Irreparable Injury and Extraordinary Precaution: The Safety and Feasibility Norms in American Accident Law

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The tort law of negligence is one of our principal forms of protection against accidental physical injury. But it is underspecified in one respect and incomplete in another. The common law of negligence is underspecified in that its norm of reasonable care does not register clearly enough the fact that it is reasonable to take greater precautions against some kinds of physical injuries — severe and irreparable ones — than it is against other kinds — mild and fully repairable ones. The common law of negligence is incomplete in that it relies on the award of money damages to induce prospective injurers to exercise reasonable care prospectively, yet does not so much as attempt to fully monetize the harm done by unreasonable risks that result in death.

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This paper examines two statutory norms — the "feasibility" and "safety" norms found in federal risk regulation — which are directed at risks of severe, irreparable injury and which articulate relatively precise, coherent, and stringent standards of precaution. The feasibility norm calls for the elimination of "significant" risks of devastating injury, unless the elimination of those risks would cripple the activity whose risks they are. The safety norm requires the elimination of all "significant" risks of devastating injury. This paper argues that considerations of fairness justify the answers that these two norms give to some of the most difficult questions in the law of accidents — What kinds of benefits are worth the price of some death and devastating injury? What level of precaution is appropriate when death and devastating injury are risked?

I. THE INCOMPLETENESS OF TORT LAW

American legal scholarship on the law of accidents has, on the whole, been preoccupied with the common law of torts. Law reviews devote whole issues to symposia on tort theory and the Restatements of the Law of Torts.[1] Legal scholars write books on tort law that are overwhelmingly concerned with tort accident law[2] and books on accident law that are overwhelmingly concerned with the tort law branch of the subject.[3] Torts casebooks, however catholic their titles, devote most of their pages to accident law, but relatively few of those pages to the study of non-tort accident law: to administrative alternatives to tort liability, such as worker's compensation and automobile no-fault insurance, and to direct risk regulation by administrative agencies.[4]

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1 *See, e.g.*, Symposium, *Corrective Justice and Formalism, The Care One Owes One's Neighbors*, 77 Iowa L. Rev. 403 (1992); Symposium, *The John W. Wade Conference on the Third Restatement of Torts*, 54 Vand. L. Rev. 639 (2001).

2 *See* William M. Landes & Richard A. Posner, The Economic Structure of Tort Law (1987).

3 *See* Steven Shavell, Economic Analysis of Accident Law (1987). Guido Calabresi, The Costs of Accidents (1970), is an exception to this generalization, but it was written thirty years ago.

4 Marc A. Franklin & Robert L. Rabin, Tort Law and Alternatives (7th ed. 2001), for example, devotes most of ten chapters to tort accident law, four to intentional tort liability, and one to "alternatives" to tort law. Richard Epstein, Cases and Materials on Torts (7th ed. 2000), devotes most of ten chapters to tort accident law, six chapters to intentional tort law, and one to no-fault administrative systems. Dan B. Dobbs, Torts and Compensation (4th ed. 2001), devotes most of twenty chapters to tort accident law, six chapters to intentional tort liability, and four to "alternatives

The last of these — direct risk regulation by administrative agencies — is given particularly short shrift. Keeton et al.[5] is the only one of five casebooks surveyed to devote a separate chapter to direct risk regulation.

This slighting of direct risk regulation is unfortunate. Tort accident law itself is, in important part, a system of risk regulation. It seeks to control the imposition of risks of physical injury, to ensure that only reasonable risks are imposed. Unlike direct risk regulation, however, tort accident law pursues risk regulation not by specifying the terms of reasonable risk imposition *ex ante* and forbidding the imposition of risks that violate its norms of reasonableness, but by holding injurers liable *ex post* for the physical injuries for which their risky conduct is responsible.[6] And as a system of risk regulation, tort accident law is intrinsically incomplete. It effects risk regulation by reparation. Tort accident law requires injurers to repair the harm they do by making injurers compensate those they physically harm, either when those harms arise out of the "characteristic" risks of their activities (strict liability) or else when those harms arise out of injurers' unreasonable risk impositions (negligence liability). Some harms, however, are beyond compensation and repair. Death, of course, is the preeminent example. No relief can restore to the dead the lives they have lost. But other losses — permanent disability, disfiguration, dismemberment, chronic disease, and even much emotional trauma — are beyond complete repair or compensation. Liability in tort cannot, therefore, fully repair the harms it addresses.

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to tort law." Victor E. Schwartz et al., Prosser, Wade and Schwartz's Torts, Cases and Materials (10th ed. 2000), devotes fourteen chapters to tort accident law, eight to intentional tort liability, and two to non-tort accident law. Keeton et al., Cases and Materials, *supra* note *, devotes thirteen chapters to tort accident law, eight to intentional tort liability, and three to non-tort accident law.

5 Keeton et al., Cases and Materials, *supra* note *, at 930-91 (Chapter 20: "Physical Harm in the Modern State"), examines direct risk regulation.

6 Responsibility in tort accident law may (in gross) be either negligent or strict. When liability is strict, tort accident law holds injurers liable for physical injuries that emerge out of the "characteristic" risks of their activities. When liability is based on negligence, tort accident law holds injurers liable for physical injuries that emerge out of their unreasonable risk impositions. I believe that even strict liability — even liability for reasonable risk imposition — aims to induce reasonable risk imposition, but I shall not pursue that point here. For our purposes, the distinction between liability for unreasonable risk imposition and liability for reasonable risk imposition is of peripheral importance. The incompleteness we are concerned with in the text affects both negligence and strict liability. For an argument that (strict) liability for reasonable risk impositions has strong support in considerations of fairness, see Gregory C. Keating, *The Idea of Fairness in Enterprise Liability*, 95 Mich. L. Rev. 1266 (1997).

The law of torts is keenly conscious of the limits of reparation and does not even try to repair all of the harms it hopes to prevent. Most famously, tort liability does not now extend, and never has extended, financial responsibility for wrongful death to encompass the value *to the victim* of the life she has lost.[7] This decision not to insist on reparation where reparation is impossible, however sensible, has a price. Because tort accident law stops short of imposing on tortfeasors the full cost of the harms they have inflicted, it falls short in its effort to discourage the accidental infliction of irreparable physical injury. Some of the value lost when a life is prematurely ended — *the most important part of the value to the person whose life it is* — can be taken for free. Yet premature death is the harm that we have most reason to fear *ex ante*, not least because it cannot be repaired *ex post*. The tort law of accidents is, thus, intrinsically incomplete. Because it cannot repair the most grievous injuries it governs, and sensibly chooses not even to attempt to do so, tort law cannot bring to bear the amount of cost-pressure that its own internal logic requires on the risks it regulates. Tort accident law fails to apply intense cost-pressure where intense cost-pressure is most needed: where the harms threatened are grave and irreparable. Tort law must, therefore, be supplemented by other mechanisms for the control of risk. The intrinsic incompleteness of tort law makes accident law scholarship's disinterest in direct risk regulation regrettable.

A. The Impoverishment of Accident Law Scholarship

Indifference to direct risk regulation has also had an impoverishing effect on

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7 *See* Restatement (Second) of Torts § 925 (1979); David W. Leebron, *Final Moments: Damages for Pain and Suffering Prior to Death*, 64 N.Y.U. L. Rev. 256, 260, 278 n.92 (1989). Because the common law of the nineteenth century took the position that recovery in tort did not survive the death of the victim, tort recoveries for wrongful death are governed by survival and wrongful death statutes. Survival statutes permit surviving relatives to recover any damages that the victim herself could have recovered had she not died, including damages for her own conscious pain and suffering prior to death, but not damages for her death itself. Wrongful death statutes allow survivors to recovery on account of the death itself. *See* Restatement (Second) of Torts §§ 925-26. Wrongful death statutes originally limited recovery to pecuniary damages suffered by the survivors, but liability has gradually expanded so that many jurisdictions now permit recovery for relational harm as well. That expansion, however, has always stopped short of "compensating" dead victims for the value to them of the lives that they have lost. *See generally* W. Page Keeton et al., Prosser & Keeton on Torts 949-50 (5th ed. 1984); Dan B. Dobbs, The Law of Torts 803-13 (2000) (especially at 811-13).

scholarly discourse. Preoccupation with the common law of torts has focused a disproportionate amount of attention on negligence law's reasonableness standard for acceptable risk imposition, while statutory standards have languished relatively unnoticed. As *Physical Harm in the Modern State*[8] shows, American federal statutory law recognizes three distinct standards of acceptable risk regulation: the "safety" or "safe-level" standard, the "feasibility" standard, and the "cost-justified" standard. These standards, especially the first two, warrant closer and more sympathetic scrutiny than they have so far received in the accident law literature.[9]

The idea of cost-justified precaution, although controversial, is relatively well-understood and highly influential in American accident law scholarship. Influential legal scholars have equated negligence law's "unreasonable risk" standard with the economic idea of cost-justified risk. Safety, on this view, is a matter of economy. Precautions should be taken until the marginal costs of more precaution exceed the marginal benefits — until a penny spent on precaution yields less than a penny's reduction in expected accident costs.[10] This economic interpretation of "unreasonableness" is, to be sure, contestable. For one thing, it equates reasonableness with rationality, and the

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8 Keeton et al., Cases and Materials, *supra* note *, at 930-91. This chapter is the principal exception to casebook indifference to direct risk regulation. My exposition of the safety and feasibility standards in this paper (in Part II as well as in this section) follows these materials and the accompanying chapter of the Keeton et al., Teacher's Manual, *supra* note *, also prepared by Lewis Sargentich.

9 Mark Geistfeld, *Reconciling Cost-Benefit Analysis With the Principle That Safety Matters More Than Money*, 76 N.Y.U. L. Rev. 114 (2001), is an important exception to this generalization. Cass R. Sunstein, *Paradoxes of the Regulatory State*, 57 U. Chi. L. Rev. 407 (1990), is another. Sunstein argues, among other things, that the stringency of the safety and "feasibility" norms produces "underregulation": "[T]he first paradox of the regulatory state" is "that stringent regulatory standards produce underregulation." *Id.* at 416; *see generally id.* at 413-16. This paper speaks to only one piece of Sunstein's paradox, namely, whether or not there is adequate normative justification for insisting on safe or feasible risk-reduction in some circumstances. The justification advanced by this paper is different from the justification attributed to these standards by Professor Sunstein. Sunstein believes that the "safety" and "feasibility" standards were "fueled by the notion that a safe workplace, or clean air and water, should be treated as involving a right to be vindicated rather than a risk to be managed." *Id.* at 413-14. This paper justifies the standards by appealing to a conception of fairness, not to an idea of individual rights. For a brief discussion of the distinction between moral rights and fairness, see *infra* note 137 and accompanying text.

10 Richard Posner, *A Theory of Negligence*, 1. J. Legal Stud. 29 (1972), is a classic statement of this idea.

two ideas may well be distinct and irreducible. Rationality may be a norm appropriate for individual choice but inappropriate for social choice. Taking seriously the distinction between persons may require us to demand not that risk impositions be rational, but that they be reasonable.[11] Be that as it may, the fact remains that the idea of cost-justified precaution is not understudied. The same cannot be said of safety-based regulation and feasibility-based risk regulation. By comparison with cost-benefit analysis and cost-justified precaution, safety-based and feasibility-based analyses and risk regulation are all but ignored.

Safety-based regulation and feasibility-based risk regulation warrant our scrutiny, not least because both of these regulatory norms reject the conceptual framework of cost-benefit analysis and demand more than cost-justified precaution against risks of physical injury. The safety (or safe-level) standard requires the elimination of all "significant" risks of physical harm, whereas the feasibility standard requires the elimination of all "significant" risks that can be eliminated without crippling the activity at issue.[12] The safety standard rejects the conceptual framework of cost-benefit analysis because it fixes the acceptable level of risk without inquiring into the benefit lost by not imposing more risk. The feasibility standard rejects the conceptual framework of cost-benefit analysis because feasibility analysis takes practical possibility — not maximal benefit — as its guiding aim.[13]

Because the safety and feasibility standards press precaution beyond the point of cost-justification, questions about their moral basis naturally arise. The standard of cost-justified safety expresses the idea of efficiency. Pressing precaution beyond the point identified by cost-benefit analysis entails pressing precaution beyond the point of maximal benefit, economically conceived. Economically speaking, this is irrational. The extra dollars that the safe-level and feasible-level standards devote to avoiding cost-justified accidents could be better spent elsewhere. Overall welfare could be improved by retreating back to the point of cost-justified precaution and putting the

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11 *See* Gregory C. Keating, *Reasonableness and Rationality in Negligence Theory*, 48 Stan. L. Rev. 311 (1996). For the basic distinction between reasonableness and rationality, see W.M. Sibley, *The Rational and the Reasonable*, 62 Phil. Rev. 554 (1953). The distinction is emphasized by "social contract" or "contractualist" thinkers such as John Rawls and Tim Scanlon. *See* John Rawls, *The Reasonable and the Rational, in* Political Liberalism 48-54 (rev. ed. 1996); Thomas M. Scanlon, *Reasonableness, in* What We Owe to Each Other 191-97 (1998).

12 *See infra* text accompanying notes 46-61.

13 I adapt this summary from Lewis Sargentich's note on *Feasibility* in Keeton et. al., Cases and Materials, *supra* note *, at 953.

dollars saved to another use.[14] Why, then, should society ever press precaution beyond the point of cost-justification?

B. Pressing Precaution beyond the Point of Cost-Justification

One answer (there may be others) lies in considerations of fairness and urgency.[15] Cost-benefit analysis draws on the idea of preference, crystallized in dollars.[16] Yet preference does not seem to get at the moral nerve of the

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14 *See, 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) (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 the alternatives that do not provide the maximum possible 'net benefits' or 'surplus.'"); Thomas Schelling, *Economic Reasoning and the Ethics of Policy, in* Choice and Consequences 1, 17 (1984) ("'not efficient' merely means that I can think of something better — something potentially better from the points of view of all parties concerned"). Lewis Kaplow & Steven Shavell, *Fairness versus Welfare*, 114 Harv. L. Rev. 961, 1011 (2001), state the flipside of this coin when they write 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 ... ." Guido Calabresi, perhaps the finest tort scholar of the past fifty years, has worried recurrently about the apparent irrationality of such things as spending "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 6 (1985). *Compare id.* at 1-19, *with* Guido Calabresi & Phillip Bobbit, Tragic Choices 38-41 (1978). *But see* Annette Baier, *Poisoning the Wells, in* Values at Risk, *supra*, at 49, 73 n.22 (arguing, by way of a "new 'modest proposal,'" that there seems no end to letting people die once we commit to maximizing the number of lives saved in this way, because there will "almost always" be "more efficient uses for our lifesaving money").

15 In their paper *Fairness versus Welfare*, Lewis Kaplow and Steve Shavell, *supra* note 14, define fairness and welfare as opposed values. I agree that fairness does not represent a way in which individuals may be better off; it is, rather, an independently desirable property of institutions or states of affairs. Treating people fairly is desirable, because it is an essential part of responding to their equal value as reasonable agents, an essential part of treating them in ways that could be justified *to them*. I disagree, however, with Kaplow and Shavell's claim that fairness and welfare are opposed, taking fairness to be an ingredient in most people's well-being. For a brief discussion of the relation between fairness and well-being along these lines, see Scanlon, *supra* note 11, at 142-43.

16 *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

problem with which these statutes grapple. That problem is defined by three characteristics. First, these standards typically apply to toxins and carcinogens that threaten devastating injury, injury that is severe and irreparable. Severe, because the injuries threaten to bring life to a premature close or to seriously impair normal physical functioning, in the way that diseases like brown lung disease do.[17] Irreparable, because the harm that these injuries inflict cannot be undone; normal functioning and normal life cannot be restored. Second, the injuries to which these standards apply are avoidable ones. No one need suffer brown lung disease if we are prepared to forego milling cotton; no one need die from the effects of lifetime occupational exposure to benzene if we are prepared to forego refining petroleum. Third, the risks governed by these standards are certain to ripen into some incidence of the harms risked. The activities governed by these standards — growing crops, milling cotton, refining petroleum — are sufficiently large in their scale and sufficiently extended in time that there is no longer just a chance that the harms risked by conducting these activities will occur; there is certainty that such harm will occur. The only questions are how many injuries will be inflicted and who will suffer them.

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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."). Kaplow & Shavell, *supra* note 14, make essentially these same assumptions. *See, e.g., id.* at 1041 n.153 (indicating that "the importance of liberty to an individual" should be "determined by the amount by which the individual values it"); *id.* at 1052-53 n.180 (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* the sources cited Keating, *supra* note 11, at 334-35 & nn.78, 81.

17 Inhalation of cotton dust, for example, can lead to byssinosis, or "brown lung" disease. "Byssinosis is a 'continuum ... disease,'" categorized into four grades. Am. Textile Mfrs. Inst. v. Donovan, 452 U.S. 490, 496 (1981) (*citing* 43 Fed. Reg. 27354, col. 2 (1978)). These are:

> [Grade] ½: 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. An estimated 100,000 employed and retired cotton workers suffer 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. *See id.* at 490, 496-98. Following Lew Sargentich's usage in Keeton et al., Cases and Materials, *supra* note *, I shall refer to this as the *Cotton Dust Case*.

The infliction of certain premature death and crippling disease on even a handful of people raises the question, What sort of gains to some people justifies inflicting devastating injuries — including death — on other people? Not just any gain will do. Suppose 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[18] 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. The disappointment of millions of viewers is not morally comparable to the life of the technician. Inconvenience and disappointment are not morally comparable to death. No amount of inconvenience, dispersed across distinct persons, sums up to the loss of a single life. We should not, therefore, decide how to proceed by measuring the victim's preference for having her life saved in the dollars that she would pay to save it and comparing that sum to the dollars that the viewers would pay to have the broadcast continue. The cost to the technician and the benefit to the viewers are not fungible 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 merely severe injury — thirty minutes of excruciating pain that leaves no long-term physical traces, for example. The gains and losses on the opposite sides of the equation — the inconvenience and disappointment of missing a favorite television show and suffering thirty minutes of excruciating pain — are still not comparable in the havoc they wreak in the lives of those they affect. They are not comparable in their *urgency*.[19] No amount

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18 I am adapting slightly an example of Tim Scanlon's invention. Scanlon, *supra* note 11, at 235. Nothing in the example hinges on the "low cultural value" of *Baywatch*. You can, if you like, substitute a show of higher cultural value, though it will have a smaller audience.

19 The argument of fairness advanced here rests not on ideas of preference but on ideas of urgency, or need. On the contrast generally, see Thomas M. Scanlon, *Preference and Urgency*, 72 J. Phil. 665 (1975) [hereinafter Scanlon, *Preference and Urgency*]. Scanlon writes, *inter alia*, that interpersonal comparisons based on considerations of urgency represent "the best available standard of justification that is mutually acceptable to people whose preferences diverge." *But see* Thomas M. Scanlon, *The Moral Basis of Interpersonal Comparisons, in* Interpersonal Comparisons of Well-Being 17 (Jon Elster & John E. Roemer eds., 1991) [hereinafter Scanlon, *The Moral Basis of Interpersonal Comparisons*]. In these writings, Scanlon characterizes urgency— or need-based approaches to interpersonal comparison as "objective" (in contrast to "subjective") approaches. In his later writings, Scanlon has come to characterize urgency-based approaches to interpersonal comparison as one kind of "substantive goods" approach. *See* Thomas M. Scanlon, *Value, Desire and Quality*

of viewer disappointment and inconvenience, no number of disappointed and inconvenienced viewers, 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.

These intuitive judgments of comparability reflect a general idea. Harms are comparable when their impact on the lives of those they affect is similarly grave — when they impair ordinary activities, or important activities, or the pursuit of rational life plans, in similarly severe ways. Harms are comparable when they strike at the preconditions of rational agency in similarly severe (or similarly mild) ways. Harms are comparable when they disrupt the lives of those they affect in similarly urgent (or similarly insignificant) 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 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.

Unrestricted cost-benefit analysis rejects the idea that harms and benefits differ qualitatively and that harms must be comparable in value before they can sensibly be traded-off against one another. Cost-benefit analysis typically[20] takes preference as its touchstone and cashes preference out in dollars,[21] thereby assuming "that all human interests are commensurable, and

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of Life, in The Quality of Life 185 (Martha Craven Nussbaum & Amartya Sen eds., 1992); Scanlon, *supra* note 11, at 113-26. For our purposes, the contrast between urgency— and preference-based approaches can be understood in either way. John Rawls' idea of "primary goods" and Amartya Sen's idea of "basic capabilities" are examples of approaches to interpersonal comparison that take fundamental needs or interests as the proper basis of comparison. *See* Rawls, *supra* note 11, at 87-90; Amartya Sen, Inequality Reexamined 39-42, 49 (1992). I explain the way in which the approach pursued in this paper uses urgency-based, or "objective," criteria of interpersonal comparison in *infra* text accompanying notes 42-44.

20 But not always. One prominent exception is Allan Gibbard, *Risk and Value, in* Values at Risk, *supra* note 14, at 94. For examples of preference-based approaches, see the sources cited *supra* note 16.

21 *See supra* note 16.

that between any two there always exists some rate of exchange in terms of which it is rational to balance the protection of one against the protection of the other ...."[22] In its unrestricted and most characteristic form, cost-benefit analysis assumes that everything is fungible at some ratio of exchange.[23] In the case of the injured television technician, unrestricted cost-benefit analysis permits the disappointment and inconvenience of the viewers to outweigh the death or agony of the technician. If the preferences of a small number of viewers for continued broadcast of *Baywatch* are intense enough (and if those viewers have the resources to back their preferences with an appropriate amount of money) or if a large enough number of viewers have even mild preferences for continued broadcast of the show, letting the technician die or suffer agonizing pain may be both the wealth-maximizing and the utility-maximizing course of action. Yet this is morally grotesque. The disappointment and inconvenience of viewers are simply not urgent enough to compete with either the death or the agony of the technician.

The existence of discontinuities of value — the fact that not everything is comparable in value to undevastated human life — gives us reason *not* to fix the appropriate level of precaution against risks of devastating injury by applying the standard of cost-justification. Inflicting death and devastating injury on some person or class of persons is only justified if doing so realizes some comparable value, some equally *urgent* benefit to some other person or class of persons. It is unfair to inflict even one death for the sake of trivial gains to others, no matter how numerous those others may be, and it is equally unfair to devastate even one person so that many people may reap trivial benefits.[24] Unrestricted cost-benefit analysis is incompatible with these convictions. Unrestricted cost-benefit analysis assumes that a sufficient *quantity* of any value, no matter how trivial that value may be *qualitatively* speaking, will suffice to justify devastating some human life. This assumption of universal comparability is mistaken.

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22 Rawls, *supra* note 11, at 312.

23 My point here is a conceptual one. Unrestricted cost-benefit analysis aims to compare all costs and benefits and counts them fungible at some ration of exchange. In practice, cost-benefit analysis rarely, if ever, reaches as far. The practical application of cost-benefit analysis requires making choices about how widely to cast the net of "cost" and "benefit." On this, see Keeton et al., Cases and Materials, *supra* note *, at 955-56 ("4. *Costs and Benefits*"), distinguishing between "focused" and "plenary" cost-benefit analysis: "The distinction has to do with how many factors are placed in the cost-benefit scales and weighed against one another."

24 In practice, it may not be possible to protect single individuals. We may have to evaluate practices of risk imposition by estimating their impacts on representative persons. *See* discussion *infra* text accompanying notes 36-39.

The idea of comparable value provides a reason for moving beyond the point of cost-justified precaution (beyond the point of maximal benefit economically conceived), which explains why we might sometimes insist that risks be reduced to the "safe" level and other times insist only that risks be reduced to the "feasible" level. Reducing risks of devastating injury beyond the point of maximal benefit (economically conceived) is justified when the gains to be won are not morally comparable to the death or devastation that is their price. Reducing risks of devastating injury to the point where they are "insignificant" — the demand of safety-based regulation — is justified when the benefits of bearing a "significant" risk of devastating injury are not comparable, morally speaking, to the burdens. Reducing risks of devastating injury as far as we feasibly can without crippling the beneficial activity that generates the risks — the demand of feasibility analysis — is justified when crippling the activity in question would produce 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 whose risks they are is a benefit to some morally comparable to the significant risk of devastating injury that is the price of that benefit.

Considerations of comparable value are not the only reasons we have to believe that the acceptability of some risk impositions should not be settled by appealing to the standard of cost justification. When we are considering the burdens and benefits of some risk imposition (or some practice of risk imposition), we should be concerned with *the actual burdens borne by those affected by the risky practice at issue, not with maximizing the total values involved.*[25] Maximizing total utility is misguided even if one accepts utility as the appropriate unit of value, because what counts is the utility experienced by each sentient being, whereas total utility is experienced by no one.[26] 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

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25 *See* Scanlon, *supra* note 11, at 229-41.

26 *See, e.g.*, John Rawls, A Theory of Justice 140 (rev. ed. 1999) (noting that "when 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.").

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.

The failings of cost-benefit analysis in this respect echo the failings of classical utilitarianism. Like classical utilitarianism, cost-benefit analysis fails to "take seriously the distinction between persons."[27] It aggregates incommensurable benefits and burdens *across persons*. It therefore makes the permissibility of various practices of risk imposition turn on the total value involved instead of on the actual burdens and benefits borne by those affected by the practices in question, and it therefore permits trivial gains to many to justify devastating harms to a few. Avoiding these mistakes requires that we attend both to the commensurability of the costs and benefits being compared and to the actual distribution of those burdens.

When significant risks of devastating injury are involved, both considerations of comparability and attention to the distribution of benefit and burden suggest reasons why we may wish to press precaution beyond the point of cost-justification. Concern with comparability should make us wary of taking only cost-justified precaution, because unrestricted cost-benefit analysis fixes the point of cost-justified precaution by counting costs and benefits that are not comparable to devastating injury in its calculus of value. It is therefore likely to overstate the benefits of devastating injury. Concern with the actual distribution of burdens and benefits among affected persons should likewise lead us to be wary of cost-justified precaution. When significant risks of physical injury ripen into death and incurable disease, the benefits of going beyond the cost-justified level of precaution (and the burdens of failing to do so) 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. If we set the permissible level of chemical residue on fresh produce below the cost-justified level, for example, farmers may be unable to extract as much yield per acre of crop.[28] They may forego profit, and consumers may pay higher prices as a result. Demanding that they forego these profits, and that consumers pay higher prices, may nonetheless be fair. No farmer, no farm laborer, and no consumer will die or acquire a devastating

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27 *Id.* at 24.

28 Pesticide residue on agricultural products is one setting for the application of safety-based regulation. *See* discussion *infra* text accompanying notes 48-51.

and incurable disease. They may each suffer no more than imperceptible losses, and none will suffer a loss comparable to death.

The fact that a particular level of pesticide residue on produce, or a particular level of benzene or cotton dust in a workplace, maximizes the wealth that society extracts from the activity at issue does not supply those who stand to lose their health or their lives with good reason to accept the level of risk that efficiency licenses. Society is extracting maximum advantage from the activity by putting them in peril of great and readily avoidable harm. If the sacrifice demanded of them might be avoided without imposing a comparable sacrifice on anyone else, the risk should be reduced. When avoiding great sacrifice on the part of a few requires only that many shoulder modest burdens, many should shoulder modest burdens. Devastating injuries are worth tolerating only if we must give up something of comparable value to eliminate them.

C. Fairness and Risk

Cost-benefit analysis emerges out of the value maximizing framework of economic thought. Its particular conception of value as the rational satisfaction of subjective preferences connects it to the utilitarian tradition in political philosophy. The criticisms of cost-benefit analysis that this paper has voiced sound in fairness. The fact that these criticisms can be presented directly, without invoking any particular intellectual framework, attests to the fact that the idea of fairness is a part of our shared moral vocabulary. But these criticisms do draw implicitly on a particular conception of fairness, and that conception does emerge out of a particular intellectual tradition, namely, the social contract tradition in political philosophy, broadly conceived. So we need both to make our conception of fairness more specific and to explain the intellectual framework from which it emerges.

The variant of the social contract tradition on which I shall draw conceives of persons as both rational and reasonable, with their rationality being conceived in a way that differs from the conception embedded in cost-benefit analysis. Persons are taken to be rational by virtue of their capacity to govern their actions in accordance with reason, of course, but reason is understood not just instrumentally — as the ability to determine how best to satisfy independently given preferences — but practically — as the capacity to determine that certain reasons, purposes, ends, or preferences are worth

acting on.[29] This capacity for "critically, reflective self-governance"[30] gives rise to a fundamental human interest in freedom, in being free to govern one's life in accordance with one's judgments of value.

Our fundamental interest in shaping our own lives means that we have an enormous stake in living under institutions that provide us with favorable circumstances for making our lives answer to our aspirations for them. Our capacity to realize our ends is deeply affected by the institutions under which we live and deeply dependent on the cooperative efforts of others.[31] Our natural habitat is not the isolation of Robinson Crusoe's island, but the society of others, whose cooperation in sustaining a common economy, society, and politics is essential to our own well-being, even to our ability to realize our particular ends. It is our capacity for reasonableness that makes cooperation with others on fair terms possible. We are reasonable agents by virtue of our sense of justice, our capacity for fair social cooperation with other free and equal, rational and reasonable persons. And here, too, we have not just the capacity to cooperate with each other and to treat each other fairly; we have as well a fundamental interest in living together on terms of equal freedom and mutual respect.[32] Terms of equal freedom and respect express our fundamental moral status as free and equal persons.

To make our lives answer to our aspirations for them, we need, among

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29 The idea of practical reason goes back to Aristotle, who took it to be concerned with the proper ends of human life. More generally, practical reason is reason concerned with action and judgment oriented toward action. It contrasts both with theoretical reason, which is concerned with understanding, and with instrumental reason, which is concerned with the realization of ends taken as given (with the effective pursuit of independently given ends). *See* Oxford Dictionary of Philosophy 287, 296 (Simon Blackburn ed., 1994); Cambridge Dictionary of Philosophy 728 (Robert Audi general ed., 1999).

30 The expression is Tim Scanlon's. Thomas M. Scanlon, Jr., *The Significance of Choice, in* 8 The Tanner Lectures on Human Values 149, 175 (Sterling M. McMurrin ed., 1988).

31 The idea that, as Annette Baier puts it, "morality is a cooperative scheme" is not peculiar to views with a Kantian flavor; it is also endorsed by Mill and Hume, among others. For Hume, morality is a "conjunction of forces"; for Mill, a "joining to make safe the very groundwork of our existence." This idea of moral obligation as cooperative "all the way down," so to speak, is rejected by libertarian views. *See* Baier, *supra* note 14, at 56-61 (especially at 57).

32 If the conception of society and morality as cooperative ventures sets Kantian liberalism apart from libertarianism, a commitment to equal freedom and mutual respect is one Kantian liberalism shares with more libertarian conceptions. *See, e.g.*, Charles Fried, Right and Wrong 28-29 (1978) ("Respect for Persons").

other things, a substantial measure of security, of freedom from accidental injury and death at the hands of others. "Security," John Stuart Mill remarked,

> no human being can possibly do without; on it we depend for all our immunity from evil and the whole value of all and every good, beyond the passing moment, since nothing but the gratification of the instant could be of any worth to us if we could be deprived of everything the next instant ... .[33]

Our need for security, however, is only half the story. We also need a substantial measure of liberty — of freedom to put others at risk of physical harm in pursuit of our own ends — if we are to lead our own lives in accordance with our aspirations for them. When we act, we put others at peril, even if only very slightly and even when we act with appropriate caution. If we cannot put others at peril — cannot endanger their security — we cannot act and so cannot pursue our ends and lead our lives. Maximal security extinguishes liberty, and maximal liberty extinguishes security. Yet substantial measures of both liberty and security are essential if we are to have the chance to make our lives answer to our aspirations for them.[34] Liberty and security are both essential conditions of effective rational agency. This is the dilemma at the heart of accident law.[35]

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33 John Stuart Mill, Utilitarianism 53 (George Sher ed., 1979) (1861).

34 Although this conception of the problem of accidental harm has its roots in the social contract tradition in political theory, especially as carried on by John Rawls, "liberty" and "security" in the sense used here do not identify "primary goods" lexically superior to income and wealth in the manner of the liberties covered by Rawls' first principle of justice. "Liberty" and "security" are general cover terms designed to characterize, at a fairly high level of generality, the stakes in accidental risk imposition. The burdens and benefits of risk include increases and losses in wealth and income, so there is no question of these freedoms being lexically prior to the primary goods of wealth and income. Thus, in judging the reasonableness of various risk impositions or liability rules, we should assess the significance of gains and losses in wealth and income in terms of their impacts on liberty and security. Why characterize the interests at stake in risk impositions as interests in freedom at all? Because risks and their reduction affect the space that we have to form, evaluate, and act upon our aims and aspirations.

35 It is possible to accept essentially this account of the interests at stake in accidental risk impositions from an economic perspective. *See, e.g.*, Geistfeld, *supra* note 9, at 138 ("In the context of nonconsensual risky interactions, entitlements embody the legal resolution of how conflicting liberty and security interests should be mediated. Potential injurers have liberty interests in pursuing risky behavior that imposes risks on others, whereas potential victims have interests in their bodily security. The interests of the two parties conflict."). By accepting entitlements to liberty and security as its starting point, Geistfeld's approach breaks with purely

When the law of accidents licenses the imposition of a risk, it enhances the freedom of some and imperils the security of others. Those who impose the risk are set free to pursue ends and activities that they value, and their pursuit exposes others to risks of physical harm. When the law of accidents forbids the imposition of some risk, it does the reverse: it curbs the freedom of prospective injurers and enhances the security of potential victims. Risk impositions thus pit the liberty of injurers against the security of victims, and the law of accidents sets the terms on which these competing freedoms are reconciled. The task of the tort law of accidents is to reconcile liberty and security on terms that are both favorable and fair. Favorable terms provide advantageous conditions for people to pursue their ends, aims, and aspirations; the most favorable terms (if they exist) reconcile security and liberty in the unique way that provides the most auspicious terms for people to shape their lives in accordance with their aspirations for them. Fair terms reconcile the competing claims of liberty and security in ways that are to the advantage of even those they most disadvantage when any alternate reconciliation of liberty and security would make those worst off under the present arrangement — or some comparable class of persons — even worse off.

Questions of fairness come to the fore once we recognize that the problem of accidental harm is a problem of *social* choice, a matter of reconciling the competing claims of liberty and security for a *plurality* of persons, and that problems of social choice differ in kind from problems of individual choice, because our lives are distinct and our ends diverse and incommensurable. The question of how best to reconcile the pursuit of activities we value with the physical and psychological integrity that those activities can jeopardize is, of course, an issue that each of us must face individually. What ends are worth the risks they entail? Are the risks of death and disfigurement that are the price of scaling Mount Everest worth the sense of accomplishment that comes from standing on its summit? Are increased risks of cancer worth bearing as the price of performing pathbreaking medical research? Are increased risks of cancer worth bearing as the price of earning a living?

These questions of individual choice, however, differ fundamentally from the parallel questions of social choice. Individual choice is the domain of rationality, whereas social choice is the domain of reasonableness. The

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welfarist approaches within economics such as that of Kaplow & Shavell, *supra* note 14. But Geistfeld's approach to the problem of irreparable injury also differs fundamentally from the approach taken in this paper, because it uses cost-benefit analysis to determine the appropriate weighting of the security and liberty interests.

rationality of exposing oneself to a risk depends on the end furthered by the exposure, the importance that one attaches to furthering that end, and the efficacy with which the exposure will further those values. The canons of rationality thus give wide rein to individual subjectivity and are naturally expressed in the language of efficiency. Individuals are free to value the burdens and benefits of risks by any metric they choose, and it is surely natural for them to value burdens and benefits by their own subjective criteria of well-being. It is also rational for individuals to run risks whenever, by their own lights, the expected benefits of so doing exceed the expected costs and to decline to run risks whenever the expected costs exceed the benefits.

It is not, however, *reasonable* for people to expose others to risks whenever — by the potential injurer's own criteria of value — the benefits of imposing the risk exceed the burdens of having to bear exposure to it. The circumstance where we voluntarily expose ourselves to risks in the pursuit of our own ends is very different from the circumstance where others involuntarily expose us to risks in the pursuit of their ends. The separate lives of different people cannot be collapsed into a single life that reaps both the burdens and the benefits of rational risk impositions. And the diverse aims and aspirations of a set of free and equal people cannot be converted into a single scale so that we may make collectively the same kinds of judgments that we each make individually. In a world of distinct persons who affirm diverse and incommensurable conceptions of the ends worth pursuing over the course of a human life, there is no reason to assume that those who are put at risk value the ends pursued through the relevant risk impositions in the way that those imposing the risks do. The fact that you are prepared to run enormous risks for the advancement of medical knowledge does not mean that I am prepared to do so.

The difference between individual and social choice undermines the argument that a risk should be borne because it pursues a worthy end at an acceptable cost. Given the reasonable diversity of persons' aims and aspirations, the justification for accepting risk impositions by others is not common acknowledgment of some shared final end, but mutuality of benefit. It is reasonable to expose other people to risks of serious injury and even death when it is fair to do so; and it is fair to do so, when they, too, stand to gain, *ex ante* and over time, from the imposition of those risks. Prospective victims may stand to benefit from the imposition of risks upon them in either of two ways. First, victims may stand to benefit because, *ex ante* and over a reasonable span of time, they stand to gain by receiving the reciprocal right to expose others to equal risks. The right to impose risks *on* others can justify the imposition of equal risks on us *by* others, because we may each gain more from the right to impose risks than we lose from having to bear

exposure to risks. Second, prospective victims may stand to benefit from the imposition of risks upon them because, again *ex ante* and over a reasonable period of time, the imposition of those risks works to the long-run benefit of those endangered by them, even though these potential victims do not impose these risks or benefit from being free to impose equal risks on others.

The activity of driving is often taken as the canonical illustration of the first kind of case.[36] We may each gain more from the mundane freedom to take our cars on the road, for example, than we lose from having to bear the risks created by the presence of other cars on the road. This kind of mutual advantage is most fully present when potential injurers are also potential victims, and equally so. When this is the case, a "community of risk" is present, in its strongest form. Within a "community of risk," practices of risk imposition are fair if and when they are to the advantage of a representative member of the community. They are to the advantage of a representative member of the community when the liberty that she gains from the right to impose the relevant risks is more valuable to her than the security she loses from having to bear exposure to equivalent risk impositions at the hands of others. Each member of the community then has her security compromised by having to bear risks imposed by others, but each also has her liberty enhanced by being able to impose risks on others. When the gains to freedom outweigh the losses to liberty, the imposition of the risk makes each member of the community better off. When this criterion is met, no one's life or limb is sacrificed to the greater good of others and each member of the community is favored with better life prospects than she would be if the practice of imposing the risk in question were forbidden.

The second kind of case may be illustrated by the practice of transporting large quantities of gasoline over the roads by tanker trailer. Given the importance of driving to our daily lives (this from someone who lives in Los Angeles), we may all stand to benefit from this method of transportation, even though it creates risks of massive explosion and even though most of us never expect to make use of the legal right to transport gasoline in this manner.[37] Residents of Manhattan, for example, generally gain relatively little from the right to haul gasoline by tanker. They drive so much less than

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36 See, for example, Judge Blackburn's opinion in Rylands v. Fletcher, 1868 L.R. 3 H.L. 330, 339-40. *See also* George Fletcher, *Fairness and Utility in Tort Theory*, 85 Harv. L. Rev. 537, 549 (1972) ("driving is a reciprocal risk relative to the community of those driving normally").

37 The transport of gasoline in this manner precipitated the death of the plaintiff in *Siegler v. Kuhlman*, 502 P.2d 1181, 1187 (Wash. 1972).

Angelenos that they gain far less from this method of transporting gasoline.[38] But the life prospects of Manhattanites may still be better by virtue of the prosperity created and sustained by the practice of transporting gasoline by tractor trailer than they would be if that practice were prohibited. If so, the practice is to their advantage and the risks it imposes upon them are fair. When risks are not imposed within a community of risk — when a discernible group bears more of the burden or garners less of the benefit of some practice of risk imposition — practices of risk imposition are fair when they work to the long-run advantage of a representative member of the class of those most disadvantaged by the practice of risk imposition.[39]

In both of these circumstances — driving in general and transporting gasoline by tanker trailer in particular — some people exposed to the risky practice will suffer devastating injury, including death. As the practice unfolds in time, some people will reap the benefits of letting these risks be imposed and others will bear the burdens. Because devastating risks are not fully compensable, the actual gains of those who win cannot be used to repair the harm done to those who lose. The practices, therefore, cannot be made to work to the *actual* advantage of everyone they affect. Devastating losses will stay concentrated on the victims they have devastated. Over

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38 It is tempting to think that they are also exposed to proportionately less risk from this practice of transporting gasoline so that their lesser benefit is matched by lesser burden. But it is not clear to me that they are at as much less risk from the practice. Tractor-trailers towing gasoline may create risks of especially great harm in the confined quarters and crowded spaces of Manhattan, even if there are fewer of them. The risks posed by tractor-trailers hauling gasoline may not diminish commensurately with the frequency of tractor-trailer trips.

39 In an early use of Rawlsian ideas in legal theory, Frank Michelman proposes a similar criterion for determining when compensation should be granted for a "taking" under the just compensation clause.

> A decision not to compensate is not unfair as long as the disappointed claimant ought to be able to appreciate how such decisions might fit into a consistent practice which holds forth a lesser long-run risk to people like him than would any consistent practice which is naturally suggested by the opposite decision.

Frank Michelman, *Property, Utility and Fairness: Comments on the Ethical Foundations of "Just Compensation" Law*, 80 Harv. L. Rev. 1165, 1223 (1967). In *Fairness and Feasibility*, Keeton et al., Teacher's Manual, *supra* note *, at 20-6 to 20-11, and *Rawlsian Fairness, id.* at 20-11 to 20-12, Lewis Sargentich advances a fairness justification for feasible risk-reduction. That justification owes much to Rawls and explicitly analogizes feasible risk-reduction to the difference principle. This paper seeks both to build on Michelman's and Sargentich's fairness arguments and to incorporate the generally Rawlsian idea of fairness that they articulate into the framework sketched in this section.

time, then, practices of devastating risk imposition must work to the severe disadvantage of some of those they affect. What can be said by way of justification to those who lose? Only that the relevant practices of risk imposition were to their *ex ante* advantage and that their lives and limbs were not, therefore, sacrificed either to the general good or to the lesser interests of others. There was no alternate way of reconciling liberty and security that would have improved their life prospects, and perhaps have avoided their devastation, without working a greater hardship on another comparably large class of persons.

More particularly, in the case of a "community of risk," we will be able to say that there was no reconciliation of these two conditions of rational agency, which would have improved the prospects of a representative member of the community *ex ante* (and so have improved the circumstances of at least a few members *ex post*). In the case of a practice that puts some in particular peril, we can say that there was no reconciliation of these two essential conditions of rational agency that would have improved the prospects of those most disadvantaged by reconciliation at issue, without imposing a greater disadvantage on a comparable class of those affected by the practice. When these criteria of *ex ante* advantage are met, the actual distribution of winners and losers will turn out better than under any alternate arrangement, but some will still lose, and devastatingly. The only consolation we can offer them is that their lives were not taken unfairly.

To count for something important, *ex ante* advantage must, in general, turn into actual benefit. This raises the question of time. How soon must the actual benefit accrue? Much depends upon context, but in general, the outer limit of a reasonable time period is the course of a normal life. The life prospects of those who are asked to bear the risks licensed by some practice of risk imposition are usually the longest reasonable touchstone of advantage. Were we to choose a longer touchstone, those disadvantaged by a particular practice of risk imposition could not expect to reap the benefits of the risk impositions at issue.[40]

Talk of advantage and disadvantage requires, of course, criteria of interpersonal comparison. Questions of interpersonal comparison — of comparable value — are at the heart of the objections that we have voiced to fixing the level of precaution against risks of death and devastating injury by

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40 To be sure, there may be cases where potentially massive burdens to future generations justify present ones in bearing some cost whose benefit will be reaped by others; perhaps present sacrifices should be made now to avoid massive environmental harm later, for example. These are special cases, and the criterion proposed here would have to be adapted to cope with them.

cost-benefit analysis. Cost-benefit analysis makes interpersonal comparisons of well-being by deploying a subjective conception of well-being: benefit and burden are measured by inquiring into the preferences, as expressed in dollars, of those affected by the risk impositions at issue. The unrestricted use of subjective preference (whether or not it is expressed in dollars) is objectionable, because it compares harms — death and inconvenience, for example — that are not comparable, morally speaking, and permits a sufficient quantity of trivial benefit to some to justify irreparable injury to others.[41] Harms must be comparable in urgency, comparable in the benefit or injury they work on the lives of those they affect, before they may be traded-off against one another. The idea of subjective preference satisfaction expressed in dollars underlies cost-benefit analysis. What competing ideas underlie our talk of urgency and moral comparability? How do these relate to "liberty" and "security"?

The idea that life should be sacrificed only for something of comparable value is a considered moral judgment that is not so much the product of a moral or political theory as data for it. So, too, is the judgment that it is unfair to sacrifice one person's life to avoid inconveniencing millions of other people. But these judgments of comparability and fairness, like other considered judgments, invite theorizing. We do not know, intuitively, what these judgments imply in the way of criteria for permissible risk imposition, where the risks at question issue in irreparable injury. We therefore have reason to search for and articulate principles that can make sense of these judgments and guide our thinking in other cases. Social contract theory makes general sense of these judgments by supposing that judgments of comparable value must be based on objective criteria of interpersonal comparison, criteria whose touchstone is urgency, not preference. "Subjective" criteria of interpersonal comparison 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 that person's tastes and interests."[42] "Objective" criteria appraise burdens and benefits in terms that are "the best available standard of justification ... mutually acceptable to persons whose [aims, ends and] preferences diverge."[43] In a world where people's ends are diverse and incommensurable, comparisons of well-being must be made on the basis of

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41 *See infra* text accompanying notes 92-96. Note that the same point could be made by saying that cost-benefit analysis compares benefits that are not comparable, such as life saved and convenience.

42 Scanlon, *Preference and Urgency, supra* note 19, at 656.

43 *Id.* at 668.

criteria of well-being that are independent of any particular ends or preferences and sensitive to the urgency of the claims at stake.

Freedom of action and security are "objective" criteria of interpersonal comparison, albeit highly abstract ones. Their importance does not depend on affirming any *particular* conception of the good, on holding any particular set of final ends and aspirations. Rather, their importance depends on *having* ends and aspirations and on having a fundamental interest in being able to realize those ends and aspirations over the course of a normal lifespan. Freedom and security are essential conditions for the pursuit of most of the ends human beings do hold, especially when we think of pursuing ends over the course of a lifetime.

In comparing burdens and benefits to freedom and security, we must ask just how far the burdens and benefits disrupt or promote the capacity of those affected to pursue their ends and aspirations, over the course of a normal life. Death and devastating injury are great burdens, whereas the inconvenience of missing an evening of *Baywatch* is not — no matter how subjectively intense someone's desire to watch *Baywatch* may be — because death and devastating injury interfere with our ability to realize our ends over the course of a life far more gravely than missing an evening of one's favorite television show does.[44] Considerations of urgency underlie our judgments of comparability. In turn, these considerations rest tacitly on ideas about the course of a normal life and the conditions that favor its pursuit, on judgments about the relative importance of avoiding severe pain and avoiding inconvenience, on ideas about the goods and conditions that enable us to pursue our ends, and so on.

The abstractness of these ideas sets a challenge for objective approaches to interpersonal comparison. That challenge is to "construct a more concrete conception of welfare in terms of particular goods and conditions that are recognized as important to a good life even by people with divergent values."[45] Negligence law constructs more concrete conceptions by making "normalizing" assumptions — assumptions that children do not need the

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44 This is what Tim Scanlon calls a "normalizing assumption." Scanlon, *The Moral Basis of Interpersonal Comparisons, supra* note 19, at 39. In *The Significance of Choice, supra* note 30, at 183, Scanlon writes,

> We take it as given for purposes of moral argument that it is very important that what one wears and whom one lives with be dependent on one's choices and much less important that one be able to choose what other people wear, what they eat, and how they live. And we do this despite the fact that there may be some who would not agree with this assignment of values.

45 Scanlon, *The Moral Basis of Interpersonal Comparisons, supra* note 19, at 39.

freedom to engage in adult activities but do need the freedom to engage in risky activities appropriate to their age and development, assumptions that the need of those with various disabilities to lead independent and self-sufficient lives justifies the imposition of some extra burdens on others (e.g., the extra burden of coping with blind pedestrians assisted by seeing eye dogs and canes) but not others (e.g., the burden of coping with blind automobile drivers). These judgments are socially contingent and contestable. Our sense of what activities are "age-appropriate" varies from era to era, in accordance with shifts in our ideas about the course of normal human development and the ordinary capacities of children of various ages, in accordance with changes in our ideas of acceptable risk, and so on. Our conceptions of just how much the "disabled" are capable of leading "normal" lives and of just how much the "normal" must accommodate the disabled and vice versa also shift over time.

We may hope that shifts in our sense of "age-appropriate" activities and our sense of how far we should go to accommodate various disabilities express progress. But whether or not they express progress, shifts in our ideas about the needs and capacities of children and the developmentally disabled affect our conceptions of their urgent needs and, so, affect our evaluations of the burdens and benefits of permitting them to impose certain kinds of risks. Safety-based and feasibility-based risk regulation likewise rest on tacit claims of comparable value, and those claims are similar both in their social contingency and in their contestability. Needs that are urgent in one period (the need for increased agricultural productivity to meet basic nutritional needs, for instance) may not be urgent in another. A fundamental task of this paper is to reconstruct the "concrete conceptions of welfare," the "particular goods and conditions" that underpin and justify these statutory standards.

With this sketch of the fairness framework in hand, we are in a position to take up the details of safety-based and feasibility-based risk regulation. Those details are complex, but the basic normative argument in support of these standards is not. Considerations of fairness and comparable value justify reducing risks of devastating injury to the point where they are "insignificant" (the demand of safety-based regulation) when the benefits of "significant" risk are, like inconvenience, trivial in comparison with the increase in death and devastating injury that is their price. Reducing risks of devastating injury as far as we feasibly can without crippling the beneficial activity that generates the risks (the demand of feasibility analysis) is justified when the long-run flourishing of the activity whose risks they are is a good morally comparable to a significant risk of devastating injury. The fairness rationale is the same in both cases: it is (presumptively) unfair to devastate a few for the sake of gains that are not comparable, morally speaking, to

the hardship wreaked by death and devastating injury, no matter how many others may reap those gains and even if the total quantity of "benefit" as measured by cost-benefit analysis exceeds the total "cost" of the devastation that is its price. Protecting the fundamental interests of each person trumps maximizing the overall good of everyone. Death and devastating injury may only be inflicted to avoid comparable harms to, or to confer comparable benefits on, others.

II. LEGAL STANDARDS

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 safe standards of acceptable risk imposition are well defined.[46] They identify distinct levels of permissible risk imposition, and they stand in linear, vertical relation to one another:[47]

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 injury and their prevention, thereby maximizing the benefits of the risky activity at issue. Feasibility analysis requires the elimination of "significant" risks, when they can be eliminated without threatening the long-run health of the activity whose risks they are. The costs of risk reduction matter, but only

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46 My discussion here follows the presentation of these standards in Lewis Sargentich's note entitled *Cost-Assessment* in Keeton et al., Cases and Materials, *supra* note *, at 952-56, and his commentary on that note in Keeton et al., Teacher's Manual, *supra* note *, at 20-5 to 20-6.

47 See Sargentich's comments in Keeton et al., Teacher's Manual, *supra* note *, at 20-6.

to the extent that those costs are sufficient to impair the long-run survival of the risky enterprise. Cost-justified risks are eliminated, so long as their elimination is compatible with the long-term flourishing of the activity at issue, and "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 substances that may endanger public health. The Food Quality Protection Act of 1996[48] is a case in point. The Act regulates the amount of pesticide that can be present in foods, both fresh and processed. 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."[49] 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.[50] Pesticide chemical residue on food is thus permissible only to the extent that it is reasonably certain to harm no one, not even those unusually susceptible to harm.

Clean air regulation also incorporates safety-based regulation.[51] A provision of the Clean Air Act amendments of 1990, for example, focuses on carcinogenic risks remaining after technology-based regulations for

48 110 Stat. § 1489 (1996).

49 21 U.S.C. § 346a(b)(2)(A)(ii) (2003).

50 *Id.*

51 For a clear statement that there are aspects of the Clean Air acts that leave no room for *either* feasibility-based or cost-based objections to compliance, see Union Elec. Co. v. Envtl. Prot. Agency, 427 U.S. 246 (1976).

hazardous pollutants have been in effect for eight years.[52] 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." 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." 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 — an emphasis on those most disadvantaged by the risks being regulated — is a recurring theme in safety-based regulation. Clean water regulation supplies a closely related example: *Hercules, Inc. v. Environmental Protection Agency*[53] insists on especially stringent precaution against grave harm, even though the chances of that harm materializing cannot even be estimated. The Federal Water Pollution Control Act amendments of 1972, *Hercules* holds, 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. 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."[54] The importance of safeguarding health trumps the goods with which it competes.

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."[55] "Feasibility" is also the touchstone of the Occupational

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52 42 U.S.C. § 7412(f)(2)(A) (2003).
53 598 F.2d 91 (D.C. Cir. 1978).
54 *Id.* at 104, 111.
55 42 U.S.C.A § 7412(d)(2).

Health and Safety Act of 1970,[56] 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"[57] and, second, an analysis of the feasibility of reducing that risk without crippling the activity that imposes the risk. 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?"[58] 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?"[59] The aim of feasibility analysis is to protect "worker health and safety within the limits of economic possibility."[60] "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 the attainment of this 'benefit' unachievable."[61] 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. So let us postpone detailed exploration of "significance" until we have

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56 29 U.S.C. §§ 651(b) *et seq.* (2003).

57 Indus. Union Dep't v. Am. Petroleum Inst., 448 U.S. 607, 614 (1980) ("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.' 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 Government argues, 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.") (following Lewis Sargentich's casebook usage I shall refer to this as the *Benzene Case*).

58 *See* Lewis Sargentich, *Feasibility Analysis, in* Keeton et al., Cases and Materials, *supra* note *, at 965-66 (discussing technological-feasibility prong of feasibility analysis).

59 Keeton et al., Cases and Materials, *supra* note *, at 953-54, 966-67 (discussing economic-feasibility prong of feasibility analysis).

60 United Steelworkers v. Marshall, 647 F.2d 1189, 1236 (D.C. Cir. 1980) (Wright, J.).

61 The Cotton Dust Case, 452 U.S. 490, 509 (1982).

fleshed out the two dimensions of "feasibility": the technological dimension and the economic dimension.

1. Technological Feasibility

The technological side of feasibility analysis asks, as a matter of engineering technique, what the lowest level of risk achievable by an ongoing activity is. Any limit set on risk — a "permissible exposure level" ("PEL") 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 frontier of technological feasibility. The frontier of technological feasibility is fixed not by the best present practice, but by the engineering practice that might be achieved through 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 that level of risk reduction attainable within the timeframe of the regulation.

In *American Iron & Steel Institute v. Occupational Safety & Health Administration*,[62] 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. 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." 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." The court therefore approved OSHA's reliance on "innovative technology currently in the experimental stage" and its faith in new techniques "looming over the horizon."

In *United Steelworkers v. Marshall*,[63] (upholding OSHA's airborne lead standard for ten industries), 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." AFL-

62 577 F.2d 825 (3d Cir. 1978).

63 647 F.2d 1189 (D.C. Cir. 1980).

> CIO v. Brennan, 530 F.2d 109, 121 (3d Cir. 1975). 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 vigorously 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.
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> Our view finds support in the statutory requirement that OSHA act according to the "best *available* evidence." 29 U.S.C. § 655(b)(5) (1976) (emphasis added). OSHA cannot let workers suffer while it awaits the Godot of scientific certainty.[64]

2. Economic Feasibility

Portland Cement Association v. Ruckelshaus[65] explains the economic side of feasibility analysis. The *Portland Cement* opinion interprets language in the Clean Air amendments of 1970 requiring "the degree of emission limitation achievable ... taking into account the cost of achieving such

64 *Id.* at 1264-66.

65 486 F.2d 375 (D.C. Cir. 1973).

reduction." *Portland Cement* holds that this language did not require the EPA to undertake "a quantified cost-benefit analysis" in order to justify its air pollution standard for new or modified cement plants. The EPA's conclusion that the cement industry could absorb the cost of control devices without detriment to competition between cement and substitute products, 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." Judgments of economic feasibility require "cost-assessment," but they do not require "cost-benefit analysis." 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, which mandate pollution control to the extent "technologically and economically achievable,"[66] also illustrate the economic side of feasibility-based regulation. The Clean Water Act subjects water pollution sources to two different sorts of effluent limitations: ones based on "the best practicable controls technology currently available" ("BPT") and ones based on "the best available technology economically achievable" ("BAT"). The BPT standard generalizes "the best existing performance" in an industry — "control practices in exemplary plants" — despite an expectation of "economic hardship, including closing of some plants."[67] 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."[68] "'[C]ost-benefit analysis' is involved in the setting of BPT standards, but it is not a part of BAT determinations. 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."[69]

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 costs. Economic feasibility regulation by OSHA means "protecting worker health and safety within the limits of economic possibility."[70] Skelly Wright again explains:

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66 33 U.S.C.A. §§ 1311(b)(2)(A), 1314(b)(2)(B), 1317(a)(2) (as amended through 1995).

67 EPA v. Nat'l Crushed Stone Ass'n, 449 U.S. 64, 76 n.15, 79 (1980).

68 *Id.* at 74.

69 Rybacheck v. EPA, 904 F.2d 1276, 1290-91 (9th Cir. 1990).

70 United Steel Workers v. Marshall, 647 F.2d 1189, 1263 n.102 (D.C. Cir. 1980) (Wright, J.).

The most useful general judicial criteria for economic feasibility come from Judge McGowan's opinion in *Industrial Union Dep't, AFL — CIO v. Hodgson*, [499 F.2d 467 (D.C. Cir. 1974) (OSHA asbestos standard)]. 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 ...

[Id. at 478.] 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.

In the *Cotton Dust Case*, both the Court of Appeals and the Supreme Court upheld OSHA's assessment of economic feasibility.[71] OSHA had concluded that "compliance with the standard is well within the financial capability" of the cotton industry. The Agency noted that "although some marginal employers may shut down rather than comply, the industry as a whole will not be threatened." Both courts agreed that OSHA had shown that the industry would be able to absorb the projected costs. Regulatory requirements remain economically feasible, the Court of Appeals wrote, even though they

71 AFL-CIO v. Marshall, 617 F.2d 636, 659-62 (D.C. Cir. 1979), *aff'd sub nom.*, Am. Textile Mfrs. Inst. v. Donovan, 452 U.S. 490, 522-36 (1981).

"impose substantial costs on an industry ... or even [though they] force some employers out of business," as long as they are not "prohibitively expensive" and do not make "financial viability generally impossible."[72] 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."[73]

3. Significance

Feasibility analysis, like safety analysis, requires the identification of "significant risks" of "health injury." (Safety-based risk regulation requires the elimination of "significant risks," whereas feasibility-based regulation only requires the elimination of such risks if feasible.) 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*.[74] Writing for the court, Justice Stevens agreed

> with the Fifth Circuit's holding that § 3(8)[75] [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.'[76]

Unless and until such a finding is made, the requirement that the risk be reduced as far as technologically and economically feasible does not kick in. 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 ... . 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

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72 617 F.2d at 655, 661.

73 452 U.S. at 530 n.55.

74 Indus. Union Dep't, AFL-CIO v. Am. Petroleum Inst., 448 U.S. 607, 639-59 (1980).

75 Section 3(8), 29 U.S.C. § 652 (8) (2003), 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.

76 *Indus. Union Dep't*, 448 U.S. at 614-15.

> 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.[77]

"Significance" here appears to have two principal aspects.[78] 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. It must stand out among its fellow risks. Second, to be significant, when a risk ripens into harm, it must inflict a severe injury, the kind of injury we associate with cancer. A devastating injury. 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 that 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 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

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77 *Id.* at 667, 671-72.

78 *See* Keeton et al., Teacher's Manual, *supra* note *, at 20-7.

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."[79] But the concept of significance cannot be exhausted by any purely quantitative criterion. For one thing, 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.

"Significance" eludes purely quantitative measure for another reason as well: "significant" risks are salient ones, and salience is a matter of standing out. Salient phenomena stand out in a context, against some background.[80] Salient risks are prominent ones, risks that 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 (or the context within) 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 be located against the general risk of contracting the disease, or against the general risk of contracting that particular cancer, or against the background of the other risks of some occupation, and so on.

Consider the Clean Air Act amendments of 1990. The "significance" of the risk of cancer addressed by those amendments is dependent in this way on some background. Talk of "excess cancer risks" presumes a preexisting risk of cancer, a risk independent of exposure to the particular emission being appraised. The idea of "excess risk" implies the idea of "background risk," of cancer risk independent of exposure to any particular carcinogen (though not necessarily independent of exposure to all of them). The Clean Air Act's one-in-a-million threshold for "excess risk" thus defines an acceptable level

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79 *See supra* note 52 and accompanying text.

80 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 *, at 20-7.

of increased risk for a harm whose gravity we have already largely agreed upon and of which there is a preexisting incidence. Why, then, fix on "one in a million" as the threshold separating acceptable increases in excess risk from unacceptable ones? In part, because we already face greater threats in our daily lives: the annual risk of death by automobile accident, for example, is 1 in 6500 and the annual risk of death from cancer is a little less than 1 in 200.[81] Given these other threats, we feel justifiably comfortable entirely disregarding risks of cancer less than one in a million — in treating them as functionally equivalent to no risk at all.[82] And, perhaps, we fix on a "one in a million" threshold because it has a certain natural prominence as a measure of significance arbitrary in its exactitude but reasonable in its general order of magnitude. Who would fix on one in 997,832?[83]

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 Pinto* case.[84] 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 potential of gasoline makes it dangerous in a way that no other substance normally present in a car is. Most of us imagine that it is particularly horrible to be burnt 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

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81 According to the 2001 Cancer Progress Report, available at the National Cancer Institute website, http://www.nci.nih.gov, as of 1998, the annual risk of dying of cancer was 47 in 10,000. There are 15.23 automobile accident fatalities for every 100,000 people. National Highway Safety Admin., Traffic Safety Facts, 2000 National Statistics Page (2001), *available at* http://www.nhtsa.gov [hereinafter Traffic Safety Facts 2000].

82 "The 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 a million." Superfund Reform Act of 1994, S. Rep. No. 103-349, § 501 (1994).

83 Kathryn A. Kelly's and Nannette C. Gordon's critical account of the origins of the "one-in-a-million" standard lends some support to this hypothesis. They trace the standard to a one-in-100 million number two scientists "pulled ... out of a hat" in a 1961 article attempting to define when exposure to a substance could be said to be "safe." The FDA adopted that number in a 1973 notice in the Federal Register and changed it to one-in-1 million by the time the final rule was issued in 1977. Kathryn A. Kelly & Nannette C. Gordon, *The Myth of 10-6 as a Definition of Acceptable Risk*, 3(17) EPA Watch, Sept. 15, 1994.

84 Grimshaw v. Ford Motor Co., 119 Cal. App. 3d 757 (1981).

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 a comparative one, in part, and this comparison cannot be made without attending to context. The numerical risk of gasoline tank explosions is equal in motorcycles and in passenger cars,[85] and they may well be more dangerous in motorcycles, since riders are both closer to and less protected from their gas tanks.[86] Does it follow that the risk of gas tank explosions is as significant for motorcycles as it is for passenger cars? I think not. 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 by 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, implicitly, a higher level of safety than motorcyclists. Implicit in the purchase of a subcompact family sedan is a desire to reduce the risk of gasoline tank explosion as much as it can be reduced, 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.[87] These characteristics make the risks of gas tank explosion in subcompact cars

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85 In both passenger cars and motorcycles there is a 0.1% chance of a fire occurring. Traffic Safety Facts 2000, *supra* note 81, at 66.

86 "Per vehicle mile traveled in 1999, motorcyclists were about 18 times as likely as passenger car occupants to die in a motor vehicle traffic crash and 3 times as likely to be injured." *Id.* at 2 (Motorcycles). In 1999, there were 23.5 fatalities for every 100,000 miles traveled by motorcycle, but only 1.3 fatalities for every 100,000 miles traveled by passenger car.

87 The specific facts of the Pinto's design made the failure of its gas tank even more

qualitatively significant in a way that risks from motorcycle gas tanks are not, even if those risks turn out to be quantitatively much greater.

The significance of a risk, then, is not fundamentally a quantitative matter, a matter of statistical probability, and magnitude measured quantitatively. Significance depends on both gravity and salience. Determining the gravity of a risk requires evaluative and qualitative judgments — judgments about how much reason we have to 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 with other risks of an activity, how expected it is, how gratuitous it is, and so forth.

III. JUSTIFICATION: THE MORAL BASES OF SAFETY-BASED RISK REGULATION AND FEASIBILITY-BASED RISK REGULATION

Safety-based risk regulation and feasibility-based risk regulation raise three basic questions. First, why should we push beyond the cost-justified level of safety, beyond the point of maximum benefit, economically conceived? Second, if we should 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? Third, 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?

A. Why Demand More than Cost-Justified Precaution?

Reasons of fairness, we argued, justify pressing precaution beyond the point of cost justification.[88] It is unfair to inflict even one death for the sake of trivial gains to others, no matter how numerous those others may be, and it

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salient. In comparison with other subcompact cars, the design of the Pinto's gas tank stood out as singularly inferior, no functional necessity justified its inferiority, and that inferiority came as a shock and surprise to the owners and users of Pintos, who had no reason to think that they were purchasing a substandard subcompact. *See* Gary Schwartz, *The Myth of the Ford Pinto Case*, 43 Rutgers L. Rev. 1013, 1031-32 (1991).

88 *See supra* notes 14-28 and accompanying text.

is equally unfair to devastate even one person so that many people may reap trivial benefits. Unrestricted cost-benefit analysis is incompatible with these convictions. Unrestricted cost-benefit analysis assumes that all burdens and benefits are fungible at some ratio of exchange, 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. 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. Terminating the life of a television technician may maximize both wealth and utility.

This assumption of universal comparability is mistaken. Not everything is morally comparable to death and devastating injury. No amount of inconvenience, for example, can justify inflicting a devastating injury on someone. The existence of discontinuities of value — the fact that not everything is comparable in value to undevastated human life — gives us reason to reject unrestricted cost-benefit analysis and to refuse to fix the appropriate level of precaution against risks of devastating injury by applying the standard of cost-justification. Inflicting death and devastating injury on some person or class of persons is only justified if doing so realizes some comparable value, some equally *urgent* benefit to some other persons or class of persons. We therefore have good reason to press precaution beyond the point of maximal benefit, economically conceived, when the gains to be won are not morally comparable to the death or devastation that is their price.

Concern with the actual distribution of burdens and benefits among affected persons buttresses the case for moving beyond the point of cost-justified precaution. When significant risks of physical injury ripen into death and incurable disease, the benefits of going beyond the cost-justified level of precaution (and the burdens of failing to do so) 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. The fact, then, that a particular level of pesticide residue on produce or a particular level of benzene or cotton dust in a workplace maximizes the wealth that society extracts from the activity at issue does not supply those who stand to lose their health or their lives with good reason to accept the level of risk that efficiency licenses. Society is extracting maximum advantage from the activity by putting them in peril of great and readily avoidable harm. If the sacrifice demanded of them might be avoided without imposing a comparable sacrifice on anyone else, the risk should be reduced. When avoiding great sacrifice on the part

of a few requires only that many shoulder modest burdens, many should shoulder modest burdens. Devastating injuries are worth tolerating only if we must give up something of comparable value to eliminate them.

These ideas of fairness and comparable value provide a general explanation of why we might sometimes be justified in reducing risks of death or devastating injury to either the "safe" or the "feasible" level. Reducing risks of devastating injury to the point where they are "insignificant" — the demand of safety-based regulation — is justified when the benefits of bearing a "significant" risk of devastating injury are not comparable, morally speaking, to the burdens of that injury. Reducing risks of devastating injury as far as we feasibly can 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 whose risks they are is a good morally comparable to a significant risk of devastating injury. But the ideas of comparability and urgency at work here need to be spelled out, and the details of the statutory schemes involved need to be justified.

B. Justifying Safety-Based Risk Regulation I: 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 justify both safety-based and feasibility-based regulation in broad outline. But they do not, by themselves, 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[89] and the Supreme Court's opinion in the *Benzene Case*[90] make clear that the elimination of "significant" risk is not the same as the elimination of all risk. So the "safe level" of risk is not the same as the level of "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, again 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

89 42 U.S.C.A. § 7412(f) (West 1993).

90 Indus. Union Dep't v. Am. Petroleum Inst., 448 U.S. 607, 614 (1980).

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?

The stringency of safety-based risk regulation jumps out at us. 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 cannot 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 is equally worth remarking upon. 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 with our lives. At worst, it ends lives prematurely and traumatically. At best, it impairs them severely, foreclosing the pursuit of certain activities and ways of life, seriously hampering the pursuit of others, and often leaving us with enduring, agonizing 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 we explored earlier.[91] 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 a normal lifespan. To effectively pursue our aims and aspirations 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' primary goods, liberty and security are things that we each need if we are to realize any aims or aspirations. "Liberty" is essential because we cannot survive without acting, much less lead anything worth calling a life. Yet "security" is equally essential. Physical injury can end our lives prematurely or leave us permanently impaired in ways that prevent us from pursuing many

91 *See supra* notes 29-35 and accompanying text.

valuable ends and aspirations. And 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 or refine benzene) without taking and imposing risks of devastating injury. Foregoing all activity would itself be a short path to death, and even if death could somehow be avoided, foregoing all activity 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 led. *Some* risk of devastating injury is the price of activity. These risks are the "background risks of social life," risks whose existence is the unavoidable price of activity.[92] The only way to eliminate them is by bringing activity to a halt. Some background risks are typical of social life in general; they are the price of activity *in toto*, not the price of any particular activity. Other background risks are typical of particular activities; they are the price of having that activity. 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 issue 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 built, 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 set about reducing a risk we must, then, first conclude that it crosses the threshold that separates eliminable risks from uneliminable ones. We must, in short, decide if the risk in question crosses a threshold of "significance."[93] Without a "significance" requirement, safety-based risk regulation would be self-defeating. One essential condition

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92 *See* Keating, *supra* note 11, at 350-52 (discussing a "mutually imposed and mutually beneficial level of background risk" consisting of "very, very low probability risks," which are "simply the price of freedom to act"); Keeton et al., Teacher's Manual, *supra* note *, at 20-8 ("Safety means that no significant risk remains. But safety is not attainable, by assumption, unless valuable activity ceases.").

93 *See supra* notes 71-85 and accompanying text (discussing the nature and role of the "significance" requirement).

for leading a worthwhile life — liberty — would be destroyed in the name of securing another essential condition — security.

2. Why May We Inflict "Insignificant" Risks of Devastating Injury for Trivial Reasons?

The inevitability of background risks presents a problem for our critique of cost-benefit analysis, however. We have faulted unrestricted cost-benefit analysis because it licenses the infliction of devastating injury on a few for the sake of trivial gains to many.[94] We have argued that when trivial gains to a large number of persons stand on the benefit 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 can ever compare to a single one of the devastating injuries that are their price. The gains and the losses are simply not comparable, morally speaking. Our willingness to tolerate background risks of devastating injury, however, suggests that we sometimes do inflict devastation on 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. Some children, for example, may be inspired to play with fire after winning toy lighters as prizes in gumball machines.[95] If their play goes awry, they may be horribly disfigured and even killed. When we consider the risk that injured them a background risk of life, are we not countenancing the infliction of devastating injury for the sake of trivial gain, for the sake of inconsequential profit? If so, must not either our critique of cost-benefit analysis or our toleration of background risk be mistaken?

The argument seems even stronger if we take driving as our example. Driving is the riskiest of our ordinary activities. A normal American driver exposes herself (and others?) to an annual risk of death of approximately 1 in 6000.[96] This, surely, is a significant risk of devastating injury. A driver subject to a 1-in-6000 annual risk of death is subject, over the course of a normal lifespan, to a lifetime risk of death of 1 in 75. If a lifetime excess risk of cancer of 1 in 1,000,000 is significant, a lifetime risk of death of 1 in 75 is much more than significant. Yet precisely because driving is so woven into the fabric of normal American life, we routinely take to the road in pursuit

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94 *See supra* notes 18-24 and accompanying text.

95 *See infra* text accompanying notes 99-100.

96 National Highway Safety Admin., Traffic Safety Facts, 1999 National Statistics Page (2000).

of trivial ends: to get to work, to go to the market, to rent videos, to take our children to softball practices, and so on. Yet each time we take to the road, we impose a risk of devastating injury.[97] How can this be justifiable? How can such trivial ends justify the infliction of a substantial amount of devastating injury?

The risks of devastating injury imposed by the activity of driving as we practice it in turn-of-the-twenty-first-century America may well be unacceptably great. In all likelihood, we should be taking various steps — including shunting people into public transportation — to reduce these risks. But it is a mistake to believe that those risk are unacceptably high *because* each instance of driving imposes a risk of devastating injury for the sake of trivial gain. At stake is not individual trips, but a 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 is essentially indistinguishable from the others. No trip to the grocery store or to the movies or to the theater stands out as especially urgent. (Contrast an ambulance taking a critically ill person to a hospital.) So if we should judge any one of them unacceptable because it wrongly risks devastating injury for trivial gain, we should judge all of them unacceptable because they wrongly risk devastating injury for trivial gain. But when we do this, we encounter a cost 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 thing that makes the life of the working poor in Los Angeles so onerous.

There is an important lesson here, and it is independent of the acceptability of practice of private automobile use as it now exists in our society. Even an acceptable practice of transportation will impose some risk of devastating injury for 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, and that is an unacceptably high cost. Some risks of devastating injury are thus justifiably imposed even though each instance of their imposition realizes only trivial benefit, because there is no plausible way of distinguishing among instances of the risk imposition that we are considering and the

97 There are 1.5 deaths per 100 million vehicle miles traveled. *Id.*

burden of eliminating all instances of such risk imposition *is* comparable to the significant risk of devastating injury that the practice creates. The flipside 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 forego driving as an activity, 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 the movies will end in devastating injury. We therefore have no good reason to forego any particular trip, and good reason not to forego 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 become evident. 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. The burden of rescue will not raise the level of devastating injury, even over the long run. A practice forbidding going to the grocery store or the movies or to work whenever doing so risks devastating injury will, by contrast, profoundly disrupt our lives. It will forbid most of our going out and about in the world and will preclude living a normal life.

3. Acts, Practices, and Paradoxes

This argument is likely to strike some people as flatly illogical.[98] Why should it matter whether we can distinguish one risk that might be eliminated by an untaken precaution whose cost is foregoing a trivial benefit, from a host of similar risks? If the risks really are indistinguishable, the cost of eliminating each risk will be comparably small and the benefits comparably great. If the incremental benefits of the precaution needed to eliminate one of these risks exceed that precaution's costs, the incremental benefits of the precautions needed to eliminate each of these risks will exceed the combined costs of those precautions. If not, some of the risks that we have lumped together must be distinguishable from the one that we are considering. So long as each incremental benefit exceeds each incremental cost, why should it matter if the risk at hand is indistinguishable from five or fifty or one-hundred or five-hundred other risks? Mere addition proves that if one risk is

98 Louis Kaplow pressed this charge forcefully in an exchange of letters with the author in the Winter and Spring of 2000.

worth eliminating, they are all worth eliminating. It thus seems irrational — rudimentary arithmetic error — to assert that it matters whether or not a risk of devastating injury that might be eliminated by a small precaution cost is indistinguishable from a host of other risks. Our judgment about the reasonable course of action with respect to a class of indistinguishable precautions is directly opposed to our judgments about the reasonable course of action with respect to each of the constituent parts of that heap. Our judgments about the correct course of action with respect to a class of indistinguishable precautions appear to violate firmly fixed canons of rationality.

We have, in fact, stumbled across a "lottery paradox," a case where our judgments with respect to the correct course of action for a heap of cases conflict with our judgments about the correct course of action for any individual case in that class.[99] "Lottery paradoxes" exist when (1) the expected value of any given act appears to justify undertaking that act, but (2) the expected value of undertaking that act over and over again does not justify undertaking it over and over again. In the case of a lottery, for example, the chances of purchasing the winning ticket are so low that we are justified in regarding the decision to purchase a ticket as irrational; the expected benefit is less than the present cost. But we are not justified in acting as though no ticket will win, because some ticket is certain to win. The paradox is that we are both justified in acting as if no one of the tickets will win and not justified acting this way.

In the risk-imposition cases that are our concern, we appear to be justified in acting as if (1) no single risk imposition is justified, but not justified in acting as if (2) all identical risk impositions are justified. We appear, for example, to be justified in foregoing a trip to the video store to rent a movie because the expected benefits of the rental are insufficient to justify running the risk of being killed in an automobile accident. But we do not appear to be justified in foregoing all trips to the video store to rent movies — along with all comparably trivial errands — because the cost of foregoing so much of normal life is unacceptably great.[100] Deep logical and conceptual puzzles involving the relation between probability and justification may lurk here, but the fairness puzzle that is our principal preoccupation seems both explicable

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99 I am grateful to Gideon Yaffe for persuading me that the paradox at work here is a "lottery paradox" and not a "sorites paradox." On lottery paradoxes generally, see Dana K. Nelkan, *The Lottery Paradox, Knowledge and Rationality*, 109 Phil. Rev. 373 (2000).

100 The problem may also appear in exactly the reverse form — each individual risk imposition may be justified, while a class of such risk impositions does not appear justified. The risks of smoking any single cigarette, for example, may be so low that we are justified in smoking it even though the risks of smoking cigarettes as

and soluble. The fairness of insisting that some precaution be taken depends not so much on the cost of taking that precaution in the case at hand as it does on the cost of taking that precaution in the *class of cases* to which it applies. Practices of risk imposition, not individual instances of risk imposition, are the law's basic unit of analysis. The requirement that like cases be treated alike, if nothing else, requires this general focus.

Questions of reasonable risk imposition, then, are questions about the conduct of practices and the design of institutions. They are not questions about the rationality of individual acts, conceived in isolation. If we must, in fairness, eliminate a host of similar risks should we proceed to eliminate one risk whose distributed cost is small, then the cost of the precaution necessary to eliminate that one risk is the cost of eliminating all the similar risks. The latter cost may be unacceptably high even when the former cost is trivial. The paradox that this creates for our canons of rationality can be left for others to unravel. General philosophical puzzles do not pose special problems for law.

Consider an example taken from the common law.[101] Suppose that we tell the operators of gumball machines that they cannot include toy lighters among the prizes small children may win when they drop coins into the slots of the machines. This may seem like a small cost. Who will miss toy lighters if they disappear from the stock of prizes found in gumball machines? If we are applying a general legal standard, however, the cost to these operators is much greater than the cost of withdrawing toy lighters from their machines. The cost of complying with our command is the cost of withdrawing toy lighters *plus* the cost of identifying and withdrawing all other prizes that might also inspire children who win them to wreak physical harm on themselves or others.[102] And there is no reason to stop here. The particular risk of toy lighters is that they will inspire small children to play with fire. Yet many things are

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a habit are so great that we are not justified in doing so. So too the risks of being killed on any particular errand may be so low that we are justified in disregarding them entirely in deciding whether or not to run any particular errand, whereas the risks of being killed on some errand are great enough that we are not justified in disregarding them. The particular form of the paradox that sheds light on the "significance" requirement of feasibility analysis is that there are risks that are indistinguishable from each other, each of which, viewed individually, is worth eliminating, but all of which are not worth eliminating.

101 This example is drawn from Van Skike v. Zussman, 318 N.E.2d 244, 246 (Ill. Ct. App. 1974). In *Van Skike*, a small child "won" a toy cigarette lighter as a prize from a gumball machine, purchased lighter fluid, and set himself on fire when he attempted to fill the lighter with the lighter fluid.

102 If we take the critical feature of toy lighters to be that they inspire children to play in ways harmful to themselves and others and choose to prohibit toy lighters,

much more likely to inspire children to play with fire: matches, gas lighters, gas stoves, outdoor grills, television shows, cigarettes, and especially dry conditions at the end of a hot summer, to name just a few. Must we withdraw all of these (or mention of them) from places where they might fall into the hands of children? If we must, can we do that without withdrawing them from circulation entirely? After all, so long as there are matches and lighters in the world, some of them will fall into the hands of children.

It will not do to dismiss the bizarre facts of *Van Skike* as an utter fluke. Its facts are typical of a class of cases, and a tragic class at that: cases where children harm themselves and others by playing with fire, despite our best efforts to keep them safe. Yet even though the case is part of a tragic class of cases, it is clear that we are not required to withdraw from our world everything that might inspire children to play with fire. We need sources of fire, even though an inevitable price of such sources is a number of out-of-control and harmful fires started by children. There is no effective way to eliminate all fires set by children without withdrawing all potential sources of fire from the world. And withdrawing all potential sources of fire from the world would shut down all of the activities dependent on starting fires. Withdrawing from the world all toys that might inspire children to harm themselves or others would wreak havoc with childhood play.

The correct conclusion to draw in this case is, therefore, the conclusion drawn by the *Van Skike* court. The risks of fire associated with the practice of placing toy lighters in gumball machines are not significant enough to trigger any duty of risk reduction. The risks of fire associated with this particular practice constitute background risks of living. We need fire, and we therefore need sources of fire. Part of the price we pay for this need is some devastating harm caused by children playing with fire. The lesson of both this example and the driving example is that not all cases where the cost of the precaution necessary to reduce a risk of devastating injury *appears* small are cases where that cost *is* small. When a particular action (driving to the movies or dispensing toy lighters from gumball machines) is indistinguishable from a large number of other actions, consistency requires us to prohibit all such actions if we prohibit any. The cost of eliminating all such actions is the true cost of the precaution at issue.

Finally, if this discrepancy between the reasonable course of action with respect to a single action and the reasonable course of action with respect

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consistency will presumptively require eliminating all toys that might inspire children to injure themselves or others. What might the elimination of all such toys do to the activity of "play"?

to a class of such actions is paradoxical, it is also familiar. Consider the rationality of smoking cigarettes.[103] If you enjoy smoking cigarettes, it is always rational to smoke any given cigarette. The odds that smoking any one cigarette will kill you are trivial. The odds that habitual smoking will kill you are, by contrast, quite high. If you think the odds of death from habitual smoking are unacceptably high, it is entirely reasonable to make a habit of never smoking any cigarettes, even if you enjoy smoking and even though the odds that any one cigarette will kill you are acceptably low. And it is rational not just because smoking is addictive, but because it is impossible to identify the single cigarette that will kill you. A reverse phenomenon is at work here. If it is impossible to distinguish among a substantial number of very small risks of grave harm, each of which might be eliminated by a precaution whose cost is very small, and if the aggregate cost to each prospective injurer of taking all these precautions is unacceptably high, then it is rational not to take any of the precautions, even though each of them, viewed individually, appears justified.

The paradoxical fact that the reasonable course of action for a class of risks may differ from the apparently reasonable course of action for a single risk imposition within that class thus explains and justifies the "significance" requirement. "Significance" separates those risks whose elimination is desirable from those whose elimination is not. If a particular risk really *is* significant, then that risk is different from a number of other risks, and the distributed cost of eliminating that risk is not the cost of eliminating a host of indistinguishable risks. If the distributed cost of the precaution necessary to eliminate the risk does not impose an equally grave burden on anyone else, the risk should be eliminated. Suppose, for example, that a child sets himself on fire by purchasing lighter fluid from a store.[104] The risks of lighter fluid are significant in a way that the risks of toy lighters are not, and plainly

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103 This example is taken from Warren S. Quinn, *The Puzzle of the Self-Torturer, in* Morality and Action 198, 199 (1993). Quinn points out that the same is true about bites of food. No single bite will make us fat, but it does not follow that we can eat as much as we want.

104 In *Van Skike v. Zussman*, 318 N.E.2d 244, the child had both won a toy lighter as a prize from a gumball machine and purchased lighter fluid from a store. The court held that the risk a toy lighter would inspire a child to start a fire was not "reasonably foreseeable." This is functionally equivalent to calling the risk "insignificant." The court conceded, however, that the risk a child would use lighter fluid to start a fire was "reasonably foreseeable," in other words, "significant" enough to warrant exploring whether it was negligent to sell lighter fluid to such a child. Had the court applied a "safety" type of norm to the action of giving a toy lighter as a prize, it would have found it impermissible.

so. The very point of lighter fluid is to start fires. Selling lighter fluid to a child therefore creates a significant risk that the child will start a fire.

To summarize: "Significance" 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.

4. Permissible and Impermissible Aggregation: Combining Costs within and across Persons

The preceding argument in support of the significance requirement seems, however, to escape from one criticism only to run afoul of another. The argument merges separate risk impositions, each of which risks devastating injury for trivial gain, into classes of similar risk impositions whose cumulative importance is qualitatively greater than the quantitative total of the parts summed. This procedure and this claim appear inconsistent with the argument that cost-benefit analysis aggregates harms impermissibly. Unrestricted cost-benefit analysis, we argued, is unacceptable because it allows a large number of trivial harms to justify inflicting devastating injury even though none of the harms aggregated is comparable to the injury whose infliction they collectively license. Yet the argument that we have just advanced takes the cumulative effect of a host of trivial benefits to be comparable to some risk of devastating injury. In the case of driving, for instance, we took the cumulative effects of being unable to go to the theater, to work, to restaurants, and so on, to be a kind of detriment morally comparable to some risk of devastating injury. What, if anything, makes the aggregation on which this claim depends permissible?

Unlike the aggregation practiced by cost-benefit analysis — which aggregates qualitatively different costs and benefits *across* different people — the aggregation on which our argument depends involves only the aggregation of costs *within* persons. It is the cumulative cost to *each* prospective driver that can rise to comparability with driving's risks of devastating injury. It is the cumulative effect on each prospective driver's life that is comparable to devastating injury. Aggregation *across* persons ignores the distinction between persons and sacrifices some for the benefits of trivial gains to others. Aggregation *within* persons does not suffer from this fault.[105] Those who extract the cumulative benefits of imposing many

105 *See* Scanlon, *supra* note 11, at 229-41 (especially at 237).

risks for individually trivial reasons are also those who bear the concomitant risks of devastating injury. If they cannot extract the benefit without bearing the burden and if the aggregate benefit is comparable to and greater than the burden, their lives are not sacrificed for trivial advantage to others, even when they themselves suffer death or devastating injury at the hands of the activity.

C. Justifying Safety-Based Risk Regulation II: Why Exclude Costs Entirely?

The arguments in the previous section justify and explain the threshold of significance, but what about 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[106] that tolerances for pesticide residue must be set at a level that is "safe," where safe means "reasonable certainty that no harm will result from aggregate exposure to the pesticide chemical residue, including all anticipated dietary exposures and all other exposures."[107] This determination expresses a legislative judgment that the costs of reducing pesticide residues to safe levels thus not only *may* be disregarded entirely, they *must* be disregarded entirely. Structurally, then, safety-based regulation is radically different from cost-benefit analysis. In order to fix 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.[108]

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 where it is no longer significant? The answer to this question is simple enough, in principle. We should eliminate significant risks of injury when the costs of doing so are not comparable to the devastation that significant risks are sure to wreak. Better still, this answer suggests a division of labor between safety-based risk regulation and feasibility-based risk regulation. The former is appropriate when the costs of reducing risks of devastating injury to the point where they are no longer significant are *not* comparable to the cost of bearing those risks of devastating injury. The

106 110 Stat. § 1489 (1996).

107 21 U.S.C. § 346a(b)(2)(A)(ii) (2003).

108 The "exclusionary" character of safety-based risk regulation should not be seen as an oddity. Joseph Raz, Practical Reason and Norms (2d ed. 1990), rightly emphasizes the fact that norms of practical reason are often exclusionary in character.

latter is appropriate where the costs of reducing risks of devastating injury to the point where they are no longer significant *are* comparable to the cost of bearing those risks of devastating injury. These claims, however, beg some important questions: When is a "cost" comparable to a "significant" risk of devastating injury? What makes a cost "comparable" to a significant risk of devastating injury?

1. Comparability: Risks and Rewards

Judgments of comparability are complex. For one thing they are qualitative, evaluative, and contestable all the way down. Consider the claim that missing an episode of one's favorite television show and dying are not comparable, whereas dying and being permanently paralyzed are comparable. This claim rests on the idea that severity of harm depends largely on the extent to which something interferes with a person's capacity to realize diverse values and ends and to engage in the activities constitutive of a normal life. Harms are comparable when they disrupt the lives of those they affect in similarly urgent (or insignificant) ways: when they impair ordinary activities or important activities or the pursuit of rational life plans, in similar ways. Burdens and benefits are comparable when they improve or impair lives in similarly urgent (or insignificant) ways. And these remarks conceal a latent complication. In a world where people's values, ends, and aspirations are diverse and incommensurable, our thinking about well-being and impairment must draw on ideas that people with such diverse values might find mutually acceptable. Abstracting from particular values, ends, and life plans, we can say that harms are comparable when they strike at the preconditions of rational agency in similarly severe (or similarly mild) ways.

Appealing to impacts on two preconditions of rational agency takes us a certain distance. It explains, for instance, why we are better off bearing background risks rather than eliminating them. Eliminating background risk works greater harm to one of the essential conditions of rational agency — the liberty to pursue our diverse aims and aspirations — than bearing background risk works to another essential condition of rational agency — the physical integrity of the individual. The costs of eliminating background risk are thus not only comparable to the burdens of living with such risks; they are also plainly greater than the burdens of bearing that risk. Matters are rarely so stark, however. Most of the activities that do or might put us at significant risk of devastating injury (driving automobiles, riding motorcycles, flying planes, using pesticide on crops, refining petroleum, or milling cotton) are not essential to our rational agency. It is simply (or not so simply) a socially and historically contingent fact that we engage in such activities and that they are important to us, sometimes for instrumental reasons and sometimes

for intrinsic ones. How should we think about comparability of value when the cost of reducing risk is not threatening the very existence of activity, but threatening some historically and socially contingent activity? How can comparability even exist when we are comparing an essential condition of rational agency — the physical integrity of the individual — to an activity whose very existence is an accident of history and technology?

It helps, here, to begin with a clear and, therefore, easy example of comparability and to work our way to murkier and more difficult ones. The clearest kind of comparability exists when the values involved are identical, when the very same devastating injury is on both sides of the calculus of risk and benefit. Suppose, for example, that a large population is at risk of contracting a disease (polio, for instance) that leaves a high percentage of those infected by it dead or crippled. Suppose, too, that a vaccine is developed for the disease. The vaccine is highly effective, but imperfect. Vaccination will prevent many people from contracting polio, but it will also cause a significant, though far smaller, number of people to contract polio. Given the present state of medical knowledge, however, the only way to eliminate this "significant" risk of contracting the disease from the vaccine is by discontinuing the use of the vaccine. Attempting to reduce this risk by withdrawing the vaccine would be self-defeating. The cost of reducing the significant risk of devastating injury created by vaccinating people is more — not less — devastating injury. The benefits of the vaccine are comparable to and greater than the significant risk of injury that is its burden.[109]

Comparability matters to fairness. Imposing risks of devastating injury is plainly fair when the imposition of those risks is to the advantage of those subject to them. Our vaccination example involves a "community of risk," albeit in a slightly unusual form. Each member of the community is subject to the same preexisting risk of disease, and each member of the community runs the same risks and stands an equal chance of reaping the same benefits by submitting to vaccination. The practice of vaccination is fair because the administration of our hypothetical vaccine decreases each potential victim's chances of contracting the disease. Vaccination is, therefore, to the *ex ante* advantage of a representative member of the community at risk of disease.[110]

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109 In Geistfeld, *supra* note 9, at 122 (especially n.26), Mark Geistfeld suggests that value should be maximized whenever risks of "nomonetizable" injury are traded-off against one another. For reasons briefly outlined in *infra* note 115, I believe that this claim needs to be qualified. But the vaccination example in the text *is* a case where maximizing the relevant value (life saved or disease avoided) is the correct way to proceed.

110 *See supra* text accompanying notes 36-39.

When the benefits of vaccination are, at least in significant part, a public good whose realization depends on everyone's doing their part by participating in the program of vaccination, it is presumptively fair to insist on a program of universal vaccination.[111] Those who lose out as a result of the program — those who contract the disease they are seeking to avoid — are unlucky, but they are not the victims of injustice.

Consider next a case where the harms involved are not identical, but are clearly comparable, because they are of the same kind. The Pasteur vaccine for rabies, a favorite example of section 402A comment k of the Restatement (Second) of Torts, illustrates this kind of case. The Pasteur vaccine "not uncommonly leads to very serious and damaging consequences when it is injected."[112] Because, however, "the disease itself invariably leads to a dreadful death, both the marketing and the use of the vaccine are fully justified, notwithstanding the unavoidable high degree of risk which they involve."[113] Because the harms are of the same kind (they impair health) and because they are both severe (they both impair normal functioning in serious ways), we do not hesitate to compare them. And, because the threat to health posed by the disease is both graver and more likely than the threat posed by the vaccine, we "are fully justified" in administering the vaccine, despite its unavoidable and significant risks. Once again, the benefits of the vaccine are comparable to and greater than the significant risk of injury that is their burden.

The question of fairness is more complex in this case, though. Because rabies is not easily transmitted, people infected with the disease are not a significant risk to others. So the decision to take the Pasteur vaccine is essentially a self-regarding one. The fact that it is to an infected person's advantage to take the vaccine, even given its side effects, is thus a reason why she should do so. Someone who fails to do so may be criticized as irrational — she is very likely making herself worse off — but she is not treating anyone else unfairly. Individual consent is therefore usually required before the vaccine can be administered, and when consent is withheld, it cannot usually be overridden. Considerations of fairness and justice control only when individual consent is impossible to obtain. Because the administration of the Pasteur vaccine is reasonably thought to be to the advantage of

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111 By "presumptively fair" I mean that there can be special circumstances, such as special religious beliefs, that justify exempting some people from an otherwise compulsory program. The fact that these people become "free clingers" on the coordinated sacrifices of others is not sufficient reason to compel them to act against their consciences.

112 Restatement (Second) of Torts § 402A cmt. k (1979).

113 *Id.*

those infected with rabies, imputing consent through the reasonable person standard is fair,[114] unless we know of special reasons why the patient at issue would refuse the vaccine. Someone who has the vaccine administered when they are incapable of consent and who now asserts that she would not have consented had she been capable cannot claim unfair treatment unless she can show that those administering the vaccine should have known that she, unlike the reasonable person, would not have consented were she capable of giving or withholding consent.

Now let us turn to more difficult cases of comparability. In these cases, devastating injury — threat to life and limb — is on one side of the calculus of risk and the value of some activity that does not contribute to saving life or limb is on the other side. The activity itself is historically particular, and the good it realizes mundane in comparison with saving life and limb. Here, judgments of comparability depend both on appraising the good realized by the activity in question and on the particular characteristics of the risks in question. In appraising the good in question, moreover, we must be sensitive to the plurality and diversity of values. We must ask not how valuable we find an activity, but whether some reasonable people might find it valuable and, if so, why. So let us consider and compare two sets of plainly significant risks: the risks of riding motorcycles and the risks of smoking.[115]

The heightened risks characteristic of motorcycling force us to inquire into the good realized by the activity of riding motorcycles, because these risks cannot, in practice, be disentangled from the aspects of the activity that make motorcycling something one might like to do. Motorcycling is exceptionally dangerous because motorcyclists travel at the speed of automobiles without the protection of passenger compartments. The cost of reducing the risks of motorcycling to a more modest level is the cost of adding passenger compartments to motorcycles. Adding passenger compartments to motorcycles, however, transforms the activity to the point of destroying it. Motorcycles with passenger compartments are no longer motorcycles. The inseparability of motorcycling's riskiness from the

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114 Physicians "may take medically indicated steps that do not risk more [harm] than they are likely to avoid, provided that the physician has no reason to think the plaintiff would refuse consent." Dan Dobbs, The Law of Torts § 106, at 247 (2000).

115 Recall that the fatality rate for motorcyclists is 59.53 per every 100,000 registered. *See* Grimshaw v. Ford Motor Co., 119 Cal. App. 3d 757 (1981). More than 400,000 Americans die from smoking cigarettes every year. One in every five deaths in the United States is smoking-related. Centers for Disease Control & Prevention, *Smoking — Attributable Mortality and Years of Potential Life Lost — United States, 1990*, 42(33) Morbidity & Mortality Wkly. Rep. 645 (1993).

constitutive characteristics of the activity makes the principal cost of risk reduction the cost of destroying the activity. So we must ask, "Is the activity of motorcycling a valuable one, an activity that some reasonable people might find enjoyable enough to be worth its significant risks?"

Thinking about the values realized by the activity of motorcycling leads to (among other places) thinking about the value of taking risks. Riskiness itself (the opportunity to put one's physical safety at more than normal peril) may well be one of the things that make motorcycling attractive. Even if it is not — even if most motorcyclists are not risk-seekers in that sense, even if they only enjoy the sensual thrill of experiencing high-speed travel, instead of being cut-off from it in the comfort of a car's passenger compartment — that particular sensual experience can only be purchased at the price of dramatically increased risk of serious physical injury. Taking this to be some rough specification of the intrinsic goods of motorcycling, we must ask, then, how valuable these goods are. Valuable enough to justify bearing the significant risks that are their price?

The answer to this question is powerfully affected by the fact that the risks of the activity are borne largely by participants in it — not by strangers to it — and by the fact that participation in the activity is largely a matter of voluntary choice. The distribution of some risk and the voluntariness with which it is or is not borne are critical to the risk's acceptability. We would not allow people to drive cars with unshielded, external gas tanks just for the thrill of it, for example. The risk to the rest of us (who did not choose to purchase such risky vehicles and who do not reap either their thrills or their substantial cost savings) is unacceptably high. Interfering in other people's freely chosen activities because we do not ourselves find the goods they realize worth the risks they require is, by contrast, unacceptably meddlesome, unjustifiably paternalistic. The heightened risks of motorcycling are acceptable in part because we recognize that risk-taking plays an important role in activities we recognize as valuable for at least some reasonable people (think, for example, of all extreme sports and many not so extreme ones). But they are also acceptable because they fall largely on motorcyclists and because the choice to ride a motorcycle is largely an unburdened one. Motorcycling is a mode of transportation, but in its voluntariness, the choice of motorcycling as a form of transportation is analogous to the choice to engage in a risky recreational activity. Considerations of fairness recede when risks are borne by those who impose them and when those who impose and bear them do so voluntarily.

The substantial risks of riding motorcycles are, in short, acceptable because we may reasonably judge the costs of reducing motorcycling's substantial risks to be comparable to the costs of bearing those risks,

because the value sacrificed in reducing the risk is one that figures in a valuable way of life and because the costs of realizing those values is voluntarily borne by those who find the values especially important. Unless we believe it is actually *irrational* of people to ride motorcycles, we have no reason to insist on reducing the very significant risks of motorcycling, when the price of risk reduction is the destruction of the activity itself.

The activity of smoking contrasts nicely with motorcycling. Here, too, the risks of the activity seem inseparable from its enjoyment. Here, too, the decision to take up the activity falls on the unforced end of the spectrum (though one may well wonder how unfettered the decision to take up smoking as a teenager is in a culture where smoking is a rite of passage into the adult world and a cool corner of it at that). And here, too, the only way to reduce the risks of the activity to a level closer to the normal risks of life is by curtailing the activity. But smoking and motorcycling differ in other ways, ways that affect our evaluations of the "cost" of curtailing the activity of smoking. For one thing, smoking imposes substantial risks on nonsmokers, at least when it is practiced indoors.[116] The risks of smoking are less self-regarding and more other-regarding than the risks of motorcycles. For another thing, smoking is addictive. Partly for that reason, it is harder to explain just how smoking figures in a comprehensible and defensible form of human flourishing. We understand how risk-taking might figure in a valuable way of life more easily than we understand how the self-destructive pursuit of pleasure might figure in a valuable way of life. We suspect smokers of irrationality. We may therefore believe that the costs of curtailing the activity are less weighty than the costs of curtailing motorcycle riding. It may even be justified to make the those who ostensibly benefit from smoking the beneficiaries of paternalism. Extensive efforts to discourage smoking (especially taking up smoking) and extensive efforts to stigmatize smoking as an activity therefore seem justified. The fact that we have difficulty recognizing how the game of smoking might be worth its candle makes us unusually willing to interfere with the self-regarding risks of smoking. The perceived *absence* of comparable value is thus essential to our current practices of regulation.

Important general lessons about comparability lurk in these examples.

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116 Environmental Tobacco Smoke ("ETS") causes 3000 lung cancer deaths annually to nonsmokers, according to the Center for Disease Control. See the CDC website at http://www.cdc.gov/tobacco/research_data/environmental factsheet_ets.htm. U.S. Dep't of Health & Human Services, 1986 Surgeon General's Report: The Health Consequences of Involuntary Smoking (1986); second-hand smoke was found to be a cause of lung cancer and other cancers, respiratory problems, and cardiovascular disease.

The most abstract (and apparently fundamental) criterion of comparability holds that comparability exists when the burden of reducing some risk threatens the freedom of action of the affected individuals as gravely as the risk itself threatens their physical integrity. The kind of threat this criterion contemplates is starkly visible in the case of background risk. Eliminating background risk requires eliminating activity, and the threat that this poses to freedom of action is even graver than the threat that background risk of devastating injury poses to the physical integrity of the person. But this general account will only take us so far. In some cases (our vaccine and treatment for rabies examples), both risk and risk reduction register their costs in harm to the physical integrity of the individual. So long as the harm threatened is equally grave, comparability does not present any particular problem. Other things equal,[117] the correct course of action is the one that minimizes the total life lost or disease suffered (thereby maximizing the lives saved or the disease avoided). Comparability is, in fact, at its least problematic when the harm threatened by risk reduction is identical to the harm threatened by the risk at hand, as it is in our vaccine example. Questions of comparability are only slightly more difficult when the harm threatened by the risk at issue and by its reduction are of the same kind (health injury, in our rabies treatment example), but where the health injury threatened by the precaution is both less likely and less grave than the injury threatened by the risk at issue. Administering the Pasteur vaccine for rabies is an easy call for both patient and doctor, even though doing so creates a substantial probability of severe physical injury, because the disease threatens more severe physical injury — painful death — with certainty.[118]

The burden of reducing some risk is not always borne in the same coin as the burden of the risk itself, however, and the threat that risk reduction poses to freedom of action, to a fundamental condition of human agency, is rarely as stark as the threat posed by the elimination of background risk.

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117 Other things are often not equal, as our examples show. It matters whether risks are borne by those who impose them, whether the decision to engage in a risky activity is an unburdened one, whether rights are in play (as in the Pasteur vaccine), and this is hardly a complete list. Judith Thomson's famous transplant example is another case where minimizing the life lost requires violating someone's rights. In this case, minimizing life lost is clearly impermissible. Judith Jarvis Thomson, The Realm of Rights 134-38 (1990).

118 However strong the case may be for administering the Pasteur vaccine for rabies to a victim of the disease, it is, of course, generally impermissible to administer it without the consent of the victim. The patient's right to refuse treatment is another example of a right that may constrain the minimization of harm otherwise required.

Our motorcycle and smoking examples are cases in point. In each of these cases, the cost of risk reduction is the destruction or severe curtailment of the risky activity itself. The cost is to the *values realized by the activity*. The cost is not to one of the fundamental conditions of human agency — not to freedom of action — but *to a use to which people have put their freedom*. Costs of this kind are important because freedom of action is a condition of value, not a thing of value in itself. Activities of value give freedom of action its point. Freedom of action matters because there is a wide variety of things worth doing, a large set of values worth realizing. It is therefore important that a diverse range of activities be allowed to flower.

Against this deference to the wide range of values realized by diverse activities stands the need not to endanger life and limb lightly. So we must make judgments of comparability. And if it is important that a wide range of activities be allowed to flower because the set of values worth realizing is a large one, it is also difficult to make judgments of comparability when the value of some activity is pitted against devastating injury. In cases where the value of an activity is at stake, the magnitude of the cost depends importantly on the goods that the activity realizes. But it also depends on who bears the cost, on how voluntarily they choose to engage in the activity and shoulder its costs, and on the existence or absence of alternative ways of realizing the values at stake. In cases like these, judgments of comparability are difficult, contestable, and contextual.

2. Comparable Value and Safety-Based Risk Regulation

With these general ideas and particular examples in mind, let us return to the topic of safety-based regulation. In contrast to the risks of motorcycling and smoking, safety-based regulation is usually directed at risks (of devastating injury) that we can hardly avoid encountering in the course of normal life in our society. Toxins in our food, air, and water are the principal targets of this kind of risk regulation.[119] We can hardly avoid eating food, breathing the air, or drinking water. By and large, moreover, we bear these risks whether or not we participate directly in the productive activities whose byproducts these risks are (though we are all beneficiaries of these activities in diffuse and indirect ways). The risks subject to safety-based regulation are thus markedly different from the primary risks of motorcycling and smoking not only in the voluntariness with which they are borne, but also in the extent to which they are borne by the people who participate in creating them. The risks subject to safety-based regulation are largely unavoidable.

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119 *See* Keeton et al., Cases and Materials, *supra* note *, at 952.

The harms threatened by the risks 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 flipside 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, and 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. Statutes like the 1996 Food Quality Protection Act 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.[120] Health has a special urgency. It is part of a package of goods that are essential conditions of rational agency, and it takes priority over lesser, inessential goods. Health, on this view, should only be sacrificed when we stand to gain more of something comparable to health in importance.

But a hierarchical view of human interests is only one part of the

120 On primary goods, see Rawls, *supra* note 11, at 173-211 (especially at 187-90) ("Primary Goods as Citizens' Needs"). The contrast between needs and preferences

justification for safety-based risk regulation. Safety-based risk regulation also rests on particular, historically and socially contingent claims of value. The 1996 Food Quality Protection Act, 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. And 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 foregone, the cost of eliminating significant health risk is not comparable to the cost of bearing such risk. In poorer or less technologically advanced societies, things might be different. It might, for example, be impossible to reduce the risks of air and water pollution to "insignificance" without shutting down the ordinary productive activities that generate such pollution.

(or wants) is fundamental to the contrast between safety-based regulation and cost-benefit analysis. The idea here is more general than Rawls' conception of "primary goods." It might, for example, be possible to elaborate it in terms of Amartya Sen's notions of "functionings" and "capabilities." Sen, *supra* note 19. For a more general discussion of these matters, see *supra* note 21 and accompanying text.

And that might make those workers most disadvantaged by the pollution in question worse off, not better off.

Safety-based risk regulation, in short, is justified when the costs of eliminating significant risks of devastating injury are simply not comparable to 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[121] is right to require tolerances for pesticide residue on food products to be set at a level where "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,"[122] even in light of the special susceptibility of infants and children to harm from toxic substances,[123] 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 "significant" risk of devastating injury (and all indistinguishable risks) to the point of "insignificance" is of a *kind* that might outweigh the burden of the 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.[124] 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.

The presence of comparability marks the point at which tradeoffs begin. Within the framework of federal risk regulation, comparability marks the point at which feasibility-based regulation of risks of devastating injury replaces safety-based risk regulation. When are burdens to major, productive economic activities — the kind of governed by both safety-based 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

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121 110 Stat. § 1489 (1996).

122 21 U.S.C.A. § 346a(b)(2)(A)(ii) (2003).

123 *Id.*

124 Or so we have argued. *See supra* text accompanying notes 90-92.

of our society is comparable to, and generally greater than, significant risk of devastating injury. And it is this claim that we must now probe.

3. 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 work greater hardship than allowing them to continue, where their continuation involves imposing "significant" risks of devastating injury that can only be reduced by jeopardizing the viability of those activities in the long run. The judgment of comparability at work here is a simple one: the risky activity being regulated is sufficiently valuable that shutting the activity down would work a greater hardship to those who benefit from it than would asking those workers endangered by the activity to bear 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. When would shutting down a major, productive activity like milling cotton or refining petroleum work a greater hardship upon the workers employed by those activities than bearing the significant risks of those activities does? When shutting down the activity would impair a representative worker's ability to make her life answer to her hopes for it more than bearing the activity's significant risk of injury would. When shutting down the activity would make her worse off, not better off, over the long run.

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, a background level of risk of devastating physical injury must be accepted, because the cost of eliminating it is the prohibition of all activity, and the prohibition of all activity is a cure worse than the disease. It impairs our capacity to pursue our conceptions of the good over the course of complete lives 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 activity is worse than the devastating physical injury risked by the activity.

a. 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.[125] Because exposure to cotton dust is the primary cause of this disease, the disease is "a distinct occupational hazard associated with cotton mills."[126] At the time of the *Cotton Dust Case*, an estimated one-in-twelve retired cotton workers were afflicted with byssinosis.[127] 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 $\mu g/m^3$. OSHA concluded that this upper limit of safe exposure should be used to define the "permissible exposure limit" ("PEL") for exposure to cotton dust over the course of an eight-hour workday. Attaining this PEL, however, was not always feasible. Therefore:

> 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 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 PELs 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,"

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125 *See supra* note 17.

126 The Cotton Dust Case, 452 U.S. 490, 498 (1982).

127 *Id.*

> and for that and other reasons adopted a less stringent PEL of 750 $\mu g/m^3$ for weaving and slashing.[128]

The "safe level" of 100 $\mu g/m^3$ is thus technologically unattainable, and the best attainable level — the technologically feasible level — of 200 $\mu g/m^3$ is often 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. Bearing that higher risk of brown lung disease is justified by the fact that the benefits of the activity of milling cotton outweigh that risk. Put differently, the justification for bearing the risk is that it can only be avoided by shutting down the activity, and the value of the activity is greater than the devastation that is its price.

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, holds that shutting down an activity is 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 local and more relaxed application of the criterion employed by safety analysis. Safety analysis sees the shutting down of all activity as a cost sufficient to justify bearing *insignificant* risk of devastating injury from any given activity. Feasibility analysis sees the shutting down of major productive activities in our market economy as a cost sufficient to justify bearing *significant* risk of devastating injury from such activities.

By taking the cessation of significant productive activities in a market economy to be comparable in kind and generally greater than a significant risk of devastating injury, feasibility analysis extends the idea of comparable value in a way that we have yet encountered. This is not a case of minimizing the same disease (like the vaccine example) or a case of minimizing severe health injury (like the rabies example) or a case where an activity realizes a distinctive form of value that might figure prominently in some plausible conceptions of the good (like the motorcycle example). This is a case where the instrumental, everyday activity of earning a livelihood and generating wealth justifies bearing significant risks of devastating injury. Comparing significant risks of devastating injury to the termination of economically productive, but everyday, activities is plainly controversial. If we picture this tradeoff at the level of an individual life, the comparison looks unconvincing.

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128 *Id.* at 503-04.

Losing a job (the consequence to those most severely affected of shutting down some ordinary economic activity) does not appear comparable to losing life or limb or 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.

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 whose importance has already been vouched for by the market. It accepts the validity of a prior (market) 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 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 is too high a price to pay for the elimination of significant risk.

The first of these ideas is that ongoing, productive activities, which flourish in a market economy, have significant value. Because they have passed the market's test of value, we may presume that their overall benefits outweigh their overall costs.[129] Shutting down such activities therefore drives something of significant value to many people — workers, consumers, suppliers, shareholders — out of the world.

The second idea asserts that contingent social facts (accidents of history, if you like) can embed themselves so deeply into the structure of our social

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129 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. I shall take this up in the *infra* text accompanying notes 145-46. It is worth noting, however, that feasibility analysis will proceed in the very same way if we adopt an underlying test based on fairness. Imagine a social world such as our own except that the workings of the market economy satisfy the requirements of Rawls' difference principle. We would then say that the activities in question are valuable not because they passed a market test of cost-justification, but because they are part of an economic system that is to the advantage of all those who participate in it, including those worst off. This 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 principles that govern our market economy, not against feasibility analysis?

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 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 these products and the jobs they generate.

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 here 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 activities 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 for us. 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 way, an important part of the argument for tolerating "insignificant" risks of devastating physical injury. 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 including toy lighters as prizes in gumball machines are indistinguishable from a host of other remote risks, we must eliminate all of these risks if we choose to eliminate any 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-based 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 choose 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 shut down 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 is unacceptable. Perhaps we would be better off living without cotton milling, and perhaps we would be better off living without petroleum refineries (though I doubt it), but the more activities we add to the list, the less persuasive the claim that we are gaining value, not giving it up, becomes. 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 *would* almost certainly *not* be to the *ex ante* advantage of the workers employed by those activities and most exposed to their risks.[130]

Insofar as it is correct to claim that the case for shutting down 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 those activities would be made worse off in the long run, not better off, 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 they would not, in general, do so if their benefits were not to exceed their costs. 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, though, are not

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130 *Cf.* Whitman v. Am. Trucking Ass'ns, Inc., 531 U.S. 457, 466-67 (2001) (holding, in part, that section 109(b) of the Clean Air Act does not permit the Administrator of the Environmental Protection agency to consider implementation costs in setting national ambient air quality standards: "[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) 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.' 84 Stat. 1683 (emphasis added).").

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.

b. Feasibility Analysis in the Common Law of Products Liability

The general point that market demand alone cannot guarantee the value of an activity becomes even clearer when we consider the possibility of extending feasible risk-reduction from workplace risks to product risks. Bringing feasibility analysis to bear on product risks involves: (1) presuming that the products to which our test of justified precaution applies are beneficial because they have passed the market's test of value and (2) requiring products to be as safe as they can be without impairing their usefulness. The second element of the risk-utility test for product defectiveness articulated in *Beshada v. Johns-Manville Products Corp.*[131] embraces this second requirement:

> For purposes of analysis, we can distinguish two tests for determining whether a product is safe: (1) does its utility outweigh its risk? and (2) if so, has that risk been reduced to the greatest extent possible consistent with the product's utility? ... The second aspect of strict [products] liability ... requires that the risk from the product be reduced to the greatest extent possible without hindering its utility.[132]

Insisting that risk reduction not impair product usefulness sharply limits the critical bite of feasibility analysis. Some significant product risks cannot be feasibly reduced, because reducing the risk deprives the product of its usefulness. It is not, for example, feasible to eliminate the risk of devastating accidental (and intentional) injuries from sharp steak-knife blades, even though dulling knife blades to the point where they cannot cut human flesh poses no technological challenge at all. Dulling steak knives until they can no longer cut human flesh makes them unfit for their intended use. Tinkering a bit with our earlier discussion of the unusually great risks of motorcycles supplies another case in point.[133] Suppose that the exposed character of motorcycle gas tanks creates a significant risk of devastating injury, a risk that stands out in comparison with the background

131 447 A.2d 539 (N.J. 1982).

132 *Id.* at 545.

133 *See supra* text accompanying notes 84, 113.

risks of riding motorcycles.[134] Suppose, too, that we might reduce the risks of injury from gas tank explosions to the point of insignificance by encasing gas tank and passengers in separate, enclosed compartments. Would this precaution pass muster under the "feasibility" test? The answer, plainly, is no. The heightened risks associated with motorcycle gas tanks are inseparable from the characteristics that distinguish motorcycles from cars.[135] These characteristics define the activity of motorcycling; they give it its distinctive value as a form of recreation and mode of transportation. The greater safety of an encased passenger compartment separated from the gas tank comes at the price of killing the joy of the activity. The precaution transforms the activity of motorcycling to the point where it is no longer the same activity. The precaution is infeasible because it destroys the product.

In both of these examples, the case for cutting precaution off at the point where further precaution would impair the usefulness of the product rests on the first element of *Beshada*'s test being met: the product's usefulness must be greater than the risk that is its price. Some products plainly fail this test. Assault weapons, for instance, are widely banned, on the ground that the risks of their illegitimate use exceed whatever legitimate value they may have.[136] If we were to adopt a market test of value and use it to limit the reach of feasible risk-reduction, we would handle assault weapons differently. There is, after all, a market demand for such weapons. If we were to take that market demand to vouch for the product's value, we would cut precaution short at the point where further precaution impairs the product's usefulness. We would refuse, for example, to disable the capacity for continuous firing that makes assault weapons especially useful as instruments of mass murder. Yet limiting precaution in that way would strike most of us as perverse.

The facts of the assault weapons example are, of course, special. At least in part, the market demand for assault weapons derives from their special usefulness as instruments of mass murder.[137] At least in part, then, the market demand for assault weapons is generated by consumer preferences we wish

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134 This supposition is contrary to our earlier discussion and probably incorrect. *See supra* text accompanying note 84.

135 *See supra* text accompanying note 113.

136 *See, e.g.*, Cal. Penal Code § 12275.5 (Deering 2003) ("The Legislature has restricted the assault weapons specified in Section 12276 based upon finding that each firearm has such a high rate of fire and capacity for firepower that its function as a legitimate sports or recreational firearm is substantially outweighed by the danger that it can use to kill and injure human beings.").

137 The marketing director of the gun manufacturer whose assault weapons were used to kill eight people and wound six others in a rampage at a San Francisco law firm told the *New York Times* that "he welcomed damning criticism by law

not to satisfy but to thwart. That particular fear is not present in the case of most products, or in the case of the productive economic activities subject to feasibility-based risk regulation by OSHA. In more typical cases, the worry is that legitimate market demand is insufficient to vouch for the value of the product or activity, in light of its unavoidable risks. The original VW Beetle, for example, was driven off the market, in part by increasingly stringent regulation of automobile safety.[138] The judgment expressed by that regulation was that the Beetle's benefits were not sufficient to overcome its substantial risks, notwithstanding substantial consumer demand for the car. The hazards of a toy gun that shoots hard rubber pellets likewise could be found sufficient to make the whole product defective according to the Restatement (Third) of Torts (Products).[139]

The general lesson here is plain enough: just as there are games that are not "worth their candles" even though someone might like to play them, so too there are products and activities that are not worth their unavoidable risks, even though the market demands them. The presumption built into OSHA's practice of feasibility analysis that because the productive activities subject to that analysis flourish in our market economy, their value is comparable to and generally greater than any significant risks of devastating injury the activities may create is, therefore, open to question. And we have reason to question this presumption: the practice of feasible risk-reduction is justified by ideas of fairness, whereas the institution of the market is justified by the idea of efficiency. Activities that satisfy the test of efficiency may well fail to satisfy the demands of fairness.

4. Is Feasibility-Based Risk Regulation Fair?

We need to retrace our steps a bit. Whenever we press precaution beyond the point of cost-justification, we insist that some value requires us not to maximize the net economic value extracted from the activity whose risks are at issue. This decision to leave wealth on the table requires

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enforcement of the TEC-9, a popular weapon with criminals. He explained: 'I'm kind of flattered. It just has that advertising tingle to it. Hey, it's talked about, it's read about, the media write about it. That generates more sales for me." Merrill v. Navegar, 110 Cal. Rptr. 2d 370, 391 (2001).

138 *The New Beetle: 23 Smiles per Gallon*, L.A. Times, Feb. 19, 1998, at E1 ("in 1977, plagued by poor sales ... crimped by federal safety and pollution demands, the Beetle went away"). *Accord Volkswagen Pushing Memories with Beetle; Ever-Popular Car Not the Inexpensive Model of Old*, St. Louis Post-Dispatch, Feb. 22, 1998, at E8.

139 Restatement (Third) of Products Liability § 2(b) cmt. e at 21-22 (1997).

justification in terms of some value urgent enough to trump the claims of efficiency. Feasibility-based risk regulation draws its justification for pressing precaution beyond the point from considerations of fairness.

Fairness has to do with the distribution of benefits and burdens.[140] Unfairness presumptively exists when the burdens of a common enterprise are concentrated on some and the benefits of that enterprise are captured by others,[141] and even more so when the burdens are great and the benefits slight. It is unfair to make a few suffer devastating injury so that many may reap trivial benefits. 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. Taking the dilemma of accident law to be how to reconcile two essential conditions of rational agency (the freedom to pursue valuable ends and activities and security understood as the physical integrity of one's person) on favorable terms for a plurality of persons, we have advanced a particular criterion of fairness. We have argued that where devastating risk is concerned, practices of risk impositions are plainly fair when they reconcile these two conditions of rational agency in a way that is to the long-run advantage of either a representative member of a "community of risk" or a representative member

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140 *See, e.g.*, John Broome, *Fairness*, 16(I) Proc. Aristotelian Soc'y 87, 95 (1990-1991) ("[F]airness is concerned with only with how well each person's claim is satisfied *compared with* how well other people's are satisfied. It is concerned only with relative satisfaction not absolute satisfaction."). Fairness and individual (moral) rights are distinct moral phenomena. Rights allocate control over various decisions. They identify domains within which individuals are able to decide what to do, "without any coercive interference by or on behalf of society." Brian Barry, *Lady Chatterley's Lover and Doctor Fisher's Bomb Party: Liberalism, Pareto Optimality, and the Problem of Objectionable Preferences, in* Foundations of Social Choice Theory 11, 15 (Jon Elster & Aanund Hylland eds., 1986). *Cf.* Thomas M. Scanlon, *Rights, Goals, and Fairness, in* Public and Private Morality 93 (Stuart Hampshire ed., 1978) (distinguishing fairness and rights both from each other and from welfare).

141 *See* Keeton et al., Teacher's Manual, *supra* note *, at 20-6 to 20-7 ("[The] same idea of fairness that provides a rationale for enterprise liability [also justifies feasible risk reduction]. According to this conception, it is unfair to impose the burden of one's profitable activity on another, while reaping the benefit oneself; it is unfair to rig a common activity so that some bear its burdens while others reap its benefits."). *Cf.* Rawls, *supra* note 26, at 111-12 (when "a number of persons engage in a mutually advantageous cooperative venture according to rules, and thus restrict their liberty in ways necessary to yield advantages for all," a "principle of fairness" applies and requires each participant to do her part and accept an appropriate share of the scheme's burdens and benefits).

of the class of those most disadvantaged by the risks, unless an alternate reconciliation would work greater disadvantage to some other class of persons. For feasibility analysis to be fair in this sense, the long-run flourishing of the activities to which it applies must outweigh the significant risks of devastating injury that are the price of that flourishing. The benefit of those activities to those who bear their significant risks must be greater than the burden of the risks themselves. And here, there is cause for concern.

That concern has two sources. First, feasibility analysis depends on contingent social facts, and in quite a particular way. It equates the survival of particular productive economic activities with significant threats to our health and bodily integrity. OSHA's application of feasibility analysis assumes that shutting down activities such as the milling of cotton and the refining of petroleum is a harm comparable to, and generally greater than, bearing a significant risk of devastating injury at the hands of such activities. Extending feasibility analysis to a common law context — product design — involves counting the elimination of a class of products as a harm comparable to, and generally greater than, bearing a significant risk of devastating injury. Yet our attachment to these particular activities is historically and socially contingent. These activities were not comparably important to us once, and they will cease to be comparably important at some future point in time. This dependence on socially contingent facts seems to threaten feasibility analysis with arbitrariness and triviality. It seems that grave harms such as death and devastating injury may end up being equated to almost any loss, so long as that loss is of something sufficiently entrenched in our social world.

In part, this worry has its source in the discrepancy in the degree of contingency of the goods being compared. The importance of bodily integrity and physical health to effective agency is both clear and dependent on facts about us that are contingent, but only at a very deep level. So long as we are mortal and so long as our bodies are vulnerable to grave physical injury, death and devastating injury constitute the gravest of threats to our agency.[142] The importance of milling cotton or refining petroleum, by contrast, is less clear and is dependent on contingent facts that are much less deep, much more likely to change. The importance of particular types of products whose significant risks can only be reduced by impairing their usefulness (consider the significant risks of moderately priced

142 *But see* H.L.A. Hart, *The Minimum Content of Natural Law, in* The Concept of Law 189, 190 (1961) (pointing out the connection between "human vulnerability" and "the most characteristic provision of law and morals: *Thou shalt not kill*").

subcompacts or sport-utility vehicles, as well as motorcycles[143]) is even less clear. This discrepancy threatens the claim that the two kinds of burdens (devastating physical injury and shutting down major productive activities) really are comparable.

But this worry also has a second source, highlighted earlier. Feasible risk-regulation, as practiced by OSHA, accepts a market test for the value of the activities to which it applies. Feasibility analysis cuts its criticisms of significant risk short when pursuing that criticism would jeopardize the productive economic activities to which it applies. Feasibility analysis thus counts the continued vitality of basic productive activities as comparable to and valuable enough to justify bearing significant risk of devastating injury. The value of these activities is vouched for by the fact that they prosper in our market economy. The fear this acceptance of market value raises 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.

Let us take these worries in turn.

a. Comparability and Contingent Social Facts

Feasibility analysis is hardly unusual in its dependence on contingent social facts. Such dependence characterizes many legal norms, including both safety-based risk regulation and cost-benefit analysis. The case for prohibiting pesticide residue on agricultural products, when such residue would impose "significant" risk of devastating injury, for example, is justified by the contingent social fact of society's having achieved a level of abundance that makes greater agricultural productivity a luxury instead of a necessity. The dependence of cost-benefit analysis on contingent social facts is, if anything, even deeper than that of feasibility-based analysis.

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143 It is "infeasible" to make moderately priced subcompact cars as safe as larger cars or luxury small cars because of the expense. Sport-utility vehicles are unusually prone to roll over, because of their high and narrow wheelbase, but it is "infeasible" to eliminate this risk because that high, narrow wheelbase is essential to their off-road capacity. *Cf.* Denny v. Ford Motor Co., 662 N.E.2d 730, 738 (N.Y. 1995) (holding that a jury might reasonably find that the high, narrow wheelbase that made a Ford Bronco sport-utility vehicle more prone to roll over than a normal passenger car does not constitute a defect under the risk utility test, because the design and its risks were essential to the vehicle's off-road usefulness, but did constitute a defect under Ford's implied warranty of merchantability, because the vehicle was not "minimally safe for its expected purpose").

Professor Viscusi, a leading practitioner of cost-benefit analysis as applied to risks to life and limb, attempts to tease out the actual value that people do implicitly place on their own lives, not the value that they would place if their valuations were corrected for irrationality, imperfect information, and the effects of growing up under institutions that are not themselves fully cost-justified.[144] The effect of doing so, however, is to make the practice of cost-benefit analysis dependent on contingent social facts.

The acceptance of contingent social facts both by our laws and by the normative frameworks we invoke to justify them open both up to the charge of being instruments of denial and apology.[145] By accepting so much of our existing social world, law and legal justification suppress criticism and reform. Accepting contingent facts as fixed points hides their contingency; it transforms accidents of history, which might well be otherwise, into fixed and frozen arrangements. This cramps our legal and political imaginations, binding them too closely to our actual practices. It preempts criticism and makes it hard even to envision fundamental reforms. In short, the uncritical acceptance of contingent social facts converts the ideals we invoke to justify our law from powerful instruments of criticism into shameful apologies for flawed arrangements.

As a call to awaken ourselves and open our eyes to the character of the legal institutions and practices that surround us, this thesis of critical legal studies is well-taken and powerful. But any constructive concern with the dependence of feasible risk-reduction on contingent social facts must take more particular issue with the practice of feasible risk-reduction and point us toward its reform. We need to identify some way in which feasible risk-reduction betrays the values it invokes by accepting too much in the way of contingent social facts. Let us then revisit our own first premises and see how they might lead us to fault our present practices of feasible risk-reduction. Our first premise is that freedom to act (and so to impose risk) and bodily integrity are both essential conditions of rational agency. Other things equal, more of both is always desirable, and a substantial measure of each is necessary if we are to pursue our conceptions of the good over the course of complete lives. Within this framework, the importance of avoiding serious accidents is quite evident. So long as we are mortal beings

144 *See supra* text accompanying notes 36-39.

145 This critique has been pressed by the critical legal studies movement. *See, e.g.*, Robert Gordon, *New Developments in Legal Theory, in* The Politics of Law: A Progressive Critique 413 (David Kairys ed., rev. ed. 1990); Mark Kelman, A Guide to Critical Legal Studies 262-68 (1987); Roberto M. Unger, The Critical Legal Studies Movement 5-15, 118-19 (1986).

with vulnerable physical bodies, we will have reason to fear devastating accidental injury.[146]

Our mortality and vulnerability are, moreover, fundamental facts about us. Physical vulnerability and mortality have *always* characterized human beings and will continue to do so for the foreseeable future. By contrast, the importance to us of various activities whose elimination would eliminate significant risks of devastating injury (driving our own cars, milling cotton, refining petroleum, having reasonably inexpensive subcompact cars) depends on contingent 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 taken as proof that we can and should learn to live without them. We cannot live without intact bodies, but we can live without cotton shirts or private passenger automobiles. The importance to us of keeping our bodies intact, coupled with the socially 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 both sustain other conditions of rational agency and realize the diversity of values that give rational agency its point. Unless we believe that an equivalent range of values can be realized by the 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. So feasibility analysis cannot be faulted simply because it counts the continued flourishing of contingent activities 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 counts comparable. The right worry to have about feasible risk-reduction as we practice it is that it counts any activity

146 *Cf.* Hart, *supra* note 142.

that flourishes in a market economy valuable enough to justify imposing significant risk of devastating injury. Our first concern — our concern with feasibility analysis' dependence on contingent social facts — leads us to our second concern: that our practice of feasible risk-reduction relies on a questionable test of an activity's value.

b. Feasibility and Efficiency

The difficulty is that flourishing in a market economy vouches not for the fairness of an activity, but for its efficiency. Fairness requires that an activity that imposes a significant risk of devastating injury be to the advantage of those most burdened by it, in the sense that it reconciles their competing interests in liberty and security more favorably than eliminating the activity does.[147] The risks an activity imposes on those it most endangers (be they workers, as in the case of OSHA regulations, or consumers and users, as in the standard cases for product users) are fair to those it most endangers when shutting down that activity (or withdrawing that product) would make those most endangered by it worse off, not better off. An activity is efficient when it makes the pie larger — when it generates wealth, expands 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, we may wish to add, 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 if they were to refuse to participate. In the cases that we are concerned with, Pareto superiority means that workers, customers, and product users are made better off by accepting the jobs they accept and purchasing the products they purchase than they would be if they were not to accept those jobs or purchase those products, notwithstanding the significant risks of those occupations and products.

Pareto superiority guarantees advantage against the preexisting background of entitlements and opportunities, but it does not guarantee fairness.

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147 Bear in mind that matters are more complex when shutting down an activity would be to the advantage of those most endangered by it in the sense we have defined, but would impose a comparable burden on others who benefit from the activity. Then we must decide if the benefit to those others is greater than the burden of significant risk to the most endangered. In the kind of case we are considering, this would happen when the burden to shareholders and consumers of shutting down a major productive activity is greater than the burden to workers of bearing a significant risk of injury. In the analysis in the text, I shall ignore this more complicated case.

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 share they would be unwilling to accept from behind a "veil of ignorance," for example. Where risk of devastating injury is involved, a Pareto-superior transaction may burden the weaker party with an unfair risk — with 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 are influenced by these existing background conditions and inequalities. 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 parties would agree to if they ignore their particular advantages and disadvantages and seek only to agree upon terms that neither party could reasonably reject.[148] 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 guarantee that they are fair.

With this background in mind, let us consider the fairness of milling cotton, supposing that it is not feasible to both mill cotton and avoid exposing workers to a significant risk of brown lung disease. Is that activity valuable enough to justify the significant risk of devastating injury that is its unavoidable price? Milling cotton under the circumstances that we have supposed is fair to those workers endangered by it if those workers would be made worse off by the elimination of the activity. They will be made worse off if ending the enterprise saves them from exposure to a significant risk of severe health impairment, but also leaves them unable to secure employment at all comparable in its advantages (its wages, benefits, and general desirability) to milling cotton. The loss of anything approaching comparably advantageous employment counts as a harm greater than bearing a significant risk of brown lung disease. Conversely, the enterprise of cotton milling is unfair to those workers it most endangers if shutting it down would make them better off: if it would secure for them more protection of health and bodily integrity without extracting an offsetting and greater loss in the benefits that employment in the enterprise of cotton milling

148 On "reasonable rejection," see Scanlon, *supra* note 11, at 195-97, 202-18, 223-31.

confers. Shutting down the enterprise will make workers better off if those workers can find employment in other industries and that employment is as advantageous as milling cotton, without imposing cotton milling's significant risk of devastating harm to their health.[149]

Next, let us consider the fairness of selling subcompact cars, supposing those cars to be significantly less safe, even after all feasible safety features have been incorporated, than larger ones. The enterprise of selling subcompact cars is fair to those who purchase and use them if those purchasers and users would be made worse off by the disappearance of those cars from the marketplace — if, say, the disappearance of subcompacts left them with no real choice but to purchase larger but less safe cars on the used car market. It is unfair to sell a subcompact car even to "willing" purchasers — a matter of taking advantage of their ignorance or their inferior bargaining position — if the adopting of stringent safety measures would drive that car off the market and improve the well-being of its would-be purchasers by giving them access to safer cars at a sufficiently small increase in price.[150] It may have been fair, for instance, for stringent safety standards to drive the original VW Beetle out of the American automobile market.[151] The disappearance of the original Beetle from the market eliminated a significantly unsafe automobile without depriving consumers of subcompact cars of vehicles to purchase.[152] On the contrary, the stringent safety regulations that played a role in the disappearance of the original Beetle appear to have improved the lot of consumers of subcompact cars by securing substantially more safety without depriving would-be subcompact car buyers of the transportation of their choice. The improvement in their security was not cancelled out by a comparable decrease in their liberty.

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149 For this to be the case, the stringent safety regulations that shut down the cotton mills would probably also have to stimulate other, better employment opportunities. If equally advantageous but less dangerous employment preexisted the adoption of the regulation, the workings of the market would, presumably, tend to drive cotton mills out of existence. Who would bear its significant risks without any substantial offsetting advantage? If this is so, it is a practical reason why OSHA should practice feasibility analysis as it does.

150 Recall that a full statement of what fairness requires would add the clause "without working a comparable hardship on anyone else." *See supra* text accompanying notes 36-39. We are ignoring this complication for purposes of simplicity.

151 *See supra* note 139.

152 For completeness, we can add "and without working a harm comparable to the risk of devastating injury characteristic of VW Beetles on anyone else."

c. Valuing Activities: Feasibility, Fairness, and Efficiency

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, in both its statutory and common law incarnations. 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 similarly assured. 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. 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. Activities that are efficient but unfair are activities that unjustifiably burden those they most disadvantage. Unfair activities could be conducted on terms that would make those they most disadvantage better off, without imposing a comparable burden on anyone else (on any other class of persons burdened or benefited by the activity). When feasibility analysis counts the continued flourishing of efficient but unfair activities a value great enough to justify bearing significant risk of devastating injury, it appears to be reneging on its promise of fairness. Feasible risk-reduction, it seems, should press the claims of fairness further. An activity should be counted valuable enough to justify significant risk of devastating injury only if: (1) it is to the advantage of those most endangered by it in the sense that its disappearance would leave them with less favorable conditions for the exercise of their rational agency or (2) ending the activity would impose a greater disadvantage on another class of persons affected by the activity — would make the conditions for the exercise of their rational agency even less favorable.

Conceptually, it is easy to imagine how we might press the claims of fairness further than does feasible risk-reduction as presently practiced. Two paths suggest themselves. The first path suggests itself when we take the

position of ideal legislators, fixing the respective domains of the safety and feasibility norms. When those most endangered by an activity would be made better off by the elimination of its significant risks and no other class of persons would be made to bear a comparable burden by the elimination of the activity, we should insist that the activity satisfy the more rigorous standard of safety-based risk regulation or else pass from our social world. Feasible risk-reduction should govern either activities whose presence in our social world is to the advantage of those they most endanger or else activities whose disappearance would work a greater hardship on other classes of persons affected by the activity than the hardship that their significant risks work on those they most endanger. Safety-based risk regulation should govern activities whose presence in our social world is not valuable enough to justify bearing significant risk of devastating injury. If we are right to think that a nontrivial number of the activities that flourish in our economy are not fair, not valuable enough to justify the significant risks that are the price of their presence in the world, we should expect this approach to expand the domain of safety-based risk regulation and shrink the domain of feasibility-based risk regulation.

The second path is most attractive when we assume the position of common law judges, seeking to make our law the best that it can be. We should follow the lead of the New Jersey Supreme Court in *Beshada*, whose embrace of a common law variant of feasible risk-reduction was one piece of a two-part standard of acceptable product risk:

> For purposes of analysis, we can distinguish two tests for determining whether a product is safe: (1) does its utility outweigh its risk? and (2) if so, has that risk been reduced to the greatest extent possible consistent with the product's utility? The first question looks to the product as it was in fact marketed. If that product caused more harm than good, it was not reasonably fit for its intended purposes. We can therefore impose strict liability for the injuries it caused without having to determine whether it could have been rendered safer. The second aspect of strict liability, however, requires that the risk from the product be reduced to the greatest extent possible without hindering its utility. Whether or not the product passes the initial risk-utility test, it is not reasonably safe if the same product could have been made or marketed more safely.[153]

153 Beshada v. Johns-Manville Prods. Corp., 447 A.2d 539, 545 (1982) (citation omitted).

Common law courts should be willing, in other words, to judge some products — and, by extension, some activities — not worth having because their significant risks of devastating injury are not offset by some comparable benefit.

Both of these paths will prove well worth pursuing in many cases. But there are reasons to think that other paths may also be worth pursuing, and perhaps even more so. Feasibility analysis as presently practiced by OSHA already sets the Agency a formidable institutional task. Figuring out if and how major productive activities can reduce their principal risks of serious physical injury without jeopardizing their long-run vitality is a complex and challenging undertaking, in both its technological and economic dimensions. Figuring out just which major productive activities should be driven from our world because the workers they endanger would be better off without them is an even more heroic undertaking, a worthy task for an omniscient legislator at least, if not an omniscient God. Questions of institutional competence give us equal reason to pause when we consider the common law analog to feasible risk-reduction. Deciding if the Ford Pinto's gas tank presents a "significant" risk of injury that it is feasible to reduce is a difficult but manageable task. Deciding if consumers would be better of without Ford Pintos is not a decision a judge or jury is well situated to make, especially on the basis of the facts developed in the course of litigating a particular injury. Negligence has never been widely and effectively applied at what economists call the "activity level."[154] Courts may sometimes be able to make well-founded judgments that an activity's benefits do not justify the harm that is its price, but it seems unlikely that they will be able to do so routinely.[155]

The larger problem here is that the fairness of market transactions, and of the activities that emerge out of 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

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the ongoing operation of the market must be regularly adjusted in order to maintain 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, accident law institutions 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[156] 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 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 indirect, not direct. It may not be best to extend the practice of feasibility analysis in regulatory and common law so that it regularly appraises the value of the activities whose risks are at issue, in light of the conception of fairness we have embraced. It may be best to seek to achieve 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 satisfy a principle of fairness. (Rawls' difference principle is one such principle.) The economic activities that would flourish in such a social world would be counted fair not because they pass a market test of cost-justification, but because they arose out of a fair background situation, through procedurally fair transactions, and flourish in an economic system governed by principles of justice that ensure that the economic system works to the advantage of all those who participate in it, even those it most disadvantages. 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

156 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 *, at 20-7.

enough to justify bearing a significant risk of devastating harm would stand on firmer ground.

Of course, the best way of realizing fairness at the level of activities under ideal circumstances (or very favorable ones) may not be the best way to do so under our present, less than ideal, circumstances. For us, it may often be the case that the best way to achieve fairness at the level of activities is by incorporating the evaluation of activities into the practice of feasible risk-reduction, where possible. This, question of strategy, however, lies beyond the boundary of our present inquiry.

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. 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. Activities that are efficient but unfair are activities that unjustifiably burden those they most disadvantage. Unfair activities could be conducted on terms that would make those they most disadvantage better off, without imposing a comparable burden on anyone else (on any other class of persons burdened or benefited by the activity). When feasibility analysis counts the continued flourishing of efficient but unfair activities a value great enough to justify bearing significant risk of devastating injury, it appears to be reneging on its promise of fairness. Feasible risk-reduction, it seems, should press the claims of fairness further. An activity should be counted valuable enough to justify significant risk of devastating injury only if: (1) it is to the advantage of those most endangered by it in the sense that its disappearance would leave them with less favorable conditions for the exercise of their rational agency or (2) ending the activity would impose a greater disadvantage on another class of persons affected by the activity — would make the conditions for the exercise of their rational agency even less favorable.

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