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Rethinking the ecological leviathan: environmental regulation in an age of risk

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Abstract

Little attention has been given to the changing role of the state in the mediation of environmental risk. This review paper examines three interrelated themes: first, the extent to which contemporary environmental risks differ from those of the past; second, the various ways in which the rationality and legitimacy of environmental regulation have been challenged by a combination of political and economic developments; and third, the dilemmas posed by different institutional strategies for risk management. The paper argues that in order to better understand the implications of environmental risk for regulatory institutions it is necessary to develop our conception of risk beyond narrowly conceived technical, technological and micro-political discourses. © 1998 Elsevier Science Ltd. All rights reserved.

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1. Introduction

Concern with environmental risk has become the focal point for a broad-ranging critique of public policy making in western societies which has called into question the rationality, accountability and controllability of a range of technological and scientific developments. The scale and complexity of contemporary environmental risk has undermined public confidence in the ability of the state to undertake effective environmental regulation. The academic debate has become polarized between on the one hand, an array of positivist attempts at risk assessment, and on the other, by various social constructivist approaches which emphasize the qualitative and subjective dimensions to risk.¹ This review paper outlines the basis for a different analytical strategy rooted in the socio-economic context for the risk debate itself. It will be argued that contemporary concern with environmental

risk can best be understood in relation to the changing role of the state in environmental regulation.²

The most obvious way in which public exposure to environmental risk has become rationalized is through reliance on various forms of risk assessment. Risk assessment, as it has emerged over the last thirty years, is rooted in a series of positivist methodological paradigms ranging from the application of statistical inference and probability based estimates to the use of complex models to predict the behaviour of pathogens, weather patterns and other environmental systems. Advocates of positivist risk assessment point out that even though scientific knowledge is invariably incomplete this does not prevent many of these approaches from playing a useful role in diverse fields of environmental concern ranging from flood control to ozone depletion (Krebs, 1997). In recent years, however, these basic methodological approaches have become extended to ever more complex problems such as the impact of toxic wastes, the long-term effects of pesticides and the monitoring of global environmental change. The extensive use of risk assessment techniques has proved especially ill suited to understanding the type

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¹ The positivist and social constructivist conceptions of risk have frequently been in direct conflict. A now classic example is the Royal Society's conference on risk held in 1992 (see Douglas, 1994; Hinde, 1997). A follow up conference organized by the Royal Society in March 1997 entitled *Science, policy and risk* indicated a greater degree of intellectual dialogue between these disparate factions (see Durant, 1997).

² A more historically focused analysis of regulatory responses to environmental risk is contained in Leiss and Chociolko (1994); Paehlke (1990); Tarr and Jacobson (1987) and Wikeley (1997).

of low probability catastrophic events such as Chernobyl which are central to public anxiety (Giddens, 1991; Pearce and Tombs, 1996; p. 445). The use of probability based estimates of risk for cancer and other illnesses caused by environmental exposure to ionizing radiation, dioxins and other toxins has also met with public disquiet because it reveals how environmental risk is an integral dimension to contemporary production processes.

Shifting conceptions of environmental risk form an integral element in the historical development of different institutional strategies for environmental protection. In the nineteenth century the environmental role of the state was mainly focused at a local level in order to protect public health and coordinate the infrastructural needs of rapidly growing urban areas.³ Over the twentieth century, however, the state's role in environmental management has developed extensively, involving ever more complex institutional structures extending within and between sovereign nation states.⁴ The earlier emphasis on public health has been extended to a range of newer concerns with biodiversity, climate change and the pollution of the global commons. Though science has played a crucial role in raising awareness of these issues, the necessary administrative and legislative changes required to modify relations between society and nature have been largely left to governmental institutions. After the 1970s, however, an important set of changes occurred which fundamentally altered the context for environmental policy making. Public demand for ever higher levels of environmental protection grew steadily yet the fiscal and ideological capacity of governmental institutions to intervene decisively on behalf of some putative public interest began to diminish.

How should we approach analysis of changing patterns of state intervention in the field of environmental risk? The theoretical literature on the capitalist state has grown significantly since the 1970s but has not been systematically extended to the understanding of environmental issues. The environmental literature has generally adopted a static and typological approach to understanding state intervention with little attempt to examine the broader context for environmental regulation itself.⁵ An initial problem is one of definition since the state is far

more than an administrative system but represents a dynamic and unstable series of structures engaged in a variety of often contradictory and ill-specified tasks. The state is both a thing in itself that can be explored empirically but is also an idea around which competing conceptions of society have repeatedly clashed introducing a subjective and ideological dimension into any meaningful critical analysis. Rather than a specific form the capitalist state is best conceived as a process or tendency in a continuous state of flux and reformulation. The state is thus simultaneously part of wider society but is at the same time a separate entity capable of pursuing its own agenda within a set of structural and ideological constraints. The emerging structures and relationships that constitute the modern state will always be contradictory and shaped by a multiplicity of forces ranging from 'micro-political practices dispersed throughout society' to 'the emergent international system formed through the interaction of sovereign states' (Jessop, 1990; p. 342). This paper develops a conception of state intervention as the dynamic outcome of competing and often contradictory perspectives. Central to the thesis advanced here is the contention that the late twentieth century marks an important shift in the constitution of the environmental debate within which an ecological critique of modernity has successfully challenged a series of assumptions inherited from Enlightenment conceptions of law and political economy. The perspective developed here rejects the outright abandonment of Enlightenment rationality advanced by various ecocentrist and poststructuralist variants of environmental thought and seeks to emphasize the continuing relevance of universalist and consensual ideals in environmental policy making.

The first part of the paper outlines the extent to which contemporary environmental risks differ from those of the past. The paper then examines some of the specific contexts within which environmental regulation has lost its legitimacy in order to illustrate how the historically constituted coalition of forces behind the post-war expansion in the regulatory role of the state has been systematically undermined and weakened by a series of interrelated developments at different spatial scales. The final part of the paper presents some empirical illustrations of these regulatory dilemmas by focusing on the example of environmental insurance and the implications of economic 'virtualization' for environmental management.

2. Environmental risk under late modernity

It is now widely accepted that the scale of environmental change over the post-war period poses unprecedented threats to long-term bio-physical security. The accumulative impact of these new threats transcends the spatial, social and temporal limits of the industrial risks

³ There is a large literature on the inter-relationship between public health and the reform of local government in 19th-century Europe and North America. Important examples include Dyos and Wolff (1973); Evans (1987); Gillet (1972); Rosenberg (1962); and Wohl (1983).

⁴ The development of environmental management in developed economies is comprehensively covered in Caldwell (1990), Ostrum (1990), Weale (1992) and Yeager (1991).

⁵ Static interpretations of 'state failure' derived from the administrative structure of environmental regulation are contained in Andersen (1994) and Jänicke (1990). Jessop develops a more dynamic interpretation of the state through what he terms 'the strategic-relational approach with its emphasis on the continuing interplay between strategies and structures' (Jessop, 1990, p. 364).

of the past. The simple cause–effect assumptions and individual apportionment of culpability inherited from the nineteenth-century origins of environmental regulation have been overwhelmed by the scale and complexity of contemporary risks (Goldblatt, 1996). Post-war scientific and technological developments have facilitated an unprecedented phase in global economic expansion but have heralded an increased vulnerability of human populations to anthropogenic sources of risk. The synergistic effects of the tens of thousands of chemicals released into the environment undermine any simple conception of causality and responsibility introducing a radical indeterminacy beyond the scope of established scientific and policy discourse. As a consequence, our social institutions, and in particular the regulatory institutions of the modern state, are ill-suited to handle this unprecedented proliferation of environmental risks. Epidemiological research over the last fifteen years has revealed a series of newly emerging and systematically overlooked sources of environmentally induced ill health in spite of improved safety records in many parts of the production process.⁶ Examples include chronic respiratory illnesses induced by poor air quality in urban areas (Gottlieb et al., 1995; Mann, 1991); the emergence of new hormonal, immunological and developmental disorders triggered by contact with synthetic substances released into the human environment (Birnbaum, 1994; Colborn and Clement, 1992; Schecter, 1995; US EPA, 1994); and new resistant strains of tuberculosis and other infectious diseases spreading in response to growing poverty, infrastructural decay and declining health services (Lewontin and Levins, 1996; World Health Organization, 1996).⁷

Lack of knowledge and uncertainty are now an integral feature of contemporary environmental debate since only a fraction of synthetic substances have ever been systematically tested for their potential effects on human health and bio-physical systems (Adams, 1994). Similarly, the causal networks and proliferation of feedback loops involved in global environmental change exceed the capacity of the most complex environmental models that can be devised (Rayner and Malone, 1997). The relative

imperceptibility of many of these threats in everyday life strengthens the power of knowledge and specialist expertise in society and problematizes classic conceptions of environmental management based around intervention in relatively simple environmental systems. The impact of differential access to knowledge is further heightened by the power of the mass media in structuring and directing environmental discourse in a complex pattern of shifting agendas amid the electoral and economic cycles that determine the momentum of much contemporary political debate. Given the innate uncertainties surrounding these changes and the immense significance of cultural representations of environmental change in shaping political discourse there has been growing interest in social constructivist perspectives on relations between society and nature (see Szerszynski et al., 1996). Yet these types of perspectives systematically ignore the degree to which concern with environmental risk stems from a wider crisis in the public sphere generated by structural change in western societies. Brian Wynne, for example, fails to develop his radical critique of science beyond a narrowly ahistorical and micro-political analysis of environmental conflict (see Wynne, 1996). In order to fully appreciate the implications of the debate surrounding environmental risk we need to recognize the materiality of relations between society and nature: environmental regulation exists because it is necessary for sustaining the ecological well-being of complex urban societies yet the precise character of regulatory institutions will be determined by an interaction between many different contributory factors at a variety of spatial and temporal scales.

Existing patterns of environmental regulation in western societies evolved in response to the risks associated with the emerging industrial societies of the nineteenth-century based around ‘principles of rule-governed attribution of fault and blame, legally implemented compensation, actuarial insurance principles and collectively shared responsibility’ (Goldblatt, 1996; p. 159). Complex state structures emerged under the impetus of modernity in order to secure the conditions for capital accumulation and social cohesion within a series of regional and national production systems.⁸ Early dimensions to environmental management include water supply, sanitation, food inspection, and initial attempts at urban planning. From the late 1960s onwards these established patterns of state intervention in the environmental arena were embellished by a wave of additional legislative and administrative structures exemplified in the United States by the creation of the US Environmental Protection Agency and the enactment of new occupational health and safety regulations (Hays, 1987; Pearce and Tombs,

⁶ Environmental policy making since the 1980s has involved a variety of institutional and organizational innovations such as integrated pollution control, environmental audits, and the application of new ‘upstream’ environmental management strategies, yet there remains a widespread perception of regulatory failure.

⁷ There is now a growing literature on the political ecology of ill health which seeks to extend epidemiological research to take account of the socially and spatially uneven impact of socio-economic restructuring. See, for example, Chen and Huang (1997), Johanning et al. (1994), Matthews (1995), Mayer (1996) and McLafferty and Templaski (1995). A range of assumptions concerning the progressive impetus and scientific basis of public health advances in western societies have been problematized by new sources of environmental risk which challenge both the epistemological basis of environmental research and also the regulatory capacity of governmental institutions.

⁸ See, for example, Boyer (1983), Carnoy, (1984) and Clark and Dear (1981, 1984).

1996). A range of scholarship on the post-war history of environmental management now suggests that the late 1960s and early 1970s was a unique period in terms of the strength of the environmental coalition spanning both organized labour and the newly formed environmental pressure groups (see Faber and O'Connor, 1993; O'Connor, 1994).

During the 1970s, however, the development of extensive state involvement in environmental management was to prove increasingly at odds with the emerging neo-liberal context for policy making in Western societies. The post Bretton Woods liberalization of global markets progressively diminished the scope for Keynesian patterns of state intervention. The increasing fiscal and political problems facing state institutions in developed economies began to significantly erode the degree of state autonomy which had previously existed in the Fordist era. In some cases the challenge to environmental management rested on the attempt to separate environmental service provision from the democratic process whereas in other cases the impetus stemmed from the reassertion of private property rights over the control of natural resources.⁹ By the early 1990s the anti-regulation lobby had become sufficiently powerful to deflect and undermine the rationale of environmental policy making by systematically capturing legislative agendas and rolling back many of the gains made in earlier years (see Pearce and Tombs, 1997). These developments suggest that environmental regulation has always existed in a state of dynamic tension with prevailing centres of economic and political power to a far greater extent than is acknowledged in much of the environmental literature. The current attempt to extend the impetus of neo-liberal deregulation to the environmental arena is simply an intensification of incipient and long-established tensions within environmental management. Yet this deregulative drive coincides with a period of heightened public anxiety in relation to the extent of environmental risk and the inability of regulatory institutions to protect the public interest. This is the defining paradox of the risk debate which necessitates a more detailed contextualization and periodization of environmental regulation than has hitherto been the case.

3. Risk, rationality and public policy

The assumption that the state acts in the 'public' interest has been shattered by evidence of systematic health inequalities by class, gender, race and age under

ostensibly uniform regulatory regimes within particular sovereign nation states. The starting point of this newly emerging critique of environmental regulation has been a range of evidence, especially from the United States, suggesting that regulatory agencies are not spatially neutral in their operation.¹⁰ Whilst some analysis suggests that it is the impact of institutionalised racism in the regulatory structures of the state which accounts for this uneven geography other studies have emphasized how the class basis of American society is expressed through land use policy. What these diverse approaches share, however, is a broad-ranging critique of post-war environmental regulation which moves beyond procedural conceptions of social justice in order to challenge the underlying sources of environmental risk in capitalist societies (see Pulido, 1994; Szasz, 1994). The legitimacy of law making and regulatory structures has been challenged by a widening gulf between the types of common values and implicit norms held in an increasingly fragmentary civil society and what one might term the 'strategic rationality' of administrative and financial systems which underpin the day-to-day functioning of social life (Salter, 1997).

The contemporary inability of the state to handle environmental risk in the post-Fordist era poses a series of dilemmas for regulatory institutions as currently constituted. Recent developments in state theory (particularly from the regulationist school) have emphasised how social institutions evolve in order to handle innate tensions and contradictions in the relations between capitalist economies and societies.¹¹ What is especially interesting about the potential application of regulationist insights to the study of environmental management is the emphasis on a non-determinist analytical framework. An important starting point for a more theoretically informed understanding of environmental management is an explicit recognition of the extent to which regulatory agencies 'can only employ the strategic capacities available to the state and these are always limited relative to the tasks facing them' (Jessop, 1990; p. 362). In other words, the state is always vulnerable to legitimation crises in the increasingly complex and intractable sphere of environmental risk. The organizational capacity of the state makes it indispensable for managing the ecological contradictions of capital accumulation (just as state activity is critical in the effective mediation of labour relations) yet specific forms of state regulation are faced by a series of structural constraints.

⁹ Examples of early attempts to dismantle or weaken post-war environmental regulations in the 1970s before the ascendancy of neo-liberal approaches are discussed in Ackerman and Hassler (1981), Sandbach (1980), Schnaiberg (1980), Walker et al. (1979), Walker (1982), Unnever and Higgins (1995) and Yeager (1991).

¹⁰ For greater detail on the rise of the US environmental justice movement see Bryant and Mohai (1992), Bullard (1990, 1993), Gibbs (1993) and Hofrichter (1993).

¹¹ See Amin (1994), Jessop (1995) and Tickell and Peck (1995) for recent overviews of this literature. For an examination of more specific applications of regulationist insights to environmental problems see Drummond and Marsden (1995) and Whiteside (1996).

The declining legitimacy of centralized state-led approaches to environmental management has led to the emergence of various forms of 'environmental governance' founded on new patterns of policy making involving a variety of new institutional structures. In effect, the state has sought to retain its role in the field of environmental management by strengthening its interaction and dependence on both the private sector and civil society by altering relationships between its core institutions and other state-like structures in society. The increasing emphasis on market-based policy instruments and the privatization of environmental services provided by the state forms part of this regulatory realignment. Indeed, we can trace linkages between the environmental critique of 'state failure' advanced by Jänicke (1990) and Huber (1991) and the emergence of the neo-liberal challenge to the perceived inflexibility and inefficiency of the regulatory state.¹² Yet the more the state widens its interdependence with other interests in society the weaker its autonomous role in mediating social conflict. In effect, therefore, the state's search for greater legitimacy may paradoxically frustrate its capacity for new forms of decisive intervention as its regulatory activity becomes increasingly dependent on other structures and organizations dispersed through society.

Environmental management has been dominated by conceptions of state activity as a realm of technical and managerial expertise separate from the political arena. The messy ambiguities of political debate have been widely conceived as an intrusion capable of undermining regulatory efficiency. The state has needed to rely on sources of 'neutral' technical expertise in order to present itself as an arbiter of different interests in society. As a consequence, the political dimensions to state intervention are obscured by the reframing of policy dilemmas in purely technical terms. This can be illustrated by hazardous waste regulation where structural (political) problems have been systematically displaced into a series of locational (technical) issues (see Lake and Disch, 1992). The exposure of the fallacy of technical neutrality risks undermining the legitimacy of state intervention by unravelling the 'condensation' of contradictory forces which allow the state to intervene on behalf of some putative public interest. This presents a significant challenge to various forms of 'ecological modernization' which seek to convert ethical and political dilemmas into technical and managerial problems (Christoff, 1996; Hajer, 1995). The newly emerging discourses of ecological modernization have sought to counter the abstract commodification of nature by bringing ecological systems back into 'the sphere of economic rationality' (Mol, 1996;

p. 306–309). Yet the ecological modernization literature has consistently failed to explore the structural determinants of the contradiction between capital and ecology, replacing earlier forms of technical neutrality with new forms of techno-managerial control.

Public anxiety with environmental risk has been intensified by the *depoliticisation* of policy discourse as biophysical security slips out of the regulatory capacity of modern state institutions. The relative impotence of regulatory agencies to control environmental threats or even adequately respond to public demands has contributed to a weakening in the legitimacy of governmental institutions. A recent illustration is provided by the import of genetically modified food into the European Union where regulatory agencies have been unable to achieve any consistent labelling of genetically altered products let alone address broader public concerns with the impact of bio-technology on the food industry (Rissler and Mellon, 1996; Steinbrecher, 1996). The state can only make limited interventions in the capitalist economy because of its structural relation to the distribution of power in capitalist societies (Dryzek, 1995). Because the state is systematically excluded from the production process 'it must either react *a posteriori* to events it cannot directly control and/or engage in ineffective *a priori* planning' (Jessop, 1990; p. 356). In effect, therefore, the capitalist state is charged with managing the *consequences* of 'real' economic processes since 'it is the political repercussion of economic events and crises which matter more than their inherent economic form or substance' (Jessop, 1990; p. 357). We can take this conception of the 'real' economy further by considering the relationship between the state and the 'real' nature of ecological risks. Modern political discourse has emerged in dynamic relation to prevailing conceptions of the public sphere. Ecological risk undermines classic conceptions of the public sphere by exposing the arbitrariness of politico-institutional boundaries. Just as feminist theory has demonstrated the diffuse and gendered dimensions to power dispersed through society at all levels, the recognition of ecological risk reveals new structures of interdependence and causality beyond the ontological frame of reference contained in classical liberal traditions of political economy which have shaped much of western political discourse since the Enlightenment. The diminution in the power and legitimacy of liberal conceptions of the state as arbiter of the public interest has led to a radical weakening of any widely agreed conception of the common good or any broader ethical basis for social policy.

The capitalist state is best conceived as a precarious balancing act which must mediate between the needs of capital accumulation and social cohesion and is characterized by an 'unstable equilibrium of compromise' derived from its bases of power vested in wider society (Jessop, 1990; p. 346). Ecological risk exacerbates these innate tensions in the capitalist state by simultaneously

¹² Arguments against the effectiveness of environmental regulation by the state include regulatory capture by vested interests; administrative costs; and limited innovatory capacity (see, for example, Eckersley, 1995).

emphasising problems of rationality (the sustainability of the system as a whole), legitimacy (the ability of the state to serve the public interest) and fiscal autonomy (the dynamic of state expenditures). The emergence of new environmental threats necessitates a reorientation in the rationale for state activity and further problematizes the conflicting role of state institutions as arbiters of an increasingly globalized community of interests. The globalization of environmental discourse has led to a dispersion of state responsibilities to different types of resource regimes and new forms of governance (Lipschutz and Conca, 1993; Lipschutz, 1996; Susskind, 1994; Young, 1994) yet this transfer of jurisdictional responsibilities does not significantly alter the centrality of state power to the implementation of environmental regulation. Although modern states no longer enjoy the degree of concentration of sovereignty within mutually exclusive territories that existed in past decades, the nation state continues to play a pivotal role in the shaping of supranational organizations. In other words, current processes of international political and economic change cannot be conceived in terms of a simple national–global duality but involve a complex reconfiguration of state power within new institutional constellations (Sassen, 1996; Weiss, 1997). Globalization involves the creation of new geographies of regulation and liberalization within which new forms of institutional innovation and market discipline are emerging. The extent to which new forms of international environmental regulation present a challenge to the underlying rationale behind global capital markets is a critical emerging theme in international political-economy. It remains to be seen whether a new ‘ecological leviathan’ under the auspices of greater cooperation between nation states will play a significant role in the governance of the emerging global economy.

4. The virtualization of environmental regulation

The word ‘risk’ in its English usage emerged in relation to the establishment of nineteenth-century insurance markets. Risk management has emerged as a vital institutional component of capitalist societies with its origins in protection against accidental losses and commodity price fluctuations (Ewald, 1992; Giddens, 1991). In recent years the promotion of environmental insurance as an alternative to more direct forms of state regulation has gained an unprecedented degree of credence in the environmental management literature. Conventional approaches to risk which emphasize a combination of private insurance with state regulation are now being challenged by a newly emerging neo-liberal emphasis on purely market driven forms of regulation (see Paté-Cornell, 1996).¹³ At

a recent international conference on the theme of catastrophic risk held at Stanford University, for example, a number of participants suggested that private insurance ought eventually to replace direct forms of state regulation in the environmental arena (see, for example, Arrow, 1996; Epstein, 1996; Kane, 1996; Priest, 1996). Arguments employed against state regulation include the inability of political institutions to pursue consistent long-term policies; fraud; bureaucratic inefficiency; and the misallocation of disaster relief. Epstein (1996), for example, argues for a privatized regulatory regime based simply on the laws of property, contract and tort since all forms of state intervention, however well intentioned, are best conceived as barriers to the effective operation of markets. In a similar fashion, Priest (1996; p. 232) suggests that the state can do little to reduce risk levels since state intervention is ‘directly antagonistic to insurance as a risk-reduction mechanism’. Central to this developing perspective lies faith in new forms of financial innovation, particularly the flexibility of derivatives, in responding to environmental risks far more effectively than public agencies. In the case of environmental risk this involves the spreading of potential risk through ever more elaborate systems of reinsurance with interlinking syndicates for risk-sharing and risk-pooling. Since the rationale behind the expansion of financial derivatives stems principally from the avoidance of regulatory obstacles to capital accumulation (see Miller, 1986; Scholes, 1996), we can argue that the advocacy of environmental insurance forms an integral element in the neo-liberal environmental agenda.

But what are the implications of this emphasis on private forms of environmental insurance as an alternative to the regulatory role of public agencies? The last 15 years has seen substantial restructuring in the provision of environmental insurance. In the case of the chemical industry, for example, insurers have been unwilling to provide comprehensive general liability insurance since the early 1970s without significant exclusions (Pearce and Tombs, 1996).¹⁴ From the mid-1980s onward there have been a series of decisive events affecting the development of environmental insurance: the Bhopal incident and compensation claims derived from asbestos claims and hurricane damage have played a key role in forcing the restructuring of insurance provision including the *débâcle* facing Lloyds of London in the 1990s (Fischer, 1996; Raphael, 1994).

An instructive recent example is provided by Asbestos personal injury litigation. This is widely recognized as the most significant mass tort of recent years and has fundamentally challenged the nature of environmental risk

¹³ For conventional approaches to risk management, see for example the analysis of Kunreuther (1996) and Viscusi (1996).

¹⁴ Even before Bhopal the environmental insurance market for the chemical industry had almost disappeared (see Bogard, 1988, 1989; Jones, 1988; Pearce and Tombs, 1996, p. 444).

insurance in Western societies (Grant, 1995).¹⁵ The increasing recourse to individual litigation against environmental risk poses real dangers for companies which might previously have only had to contend with the demands of state regulation. The dominance of corporate, professional and governmental defendants in the use of civil damage judgements as a policy instrument suggests that ‘toxic tort’ is an extremely inefficient and inequitable approach to environmental regulation (Baram, 1987; Galanter, 1994; Pearce and Tombs, 1996; Priest, 1993). Legal scholars note how the inadequacies of tort law have periodically fostered new roles for public agencies in the evolution of public health legislation. Nagareda (1996; p. 940), for example, compares contemporary mass legal actions in the United States over asbestos and Agent Orange to earlier developments in the history of American regulation:

Lawsuits within the common law system of the nineteenth century provided only slow, sporadic means to achieve these regulatory ends. Like their present-day descendants in the mass tort area, common law courts proved institutionally incapable of handling the large amount of recurring cases needed to achieve coherent economic regulation. The problems that industrial activity on a national scale posed, instead, demanded ongoing oversight on a long term basis. The response ultimately was not to tinker with the common law but to empower new institutions: namely, public administrative agencies acting upon delegations of power from a national Congress.

The interrelated issues of risk, regulatory efficacy and social equity lead us to the critical example of the restructuring of environmental insurance provoked by the rapidly rising compensation claims for the effects of climate change induced tropical storms. Since the early 1990s a succession of hurricanes have led to a spate of bankruptcies for insurance companies, particularly for Pacific Islands and for coastal settlements along the southern and eastern seaboard of the United States. Hurricanes Gilbert (1988), Hugo (1989), Andrew (1992) and Opal (1995) have all had a wide ranging impact on the restructuring of markets for environmental insurance with the scaling back of insurance cover for climate change related property damage (Academic Task Force, 1995;

Beck, 1996). In 1993, for example, the State of Florida was forced to place a moratorium on insurance companies to prohibit the cancellation or non-renewal of existing property insurance and ultimately set up its own insurance fund to protect its residents and prevent widespread capital disinvestment. In poorer countries and regions affected by climate change the situation is far more problematic: Western Samoa, for example, has been left with no insurance cover for weather related property damage since the early 1990s (see Leggett, 1993; Tucker, 1997). The environmental insurance industry has begun to respond to climate change in a number of ways: raising the cost of premiums; imposing minimum damage limits; risk spreading through reinsurance; and the selling of so-called Catastrophe Futures and Catastrophe Bonds (UK DoE, 1996). Property insurers (especially major reinsurers such as Munich Re and Swiss Re) have become increasingly vocal in their concern about the effects of global environmental change and now represent a major economic interest group ranged against the fossil fuel industry (Dlugolecki et al., 1995; Flavin, 1994; Tucker, 1997). The example of climate change suggests that the limits to environmental insurance may provide a significant pretext for new forms of state intervention as well as exposing a polarization of economic interests behind current patterns of energy and resource use.

The available evidence suggests that reliance on environmental insurance as an alternative to various forms of state regulation is likely to exacerbate rather than ameliorate the distributional consequences of environmental risk. The displacement of direct forms of regulation by private insurance holds important implications for levels of environmental security both within and between different societies. As risks are increasingly perceived in terms of insurable property damage this will powerfully skew the evaluation of the impact of environmental change towards the wealthier sectors of Western societies. Yet the extent of available insurance appears to be in inverse proportion to the scale and seriousness of risk (Beck, 1995, 1996). This is in large part due to the fact that ‘insurance operates where losses have some stochastic or probabilistic character’ (Priest, 1996; p. 221) leaving the more long-term, uncontrollable and least well-understood dimensions of environmental change beyond the practical remit of the private insurance industry. Just as nineteenth-century urbanization necessitated new forms of state intervention it appears that the inadequacies of various forms of environmental insurance may provide powerful new arguments to strengthen the regulatory role of public agencies.

Property-based conceptions of ‘economic citizenship’ conflict with views of citizenship and democratic participation that seek to link environmental protection with social equity. The ‘virtualization’ of environmental risk through the commodification of uncertainty has emphasized the short-term profitability of insurance derivatives

¹⁵ Some legal scholars suggest ways of minimizing the impact of mass torts and even dismiss suggestions that there is anything particularly significant or novel about recent developments (see Siliciano, 1995). In contrast others warn that at present only a small fraction of potential claimants actually pursue their grievances through the legal system to the extent that any systematic response on the part of the public could seriously undermine the legal system as a whole (see McGovern, 1995; Rabin, 1995). Asbestos also provides us with clear examples of new regulatory inequalities emerging at an international level (see Castleman and Navarro, 1987; Chen and Huang, 1997; and Johanning et al., 1994).

over long-term investment in social and economic welfare. These developments pose a major challenge to existing institutional and state structures of regulation and control with policy emphasis increasingly predicated on the maintenance of confidence in financial markets rather than investment in the 'real economy' (Sassen, 1996). The dynamic behind these new forms of risk mitigation through the indirect effects of market discipline holds profound implications for more direct forms of regulatory activity by the state.

5. Conclusions

The 'risk society' metaphor reflects both the increased scale of environmental risk and the concomitant weakness of existing social institutions for handling relations between society and nature. The persistence and severity of environmental risk reflects the fragility and historical ephemerality of the various institutional and social arrangements which serve to mediate between conflicting interests in capitalist society. It is this historical dimension to environmental regulation which is largely absent from both positivist conceptions of risk and more recent attempts to apply social theory to the understanding of risk. The force of post-war globalization has brought about an extensive realignment between state, economy and society ushering in new forms of 'governance' in the place of established models of national and regional state activity. We can argue that the state and modern society are to a certain degree synonymous because the complexity of modern urban societies demands the existence of state-like structures in order to function. Since state regulation and modernity are inextricably linked it follows that the crisis of modernity will be reflected in emerging patterns of regulatory failure. The perception that environmental problems are out of control and present a growing threat to human well-being stems in part from the erosion of the public sphere and the limited institutional and administrative structures which might allow wider involvement in the development of public policy.

The unequal distribution of the cause of environmental risk (inherent in vastly different patterns of global energy and resource use) has undermined international efforts to achieve a more socially just regulatory order (Lipietz, 1992b, 1997). The rapid expansion of social science research on global environmental change has generated a plethora of policy scenarios rooted in an illusory capacity for intervention in environmental systems on the basis of a techno-managerial logic which ignores the political and institutional context for the global use of energy and resources. These globalized environmental discourses not only misread the causes of environmental degradation but perpetuate the kind of western cultural and scientific dominance which has undermined any meaningful attempts to create greater international co-

operation and understanding. The emphasis on various forms of sophisticated data gathering and environmental 'surveillance' intensify the regulatory tensions between the imposition of rational order from above and the more complex task of connecting regulatory strategies to actually existing social relations and institutional structures on the ground. The limits to environmental regulation form part of a broader set of dilemmas facing relations between society and nature under the impetus of capitalist urbanization and the globalization of modernity. Since the nineteenth century ecological risk and public health scares have been repeatedly translated into new regulatory regimes which threaten the viability and profitability of different fractions of capital whilst seeking to protect the stability and well-being of society as a whole. Contemporary developments are distinctive in a number of respects: the emergence of new sources of environmental risk; the development of greater degrees of public scepticism towards technical and scientific expertise; the complexification of spatial scales (in terms of interactions between different levels of state activity); the power of global capital markets to frame policy debate (as recent crises in Mexico, Indonesia and South Korea dramatically attest); and above all, the intensity of neo-liberal challenges to the fiscal autonomy and ideological legitimacy of public regulatory agencies.

The combination of economic restructuring in the core economies of the West with the increasing power and flexibility of global capital markets have challenged the political legitimacy and administrative efficacy of environmental regulation. This is not to argue, however, that effective forms of international regulation are no longer possible but that new institutional innovations face formidable ideological and fiscal obstacles to their success. As Hirst and Thompson (1996) point out, the global regulatory crisis is essentially political rather than logistical in nature. The critical question is whether the assertion of some kind of ecological public interest has the potential to challenge the post Bretton Woods hegemony of global finance capital. Just as nation states have been pivotal in fostering greater degrees of global economic integration they also hold the key to altering current developments through the promotion of greater degrees of international cooperation. The 'ecological leviathan' of past legislative achievement must be capable of responding and adapting to these changed circumstances. This is why deliberative conceptions of environmental law which advocate consensual conceptions of the public good must play a vital role in combining issues of equity, legitimacy and regulatory efficacy.

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