Reflexivity or Governmentality? The Curious Case of On-line Pollution Inventories

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Abstract

The Internet is playing an increasingly significant role in the politics of environmental risk: pressures groups are now using homepages and e-mail as part of their normal campaigning, businesses are developing on-line marketing strategies, and states are increasingly trying to use the web as a tool of governance. One of the manifestations of these developments has been the creation of on-line pollution inventories that require polluting firms to publicly disclose their annual emissions on state controlled web sites. The idea is that the fear of negative publicity and protest will goad firms into reducing the level of environmental risk they create. This approach therefore has a significant impact on the Internet strategies of all three players: business, pressure groups and the state. This paper considers how to interpret these inventories by comparing explanations that can be generated using Foucault's concept of governmentality and Beck's notion reflexive modernisation. Examples are taken from Australia, the USA and UK. Overall it is argued that while both approaches offer an engaging description of responses to environmental risk, reflexivity also offers an embryonic praxis.

Introduction

If knowledge is power, how will the major institutions of power be affected as the Internet alters the distribution of information? Will it increase the democratic input of the community into major decisions? Could it strengthen the hold of business over government? Might it encourage the development of more autocratic state power? These are important questions because they are affect the way we are governed. This paper explores these issues with a particular focus on environmental governance and on-line pollution inventories. The first section briefly reviews three positions on the impact of the Internet on democratic governance: positive, negative and neutral. Section two then summarises a comparative case study of state controlled on-line pollution inventories that have been operating in the USA, Australia and the UK. The next two sections then consider how to interpret these inventories through two risk theory frameworks: governmentality and reflexive modernisation. Finally, a synthesis of the two schools of thought is outlined and some key criticisms addressed. The broader implications for the Internet and governance are also considered.

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The Internet & its Users

Business, the state and non-government organisations (NGOs)[2] see the Internet as having considerable political importance and have developed various on-line strategies as a consequence. From Seattle to CHOGM, NGOs utilised web sites and e-mail to promote their causes, recruit members, network groups, coordinate actions, and directly lobby business and state institutions for change (Howes 2001a). But business has also seen the potential of the Internet. On the one-hand it promotes on-line business transactions and on the other it seeks to counter the negative messages of protesters. Shell, for example, uses its web site to give its own version of the social and environmental impacts of its operations in Nigeria as a counter to the international campaign waged by environmental and human rights NGOs (Howes 1997). The state has also taken up the new technology with parliamentary debates, ministerial media releases, legislation and many reports now available on-line. Further, it is possible for citizens to e-mail their local MP or government agency to communicate their concerns and request information. For all three players (NGOs, business and the state) there is the added attraction of being able bypasses the editorial controls of the media and make direct contact with target audiences. Does this mean, therefore, that the Internet has had a significant effect on governance and the distribution of power?

Broadly speaking the literature on the effect of the Internet can be sorted into three main categories: positive, negative, and neutral. On the positive side, Smith (2001, 48-50) emphasises how the Internet has increasingly been used by NGOs and suggests that this could lead to more democratic control of government. Hewitt (1998, 83-87) argues that it may be the historical equivalent to the invention of the printing press that could break down the control of information and allow the formation of direct relations between people and NGOs around the world. There is a note of caution, however, in that on-line communications could lead to greater surveillance. The risk of surveillance is the point often picked up by the negative camp and several features of this information technology increase this risk. First, all visits to web sites and all e-mails sent and received leave an electronic trail that can be traced. This means that an employer or state agency can see what you have been accessing, who you have been in contact with, and read the content of your communications. Second, electronic records of communications persist on the hard drive of a computer and may be retrieved after the visible files have been deleted. Third, software is available that can scan for key words within communications and automatically bring messages that contain them to an observer's notice. These points have led the media to warn of a potential for Orwellian 'Big Brother' surveillance (Correy 1998; Foreshew 2001). In the academic literature, Moore (1999, 41-59) warns of the need to protect against intrusive surveillance, the hijacking of the web by the extreme right, and the development of information monopolies by powerful trans-national firms that seek to act as on-line gatekeepers. Boden (2000) also argues that the Internet introduces a greater instability into financial markets that could increase the risk of capital flight. I would suggest that this adds to the influence of trans-national firms over governments that are usually sensitive about levels of economic growth and adjust policies to try to encourage investment by business.

Between the positive and the negative ends of the spectrum are theorists that approach the Internet with a degree of neutrality. Hague and Loader (1999, 21) suggest that it is neither a panacea for the shortcomings of liberal democracy, nor does it spell its downfall, it is simply a

[2] For the purposes of simplicity I will use NGO as a collective term to refer to interest groups, pressure groups, lobby groups, advocacy groups, protest groups, service delivery organisations, etc., that are not under direct control of the state or business. I will use 'business' as a collective noun to refer to both firms and their organisations.

useful tool for conducting current interactions in new ways. Hale, Musso and Weare (1999, 97-115), for example, studied 290 US municipal web sites and identified substantial barriers to greater civic engagement such as a lack of civic education, general apathy, and feelings of disconnection between citizens and leaders. They concluded that the use of the Internet to date has not overcome these barriers because they are a product of the general US political culture. Wilhelm (1999, 175-76) also found that the Internet is not being used to its full potential and Bimber (2001, 53-65) found it had not encouraged a culture of greater participation in the USA. Magarey (1999, 417-19) concluded that Australian politicians are generally not enthusiastic about the idea of e-democracy and were sceptical about the effectiveness of e-mail communications with citizens. Malina (1999, 25-38) concludes that social networks are the key to improving democracy and argues that the Internet on its own may only entrench current inequalities because of limited access to the necessary technology and training. Milner (1999, 63-72) compared on-line public sector initiatives to provide better information to the community in Australia, the USA and UK. While she made favourable comments about the Australian initiatives of the early 1990s, she also raised the issue of the information 'haves' and 'have nots', that is, those who can afford the equipment, resources and training to make use the Internet and those who cannot. The theme of the possibility of a growing digital divide is picked up by Symmonds (2000, 32) who argues that it may increase the marginalisation of already vulnerable groups.

Overall it is apparent that the Internet has not yet led to the democratic transformation of government predicted by the positive theorists, nor does it appear to have established a totalitarian regime of surveillance. There are signs, however, that the web is increasingly being used by the state, business and NGOs, although users constitute only a small proportion of the world's total population. This is true even in industrialised countries where the Internet is reasonably widely available. Magarey (1999, 410), for example, found that only 26% of Australians were regular Internet users in 1997 and Bimber (2001, 61) cites a similar figure for Americans who were both on-line and engaged in politics in 1999. To explore the impact of the Internet on governance further, I would like to briefly examine the case of web-based pollution inventories because they demonstrate the on-line strategies of all three key players and highlight an interesting impact of increased surveillance.

Putting Pollution On-Line

The US Toxics Release Inventory (TRI) was the forerunner for both the Australian National Pollutant Inventory (NPI) and the UK Pollution Inventory. Under pressure from community-based NGOs, Congress passed the *Emergency Planning & Community Right to Know Act* in 1986 that created the TRI. The inventory was based on the principle of community 'right to know' that asserts the entitlement of residents to be informed about hazards that may affect them (US EPA 1995). Under the TRI, the US Environmental Protection Agency (EPA) identifies a list of hazardous substances (initially 329, later expanded to 647), sets threshold levels for the emission, production or use of these substances, and issues guidelines for calculating and reporting their release. Any firm that uses, produces or releases more than the threshold amount of one of these substances in a year must calculate and report their level of emission to the EPA. The agency checks and collates the information then releases it on a publicly accessible database. Data was first collected for 1987 and published in a paper format that was supplied to public libraries. It made the transition to computer disc and web versions as the technology became available. The public can now use the TRI web site to search for specific substances or investigate emissions from

individual plants, companies or geographical locations. Aggregate and historical trend data are also available (US EPA 2000).

The UK Pollution Inventory works in a similar fashion to the TRI and is administered by the national Environment Agency. It started as the Chemical Release Inventory in 1990, was restructured into its current form in 1997, and has 150 substances on its reporting list (Environment Agency UK 2000). The Australian NPI was first proposed in 1992 in the wake of the Rio Earth Summit in Brazil (Keating 1992, 7). After lengthy consultations and trials it began to collect data for 1998-99 and the web site was formally launched in 2000. A joint Commonwealth-State ministerial body, the National Environment Protection Council, oversees the inventory. Six State and two Territory environment agencies collect the emission data, while the Commonwealth Department of Environment runs the web site. The NPI is the most modest of the three inventories with only 36 substances or groups of substances covered. There are plans to expand the list to 90 over the next few years.

International research into the effect of on-line pollution inventories has been patchy. Early work by Habitch (1990) for the US EPA suggested that the TRI did put pressure on firms to reduce their emissions. Over ten years the TRI itself indicates a fall of 40% in emissions of the original listed substances (US EPA 2001). The mechanisms that put pressure on industry to clean up its act appear to be threefold. First, industry executives were actually surprised at the amount of raw material being wasted when the TRI started and ordered improvements in production efficiency (Gottlieb, et. al. 1995). Second, NGOs have been willing to take legal action against polluting firms which has effectively scared some firms into action (Shapiro 1990; English 1997). Third, firms that appear high on the TRI's list of polluters tend to lose share value as investors are wary of potential losses through court actions and clean-up costs (Hamilton 1993; Khanna 1998). Such a fall is seen as poor performance by company executives, who take action to try to avoid the effect. Of course the aggregate results may overstate the impact of the inventory. Some of the reduction in total emissions may be due to older industries shutting down or more polluting processes being moved off-shore. The size of the drop during a period of strong economic growth, however, suggests that industries have gone at least some way towards reducing their emissions per unit of output.

As would be expected, industry has tended to be critical of the imposition and expansion of the inventory (Fairley 1996) while NGOs have been supportive and pushed for a more comprehensive system of accountability, fewer exemptions, and more accurate reporting (Hearne 1996; English 1997). Similar reactions have occurred in response to the UK inventory (Society of Chemical Industry UK 1994; Finer 2000; Maslin 2000; Scott 2000) and the Australian NPI (Howes 2001b; Gunningham 1993; Gunningham & Cornwall 1994; Streets & Di Carlo 1999; Sullivan 1999; Fayers 1998; Taberner 1999; Greenpeace 1999; Queensland Conservation Council 1999; National Toxics Network 1998;Slagle 1995; Murphy 2000; Ernst & Young 1995; Minter Ellison 1995; NEPC 1998; QEPA 1998; Hill 1999). The UK has also experienced significant reductions in emissions since the first version of the inventory was introduced (Environment Agency UK 2001). The Australian inventory is too recent to provide a reasonable historical trend. My own research suggests that NGOs are not as interested as their US counterparts in pursuing polluting firms because of the barriers to using the legal system and a different political culture that encourages them to focus on wilderness issues. This bears out the more general findings on the impact of political culture and institutional contexts on the Internet's ability to encourage greater civic engagement.

Critiques of these inventories indicate that they are not a panacea for the environmental risks generated by industrial society. They do, however, provide an interesting tool of governance in that they seek to use the Internet as a means to strategically redeploy knowledge in a way that prompts NGOs to act as environmental watchdogs. This role is limited to those organisations with Internet access, the ability to interpret the technical data, and the resources to undertake some kind of effective response (Howes 2002). In general industry has been uncomfortable with the increased surveillance, while the state appears satisfied with the deflection of criticism from its agencies onto specific polluters. There was some argument between the different levels of Australian government over how the burden of funding should be shared but these inventories are relatively inexpensive because the cost of reporting falls to industry, while the resources for surveillance and confrontation come from NGOs. What then are the implications of these inventories for the broader impact of the Internet on how we are governed and how, if at all, will the distribution of power change? Given the lack of long-term empirical data, the answer will require the use of a theoretical framework to further the analysis and extrapolate results.

Inventories, Environmental Risk & Governmentality

Pollution is popularly perceived as a risk to both human health and the environment. Studies in all three countries, however, suggest that there is a significant difference in the perception of such risks between experts and the broader community (Landy, et al. 1994, 133-171; ANOP 1993, 8; Scott 2000, 38-39; Lash 2000, 52-57). On-line inventories are an attempt by the state to respond by providing more information about potential risks to the public and in so doing encourage better risk management by industry. These features make them a prime subject for analysis by risk theory. Lupton (1999, 17) offers a comprehensive survey of various forms of risk theory that she divides into three main groups: cognitive science, socio-cultural, and social constructionist (Howes 2001c). In this paper I would like to focus on two particular schools within the socio-cultural group: governmentality and risk society theory. Mol and Spaargaren (2000, 21-22) link risk society theory to the stronger versions of ecological modernisation to form the reflexive modernisation school, a move that will prove useful later in the analysis.

The governmentality version of risk theory springs from the ideas of Foucault, who begins with two fundamental premises. First, he asserts that power and knowledge are inextricably linked, like two sides of the same coin. Second, he claims that power comes from below, not above, because any institution or structure ultimately depends on the consent of the subjects that it attempts to rule (Foucault 1985, 31; Hindess 1996, 96-97). Foucault suggests that when two or more people enter into an unequal association, a force relation is formed in which one person is dominant and the other is subordinate (Foucault 1990, 93-101). Associated with this force relation are discourses that reinforce the situation. A discourse is a kind of relation-specific ideology that includes constructed knowledge which gives the dominant person strategic information about the subordinate that helps maintain their relative positions. It also produces a kind of ‘micro-worldview’ that justifies the relation, encouraging both the subordinate and dominant person to accept the legitimacy of the situation. Discourses manifest themselves in the ideas, values, categorisations, practices, and self-discipline that cause people participate in their own control (Foucault 1985, 25, 80; Hajer 1995, 44). Unlike the Marxist notion of a single dominant ideology, however, there is a multiplicity of discourses that pervade the fabric of society that are constantly transmuting, clashing, or reinforcing each other. Further, any force relation can be affected by many different discourses.

With regards to pollution inventories, a good example would be that of a typical relationship between an environmental health scientist and a local resident living in an industrial suburb. Associated with this relationship is a discourse that gives the scientist strategic knowledge about the dispersion patterns, levels of on the ground exposure, and health effects on the resident. The resident does not have this knowledge or expertise, so even if they can find local emission data on a web site they must rely on the scientist's assurances that living in the area is safe. This discourse encourages trust by giving the scientist a particular social status on the basis of their expertise and gets both to accept this legitimacy of this situation. As a result, even when the resident can see smoke coming form a nearby chimney and smell an odour, they may accept the scientist's assurance that they are safe. If, however, the resident happens to be a member of Greenpeace and is simultaneously under the influence of an environmental discourse that assumes no level of pollution is safe, the dominance of the scientist will be undermined. Things may get even more complicated in other economic, social, political, cultural or historical contexts. If the relation is occurring in a post-colonial state, there may be a discourse relating to race, for example when an Anglo-Saxon scientist speaking to an Indian resident. Alternatively, gender differences may also be a factor if a male resident is working under a patriarchal discourse and the scientist happens to be female. Class might also generate a discourse if a middle class scientist tries to relate to a working class resident. Foucault himself did not say a great deal about these specific kinds of discourses, but his ideas are adaptable enough to accommodate them (a point taken up in the last section of this paper). So different contexts lead to different force relations. This may be another reason why the NGO responses to pollution inventories in Australia varies from that in the USA.

Surveillance and the possibility of observation is a key feature of the way discourses operate because individuals modify their behaviour and discipline themselves if they think they are visible (Foucault 1977, 202-203). This is particularly important for the way pollution inventories work by making firms feel visible, even if no one looks at their emissions on a web site. Rutherford finds evidence that current attitudes towards environmental problems are examples of an ecological discourse at work that assumes scientific surveillance and management is the solution. Although Foucault did not apply his ideas directly to environmental issues, Rutherford (1994, 44) argues that such a discourse is a version of the 'population-riches problem' that Foucault identified in nineteenth century thinking. Meister and Japp (1998, 417-418) found that the discourses underpinning the model of sustainable development in *Agenda 21* supported the dominant position of US business by constructing the environment as a resource to be used and promoting consumerist behaviour. Stratford (1994, 58) draws comparisons between discourses that support a "disciplining" and managerial approach to both nature and women.

Foucault applied the notion of discourse to the state in a very specific way. He used the term 'governmentality' and gave it three definitions: a description of the workings of state governance, an historical trend, and a particular European transformation.

> "1. The ensemble formed by the institutions, procedures, analyses and reflections, the calculations and tactics that allow the exercise of this very specific albeit complex form of power, which has as its target population, as its principal form of knowledge political economy, and as its essential technical means apparatuses of security.
> 2. The tendency which, over a long period and throughout the West, has steadily led towards the pre-eminence over all other forms (sovereignty, discipline, etc.) of this type of power which may be termed government, resulting, on the one hand, in the

> formation of a whole series of specific governmental apparatuses, and, on the other, in the development of a whole complex of *savoirs*.
> 3. The process, or rather the result of the process, through which the state of justice of the Middle Ages, transformed into the administration state during the fifteenth and sixteenth centuries, gradually becomes 'governmentalized'" (Foucault 1991, 102-103).

Most theorist have picked up on the first definition and for the purposes of this paper governmentality can be understood as the mentality of both the governed and those governing that rationalises and legitimates the sovereignty of the state. It is a set of discourses that get subjects to accept the legitimacy of the existence and actions of state institutions, and guide these institutions in their calculations and strategies of intervention. Miller and Rose (1993, 78-82) argue that governmentality is apparent in the way the state institutions operate: the assumption that government reports and collected data can adequately transmit information to decision makers; the attempts to deploy programs and promulgate norms in response to issues; and the use of experts to interpret and guide decision making. They also suggest that the underlying assumption about these activities is "an eternal optimism that a domain or a society could be administered better or more effectively, that reality is, in some way or other, programmable" (Miller & Rose 1993, 78).

Rutherford (1994, 43) suggests that environmental impact assessments are a tangible manifestation of the governmentality approach to environmental problems. I would argue that it is also evident in on-line pollution inventories, particularly when the risk theory variant is used. Lupton (1999, 85-103) points out that the key to governmentality is to try to normalise risks through surveillance, regulation and discipline. First, risk avoidance is constructed as a moral norm by the discourses of governmentality. Then 'risky' people, those that deviate from the norm, are identified and put under surveillance. Finally, disciplining regulations are imposed as mechanisms of power to try to normalise these 'deviants'. The discourses of risk therefore influence decision-making and service delivery by the state. Pollution inventories essentially construct the avoidance of emissions as a moral norm, identify polluters as the risky population, discipline them into reporting their emissions and place them under the surveillance of the public. They also generate normalisation mechanisms to reduce pollution through concerns about inefficiency, together with fears of negative public relations that could lead to legal action and reductions in share value.

While this is an elegant way of considering environmental governance, and pollution inventories in particular, there is a major drawback. Foucault's approach does not generate a praxis. He offers some thoughts on individual resistance to unjust exercises of power (Foucault in Rabinow 1991, 6), but having pointed out the flaws in state activities, there is no sense of how to respond collectively. With regards to pollution inventories, for example, it gives a wonderful explanation for the mentality behind their operation, but it does not tell us if they are an appropriate strategy for responding to environmental risks, nor does it tell us if they will support or undermine democratic decision-making. This is where risk society theory and reflexive modernisation comes to our assistance.

Risk & Reflexive Modernisation

Beck's (1992, 21-26) concept of the risk society is that the process of modernisation is undermining itself with the negative impacts that it produces as part of its normal operation. As industrial production has spread, it has become the main foundation on which modern society is built. The side effect of this transformation, however, has been to generate

environmental risks that seriously threaten the survival of humanity and the planet. This effect has spilled over into politics where the struggle between classes over the distribution of goods has been usurped by a struggle over the distribution of 'bads', such as pollution and toxic waste. The idea of risk society is also pursued by Giddens (1998a, 31-33; 1994, 91-95) and he is particularly interested in the rise of uncertainty and the loss of faith in expert knowledge. Both Beck and Giddens offer a framework strategy for managing the uncertainty inherent in expert knowledge through a more accessible public review process (Giddens 1994, 107; Beck 1998a, 20-21). This could include public consultation forums on major issues, community representation on major decision-making bodies within the state and industry, and the possibility of community-state-business partnerships on specific projects (Giddens 1998b, 70-79). Pollution inventories fit quite neatly into the sorts of reforms being proposed because they at least partly open-up business environmental decision making to public scrutiny.

Beck (1994, 6) defines reflexive modernisation as "self-confrontation with the effects of risk society that cannot be dealt with and assimilated in the system of industrial society". This approach shifts the focus from the notion of surveillance used by Foucault, to the overtly collective political act of confrontation. In this case, pollution inventories force industry to internally confront the negative effects of their activities by making them audit their operations, recognise waste and inefficiency in their processes, and publicly admit their emission levels. Further, this process encourages NGOs to externally confront industry with demands for change. Giddens (1998, 31) is careful to point out that reflexive modernisation goes beyond simple modernisation because it "implies coming to terms with the limits and contradictions of the modern order." Scott (2000, 34-35) argues that rather than there being an identifiable switch between simple and reflexive modernisation, these features of have always been part of industrialisation. Lash (1994, 120-121) suggests that reflexivity requires access to information and communication networks. It is therefore a strong feature of on-line pollution inventories because they network NGOs while turning the products of industry (electricity, computers, software, and the Internet) against itself, confronting it with the environmental risks generated. Further, the inability of the state to prevent pollution has led to the proliferation of NGOs as a sub-political movement that takes up neglected issues.

Mol and Spaargaren (2000, 21-22) group both risk society theory and the stronger versions of ecological modernisation under the reflexive modernisation umbrella. Fundamentally, ecological modernisation argues that while the institutions of modern society (liberal democracy, industry and market economics) have gone astray, they can be saved with appropriate restructuring (Mol and Spaargaren 2000, 19; Dryzek 1997, 141; Christoff 1996, 490-493). Mol and Spaargaren (2000, 19-23) and Christoff (1996, 490) point out that the later versions of this school of thought have moved away from a narrow technological focus on efficiency and sought to encompass broader social, economic and political transformations. Representative thinkers would include Gore (1992), AtKisson (1999), and Hawken, et al. (1999). Hajer (1995) and Curran (2001, 47) use ecological modernisation as a means to explain the popular rise of environmental policy goals such as sustainable development. Weale (1998) found that political culture was a significant factor in the uptake of ecological modernisation ideas amongst policy makers. Blowers (1997) and Cohen (1997) suggest that both environmental policy making and the rise of NGOs can be explained by the reflexivity of risk society and ecological modernisation. It is also clearly an underpinning feature of pollution inventories that are simply designed to make industry use the environment as a resource more efficiently. Further, it is assumed that the cost cutting imperative of the market will add to the political pressure from NGOs armed with inventory data, to encourage cleaner production practices.

Tension & Synthesis

The stronger versions of ecological modernisation, together with risk society theory, deal with issues of surveillance and governance in very different ways to governmentality. Surveillance is transformed into a stronger notion of confrontation that better represents the purpose of pollution inventories. Internet-based governance is not just a manifestation of the mentality of both governed and governing, it is transformative because it represents a strategic opening up to community scrutiny for reporting firms. Hajer (1995) has shown that it is possible to construct a useful synthesis between the two. He uses discourse analysis to reveal how some narrower versions of ecological modernisation have underpinned the development of environmental policies in industrialised states. In the final part of the analysis he supports Beck's reflexive approach to challenging expert decision-making. Specifically, he proposes the creation of discursive public forums and laws to increase civic engagement. This synthesis draws on the strengths of both risk theory schools: the analytical tools derived from Foucault that expose the workings of power, and the praxis of Beck and Giddens that can put this knowledge to use.

Such a synthesis is not problem-free because both reflexive modernisation and discourse theory have their critics. One point that has been levelled against both is their gender blindness. In examining Foucault's work, Newton (1998, 426) argues that feminists highlight how discrimination against women spans cultural and historical boundaries to operate under wide range of different discourses (eg. tribal, feudal, or modern). Newton suggests that this stability of power relations is a problem because Foucault's discourses and force relations are dynamic and should change with historical and cultural circumstances. The persistence of almost universal discrimination against women is therefore difficult to explain. Although Foucault addresses issues such as "hysterization of women's bodies" in nineteenth century Europe, on the whole he neglects gender issues and even draws on an ideal of citizenship that comes from the patriarchal ancient Athenian model. Having said this, feminism appears to have a more ambiguous attitude towards Foucault's work. Diamond et. al (1988), for example, agree with his basic idea about power and knowledge being linked, but criticise him for ignoring prevalent masculine discourses, while Stratford (1994, 58) uses his techniques to criticise the subjugation of both women and the environment. Rose (2000, 65) makes a similar criticism of Beck in that the impact of the risk society is felt disproportionately by women, but at the same time she support Beck's call for a new openness in risk management. This suggests that the analysis developed by both schools of thought can be adapted to include the gender dimension.

The second criticism that is often raised, again against both schools, is that they do not adequately deal with the issues of class or race. Newton (1998, 426-427) argues that there are more persistent social structures, such as patriarchy and class, that Foucault neglects and the problem of explaining the persistence of some force relations and discourses is an issue taken up by Marxists. They claim that he does not account for the impact of real material circumstances on power relations. Although markets are themselves constructed, they are ubiquitous and impose a particular kind of material discipline on individuals across different societies. Further, Foucault offers no project for labour to resist exploitation, he only considers individual discourses. Foucault deliberately set out to study 'things as they are' and he wanted to avoid the distortion of data by totalising theories (Foucault in Rabinow 1991, 6, 60). Although he was trained within the structural Marxist school, he rejected the notion of real material interests and a dominant ideology. This is why he was reluctant to set his work

within a broader Marxist framework and it goes some way to explaining why it is difficult to derive a praxis from Foucault's work.

Beck does not escape criticism by theorists interested in class or race as social divisions. Levitas (2000, 198) uses discourse analysis to argue that Beck and Giddens do not go far enough in their proposals for reform because they leave the basic structures and contradictions of capitalism in place. Dryzek (1997, 151) makes the point that class and race are still a significant factor in the distribution of environmental risks. Toxic waste dumps and the worst effects of pollution tend to be located in poorer areas of the USA, for example, particularly those inhabited by Latin and African Americans. This was conceded to some extent by Beck (1998b, 337; 2000, 211-213) in his later work, although he argues that focussing on categories like class, gender, or race, are too restrictive and he argues that there are new risks that cut across these groupings (such as nuclear war). While he accepts cultural context as important, he argues that the divide between culture and nature has been blurred because they have both been shaped by industrial activity. Perhaps we can accept that there are many kinds of older discourses/force relations that persist within the social fabric and still influence the distribution of localised risks. (See the example used earlier in this paper, where the force relation between an environmental health scientist and a resident can be influenced by discourses on expertise, environmentalism, gender, race, culture, and class.) This may explain the different responses to pollution inventories in different states.

One of the major issues facing both schools is the realism v. constructivism divide. Foucault's idea of discourse may lead straight to a relativistic paralysis. If all knowledge is constructed by discourse, even if an external reality exists no knowledge of it is possible and all we have are fictions created by the discourses we hold. Poster (1984, 163) uses this problem to point out that Foucault's own research may just be a fictional construction of discourses. He appears to be aware of this dilemma.

> "I am fully aware that I have never written anything other than fictions. For all that, I would not want to say that they were outside the truth. It seems plausible to me to make fictions work within truth, to introduce truth-effects within a fictional discourse, and in some way to make discourse arouse, "fabricate", something which does not yet exist, thus to fiction something. One "fictions" history starting from a political reality that renders it true, one "fictions" a politics that does not yet exist starting from a historical truth" (Foucault in Dreyfus & Rabinow 1984, 204).

Rutherford (1994) argues that Foucault was not a total relativist when it came to knowledge. He suggest that on the one hand, Foucault did adopt a critique of the human centred sciences, such as psychology and medicine, because people were constructed as subjects and caught up in the web of force relations and discourses. On the other hand, Foucault's approach to the natural sciences, such as physics and chemistry, appeared to assume that while the natural sciences may have been a product of power relations in their infancy, at some point they detached themselves from its influence. Rutherford disagrees with Foucault's treatment of the natural sciences and argues that the specific ecological discourse that influences our perception of nature and environmental problems is a product of "big science" and "systems" discourse that emerged from dominant US corporations in the post-war period. Despite this criticism, Rutherford still argues that the influence of power relations and discourses on environmental problems does not make them any less real. It does, however, affect our understanding of them and our response.

Beck and Giddens, on the other hand, are often accused of being too realist in their approach to risk. Lupton (1999, 82) points to criticisms that suggest risk society theory oversimplifies social responses to expert knowledge. As Hajer (1995) has shown, however, combining risk theory with discourse analysis may overcome this objection. Van Loon (2000) argues that risks are not real in the stand-alone sense, they need some socially constructed mechanism to be interpreted or realised. Beck (2000, 211-220) responds to such criticism by arguing that he is trying to step beyond the realist v. contructivist debate. According to his defence, risks are things that have not yet happened but might. While knowledge of, or ignoring, a risk is socially constructed, the impact of a risk is real if the event happens. Therefore risks have both a constructed and a real component. Mol and Spaargaren (2000, 31) argue that assuming a real basis to risk is a strength rather than a weakness because it avoids the decision-making paralysis that can be invoked by accepting competing social constructions as equally valid. In the case of pollution inventories, it is often necessary for residents or the state to choose between contradictory scientific constructions generated by industry and NGOs regarding the safety of emission levels. Landy, et al. (1994, 49-88), for example, record the difficulty that the US EPA had in setting and resetting ambient ground-level ozone standards in the face of contradictory scientific studies of health effects and the clashing discourses of business versus NGOs. This led to an extended delay that was only broken by a somewhat arbitrary political decision. Getting caught in a relativist policy paralysis more generally risks the onset of serious health and environmental impacts. In short, even if we accept that there is a constructed component to understanding risk, it is a reasonable strategy to behave as if the potential impacts are real.

Applying this synthesis and critique to pollution inventories highlights some interesting points and raises important questions. Clearly such programs do seem to be a product of the calculations of governmentality in that they seek to quantify and manage pollution risks with the identification of risky firms, surveillance, discipline and normalisation mechanisms. They may also open up a small window of opportunity for the sub-politics of risk society by increasing the ability of NGOs to confront industry and play upon the discourse of ecological modernisation that is obsessed with efficiency within companies. In terms of further research, it would be an interesting to test for correlations between gender, race and class in the geographic distribution of high polluting firms. Further, it would be interesting to see if the inventories affect the perception of the environmental and health risks posed by pollution.

Conclusions

While there have been many predictions, to date there is little empirical evidence on whether the Internet will have a positive, negative, or neutral impact on democratic governance. It certainly has the potential to increase the flow of information between NGOs, business and the state and this might make it more difficult for one player to dominate. On-line pollution inventories provide an interesting laboratory in which to test such predictions. A comparison of US, Australian and UK inventories suggest that political culture, access to technology, the design of web sites, expertise, and the particular context of legal/political institutions, remain significant factors that affect the local level of participation and civic engagement. Understanding the broader implications of such web-based tools for governance, however, requires a foray into theories of environmental risk. Both governmentality and reflexive modernisation have something to offer in this regard. Governmentality gives a compelling account of the mind-set that influences the design of such programs, highlights the key role of surveillance, and offers discourse analysis as a means to identify who is shaping the governance agenda. Reflexive modernisation goes further to generate an explanation for why

the environmental risks have arisen in the first place and locates specific programs, such as pollution inventories, within a broader praxis of reform. Together these schools of thought can be synthesised into useful analysis of how the Internet might and should be used to alter democratic and environmental governance.

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