunnel under Mont Blanc because it is essential to the Common Market and cuts down the traveling time from Rome to Paris, though we know that about one man per kilometer of tunnel will die. We take planes and cars rather than safer, slower means of travel. And perhaps most telling, we use relatively safe equipment rather

20. Gary T. Schwartz, *The Myth of the Ford Pinto Case*, 43 RUTGERS L. REV. 1013, 1038 (1991); W. Kip Viscusi, *Jurors, Judges, and the Mistreatment of Risk by the Courts*, 30 J. LEGAL STUD. 107, 115-26 (2001).

21. Schwartz, *supra* note 20, at 1038. This lesson is taken to be the moral of the Ford Pinto case, *Grimshaw v. Ford Motor Co.*, 174 Cal. Rptr. 348 (Ct. App. 1981). R

22. *See* ISAIAH BERLIN, *Two Concepts of Liberty*, *in* FOUR ESSAYS ON LIBERTY 118, 168 (1969) ("The world that we encounter in ordinary experience is one in which we are faced with choices between ends equally ultimate, and claims equally absolute, the realization of some of which must inevitably involve the sacrifice of others.").

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> than the safest imaginable because—and it is not a bad reason—the safest costs too much. It should be apparent that while some of these accident-causing activities also result in diminution of accidents—the Mont Blanc tunnel may well save more lives by diminishing traffic fatalities than it took to build it—this explanation does not come close to justifying most accident-causing activities. Railroad grade crossings are used because they are cheap, not because they save more lives than they take.[23]

We might expect this blunt demonstration that our actual practice belies our professed belief in the pricelessness of life to be followed by the equally blunt conclusion that a belief in the pricelessness of life is so much sentimental silliness. But this is not the conclusion that Calabresi draws:

> The problem is that while we know at some level that not every safety measure is worth paying for and that some accidents—however horrible—are "worth having," yet we are committed to the ideal that life is a pearl beyond price. And we are *determined*, as a society, to hold to both contradictory views. Thus, shortly after I wrote an article provocatively titled "The Decision for Accidents," the *New York Times* thundered in an editorial that when safety is at stake, *no amount of expenditure is too much*. I was tempted to write them welcoming the fact that thereafter all their delivery trucks would, I supposed, drive no faster than 5 miles an hour. I did not do so, of course, because I realized that the *Times* was saying something important, and in a way *true*, when it denied the acceptability of safety/cost tradeoffs, just as I was when I asserted their inevitability.[24]

This conflict between abstract conviction and actual practice embodies, then, a tragic conflict of values that drives us to a defensible subterfuge:

> We *want* Ford to make a cost/benefit analysis, and choose the cheaper way. But—at least in cases as gruesome as the *Pinto* one—we certainly don't want to have that analysis thrown in our face. We cannot accept the blatant statement that burning babies is not only something that, tragically, will occur from time to time, but that Ford was

23. THE COSTS OF ACCIDENTS, *supra* note 3, at 17-18 (footnote omitted). The omitted footnote directs the reader to "a more complete discussion of this point" in Calabresi, *The Decision for Accidents*, *supra* note 3, at 716-21. R R

24. Calabresi, Complexity, *supra* note 1, at 10. R

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> somehow *right* in choosing to bring it about, and *therefore* should not pay damages. What then is the answer?
>
> At least in cases like the *Pinto* one, our seeming adherence to a fault standard described in cost/benefit terms is a false one. We may not, ultimately, object to where Ford put its gas tanks enough to forbid their doing so. We may not even think it wrong for Ford to decide on the tank's placement based on a cost/benefit analysis. But we will not let Ford defend against liability to those killed or injured, by citing that cost benefit analysis. The *cost* to us, of being blatantly told what, even if inevitable, is unacceptable, is simply too high. Despite, then, the supposed applicability of a fault standard to such situations, we require, in these extreme cases, that the defendant pay damages, regardless of Learned Handisms, and shut up! And we enforce this subterfuge—this actuality of strict liability despite the nominal dominance of cost/benefit determined fault—by assessing punitive damages o[n] any defendant foolish enough not to appreciate our self-contradictory but not irrational rules.[25]

For Calabresi, then, the conflict between our need to put lives at risk in a rational way and our competing need to affirm the sanctity of life can only be resolved by dissembling.

The burden of this Essay is to suggest that our predicament may not be quite so grim. The proposition that life has a value beyond all price might be understood not to forbid all trading off of lives against other goods, but only to forbid trading lives off in accordance with market principles of rationality. The market *is* the price system. The claim that life is beyond all price may, therefore, be understood not as a claim that life may never be put at risk in pursuit of some other value, but as a claim that life should not be traded off against other goods in accordance with the principles of the market. The market is a particular, contestable mode of valuation and exchange. The market trades goods off against each other in a way that denies that some—like life—are more valuable than others—like money or convenience. When everything is given a price, everything is fungible with everything else at some ratio of exchange. Yet life is especially valuable and its protection especially urgent. Morally acceptable principles for trading life off against other goods must account for the special value of life and the special urgency of protecting against death and devastating injury.

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25. *Id.* at 11. The need for subterfuge is a theme in Calabresi's *Tragic Choices* as well. CALABRESI & BOBBITT, *supra* note 6, *passim.* **R**

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I shall argue that our legal system does in fact contain norms that insist on more than cost-justified precaution against risks of death or devastating injury, and that these norms are plausibly understood as appropriate ways to register the special value of life itself and the urgency of its protection. These norms show that there is, extant in our legal culture, a practical way of expressing the pricelessness of life. That way consists of acting in accordance with principles of precaution that reject the "pricing" rationality of cost-benefit analysis and take a restricted view of the goods that are worth pursuing when the cost is significant risk of devastating injury.[26] Before we turn to these norms, however, we must examine the conflict between coherent economic science and inchoate moral intuition more closely.

B. Inchoate Intuition and Coherent Science

If the economic interpretation of reasonable care is at odds with jury practice, the claim implicit in jury practice—that precaution should be pressed beyond the point of cost-justification—is underdeveloped. The ideal of reasonableness that lies at the heart of negligence law is intrinsically moral—and so eludes reduction to the morally neutral notion of rationality[27]—but because the practice of negligence adjudication involves jury application of the general legal standard of reasonable care to particular fact patterns, the norm of reasonable care has not given rise to conceptually well-defined and clear alternatives to cost-justified precaution in cases where life itself is at stake. Jury adjudication yields particular judgments of reasonableness, not conceptual refinement of the norm of reasonable care itself.[28] For their part, scholars of negligence law sympathetic to jury revulsion towards cost-benefit analysis of risks to life and limb have not

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26. It is worth noting that my views can be incorporated within the framework of *The Costs of Accidents* in two ways. First, they can be understood as a constraint of justice that limits the use of efficiency criteria in a particular context. *See* THE COSTS OF ACCIDENTS, *supra* note 3, at 24 n.1. *The Costs of Accidents* contemplates this possibility and accepts its applicability in some range of circumstances. *Id.* Second, the statutes that I discuss in Parts II and III of this Essay involve the kind of collective valuation of activities that *Costs* analyzes under the rubric of "specific" or "collective" deterrence. *See generally id.* at 95-134. R

27. *See* JOHN RAWLS, POLITICAL LIBERALISM 48-49 n.1, 48-54 (1993) [hereinafter POLITICAL LIBERALISM]; W.M. Sibley, *The Rational Versus the Reasonable*, 62 PHIL. REV. 554 (1953); *see also* Keating, *Reasonableness and Rationality*, *supra* note 10, at 311-12 ("When we act rationally, we pursue our self-interest in an instrumentally intelligent way. When we act reasonably, we restrain our pursuit of self-interest by acting in accordance with principles that fix fair terms of cooperation."). Reasonableness requires that we take the impact of our proposed actions on others as a circumstance capable of affecting our conduct and seek to act on a basis acceptable to those we affect. R

28. Reasonable care is sometimes given precise form in rules through the adoption of customarily or statutorily prescribed precautions, but this enterprise does not generate

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explained why more than cost-justified precaution might indeed be appropriate when life itself is threatened with severe and irreparable injury. Nor have they explained just how much more precaution is appropriate.

Economically inclined tort scholars, by contrast, have clear and well-articulated objections to taking more than cost-justified precaution. Cost-justified precaution is efficient precaution. Economically speaking, it is irrational to take more than efficient precaution; it shrinks the pie instead of expanding it. Precautions taken once the point of cost-justified precaution has been reached yield less in dollars saved than they cost in dollars spent. We would thus be richer if we chose not to take the extra precautions demanded by the safety and feasibility norms. Therefore, insofar as they insist on taking more than efficient precaution, feasible precaution and safe precaution make us worse off, not better off.[29] Our welfare could be improved by retreating back to the point of cost-justified precaution and by putting the money saved to better use elsewhere. Why, then, should society ever press precaution beyond the point of cost-justification?

One answer—and there may be others—lies in considerations of fairness and urgency. The idea of fairness directs our attention to a distinct domain of concerns, a domain different from that of either efficiency or rights. Fairness is concerned with the distribution of burdens and benefits—"with how well each person's claim is satisfied *compared with* how well other people's are satisfied."[30] Treating people fairly generally requires us to align burden and benefit proportionally

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much in the way of the conceptual refinement or specification of the idea of reasonableness.

29. The claim that it is wasteful and irrational to take more than cost-justified precaution is fundamental to the economic analysis of risk and precaution. Leonard & Zeckhauser, *supra* note 18, at 35; *see also* KAPLOW & SHAVELL, *supra* note 10, at 52 (arguing that "individuals will be made worse off overall whenever consideration of fairness leads to the choice of a regime different from that which would be adopted under welfare economics"); THOMAS C. SCHELLING, *Economic Reasoning and the Ethics of Policy*, *in* CHOICE AND CONSEQUENCE, *supra* note 4, at 1, 15-17 (explaining that "'not efficient' merely means that I can think of something better—something potentially better from the points of view of all parties concerned"). R R

30. John Broome, *Fairness*, 91 PROC. OF THE ARISTOTELIAN SOC'Y 87, 94-95 (1990-91). Fairness does not, therefore, represent a way in which people are made better off. Explaining just why considerations of fairness may still have priority over considerations of well-being is thus an important challenge, as Louis Kaplow and Steve Shavell rightly insist. *See generally* KAPLOW & SHAVELL, *supra* note 10. A complete response to Professors Kaplow and Shavell is beyond the scope of this paper. A brief comment, however, is in order: Circumstances where risks of physical injury inevitably result in some death or devastating injury are circumstances where the well-being of some is increased by the imposition of the risks in question and the well-being of others is decreased very greatly. Considerations of fairness—of who wins and how great are their gains, and who loses and how great are their R

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and to treat competing claims in ways that can be justified to those whose claims they are.[31] Because fairness is concerned with competing claims, it brings issues of urgency to the fore. When we must decide if the burdens to one person (or class of persons) are justified by benefits to another person (or class of persons) we are pressed towards employing "objective," urgency-based criteria of interpersonal comparison.[32] We are pushed *not* towards asking how intensely the affected persons desire the benefits—or loathe the burdens—at issue, but how urgent the harms done and the gains won are. When people complain that it is unfair for some to live in the lap of luxury while others go hungry and sleep beneath bridges, they are not asserting that those who live in the lap of luxury do not prize their pleasures. They are asserting that adequate food and shelter are more urgent needs. Protection against irreparable injury and death are similarly urgent needs.

Efficiency, by contrast, directs our attention to questions of individual welfare or well-being. It is natural to measure a person's welfare or well-being by asking how well that person's life is going from his or her point of view. This is what efficiency analysis tries to do by taking preference satisfaction as its basic measure of welfare. Risk of accidental death—the most severe case of the sort of irreparable injury that concerns us—presents efficiency analysis with an especially difficult exercise in determining other people's preferences. "What is it worth," Thomas Schelling asks, "to reduce the probability of death . . . within some identifiable group of people none of whom expects to die except eventually?"[33] What is it worth, in other words, to save a "statistical life"—a life that will be saved not here, now and vividly, but later and invisibly? The answer hinges, Schelling argues, on the value

losses—therefore come to the fore while considerations of overall well-being recede into the background.

31. The first point is as old as Aristotle. *See* ARISTOTLE, NICOMACHEAN ETHICS 87 (Roger Crisp ed. & trans., 2000) ("[W]hat is just . . . is what is proportionate . . . ."). The second is brought out by the "Kantian Interpretation of Justice as Fairness." RAWLS, THEORY, *supra* note 12, § 40, at 221; *see id.* § 4, at 15-19 (discussing the problem of "justification"). R

32. *See* T.M. Scanlon, *Preference and Urgency*, 72 J. PHIL. 655, 656-59 (1975) [hereinafter *Urgency*] (contrasting "objective" and "subjective" criteria of interpersonal comparison). Subjective criteria, Scanlon writes, evaluate "the level of well-being enjoyed by a person in given material circumstances or the importance for that person of a given benefit or sacrifice . . . solely from the point of view of that person's tastes and interests." *Id.* at 656. Objective criteria "provide[ ] a basis for appraisal of a person's level of well-being which is independent of that person's tastes and interests." *Id.* at 658.

33. SCHELLING, *The Life You Save*, *supra* note 4, at 113. When it was first published in 1968, Schelling's article inaugurated the modern economic approach to the valuation of human life. R

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that the affected individuals themselves place on their lives.[34] Conceptually, what is required is not a moral judgment but a "consumer choice."[35] We need to determine how highly people value life and safety in comparison with the many other objectives that they seek, all of which are substitutable at the margin. Operationally, what is required is a way of mimicking the market—a way of pricing lives and safety so that they may be rationally traded off against the other goals with which they compete. This is the role of cost-benefit analysis.

1. Cost-Benefit Analysis: Subjecting Risk to the Metric of the Market.— In its orthodox form, cost-benefit analysis is an attempt to extend a market mode of valuation and choice to areas where actual markets fail—where actual markets either do not exist or are incomplete and imperfect.[36] Risks to life and limb are a classic case in point.[37] Because it seeks to mimic the market, cost-benefit analysis is constructed around three criteria of economic efficiency: Pareto optimality, Pareto improvement, and potential Pareto improvement. A state of affairs is Pareto optimal (or Pareto efficient) if and only if all opportunities for improving the welfare of any person without making any

34. *Id.*

35. *Id.* at 114.

36. Cost-benefit analysis comes in a wide variety of forms. At one end of the spectrum, cost-benefit analysis is cast as a matter of common sense; at the other end it is reconstructed as an element of "deliberative democracy." *See* Robert H. Frank, *Why Is Cost-Benefit Analysis So Controversial?*, 29 J. LEGAL STUD. 913, 913 (2000) (noting that many find it "hard to imagine" that anyone could disagree with the "commonsensical" principle that we should take only those actions whose benefits exceed their costs); CASS R. SUNSTEIN, RISK AND REASON: SAFETY, LAW AND THE ENVIRONMENT 7-8 (2002) (recasting cost-benefit analysis so that it has an important role in deliberative democracy).

This Essay describes a particular variant of cost-benefit analysis. I believe that it is fair to label this variant "orthodox" cost-benefit analysis and that it defines a distinct and important position. The version that I describe is along the lines of the Kaldor-Hicks version that Posner finds implicit in the Hand Formula. Richard A. Posner, *Cost-Benefit Analysis: Definition, Justification, and Comment on Conference Papers*, 29 J. LEGAL STUD. 1153, 1154 (2000) [hereinafter *Cost-Benefit Analysis*]. On the one hand, this version is not mere common sense; it applies the distinctively counterintuitive ideas of economics to a domain where actual markets do not exist. On the other hand, it is not a practice of deliberation either. Orthodox cost-benefit analysis does not model a deliberative process for a number or reasons. For one thing it takes the market idea of consumer choice as its guiding ideal, and the market is not a deliberative institution. It is a forum in which people act on their wants or preferences insofar as they are prepared to back those preferences with money. More particularly, preferences are the upshot of deliberation, not an aspect of deliberation. Henry S. Richardson, *The Stupidity of the Cost-Benefit Standard*, 29 J. LEGAL STUD. 971, 977 (2000).

37. Calabresi comments eloquently on this in THE COSTS OF ACCIDENTS, *supra* note 3, at 205-08. R

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other person worse off have been exhausted.[38] A policy effects a Pareto improvement if and only if it makes at least one person better off without making anyone worse off.[39] A policy makes a potential Pareto improvement if and only if it produces gains that could be redistributed to make an actual Pareto improvement.[40] When cost-benefit analysis seeks the "alternative . . . for which benefits most exceed costs," it is searching for the alternative that maximizes potential Pareto improvements.[41]

Pareto optimality and Pareto improvement are "ordinal" conceptions of utility: they rank states of affairs without relying on "any intensity of preference [or] interpersonal comparison of utilities."[42] But judgments of *potential* Pareto superiority require determining if those who stand to win from a proposed change will benefit so greatly that they can compensate those who stand to lose.[43] Judgments of potential Pareto superiority therefore require some metric by which to measure gains and losses, in order to determine if gains exceed losses enough for the winners to compensate the losers and still improve their lots. The metric employed by cost-benefit analysis is money. More exactly, cost-benefit analysis typically measures a person's wel-

38. B. Lockwood, *Pareto Efficiency*, *in* 3 THE NEW PALGRAVE DICTIONARY OF ECONOMICS 811, 811 (John Eatwell et al. eds., 1998) ("[A]n allocation of resources in the economy [is Pareto] optimal if there exist[s] no other productively feasible allocation which ma[kes] all individuals in the economy at least as well-off, and at least one strictly better off, than they were initially."). On the influence of this concept, see *id.* ("Simple and limited idea though this is, it has had an enormous influence on the development of neoclassical economics. . . . It is no exaggeration to say that the entire modern microeconomic theory of government policy intervention in the economy (including cost-benefit analysis) is predicated on this idea."). In Guido Calabresi, *The Pointlessness of Pareto: Carrying Coase Further*, 100 YALE L.J. 1211, 1212 (1991), Calabresi argues that "any given society is always or will immediately arrive at a Pareto optimal point *given* transaction costs." To the extent that cost-benefit analysis survives—as opposed to merely ignores—Calabresi's claim, it does so by shifting to potential Pareto superiority as its criterion of (in our case) justified risk imposition. As Calabresi argues, however, potential Pareto superiority does not have the same uncontroversial appeal as true Pareto superiority, even though use of the potential Pareto-superiority criterion may enable courts to make arguably "efficient" changes from the status quo (because courts may be able to impose potentially Pareto-superior changes at sufficiently low transaction costs). The potential Pareto-superiority criterion cannot claim *either* the kind of unanimous consent that actual Pareto superiority can claim, *or* to avoid controversial distributional consequences. *See id.* at 1221-23.

39. COOTER & ULEN, 3d ed., *supra* note 14, at 44. R

40. Potential Pareto superiority is the same as satisfaction of the Kaldor-Hicks test, *id.*; hence the compatibility of the model of cost-benefit analysis I sketch in the text with the form that Posner finds implicit in the Hand Formula. *See* Posner, *Cost-Benefit Analysis*, *supra* note 36, at 1154. R

41. Leonard & Zeckhauser, *supra* note 18, at 35. R

42. Lockwood, *supra* note 38, at 811. R

43. COOTER & ULEN, 3d ed., *supra* note 14, at 44. R

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fare as it is affected by some proposed "policy"[44] by the maximum amount that she is either prepared to pay to implement a policy that she favors, or by the minimum amount she will accept to tolerate a policy whose implementation she opposes.[45]

Conceptually, then, determining how great a risk of accidental premature death or devastating injury is acceptable entails comparing what the potential victim whose life is at risk would have to be paid to accept that risk with what the potential injurer who benefits from the imposition of the relevant risk would pay to impose that risk.[46] If a prospective injurer is prepared to pay more to impose a risk than a prospective victim is prepared to pay to avoid it, then value in the form of wealth is maximized by imposing the risk. Conceptually, the victim's life—or, more exactly, that fraction of her life that is exposed to the risk—is an economic resource, properly traded on the market and properly purchased by the highest bidder. If a potential injurer values her expected gain from a risk imposition more highly than a potential victim values the danger to her life that is the expected cost of risk imposition,[47] imposing the risk adds economic value even if it ends up consuming the victim's life. Letting potential injurers and potential victims alike bid for the safety of the potential victim's life ensures that her life will be put to its highest use.

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44. "Policy" is a term of art here. For present purposes the point is that it covers proposed risk impositions.

45. "Willingness to pay" and "willingness to accept" measures often diverge because people typically demand more to accept a "policy" they dislike than they are willing to pay to bring about a policy that they approve. Note, too, that willingness to pay is constrained by income, whereas willingness to accept is not.

46. This is a representative statement of how cost-benefit analysis proceeds, not a canonical one. An influential strand of cost-benefit analysis approaches the problem of valuing risks of death in a slightly different way: it seeks to extract from market choices of occupation and consumption the "implicit" value (or values) that people place on their own lives. Wage differentials between more and less dangerous jobs, for example, are often used as a source for deriving implicit valuation-of-life figures. The presumption that rational people should pay the same amount to avoid a given risk, independent of the particular context within which it occurs, gives rise to the conclusion that rational implicit value-of-life figures will be stable across contexts. With a stable implicit valuation in hand, an analyst can generate a dollar figure for the value of avoiding a determinate statistical probability of losing a life. This approach is generally traced to SCHELLING, *The Life You Save*, *supra* note 4. Kip Viscusi is the most prominent contemporary practitioner of this methodology. *See, e.g.*, W. KIP VISCUSI, FATAL TRADEOFFS: PUBLIC AND PRIVATE RESPONSIBILITIES FOR RISKS (1992). The appeal of this particular methodology to tort lawyers is plain: credible value-of-life figures could be plugged into the Hand formula to determine when risks of death may reasonably be imposed. R

47. In a simple case where death and death alone is risked, the danger to the victim's life is the value that she places on her life, discounted by the probability that it will be taken.

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2. Fairness: From Inchoate Intuition to Informing Principle.—It is not hard to put one's finger on a powerful source of moral aversion to cost-benefit analysis of risks of death. Cost-benefit analysis repudiates Kant's famous dictum that the value of persons is beyond all price in the most direct way imaginable.[48] By holding that we act rationally and value appropriately when we model our decisions regarding risks of death on the workings of the price system, cost-benefit analysis treats life like an ordinary commodity available to the highest bidder and fungible with an all but infinite number of alternative goods. Our moral intuition insists, with Kant, that if anything is irreplaceable—if anything is not fungible with all other goods at some ratio of exchange—life is irreplaceable. Life has a dignity and not a price, and we must put it at risk only in ways that respect its dignity. As powerful as this intuition is, its proper articulation into a coherent moral conception, and its proper expression in principles of precaution, are not easy tasks.

The articulation of the practical significance of the pricelessness of life begins with the recognition that the problem we are confronting is a matter of collective choice, and irreducibly so. The issue is irreducibly collective in part because the questions at the heart of accident law are intrinsically social. The questions—When may people justifiably impose risks of premature death and devastating injury upon one another? What gains to some justify putting the lives of others at significant risk?—are questions about what people may do to one another, of the use that they make of each other's lives. But the questions at the heart of accident law are also inescapably collective because they are questions about *law*—about the protections that some people may legally demand from others and the freedoms those others may in their turn insist on as a matter of legal right.

Questions concerning the assignment of legal rights and duties implicate each of us and all of us, because we are all bound to respect each other's rights and liberties. Legally recognized slavery is not just a private contract between two consenting parties. Legally recognized slavery requires each and every member of society to acknowledge the legal import of the contract between master and slave, and to affirm the slave's status as a piece of property. A slave society requires each and every one of its members to reject the slave's claims to treatment

48. IMMANUEL KANT, GROUNDWORK OF THE METAPHYSIC OF MORALS, *reprinted in* H.J. PATON, THE MORAL LAW 51, 96 (1948). Kant writes: "In the kingdom of ends everything has either a *price* or a *dignity*. If it has a price, something else can be put in its place as an *equivalent*; if it is exalted above all price and so admits of no equivalent, then it has a dignity." *Id.*

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as a human being and to acknowledge the slave owner's claim to recognize ownership of another person as property. Legally recognized slavery implicates every member of a slave society in the wrong of converting a human being into a thing.[49] Principles of risk regulation likewise implicate all of us. They determine what perils we may impose on others and must bear ourselves, and they require us to acknowledge the rights of third persons to put each other at risk in various ways. Principles of risk regulation that treat human life as a fungible commodity, commensurable with all other commodities at an appropriate rate of exchange, require us all to recognize that we may treat each other and be treated by each other as mere things.

The problem of accidental injury is intrinsically social and inescapably moral for other reasons as well. Accidents are inherently social because they normally arise in the course of activities that are normally both net and mutually beneficial. Driving is a classic case in point. The problem of accidental harm is intrinsically moral because accidental injuries involve circumstances where some come to grief at the hands of others. This relationship of doing by some and suffering by others has "simply as such, an ethical significance."[50] Injurers do not consume—or do not only consume—their own lives; they take the lives of others as well. In the case of risks of devastating injury, this fact is particularly stark. Some reap the rewards of risks of death and irreparable injury; others are killed and crippled. The fundamental questions raised by such risks, therefore, are questions of fairness and

49. As Samuel Freeman notes:

> Alienation of basic rights, if politically recognized, imposes duties not just upon the transferor, but also upon society and its members to respect and uphold such transactions. We are called upon to ignore the moral fate and political status of others as equals and to participate in their civic and moral debasement. . . . By embracing alienation agreements as matters of enforceable public right, we accept a mandate to coerce and harm certain people against their will, and to respond to them as if they were things.

Samuel Freeman, *Illiberal Libertarians: Why Libertarianism Is Not a Liberal View*, 30 PHIL. & PUB. AFF. 105, 112 (2002). This is not to say that particular accident law norms ought to be matters of inalienable basic right; it is to say that the choice of legally enforceable accident law norms is a matter of general public concern because these norms determine how we must and may treat other people.

50. Martin Stone, *On the Idea of Private Law*, 9 CAN. J.L. & JURISPRUDENCE 235, 259 (1996); *see also id.* ("[T]he situation in which one person suffers through the doing of another . . . has a natural saliency for human beings. It is bound to figure in the most basic thinking about what sorts of happenings can be controlled, and related to this, it produces such natural psychological responses as resentment and revenge."). *See generally* Martin Stone, *The Significance of Doing and Suffering*, *in* PHILOSOPHY AND THE LAW OF TORTS 131 (Gerald J. Postema ed., 2001).

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valuation:[51] What kinds of gains to some are valuable enough to justify inflicting accidental death on others? What kinds of precaution may those endangered reasonably insist upon in light of the urgency of their claim to undevastated life?

In its unrestricted and most characteristic form, cost-benefit analysis gives a distinctive and disturbing answer to these questions of valuation and interpersonal comparison. It assumes that all burdens and benefits are fungible at some ratio of exchange[52] so that a sufficient *quantity* of any benefit will suffice to justify the infliction of devastating injury, no matter how trivial that benefit may be *qualitatively* speaking. Suppose, for example, that a piece of transmitting equipment has toppled and crushed a television technician helping to broadcast an episode of "Baywatch" to a billion viewers worldwide,[53] and that the only way to save the technician's life is to interrupt the broadcast for thirty minutes, effectively thwarting the transmission of the show on this particular evening. Unrestricted cost-benefit analysis holds that, if enough people stand to be disappointed by the termination of a television show, terminating the life of a television technician may be preferable to terminating the broadcast of the show. The net benefit to all of the viewers may exceed the net loss to the technician.

Our moral sensibility balks at this conclusion. Although the number of viewers may be vast, the harm to them is not comparable to the life of the technician. Inconvenience and disappointment are not morally comparable to death. No amount of inconvenience *distributed across a large number of distinct persons* sums to the loss of a single life.

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51. In an e-mail commentary on a draft of this Essay, Judge Posner remarked: "It seems to me the question should be whether [the statutory standards I discuss later in this Essay] make us better off or worse off in some sense, not whether they conform to some abstract sense of fairness." E-mail from Judge Richard A. Posner (Aug. 5, 2004) (on file with author). Much is at issue in this line of criticism and I cannot respond to all of it in this paper. As a beginning, however, it is worth observing that those devastated by accidental injury are made worse off whereas those who reap the gains of the risks that result in those injuries are made better off. It is not possible to make "us"—that is, everyone affected by the risks—better off. It is precisely because some will be made better off and others will be made worse off that questions of fairness are so pressing in this context. For different reasons, the questions raised by accidental risk impositions are not fundamentally questions about the rights people should have, taking rights to identify domains where persons may do as they please, free from interference by others. For discussion of this point, see Keating, *Pressing Precaution*, *supra* note 0, at 668-69. R

52. *Supra* note 11 and accompanying text. R

53. I adapt this example from T.M. Scanlon. *See* T.M. SCANLON, WHAT WE OWE TO EACH OTHER 235 (1998) [hereinafter WHAT WE OWE] (using the World Cup soccer tournament as an example). Nothing in the example hinges on the "low cultural value" of Baywatch. One may substitute a show of higher cultural value, but it will have a smaller audience.

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We therefore should not decide how to proceed by measuring the victim's preference for having her life saved in dollars and by comparing that sum to the price that the viewers would pay to have the broadcast continue. The cost to the technician and the benefit to the viewers are not substitutable at some ratio of exchange.

Death, or even devastation, is not essential to this example. The harms involved would not be comparable even if the harm to the technician were not death, or even devastation as I have defined it, but severe injury—thirty minutes of excruciating pain that left no long-term physical traces, for example.[54] The gains and losses on the opposite sides of the equation—the inconvenience and disappointment of missing a favorite television show on the one side and suffering thirty minutes of excruciating pain on the other—are still not comparable in the havoc they wreak in the lives of those they affect. They are not comparable in their *urgency*.[55] No amount of viewer disappointment and inconvenience—no number of disappointed and inconvenienced spectators—can justify letting the technician suffer thirty minutes of excruciating pain, much less die. Matters would be different only if the harms on either side of the equation were comparable—if we were somehow forced to choose between inflicting death on some and quadriplegia on others, for example. Quadriplegia and death *are* comparable to one another. Both devastate the lives of those they affect. If we must choose between risking quadriplegia to some and death to others, we must consider the number of persons affected.

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54. Scanlon's World Cup fact pattern involved the risk of prolonged pain, not death. *Id.*

55. The argument of fairness advanced here rests not on ideas of preference but on ideas of urgency, or need. T.M. Scanlon writes that interpersonal comparisons based on considerations of urgency represent "the best available standard of justification that is mutually acceptable to people whose preferences diverge." Scanlon, *Urgency*, *supra* note 32, at 668; *see also* Thomas M. Scanlon, *The Moral Basis of Interpersonal Comparisons*, *in* INTERPERSONAL COMPARISONS OF WELL-BEING 17 (Jon Elster & John E. Roemer eds., 1991). In these papers Scanlon characterizes urgency- or need-based approaches to interpersonal comparison as "objective" (in contrast to "subjective") approaches. In a later paper, Scanlon characterizes urgency-based approaches to interpersonal comparison as one kind of "substantive goods" approach. *See* Thomas Scanlon, *Value, Desire and Quality of Life*, *in* THE QUALITY OF LIFE 185 (Martha Nussbaum & Amartya Sen eds., 1993). For our purposes, the contrast between urgency and preference-based approaches can be understood in either way. John Rawls's idea of "primary goods" and Amartya Sen's idea of "capabilities" are examples of approaches to interpersonal comparison that take fundamental needs or interests as the proper basis of comparison. *See* RAWLS, POLITICAL LIBERALISM, *supra* note 27, at 187-90 (arguing that the "practical nature of primary goods" makes possible "a public understanding . . . concerning what is to be counted as advantageous in matters of political justice"); AMARTYA SEN, INEQUALITY REEXAMINED 49 (1992) (noting that "capability represents a person's freedom to achieve well-being"). R R

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These intuitive judgments of comparability reflect a general idea. Harms are comparable when they disrupt the lives of those they affect in similarly urgent (or similarly insignificant) ways, when they strike at the preconditions of rational agency in similarly severe (or similarly mild) ways. Burdens and benefits are comparable when they improve or impair lives in similarly important or modest ways. When burdens and benefits are comparable, they may, other things being equal, be traded off against one another. When they are not comparable it is unfair—unjust—to trade them off against one another. Trading grave injuries for trivial benefits sacrifices the essential interests of some for the sake of inessential gains by others. Justice forbids this kind of sacrifice.

Thus, when risks of death or severe irreparable injury are at issue, the idea of efficient precaution is fatally flawed in two ways. First, the existence of discontinuities of value—the fact that not everything is comparable in value to undevastated human life—requires us to reject the premise of universal fungibility. Second, the distribution of burden and benefit among affected persons is of far greater moral significance than the overall sum of burden and benefit.[56] Not everything is morally comparable to death and devastating injury, in part because what counts morally is not the total sum of burden and benefit but the actual distribution of burdens and benefits among affected persons. When significant risks of physical injury ripen into death and incurable disease, the benefits of going beyond the cost-justified level of precaution are measured in terms of lives saved and incurable diseases avoided. To those who reap them, these are invaluable benefits. The *distributed* costs of going beyond the cost-justified point of precaution, by contrast, may well be small—perhaps very small—losses to large numbers of people.[57]

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56. This perception played an important role in the genesis of feasible risk regulation as practiced by OSHA. *See* ROBERT E. KEETON ET AL., TORT AND ACCIDENT LAW: CASES AND MATERIALS 1255-57 (4th ed. 2004) [hereinafter 4th ed.]. The text quotes testimony by Dr. Nicholas Ashford of MIT at OSHA hearings on the agency's cancer policy. In part, that testimony states:

> The most serious limitation (of cost-benefit analysis), however, lies in the failure to successfully deal with the fact that costs and benefit streams accrue to different parties. One person's benefit cannot be neatly traded off from another's cost.

Id. at 1256 (citing Identification, Classification and Regulation of Potential Occupational Carcinogens, 45 Fed. Reg. 5001, 5249 (Jan. 22, 1980)). The subsequently adopted OSHA cancer policy goes on to state that "equity considerations" are "paramount to occupational health regulation." Identification, Classification, and Regulation of Potential Occupational Carcinogens, 45 Fed. Reg. at 5250.

57. My point is parallel to a familiar objection to maximizing total utility. Maximizing total utility is misguided even if one accepts utility as the appropriate unit of value, because

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Put differently, the point is that sacrificing an urgent interest—the interest in avoiding premature death or devastating injury—for the sake of trivial gains to others, cannot be justified to those whose urgent interests are sacrificed. It is only fair to ask some people to bear a significant risk of devastating injury when the burden of eliminating that risk is comparable to the burden of bearing it.

The flaws in the economic argument that it is irrational to press precaution beyond the point of cost-justification—because doing so will make everyone worse off[58]—should now be apparent. When attention to the net balance of costs and benefits licenses a level of risk imposition that devastates some for the sake of trivial gains to others, *irreparable injustice* (as well as irreparable harm) is done. Redistribution of the wealth saved by taking *only* efficient precaution will not make those who have been killed and devastated better off than they would have been had their death and devastation been avoided.[59] They have been harmed beyond the power of redistribution to repair. When attention to overall welfare as measured in wealth authorizes a level of risk imposition that devastates some for the sake of trivial gains to others, some have been made much worse off for the sake of minor gains to others.[60] Because well-being accrues to actual persons,

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what counts is the utility experienced by each sentient being and total utility is experienced by no one. As Rawls argues:

> [W]hen population is subject to change [the principle of maximizing total utility] entails that so long as the average utility per person falls slowly enough when the number of individuals increases, the population should be encouraged to grow indefinitely no matter how low the average has fallen . . . . [T]he sum of utilities added by the greater number of persons is sufficiently great to make up for the decline in the share per capita. As a matter of justice . . . , a very low average level of well-being may be required.

RAWLS, THEORY, *supra* note 12, § 27, at 140. Maximizing wealth—the practice recommended by cost-benefit analysis—is misguided for the same reason. No single person reaps all of the benefits and bears all of the burdens of any social practice. The sum of those benefits minus those burdens is therefore an unreliable guide to the actual gains and losses of the persons affected by the practice. R

58. *Supra* note 29 and accompanying text. R

59. Louis Kaplow and Steve Shavell have developed in great detail the claim that efficient precaution always makes everyone better off. They argue that efficiency should be the norm for all bodies of law, except for tax law, which may rightly pursue redistributive measures to promote welfare. *See, e.g.*, KAPLOW & SHAVELL, *supra* note 10, at 52 (arguing that "satisfying notions of fairness can make individuals worse off"); *id.* at 33-34 (on taxes as a redistributive measure). My objection here to this kind of argument is narrow. Redistribution cannot repair the harm done by irreparable injury. R

60. I suspect that Kaplow and Shavell's denial of this rests on a conflation of ex ante advantage with actual well-being. *See* KAPLOW & SHAVELL, *supra* note 10, at 436-49 (defending the ex ante perspective). When the repeated imposition of a justified risk is certain to result in at least one person's death, it is impossible to make "everyone better off." The person who dies is not made better off by his own untimely death. Risk impositions that R

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pressing precaution beyond the point of cost-justification will confer great benefits on some at the cost of trivial losses to others. Each person who benefits will gain far more than each person who loses. When taking more than efficient precaution spares some from death or devastation at the cost of only small losses to many others, taking more than efficient precaution is not only fair, it is also desirable insofar as well-being itself is of primary concern.

Our law of accidents is not insensitive to the fact that the requirement of comparable value—coupled with appropriate attention to the actual distribution of burden and benefit—gives us good reason to move beyond the point of cost-justified precaution. Federal statutory risk regulation, for example, requires that some risks of death or severe, irreparable injury be reduced either to the safe level or to the feasible level.[61] In our terms, reducing risks of devastating injury to the point where they are "insignificant"—the demand of safety-based regulation—is justified when the benefits of an activity are not comparable, morally speaking, to the burden of bearing a significant risk of devastating injury. Reducing risks of devastating injury to the extent feasible without crippling the beneficial activity that generates the risks—the demand of feasibility analysis—is justified when crippling the activity in question would work a harm comparable to bearing a significant risk of devastating injury. Reducing risks only so far as feasible is fair when the long-run flourishing of the activity that gives rise to the risks in question is a good morally comparable to a significant risk of devastating injury.

To develop this argument we must first examine the relevant legal standards.

II. COST-JUSTIFIED, FEASIBLE, AND SAFE PRECAUTION

In comparison with negligence law's notion of reasonable risk imposition—a notion that is enormously rich, but also susceptible to a variety of plausible interpretations—the cost-justified, feasible, and

result in death can be to the ex ante advantage of those they kill, but they do not make those they kill "better off." Ex ante advantage and actual well-being are different matters. *See* John Broome, *Trying to Value a Life*, 9 J. PUB. ECON. 91, 95 (1978) (proclaiming ex ante valuation to be worthless when a risk results in death).

61. "Cost-justified," "feasible," and "safe" precaution are the three standards of precaution discussed in the next Part. In general, cost-justified precaution is less protective of safety than feasible precaution, and feasible precaution is less protective than safe precaution is—but not always. Feasible precaution will be less protective of safety than cost-justified precaution when it is not cost-justified to engage in an activity in the first place.

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safe standards of acceptable risk imposition are well defined.[62] They identify distinct levels of permissible risk imposition, and they stand in linear, vertical relation to one another:[63]

> *Cost-justified risk reduction.* Among these three standards, the cost-justification standard tolerates the most risk. Costs and benefits are aggregated, with the aim of minimizing the costs of paying for and preventing accidents, thereby maximizing the benefits extracted from the risky activity at issue. Cost-benefit analysis requires risks to be reduced to the point where the costs of further precautions exceed their benefits. If the marginal costs of eliminating significant risks exceed the marginal benefits, significant risks will continue to exist.
>
> *Feasible risk reduction.* The feasibility standard tolerates less risk. Feasibility analysis looks to achieve the lowest level of risk practically attainable, not the level of risk that minimizes the combined costs of injuries and their prevention. Feasibility analysis requires the elimination of "significant" risks, when they can be eliminated without threatening the long-run health of the activity to which the risks belong. Significant cost-justified risks are eliminated so long as their elimination is compatible with the long-term flourishing of the activity at issue. Significant risks remain only if their elimination would threaten the survival of the activity.
>
> *Safe level of risk imposition.* The safe-level standard tolerates the least risk. Safety-based regulations require risk to be reduced to a point where no significant risk of devastating injury remains. Applying the safe-level standard therefore does not require any inquiry into the costs of risk reduction. All that it requires is a determination of the level at which the risk created by exposure to the regulated substance ceases to be significant.

The two standards that most interest us—the safety and feasibility standards—also have their characteristic domains of application.

A. The "Safe" Level of Risk Imposition

The safe-level approach is taken in some aspects of clean air, clean water, and pure food legislation, particularly regulation of toxic

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62. My discussion here follows the presentation of these standards in the section on cost-assessment in KEETON ET AL., 4th ed., *supra* note 56, at 1237-41 and the commentary on that note by Lew Sargentich in KEETON ET AL., TEACHER'S MANUAL TO ACCOMPANY TORT AND ACCIDENT LAW: CASES AND MATERIALS (3d ed.) 20-5 to 20-6 (1998) [hereinafter TEACHER'S MANUAL]. R

63. *See* KEETON ET AL., TEACHER'S MANUAL, *supra* note 62, at 20-6. R

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substances that may endanger public health. The Food Quality Protection Act of 1996[64] is a case in point. The Act regulates the amount of pesticide that may be present on foods, both fresh and processed.[65] It requires that tolerances for pesticide be set at a level that is safe, where "safe" means that "there is reasonable certainty that no harm will result from aggregate exposure to the pesticide chemical residue, including all anticipated dietary exposures and all other exposures."[66] Regulators are instructed to set limits that provide an additional margin of safety in light of the special susceptibility of infants and children to harm from toxic substances.[67] Pesticide chemical residue on food is therefore permissible only to the extent that it is reasonably certain to harm no one—not even those unusually susceptible to harm.

Clean air statutes also incorporate safety-based regulation.[68] A provision of the Clean Air Act Amendments of 1990,[69] for example, focuses on cancer risks remaining after technology-based regulations for hazardous pollutants have been in effect for six years.[70] If a numerically defined level of cancer risk has not been achieved by that point, the EPA is directed to issue additional regulations that will "provide an ample margin of safety to protect public health."[71] The regulatory aim behind these provisions is to "reduce lifetime excess cancer risks to the individual most exposed to emissions . . . to less than one in one million."[72] Some residual risk thus survives safe-level regulation. Requiring that "lifetime excess cancer risks to the individual most exposed to emissions" be reduced "to less than one in one million" expresses a judgment of significance. A lifetime risk of cancer (from a regulated emission) that crosses the "one in a million" threshold crosses from the domain of insignificant risk into the domain of significant risk.

The emphasis on those most exposed to risk or those most susceptible to it—those most disadvantaged by the risks being regu-

64. Pub. L. No. 104-170, 110 Stat. 1489 (codified as amended at 7 U.S.C. § 136, and in scattered sections of 21 U.S.C. (2000)).

65. 21 U.S.C. § 346a(b)(2)(A)(ii).

66. *Id.*

67. § 346a(b)(2)(C)(ii)(II).

68. *See* Union Elec. Co. v. EPA, 427 U.S. 246, 258 (1976) (stating that the Clean Air Act's three-year deadline purposely "leaves no room for claims of technological or economic infeasibility").

69. Pub. L. No. 101-549, 104 Stat. 2399 (codified as amended at 42 U.S.C. §§ 7401-7671 (2000)).

70. 42 U.S.C. § 7412(f)(1).

71. § 7412(f)(2).

72. *Id.*

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lated—is a recurring theme in safety-based regulation. Clean water regulation supplies a closely related example: the court in *Hercules, Inc. v. EPA*[73] insisted on especially stringent precaution against grave harm, even though the chance of that harm materializing could not be estimated. The Federal Water Pollution Control Act Amendments of 1972,[74] the court held, authorized health-based regulation of toxic effluents without consideration of "feasibility, achievability, practicability, economic impact, or cost," and addressed standards for determining permissible discharge levels for such toxins.[75] EPA discharge standards, the court ruled, must provide an "ample margin of safety" and "protect against incompletely understood dangers to public health and the environment, in addition to well-known risks."[76] The importance of safeguarding health trumps the goods with which it competes, and the well-being of those most imperiled comes to the fore. This is only natural: those most imperiled bear the greatest burden.

B. Feasible Risk Reduction

The feasibility approach also governs aspects of clean air and water regulation. The Clean Air Act, as amended in 1990, for example, provides that regulatory standards for hazardous air pollutants "shall require the maximum degree of reduction in emissions" that the EPA, "taking into consideration the cost of achieving such emission reduction," determines to be "achievable."[77] Feasibility is also the touchstone of the Occupational Health and Safety Act of 1970,[78] and it is in this context that it has received its most extensive application and judicial interpretation.

Feasibility-based regulation has a more complex structure than safety-based regulation. Feasibility analysis requires, first, the identification of "a significant [workplace] health risk"[79] and, second, an

73. 598 F.2d 91 (D.C. Cir. 1978).

74. Pub. L. No. 92-500, 86 Stat. 816 (codified as amended at 33 U.S.C. §§ 1251-1376 (2000)).

75. *Hercules*, 598 F.2d at 111.

76. *Id.* at 104.

77. 42 U.S.C. § 7412(d)(2).

78. Pub. L. No. 91-596, 84 Stat. 1590 (codified as amended at 29 U.S.C. §§ 651-678 (2000)).

79. Indus. Union Dep't v. Am. Petroleum Inst., 448 U.S. 607, 615 (1980) [hereinafter *The Benzene Case*]. The Court noted the importance of this threshold inquiry:

> We agree with the Fifth Circuit's holding that § 3(8) requires the Secretary to find, as a threshold matter, that the toxic substance in question poses a significant health risk in the workplace and that a new, lower standard is therefore "reasonably necessary or appropriate to provide safe or healthful employment and places

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analysis of the feasibility of reducing that risk without crippling the activity that imposes the risk.[80] Feasibility, in turn, has two aspects—a "technological" one and an "economic" one. Technological feasibility analysis asks: What is the lowest level of risk technically attainable? How much could we reduce this risk if we single-mindedly set out to reduce it as much as possible?[81] Economic feasibility analysis asks: What is the lowest level of risk whose costs can be borne by the activity that imposes the risk at issue?[82] The aim of feasibility analysis is to protect "worker health and safety within the limits of economic possibility."[83] "Congress itself defined the basic relationship between costs and benefits [when it enacted the Occupational Health and Safety Act of 1970 with its feasibility standard], by placing the 'benefit' of worker health above all other considerations save those making attainment of this 'benefit' unachievable."[84] Feasibility analysis looks to achieve the lowest level of risk practically attainable.

Feasibility analysis shares with safety analysis the idea that a risk must be significant before it is subject to regulation. Feasibility is, however, a new idea. Let us, then, postpone detailed exploration of significance until we have fleshed out the two dimensions of feasibility—the technological and the economic.

1. Technological Feasibility.—The technological side of feasibility analysis asks, as a matter of engineering technique, what is the lowest level of risk achievable by an ongoing activity. Any limit set on risk—a "permissible exposure level" (PEL)[85] for a toxic substance, for example—must be technologically attainable. Technological achievability, however, is not fixed by the outer limit of technological possibility at a given moment in time, because the most advanced techniques of risk control in place at a given moment in time may fall well short of the

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> of employment." Unless and until such a finding is made, it is not necessary to address the further question whether the Court of Appeals correctly held that there must be a reasonable correlation between costs and benefits, or whether, as the federal parties argue, the Secretary is then required by § 6(b)(5) to promulgate a standard that goes as far as technologically and economically possible to eliminate the risk.

Id. at 614-15.

80. *Id.*

81. *See* KEETON ET AL., 4th ed., *supra* note 56, at 1238-39, 1252-53 (discussing the technological feasibility prong of feasibility analysis). R

82. *See id.* at 1253-55 (discussing the economic feasibility prong of feasibility analysis).

83. United Steelworkers v. Marshall, 647 F.2d 1189, 1263 n.102 (D.C. Cir. 1980).

84. Am. Textile Mfrs. Inst., Inc. v. Donovan, 452 U.S. 490, 509 (1981). Following Lewis Sargentich's usage, I shall refer to this case as *The Cotton Dust Case*. *See* KEETON ET AL., 4th ed., *supra* note 56, at 1242. R

85. *The Cotton Dust Case*, 452 U.S. at 500.

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frontier of technological feasibility. The frontier of technological feasibility is fixed by the engineering practice that might be achieved through a dogged commitment to feasible risk reduction. A regulatory agency promulgating a feasibility-based risk regulation may therefore specify an acceptable level of risk lower than that attainable through the application of existing techniques, if the agency can reasonably predict that technical capability will advance sufficiently to make a lower level of risk imposition attainable within the time frame of the regulation.

In *American Iron & Steel Institute v. OSHA*,[86] for example, OSHA's standard for coke oven emissions was upheld as technologically feasible even though "the most modern and clean coke oven battery operating" met the standard only one-third of the time.[87] Evidence of one-third compliance using less than all suitable technology—plus dramatic progress toward compliance at another plant after new engineering controls were implemented—showed sufficiently that the standard was not "impossible of attainment."[88] The question was not what could be done at the moment, but "what the industry could achieve in an effort to best protect its . . . employees," given a determination to exploit "technological potentialities."[89] The court therefore approved OSHA's reliance on "innovative technology currently in the experimental stage,"[90] and its faith in new techniques "looming over the horizon."[91]

In *United Steelworkers v. Marshall*, Judge J. Skelly Wright gave the following summary of the concept of "technological feasibility":

> The oft-stated view of technological feasibility under the OSH Act is that Congress meant the statute to be "technology-forcing." This view means, at the very least, that OSHA can impose a standard which only the most technologically advanced plants in an industry have been able to achieve—even if only in some of their operations some of the time. But under this view OSHA can also force industry to develop and diffuse new technology. At least where the agency gives industry a reasonable time to develop new technology, OSHA is not bound to the technological status quo. So long as it presents substantial evidence that companies acting vig-

86. 577 F.2d 825 (3d Cir. 1978).
87. *Id.* at 832.
88. *Id.* at 834.
89. *Id.* at 833, 834.
90. *Id.* at 835.
91. *Id.* at 833 (internal quotation marks omitted).

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> orously and in good faith can develop the technology, OSHA can require industry to meet PEL's never attained anywhere.
>
> . . . .
>
> As for [proof of] technological feasibility, we know that we cannot require of OSHA anything like certainty. Since "technology-forcing" assumes the agency will make highly speculative projections about future technology, a standard is obviously not infeasible solely because OSHA has no hard evidence to show that the standard has been met. More to the point here, we cannot require OSHA to prove with any certainty that industry will be able to develop the necessary technology, or even to identify the single technological means by which it expects industry to meet the PEL. OSHA can force employers to invest all reasonable faith in their own capacity for technological innovation, and can thereby shift to industry some of the burden of choosing the best strategy for compliance. OSHA's duty is to show that modern technology has at least conceived some industrial strategies or devices which are likely to be capable of meeting the PEL and which the industries are generally capable of adopting.
>
> Our view finds support in the statutory requirement that OSHA act according to the "best *available* evidence." OSHA cannot let workers suffer while it awaits the Godot of scientific certainty.[92]

The requirement of technological feasibility thus imposes stringent risk-reducing demands. It fixes the presumptively appropriate level of precaution not by reference to what is customarily done, nor even by reference to the best that is now done, but by reference to the best that *might* be done, given an *unstinting commitment* to the goal of feasible risk reduction.

2. Economic Feasibility.—In *Portland Cement Ass'n v. Ruckelshaus*,[93] the court provided an explanation of the economic side of feasibility analysis. The court interpreted language in the Clean Air Amendments of 1970 requiring "a standard for emissions of air pollutants which reflects the degree of emission limitation achievable . . . taking into account the cost of achieving such reduction."[94] It held that this language did not direct EPA to undertake "a quantified cost-benefit analysis" in order to justify its air pollution standard for new or modi-

92. 647 F.2d 1189, 1264-66 (D.C. Cir. 1980) (citations omitted).
93. 486 F.2d 375 (D.C. Cir. 1973).
94. *Id.* at 378 (citation omitted).

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fied cement plants.[95] EPA's conclusion that the cement industry could absorb the cost of control devices without detriment to competition between cement and substitute products, even though some plants might have to close, sufficed to answer the "essential question" under the Act: "whether the mandated standards can be met by a particular industry for which they are set."[96] Judgments of economic feasibility require "cost-assessment," but they do not require "cost-benefit analysis."[97] Indeed, insofar as the criterion of cost-justified precaution requires less precaution than the criterion of economic feasibility does, the criterion of economic feasibility rejects the criterion of cost-justification outright.

Provisions of the Clean Water Act that mandate pollution control to the extent "technologically and economically achievable"[98] also illustrate the economic side of feasibility-based regulation. The Clean Water Act subjects water pollution sources to two different sorts of effluent limitations: those based on "the best practicable control technology currently available" (BPT),[99] and those based on "the best available technology economically achievable" (BAT).[100] The BPT standard generalizes "the best existing performance" in an industry—"control practices in exemplary plants"—despite an expectation of "economic hardship, including the closing of some plants."[101] The BAT standards are more stringent. They require "a commitment of the maximum resources economically possible to the ultimate goal of eliminating all polluting discharges."[102] The setting of BPT standards involves "cost-benefit analysis," but cost-benefit analysis is not part of BAT determinations.[103] In determining the economic achievability of a technology, "the EPA must consider the 'cost' of meeting BAT limitations, but need not compare such cost with the benefits of effluent reduction."[104]

For "economic feasibility" analyses, then, the ultimate question is not whether costs are outweighed by benefits, but whether the industry is able to bear the cost. Economic feasibility regulation by OSHA

95. *Id.* at 387.
96. *Id.* at 389.
97. *Id.* at 387.
98. 33 U.S.C. §§ 1311(b)(2)(A), 1314(b)(2)(B), 1317(a)(2).
99. § 1311(b)(1)(A).
100. § 1311(b)(2)(A).
101. EPA v. Nat'l Crushed Stone Ass'n, 449 U.S. 64, 76 & n.15, 79 (1980).
102. *Id.* at 74.
103. *Id.* at 71 n.10 (citation omitted).
104. Rybacheck v. EPA, 904 F.2d 1276, 1290-91 (9th Cir. 1990).

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means "protecting worker health and safety within the limits of economic possibility."[105] Judge Skelly Wright again explains:

> The most useful general judicial criteria for economic feasibility comes from Judge McGowan's opinion in *Industrial Union Dep't, AFL-CIO v. Hodgson.* A standard is not infeasible simply because it is financially burdensome, or even because it threatens the survival of some companies within an industry:
>
> > Nor does the concept of economic feasibility necessarily guarantee the continued existence of individual employers. It would appear to be consistent with the purposes of the Act to envisage the economic demise of an employer who has lagged behind the rest of the industry in protecting the health and safety of employees and is consequently financially unable to comply with new standards as quickly as other employers.
>
> A standard is feasible if it does not threaten "massive dislocation" to, or imperil the existence of, the industry. No matter how initially frightening the projected total or annual costs of compliance appear, a court must examine those costs in relation to the financial health and profitability of the industry and the likely effect of such costs on unit consumer prices. . . . [T]he practical question is whether the standard threatens the competitive stability of an industry, or whether any intra-industry or inter-industry discrimination in the standard might wreck such stability or lead to undue concentration.
>
> . . . .
>
> . . . [A]s for [proof of] economic feasibility, OSHA must construct a reasonable estimate of compliance costs and demonstrate a reasonable likelihood that these costs will not threaten the existence or competitive structure of an industry, even if it does portend disaster for some marginal firms.[106]

In *The Cotton Dust Case*, both the court of appeals and the Supreme Court upheld OSHA's assessment of economic feasibility.[107] OSHA had concluded that "compliance with the standard [was] well within the financial capability" of the cotton industry.[108] The agency noted that "although some marginal employers may shut down rather

105. United Steelworkers v. Marshall, 647 F.2d 1189, 1263 n.102 (D.C. Cir. 1980).

106. *Id.* at 1265, 1272 (citations omitted).

107. AFL-CIO v. Marshall, 617 F.2d 636, 662 (D.C. Cir. 1979), *aff'd in part & vacated in part by* Am. Textile Mfrs. Inst., Inc. v. Donovan, 452 U.S. 490, 536 (1981).

108. *The Cotton Dust Case*, 452 U.S. at 531 (citation omitted).

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than comply, the industry as a whole will not be threatened."[109] Both courts agreed that OSHA had shown that the industry would be able to absorb the projected costs.[110] Regulatory requirements remain economically feasible, the court of appeals wrote, even though they "impose substantial costs on an industry . . . or . . . force some employers out of business," as long as they are not "prohibitively expensive" and do not make "financial viability generally impossible."[111] The cotton dust controls fit "the plain meaning of the word 'feasible,'" the Supreme Court wrote, given OSHA's conclusion "that the industry will maintain long-term profitability and competitiveness."[112]

3. Significance.—Feasibility analysis, like safety analysis, requires the identification of "significant risks" of "health injury."[113] What makes a risk "significant" and why should significant risks be singled out for special treatment? The significance requirement receives its canonical exposition in *The Benzene Case*.[114] Writing for the Court, Justice Stevens agreed with the Fifth Circuit's holding that

> § 3(8) [of the Occupational Health and Safety Act of 1970] requires the Secretary to find, as a threshold matter, that the toxic substance in question poses a significant health risk in the workplace and that a new, lower standard is therefore "reasonably necessary or appropriate to provide safe or healthful employment and places of employment."[115]

"Unless and until such a finding is made," the requirement that the risk be reduced as far as technologically and economically feasible is not triggered.[116] Justice Stevens rejected OSHA's contention that no significance requirement was necessary:

> If the purpose of the statute were to eliminate completely and with absolute certainty any risk of serious harm, we would agree that [OSHA's approach] would be proper

109. *Id.* (citation omitted).

110. *Id.* at 530-36.

111. *Marshall*, 617 F.2d at 655, 661 (citations omitted).

112. *The Cotton Dust Case*, 452 U.S. at 530 n.55 (citations omitted).

113. Safety-based risk regulation requires the elimination of significant risks, whereas feasibility-based regulation only requires the elimination of such risks if feasible.

114. 448 U.S. 607, 639-59 (1980).

115. *Id.* at 614-15. Section 3(8) of the Act provides:

> The term "occupational safety and health standard" means a standard which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment.

29 U.S.C. § 652(8).

116. *The Benzene Case*, 448 U.S. at 615.

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> . . . . But we think it is clear that the statute was not designed to require employers to provide absolutely risk-free workplaces whenever it is technologically feasible to do so, so long as the cost is not great enough to destroy an entire industry. Rather, both the language and structure of the Act, as well as its legislative history, indicate that it was intended to require the elimination, as far as feasible, of significant risks of harm.
>
> . . . .
>
> By empowering the Secretary to promulgate standards that are "reasonably necessary or appropriate to provide safe or healthful employment and places of employment," the Act implies that, before promulgating any standard, the Secretary must make a finding that the workplaces in question are not safe. But "safe" is not the equivalent of "risk-free." There are many activities that we engage in every day—such as driving a car or even breathing city air—that entail some risk of accident or material health impairment; nevertheless, few people would consider these activities "unsafe." Similarly, a workplace can hardly be considered "unsafe" unless it threatens the workers with a significant risk of harm.
>
> Therefore, before he can promulgate *any* permanent health or safety standard, the Secretary is required to make a threshold finding that a place of employment is unsafe—in the sense that significant risks are present and can be eliminated or lessened by a change in practices.[117]

"Significance" appears to have two principal aspects.[118] First, the risk must be salient—it must be distinguishable from other risks associated either with the activity in question or with social life in general.[119] It must stand out among its fellow risks. Second, to be significant, when a risk ripens into harm it must inflict a severe injury, a devastating injury, the kind of injury that seriously impairs ordinary life.[120] It seems natural to suppose that the same basic ideas underlie the concept of significance as it is used in safety-based risk regulation. Beyond these two points, however, just how to interpret significance is a difficult question. Is significance a purely quantitative notion? Some numerical threshold combining magnitude and probability? Or is it a more qualitative and contextual judgment, one which depends on the distinctive features of the context in which it arises? May the numerically same risk of death be significant in the workplace, but

117. *Id.* at 641-42.

118. *See* KEETON ET AL., TEACHER'S MANUAL, *supra* note 62, at 20-7. R

119. *Id.*

120. *Id.* at 20-8.

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trivial in an extreme sport? May risks of equivalent probability and magnitude in one sense—equal risks of death, for example—vary in significance if one way of dying is more widely feared than another?

Significance is measured by a purely quantitative criterion at least some of the time. The amendments to the Clean Air Act of 1990, for example, aim "to reduce lifetime excess cancer risks to the individual most exposed to emissions . . . to less than one in one million."[121] But the concept of significance cannot be exhausted by any purely quantitative criterion. For one thing, significant risks are salient ones, and salience is a matter of standing out. Salient phenomena stand out in a context—*against a background*.[122] Salient risks are prominent risks, risks which jut out in the context of the activity subject to regulatory scrutiny. *Probability* of harm can be expressed by a purely quantitative measure—by a number—but the significance of a particular probability of harm depends in part on the background against which that probability is framed. That background or context can be general or particular, or general in some ways and particular in others. Particular risks of cancer, for example, can involve the general risk of contracting the disease, the general risk of contracting a particular cancer, the risks inherent in a particular occupation, and so on.

Significance eludes purely quantitative measure for another reason as well: The relation of significance to serious injury—to devastating injury—builds qualitative evaluation into the concept of significance. Devastating injuries are ones that impair normal functioning—normal life—in ways that cannot be repaired, and "normal life" is an evaluative idea. Even the purely quantitative criterion of significance employed by the 1990 Amendments to the Clean Air Act operates against a background in which the gravity of the harm being considered has already been fixed qualitatively in this way. Cancer is generally a serious disease—a disease quite capable of inflicting death and devastating injury—and that is enough to establish that we have especially urgent reason to reduce the incidence of such harm.

Consider the Clean Air Act Amendments of 1990. The significance of the risk of cancer addressed by those amendments depends in this way on the background risk of cancer. Discussion of "excess cancer risks" presumes a preexisting risk of cancer—a risk independent of exposure to the particular emission being appraised. The

121. 42 U.S.C. § 7412(f)(2)(A); *see supra* notes 68-72 and accompanying text (describing the regulatory aims of the Clean Air Act). R

122. As Lewis Sargentich puts it: "The risk to be averted must be . . . noteworthy in comparison with other risks of the same activity that might also be reduced further by costly measures." KEETON ET AL., TEACHER'S MANUAL, *supra* note 62, at 20-7. R

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Clean Air Act's one-in-a-million threshold for "excess risk" thus defines an acceptable level of increased risk for a harm whose gravity we have already largely agreed upon, and of which there is a preexisting incidence.

Why fix "one in a million" as the threshold separating acceptable increases in excess risk from unacceptable ones? Four reasons come readily to mind. First, that threshold defines a negligible level of risk, a level of risk that we might reasonably disregard entirely. Reducing a risk to the point where it might reasonably be disregarded entirely is, presumably, reducing it to the point where it is no longer significant. Second, we already face greater threats in our daily lives—the annual risk of death by automobile accident, for example is 1 in 6,500,[123] and the annual risk of death from cancer is less than 1 in 500.[124] Given these other threats, we feel justifiably comfortable entirely disregarding excess risks of cancer less than one in a million—in treating them as functionally equivalent to no risk at all.[125] Third, we might choose to tolerate excess risks of cancer less than one in a million—but not risks greater than that—because the background risk of cancer is alarming, and we are eager not to see it increase. Fourth, "one in a million" has a natural prominence—a salience—as a measure of significance arbitrary in its exactitude but reasonable in its general order of magnitude. Who would fix on 1 in 997,832?[126]

But the idea of significance is not purely quantitative. To see more clearly just how and why the concept of significance cannot be exhausted by purely quantitative criteria, consider the risk of gas tank explosions in automobile accidents—the subject of the famous Ford

123. In 2000, there were 15.23 automobile accident fatalities for every 100,000 people. U.S. DEP'T OF TRANSP., TRAFFIC SAFETY FACTS 2000: A COMPILATION OF MOTOR VEHICLE CRASH DATA FROM THE FATALITY ANALYSIS REPORTING SYSTEM AND THE GENERAL ESTIMATES SYSTEM 15 (2001) [hereinafter TRAFFIC SAFETY FACTS 2000], *available at* http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSFAnn/TSF2000.pdf.

124. In 1998, the death rate for all cancers was 202.6 per 100,000. U.S. DEP'T OF HEALTH & HUMAN SERVS. ET AL., 2001 CANCER PROGRESS REPORT 63 (2001), *available at* http://progressreport.cancer.gov/2001/additionalMaterials/sectionPDFs/NCI_CPR2001.PDF.

125. *See, e.g.*, S. REP. NO. 103-349, at 76 (1994) ("[T]he term 'reasonable certainty of no harm' means an increased risk of cancer to an individual exposed over a lifetime of no more than one in one million.").

126. Kathryn A. Kelly and Nanette C. Cardon's critical account of the origins of the one-in-a-million standard lends some support to this hypothesis. Two scientists randomly chose a safety standard of one in one hundred million in a 1961 article attempting to define when exposure to a substance could be considered "safe." The FDA adopted that number in a 1973 notice in the Federal Register, and changed it to one in one million by the time that final rule was issued in 1977. Kathryn A. Kelly & Nanette C. Cardon, *The Myth of 10^{-6} as a Definition of Acceptable Risk*, EPA WATCH, Sept. 15, 1994, at 5.

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Pinto case.[127] Risks of gas tank explosions strike us, intuitively, as prominent risks of driving. Among the myriad risks of automobile accidents, the dangers of fire and explosion stand out. The explosive properties of gasoline make it especially dangerous. Most of us imagine that it is particularly horrible to be burned to death, and many of us may think it worse still to survive a terrible fire horribly disfigured. These judgments involve assessments of magnitude that might be *expressed* quantitatively: People might be able to rank injury by gasoline explosion on a scale with other possible injuries from automobile accidents, and we might be able to assign a number to the relative disvalue that they place on such injuries. But a judgment that the risks of gasoline tank failure are a significant risk of driving is both evaluative to its core and inherently comparative. And comparison cannot be made without attending to context, a point illustrated by the difference in significance of risks of gas tank explosions in motorcycles and cars, respectively.

The numerical risk of gasoline tank explosions is equal in motorcycles and in passenger cars,[128] and the risks of gas tank explosions may well be more dangerous in motorcycles, since riders are both closer to and less protected from their gas tanks. Does it follow that the risk of gas tank explosions is as significant for motorcycles as it is for passenger cars? It seems unlikely to me that it does. Even if gas tank explosions are equally frequent and more dangerous in motorcycles than in passenger cars, the risk of gas tank explosion is qualitatively more significant in passenger cars. The risks associated with motorcycle gas tanks are framed by the heightened risks characteristic of motorcycles. The exposed character of motorcycle riding and the relatively small size of motorcycles in comparison with cars and trucks expose motorcyclists to a host of other substantial risks—to greater-than-normal risks of being crushed in collisions with other vehicles, to greater-than-normal risks of being thrown from their cycles, and to greater-than-normal risks of severe head trauma, to name just three. Risks of gasoline tank explosion do not stand out as comparably salient—comparably significant—in such company.

The heightened risks of gas tank explosion in passenger cars—Ford Pintos, for example—are, by contrast, salient, gratuitous, and unexpected in just the way that the risks of gas tank explosion in motorcycles are not. Ford Pintos were family cars: children rode in their back seats. Pinto purchasers sought a higher level of safety than

127. Grimshaw v. Ford Motor Co., 174 Cal. Rptr. 348 (Ct. App. 1981).

128. In both passenger cars and motorcycles there is a 0.1% chance of a fire occurring. TRAFFIC SAFETY FACTS 2000, *supra* note 123, at 66. R

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motorcyclists. They did not choose to forego the protections of a passenger compartment for themselves and their offspring in exchange for the thrills of immediate exposure to both road and machine. Implicit in the purchase of a subcompact family sedan is a desire to reduce the risks of private automotive transportation, consistent with the constraints imposed by the fact that the car being purchased is a comparatively inexpensive subcompact. In this context, the risks of gas tank fires stand out, quite independent of any hidden flaw in the car. For people who are trying to keep their children safe, the risks of an automobile's gas tank are especially salient. Gasoline explosions threaten horrible deaths, horrible disfigurements, and terrible psychological trauma.[129] These characteristics make the risks of gas tank explosion in subcompact cars qualitatively significant in a way that risks from motorcycle gas tanks are not, even if those risks are quantitatively much greater.

The significance of a risk, then, is not fundamentally a quantitative matter, a matter of statistical probability and magnitude measured numerically. Significance depends on both gravity and salience. Determining the gravity of a risk requires evaluative and qualitative judgments—judgments about how much we should fear a particular kind of harm or harms, how much a particular harm impairs the pursuit of a normal life, how bad it would be to live with that harm, and so on. Determining the salience of a risk requires not just an appraisal of the risk's numerical probability, but also an evaluation of how prominent the risk is in comparison to the other risks of an activity.

III. SAFETY, FEASIBILITY, AND FAIRNESS

Safety- and feasibility-based risk regulation raise three basic questions. First, when we push beyond the cost-justified level of safety, why should we eliminate only significant risks of physical injury? Why not eliminate all risks of physical injury? Second, why should we sometimes require the elimination of all significant risks of injury and other times require only the elimination of those significant risks whose elimination is feasible? Why are we prepared to shut down some activities that cannot be made safe, but not others? Third, how do the answers to these questions and the standards that they support relate to the reasons of fairness we have for pressing precaution beyond the point of cost-justification?

129. Aspects of the Pinto's design made the failure of its gas tank even more salient. In comparison with other subcompact cars, the design of the Pinto was the first to be stripped of common safety features in conjunction with inadequate placement of the gas tank. Schwartz, *supra* note 20, at 1027-28. R

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A. Justifying the "Significance" Requirement

Considerations of fairness and comparable value justify moving beyond the cost-justified level of precaution when risks of devastating injury are at issue and show both safety- and feasibility-based regulation to be reasonable in broad outline. By themselves, however, considerations of fairness and comparable value do not justify the two central and striking characteristics of safety-based regulation. First, that standard requires safety but not absolute safety. Both the 1990 Amendments to the Clean Air Act and the Supreme Court's opinion in *The Benzene Case* make clear that the elimination of significant risk is not the same as the elimination of all risk.[130] So the safe level of risk is not the same as "no risk." Second, safety-based regulation is all risk evaluation and no cost assessment. Significant risks must be reduced until they are insignificant—without regard to cost—but insignificant risks are tolerated, also without inquiring into the cost of eliminating them. These features of the statutory standard raise a number of questions: Why draw the line at significance? Why not eliminate all risks of devastating injury? Why ignore all of the costs of eliminating significant risks? If we are prepared to eliminate significant risks without regard to cost, why should we refrain from eliminating insignificant risks without so much as inquiring into the costs of doing so?

1. Why Does Safety-Based Risk Regulation Leave "Insignificant" Risks of Devastating Injury Untouched?—Safety-based risk regulation is particularly stringent. As familiar as we are with cost-benefit analysis and its insistence on balancing costs and benefits so as to extract the greatest possible benefit from risky but valuable activities, we can hardly help but be struck by the fact that categorical judgments of significance push risk-reduction beyond the point of maximal benefit, economically conceived. But the doctrine has a lax side as well—it leaves insignificant risks entirely untouched—and this lenient side is equally noteworthy. Why should a standard that forbids trading safety against costs above some threshold level of risk have a threshold to begin with? Even insignificant risks of devastating injury are risks of devastating harm. A lifetime excess cancer risk of less than one in a million is still a risk of a devastating disease, and devastating disease, when it materializes, wreaks havoc in our lives. At worst, it ends life prematurely and traumatically. At best, it impairs life severely, foreclosing the pursuit of certain activities and ways of life, seriously hampering the pursuit of others, and often leaving us with enduring, agonizing

130. *Supra* notes 113-117 and accompanying text. **R**

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pain and suffering. The fact that it impairs our lives so seriously is, after all, what makes devastating harm devastating. Why then should we tolerate any risk of such harm?

An answer to that question lies in the fundamentals of the predicament with which the law of accidents must grapple. We each have various aims, ends, and aspirations to pursue over the course of our lives. We may each expect, with decent luck, to pursue our aims and aspirations over the course of normal life spans. To pursue our aims and aspirations effectively over the course of complete lives, however, we need both freedom to act (liberty) and freedom from physical harm (security). Liberty and security are preconditions of rational agency. Like Rawls's "primary goods,"[131] liberty and security are things that we each need if we are to realize any aims or aspirations. Liberty is essential because we can neither survive nor realize much of anything of value unless we are free to engage in a wide range of activities. But security is equally essential. Physical injury can end our lives prematurely or leave us permanently impaired in ways that prevent us from pursuing many valuable ends and aspirations. Indeed, even injuries that do not kill or permanently harm us may disrupt our lives in ways that utterly upend our life plans.

Our predicament is that liberty and security conflict. Risk of physical harm—diminished security—is the byproduct of action. Diminished liberty is the price of increased security. We cannot farm or build or drive or fly—or mill cotton and refine benzene—without taking and imposing risks of devastating injury. Some risk of accidental injury is the price of activity.[132] We cannot help but eat and drink, yet eating and drinking exposes us to risks of death and disease. We cannot help but travel about, but traveling about by whatever means we can devise—foot, car, horse, or rickshaw—puts both us and others in physical peril. Foregoing all activity would itself be a short path to death, and even if death could somehow be avoided, forgoing all activ-

131. *See, e.g.*, RAWLS, POLITICAL LIBERALISM, *supra* note 27, at 181 (preliminarily listing five primary goods: basic rights, freedom of opportunity, participation in political and economic institutions, income and wealth, and self-respect). R

132. The impossibility of preventing *all* accidental injury is a fundamental fact that any approach to accident law must acknowledge. James M. Buchanan, for example, begins his defense of caveat emptor in products liability law with the following comment:

> It is useful to note at the outset that *accidents cannot be prevented*, in the sense that the probability of occurrence cannot be reduced to zero. We live in an uncertain world, whether we like it or not, and the working properties of either human or material agents cannot be completely specified. Any discussion of products liability, therefore, involves only the possible modification in the probability distribution of accidents.

James M. Buchanan, *In Defense of Caveat Emptor*, 38 U. CHI. L. REV. 64, 64 (1970).

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ity would cripple the pursuit of our aims and aspirations as surely and severely as devastating physical injury does. A world in which no one moves is a world in which few, if any, aims, ends, and aspirations can be realized, and few, if any, lives can be led.

Risks that cannot be eliminated without ceasing the activity that engenders them are the background risks of social life. The only way to eliminate them is by bringing activity to a halt.[133] Some "background" risks are typical of social life in general; they are not the price of any particular activity but of activity in general. Other background risks are typical of particular activities; they are the price of engaging in those activities. Background risks are acceptable—worth bearing—because eliminating them works even more harm to our ability to lead the lives we wish to lead than bearing them does, even though these risks are sure to result in some devastating injuries.

The fact that a low level of risk of devastating injury—the background level of risk—is an inescapable price of activity explains why a significance requirement must be introduced, implicitly or explicitly, into even the most stringent standards of risk regulation. The background level of risk must be accepted even though that level results in some devastating injuries, because some risk of devastating injury is the price of activity and activity is worth having. Before we attempt to reduce a risk we must, then, first conclude that it crosses the threshold that separates eliminable risks from uneliminable ones. We must decide if the risk in question crosses a threshold of significance. Without a significance requirement, safety-based risk regulation would be self-defeating. One essential condition for leading a worthwhile life—liberty—would be destroyed in the name of securing another essential condition—security.

a. Lives for Convenience?—This answer, however, appears to undermine our critique of cost-benefit analysis, and to vindicate Calabresi's claim that we are quite prepared to sacrifice lives for convenience.[134] I have faulted unrestricted cost-benefit analysis because it

133. *See* KEETON ET AL., TEACHER'S MANUAL, *supra* note 62, at 20-8 ("Safety means that no significant risk remains. But safety is not attainable, by assumption, unless valuable activity ceases."); Keating, *Reasonableness and Rationality*, *supra* note 10, at 351 (discussing a "mutually imposed and mutually beneficial level of background risk" consisting of "very, very low probability risks" that are "simply the price of freedom to act"). R R

134. *See* THE COSTS OF ACCIDENTS, *supra* note 3, at 17. The proposition that we do and should trade lives for convenience has also been defended very forcefully by Alastair Norcross. *See* Alastair Norcross, *Comparing Harms: Headaches and Human Lives*, 26 PHIL. & PUB. AFF. 135 (1997); Alastair Norcross, *Speed Limits, Human Lives and Convenience: A Reply to Ridge*, 27 PHIL. & PUB. AFF. 59 (1998). What I say here is, I think, a partial response to Norcross. R

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licenses the infliction of devastating injury on a few for the sake of trivial gains to many.[135] When trivial gains to a large number of persons stand on the credit side of the balance sheet and devastating harms to a few stand on the debit side, the imposition of the risks in question should be forbidden. No number of trivial gains to some can ever compare to a single devastating injury to another. The gains and the losses are simply not comparable, morally speaking. Or so I have argued.

Our willingness to tolerate background risks of devastating injury, however, suggests that we sometimes do inflict devastation on a few for the sake of trivial gains by many. When we count certain risks of fire among the background risks of life, we countenance some incidence of death and disfigurement, and some of that death and disfigurement will be occasioned by trivial gains to others. When we count a risk that inflicts devastation on a very few a background risk of life, are we not countenancing the infliction of devastating injury for the sake of trivial gain—for the sake of convenience? If so, must not either our critique of cost-benefit analysis or our toleration of background risk be mistaken?

The argument that we take lives for the sake of convenience seems even stronger if we turn our attention to the activity of driving. Driving is the riskiest of our ordinary activities. A normal American driver exposes herself to an annual risk of death of approximately 1 in 6,500.[136] This, surely, is a *significant* risk of devastating injury. A driver subject to a 1 in 6,500 annual risk of death is subject, over the course of a normal lifespan, to a lifetime risk of death by driving of roughly 1 in 80. If a lifetime excess risk of cancer of one in one million is significant, a lifetime risk of death of 1 in 80 is much more than significant. Yet, precisely because driving is so essential to normal American life, we routinely take to the road in pursuit of trivial ends—to get to work, to go to the market, to see a movie, to take our children to softball practices and soccer games, and so on. Yet each time we drive, we impose a significant risk of devastating injury. How can this be justifiable? How can such trivial ends justify the infliction of a substantial amount of devastating injury? How can we exchange lives for convenience?

To be sure, the risks of devastating injury imposed by the activity of driving today may well be unacceptably high. In all likelihood, we should be taking various steps to reduce these risks, even if those steps

135. *Supra* note 48 and accompanying text. R
136. *Supra* note 123 and accompanying text. R

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come at some cost in convenience. But this answer merely sidesteps the challenge. Even if we reduce the risks of driving, it seems unreasonable to suppose that we will reduce them to the point where driving no longer kills and maims. Some trips to the movies will inevitably end in devastating injury and death. Lives will thus be taken in exchange for trivial ends—sometimes for nothing more urgent than the convenience of getting somewhere more quickly by hopping in the car. Leaving even insignificant risks of devastating injury untouched thus seems to guarantee that lives will be exchanged for mere convenience. How can that be either acceptable, or consistent with our criticisms of cost-benefit analysis?

The beginnings of an answer lie in a fundamental characteristic of accidents, one remarked upon by Frank Michelman in the course of distinguishing the "pollution problem" from the problem of accidental injury:

> It is of the essence of an "accident" that, while the frequency of its occurrence in general form may perhaps be statistically ascertained, its particular incidence is unpredictable. Moreover, as soon as an accident has occurred it is over, and can no longer be prevented. There is, in short, an important sense in which any accident can be called unintentional.[137]

The appearance of exchanging life for convenience arises when we focus on an ordinary errand that ends in accidental death or devastating injury. In hindsight, we appear to have exchanged life for mere convenience. But because particular accidents cannot be predicted we are never in a position to choose between life and convenience in the way that hindsight supposes us to have chosen. The unavoidable randomness of particular accidents means that when we are choosing to impose or to bear risks of death or devastation we can only choose—can only evaluate—the merits of various *classes* of risks or practices of risk imposition. We can, for example, evaluate the merits of making a practice of running ordinary errands by private automobile but we cannot rationally evaluate the merits of running one particular errand among ten thousand indistinguishable errands by automobile. Evaluating any *particular* errand is fruitless.

It is therefore a mistake to believe that the risks of driving are unacceptably high *because* each instance of driving imposes a risk of

137. Frank I. Michelman, *Pollution as a Tort: A Non-Accidental Perspective on Calabresi's* Costs, 80 YALE L.J. 647, 666 (1971) (book review). Michelman's principal point is that typical instances of pollution or nuisance do not share this inescapably unpredictable and unintentional character.

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devastating injury for the sake of trivial gain. What is at stake in evaluating the reasonableness of the risks of driving is a general practice—the loose practice of private automobile use as it now exists in this country. Within the practice as we now conduct it, each of the innumerable risk impositions that put others at risk of devastating injury for trivial gain are essentially indistinguishable from each other. No trip to the grocery store, to the movies, or to the theater, is especially urgent. (Contrast an ambulance taking a critically ill person to a hospital.) So if we judge any one automobile errand unacceptable because it wrongly risks devastating injury for trivial gain, we should judge all such errands unacceptable. When we shift our focus from particular trip to general practice, however, we encounter a benefit that is not trivial. Collectively, these mundane trips are an important part of a normal life in our society. Doing without a private automobile in contemporary Los Angeles, for instance, is a hardship—the kind of hardship that makes the lives of the working poor in Los Angeles so onerous.

b. Instances and Practices of Risk Imposition.—The important lesson here is independent of the acceptability of the practice of private automobile use as it now exists in our society. It is a lesson about the inevitability and ineliminability of risk. Even an acceptable practice of transportation will impose some risk of devastating injury for apparently trivial gain. By car, by train, by foot, or by bike, we will still transport ourselves to work, to the market, and to the video store, and in doing so we will still risk death and devastating injury. Some background risk of devastating injury is the price of any practice of transportation. That risk can be avoided only by ceasing the practice of transportation entirely—an unacceptably high cost. Some risks of devastating injury are therefore justifiably imposed even though each instance of their imposition realizes only trivial benefit, because there is no plausible way of distinguishing among the instances of risk imposition that we are considering, and the burden of eliminating all instances of such risk imposition *is* comparable to the significant risk of devastating injury that the practice creates. The other side of this coin is that we have reason to engage in particular instances of risk imposition falling within the practice at issue, even though those instances risk devastating injury for trivial gain. If we have reason not to forgo driving as an activity, then we have reason to take to the road for trivial reasons, even though we impose significant risks of devastating injury when we do so. We cannot tell which trip to the grocery store or to the movies will end in devastating injury. We therefore have no

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good reason to forgo any particular trip, and good reason not to forgo all of them.

Once we think of ourselves as adopting a principle to cover a class of cases—once we train our gaze on a *practice* of risk imposition—the dissimilarity between the activity of driving and the hypothetical involving the endangered television technician becomes evident.[138] Life-threatening injuries to television technicians are not so common that a practice of rescuing endangered technicians at the price of shutting down television transmission for the duration of the rescue is likely to jeopardize the very practice of transmitting television signals.[139] The burden of rescue will not seriously disrupt a normal life, even over the long run. Forbidding going to the grocery store, to the movies, or to work, whenever doing so risks devastating injury would, by contrast, profoundly disrupt our lives. It would forbid most of our going out and about in the world and would preclude living a normal life.[140]

Significance thus distinguishes the realm of irreducible, or unavoidable, risk from the realm of avoidable risk. Without the significance requirement, safety-based regulation would require the elimination of every discernible risk of devastating injury. But the elimination of *all* discernible risk requires the elimination of all discernible activity. And the elimination of all discernible activity is a cure worse than the disease it treats.

B. Why Exclude Costs Entirely?

These arguments justify and explain the threshold of significance, but what of the second distinctive feature of safe-level analysis—its disregard of the costs of reducing risks to the point of insignificance? Consider, for example, the determination in the Food Quality Protection Act of 1996 that tolerances for pesticide residue must be set at a level that is safe, where "safe" means that "there is a

138. *Supra* notes 53-55 and accompanying text. R

139. Note, too, that the television technician example involves rescue after the fact of accident, not accidental injury itself. Change the hypothetical so that it involves a "pure accident"—the killing of someone by the non-negligent collapse of a transmission tower that buckled under the strain of broadcasting Baywatch—and it no longer involves trading life for convenience. The question would then be what it would cost to prevent every such transmission tower collapse from causing serious physical injury.

140. There is, to be sure, a paradox here: It strikes us that it is wrong to put our lives at risk for the convenience of renting a video most quickly, but right to run a larger risk of death to view a sufficient number of indistinguishable valuable videos quickly. A course of action that appears irrational in each instance appears rational when considered as a class. The phenomenon is, I believe, an instance of a "lottery paradox," and I discuss it in some detail in Keating, *Pressing Precaution*, *supra* note 0, at 704-08. R

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reasonable certainty that no harm will result from aggregate exposure to the pesticide chemical residue, including all anticipated dietary exposures and all other exposures for which there is reliable information."[141] This determination expresses a legislative judgment that the costs of reducing pesticide residues to safe levels not only *may* be disregarded entirely, but *must* be disregarded entirely. Structurally, then, safety-based regulation is radically different from cost-benefit analysis. To determine an appropriate level of safety, cost-benefit analysis insists on balancing all relevant considerations (as it conceives them) in a comprehensive calculus. Safety-based regulation insists on *excluding* an entire class of arguably relevant reasons—namely, costs—from the exercise of fixing an acceptable level of risk.[142]

Why—or in what contexts—should we disregard entirely the costs of eliminating significant risks, pursuing risk reduction until we have cut the risk to the point at which it is no longer significant? In answering this question, it helps, I think, to realize that the safety norm defines an attractive social world so far as risks of physical injury are concerned. The risks that it tolerates are ones whose probability is so low that we may reasonably ignore them. A social world sufficiently safe that each of us might reasonably expect to live a life of normal length—secure in the knowledge that we can reasonably expect that our lives will not be cut short by death or devastating injury—is an immensely attractive social world. The basic premise of the safety norm is that we should not sacrifice such a world unless we stand to gain something of comparable value. We should, therefore, eliminate significant risks of injury when the costs of doing so are not comparable to the devastation that significant risks are sure to wreak. This deceptively simple answer suggests a division of labor between safety- and feasibility-based risk regulation. Safety-based risk regulation is appropriate when the costs of reducing risks of devastating injury to the point at which they are no longer significant are *not* comparable to the costs of bearing those risks of devastating injury. Feasibility-based risk reduction is appropriate where the costs of reducing risks of devastating injury to the point at which they are no longer significant *are* comparable to the cost of bearing those risks of devastating injury.

141. 21 U.S.C. § 346a(b)(2)(A)(ii).

142. The "exclusionary" character of safety-based risk regulation should not be considered an oddity. *See* JOSEPH RAZ, PRACTICAL REASON AND NORMS (Princeton Univ. Press 1990) (1975). Raz rightly emphasizes the fact that norms of practical reason are often exclusionary in character.

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IV. COMPARABLE VALUE IN SAFETY AND FEASIBILITY ANALYSIS

A. Comparable Value and Safety-Based Risk Regulation

The harms threatened by the risks that are subject to safety-based regulation are a particular sort of irreparable injury. The costs of unsafe food, air, and water are borne in irreparable injury to health, and health is an essential condition of effective human agency—a kind of primary good. What about the benefits of bearing risks to health, or the flip side of the coin, the costs of reducing such risks? How should we characterize them? Pesticide residue on our crops is the byproduct of the pursuit of greater agricultural productivity. Toxins in our air and water are byproducts of ordinary, economically productive activities (ubiquitous byproducts, perhaps). The enactment of safety-based regulatory statutes expresses a categorical judgment that the costs these productive activities must bear in order to eliminate significant risks of devastating harm are acceptable. We need not inquire into the costs of eliminating significant risk on a case-by-case basis, and we need not attend to the marginal balance of cost and benefit in any particular case, because the benefits of significant risk are simply not comparable to the incidence of harm to human health that is their price. The safety-based regime in place for the regulation of the risks of pesticide residues on agricultural products, for example, expresses the conclusion that no amount of increased agricultural productivity can justify imposing a significant risk of devastating disease. The benefits of more risk—the increased yield in crops harvested per acre planted and the like—are not the kind of benefits that can justify the increased incidence of devastating injury that is their price.

Why might a reasonable legislature come to the conclusion that the benefits of increased agricultural productivity cannot justify imposing a significant risk of devastating injury? In part, because a reasonable legislature should reject the central idea of unrestricted cost-benefit analysis—that all goods are commensurable, fungible at some ratio of exchange. Laws like the Food Quality Protection Act of 1996 reject this idea of universal commensurability. They implicitly single out health for special protection. Safety-based statutes assume that health—like the physical integrity of the person—is a kind of primary good, something that each person needs in order to realize her aims and aspirations over the course of a normal life span, whatever those aims and aspirations may be.[143] Health has a special urgency. It is

143. *See* RAWLS, POLITICAL LIBERALISM, *supra* note 27, at 187-90 (describing primary goods as "citizens' needs"). *See generally id.* at 173-211. The contrast between needs and preferences (or wants) is fundamental to the contrast between safety-based regulation and **R**

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part of a package of goods that are essential conditions of rational agency, and it takes priority over lesser, inessential goods. Health should only be sacrificed when we stand to gain more of something comparable.

But a hierarchical view of human interests is only one part of the justification for safety-based risk regulation. Safety-based risk regulation also rests on particular, historically and socially contingent claims of value. The Food Quality Protection Act of 1996, for example, implicitly rests on the particular, historically contingent claim that more yield per acre of crop planted is not a good comparable to a significant risk of irreparable health injury. Why? Because health is, for each of us, an essential condition of effective agency whereas the benefits of increasing the yield of crop per acre are not—for us—measured in the attainment of an equally essential good. For us, the benefit of increased agricultural productivity is simply increased wealth, and the wealth obtained is not an essential condition of anyone's agency. We should not, therefore, treat risks to health and yield per acre as commensurable goods and let maximum overall benefit fix the proper balance between them. Were we poorer, matters might well be different. The benefit of increased agricultural productivity might be measured in our ability to provide adequate nutrition to each member of our society. Adequate nutrition *is* an essential condition of effective agency, one comparable to health in its urgency. Contingent social facts thus make the benefits of increased agricultural productivity not comparable—for us—to significant health risks.

The same combination of a hierarchical conception of human interests with historically and socially contingent facts is capable of explaining and justifying the application of safety-based risk regulation to air and water pollution. Air and water, like food, are necessities. Breathing and drinking, like eating, are unavoidable activities. Breathing the air and drinking the water should not put our health in significant peril unless the cost of eliminating that peril threatens our agency in some comparable way. In an affluent society, when the cost of eliminating significant health risks from breathing the air and drinking the water is measured simply in wealth forgone, the cost of eliminating significant health risk is not comparable to the cost of bearing such risk. In poorer or less technologically advanced societies, matters might be different. It might, for example, be impossible to reduce the risks of air and water pollution to an insignificant level

cost-benefit analysis. The idea here is more general than Rawls's conception of primary goods. It might, for example, be possible to elaborate it in terms of Amartya Sen's notions of "functionings" and "capabilities." *See generally* SEN, *supra* note 55, at 39-55. R

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without seriously impairing the ordinary productive activities that generate such pollution, and that might make those workers most disadvantaged by the pollution worse off rather than better off.[144]

Safety-based risk regulation, in short, is justified when the costs of eliminating significant risks of devastating injury are simply not comparable to—and fall far short of—the benefits of doing so. When this is the case, the safe-level standard then fixes the acceptable level of risk. The Food Quality Protection Act of 1996 is correct to require tolerances for pesticide residue on food products to be set at a level at which "there is a reasonable certainty that no harm will result from aggregate exposure to the pesticide chemical residue, including all anticipated dietary exposures and all other exposures for which there is reliable information,"[145] even in light of the special susceptibility of infants and children to harm from toxic substances,[146] if attaining this level of safety will not impose a burden comparable to a significant risk of devastating physical injury. When are costs comparable? When the burden of bearing the precaution necessary to reduce a particular class of significant risk of devastating injury to the point of insignificance is of a kind that might outweigh the burden of devastating injury that is the price of the risk. The burden of eliminating all insignificant risks of devastating injury, for example, is comparable to the burden of bearing them, because the elimination of all risks requires the elimination of all activity. The elimination of all activity burdens an essential condition of agency—the freedom to act—even more than insignificant risk of devastating injury burdens the physical integrity of the person, another essential condition of human agency.

144. Both the safety and the feasibility norms are especially protective of those most imperiled by the risks that these norms regulate. While these norms are not strictly analogous to Rawls's difference principle, they are strikingly similar in their solicitude for the class of those made "worst off" by the risks in question. *See generally* RAWLS, THEORY, *supra* note 12, § 13, at 65. The resemblance is worth remarking on in part because the kinds of risks under consideration are *not* wholly comparable to the design of the basic structure of society in their impacts on the life prospects of every member of society. The subject matter regulated by these norms is markedly different from the subject matter regulated by the difference principle. It therefore seems unlikely that the particular arguments for the difference principle could be extended to justify these norms. It seems likely, though, that more general reasons of fairness explain and justify the solicitude for the "worst off" shown by these norms: When the distribution of burdens and benefits is at issue "our attention is naturally directed first" to the claims of those who bear the greatest burdens, "because if anyone has reasonable grounds for objecting to the principle it is *likely* to be them." T.M. SCANLON, *Contractualism and Utilitarianism*, *in* THE DIFFICULTY OF TOLERANCE: ESSAYS IN POLITICAL PHILOSOPHY 124, 145 (2003). As I have argued, those whose lives are put at significant risk of severe, irreparable injury have an urgent claim to protection. **R**

145. 21 U.S.C. § 346a(b)(2)(A)(ii).

146. § 346a(b)(2)(C).

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The presence of comparability thus marks the point at which tradeoffs begin. Within federal risk regulation, feasibility-based regulation of risks of devastating injury replaces safety-based regulation when costs are comparable. When are burdens to major, productive economic activities—the kind governed by both safety- and feasibility-based risk regulation—comparable to significant risks of devastating injury? Feasibility-based risk regulation is constructed around an answer to that question: Burdens to ordinary, productive economic activities—activities like milling cotton, refining petroleum, and growing crops—are comparable to significant risks of devastating injury when they threaten the long-run flourishing of those activities. Feasibility-based risk regulation supposes that the value realized by the major, productive economic activities of our society is comparable to, and generally greater than, significant risk of devastating injury. It is this claim that we must now explore.

B. Comparable Value and Feasible Risk Reduction

Workplace risks are the primary domain of feasibility-based risk regulation, OSHA is the primary practitioner of feasibility analysis, and workers are the primary beneficiaries of the feasibility standard. Feasibility-based risk regulation as practiced by OSHA presumes that the productive economic activities to which it applies are sufficiently valuable that shutting them down would cause greater hardship than allowing them to continue, when their continuation involves imposing significant risks of devastating injury that can only be reduced by jeopardizing the long-run survival of those activities. More particularly, feasibility analysis as practiced by OSHA presumes that shutting the activity down would work a greater long-run hardship to the workers the activity endangers than asking those workers to accept significant risks of devastating injury. The well-being of workers is the natural focal point for appraising relative hardships, because workers are both the principal victims of the activities' risks and the principal beneficiaries of feasibility-based risk regulation. Because their lives and their health are endangered, their claims have a special urgency and a natural priority. Their claim to greater protection is especially powerful.

There is a strong resemblance between the view that feasibility-based risk regulation takes of the significant risks of major, productive activities, and the view that safety-based risk regulation takes of insignificant risk. Feasibility analysis tolerates significant risk when it is the price of particular major, productive activities. Safety-based risk regulation tolerates insignificant risk as the price of activity itself. Even under the best of circumstances, safety-based risk regulation supposes

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that a background level of risk of devastating physical injury must be accepted, because the cost of eliminating that risk is the prohibition of all activity, and the prohibition of all activity is a cure worse than the disease. The elimination of all risk of devastating physical injury paralyzes our lives, impairing our pursuit of valuable ends and activities more than the background level of risk itself does. Feasibility analysis applies these ideas in a more particular way. It holds that we are justified in accepting a level of risk greater than the background level of risk—a significant level of risk—when our only alternative is to shut down a valuable activity. The implicit judgment here is that shutting down the particular activities to which the feasibility norm applies makes those that the activity most endangers worse off, not better off.

1. Feasibility Analysis as Practiced by OSHA.—OSHA's judgments in *The Cotton Dust Case* illustrate the application of feasibility analysis in both its technological and economic aspects and the relation of feasible risk reduction to safety in some detail. Cotton dust is the primary cause of byssinosis or "brown lung" disease, a serious, potentially disabling disease.[147] Because exposure to cotton dust is the primary cause of brown lung disease, the disease is "a distinct occupational hazard associated with cotton mills."[148] At the time of *The Cotton Dust Case*, an estimated one in twelve retired cotton workers suffered from the most severe grade of byssinosis.[149] The best contemporary studies of the health effects of prolonged workplace exposure to cotton dust suggested that the exposure to "lint free cotton dust" could never be safe at any level higher than 0.2 mg of such dust per cubic meter, or 200 $\mu g/m^3$.[150] OSHA concluded that this upper limit of safe exposure should be used to define the "permissible exposure limit" (PEL) for

147. *The Cotton Dust Case*, 452 U.S. 490, 495 (1981). Byssinosis is a "continuum . . . disease," categorized into four grades "[k]nown generally as the Schilling classification grades." *Id.* at 496 & n.8. These are:

> [Grade] 1/2: slight acute effect of dust on ventilatory capacity; no evidence of chronic ventilatory impairment.
>
> [Grade] 1: definite acute effect of dust on ventilatory capacity; no evidence of chronic ventilatory impairment.
>
> [Grade] 2: evidence of slight to moderate irreversible impairment of ventilatory capacity.
>
> [Grade] 3: evidence of moderate to severe irreversible impairment of ventilatory capacity.

Id. at 496 n.8. In 1970, an estimated 100,000 employed and retired cotton workers suffered from the disease, with an estimated 35,000 (or 1 out of every 12) suffering from grade 3, the worst and most disabling form of the disease. *Id.* at 498.

148. *Id.*

149. *Id.*

150. *Id.* at 499-500.

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exposure to cotton dust over the course of an eight-hour workday.[151] Attaining this PEL, however, was not always feasible:

> OSHA interpreted the Act to require adoption of the most stringent standard to protect against material health impairment, bounded only by technological and economic feasibility. OSHA therefore rejected the industry's alternative proposal for a PEL of 500 $\mu g/m^3$ in yarn manufacturing, a proposal which would produce a 25% prevalence of at least Grade $^1/_2$ byssinosis. The agency expressly found the Standard to be both technologically and economically feasible based on the evidence in the record as a whole. Although recognizing that permitted levels of exposure to cotton dust would still cause some byssinosis, OSHA nevertheless rejected the union proposal for a 100 $\mu g/m^3$ PEL because it was not within the "technological capabilities of the industry." Similarly, OSHA set PEL's for some segments of the cotton industry at 500 $\mu g/m^3$ in part because of limitations of technological feasibility. Finally, the Secretary found that "engineering dust controls in weaving may not be feasible even with massive expenditures by the industry," and for that and other reasons adopted a less stringent PEL of 750 $\mu g/m^3$ for weaving and slashing.[152]

The "safe" level of 100 $\mu g/m^3$ was thus technologically unattainable, and as is often the case, the best attainable level—the technologically feasible level—200 $\mu g/m^3$, was economically infeasible. Levels as high as 750 $\mu g/m^3$ were accepted for weaving and slashing—one activity within the enterprise of milling cotton—because lower levels could not be achieved even with massive industry expenditures on safety.

The Cotton Dust Case thus makes plain the conception of comparability espoused by the feasibility test and squarely frames the issues that test raises. Feasibility analysis, as practiced by OSHA, treats the cessation of an activity as a cost comparable to and (in general) greater than the cost of bearing a significant risk of devastating injury. The basic criterion of comparability employed by feasibility analysis is therefore a localized and more relaxed application of the criterion employed by safety analysis. Safety analysis views the shutting down of all activity as a cost sufficient to justify bearing *insignificant* risk of devastating injury from any given activity. Feasibility analysis considers the shutting down of major productive activities in our market econ-

151. *Id.* at 500.

152. *Id.* at 503-04 (citations omitted).

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omy as a cost sufficient to justify bearing *significant* risk of devastating injury from such activities.

By considering the cessation of significant productive activities in a market economy to be comparable in kind and generally more costly than a significant risk of devastating injury, feasibility analysis extends the idea of comparable value to a case in which the instrumental, mundane activity of earning a living and generating wealth justifies bearing a significant risk of devastating injury. Comparing significant risks of devastating injury to the termination of economically productive—but mundane—activities is plainly controversial. If we picture this tradeoff at the level of an individual life, its merits are uncertain. Losing a job—the consequence of shutting down some ordinary economic activity—does not seem comparable to losing life or limb. Nor does it seem comparable to suffering a health impairment that will permanently and severely impair normal functioning and shorten the span of one's life—typical consequences of serious occupational diseases. We should, it seems, fear devastating injury more than job loss. We are, after all, more likely to find another job than another life or limb.

2. Justifying Feasible Risk Reduction.—What is the case for treating the cessation of a major, productive economic activity as comparable to a significant risk of devastating injury? The claim to comparability rests, I believe, on three ideas. First, feasibility-based risk regulation assumes that the activities to which it applies are ones for whose importance the market has already vouched. It accepts—defers to—the validity of this prior test of value. Second, feasibility-based risk regulation—like safety-based risk regulation—accepts the importance of socially contingent facts. The major, productive economic activities that feasibility-based risk regulation accepts as comparable in value to a significant risk of devastating injury are contingent and historically transient—but nonetheless terribly important—features of our economy. Third, feasibility analysis appeals implicitly to the idea that, in terms of value, the major, productive activities to which it applies are indistinguishable. The case for shutting down one major productive activity is therefore a case for shutting down all similar activities. That price is too high to pay for the elimination of significant risk.

The first of these ideas is that ongoing, productive activities that flourish in a market economy have significant value. Because they have passed the market's test of value, we may presume that their over-

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all benefits outweigh their overall costs.[153] Shutting down such activities therefore removes something of significant value to many people—workers, consumers, suppliers, shareholders.

The second idea asserts that contingent social facts—accidents of history, if you like—can embed themselves so deeply in the structure of our social life that what once might never have taken root can now only be uprooted at enormous cost. We can readily imagine social worlds without the activities governed by OSHA-style feasibility analysis—social worlds without cotton clothing or petroleum products. We know that such social worlds have existed in the past, and we expect a social world without petroleum products to exist at some point in the future. Those who have lived and who will live without cotton shirts or petroleum products surely have not suffered and will not suffer great hardship—hardship comparable to devastating physical injury—because they are deprived of the fruits of these activities.

Yet feasibility analysis as practiced by OSHA treats the termination of activities such as cotton milling and refining petroleum as a harm both comparable to a significant risk of devastating injury and generally greater than such a risk. The assumption is that the worlds in which these activities would not be sorely missed are different social worlds from our own. Activities such as refining petroleum and milling cotton are deeply entrenched in our social world. Ending them abruptly would cause massive, unpredictable dislocation. Shutting down the activity of refining petroleum, for example, is essentially unthinkable. Petroleum products are knit so tightly into the fabric of our daily lives that we cannot simply decide to do without them without working inconceivable disruption in our lives.

The third idea applies a test of generalization and makes a claim about the outcome of that test. This criterion parallels and repeats, in a more localized manner, an important part of the argument for toler-

153. Some readers may be troubled (and rightly so, I believe) by the fact that the underlying test of value is essentially a utilitarian or economic one. It is worth noting, however, that feasibility analysis would proceed in the very same way if we adopted an underlying test based on fairness. Imagine a social world such as our own except that the workings of the market economy satisfied the requirements of Rawls's difference principle. We would then say that the activities in question were valuable not because they had passed a market test of cost-justification, but because they were part of an economic system that was to the advantage of all those who participated in it. *See* RAWLS, THEORY, *supra* note 12, § 13, at 65. This situation would give us a different reason to count the shutting down of significant productive activities in that world as a serious harm—a reason of fairness, not utility. Should the objection therefore be directed against the conception of mutual advantage (Pareto superiority) that governs our market economy, rather than against feasibility analysis? I discuss this in the final Part of this Essay. R

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ating insignificant risks of devastating physical injury.[154] If a remote risk of devastating injury is indistinguishable from many other such risks, fairness requires us to eliminate all such risks if it requires us to eliminate any of them. If, for example, the risks created by driving to the movies are indistinguishable from a host of other remote risks created by trivial errands, we must eliminate all of these risks if we choose to eliminate one of them. Eliminating all of these risks is, however, undesirable. Some very low risk of devastating injury is the price of activity, and activity is essential to the leading of any worthwhile human life. The undesirability of eliminating all risk explains and justifies the otherwise puzzling significance criterion found in both safety- and feasibility-based risk regulation.

A parallel, but more particular, argument supports the assumption that the shutting down of a productive activity is a disvalue comparable to a significant risk of devastating injury. Suppose that we chose to stop milling cotton or refining petroleum because these activities cannot be conducted without imposing significant risks of devastating injury. Fairness would then require us to stop all similar productive activities—all major, productive activities that cannot be conducted without imposing significant risks of devastating injury. If milling cotton and refining petroleum are typical of the class of productive activities to which feasibility analysis applies, this result is unacceptable. Perhaps the life prospects of those most endangered by cotton milling would be better if we eliminated that activity and no other class of persons would suffer a worse hardship than those most endangered by cotton milling now do. Perhaps the same is true if we ceased refining petroleum (although I doubt it), but the more activities we add to the list, the less persuasive the claim is that we are gaining value, not losing it. Shutting down most of the major productive activities in our economy *would* be a harm comparable to bearing a significant risk of devastating injury. Shutting down most of the major productive activities in our economy almost certainly would *not* be to

154. This kind of generalization test is common in ordinary negligence analysis as well. *See, e.g.*, Grace & Co. v. City of Los Angeles, 168 F. Supp. 344, 349 (S.D. Cal. 1958) (holding that it would be unreasonable to rule that the defendant should have inspected a graphite water pipe that had not been inspected in 40 years and that damaged plaintiff's property when it burst, because the costs of unearthing and inspecting every buried pipe every 2 to 3 years "would be prohibitively expensive and economically unfeasible"); Clinton v. Commonwealth Edison Co., 344 N.E.2d 509, 515 (Ill. App. Ct. 1976) (holding that the plaintiff's proposed precaution of requiring the defendant utility to insulate the 7200-volt power line that electrocuted a 15-year-old boy was unreasonable as a matter of law because it would be "tantamount to requiring defendants and all who are engaged in the business of supplying electrical service to insulate all of their lines").

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the advantage of the workers employed by those activities and most exposed to their risks.[155]

Insofar as it is correct to claim that the case for ceasing one major productive activity is a case for shutting down all of them, this is a persuasive argument. That claim, however, should give us pause. The argument against shutting down most of society's major productive activities is an argument of fairness—the workers employed by these activities would be harmed in the long run by the elimination of these activities, even though these activities exact a significant toll on the lives and health of those very workers. Yet the fact that these activities flourish in our market economy vouches not for their fairness, but for their efficiency. The major, economically productive activities to which feasibility-based risk regulation applies flourish in our market economy, and we may assume that they would not if their costs exceeded their benefits. The market's test of value is roughly and loosely utilitarian. Roughly, because actual markets do not work perfectly. Loosely, because markets measure value in wealth, and wealth is not identical to utility. These imperfections, however, are not what should give us pause. Activities may be net beneficial in market terms—their economic benefits may exceed their costs—without being fair in the sense of working to the long-run advantage of those they most disadvantage. So there is cause for concern: Feasibility-based risk regulation may realize fairness within boundaries fixed by efficiency. That this happens would be no surprise to Calabresi: *The Costs of Accidents* shows a keen awareness that the market must remain the default mechanism for making many decisions to permit or prevent accidental injuries.[156] But this fact presents serious problems for an argument constructed around the idea of fairness.

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155. The Court considered this type of argument in *Whitman v. American Trucking Ass'ns, Inc.*, 531 U.S. 457, 466-67 (2001):

> [R]espondents argue . . . [that] the economic cost of implementing a very stringent standard might produce health losses sufficient to offset the health gains achieved in cleaning the air—for example, by closing down whole industries and thereby impoverishing the workers and consumers dependent upon those industries. That is unquestionably true, and Congress was unquestionably aware of it. . . . Section 110(f)(1) of the [Clean Air Act] permitted the Administrator to waive the compliance deadline for stationary sources if, *inter alia*, sufficient control measures were simply unavailable and "the continued operation of such sources is *essential . . . to the public health* or welfare."

Id. (emphasis added by the Court) (citations omitted).

156. Calabresi notes that "[e]ven if we accepted the notion that informed political decisions are always desirable when nonmoney costs are involved, it would be impossible for us to make such political decisions in all the myriad situations where a choice among accident-causing activities has to be made." THE COSTS OF ACCIDENTS, *supra* note 3, at 99; *see also id.* at 72 ("[I]t is hard to imagine a society where, somewhere along the line, the mar- R

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V. THE ROLE OF THE MARKET: CONTINGENCY AND EFFICIENCY

Feasibility-based risk regulation draws its justification for demanding more than cost-justified precaution from considerations of fairness. It is only fair to ask some to bear significant risk of devastating injury if the burden of eliminating that significant risk (and the devastation that is its eventual price) is comparable to the burden of bearing it. For the imposition of risks of devastating injury tolerated by feasibility analysis to be fair, the long-run flourishing of the activities to which feasibility analysis applies must outweigh the significant risk of devastating injury that is the price of that flourishing. And here there is cause for concern.

That concern has two sources. First, feasibility analysis depends on contingent social facts. It equates the survival of particular productive economic activities with significant threats to our health and bodily integrity. This equation is jarring: Mortality and physical vulnerability seem far more fundamental to our agency than do our dependence on cotton and petroleum. Second, feasible risk regulation accepts a market test for the value of the activities to which it applies. Feasibility analysis ceases to condemn significant risk of devastating injury when condemnation jeopardizes the long-run vitality of the productive economic activities on which feasibility analysis is brought to bear. Feasibility analysis thus counts the continued vitality of basic productive activities as a value great enough to justify bearing significant risk of devastating injury. The value of these activities is thus vouched for by the fact that they prosper in our market economy. The fear raised by this acceptance of market value is that the market vouches not for fairness but for efficiency, for net social benefit in the sense of wealth maximization, and for mutual advantage in the sense of Pareto superiority. Fairness, however, is quite a different matter from efficiency.

The contingent character of the activities whose flourishing is counted comparable to and greater than significant risk of devastating injury, and the fact that the flourishing of these activities in a market economy warrants only their efficiency, both present substantial challenges to feasibility analysis. Let us consider them in turn.

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ket deterrence approach to primary accident control would not be significant."); *id.* at 107-09 (arguing that the market is often by far the cheapest factfinding device available to assist in making judgments on how to deal with accidents).

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A. Comparability and Contingent Social Facts

The dependence of feasibility analysis on contingent social facts raises the worry that we are sacrificing an essential condition of effective agency for inessential gains. Our mortality and vulnerability are fundamental facts about us. Physical vulnerability and mortality have always characterized human beings. In contrast, the importance to us of various activities whose elimination would remove significant risks of devastating injury—milling cotton or refining petroleum—depends on facts much less fundamental than having vulnerable bodies and being mortal. Indeed, our attachment to any particular activity is much more contingent than our need for physical health and bodily integrity and our vulnerability to devastating injury. The socially contingent character of the particular activities to which we are attached might, then, be proof that we can and should learn to live without them. We cannot live decent lives with shattered bodies, but we can live decent lives without cotton shirts or private passenger automobiles. The importance of keeping our bodies intact, coupled with the contingent character of our dependence on the activities that endanger us, might be reason for us to criticize these activities as less important than physical integrity, not reason to equate them with physical integrity. Bodily integrity is a precondition of rational agency in a way that cotton shirts are not. Its preservation ought, therefore, take priority over the flourishing of historically particular, socially contingent activities.

This argument, though, proves too much. Our need for any particular activity may not be as deep as our need for bodily integrity, but our need for activities that are socially contingent and historically transitory *is* as deep. It is through such activities—and only through such activities—that we sustain other conditions of rational agency and realize the diversity of values that give rational agency its point. Unless we believe that we can reproduce ourselves and realize an equivalent range of values through a set of activities that do not create a significant risk of devastating injury, we cannot take the shutting down of significantly risky activities lightly simply because each activity that we might shut down is socially contingent and historically particular. Feasibility analysis therefore cannot be faulted simply because it considers the continued flourishing of particular, historically contingent activities to be a value great enough to trump significant risk of devastating injury. If it is to be faulted, it must be faulted for the particular test of value it employs and, through that test, for the particular activities it considers comparable. The correct concern is not that feasible risk reduction counts contingent activities comparable to signifi-

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cant risk of devastating injury, but that it counts any activity that flourishes in a market economy as valuable enough to justify imposing significant risk of devastating injury.

B. Feasibility and Efficiency

The difficulty, of course, is that flourishing in a market economy vouches not for the fairness of an activity, but for its efficiency. In general, it is only fair to impose a significant risk of devastating injury on workers in an industry when that risk cannot be reduced to insignificance without imposing a comparable burden on some other class of persons, and when the continued flourishing of the activity is to the long-run advantage of the workers it burdens. By contrast, an activity is efficient when it makes the pie larger—when it generates wealth, expanding the total resources at society's disposal. Efficient activities are to the advantage of those who participate in them only in a limited, Pareto sense. As long as those who participate in efficient activities do so voluntarily (and rationally and with adequate information), they are advantaged in the sense that taking part in those activities makes them better off than they would be had they refused to participate. In the cases that are the objects of our concern, Pareto superiority means that workers are better off accepting the jobs they accept than they would be if they did not accept those jobs, notwithstanding the significant risks those jobs pose.

Pareto superiority guarantees advantage against the preexisting background of entitlements and opportunities, but it does not guarantee fairness. A transaction can be Pareto superior for a party in a poor bargaining position, but still unfair. The deal struck may give the party with superior bargaining power an unjust share of the cooperative surplus. A Pareto-superior deal may give the party with superior bargaining power a share of the cooperative surplus that the party would not agree to were they to be placed behind a "veil of ignorance" and told to strike a deal that they would be prepared to honor no matter whose shoes they turned out to occupy. Where risk of devastating injury is involved, a Pareto-superior transaction may burden the weaker party with an unfair risk—a significant risk that might be eliminated without making either that party or anyone else bear a comparable hardship. Pareto-superior transactions may be unfair because they arise within a setting of unfair background conditions, inequalities, and entitlements. Inequalities of power may make it rational for someone in a weaker position to enter into a transaction on particular terms, but they do not make those terms reasonable—they do not make those terms fair. Fair (or reasonable) terms are terms that the

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parties would agree to if they ignored their particular advantages and disadvantages and sought only to agree to terms that neither party could reasonably reject.[157] Pareto-superior transactions may be ones that would never meet this test of unforced agreement. They may express not unforced agreement, but rather the coercive force of preexisting inequalities in knowledge, wealth, bargaining power, and so on. The fact that activities flourish in a market economy thus guarantees that they are mutually advantageous in a Pareto sense (roughly speaking, at least), but it does not vouch for their fairness. For Pareto-superior transactions to be fair, the pre-existing entitlements on which they improve must themselves be fair.

C. Valuing Activities: Feasibility, Fairness, and the Market

We do, then, have reason to worry about the way in which a market test of value vouches for the value of the activities governed by feasible risk reduction. The market vouches for the efficiency of the activities that flourish within it, not for their fairness. The efficiency of market transactions is assured by their being mutually advantageous (Pareto superior) for market actors, but the fairness of market transactions is not. The fairness of market transactions depends on the institutional framework within which those transactions take place. Market transactions are generally fair when they take place against a just background—against a just (or fair) assignment of initial rights and entitlements and a just distribution of resources, both governed over time by principles that prevent initially fair starting points from deteriorating into unfair distributions of rights and resources. It is the sustained presence of "background justice" that vouches for the fairness of individual transactions.[158] In the absence of background justice, nothing guarantees the fairness of particular Pareto-superior transactions, or particular efficient activities. When feasibility analysis accepts the fact of an activity's flourishing in the marketplace as proof that the activity is valuable enough to justify bearing a significant risk of injury, it accepts efficiency as a limit on fairness.

The fact that efficiency limits the critical bite of fairness in this way is cause for concern. Feasible risk reduction, it seems, should press the claims of fairness further and ask if the disappearance of an activity would make the workers endangered by its significant risks bet-

157. On "reasonable rejection," see SCANLON, WHAT WE OWE, *supra* note 53, at 194-97, 203-18, 223-31. R

158. *See* JOHN RAWLS, JUSTICE AS FAIRNESS: A RESTATEMENT §§ 14-15, at 50-55 (Erin Kelly ed., 2001) [hereinafter JUSTICE AS FAIRNESS] (describing background justice and its relationship to the basic structure of a system of social cooperation).

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ter off, without imposing a comparable disadvantage on another class of persons affected by the activity. If an activity flunks that test, it should be subjected to the more stringent demands of the safety standard.

It is easy enough to imagine how an ideal legislator might fix the respective domains of the safety and feasibility norms, assigning those activities whose presence in the world is not sufficiently valuable to justify bearing significant risk of devastating injury to the safety norm, and those whose presence is sufficiently valuable to justify bearing such risks to the feasibility norm. One may likewise imagine judges and regulators appraising the value of various activities, and condemning those activities whose irreducible risks are not worth their benefits. Even so, Calabresi seems perceptively and profoundly correct to contend that some decisions about lives and safety must be left in the hands of the market. The enterprise of asking judges and legislators to evaluate every single activity is, in the end, neither credible or compelling. It demands too much of judges and legislators. The lesson here, however, is not that efficiency must trump fairness but that fairness in risk imposition cannot be obtained solely by fair norms of accident law. It must be attained in part by embedding market processes within a larger framework of just entitlements and procedures.

The fairness of market transactions, and of the activities that emerge from them, depends principally on the establishment of what I have been calling "background justice." In order for markets to operate fairly, initial entitlements must be fixed properly, and the operation of the market must itself be regulated to maintain this background justice. Institutions designed to make and apply accident law are not ideally equipped to establish and maintain background justice. Their interventions in market activities are, almost inevitably, bound to be piecemeal and ad hoc. They target particular unfair activities, not the deeper conditions that allow those activities to flourish. To be sure, the institutions of accident law have a role to play in the construction of a just basic structure of society. The appropriate specification of the domains of safety, feasibility, and cost-justified[159] risk reduction is likely part of a just basic structure, but surely not the whole of it. The allocation of basic rights and the distribution of wealth, income, and property are also essential parts of it. The lion's

159. Taking only the cost-justified level of precaution is proper when the harm done is repairable, so that redistribution after the fact of injury can distribute the burdens and benefits of risky activity fairly. In this case, it makes sense to proceed by maximizing the size of the pie and redistributing to achieve fairness thereafter. *See* KEETON ET AL., TEACHER'S MANUAL, *supra* note 62, at 20-7. R

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share of the task of ensuring that only fair activities flourish in a market economy may best be shouldered, then, by those institutions charged with ensuring the justice of the basic structure.

The best way to address the problem of unjust activities, in other words, might be indirectly, not directly. In light of the conception of fairness we have embraced, it may not be best to extend the practice of feasibility analysis so that it regularly appraises the value of the activities whose risks are at issue. Instead, it may be best to seek a just basic structure. The existence of such a structure would ensure, for the most part, that the activities flourishing within it are fair. Imagine, for example, a social world such as our own, except that the workings of the market economy satisfied a principle of fairness.[160] The economic activities that flourished in such a social world would be counted fair not because they had passed a market test of cost-justification, but because they arose out of a fair background situation through procedurally fair transactions and flourished in an economic system governed by principles of justice that ensured that it worked to the advantage of all those who participated in it—even those it most disadvantaged.[161] In this social world, we would have a reason of fairness to count the shutting down of major productive activities a grave injury, comparable to a significant risk of devastating harm. In this world, feasible risk reduction might proceed in essentially the way that it proceeds in our world, but because it would operate against a different background, its assumption that the survival of major productive activities is a value great enough to justify bearing a significant risk of devastating harm would stand on firmer footing.

Until such a social world comes into existence, however, the conceptions of fairness expressed by the norms of feasible and safe precaution will be framed and limited by the logic of market efficiency. The legal doctrine implementing the safety and feasibility norms thus shows that our law of accidents includes principles of risk regulation that prescribe more than efficient precaution against risk to human life. These norms give practical expression to the moral conviction that life is a "pearl beyond all price." But the limiting of the feasibility

160. Rawls's difference principle is one such principle. *See* RAWLS, THEORY, *supra* note 12, § 13, at 65 ("The intuitive idea is that the social order is not to establish and secure the more attractive prospects of those better off unless doing so is to the advantage of those less fortunate."). R

161. *See* RAWLS, JUSTICE AS FAIRNESS, *supra* note 158, § 14, at 50-52 (noting that "[t]he rules of background institutions required by the two principles of justice . . . are essential . . . to make it likely that economic and social inequalities contribute in an effective way to the general good or, more exactly, to the benefit of the least-advantaged members of society"). R

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norm by the market also confirms the acuity of Calabresi's observations in *Costs* about the robustness of the market as a mechanism for valuing accidents and accident-causing activities.

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