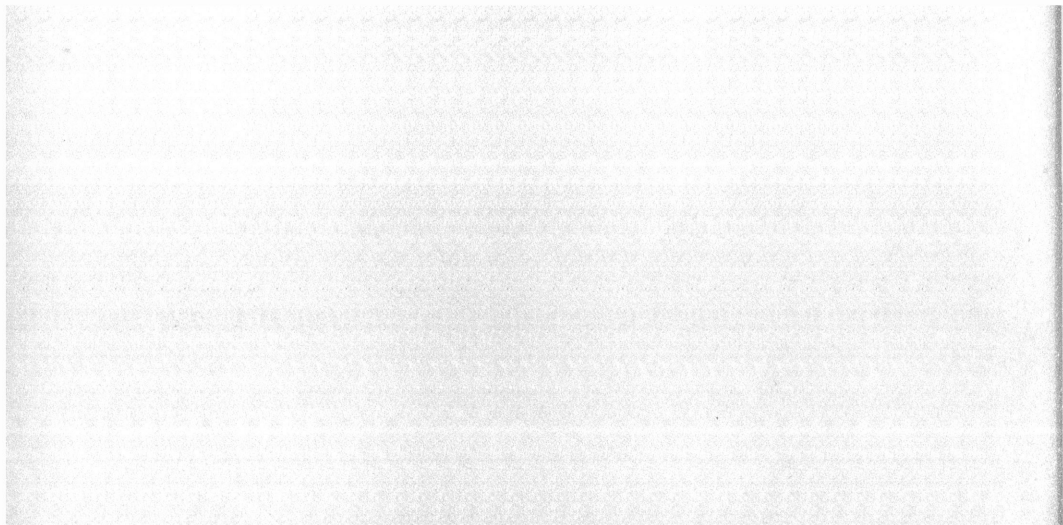




COUNTER-PRODUCTIVE REGULATION

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ABSTRACT

This paper explores the issue of regulatory failure, particularly those initiatives which either do more harm than good, or at least inflict significant "collateral damage". The paper presents a typology of regressive regulatory outcomes, then seeks to explain the circumstances which give rise to this kind of policy failure. The conclusion suggests principles and safeguards, which if heeded by those in a position to formulate and implement regulatory policy, might serve to reduce the risk of undesirable unintended consequences.



COUNTERPRODUCTIVE REGULATION

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PART ONE: INTRODUCTION

The old adage that the road to hell is paved with good intentions applies to many aspects of life, among them regulatory policy. That regulatory compliance can be an elusive goal is hardly a revelation; the analysis of regulatory failure has become a popular pastime. The ways in which efforts to produce regulatory compliance may become derailed are numerous and diverse, as are the generic pathologies which give rise to them. The present essay pursues this theme by attempting an overview of the ways by which regulatory initiatives may defeat themselves or may otherwise inflict collateral damage. The focus goes beyond those initiatives which simply fail to have their intended effect.¹ Rather, we shall be concerned with programs that either backfire entirely, in effect making things worse, or those resulting in significant harm which offsets many or most of the benefits which the original initiatives might produce.

The essay will have three main parts. Part Two will present a typology of iatrogenic outcomes of regulatory policies. Part Three will seek to explain the dynamics of these negative outcomes. Part Four will suggest principles and safeguards, which if heeded by those in a position to formulate and implement regulatory policy, might serve to reduce the risk of undesirable unintended consequences.

Although some readers may be tempted to conclude that the author is instinctively opposed to regulation, such is not the case. The approach taken here is self-consciously utilitarian. The objective is not to cast a pall of

¹. The understandable human tendency to oversimplification afflicts analyses of regulatory policy no less than other matters. Policies rarely achieve unqualified success or result in unmitigated catastrophe. Sieber (1981) distinguishes between interventions which have a positive impact, those with a null outcome, and those which produce negative consequences. As will be noted, regulatory interventions often have differential impacts, depending on context and target.

pessimism over the idea of regulation, but rather to foster more analytical rigour in the planning and the implementation of regulatory policy.² Nor does the risk that some regulatory interventions may produce significant harm necessarily imply that they should be abandoned entirely. Rather, by identifying these risks at the outset, authorities may be able to design them out, or at least to introduce measures to mitigate their adverse impact.

PART TWO: VARIETIES OF COUNTERPRODUCTIVE REGULATION

ESCALATION

Ironies abound in regulatory affairs. Programs introduced with the best of intentions may actually make matters worse. Sunstein (1990) observes that stringent regulation of new risks may exacerbate existing risks. For example, a common response to problems of air pollution is to require the installation of emission control equipment on new motor vehicles. Unfortunately, the increased cost of new automobiles equipped with the required emission control devices may lead motorists to retain their old and "dirty" vehicles longer.

A variation on this example may be drawn from current procedures for the regulation of pesticides in the United States. These prohibit the introduction of new pesticides with potentially lower risk of carcinogenicity than other existing, permissible substances. The aggregate carcinogenic risk is therefore higher (Hornstein 1993).

Even new inventions which prove to be relatively attractive may exacerbate the conditions which gave rise to their inception. Leone (1986, 9) suggests that the introduction of more energy-efficient home air conditioners can encourage greater use of air conditioning and result in greater net energy consumption than might otherwise occur.

Efforts to clean up oil spills may be further damaging to the environment; methods and substances used in clean-up may themselves be injurious to

². One can, for example analyse engineering failures without forsaking the use of bridges; concern for iatrogenic disease need not imply the repudiation of all medical practice. Moreover, it is conceivable that some regulatory interventions can have positive unintended consequences. The pleasant task of analysing serendipitous regulatory outcomes is left to another time.

particular ecosystems, and cleanup efforts may disperse the pollution in a manner which makes it even less tractable (Katz 1994). Similar problems beset the regulation of asbestos. Removal of the substance may be more hazardous than simply sealing it off and leaving it *in situ*. Site remediation in general may create transportation-related risks which would otherwise not exist (Warren and Marchant 1993).³

Regulatory policies designed to assist disadvantaged groups may in fact harm them. Consider the case of laws designed to protect members of minority groups against racial or ethnic vilification. While the objective of protecting minorities from insult and injury is laudable, there remains the risk that such laws may be enforced regressively, *against* the very minorities they are intended to protect.⁴

Otherwise, ostensibly ameliorative programs aimed at disadvantaged minorities may be delivered in a stigmatising fashion, or in a manner that generates resentment rather than sympathy on the part of non-target groups. Thus may affirmative action and other compensatory programs actually foster discrimination and increase inequalities (Sieber 1981; Boudon 1988).

* Unintentional Enticement.

It should come as no surprise to learn that warning messages may produce perverse effects. Merely by dramatising certain aspects of risk, or of the possible consequences of non-compliance, such messages can advertise the behaviour in question, bringing it to the attention of those who would otherwise be oblivious, or exciting the curiosity of those who would otherwise only be vaguely aware. Worse still, they may entice the potentially rebellious.

3. The offer of bounties for pest eradication may also escalate the problem. Some time ago, a Latin American nation offered bounties for the extermination of a dangerous scorpion. More individuals were bitten in the search for the extremely poisonous pest than would have been the case in the normal course of events. I am indebted to Al French for this observation. Pest eradication campaigns may also produce perverse incentives, as noted below.

4. Black (1989) argues that regressive bias is inherent in justice systems.

Warnings may transmit signals of opportunity to the unscrupulous. Information about endangered species, when accompanied by reference to the price certain specimens might fetch on the black market, may attract poachers to the extent that the species is placed at even greater risk.

Symbolic protest is a common response to the moralistic injunction. Stern warnings from law enforcement authorities about the perils of various illicit drugs serve to publicise the substances in question in a manner which only the most creative minds in the advertising industry could hope to rival. So too with licit drugs which may be vulnerable to misuse.

Some of the most familiar examples of unintentional enticement may be drawn from the annals of censorship. Denunciation by moral entrepreneurs can impel the eager consumption of controversial literature, film and related material. The phenomenon in question, arguably both timeless and ubiquitous, has been termed the "forbidden fruit effect" (Sieber 1981, 136).

Creative Adaptation.

Stringent business regulation has been shown to inspire technological innovation in furtherance of regulatory compliance, and thus to enhance competitive advantage (Porter 1990). The ironic "flip side" is that stringent regulation may produce a class of avoidance entrepreneurs. The ingenuity and adaptability of a regulated industry may be inspired by new challenges, and with repeated strengthening, may constitute a more formidable regulatory target than was initially the case.

With a view to remaining "one step ahead of the law", entrepreneurial targets of regulation may engage in increasingly refined avoidance behaviour. A vivid illustration of this may be drawn from the literature on tax compliance, where professional advisers, through creative legal manipulation, are often able to circumvent taxation (McBarnet 1992). More generally, corporations may resort to changes of organisational form, such as the creation of subsidiaries and other devices, in order to avoid regulation (Kane 1993; Hutter and Sorensen 1993). Some of the nation's best minds are thus mobilised to defeat the ends of public policy.

The emergence of black markets in response to demand for illicit products or services may be seen in many regulatory domains. Restrictions on the

disposal of hazardous waste and on the siting of new waste disposal facilities have given rise to the term "midnight dumping". Criminal circumvention of hazardous waste policies became a serious problem in a number of industrial nations (Block and Scarpitti 1985; Szasz 1986).

It is in nature itself where adaptation can occur most vividly. McIntyre (1987) notes some examples of pesticide use that produce unintended consequences. Species not previously considered to be a problem can flourish in plague proportions if pesticides kill off their natural enemies. Similarly, pests themselves can become resistant to pesticides; should these countermeasures kill off the pests' natural enemies, the species resurgence can be quite problematic.

Labelling.

One of the more popular theories in the sociology of deviance is that of labelling. Briefly stated, the designation of an individual as deviant facilitates the internalization of that identity, increasing the likelihood of subsequent deviant behaviour.⁵ Largely inspired by the study of juvenile delinquency, labelling theory may also apply to regulatory enforcement. In their study of nursing home regulation, Braithwaite and his colleagues have observed that a trusting approach by regulatory authorities, by fostering the internalization of regulatory objectives, is more conducive to compliance (Makkai and Braithwaite 1994a). By contrast, an antagonistic approach, where regulatory disapproval is articulated in such a manner as to denigrate the professionalism of the recipient, may lead to the development of a defiant, calculating identity and corresponding regulatory response.⁶

Under-enforcement.

Under-enforcement as an explicit regulatory strategy, or a watered-down regulatory response occasioned by political constraints or by a shortage of regulatory resources, may be counter-productive. A calculated policy of relaxed enforcement may seem like a good idea at the time, but in some

⁵ For a discussion of labelling theory, see Braithwaite 1989, 16-20; Farrington, Ohlin and Wilson 1986, 111-19).

⁶ To quote one respondent of Makkai and Braithwaite (1994b, 16) "When they keep treating you as unprofessional, untrustworthy, you end up deciding if they want to treat me like a businessman who only cares about the bottom line, then I'll be a businessman."

regulatory settings may give rise to irreversible damage. The existence of threshold effects can mean that a problem not fully confronted at an early stage may explode into one which is intractable. For example, non-linear changes in the trajectory of certain problems may produce explosive growth in certain pest populations, or precipitous decline in the population of endangered species.

Self-fulfilling Prophecy.

Warnings can work to produce the very same conditions which they are designed to prevent. Regulators are at times cautious about publicising the vulnerability of financial institutions, lest they trigger a run, and bring about the institution's collapse. Moral suasion and a hope that the beleaguered institution might trade out of its difficulties are often the preferred regulatory strategy (Sieber 1981 35-6).

Celebration of fragile ecosystems or endangered species may generate such a demand to partake of the experience that the systems themselves may be placed under great pressure, and indeed, greater risk. For this reason, tourism and recreational fishing often require exceptionally careful management (Dovers 1994a).

DISPLACEMENT

A common outcome of regulatory policy is the tendency for non-compliance to be displaced into other areas within or beyond a regulatory jurisdiction or policy domain.⁷ Some of the more sophisticated thinking about displacement has come from the discipline of criminology, in particular from the study of crime prevention (Barr and Pease, 1990). It has been suggested that, as a consequence of some prevention strategies, crime may be displaced spatially (to another location or target), temporally (to a later time) or substantively (in a different form or by means of a different method).

Displacement is evident in a variety of regulatory domains. The migration of industries to jurisdictions with relatively tolerant regulatory regimes is

7. It might be noted that displacement may not be an unintended consequence of regulatory policy. Quite to the contrary, displacement may be expressly intended. The term Not In My Back Yard (NIMBY) implies that burdens will ultimately rest in somebody else's back yard.

often noted. Thus are environment, health and safety risks displaced to more permissive places. The phenomena of cross-border and cross-media pollution are other examples of displacement (Guruswamy 1991; Andrews 1993). New smoke-stacks may improve British air quality, but only at the expense of Scandinavian forests and lakes damaged by acid rain.

The concept of displacement raises profound distributional considerations. Perhaps the most commonly recognised example of such displacement in the domain of environmental policy are those outcomes referred to collectively as the products of "environmental racism". Shipment of toxic wastes to third world nations, or, within western industrial societies, the siting of hazardous activities in proximity to disadvantaged racial minorities, are two generic examples (Lazarus 1993).⁸ Displacement can entail double ironies. Pesticides, banned in the United States but exported overseas, were used to grow produce imported back to the US. Thus consumers were exposed to pesticide residues in any event (Vogel 1992).

One of the more persistent risks of regulatory policy is that the burdens it imposes will fall disproportionately upon those less able to bear them. Yeager (1991) observes that pollution control requirements often exceed the capacity of small business to comply.⁹ It has also been observed that in some contexts, large powerful interests actually *invite* rigorous regulatory standards because their comparative advantage in compliance capability will have an anti competitive impact (Leone 1986).

Distributive considerations aside, the risk inherent in displacement is that the displaced activity may have a more serious impact than the original activity, or that it might take a more intractable form.

In some cases, displacement may be substantive, entailing the substitution of one form of negative externality for another. Requirements for automobile

⁸. For an alternative perspective, see Been (1994). One may perhaps query (especially in less racially diverse societies) whether the outcomes in question are in fact racially motivated, or rather reflect socioeconomic forces which are more or less colour-blind. The displacement then entails redistribution of burdens and risks to more vulnerable or less powerful persons generally.

⁹. Kagan (1994, 398-9) has suggested that regulators are often disinclined to enforce the letter of the law when regulated entities are marginally viable, and when compliance costs may be prohibitive, especially when the local economy may be unable to absorb job losses which may result from a shutdown.

fuel efficiency bring about the manufacture of smaller, lighter vehicles. Smaller, lighter vehicles, however, are less crash worthy than the larger "gas guzzlers". Thus clean air comes in part at the price of death and injury on the road (Crandall and Graham 1989).

Whipple (1985) identifies a variety of ostensibly responsible practices with significant displacement problems. The injunction to "Split wood, not atoms" ignored the environmental consequences of carbon dioxide and suspended particulates produced by wood-fired stoves and heaters; energy savings realised at the expense of weather stripping have been achieved at the price of greater indoor air pollution.

Compliance with regulatory standards may produce new forms of risk. Prohibitions of a particular substance normally inspire a search for a substitute. Ideally the substitute will be an improvement upon the original substance. However, circumstances may arise in which the new substance produces an adverse impact (Whipple 1985; Wildavsky 1988, 54-5). Consider, for example, the banning of DDT, a policy initiative which unquestionably served the interests of wildlife. But in the absence of an acceptable substitute, to discontinue the use of DDT for mosquito control may enhance the risk of malaria. Among the substitutes for DDT which did reach the market were organophosphate pesticides, which were more acutely toxic to agricultural workers (Andrews 1993, 529; Havender 1984).

Regulatory requirements which would impose zero emission standards for automobiles may force a shift to battery-powered vehicles. Given prevailing technology, this will entail an increase in the consumption, and disposal, of lead, and a greater use of electric power for recharging. The desirability of weight reduction may require that vehicle components be made of plastic, which could pose problems of recyclability.¹⁰

OVER-DETERRENCE

Volumes have been written about the chilling effect that liability law in the United States has had on innovation (Litan and Winston 1988; Huber 1988). Critics of business regulation often cite the threat of criminal liability as a disincentive to investment and innovation.¹¹ For example, it has recently

¹⁰. I am indebted to Bill Plummer for this observation.

been suggested that liability rules and prudential requirements in the United States have made responsible lenders over-cautious, to the detriment of that nation's economic recovery (Rowlett, 1993).

A deterrent posture may be so ferocious that it defies credibility or even implementation (Leone 1986, 207). Sunstein (1990) reminds us that draconian standards may produce under-regulation; regulators may be loath to enforce standards they perceive as too stringent, or to trigger penalties they perceive as too severe. The idea is hardly new; one may recall from the history of English criminal law the plethora of offences which carried the penalty of death, while only a relatively small proportion of crimes resulted in executions. Jurors, and judges, were simply reluctant to convict (Zimring and Hawkins 1973, 63).

Of course, regulatory authorities can make draconian threats which they have little or no intention of acting upon. The threat can provide symbolic reassurance to a concerned public, while regulatory targets may be confident that they will be spared the full force of the law. At times, there may be a tacit understanding between regulatory authorities and regulated entities that standards are aspirational or penalties merely symbolic. But in the absence of such an understanding, compliance policies that are based on a deterrent threat have been known to backfire. The threat of draconian sanctions may not be credible.

Even if credible, a deterrent threat may elicit a defiant, rather than a compliant, response from a regulatory target. Analysts of regulatory policy refer to an organised culture of resistance which can arise from policies perceived to be unreasonable (Bardach and Kagan, 1981) Sherman, 1993). In their recent work on nursing home regulation, Makkai and Braithwaite (1993; 1994b) have found just such an effect, where in some contexts a deterrent regulatory posture actually *reduces* compliance.¹²

¹¹. By contrast, we noted above in the discussion of escalation how new challenges may inspire some targets of regulation to engage in creative adaptation.

¹². Makkai and Braithwaite (1994b) identify the personality trait of emotionality as likely to provide the basis of a defiant response to a deterrent regulatory posture, especially when regulatory enforcement is perceived as mistrustful and challenging to one's professionalism. For another illustrative anecdote, see Leone (1986, 182).

Perceived fairness of a compliance regime can have a significant effect on the compliance orientation of regulatory targets. Kinsey (1992) reported that tax-payers who reported having heard accounts of others being treated unfairly in the course of audits, themselves expressed the disinclination to comply in future.

Regulatory unreasonableness can be counterproductive at the macro level as well (Kagan 1994, 402). A certain regulatory initiative can be regarded as so unreasonable as to lend itself as a justification to discredit an entire regulatory regime. Such appears to have been the case in the 1970s with regard to the United States Occupational Health and Safety Administration. As accounts of minutely detailed specifications for ladders to be used in workplaces, and citations for the most trivial violations¹³ began to accumulate, they served as powerful ammunition for those who would challenge the legitimacy of OSHA altogether, and leave workplace health and safety to market forces.

Given the risks which would appear to beset under-regulation and over-regulation, it may be appropriate to think in terms of an optimal level of enforcement — the point at which intervention achieves the best return on one's regulatory investment. (Braithwaite and Makkai 1993; Viscusi and Zeckhauser 1979).

Spillover.

In contrast to displacement, where noncompliance and its manifestations are themselves shifted across time, space, or media, spillover entails the burden of regulatory impact being shifted to or shared by interests other than the immediate regulatory target (Fisse and Braithwaite 1993, 187-9). Plant closings, with attendant depressing effects on the surrounding economy, are an obvious example (Wilson 1984, 220).

Downs (1973) observed that strict enforcement of building codes, ostensibly in the interests of the health and safety of low-income tenants, led to the literal abandonment of buildings by landlords and a consequent shortage of affordable accommodation.

¹³. One OSHA inspector is alleged to have penalized a company for permitting its staff to work on a bridge without the required lifejackets, despite the fact that the river bed below was dry (Viscusi 1986, 235).

Policies to discourage the employment of illegal immigrants may entail the threat of severe penalties for employers and strict liability for hiring workers without proper documentation. The strategy is at first blush compelling; not only would it appear to protect disadvantaged workers against exploitation by unscrupulous employers, it would serve to protect employment opportunities for legitimate members of the workforce. In furtherance of these worthy ends, the state would enlist the resources of the employer in screening prospective employees.

To shift such potential risks and administrative burdens onto the employer may incline some to avoid employing members of ethnic minorities altogether. The price of discouraging the employment of illegal immigrants can thus be discrimination against immigrants in general.

Spillover considerations often arise in the determination of appropriate sanctions in response to corporate illegality; traditionally these have entailed monetary fines. In many situations, the financial cost of such penalties may be shifted to consumers, or borne by employees, shareholders and others with little or no responsibility for the underlying transgression.

So it is that delay in drug approvals may significantly prevent relief of dying or suffering patients (Kagan 1994 413; Vogel 1990). Policies to control population growth in the Peoples' Republic of China, embodied in the "one child policy", have contributed to female infanticide, as parents dispose of unwanted female offspring in the hope of begetting a male.

Fear Generation.

Risks are often not precisely calculable. Estimations of risk, and the means by which they are communicated, may exaggerate the danger in question.¹⁴ Warning messages may elicit fear about a certain product, ingredient, or practice which is quite unwarranted. The needless anxiety this creates may be bad enough; when that anxiety is generalised to related but nonetheless safer contexts, warning messages may be even more counterproductive.

¹⁴. Douglas 1966; Douglas and Wildavsky 1982.

Alternatively, warning messages may precipitate a shift to more dangerous substitutes. Concern about the relative risks of the artificial sweeteners, cyclamate and saccharin, are examples. Fears relating to the safety of air travel may lead people to travel by car, an objectively more dangerous undertaking.

Whether they emanate from official or unofficial sources, spurious warnings may over time engender a cynicism amongst the public, an attitude which in itself can be harmful. The fable of the boy who cried wolf is evocative; spurious warnings can destroy the credibility of legitimate warnings.

PERVERSE INCENTIVES

Policies can be structured in such a manner as to provide perverse incentives, whether for the target of regulation or for third parties (Schultze 1973). One need not be an economist to recognise that certain efforts in furtherance of regulation may distort markets in a manner which produces outcomes unforeseen, and often undesirable.

Regulations that focus on process as opposed to outcome can inhibit technological innovations. Whether the regulations in question specify a particular technology, or rather require the best available technology, it removes the incentive to seek new efficiencies (Sunstein 1990, 420).

The domain of environmental protection provides numerous examples of perverse incentives. Consider, for example, a system of rebates for the return of toxic waste generated in a manufacturing process. In the absence of a carefully designed pricing structure, such a program might create incentives to increase the production of toxic waste. One could, for example, dilute a substance and seek a rebate for the larger volume. Alternatively, one could produce "counterfeit" waste, generating a substance for no other purpose than to claim a rebate (Russell, 1988, 267). Landes and Posner (1975, 26) have noted the incentive to breed noxious pests in order to claim a bounty for their extermination. Such policies could produce the perverse effect of increasing the very problem they were designed to address.

Tietenberg (1986) observes that for all of their virtues, systems of emissions trading may produce undesirable side effects. When emissions trading is overlaid upon a system of command and control regulation in which polluters vary in the promptness of their compliance, those who were previously delinquent were able to use emissions trading for their best advantage, while those with better previous compliance records were effectively penalised (Tietenberg 1986, 300). This invites recalcitrance in anticipation of the introduction of emissions trading, and a net increase in pollution, at least in the short term.

In addition to the risk of counterfeiting noted above, incentive systems, depending upon their structure, may invite collusion between prospective enforcers and offenders. Where the enforcer's potential reward is less than the offender's likely penalty, there exists an incentive for the prospective offender to bribe. Where the potential penalty is smaller than the potential reward, there is an incentive to fabricate an offence. A matter of greater concern arises when disincentives to prevent an offence are produced by the availability of greater compensation for disclosing an offence after the fact. An incentive thus exists to allow damage to occur in order to obtain a larger quantum of compensation (Landes and Posner, 1975, 24-32).

Moral Hazard as an Incentive to Risk Taking.

Insurance against loss occasioned by regulatory non-compliance may contribute to a degree of nonchalance. Perhaps the most dramatic example of the moral hazard in recent regulatory affairs is the constellation of events collectively known as the Savings & Loan scandal, which occurred in the United States during the latter half of the 1980's (Mayer 1992). With a view towards stimulating the economy, the Reagan Administration relaxed prudential controls on small financial institutions, while at the same time insuring their deposits. The result could be described most charitably as a frenzy of unwise investment; in reality, a great deal of activity was sufficiently fraudulent as to give new meaning to the axiom "The easiest way to rob a bank is to own one."

Whipple (1985, 41) observes that the existence of safety measures can reduce the incentive to act safely. To the extent that policy produces a "lulling effect" the net consequences may be more severe than in the

absence of a safety intervention.¹⁵ The construction of dams in order to reduce flood risk may encourage more people to settle on flood plains. Although the probability of flooding is reduced, the consequence of flooding, when it does occur, will be that much greater.

OPPORTUNITY COSTS

Every course of action has its cost, both in terms of direct expense incurred, and alternative activities foregone. Regulation is inherently inefficient; ideally, its ends would be better achieved by other means. Opponents of regulation often remind us that the costs of regulation place unreasonable financial burdens on industry. Perhaps even more convincing is the suggestion that pursuit of 100% compliance, or "zero pollution" may produce a set of inefficient outcomes.

If we envisage a compliance production function, where percentage compliance is represented on the vertical axis, and regulatory expenditure is represented on the horizontal axis, we would expect the production function to be asymptotic, that is, initial regulatory efforts would be expected to produce significant compliance effects, while later efforts would produce less compliance "bang for the buck" (Breyer 1993).

If we assume that compliance is related to some tangible benefit such as reduction in blood lead levels or cancer mortality, one will experience an increase in the marginal costs of control, and diminishing rates of return on regulatory investment (Krier 1990).

The more one controls, the greater the escalation in marginal costs of control. The first 50% of pollution is easier and much less expensive to control than the last 5%. In circumstances where the benefits of regulation become increasingly costly to realise, there comes a time at which resources spent in securing marginal compliance are more productively spent in furtherance of other goals (Warren and Marchant 1993; Breyer 1993; Wilson 1984, 221). At some point, expenses incurred in zealous pursuit of environmental lead might be better spent in furtherance of other regulatory objectives.

¹⁵ Whipple cites, for example, the parental nonchalance which may flow from the existence of "child-proof" containers.

In some instances, regulatory intervention may effect information flows in a manner that produces undesired outcomes. Sunstein (1990) suggests that prohibition of cigarette advertising on television may have reduced competition within the industry, eliminated counter-advertisements and saved advertising revenue. Leone, (1986, 12) suggests that regulatory preoccupation with emission controls distracted the attention of automotive engineers from clean automotive technology.

PART THREE: EXPLAINING COUNTERPRODUCTIVE REGULATION

A cynical explanation of counterproductive regulation would hold that authorities are less focused on longer term realities than they are with short-term image. In such a world, regulatory programs exist not so much to control externalities as to demonstrate official concern and the illusion of action (Dwyer 1990). Ultimate outcomes, if less than successful, are likely to be someone else's problem. Even more cynical explanations would hold that regulations exist to enhance the competitive advantage of some regulated entities at the expense of others (Leone 1986). Alternatively, governments may not even desire regulations to have their "intended" effect, but rather merely use them as "lip service" to appease certain sectoral interests while more fully accommodating others.

Whether or not this may be an intractable fact of life in contemporary western democratic political systems, where the vision of public officials may not extend beyond the next election, should not distract us here. For those who may be involved in the actual engineering of regulatory programs, there are more scientifically significant considerations. We turn now to a practical discussion of what might be termed "engineering flaws" in the design and implementation of regulatory initiatives.

BAD SCIENCE

Wishful thinking is no substitute for theoretical understanding. Underlying most regulatory failure, ironic or otherwise, is bad science. In this regard, perhaps the most common pitfall is the tendency to overgeneralise. Compliance policies that succeed in Japan, a society where deference to

authority is widespread and deeply ingrained, may not be readily transplanted to Italy.

Even in a limited setting, those policy entrepreneurs who are enamoured of a certain paradigm, such as rational choice or deterrence theory, may discover that not all targets of regulation are "utility maximizers". Some targets, in fact, may act in a very irrational manner. The threat of punishment may *invite* offending; we can learn about human behaviour from the Imp of Perversity as well as from James Buchanan. Recall how the identical stimulus can elicit compliance from some individuals, and provoke defiance on the part of others.

The same risks may beset those who would prevent and control organisational deviance. As Fisse and Braithwaite remind us: "Organizations are so different that any universalistic approach to controlling them will encounter difficulty" (1993, 130). So it is that the cutting edge of regulatory analysis envisages the ideal regulatory policy to entail a mix of instruments, best suited for specific organisational contexts (Gunningham 1993).

It is often tempting to generalise from past policy outcomes that have met with apparent success. Closer examination, whether through replication or secondary analysis, may reveal nuances not previously apparent which can seriously limit the generalizability of findings. An alternative form of unwarranted generalisation is the tendency to extrapolate in a linear manner when many processes are non linear in nature.

Another potential source of ironic reversal, and of regulatory failure in general, is the tendency to intervene at an inappropriate point in the causal chain which produces the problem in question.¹⁶ The practice of treating the symptoms of a problem rather than its causes is as risk-prone as it is familiar; post-hoc nuisance abatement is no substitute for prevention.

¹⁶ A recent observer of policy failures in general criticises the tendency of governments to focus their attention too far down the chain of causation, where problems and interventions are most visible. See Janicke 1990, chapter 3. See also Boyden 1987, 22.

A more basic scientific shortcoming is the apparent failure to understand the causal processes upon which one seeks to intervene. Recall the observations of Kinsey (1992) that a deterrent stimulus perceived as fair will have its intended effect, while the identical stimulus, if perceived as unjust will elicit defiance and resistance. An invitation to empathy will have no impact upon the affectless; the spectre of shame no effect upon the shameless.

An additional shortcoming which can detract from the quality of decision making in the domain of environmental policy has been identified by Walker (1992, 245). He notes that much environmental research is based on inadequate data, and that basic understanding of environmental systems remains incomplete.¹⁷

In addition to inadequate understanding of basic causal processes, there is often among policy entrepreneurs an inadequate appreciation of the systemic nature of modern society. Interventions can trigger other causal processes. The functional disruption of related systems is familiar to students of ecology. Similar principles apply in regulatory life. Regulatory policies, like public policies generally, have wider implications (Leone 1986). Given the density of contemporary social space, efforts to influence one variable are likely to influence others, directly or indirectly. Engineers of a given regulatory domain are often insufficiently aware of the wider social ecology — the complex, interdependent systems of social life in which the target behaviour resides.

The fragmented nature of much policy space means that decisions taken in one policy sphere often have impacts in others.¹⁸ Agricultural policies that reduce acreage available for farming can create pressures for excessive use of fertilisers and pesticides (Hornstein 1993, 399). Regulators who oversee the producers of nuclear power are unconcerned about the implications which the stringency of their regime may have on the demand for fossil fuels (Rabkin 1989, 29). The movement to de-institutionalise mental

¹⁷. Dovers (personal communication, 1994) identifies as particularly problematic the lack of baseline data, relative absence of long term ecological monitoring, and the short-term focus of much environmental research.

¹⁸. For a discussion of the shortcomings which can arise from a fragmented system of environmental regulation, see Fontaine (1993).

hospital patients in the 1970s and 80s was heralded as humane and progressive; life in "the community" simply had to be better than in the Dickensian institutions of the state. The absence of intermediate care or community based facilities, however, resulted in new problems of public order and homelessness, with a substantial increase in the workload of police, welfare and housing authorities.

Two facts of life compound this situation. The first is a common inclination to oversimplify problems and their solutions, a phenomenon too familiar to dwell upon here.¹⁹ Another is the bureaucratic specialisation which characterises contemporary public administration. Not only does this produce a degree of professional tunnel vision, it creates a risk that parochial organisational goals may dilute or displace the main thrust of the intervention. Agencies designed to be resistant to regulatory capture may run the risk of being too narrow and inflexible in outlook. Of course, scientific knowledge can be ignored entirely, in deference to subjective risk perception (Hornstein 1993, 412-20) or other political considerations (Walker 1994, 274).

BAD PLANNING

Ironical policy reversals may also result from bad planning. All too often agencies lack the requisite information to enable them to perform their task. Those agencies which do command sufficient information often fail to use it or to integrate it properly or even to use it.

One of the most fundamental causes of bad planning is failure to learn. Learning failures may take a variety of forms. One can, of course, be genuinely ignorant of precedent — oblivious to the past. But dissonance reduction is a more common human characteristic; it is much easier to luxuriate in one's previous triumphs than to dwell on one's past blunders. Unfortunate episodes of the past are more often repressed, their inherent lessons unlearned.

Although many organisations lack the institutional memory to assist in planning, numerous models exist. Principles of aviation and maritime

¹⁹. One may speculate that the tendency to oversimplification is reinforced by the adversarial discourse which characterises English-speaking democracies.

safety regulation have developed systematically in response to accidents. The cumulative wisdom they represent make it all that much more difficult to repeat a course of action which has previously led to disastrous consequences.

The problem of learning failure is compounded by some common principles of the sociology of knowledge. Those who may be unable to forget their past mistakes are nevertheless unlikely to flaunt them. Planning failures, not to mention planning disasters, are not usually publicised, and are even less likely to find their way into the scientific literature.

Sieber (1981 160) suggests a number of manifestations of bad planning. The time required to achieve program goals may be greater than originally anticipated. Planners may under-estimate the scope and depth of the target problem, as well as the quantity and quality of the intervention required successfully to address it. Thus may short term gains lead ultimately to defeat. Beyond this, policy makers tend to lack familiarity with those paradigms such as ecology and thermodynamics which would equip them to analyse and predict flow-on effects.²⁰

IMPLEMENTATION FAILURE

A final source of counterproductive regulation arises from defects in program implementation. This can entail resource inadequacy, lack of coordination between the various interests involved, and failure of oversight.

Resource Inadequacy.

Programs which might otherwise succeed can fail because of a lack of resources. The program itself may be well conceived and on target, but may founder because the intervention is of insufficient strength to have an impact on the problem (Sabatier 1975, 317-8). To use an analogy, where a sufficient dose of antibiotics can combat an infection, an insufficient dose may in fact aggravate the disease. Just as infrastructure maintenance deferred in order to save money may result ultimately in greater costs, so too can half-hearted investment in a program lead to failure and the necessity of greater remedial expenditures down the track.

²⁰. I am indebted to Steve Dovers for this observation.

Lack of Co-ordination.

The complexities of public policy often entail the involvement of more than one organisation. Implementation failure may occur because of insufficient co-ordination between agencies with responsibility for or influence upon, a program. There may be conflict and inconsistencies within and between relevant agencies; organisations can operate at cross-purposes (Castellani 1992).

The unfortunate consequence of withholding land from agricultural production was noted above. Tax concessions to Australian primary producers for land clearing led to soil degradation, compounding what is generally regarded as Australia's most serious environmental problem (Moran, Chisholm and Porter 1991, 91).

In the best of all possible worlds, inter-agency coordination would be natural and flawless. But in the real world, where institutional fragmentation tends to be the rule, organisations often have their own agendas and their own priorities (Robertson 1989). Eckersley (1995) observes that in the realm of environmental policy, traditional bureaucratic structures and mechanisms of policy development are too compartmentalised and less able to process feedback.²¹ The risk that program goals will be displaced by organisational imperatives will increase with the number of agencies involved.

Oversight Failure.

Another factor contributing to counterproductive regulation is lack of monitoring and oversight. For those concerned with image rather than substance, this may be of less concern. But for those seeking to effect genuine change, some kind of monitoring system is essential. Just as one should take care in generalising from successful regulatory outcomes, so too should one beware of overgeneralising from regulatory failures. The fact that a particular program is found to have negative consequences does not necessarily imply that the type of intervention in general is counterproductive; rather, it may be counterproductive only as specifically configured.

21. See also Dryzek (1987) and Weale (1992).

Some failures develop slowly enough to be noticed before causing irreparable damage, and corrective measures may be taken. However, there often exists the disinclination to perceive indicia of failure when they begin to appear. The tendency to perceive favourable evidence and to minimise disconfirming evidence is particularly strong on the part of those who may have a vested interest in program success (Chan 1979). In the domain of environmental protection, spatial variability in environmental capacity and regulatory potential renders the task of oversight all the more difficult.

BAD POLITICS

Regulatory programs and policies are often products of the political process. In most places, western democracies included, political systems function quite imperfectly. Compromise, so often the lubricant of policy making in a democracy, gives rise to contradiction and neutralisation. In some instances, potential downside risks must be accepted or overlooked as the price of co-operation and consent (Wilson 1984 216).

Policy entrepreneurs, anxious to stake a claim in policy space, may overstate the risk or may understate the benefits of a proposed intervention. There is an abundant literature on the exploitation of regulatory policy for private political or economic ends. In some respects, counterproductive compliance policy is a predictable product of the political system in which it is forged. To the extent that the shape and functioning of a policy depends upon the cooperation of varied interests, the interests in question may seek to shape the policy in a manner which, in lieu of or in addition to the professed policy goals, serve parochial objectives of the interest or agency in question.

The literature on regulation abounds with examples, from classic cases of regulatory capture, where the energies of the regulatory agency are diverted to serve the interests of the regulated entity, to more recent examples where some aspect of regulatory policy may be "hijacked" (Greve and Smith 1992; Leone 1986). An illustrative example can be drawn from the U.S. Clean Air Act of 1977. With the goal of reducing SO₂ emissions, the United States Congress required "best available technology" standards for coal-fired generating plants. A coalition of environmentalists and

eastern (high sulfur) coal producers succeeded in requiring the installation of emission control devices called "scrubbers", rather than allowing electric utilities to seek most efficient solution, which may have entailed substituting low sulfur western coal. Installation of scrubbers is estimated to have increased production costs by up to \$4.8 billion. Eastern coal producers, meanwhile, realised increased revenues of as much as \$245 million. (Anderson and Leal 1991, 156; Ackerman and Hassler 1981).

Another example of how politics can produce unanticipated regulatory outcomes is provided by Szasz (1986). During the legislative process leading up to the enactment of the Resource Conservation and Recovery Act, generators of toxic waste sought energetically (and successfully) to avoid responsibility for waste after it was consigned to a waste disposal contractor. The regulatory structure which emerged from legislative compromise was quickly exploited by organised crime, and contributed to a thriving profession of "midnight dumpers".

Elsewhere, the risk aversion which is so endemic to bureaucratic life can aggravate regulatory impact (Wilson 1984, 218). Leone (1986, 130) recalls the experience of one regulatory agency faced with the choice between banning a certain pesticide, or authorising its use under prescribed conditions. As it happened, the substance was available without restriction in a nearby state. The agency sought to ban the substance outright rather than run the risk that it would be criticised for any harm resulting from misuse. That the harm from uncontrolled use would most likely be greater than harm from controlled use was of less concern to the agency than its public image.

At this stage, it might be useful to suggest a synthesis of Parts Two and Three, by offering some tentative hypotheses to explain the various forms of counterproductive regulation. Escalation in its numerous manifestations would appear to result most often from bad science. Specifically, escalation is likely to flow from disregard or misinterpretation of causal processes, and from the ignorance of systemic ramifications. Displacement, over deterrence and opportunity costs, by contrast, are more likely to occur as a result of inadequate coordination, and from political constraints.

Specific regulatory institutions and instruments may also be vulnerable to particular forms of ironic reversal. Traditional deterrence-based "command and control" regulation is at risk of producing displacement, over deterrence, and spillover. Regulatory reliance upon third parties, whether professional advisers or other commercial interests, is vulnerable to creative adaptation and perverse incentives. Information-based strategies are at risk of unintentional enticement and unwarranted fear generation. And finally, market based instruments, such as tradeable permits and deposit refund systems, may produce perverse incentives.

Whether these proposed risks and linkages enjoy empirical support must await further research. Our task now turns to the means by which the risk of iatrogenic regulatory failure can be lessened.

PART FOUR: REDUCING THE RISK OF COUNTERPRODUCTIVE REGULATION

At this stage, it would be delightful to deliver a revolutionary new recipe for fail-safe regulatory policy. Unfortunately, there is nothing remotely resembling such an alluring prospect on the horizon. Rather, and somewhat anticlimactically, one can offer some basic principles derived largely from common sense. Their saving virtue is that they can only be ignored at one's peril.

There is an important role for evangelism in regulatory affairs. Political mobilisation and marketing are essential to the regulatory enterprise, and evangelists are better at these tasks than are sceptics. But sceptics too play an essential role, for as they never tire of reminding us, if something can go wrong, it often does. A less visible, but no less important role, is that of analyst. An effective regulatory regime will probably require the efforts of all three.

SCEPTICISM

One might suggest an ongoing role for the institutionalized sceptic, whose role it is to pose hard questions. Such a role is best not confined to a single individual, lest he or she be typecast as the resident cynic, and their credibility be subject to devaluation. In any event, every regulatory agency would benefit from accumulated wisdom about the ways in which

regulatory interventions can backfire. From such a knowledge base, regulatory program proposals can be tested against a checklist of potential derailments and their underlying pathologies. It is best that such scepticism be voiced from within, for if it is not, it will almost certainly be voiced from without. The regulatory agency that ignores its potential critics is looking for trouble.

ANALYSIS

Regulatory planners should recognise that complex systems often generate negative by-products. Ideally, regulators should make an effort to understand the systems in which they propose to intervene, and the processes they propose to disrupt. At the outset, problems should be framed in a manner that guides the choice of strategies for intervention.²² Regulators should look beyond the superficial, mechanistic doctrines of opportunity and deterrence, and understand the psychological processes, social organisation and economic systems in which target behaviour is embedded.

Given the density of policy space, planners should also attend to the political and administrative systems on which their programs will impinge. A grounding in principles of ecology and systems thinking will be useful in this regard. Those who design regulatory programs would do well to engage in "pluralist planning" (Chan 1979) and devise scenarios from a variety of institutional perspectives (Hall 1980). They should invite independent analytical criticism and the search for likely interactions that may be overlooked by a program's designers. Information about the likely repercussions of regulatory policy should be shared with those institutions and interests who would be affected; this would permit the design of means to mitigate the adverse consequences in question.

To the extent possible, regulatory designers should endeavour to model a proposed intervention, and anticipate the ramifications of their program, especially the program's potential downside risks. Planners should then seek to structure their intervention in a manner which would minimise the

22. Dovers (1994b) identifies a set of key attributes for problem framing in the domain of environmental policy. They include spatial scale of cause and effect; magnitude, timing and longevity of possible impacts; reversibility; mensurability; complexity and connectivity; nature of cause(s); relevance to the given political system; availability and acceptability of means; public concern; and existence of goals.

negative externalities in question. The choice of regulatory instruments should serve to neutralise or otherwise counteract those negative tendencies which cannot be "designed out".

Special care should be taken in the design of public information and warning protocols. Negative communication strategies can enhance fear without reducing risk. Delay and additional cost occasioned by careful pre-testing may well be a worthy investment.

The risk of being blinded by public pressure for a quick fix is a common feature of contemporary politics. The tendency to be dazzled by a particular technology or method may lead to its overuse and eventually to its diminishing effectiveness. Interventions which have particular symbolic value or resonance should not be embraced uncritically.

Regulators would be wise to consider those elements of a target system that might subvert their regulatory objectives. The principle of anticipatory diagnosis should be a basic feature of regulatory planning (Sieber 1981, 200). This might entail routine "forward mapping" or scenario writing: "the ability to think about what could possibly go wrong and who has an incentive to make it go wrong" Weimer and Vining (1992, 331). Put simply, the best safeguard against counterproductive compliance policy is systematic and rigorous planning.

Anticipatory planning is central to policy development (Pressman and Wildavsky 1984, 230). One hardly needs reminding that large scale interventions are best undertaken only after detailed problem framing and subsequent to piloting or pre-testing. But while they are in operation, regulatory programs, or indeed, pilot studies, should incorporate built-in feedback mechanisms, monitoring systems and contingency plans, in the event that negative consequences start to become apparent (Sieber 1981 23; Pressman and Wildavsky 1984, 222-28). Early warning of dysfunction may permit refinement or modification. The need for such contingency planning should be obvious. Of course, interventions whose effects may not become apparent until after the significant passage of time are less amenable to corrective feedback.

Those who design regulatory programs should be attuned to existing incentive structures, and seek to envisage how their proposed intervention might have an impact on those structures. (Hornstein 1993). Regulatory strategies should be flexible and dynamic, adaptable to unanticipated responses by the regulated (Makkai and Braithwaite 1994b). Where the intervention will impact on a market, they should endeavour to anticipate what that impact will entail.

PART FIVE: CONCLUSION

One could perhaps be excused for concluding from the above discussion that no regulatory initiative works, nothing can be made to work, and any efforts to this end will only produce more harm than good. But this is not the case. The intended message is rather that rigorous policy analysis is an essential ingredient of regulatory policy, and that there is a role for institutionalized scepticism (as opposed to cynicism) in the regulatory enterprise. Just as knowledge advances through negative findings, so too can policy.

Many of those with an interest in regulation would regard it as the most productive approach to the variety of problems which confront contemporary society. As such, they might tend to regard regulation uncritically. The disinclination or unwillingness to recognise potential harm is common.

All innovation entails a degree of risk. The challenge for regulation is to contain that risk within reasonable limits. Just as engineering failures can be the basis of subsequent design successes (Petroski 1985) so too can the analysis of counterproductive regulatory activity be instructive.

At first glance, the picture painted above might lead the faint hearted to conclude that life is simply too difficult and complex.²³ But life goes on, decisions must be made, and risks must be taken. The challenge is to create structures and situations which enable decision makers to anticipate negative consequences, to prevent them if possible, and where not, to minimise their impact.

²³ An even more cynical interpretation would contend that concern for perverse effects represents a reactionary embrace of free market principles. See Hirschman 1991.

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