

PERSPECTIVES

On the Professions

A periodical of the Center
for the Study of Ethics in
the Professions (CSEP),
Illinois Institute of Technology

HUB Mezzanine, Room 204, 3241 S. Federal Street, Chicago, IL 60616-3793
Tel: 312.567.3017, Fax: 312.567.3016, email: csep@iit.edu

Vol. 9, No. 2

January 1990

"Ethics and Risk Assessment"

Michael Davis, Editor, CSEP,
Illinois Institute Of Technology

The longer I serve as editor of Perspectives, the fewer ideas I have for issues and the more I rely on readers' suggestions. This issue began with such a suggestion.

I must admit that initially I did not think it a very good suggestion. Too broad. Too obvious. How can one think about ethics without thinking about risk? What is life if not risk?

Yet, everyone I asked thought risk would make a good issue. As one colleague put it, "Risk is hot:"

Still, the topic was too broad. So, I asked "risk experts" that is, people who had written about risk how I might narrow the topic. I soon began hearing about risk assessment. All professionals take risks. Hardly anyone objects so long as the risks are within acceptable limits. But how do we decide whether a certain risk is within acceptable limits. The first step is assessing the risk.

Suppose, for example, that you are an economist asked to advise Congress on legislation limiting the use of carbon based fuels. If you knew that burning such fuels at the present rate would so heat

the surface of the planet that life would end in two centuries, you would have little difficulty endorsing any necessary legislation, however burdensome. If, on the other hand, you knew that burning carbon-based fuel even at much higher rates than now would do little harm to life here, you would probably not endorse any sacrifice at all.

Today, however, climatologists and meteorologists are divided on the probable climatic consequences of burning carbon-based fuels. They don't agree that global temperature has changed as a result, how much it will change, when it will change, or what effect any change will have on global climate or human society. So, you must make your recommendation in a sea of uncertainty. And any recommendation, even "Do nothing" or "Further study," is risky. (Time might be working against us.) Where should you begin? What place does ethics have in such dark waters? That is our subject.

Mary Gibson's piece is adapted from an entry in the Encyclopedia of Ethics, edited by Lawrence Becker and soon to be published by Garland (and published here with their kind permission). Gibson, a philosopher, sets the stage for the pieces to follow. Her second sentence identifies a "normative judgment" implicit in

every judgment of risk. Risk is a complex of fact and value; risk assessment, as much an assigning of value as a weighing of facts. Both consent and justice have a part in determining acceptable risk.

Kristin Shrader-Frechette, another philosopher, then offers a critique of the way risk is commonly assessed." Risk-benefit analysis" rests on the same egoism, hedonism, and utilitarianism as most other forms of economic analysis. It systematically ignores costs to third parties, natural resources, and public goods morality requires us to take into account. Shrader-Frechette concludes by recommending that we find ways to supplement risk-benefit analysis to compensate for these economic deficiencies.

Alan Neff, a lawyer teaching at IIT's business school, dissents in part from Shrader-Frechette's critique. Risk assessment normally takes into account more than Shrader-Frechette thinks, including costs to third parties, natural resources, and public goods. For Neff, the risk in risk assessment lies elsewhere. Risk assessment is more art than science. The assumptions of a particular assessment are not "deductive" (that is, the product of a science). They are instead an expression of the assessor's judgment, her sense of what should count. The assessment is

only as good as the assumptions on which it rests. They deserve careful examination.

Our last piece (by Edwin Levy) may seem out of place here. The subject is not economic risk assessment but when as experimental drug should be released for use by people who will probably die without it. Indeed, the piece never mentions economic assessment. It is, nonetheless, plainly concerned with identifying risks a conventional cost-benefit analysis might omit. Here is risk assessment both Shrader-Frechette and Neff can applaud.

Interestingly, Levy, who once taught philosophy at the University of British Columbia, is today Manager of Regulatory Affairs at a private corporation. Part of his job is getting regulatory approval for a new cancer treatment called "photodynamic therapy." His argument here clearly grew out of very practical concerns.

"Risk: A Primer"

Mary Gibson, Rutgers University

A risk is a likelihood of injury, damage, or loss. The concept has two elements: a normative judgment of a possible event or condition as adverse plus the chance or probability that it will come about. The magnitude of a particular risk is often thought of in terms of the severity of the potential harm weighted by the probability of its occurrence; a low probability of a serious harm

may thus be seen as equivalent, in magnitude of risk, to a higher probability of a less serious harm. It may then be suggested that the acceptability of a given risk is determined by its magnitude, and hence that risks of equal magnitude are, or ought to be, equally acceptable (or unacceptable).

This way of thinking may be misleading, however, in at least three ways: (1) It suggests an often unattainable degree of precision in estimating the probabilities of the events that concern us. (2) It suggests commensurability of harms of very different sorts (loss of home, sight, life, loved one) that may occur in very different ways (during recreation, due to storm or earthquake, intentional or negligent actions of others, etc.). These and many other factors are morally and psychologically relevant to individual and social judgments of acceptability. (3) It suggests that it makes sense to think in terms of a general level of acceptable risk for a person or for a society. But to look for a general level of acceptable risk is like looking for a general fair price. Price for what? No risk is acceptable if it does not bring with it some benefit and it matters both whether those who bear the risk consent to bear it and whether they themselves reap the benefit.

Consent. Scarcely any activity can be carried on that does not impose some risk on someone? Often not (only) upon the agent, but upon others. We are not always morally required to obtain the explicit consent of others. We are not morally required to obtain the explicit consent of everyone potentially at some risk from an act such as driving to work or turning on the furnace before we

may perform it. Some risks, though, such as those involved in medical research, may not be imposed without the explicit informed consent of those potentially at risk. There may be risks it would be morally impermissible to impose even with informed consent. How should we distinguish cases where consent is required from cases where it is not (and from cases, if any, where it may not suffice)? What, if anything, should count as consent in situations where direct consent is unfeasible or unreasonable? Is there a role for such a notion as implicit or hypothetical consent to risk? There are serious limits to the justificatory force of implicit or hypothetical consent. Inferring implicit consent by workers to workplace risks, for example, presupposes that workers are fully informed about the hazards they face, that they have reasonable alternatives available if they find the risks unacceptable, and thus that they are satisfied with the wage risk packages they currently get. Each of these assumptions is subject to serious question. To extrapolate from labor market behavior to other areas of life and infer implicit consent to risks of "equal magnitude" compounds the problem. Similarly, insofar as the moral significance of consent derives from respect for the autonomy of those whose consent is sought, appeals to hypothetical consent may be poor substitutes for the real thing. Providing for meaningful participation in the decision by those potentially at risk may more fully respect their autonomy (though, admittedly, even purely self-imposed risks raise issues of whether there are duties to the self that may be violated and of the justifiability of paternalism).

Justice. Risks resulting from an activity or policy may be borne wholly or largely by some members of a community, while the benefits are shared equally, or enjoyed entirely by persons other than those at risk. In such cases, it may be possible (and perhaps even obligatory) to compensate in some way those who bear the risks (and perhaps to compensate further those for whom the risk turns out badly) so that the interests of those at risk are not sacrificed either for the common good or for the benefit of others. (Questions would remain as to whether prior consent to such a risk-compensation package would be required.) The requirements of justice may differ depending on whether those who would be at risk from an activity already bear a disproportionately larger or smaller share of risks or are antecedently worse or better off in other ways than those who would benefit. How much weight one believes such considerations ought to have will depend in part on one's general moral views-the relative importance one attaches to individual rights, the general welfare, and social equality, for example. Equity considerations arise between local communities, regions, and nations as well as between individuals or groups within a community. What are our moral obligations in cases where those potentially at risk do not yet exist? We cannot ask their consent, and it does not seem reasonable to ascribe rights to persons who do not exist-and who may or may not exist, depending in part on our decisions. Yet, it does not seem morally acceptable to ignore the potential effects of our policies on future generations. How, then, should these considerations enter into our decisions?

Facts and Values. Because the concept of risk involves two elements, chance and adversity, some propose that decisions concerning risk involve two fundamentally different sorts of activity:(1) measurement or estimation of risk and (2) evaluation of its acceptability. The first is thought to be factual, objective, and scientific, while the second is normative, subjective, and personal or political. Many practitioners and theorists of risk assessment insist that their function is restricted to the first, while the second is the job of individuals or the policy makers who represent them. Others argue that there are normative and subjective elements present throughout the process-beginning with the judgment that a possible outcome is adverse and hence its possibility constitutes a risk, and continuing with judgments as to how conservatively to estimate probabilities, how to frame risks (whether in terms of probability of adverse or favorable outcome), what comparisons and alternatives to represent in characterizing the nature and magnitude of risk, and so on. They maintain that the factual and evaluative components of risk decisions are inextricably intertwined, and hence that the widely accepted division of labor in the decision process is ill-conceived.

"The Risk of Seduction in Risk Assessment"

Alan Neff, Illinois Institute of Technology

A branch of economics called "environmental economics" has been trying to establish monetary values for social externalities,

natural resources, and public goods such as water quality. It uses the following methods: the "averting behavior" method, the "weak complementarity" method, the "hedonic market" method, and the "direct questioning/contingent valuation" method.

I won't discuss these in detail here, but I will note their premises. The "averting behavior" method assumes that the value of environmental quality can be measured by examining expenditures on market goods that compensate for reductions in the quality of environment (e.g. water filters purchased to clean up the effects of water pollution). The "weak complementarity" method, used primarily to assess the value of outdoor recreation, assumes that variation in the intensity of use of outdoor sites for recreation can be explained by their relative environmental quality, and that absolute and relative monetary values can be assigned to environmental quality by comparing the costs of visiting different sites. The "hedonic market" method begins from the assumption that environmental quality is part of a bundle of linked characteristics that account for difference in price assigned, say, to residential property. Finally, the "direct questioning/contingent valuation" method surveys respondents and asks them to state how much they are willing to pay for an environmental amenity.

As should be apparent from this quick summary of methodological premises, all these economic approaches to environmental qualityan immeasurable variable-attempt to find its economic value by measuring the measurable and assigning to that measurement an added meaning: the cost or benefit

<p>of environmental quality.</p> <p>Professor Shrader-Frechette has identified three methodological and ethical problems in economic cost benefit assessment: (1) Can social gains and losses be expressed numerically in market prices? (2) Can distributive effects be ignored, provided that overall benefits exceed overall costs? and (3) Can benefits and risks be defined correctly in terms of egoistic hedonism? I believe with her that these are genuine problems affecting the rigor and utility of these methods. I disagree with her only when she asserts that market prices fail to account for social costs, externalities, natural resources, or public goods. Market prices account for these variables, but in a non-obvious way. Let me explain.</p> <p>About 45 years ago, Friedrich Hayek argued that (1) non-centrally planned markets are the most efficient means of conducting markets and (2) a price established for a good or service is the most efficient way to inform transactions in that market because the price represents the aggregate quantity and quality of information known relevant to a good or service. Environmental quality is part of a bundle of linked characteristics that account for difference in price assigned, say, to residential property. Finally, the "direct questioning/contingent valuation" method surveys respondents and asks them to state how much they are willing to pay for an environmental amenity. As should be apparent from this quick summary of methodological premises, all these economic approaches to environmental quality attempt to find its economic value by measuring the measurable and</p>	<p>assigning to that measurement an added meaning: the cost or benefit of environmental quality.</p> <p>Professor Shrader-Frechette has identified three methodological and ethical problems in economic cost benefit assessment: (1) Can social gains and losses be expressed numerically in market prices? (2) Can distributive effects be ignored, provided that overall benefits exceed overall costs? and (3) Can benefits and risks be defined correctly in terms of egoistic hedonism? I believe with her that these are genuine problems affecting the rigor and utility of these methods. I disagree with her only when she asserts that market prices fail to account for social costs, externalities, natural resources, or public goods. Market prices account for these variables, but in a non-obvious way. Let me explain.</p> <p>About 45 years ago, Friedrich Hayek argued that (1) non-centrally planned markets are the most efficient means of conducting markets and (2) a price established for a good or service is the most efficient way to inform transactions in that market because the price represents the aggregate quantity and quality of information known relevant to a good or service, in a short-hand available to all buyers and sellers in that market. Hayek was criticizing the efficiency claimed for centrally planned economies. In his view, no central planner can have all the information about all the attributes of the market at any time. Information is dispersed among the buyers and sellers. Pricing, in his view, summarizes efficiently all the demand and supply information available about the market in the only signal available to all participants.</p>	<p>I agree with Hayek: sellers price their products and services in light of all they know or believe about the supply and demand characteristics of their market; buyers pay, or refuse to pay, sellers' prices on the basis of all they know or believe about their market. By this I do not mean that decentralized markets are "equitable." I mean only that prices convey all the available information about the condition of the market in a concise signal. "Information;" as W. Schramm said, "is anything that reduces uncertainty."</p> <p>How do I merge these observations about price as an informational signal and information as anything that reduces uncertainty? Consider this example:</p> <p>A consumer with a limited supply of money is considering whether to purchase a new car. She might have several options: several dealers and several prices of a specific car in which she is interested.</p> <p>Many things will influence her decision. Certainly she will be influenced by what she knows about the quality and features of the cars and the dealers. She will also be influenced by her knowledge of how else she could use her money and of her own needs and desires. Her information about these things will reduce her uncertainty and she will positively value that information.</p> <p>Yet, it doesn't matter whether she "rationally" costs out her options and chooses one or instead chooses impulsively. Either way her choice is influenced (consciously or unconsciously) by what she does not and cannot</p>
--	---	--

know: which choice will satisfy her. She cannot know which choice will satisfy her when she is deciding because that information about her ultimate satisfaction which would minimize or eliminate her uncertainty-is in the future, when she will have made (and must live with) her decision.

Thus, in assessing her choices she necessarily will evaluate the probable benefits and costs of her choice in terms of her information and her uncertainty. And she inevitably will attach her net assessment of those benefits and costs to the price she decides to pay (or to forego paying) for a car. The price she decides to pay represents in shorthand how she monetarily values her information and her residual uncertainty about that specific decision.

The consumer is engaged in risk benefit assessment. She is juggling what she knows and doesn't know about herself in order to decide what to do. And she will translate her assessment into market conduct.

These observations are relevant here. We have developed our risk assessment tools to aid or justify our public and private decision-making. We use risk assessment to value what we know and don't know about situations in which we can or must make choices. Risk assessment, when it is rigorous, enables us to identify and value our information and our uncertainty. Inherent, therefore, in any kind of risk assessment, including risk-benefit assessment, is a large amount of irreducible uncertainty-owing to our incomplete knowledge of the past, present, and future.

This is the most significant problem inhering in risk

assessment. Prices represent buyers' and sellers' conclusions about what they know about goods and services and what they don't know. Risk assessment, no matter how methodologically rigorous or ethically scrupulous, no matter whether it accounts for the differences between "price" and "value;" must assign a current value to uncertainty, in order to arrive at a comprehensive price for a risk or its associated benefit. Risk assessment assigns to uncertainty the value today of some product or service, some risk or benefit, whose value we cannot yet know.

When risk assessors attempt to apply their techniques to the value of environmental protection or resource conservation, they face uncertainty of huge dimensions. Environmental risk-benefit assessment manipulates poorly understood phenomena comprised of innumerable variables with relatively new and unsophisticated tools. Uncertainty dominates environmental cost-benefit analysis. Analysis of environmental quality's "price" and "value" thus may understate, overstate, or accurately state its "true" value.

For these reasons, environmental risk assessment is itself a risky business. We should recognize its limitations. We should examine it whenever we use it.

Yet, we need risk-benefit assessment in public decision-making about environmental quality. Risk benefit assessment permits us to identify, through careful criticism and refinement of assessment methods, what we know and don't know about environmental risks. It thus obliges us to confront uncertainty, and it obliges us to put a price on

uncertainty-about the future and about the methods we use to anticipate the future. Risk assessment enables us to recognize that risk assessment itself is an activity to which costs and benefits attach the cost of the labor of risk assessment and the benefits that might accrue from its contribution to policy-making.

Because it deals in known and unknown attributes of the past and present and the unknowable attributes of the future, risk assessment can be deductive in only one sense: taken together, the context and process of any assessment will force a conclusion. Otherwise, risk assessment is far from deductive: the definitions and premises an assessor chooses for an assessment, the tools she employs to collect data, and the analysis that ensues are all shaped by the assessor's judgments. If that aspect of risk assessment is ignored, risk assessment will seduce us ...and betray us in the bargain.

"When Should an Experimental Drug Be Made Widely Available to Persons Suffering From a Catastrophic Condition?"

Edwin Levy, Quadralogic Technologies, Inc., Vancouver, B.C.

On October 21, Drug Administration States announced new rules for accelerating access to treat life-threatening and severely debilitating conditions. Although the new rules, and other measures that have been

announced since last year, are seen mainly as a response to the AIDS epidemic, the changes apply to all serious conditions. I am involved in shepherding a new type of anti-cancer treatment through regulatory agencies and I welcome FDA's initiatives. They are a significant step forward and will undoubtedly help prompt reexamination of regulatory approaches worldwide. However, I think it important to reflect on some of the ethical issues that bear on access to experimental drugs, and in particular the possibility that early access by current sufferers risks harm to future sufferers. Understanding drug development and regulation, as well as the general ethical principles involved, will help ensure that the effects of earlier access are beneficial.

The "catastrophic case" may seem quite straightforward from the point of view of ethics. On what ethical grounds could one refuse an experimental drug to a person who will almost certainly die if he does not receive it? One ethical principle on which to base a refusal is paternalism. Here paternalism is roughly the view that the patient's conception of his or her own good should be overridden because the experimental drug has not yet been judged safe and effective according to the current canons of drug regulation. Paternalism has not enjoyed great favor in recent years. It certainly will not win the day here. Because the patient is facing near maximum risk and experimental drugs hold out the possibility of some benefit, denial of the experimental drug can hardly be considered in his best interest.

Does this conclusion mean that there are no ethical grounds for

denying experimental drugs? No, I think at least one ethical principle does weigh against giving people even in life-threatening situations open access to experimental drugs. Note that I said "weigh:" I do not believe this principle-or any combination of other ethical principles can provide a full justification for denying experimental drugs to people in such situations. Other considerations are relevant too.

The ethical principle I have in mind may be stated in this way: The desires of an individual can be overridden by a legitimately constituted authority when failure to do so is likely to undermine the well-being of society as a whole or large numbers of fellow citizens.

Perhaps the most obvious way that this principle bears on the case at hand is that, arguably, early access will make it difficult to recruit patients for clinical trials. Thus, the safety and efficacy of new drugs may never be scientifically demonstrated.

This point is less poignant for AIDS than for most other catastrophic conditions because AIDS support groups are sufficiently organized to ensure enough volunteers for clinical trials even if the drug in question is also available under less strict conditions.

Appreciation of the relevance, though not necessarily the persuasiveness, of the principle requires understanding drug development and regulation. What happens after a university researcher holds a press conference to announce to the world that she has discovered a chemical that significantly enhances the immune system or a

drug that attacks cancer cells without harming normal tissue? Though such announcements are usually accompanied by cautions that a great deal more testing will be required to ensure that the material is actually effective and safe, probably few know what that disclaimer means in detail.

Almost certainly the drug will not have been tested in humans at the time of the announcement. Before it is administered to humans it will have to undergo a number of tests in animals or cell cultures to establish doses at which toxicity can be expected. These toxicological tests cost a great deal of money-from several hundreds of thousands of dollars to several million-so someone must be found to underwrite the cost.

That "someone" will almost certainly be a major pharmaceutical company. It will have to address a range of business questions, for example: Can it get a patent on the material or some other proprietary protection? After spending a minimum of \$50 million and 5 years or so in getting the drug through the regulatory process, will the market for the product be large enough to justify the expense?

In addition to these business questions, the company will have to answer innumerable scientific and technological questions such as: Can the manufacturing process be replicated? Is the material stable? What is the best way to formulate the material so that it is effective in humans-as a powder or a liquid, taken by mouth or intravenously?

There are many steps leading from "discovery" at the university

through toxicological testing to human trials. Then there are three phases of human trials: Phase I is usually done on at most a few dozen subjects and is designed to test the safety of the product. Phase II is done on roughly 100 subjects and tests the dose sizes and, somewhat, the efficacy. Phase III usually involves several hundred subjects and compares the safety and efficacy of the new drug with those currently in use.

What we see is a long (and costly) process beginning in basic science, continuing into a development phase, and ending in clinical trials. As this process unfolds more and more scientific information is gathered about the drug and its positive and negative effects. Clearly, the earlier access is permitted, the less is known about the drug; and the less known, the greater the possibility of undesirable consequences. The obvious danger is that faced by individuals, namely that very sick people will be harmed seriously or taken advantage of by unscrupulous quacks.

Less obvious and perhaps more dire from an ethical point of view is that releasing drugs early could cause harm to collectives or society as a whole by undermining the scientific assessment of drugs in general. After all, at some point drug companies will say to themselves, "Why are we spending billions of dollars a year on medical research and clinical trials when someone can come along and claim that seagull droppings cure cancer and get away with marketing it?" This is where my principle comes in:

The drug development system, though certainly not fault-free, has done a creditable job of providing

a reasonably steady stream of drugs that we have scientific grounds for believing are safe and effective. Other things being equal, it is of course right to make drugs immediately available under catastrophic conditions. But things are not necessarily equal. Giving current sufferers early access to drugs may jeopardize a very much larger number of future sufferers.

I believe that this consequence must be considered, but I do not believe it is by itself conclusive. The new initiatives in the U.S. and some other jurisdictions are on the right track. But implementation of the new rules requires radical changes on the part of all those involved:

- Physicians administering experimental drugs outside of strict clinical trials will have to collect information.
- Regulatory bodies will have to ensure that that information can be used as data.
- Drug companies will have to be convinced to cooperate in making the drug available.
- Patients will have to ensure enough volunteers for full clinical trials and will have to forego some liability claims in return for earlier access.
- The public will have to understand the complexities of the issues. If these conditions are met, experimental drugs will be made more readily available to persons in catastrophic situations without harm to future sufferers.

"Ethics and Risk-Benefit Analysis"

Kristin Shrader-Frechette,
University of South Florida

Approximately two million carloads of hazardous materials (e.g., liquefied petroleum gas, sulfuric acid, anhydrous ammonia, liquid caustic soda) are shipped annually in the U.S. According to a recent study of railroad technology done by the U.S. Office of Technology Assessment (OTA), roughly 65 percent of these tank cars are annually involved in the release of hazardous material. The OTA also confirmed that U.S. railroads have double the number of serious accidents, per train mile, as Canadian railroads. Despite these facts, the OTA study concluded that no new laws or regulations were needed to reduce U.S. rail accidents.

How could the U.S. railroad accident rate not be seen as a problem? And why did the OTA recommend no new regulations? At least one reason is that the OTA analysis followed classical risk-benefit, market methodology in assessing railroad risks. In so doing, the OTA study ignored the non-market costs or externalities associated with railroads. Externalities in this case include things like the social costs of evacuations and the pollution from derailments. By excluding non-market costs, the OTA study overestimated the benefits of current railroad policy and underestimated the risks associated with it.

A variant of cost-benefit analysis, risk-benefit analysis (RBA) consists of evaluating a proposed action in terms of the monetary values assigned to each of the various risks and benefits associated with the action. Each monetary assignment is made by calculating the "compensation variation" (CV) associated with a particular risk or benefit. The CV is the amount of money whose loss or gain, respectively, would perfectly compensate a person for the benefits or risks associated with a hazardous activity. (For example, a person living near a proposed airport might claim that a CV of \$1000 per year was necessary to compensate him for the risks associated with airplane noise and crashes.) If the CV's of the gainers (e.g., those who benefit from the airport) are added to those of the losers, and if the resulting sum is positive, then the benefits outweigh the costs and risks, and the economic action (e.g., building a new airport) is usually judged acceptable. If the CV's of the gainers are added to those of the losers, and if the resulting sum is negative, then the costs and risks exceed the benefits, and the action is typically judged questionable.

Many of the important ethical problems associated with risk-benefit analysis concern how to assign a numerical or monetary value to each of the risks, costs, and benefits associated with a proposed action, e.g., transporting hazardous materials by railroad cars. Some of the more questionable assumptions built into the assignment of numerical values, by means of CV's, are: (1) that the gains and losses can be expressed numerically, on the basis of market prices; (2) that distributive effects can be ignored,

provided that overall benefits exceed risks; and (3) that benefits and risks can be defined in terms of individual preferences.

Expressing risks and benefits in terms of market values, assumption (1) is particularly problematic because it ignores Aristotle's distinction between price and value. Price is a measure merely of the intensity of human wants, but value is a measure of the intensity of ethically desirable human wants. Hence, it is arguable that market price does not measure value. Moreover, as Kenneth Boulding warned, the concept of value always includes an integrative system or "grants economy" involving things like love, duty, honor and community. None of these has market value; yet, without them, there could be no market economy.

Apart from ethical limitations, there are several economic reasons why market prices diverge from authentic values. Market values ignore social costs or externalities (as the railroad example showed), as well as the distorting effects of monopolies and speculative instabilities. Market prices also assign a zero value to natural resources, public goods (e.g., public education), and free goods (e.g., clean air). Hence, by definition, RBA undervalues risks to natural resources and public goods.

The economists' rationale for failure to include externalities and natural resources in their analyses is that it is impossible to assign an objective numerical value to such parameters. They claim that because social costs (like the risk of evacuation) and natural resources (like air) are not priced or traded on a market, they are

external to economic evaluations.

Such a response, however, seems ethically questionable. It ignores the interests of persons in breathing clean air and drinking clean water, merely because common resources have no market value. It also ignores the rights of potential risk victims (e.g., those evacuated) to equal protection and to compensation for the risks they bear. Indeed, if Oscar Wilde is correct that a cynic is someone who knows the price of everything and the value of nothing, then RBA might dictate policy that is cynical as well as unethical.

RBA has also been attacked on ethical grounds because of its presupposition (2) that the distributive effects of an action can be ignored. Built on a utilitarian ethics that attempts merely to provide the greatest amount of good for the greatest number of persons, RBA ignores the fact that one subset of persons (e.g., those living along toxic waste transport routes) might receive a disproportionately greater share of overall risks or benefits. Questionable on grounds of equity, RBA implicitly condones a "politics of sacrifice" in which certain minorities bear much higher, uncompensated risks that benefit society as a whole.

Another fundamental ethical controversy is whether RBA errs in presupposing (3) that benefits and risks are defined in terms of individual preferences and egoistic hedonism. Many ethicists would argue that such a definition ignores the distinction between fulfilling wants and securing justice, or between utility and morality. Moreover, they argue,

societal welfare is not merely the aggregate of individual, egoistic preferences. It obviously would not serve societal welfare, for example, if everyone behaved egoistically during a gasoline shortage and attempted to maximize his personal stock of fuel. A recent OTA assessment of automobile technology illustrated this point quite effectively. Using the norm of egoistic hedonism, the study concluded that, because "personal mobility" was important to each individual, future group welfare was best served by private automobiles, rather than by expanded use of mass transit. Following classical economic (RBA) methods, the OTA study defined social welfare as the aggregate of individual preferences, even though it admitted that, by the year 2000, its sanctioned automobile policy would cause more than half the U.S. population to be exposed to extremely hazardous levels of automobile-generated pollution. One solution to some of these ethical problems with risk/benefit analysis is to introduce ethical weights into economic methodology. For example, if a particular risk is inequitably distributed, then this inequity could be factored into the analysis and counted as a cost. Or, if a particular good (e.g., clean air), has no market value, then it could be "shadow priced" and air pollution (an externality) counted as a cost. Unless we devise some way for RBA to take account of the ethical principles that ought to constrain risk policy, our economics and our technology policy will be divorced from our ethics. To paraphrase Browning, our ethical reach will continue to exceed our risk/benefit grasp.

"Announcements"

CALL FOR PAPERS:

Directions and Implications of Advanced Computing, a conference to be held in Boston on July 28, 1990. Appropriate subjects include computing in a democratic society (civil liberties, community access, computerized voting), autonomous weapons systems, and computers in the public interest (software safety, computing for the disabled). Deadline for submission is March 1, 1990. Contact Douglas Schuler, Boeing Computer Services, MS 7L-64, P O.. 24346, Seattle, WA 98124-0346 (or ph. 206-865-3226).

CONFERENCE:

Moral Problems in the Professions: Advocacy, Institutional Ethics, and Role Responsibilities, Lincoln, Nebraska, March 29-31, 1990. Topics will include advocacy in the lawyer-client relationship, in journalism, in public policy; corporate responsibility, personnel policy, and moral standards for research with human subjects; and role responsibilities, individual obligations to institutions, and conflicts between duties to institutions and other moral obligations. Contact Stephen Kalish, College of Law, University of Nebraska, Lincoln, NE 68583-0902 (or ph. 402-472-2844). Professions and Public Authority: Historical and Comparative Perspectives, sponsored in part by the International Sociological Association's Research

Committee on Work, will be held April 21-22, 1990, in Boston, to examine historical, political, and comparative approaches to the changes in relationships between professions and their context, as well as new conceptions and approaches to the study of the changing relationships among professions, public authorities, and other centers of power.

Contact Louis H. Orzack, Committee on Professions, Department of Sociology, Rutgers University, New Brunswick, NJ 08903 (or ph. 201-648-525). Current Controversies in the Right to Live, the Right to Die II: Legal, Medical, and Ethical Issues, DuPont Plaza Hotel, Washington, DC, April 26-28, 1990. Contact Ms. Mary Beth London, Leahy Hall, Columbus School of Law, Catholic University of America, Washington, DC 20065.

BOOKS: Codes of Professional Responsibility, 2nd., edited by Rena A. Guilin (Bureau of National Affairs: Washington, DC, 1990) includes 43 codes of ethics, 3 detailed indexes, and names and address of 350 essential resources in ethics.

Owning Scientific and Technical Information: Value and Ethical Issues, December, 1989 by Rutgers University Press. Edited by Vivian Weil, Director of CSEP and John W. Snapper, a philosopher at IIT and member of CSEP's Steering Committee. This volume brings together fifteen essays by specialists in the law, economics, philosophy, and history. Michael Davis, Senior Research Associate at CSEP, is the author of one of the essays.

A whole range of novel problems in intellectual property rights have

arisen from recent innovations in science and technology as well as from new, intricate relationships among academic researchers, government, and private industry. Should computer software be patented or copyrighted? How can ownership of plant varieties, genetically engineered organisms, and their products be patented? Should body parts and cell lines derived from them be patented? What is the impact of changes in intellectual property rights on the process of scientific research and development? The volume includes an annotated bibliography. It is available from bookstores (including IIT's) for \$20.00 paperback and \$40.00 hardcover.

The Center for the Study of Ethics in the Professions at the Illinois Institute of Technology was established in 1976 for the purpose of promoting education and scholarship relating to ethical and policy issues of the professions.

EDITOR: Michael Davis

STAFF: Rebecca Newton

EDITORIAL BOARD: Thomas Calero, Martin Malin, Ullica Segerstrala, Vivian Weil.

Opinions expressed in *Perspectives on the Professions* are those of the authors, and not necessarily those of the Center for the Study of Ethics in the Professions or the Illinois Institute of Technology. Center for the Study of Ethics in the Professions, Illinois Institute of Technology, Chicago, Ill. 60616.
